

RENEWAL #2

Contract #0000000000000000000022591

Pursuant to IC § 5-22-17-4 and the terms of the Contract, Indiana Department of Administration (the "State") exercises its option to renew its Contract with NOKIA OF AMERICA CORPORATION (the "Contractor") under the same terms and conditions of the original Contract.

1. The Contract is hereby renewed for an additional period of six (6) months. It shall terminate on December 31, 2021.

Non-Collusion and Acceptance

The undersigned attests, subject to the penalties for perjury, that the undersigned is the Contractor, or that the undersigned is the properly authorized representative, agent, member or officer of the Contractor. Further, to the undersigned's knowledge, neither the undersigned nor any other member, employee, representative, agent or officer of the Contractor, directly or indirectly, has entered into or been offered any sum of money or other consideration for the execution of this Renewal other than that which appears upon the face hereof. **Furthermore, if the undersigned has knowledge that a state officer, employee, or special state appointee, as those terms are defined in IC § 4-2-6-1, has a financial interest in the Renewal, the Contractor attests to compliance with the disclosure requirements in IC § 4-2-6-10.5.**

Agreement to Use Electronic Signatures

I agree, and it is my intent, to sign this Contract by accessing State of Indiana Supplier Portal using the secure password assigned to me and by electronically submitting this Contract to the State of Indiana. I understand that my signing and submitting this Contract in this fashion is the legal equivalent of having placed my handwritten signature on the submitted Contract and this affirmation. I understand and agree that by electronically signing and submitting this Contract in this fashion I am affirming to the truth of the information contained therein. I understand that this Contract will not become binding on the State until it has been approved by the Department of Administration, the State Budget Agency, and the Office of the Attorney General, which approvals will be posted on the Active Contracts Database:

https://fs.gmis.in.gov/psp/guest/SUPPLIER/ERP/c/SOI_CUSTOM_APPS.SOI_PUBLIC_CNTRCT S.GBL

In Witness Whereof, Contractor and the State have, through their duly authorized representatives, entered into this Renewal. The parties, having read and understood the foregoing terms of this Renewal, do by their respective signatures dated below agree to the terms thereof.

NOKIA OF AMERICA CORPORATION

DocuSigned by:
By: *Eric W. Magley*
9D5E09AD06FA49C...

Title: Commercial Contract Manager

Date: 6/24/2021 | 15:13 EDT

Indiana Department of Administration

DocuSigned by:
By: *Mark Hempel*
AC1D5BEC2416499...

Title: Account Management

Date: 6/25/2021 | 10:29 EDT

NOKIA OF AMERICA CORPORATION

DocuSigned by:
By: *Robert Fennelly*
E82BAFD7F8B647A...

Title: Head of East Region Enterprise Sales

Date: 6/24/2021 | 15:30 EDT

Electronically Approved by: Department of Administration By: _____ (for) Lesley A. Crane, Commissioner	
Electronically Approved by: Indiana Office of Technology (IF APPLICABLE) By: _____ (for) Tracy E. Barnes, Chief Information Officer	Electronically Approved by: State Budget Agency By: _____ (for) Zachary Q. Jackson, Director

PARTICIPATING ADDENDUM

Contract # 000000000000000000022591

**NASPO ValuePoint (formerly WSCA-NASPO)
Public Safety Communication Support Equipment 05715
Administered by the State of Washington (hereinafter "Lead State")**

MASTER AGREEMENT NO. 05715

Alcatel-Lucent USA Inc. (part of Nokia Group)
(hereinafter "Contractor")

And

the State of Indiana acting through the Indiana Department of Administration ("IDOA")
on behalf of the Integrated Public Safety Commission ("IPSC")
and Other Governmental Entities
(hereinafter "Participating State/Entity")

Quantity Purchase Agreement ("QPA") #22591

1. Scope:

This Participating ADDENDUM covers the purchase of public safety communication equipment and is for use by state agencies and other entities located in Indiana authorized by Indiana's statutes to utilize **state/entity** contracts with the prior approval of the state's chief procurement official.

Contractor has been awarded the following category/subcategory:

**Microwave Radio, Carrier Grade, Packet Data
Microwave Radio, Network Grade**

2. Participation:

Use of specific NASPO ValuePoint cooperative contracts by agencies, political subdivisions and other entities (including cooperatives) authorized by Indiana's statutes to use **state/entity** contracts are subject to the prior approval of Indiana's Chief Procurement Official. Issues of interpretation and eligibility for participation are solely within the authority of the State Chief Procurement Official.

3. Order of Precedence.

- A. This Participating Addendum, including Indiana-specific terms and conditions attached as **Exhibit 1** to this Participating Addendum. This Participating Addendum shall not diminish, change or impact the rights of the Lead State with regards to its contractual relationship with the Contractor.
- B. NASPO ValuePoint Master Agreement No. 05715

These documents shall be read to be consistent and complementary. Any conflict or ambiguity between these documents shall be resolved by giving priority and precedence in the order listed above.

4. Participating State Modifications or Additions to Master Agreement:

Exhibit 1, hereby attached and incorporated by reference, is the Supplement covering compliance with State laws. The Supplement is incorporated into and made a part of the Master Agreement No, 05715 (“**Exhibit 2**”) and applies to all transactions under this Participating Addendum for the QPA.

5. Primary Contacts:

The primary contact individuals for this participating addendum are as follows (or their named successors):

Contractor

Name	Scott Mehal
Address	600-700 Mountain Ave Murray Hill, NJ 07974-0636
Telephone	(206) 465-7453
Fax	N/A
E-mail	scott.mehal@nokia.com

Participating Entity

Name	John E. Helmer IV
Address	Indiana Department of Administration Procurement Division Indiana Government Center South 402 W. Washington St., Room W-478 Indianapolis, IN 46204
Telephone	317-234-6443
E-mail	JHelmer@idoa.IN.gov

This Participating Addendum and the Master Agreement number 05715 (administered by the State of Washington) together with its exhibits, set forth the entire agreement between the parties with respect to the subject matter of all previous communications, representations or agreements, whether oral or written, with respect to the subject matter hereof. Terms and conditions inconsistent with, contrary or in addition to the terms and conditions of this Addendum and the Master Agreement, together with its exhibits, shall not be added to or incorporated into this Addendum or the Master Agreement and its exhibits, by any subsequent purchase order or otherwise, and any such attempts to add or incorporate such terms and conditions are hereby rejected. The terms and conditions of this Addendum and the Master Agreement and its exhibits shall prevail and govern in the case of any such inconsistent or additional terms within the Participating State.

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Exhibit 1

Indiana Supplement

The parties further agree:

Recitals

WHEREAS, it is in the best interest of the State to enter into a Participating Addendum to the NASPO ValuePoint Master Agreement Number 05715 (“**Exhibit 2**”) in order to establish a Quantity Purchase Agreement (“QPA”) for the purchase of:

**Microwave Radio, Carrier Grade, Packet Data
Microwave Radio, Network Grade;** and

WHEREAS, the Contractor provides its goods and services directly; and

WHEREAS, it is the State’s intent, through this QPA, to aggregate orders, achieve economies in pricing and obtain the optimum provision of services for the Contractor’s products; and

NOW THEREFORE, the parties enter into this Supplement to the NASPO ValuePoint Master Agreement Number 05715 to establish a QPA for public safety communication. support equipment, whereby the State and Other Governmental Entities may purchase Microwave Radio, Carrier Grade, Packet Data and Microwave Radio, Network Grade from the Contractor as described herein pursuant to the terms and conditions set out below.

- A. Definitions. For the purposes of this QPA, the “State” means the State of Indiana executive branch agencies, the judicial branch, the legislative branch, and separately elected statewide officers. “Other Governmental Entities” means any Indiana county, municipality, municipal corporation, state educational institution, school corporation, city or county hospital, or body corporate and politic.
- B. Quantity Purchase Agreement. The purpose of this Supplement is to modify, delete, or amend certain terms and conditions set forth in **Exhibit 2**, including all Contractor materials incorporated by reference in the foregoing, including applicable Attachments found at the Program Website (<http://www.naspovaluepoint.org/#/contract-details/74/contractor/455>), as updated (collectively, this “Contract” and/or “QPA”), which are attached hereto and incorporated herein.
 - Appendix D** Bidder Information & Profile
 - Appendix E** Management & Performance Plan
 - Appendix F** Nationwide Distribution Plan
 - Appendix G** Product Specifications
 - Appendix G** Specifications
 - Appendix H** Price WorksheetsAny inconsistency, conflict, or ambiguity between this Supplement and **Exhibit 2** shall be resolved by giving precedence and effect to this Supplement.

1. Duties of Contractor

- A. Goods and Services Provided. The Contractor shall provide Microwave Radio, Carrier Grade, Packet Data and Microwave Radio, Network Grade meeting or exceeding the requirements of this QPA.
 - 1. Standard goods and services offered under this QPA are found on the Program Website.
 - 2. All equipment ordered under this QPA shall be newly manufactured, not remanufactured or refurbished, except for service repair parts or if certified remanufactured or refurbished and warranted as new.
 - 3. All services, except for maintenance, shall be performed in accordance with a Statement of Work (“SOW”) or Purchase Order, as applicable, and any terms and conditions shall be consistent with this QPA and agreed to by the Parties. The terms and conditions in this QPA shall take precedence over any inconsistent, additional or contradictory terms in any Statement of Work and/or Purchase Order (“PO”(s)).
 - 4. The Contractor shall assist the State in quantifying cost savings and identify ongoing opportunities for additional savings during the term of this QPA as may be reasonably requested by the State.
- B. Orders Placement. Any additional incremental discounts or spot pricing, if offered, may be provided in the discretion and as the sole legal obligation of the Contractor. All requests for quotes and purchase orders placed by the State shall reference this QPA as follows: “*The above quote/PO is based on the State of Indiana Contract Number (QPA) # 22591 and the NASPO ValuePoint Master Agreement No. 05715*”. For the avoidance of doubt,

each PO is a firm offer and must (i) identify the State by full name and address; (ii) itemize the quantity, part number and description of the Equipment that State desires to purchase, the Licensed Materials that State desires to license, and/or the Services that State desires to engage Contractor to perform; (iii) state the price of the itemized Products and Services determined under Section 3 of the Master Agreement (the "Price"), (iv) identify the "bill-to" address, (v) identify the "ship-to" address, (vi) set forth the requested delivery dates (and any shipping instructions) and/or performance dates, consistent with Contractor's standard published intervals, (viii) provide a State contact name and telephone number, and (ix) explicitly refer to the number of this Participating Addendum. State's "bill-to" and "ship-to" address must be located within the United States. All POs are subject to review and written acceptance by Contractor.

Unless otherwise directed by Contractor, please send your Purchasing Entity PO to Contractor so Contractor can arrange for proper ordering and installation of the ordered items. During Contract performance, Contractor may identify and make available to Purchasing Entities upon request a list of subcontractors, dealers, and distributors who will supply products or perform services in fulfillment of Contract requirements. If applicable, the information shall include subcontractor's, dealer's, and distributor's name, the nature of services to be performed or products to be sold by product category/subcategory, address, telephone, facsimile, email, and federal tax identification number (TIN) (if the company is authorized to sell and invoice for products and services).

- C. Subcontractors: All the Contractor's dealers/resellers/distributors authorized in the State of Indiana as shown on the NASPO ValuePoint website, are approved to provide sales and service support to participants in the NASPO ValuePoint Master Agreement. The Contractor's dealer's/resellers/distributors participation will be in accordance with the terms and conditions set forth in the aforementioned Master Agreement.
- D. Other Governmental Entities. Other Governmental Entities may purchase from this QPA by the means of a Purchase Order, a Statement of Work, or such other document as is acceptable to the Contractor and the Government Entity. The State will not be responsible or financially liable for any orders placed, goods provided, or work performed for any Other Governmental Entity.

2. Term

This contract begins on January 01, 2018 and ends December 31, 2020.

3. Consideration

- A. Pricing. For purchases by the State and Other Governmental Entities, minimum pricing for all products and services shall be that shown on the Contractor's current price list in effect at the time the order is placed less firm discounts. The Equipment or services price quoted shall be for the purchase of equipment or services meeting the specifications requested (products will meet published specification and professional services will meet the requirements in the SOW), and shall be for FOB destination. No additional charge may be requested later. The price list in effect at the time of order placement shall be used when applying price discounts specified in **Appendix H** Price Worksheets submitted with Contractor's response to RFP 05715. However, if the Contractor has provided a specific price quote to the Purchaser than the prices quoted must be held firm for a minimum period of sixty (60) days after the date of the quote.
- B. Invoicing. The Contractor will invoice the State or Other Governmental Entity directly for products or services for which it received a Purchase Order or SOW. All invoices must reference this QPA in order to be processed by the Auditor of State.

For the avoidance of doubt, Contractor will issue invoices as follows:

- 1. for Products, upon shipment;
 - 2. for non-recurring Services, including engineering and installation Services, as such Services are completed; and
 - 3. for recurring Services, including maintenance, technical support, and network management Services, upon commencement of such Services and thereafter on a quarterly basis at the beginning of each quarter.
- C. By mutual agreement of the parties, the following terms and conditions are deleted from the Master Price Agreement:
 - 1. Any provision requiring the State of Indiana to provide insurance
 - 2. Any provision requiring the State of Indiana to provide indemnity
 - 3. Any provision providing that the Contract be construed in accordance with laws other than those of the State of Indiana

4. Any provision providing that suit be brought in any state other than Indiana
5. Any provision providing for resolution of contract disputes
6. Any provision requiring the State of Indiana to pay any taxes
7. Any provision requiring the State of Indiana to pay penalties, liquidated damages, interest or attorney's fees
8. Any provision modifying the applicable Indiana statute of limitations
9. Any provision relating to the time within which a claim must be made.
10. Any provision requiring payment of consideration in advance unless authorized by an exception listed in IC §4-13-2-20
11. Any provision limiting disclosure of the contract in violation of the Access to Public Records Act, IC §5-14-3. This is a Public Contract and will be posted on the State's website pursuant to Executive Order 05-07
12. Any provision requiring payment in less than 35 days
13. Any provision providing for automatic renewal
14. Any provision giving the Master Price Agreement precedence over this Supplement

4. Access to Records

The Contractor and its subcontractors, if any, shall maintain all books, documents, papers, accounting records, and other evidence pertaining to all costs incurred under this Contract. They shall make such materials available at their respective offices at all reasonable times during this Contract, and for three (3) years from the date of final payment under this Contract, for inspection by the State or its authorized designees. Copies shall be furnished at no cost to the State if requested.

5. Assignment; Successors

The Contractor binds its successors and assignees to all the terms and conditions of this Contract. The Contractor shall not assign or subcontract the whole or any part of this Contract without the State's prior written consent. The Contractor may assign its right to receive payments to such third parties as the Contractor may desire without the prior written consent of the State, provided that the Contractor gives written notice (including evidence of such assignment) to the State thirty (30) days in advance of any payment so assigned. The assignment shall cover all unpaid amounts under this Contract and shall not be made to more than one party.

6. Assignment of Antitrust Claims

As part of the consideration for the award of this Contract, the Contractor assigns to the State all right, title, and interest in and to any claims the Contractor now has, or may acquire, under state or federal antitrust laws relating to the products or services which are the subject of this Contract.

7. Audits

The Contractor acknowledges that it may be required to submit to an audit of funds paid through this Contract. Any such audit shall be conducted in accordance with IC §5-11-1, et. seq. and audit guidelines specified by the State.

8. Authority to Bind Contractor

The signatory for the Contractor represents that he/she has been duly authorized to execute this Contract on behalf of the Contractor and has obtained all necessary or applicable approvals to make this Contract fully binding upon the Contractor when his/her signature is affixed, and accepted by the State.

9. Changes in Work

The Contractor shall not commence any additional work or change the scope of the work until authorized in writing by the State. The Contractor shall make no claim for additional compensation in the absence of a prior written approval and amendment executed by all signatories hereto. This Contract may only be amended, supplemented or modified by a written document executed in the same manner as this Contract.

10. Compliance with Laws

- A. The Contractor shall comply with all applicable federal, state, and local laws, rules, regulations, and ordinances, and all provisions required thereby to be included herein are hereby incorporated by reference. The enactment or modification of any applicable state or federal statute or the promulgation of rules or regulations thereunder after execution of this Contract shall be reviewed by the State and the Contractor to determine whether the provisions of this Contract require formal modification.
- B. The Contractor and its agents shall abide by all ethical requirements that apply to persons who have a business relationship with the State as set forth in IC §4-2-6, et seq., IC §4-2-7, et seq., and the regulations promulgated

thereunder. **If the Contractor has knowledge, or would have acquired knowledge with reasonable inquiry, that a state officer, employee, or special state appointee, as those terms are defined in IC 4-2-6-1, has a financial interest in the Contract, the Contractor shall ensure compliance with the disclosure requirements in IC 4-2-6-10.5 prior to the execution of this contract.** If the Contractor is not familiar with these ethical requirements, the Contractor should refer any questions to the Indiana State Ethics Commission, or visit the Inspector General's website at <http://www.in.gov/ig/>. If the Contractor or its agents violate any applicable ethical standards, the State may, in its sole discretion, terminate this Contract immediately upon notice to the Contractor. In addition, the Contractor may be subject to penalties under IC §§4-2-6, 4-2-7, 35-44.1-1-4, and under any other applicable laws.

- C. The Contractor certifies by entering into this Contract that neither it nor its principal(s) is presently in arrears in payment of taxes, permit fees or other statutory, regulatory or judicially required payments to the State of Indiana. The Contractor agrees that any payments currently due to the State of Indiana may be withheld from payments due to the Contractor. Additionally, further work or payments may be withheld, delayed, or denied and/or this Contract suspended until the Contractor is current in its payments and has submitted proof of such payment to the State.
- D. The Contractor warrants that it has no current, pending or outstanding criminal, civil, or enforcement actions initiated by the State, and agrees that it will immediately notify the State of any such actions. During the term of such actions, the Contractor agrees that the State may delay, withhold, or deny work under any supplement, amendment, change order or other contractual device issued pursuant to this Contract.
- E. If a valid dispute exists as to the Contractor's liability or guilt in any action initiated by the State or its agencies, and the State decides to delay, withhold, or deny work to the Contractor, the Contractor may request that it be allowed to continue, or receive work, without delay. The Contractor must submit, in writing, a request for review to the Indiana Department of Administration (IDOA) following the procedures for disputes outlined herein. A determination by IDOA shall be binding on the parties. Any payments that the State may delay, withhold, deny, or apply under this section shall not be subject to penalty or interest, except as permitted by IC §5-17-5.
- F. The Contractor warrants that the Contractor and its subcontractors, if any, shall obtain and maintain all required permits, licenses, registrations, and approvals, and shall comply with all health, safety, and environmental statutes, rules, or regulations in the performance of work activities for the State. Failure to do so may be deemed a material breach of this Contract and grounds for immediate termination and denial of further work with the State.
- G. The Contractor affirms that, if it is an entity described in IC Title 23, it is properly registered and owes no outstanding reports to the Indiana Secretary of State.
- H. As required by IC §5-22-3-7:
 - 1. The Contractor and any principals of the Contractor certify that:
 - (A) the Contractor, except for de minimis and nonsystematic violations, has not violated the terms of:
 - (i) IC §24-4.7 [Telephone Solicitation Of Consumers];
 - (ii) IC §24-5-12 [Telephone Solicitations]; or
 - (iii) IC §24-5-14 [Regulation of Automatic Dialing Machines]; in the previous three hundred sixty-five (365) days, even if IC §24-4.7 is preempted by federal law; and
 - (B) The Contractor will not violate the terms of IC §24-4.7 for the duration of the Contract, even if IC §24-4.7 is preempted by federal law.
 - 2. The Contractor and any principals of the Contractor certify that an affiliate or principal of the Contractor and any agent acting on behalf of the Contractor or on behalf of an affiliate or principal of the Contractor, except for de minimis and nonsystematic violations,
 - (A) has not violated the terms of IC §24-4.7 in the previous three hundred sixty-five (365) days, even if IC §24-4.7 is preempted by federal law; and
 - (B) will not violate the terms of IC §24-4.7 for the duration of the Contract, even if IC §24-4.7 is preempted by federal law.

11. Condition of Payment

All services provided by the Contractor under this Contract must be performed in accordance with the specifications and in accordance with all applicable federal, state, local laws, ordinances, rules and regulations. The State shall not be required to pay for work found not to be performed in accordance with the specifications or in violation of any federal, state or local statute, ordinance, rule or regulation.

12. Confidentiality of State Information

The Contractor understands and agrees that data, materials, and information disclosed to the Contractor may contain confidential and protected information. The Contractor covenants that data, material, and information gathered, based upon or disclosed to the Contractor for the purpose of this Contract will not be disclosed to or discussed with third parties without the prior written consent of the State.

Each party acknowledges and agrees that this Participating Addendum and any and all information obtained by the State from the Contractor in connection with this Agreement are subject to the State's public records act. The State and each Purchasing Entity acknowledge that Contractor's and its affiliated companies' and their respective licensors' trade secrets, as defined in IC 24-2-3-2 (collectively, "Contractor's Trade Secrets") are exempt from disclosure. Contractor authorizes the State and each Purchasing Entity to use Contractor's Trade Secrets, which Contractor in its discretion may disclose or make available to the State or a Purchasing Entity, solely to exercise the State's or the Purchasing Entity's rights and to perform its obligations under this Participating Addendum and the Master Agreement. The State and each Purchasing Entity shall hold and maintain all of Contractor's Trade Secrets in confidence for the sole and exclusive benefit of Contractor or the affiliated company of Contractor who provided the Contractor's Trade Secrets or made them available to the State or the Purchasing Entity.

13. Continuity of Services

The Contractor shall be reimbursed for all reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations).

14. Debarment and Suspension

- A. The Contractor certifies by entering into this Contract that neither it nor its principals nor any of its subcontractors are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from entering into this Contract by any federal agency or by any department, agency or political subdivision of the State of Indiana. The term "principal" for purposes of this Contract means an officer, director, owner, partner, key employee or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of the Contractor.
- B. The Contractor certifies that it has verified the state and federal suspension and debarment status for all subcontractors receiving funds under this Contract and shall be solely responsible for any recoupment, penalties or costs that might arise from use of a suspended or debarred subcontractor. The Contractor shall immediately notify the State if any subcontractor becomes debarred or suspended, and shall, at the State's request, take all steps required by the State to terminate its contractual relationship with the subcontractor for work to be performed under this Contract.

15. Default by State

If the State, sixty (60) days after receipt of written notice, fails to correct or cure any material breach of this Contract, the Contractor may cancel and terminate this Contract and institute measures to collect monies due up to and including the date of termination.

16. Disputes

- A. Should any disputes arise with respect to this Contract, the Contractor and the State agree to act immediately to resolve such disputes. Time is of the essence in the resolution of disputes.
- B. The Contractor agrees that, the existence of a dispute notwithstanding, it will continue without delay to carry out all of its responsibilities under this Contract that are not affected by the dispute. Should the Contractor fail to continue to perform its responsibilities regarding all non-disputed work, without delay, any additional costs incurred by the State or the Contractor as a result of such failure to proceed shall be borne by the Contractor, and the Contractor shall make no claim against the State for such costs.
- C. If the parties are unable to resolve a contract dispute between them after good faith attempts to do so, a dissatisfied party shall submit the dispute to the Commissioner of the Indiana Department of Administration for resolution. The dissatisfied party shall give written notice to the Commissioner and the other party. The notice shall include (1) a description of the disputed issues, (2) the efforts made to resolve the dispute, and (3) a proposed resolution. The Commissioner shall promptly issue a Notice setting out documents and materials to be submitted to the Commissioner in order to resolve the dispute; the Notice may also afford the parties the opportunity to make presentations and enter into further negotiations. Within thirty (30) business days of the

conclusion of the final presentations, the Commissioner shall issue a written decision and furnish it to both parties. The Commissioner's decision shall be the final and conclusive administrative decision unless either party serves on the Commissioner and the other party, within ten (10) business days after receipt of the Commissioner's decision, a written request for reconsideration and modification of the written decision. If the Commissioner does not modify the written decision within thirty (30) business days, either party may take such other action helpful to resolving the dispute, including submitting the dispute to an Indiana court of competent jurisdiction. If the parties accept the Commissioner's decision, it may be memorialized as a written Amendment to this Contract if appropriate.

- D. The State may withhold payments on disputed items pending resolution of the dispute. The unintentional nonpayment by the State to the Contractor of one or more invoices not in dispute in accordance with the terms of this Contract will not be cause for the Contractor to terminate this Contract, and the Contractor may bring suit to collect these amounts without following the disputes procedure contained herein.
- E. With the written approval of the Commissioner of the Indiana Department of Administration, the parties may agree to forego the process described in subdivision C. relating to submission of the dispute to the Commissioner.
- F. This paragraph shall not be construed to abrogate provisions of Ind. Code 4-6-2-11 in situations where dispute resolution efforts lead to a compromise of claims in favor of the State as described in that statute. In particular, releases or settlement agreements involving releases of legal claims or potential legal claims of the state should be processed consistent with Ind. Code 4-6-2-11, which requires approval of the Governor and Attorney General.

17. Drug-Free Workplace Certification

As required by Executive Order No. 90-5 dated April 12, 1990, issued by the Governor of Indiana, the Contractor hereby covenants and agrees to make a good faith effort to provide and maintain a drug-free workplace. The Contractor will give written notice to the State within ten (10) days after receiving actual notice that the Contractor, or an employee of the Contractor in the State of Indiana, has been convicted of a criminal drug violation occurring in the workplace. False certification or violation of this certification may result in sanctions including, but not limited to, suspension of contract payments, termination of this Contract and/or debarment of contracting opportunities with the State for up to three (3) years.

In addition to the provisions of the above paragraph, if the total amount set forth in this Contract is in excess of \$25,000.00, the Contractor certifies and agrees that it will provide a drug-free workplace by:

- A. Publishing and providing to all of its employees a statement notifying them that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace, and specifying the actions that will be taken against employees for violations of such prohibition;
- B. Establishing a drug-free awareness program to inform its employees of (1) the dangers of drug abuse in the workplace; (2) the Contractor's policy of maintaining a drug-free workplace; (3) any available drug counseling, rehabilitation and employee assistance programs; and (4) the penalties that may be imposed upon an employee for drug abuse violations occurring in the workplace;
- C. Notifying all employees in the statement required by subparagraph (A) above that as a condition of continued employment, the employee will (1) abide by the terms of the statement; and (2) notify the Contractor of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;
- D. Notifying the State in writing within ten (10) days after receiving notice from an employee under subdivision (C)(2) above, or otherwise receiving actual notice of such conviction;
- E. Within thirty (30) days after receiving notice under subdivision (C)(2) above of a conviction, imposing the following sanctions or remedial measures on any employee who is convicted of drug abuse violations occurring in the workplace: (1) taking appropriate personnel action against the employee, up to and including termination; or (2) requiring such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state or local health, law enforcement, or other appropriate agency; and
- F. Making a good faith effort to maintain a drug-free workplace through the implementation of subparagraphs (A) through (E) above.

18. Employment Eligibility Verification

As required by IC §22-5-1.7, the Contractor swears or affirms under the penalties of perjury that the Contractor does not knowingly employ an unauthorized alien. The Contractor further agrees that:

- A. The Contractor shall enroll in and verify the work eligibility status of all his/her/its newly hired employees through the E-Verify program as defined in IC §22-5-1.7-3. The Contractor is not required to participate should the E-Verify program cease to exist. Additionally, the Contractor is not required to participate if the Contractor is self-employed and does not employ any employees.
- B. The Contractor shall not knowingly employ or contract with an unauthorized alien. The Contractor shall not retain an employee or contract with a person that the Contractor subsequently learns is an unauthorized alien.
- C. The Contractor shall require his/her/its subcontractors, who perform work under this Contract, to certify to the Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien. The Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor.
- D. The State may terminate for default if the Contractor fails to cure a breach of this provision no later than thirty (30) days after being notified by the State.

19. Employment Option; Deleted, not applicable.

20. Force Majeure

In the event that either party is unable to perform any of its obligations under this Contract or to enjoy any of its benefits because of natural disaster or decrees of governmental bodies not the fault of the affected party (hereinafter referred to as a "Force Majeure Event"), the party who has been so affected shall immediately or as soon as is reasonably possible under the circumstances give notice to the other party and shall do everything possible to resume performance. Upon receipt of such notice, all obligations under this Contract shall be immediately suspended. If the period of nonperformance exceeds thirty (30) days from the receipt of notice of the Force Majeure Event, the party whose ability to perform has not been so affected may, by giving written notice, terminate this Contract

21. Funding Cancellation

When the Director of the State Budget Agency makes a written determination that funds are not appropriated or otherwise available to support continuation of performance of this Contract, this Contract shall be canceled. A determination by the Director of State Budget Agency that funds are not appropriated or otherwise available to support continuation of performance shall be final and conclusive. Notwithstanding the aforementioned, Contractor shall be paid for all services performed and goods delivered prior to the cancellation date.

22. Governing Law

This Contract shall be governed, construed, and enforced in accordance with the laws of the State of Indiana, without regard to its conflict of laws rules. Suit, if any, must be brought in the State of Indiana.

23. HIPAA Compliance; Deleted, not applicable.

24. Indemnification

The Contractor agrees to indemnify, defend, and hold harmless the State, its agents, officials, and employees from all third party claims and suits including court costs, attorney's fees, and other expenses caused by any act or omission of the Contractor and/or its subcontractors, if any, in the performance of this Contract. The State shall not provide such indemnification to the Contractor.

25. Independent Contractor; Workers' Compensation Insurance

The Contractor is performing as an independent entity under this Contract. No part of this Contract shall be construed to represent the creation of an employment, agency, partnership or joint venture agreement between the parties. Neither party will assume liability for any injury (including death) to any persons, or damage to any property, arising out of the acts or omissions of the agents, employees or subcontractors of the other party. The Contractor shall provide all necessary unemployment and workers' compensation insurance for the Contractor's employees, and shall provide the State with a Certificate of Insurance evidencing such coverage prior to starting work under this Contract.

26. Information Technology Enterprise Architecture Requirements

If the Contractor provides any information technology related products or services to the State, the Contractor shall comply with all applicable IOT standards, policies and guidelines, which are online at <http://iot.in.gov/architecture/>. The Contractor specifically agrees that all hardware, software and services provided to or purchased by the State shall be compatible with the principles and goals contained in the electronic and information technology accessibility standards adopted under Section 508 of the Federal Rehabilitation Act of 1973 (29 U.S.C. 794d) and IC 4-13.1-3. Any deviation from these architecture requirements must be approved in writing by IOT in advance. The State may terminate this Contract for default if the Contractor fails to cure a breach of this provision within a reasonable time.

27. Insurance

- A. The Contractor and their subcontractors (if any) shall secure and keep in force during the term of this Contract the following insurance coverages (if applicable) covering the Contractor for any and all claims of any nature which may in any manner arise out of or result from Contractor's performance under this Contract:
1. Commercial general liability, including contractual coverage, and products or completed operations coverage (if applicable), with minimum liability limits not less than \$700,000 per person and \$5,000,000 per occurrence unless additional coverage is required by the State. The State is to be named as an additional insured on a primary, non-contributory basis for any liability arising directly or indirectly under or in connection with this Contract.
 2. Automobile liability for owned, non-owned and hired autos with minimum liability limits of \$700,000 per person and \$5,000,000 per occurrence. The State is to be named as an additional insured on a primary, non-contributory basis.
 3. Errors and Omissions liability with minimum liability limits of \$1,000,000 per claim and in the aggregate. Coverage for the benefit of the State shall continue for a period of two (2) years after the date of service provided under this Contract.
 4. Fiduciary Liability is required if the Contractor is responsible for the management and oversight of various employee benefit plans and programs such as pensions, profit-sharing and savings, among others. These contractors face potential claims for mismanagement brought by plan members. Limits should be no less than \$700,000 per cause of action and \$5,000,000 per occurrence.
 5. Valuable Papers coverage, available under an Inland Marine policy, is required when any plans, drawings, media, data, records, reports, billings and other documents are produced or used under this agreement. Insurance must have limits sufficient to pay for the re-creation and reconstruction of such records.
 6. The Contractor shall secure the appropriate Surety or Fidelity Bond(s) as required by the state department served or by applicable statute.
 7. The Contractor shall provide proof of such insurance coverage by tendering to the undersigned State representative a certificate of insurance prior to the commencement of this Contract and proof of workers' compensation coverage meeting all statutory requirements of IC §22-3-2. In addition, proof of an "all states endorsement" covering claims occurring outside the State is required if any of the services provided under this Contract involve work outside of Indiana.
- B. The Contractor's insurance coverage must meet the following additional requirements:
1. The insurer must have a certificate of authority or other appropriate authorization to operate in the state in which the policy was issued.
 2. Any deductible or self-insured retention amount or other similar obligation under the insurance policies shall be the sole obligation of the Contractor.
 3. The State will be defended, indemnified and held harmless to the full extent of any coverage actually secured by the Contractor in excess of the minimum requirements set forth above. The duty to indemnify the State under this Contract shall not be limited by the insurance required in this Contract.

4. The insurance required in this Contract, through policy provisions shall provide thirty (30) days' prior written notice of cancellation to the undersigned State agency.
 5. The Contractor waives and agrees to require their insurer to waive their rights of subrogation against the State of Indiana.
- C. Failure to provide insurance as required in this Contract may be deemed a material breach of contract entitling the State to immediately terminate this Contract. The Contractor shall furnish a certificate of insurance and all endorsements to the State before the commencement of this Contract.

28. Key Person(s); Deleted, not applicable.

29. Licensing Standards

The Contractor, its employees and subcontractors shall comply with all applicable licensing standards, certification standards, accrediting standards and any other laws, rules, or regulations governing services to be provided by the Contractor pursuant to this Contract. The State will not pay the Contractor for any services performed when the Contractor, its employees or subcontractors are not in compliance with such applicable standards, laws, rules, or regulations. If any license, certification or accreditation expires or is revoked, or any disciplinary action is taken against an applicable license, certification, or accreditation, the Contractor shall notify the State immediately and the State, at its option, may immediately terminate this Contract.

30. Merger & Modification

This Contract constitutes the entire agreement between the parties. No understandings, agreements, or representations, oral or written, not specified within this Contract will be valid provisions of this Contract. This Contract may not be modified, supplemented, or amended, except by written agreement signed by all necessary parties.

31. Minority and Women's Business Enterprises Compliance

Award of this Contract was based, in part, on the MBE/WBE participation plan. The following certified MBE or WBE subcontractors will be participating in this Contract:

MBE/WBE	PHONE	COMPANY NAME	SCOPE OF PRODUCTS and/or SERVICES	UTILIZATION DATE	PERCENT
None					0.000

A copy of each subcontractor agreement must be submitted to IDOA's MBE/WBE Division within thirty (30) days of the effective date of this Contract. Failure to provide a copy of any subcontractor agreement will be deemed a violation of the rules governing MBE/WBE procurement, and may result in sanctions allowable under 25 IAC 5-7-8. Failure to provide any subcontractor agreement may also be considered a material breach of this Contract. The Contractor must obtain approval from IDOA's MBE/WBE Division before changing the participation plan submitted in connection with this Contract.

The Contractor shall report payments made to MBE/WBE Division subcontractors under this Contract on a monthly basis. Monthly reports shall be made using the online audit tool, commonly referred to as "Pay Audit." MBE/WBE Division subcontractor payments shall also be reported to the Division as reasonably requested and in a format to be determined by Division.

32. Nondiscrimination

Pursuant to the Indiana Civil Rights Law, specifically including IC §22-9-1-10, and in keeping with the purposes of the federal Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act, the Contractor covenants that it shall not discriminate against any employee or applicant for employment relating to this Contract with respect to the hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment, because of the employee's or applicant's race, color, national origin, religion, sex, age, disability, ancestry, status as a veteran, or any other characteristic protected by federal, state, or local law ("Protected Characteristics"). Contractor certifies compliance with applicable federal laws, regulations, and executive orders prohibiting discrimination based on the Protected Characteristics in the provision of services. Breach of this paragraph may be regarded as a material breach of this Contract, but nothing in this paragraph shall be construed to imply or establish an employment relationship between the State and any applicant or employee of the Contractor or any subcontractor.

The State is a recipient of federal funds, and therefore, where applicable, Contractor and any subcontractors shall comply with requisite affirmative action requirements, including reporting, pursuant to 41 CFR Chapter 60, as amended, and Section 202 of Executive Order 11246 as amended by Executive Order 13672.

33. Notice to Parties

Whenever any notice, statement or other communication is required under this Contract, it shall be sent by first class mail or via an established courier / delivery service to the following addresses, unless otherwise specifically advised.

Notices to the State shall be sent to:

Indiana Department of Administration
Attn: Account Management
402 West Washington Street, Room W468
Indianapolis, IN 46204

Notices to the Contractor shall be sent to:

Alcatel-Lucent USA Inc.
Attn: Melanie Franz, PCM
601 Data Drive
Plano, TX 75075

As required by IC §4-13-2-14.8, payments to the Contractor shall be made via electronic funds transfer in accordance with instructions filed by the Contractor with the Indiana Auditor of State.

34. Order of Precedence; Incorporation by Reference

Any inconsistency or ambiguity in this Contract shall be resolved by giving precedence in the following order: (1) this Supplement, (2) the Participating Addendum, (3) the Master Agreement, and (4) Orders placed pursuant to this QPA. All attachments, and all documents referred to in this paragraph, are hereby incorporated fully by reference.

35. Grant of License

- A. Rights in Software. Notwithstanding anything to the contrary in this Participating Addendum and the Master Agreement, the Embedded Software and any software application program (in object-code form and excluding source code) that does not permanently reside on a computing device ("Non-Embedded Software") and any related documentation (collectively, "Licensed Material") are licensed to the Purchasing Entity and not sold. All rights, title and interest in and to the Licensed Material, including all intellectual property rights, remain vested in Contractor, its suppliers and licensors, and the Purchasing Entity is granted only a limited license to use the Licensed Material in conjunction with the equipment, as provided in this Section and in Section 31 of the Master Agreement (with respect to Embedded Software).
- B. License to Non-Embedded Software. Upon delivery of any Non-Embedded Software and subject to the Purchasing Entity's payment of the applicable fees for such Non-Embedded Software, Contractor hereby grants the Purchasing Entity a limited, nonexclusive, nontransferable license (a) to use those portions and features of the Non-Embedded Software for which Contractor has authorized the activation solely on or with the single unit or arrangement of equipment for the Purchasing Entity's internal use in the United States; and (b) to copy the Non-Embedded Software as reasonably necessary for backup and archival purposes provided the copies contain all of Contractor's proprietary notices contained in the original Non-Embedded Software. The Purchasing Entity acknowledges and agrees that (c) Contractor may have encoded within the software optional functionality, features and/or capacity, which may be accessed only through the purchase of the applicable license extension from Contractor at an additional price (no licenses are granted to such functionality, features and/or capacity unless the Purchasing Entity purchases the applicable license extension); and (d) the Purchasing Entity may need to obtain a new or additional application key from Contractor to use such software. This Section applies to all updates, upgrades, maintenance releases, revisions, and enhancements for the Non-Embedded Software.
- C. Restrictions. The Purchasing Entity shall not directly or indirectly: (a) modify, copy (other than as permitted above), transmit, alter, merge, decompile, disassemble, reverse engineer or adapt any Licensed Material or portion thereof; (b) encumber, time-share, rent or lease the rights granted herein; (c) manufacture, adapt, create derivative works of, localize, port or otherwise modify any Licensed Material or portion thereof; (d) disclose or otherwise make available any Licensed Material or portion thereof to any third party; (e) enable any software functionality, feature or capacity which Contractor licenses as a separate product, without Contractor's prior written consent; (f) take any action that may result in the software becoming subjected to the terms of a license

that requires it to be (i) disclosed or distributed in source code form, (ii) licensed for the purpose of making derivative works, or (iii) redistributable at no charge; or (g) use any Licensed Material or portion thereof except in accordance with this Section and Section 31 of the Master Agreement.

- D. **FOSS.** If the Embedded Software or Non-Embedded Software contains free or open source software (FOSS) that is packaged separately or integrated with the Software, and to which third party license obligations apply, information will be available in the FOSS itself, on the website from which the download is available, or from Contractor upon Purchasing Entity's request, indicating the license under which such FOSS was released, and containing required acknowledgements, legends and/or notices. Unless otherwise dictated by a FOSS license (such as GPL, LGPL, and Affero GPL) that requires Contractor to grant the same rights to the parties to whom we distribute the FOSS, the Purchasing Entity's rights to use, copy, and further distribute (if applicable) the FOSS are governed by this license, and not by the FOSS license originally applicable to the FOSS. If Purchasing Entity modifies any FOSS then notwithstanding any other provisions to the contrary, Contractor will have no further liability or obligation to provide support, maintenance, warranty or indemnity with respect to the modified FOSS or any Contractor products with which the modified version of the FOSS interacts.
- E. **Additional License.** Certain Software may be delivered with its own specific license ("Additional License"). In such a case, the terms of the Additional License will be delivered to Purchasing Entity, such as in a separate license .txt file or as part of a separate click-to-accept agreement, and will govern use of the Software by Purchasing Entity to the extent Contractor does not have a right to supersede them. Contractor's licensors are third party beneficiaries of these license provisions (and those in the Master Agreement) with respect to their software and documentation.

36. Payments

- A. All payments shall be made 35 days in arrears in conformance with State fiscal policies and procedures and, as required by IC §4-13-2-14.8, the direct deposit by electronic funds transfer to the financial institution designated by the Contractor in writing unless a specific waiver has been obtained from the Indiana Auditor of State. No payments will be made in advance of receipt of the goods or services that are the subject of this Contract except as permitted by IC §4-13-2-20.
- B. The State Budget Agency and the Contractor acknowledge that Contractor is being paid in advance for the maintenance of equipment and / or software. Pursuant to IC §4-13-2-20(b)(14), Contractor agrees that if it fails to perform the maintenance required under this Contract, upon receipt of written notice from the State, it shall promptly refund the consideration paid, pro-rated through the date of non-performance.

37. Penalties/Interest/Attorney's Fees.

The State will in good faith perform its required obligations hereunder and does not agree to pay any penalties, liquidated damages, interest or attorney's fees, except as permitted by Indiana law, in part, IC §5-17-5, IC §34-54-8, IC §34-13-1 and IC § 34-52-2-3.

Notwithstanding the provisions contained in IC §5-17-5, any liability resulting from the State's failure to make prompt payment shall be based solely on the amount of funding originating from the State and shall not be based on funding from federal or other sources.

38. Progress Reports

The Contractor shall submit progress reports to the State upon request. The report shall be oral, unless the State, upon receipt of the oral report, should deem it necessary to have it in written form. The progress reports shall serve the purpose of assuring the State that work is progressing in line with the schedule, and that completion can be reasonably assured on the scheduled date.

39. Public Record

Subject to Section 12, the Contractor acknowledges that the State will not treat this Contract as containing confidential information, and will post this Contract on its website as required by Executive Order 05-07. Use by the public of the information contained in this Contract shall not be considered an act of the State.

40. Renewal Option

This Contract may be renewed under the same terms and conditions, subject to the approval of the Commissioner of the Department of Administration and the State Budget Director in compliance with IC §5-22-17-4. The term of the renewed contract may not be longer than the term of the original contract.

41. Severability

The invalidity of any section, subsection, clause or provision of this Contract shall not affect the validity of the remaining sections, subsections, clauses or provisions of this Contract.

42. Substantial Performance

This Contract shall be deemed to be substantially performed only when fully performed according to its terms and conditions and any written amendments or supplements.

43. Taxes

The State is exempt from most state and local taxes and many federal taxes and shall provide Contractor with an acceptable tax exempt certificate. The State will not be responsible for any taxes levied on the Contractor as a result of this Contract.

44. Termination for Convenience

This Contract may be terminated, in whole or in part, by the State, which shall include and is not limited to the Indiana Department of Administration and the State Budget Agency whenever, for any reason, the State determines that such termination is in its best interest. Termination of services shall be effected by delivery to the Contractor of a Termination Notice at least thirty (30) days prior to the termination effective date, specifying the extent to which performance of services under such termination becomes effective. The Contractor shall be compensated for services properly rendered prior to the effective date of termination. The State will not be liable for services performed after the effective date of termination. The Contractor shall be compensated for services herein provided but in no case shall total payment made to the Contractor exceed the original contract price or shall any price increase be allowed on individual line items if canceled only in part prior to the original termination date. For the purposes of this paragraph, the parties stipulate and agree that the Indiana Department of Administration shall be deemed to be a party to this agreement with authority to terminate the same for convenience when such termination is determined by the Commissioner of IDOA to be in the best interests of the State.

45. Termination for Default

- A. With the provision of thirty (30) days' notice to the Contractor, the State may terminate this Contract in whole or in part if the Contractor fails to:
 - 1. Correct or cure any breach of this Contract; the time to correct or cure the breach may be extended beyond thirty (30) days if the State determines progress is being made and the extension is agreed to by the parties;
 - 2. Deliver the supplies or perform the services within the time specified in this Contract or any extension;
 - 3. Make progress so as to endanger performance of this Contract; or
 - 4. Perform any of the other provisions of this Contract.
- B. The State shall pay the contract price for completed supplies delivered and services accepted. The Contractor and the State shall agree on the amount of payment for manufacturing materials delivered and accepted and for the protection and preservation of the property. Failure to agree will be a dispute under the Disputes clause. The State may withhold from these amounts any sum the State determines to be necessary to protect the State against loss because of outstanding liens or claims of former lien holders.
- C. The rights and remedies of the State in this clause are in addition to any other rights and remedies provided by law or equity or under this Contract.

46. Travel

No expenses for travel will be reimbursed unless specifically permitted under the scope of services or consideration provisions.

47. Indiana Veteran's Business Enterprise Compliance.

Award of this Contract was based, in part, on the Indiana Veteran's Business Enterprise ("IVBE") participation plan. The following IVBE subcontractors will be participating in this Contract:

IVB	PHONE	COMPANY NAME	SCOPE OF PRODUCTS	UTILIZATION	PERCENT
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			and/or SERVICES	DATE	
None					0.000

A copy of each subcontractor agreement shall be submitted to IDOA within thirty (30) days of the request. Failure to provide any subcontractor agreement may also be considered a material breach of this Contract. The Contractor must obtain approval from IDOA before changing the IVBE participation plan submitted in connection with this Contract.

The Contractor shall report payments made to IVBE subcontractors under this Contract on a monthly basis. Monthly reports shall be made using the online audit tool, commonly referred to as "Pay Audit." IVBE subcontractor payments shall also be reported to IDOA as reasonably requested and in a format to be determined by IDOA.

48. Waiver of Rights

No right conferred on either party under this Contract shall be deemed waived, and no breach of this Contract excused, unless such waiver is in writing and signed by the party claimed to have waived such right. Neither the State's review, approval or acceptance of, nor payment for, the services required under this Contract shall be construed to operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, and the Contractor shall be and remain liable to the State in accordance with applicable law for all damages to the State caused by the Contractor's negligent performance of any of the services furnished under this Contract.

49. Work Standards

The Contractor shall execute its responsibilities by following and applying at all times the highest professional and technical guidelines and standards. If the State becomes dissatisfied with the work product of or the working relationship with those individuals assigned to work on this Contract, the State may request in writing the replacement of any or all such individuals, and the Contractor shall grant such request.

50. From Contract (Exhibit 2) Clarifications

A. Form Contract Appendix C, 28.(c), INSPECTION AND ACCEPTANCE.

To clarify the Acceptance Testing process for the Products:

If the Purchasing Entity does not give written notice of Acceptance or rejection at the end of any Acceptance Testing period for a Product, Acceptance will be deemed to occur on the day following the end of such Acceptance Testing period. In any event, Acceptance will be deemed to occur on the day that the State or the Purchasing Entity places the Product into production use (other than for testing performed during the Acceptance Testing period).

After a particular Product has gone through Acceptance Testing and achieved Acceptance, additional quantities of that Product will be deemed to have achieved Acceptance upon delivery of such additional Products to the Purchasing Entity.

Acceptance of Services will be deemed to occur as Services are performed.

B. Form Contract Appendix C, 29, WARRANTY.

In lieu of providing a copy of the warranties at the time of equipment delivery as set forth in Section 7.3 of the Master Agreement, Contractor's warranties for the Products listed on the Price List and for Services are as follows (the "Warranty Provisions"):

- Warranty for Equipment. Contractor warrants to Purchasing Entity that, during the warranty period defined in this paragraph, the equipment on the Price List ("Equipment") will, under normal use and service, be free from defects in materials and workmanship and function substantially in accordance with Contractor's technical specifications in effect on the date of shipment. The warranty period for Equipment is 12 months from the date of shipment. If Contractor installs the Equipment, such 12-month warranty period will commence on the date of installation completion. Under no circumstances, however, will the warranty period commence later than 4 months after the shipment date of the Equipment in question. Repaired or replaced units and subassemblies will have a new warranty period of 3 months from shipment date or the end of the original warranty period, whichever is longer. Purchasing Entity must obtain from Contractor a return authorization number and pack and ship, at its own cost, the defective part, subassembly or unit (if applicable) to the facility designated by Contractor, together with a detailed description of the problem and the appropriate documentation required for such shipment and return shipment thereof. Purchasing Entity will perform the re-installation of the repaired or replacement part, subassembly or unit at its own cost. When repairing or replacing any Product or part thereof,

Contractor may use new, remanufactured, reconditioned, refurbished, or functionally equivalent Products or parts.

2. Warranty for Software. Contractor warrants to Purchasing Entity that, during the warranty period defined in this paragraph, Embedded Software and Non-Embedded Software (collectively, "Software") will, under normal use and service, function substantially in accordance with Contractor's technical specifications in effect on the date of shipment or on the date that the Software is first loaded on Purchasing Entity's equipment or other products (as applicable). Contractor makes no warranty that any Software will operate uninterrupted or error free. The warranty period for Software is 90 days from the date of shipment or from the date that the Software is first loaded on the Purchasing Entity's Equipment or other products in accordance with the provisions below (depending upon which is applicable). If Contractor installs the Software, such 90-day warranty period will commence on the date of installation completion. Software will be deemed to have been loaded on the shipment date. The warranty period for corrected Software is the remainder of the original warranty period. This paragraph does not apply to Software supplied under license from third parties, for which the rights and guarantees given are those which Contractor is authorized to provide to its customers.

Upon notice from Purchasing Entity, Contractor undertakes to remedy defects discovered in Software during the warranty period as follows. As the first remedial measure in the case of a problem affecting the Software subsequent to the installation of an updated or new version of such Software, Purchasing Entity shall reload the most recent Software update or version to restore performance. If the foregoing is not applicable or does not correct the problem, Contractor shall remedy the defect in the Software by delivering a correction to Purchasing Entity by electronic means or by delivery to Purchasing Entity of suitable media chosen solely by Contractor.

Notwithstanding the aforesaid, defects in a part of Embedded Software that is embedded on devices which are not readily reprogrammable or correctable as set out above may, in Contractor's discretion, be rectified through the repair or replacement of the applicable Equipment module under the warranty terms and conditions applicable to Equipment.

3. Warranty for Services. Contractor warrants to Purchasing Entity that, during the warranty period defined in this paragraph, Services purchased under the Participating Addendum will be performed in accordance with Contractor's written standards, or in the absence of such standards, in a professional and workmanlike manner. The warranty period for Services is 30 days, beginning on the date of completion. Upon notice from Purchasing Entity that any Service is not as warranted, Contractor shall correct the Service. The warranty period for the corrected Service is the remainder of the original warranty period.
4. General Exclusions. The warranties of Contractor under these Warranty Provisions are valid only on condition that:
 - a. Purchasing Entity has acted in conformity with the provisions of these Warranty Provisions;
 - b. the Products have been transported, stored, installed and operated fully in accordance with the instructions and specifications of Contractor; and
 - c. the Products have not been modified or repaired or reworked by anyone other than Contractor or its designee or using any unauthorized parts, subassemblies or software without the prior written consent of Contractor; and
 - d. Purchasing Entity has notified Contractor in writing during the warranty period of each defect discovered in the Products promptly upon its occurrence but in any event not later than 10 calendar days after it has been discovered; and
 - e. Purchasing Entity has promptly provided any additional information concerning the defect and its occurrence, upon Contractor's reasonable request.
5. The Warranty Provisions do not cover:
 - a. consumable, perishable or wearing parts or Products that have had their serial numbers or month and year of manufacture removed, altered, defaced or deleted; or
 - b. any defects arising out of or in connection with (i) any improper handling or use, (ii) external reasons such as (but not limited to) excessive physical force, water, humidity or dust and other detrimental environmental or operating conditions beyond the limits specified for each Product, (iii) power failures, fires, explosions or any acts of God or other cause beyond Contractor's control, (iv) operator error, (v) use not in accordance with the Documentation, (vi) failure to implement any new releases or updates to Software, or (vii) use of the Product in conjunction with a non-Contractor product (except to the extent provided in the Documentation); or
 - c. electromagnetic interference or malfunctions of interconnected equipment; or

d. damage to property or equipment other than the Product itself.

6. Warranty does not include

- a. Contractor assisting in diagnostic efforts,
- b. access to Contractor's technical support web sites, databases, or tools,
- c. Product integration,
- d. on-site assistance, or
- e. Documentation updates.

These Services may be available for purchase during and after the warranty period at Contractor's published prices. The Warranty Provisions are non-transferable.

7. Liability. Contractor's liability for any breach of warranty or otherwise under the Participating Addendum is strictly limited, at Contractor's sole discretion, to repair, correction or replacement of the defective Products or parts thereof or Services or the repayment of amounts paid with respect thereto (which repayment will take the form of a credit that can only be applied against the Purchasing Entity's future purchases and licenses under the Participating Addendum).

The fulfillment of the obligations set out in this Warranty Provision will be in full satisfaction of Contractor's liability for defects with regard to the Products and Services, and Purchasing Entity shall hold harmless and/or indemnify Contractor from any claim of third parties in this respect.

The above warranties are exclusive warranties. Contractor disclaims all other warranties, representations and conditions, express, implied and/or statutory, including all warranties, representations and conditions of merchantability, fitness for a particular purpose, and non-infringement. The remedies provided under paragraphs 1, 2, 3, and 5 are Purchasing Entity's exclusive remedies for failure of the Products and Services to conform to the warranties.

8. Maintenance. If Purchasing Entity wishes Contractor to provide maintenance and support services in addition to these warranty services, the parties will enter into a separate written annual maintenance and support agreement on terms, conditions and prices to be agreed.

C. Form Contract Appendix C, 31. TITLE TO PRODUCT.

For the avoidance of doubt, title to all property furnished by Contractor (excluding title to Licensed Materials [defined below]) will pass to and vest in Purchasing Entity or the State (as the case may be) upon delivery of such property by the Contractor.

51. State Boilerplate Affirmation Clause

Numerous changes have been made to the State's boilerplate, which changes are acceptable to the Indiana Department of Administration and to the Office of the Attorney General.

Non-Collusion and Acceptance

The undersigned attests, subject to the penalties for perjury, that the undersigned is the Contractor, or that the undersigned is the properly authorized representative, agent, member or officer of the Contractor. Further, to the undersigned's knowledge, neither the undersigned nor any other member, employee, representative, agent or officer of the Contractor, directly or indirectly, has entered into or been offered any sum of money or other consideration for the execution of this Contract other than that which appears upon the face hereof. **Furthermore, if the undersigned has knowledge that a state officer, employee, or special state appointee, as those terms are defined in IC 4-2-6-1, has a financial interest in the Contract, the Contractor attests to compliance with the disclosure requirements in IC 4-2-6-10.5.**

Agreement to Use Electronic Signatures

I agree, and it is my intent, to sign this Contract by accessing State of Indiana Supplier Portal using the secure password assigned to me and by electronically submitting this Contract to the State of Indiana. I understand that my signing and submitting this Contract in this fashion is the legal equivalent of having placed my handwritten signature on the submitted Contract and this affirmation. I understand and agree that by electronically signing and submitting this Contract in this fashion I am affirming to the truth of the information contained therein. I understand that this Contract will not become binding on the State until it has been approved by the Department of Administration, the State Budget Agency, and the Office of the Attorney General, which approvals will be posted on the Active Contracts Database:
https://hr85.gmis.in.gov/psp/pa91prd/EMPLOYEE/EMPL/h/?tab=PAPP_GUEST

In Witness Whereof, Contractor and the State have, through their duly authorized representatives, entered into this Contract. The parties, having read and understood the foregoing terms of this Contract, do by their respective signatures dated below agree to the terms thereof.

Alcatel-Lucent USA Inc.

Indiana Department of Administration

By: *Eric W. Negley*

By:

Title: Commercial Contract Manager

Title:

Date: 16 January 2018

Date:

Alcatel-Lucent USA Inc.

By: *Lynda Smith*

Title: Commercial Contract Manager

Date: January 16, 2018

<p>Electronically Approved by: Indiana Office of Technology</p> <p>By: _____ (for) Dewand Neely, Chief Information Officer <i>Refer to Electronic Approval History found after the final page of the Executed Contract for details.</i></p>	<p>Electronically Approved by: Department of Administration</p> <p>By: _____ (for) Jessica Robertson, Commissioner <i>Refer to Electronic Approval History found after the final page of the Executed Contract for details.</i></p>
<p>Electronically Approved by: State Budget Agency</p> <p>By: _____ (for) Jason D. Dudich, Director <i>Refer to Electronic Approval History found after the final page of the Executed Contract for details.</i></p>	<p>Electronically Approved as to Form and Legality: Office of the Attorney General</p> <p>By: _____ (for) Curtis T. Hill, Jr., Attorney General <i>Refer to Electronic Approval History found after the final page of the Executed Contract for details.</i></p>

EXHIBIT 2



State of Washington
DEPARTMENT OF ENTERPRISE SERVICES
1500 Jefferson SE, PO Box 41411
Olympia, Washington 98504-1411 • (360) 407-2210
<http://www.des.wa.gov>

The State of Washington Department of Enterprise Services

Under the Authority of
State of Washington, [Chapter 39.26 RCW](#)

in furtherance of
NASPO ValuePoint Cooperative Purchasing Program



enter into this agreement

with

Alcatel-Lucent USA, Inc. (part of Nokia Group)
for
Public Safety Communication Support Equipment
Master Agreement Number 05715

1.0 OVERVIEW

1.1 CONTRACT SCOPE

The purpose of this Contract is to enable authorized purchasers to purchase public safety communication equipment from one or more awarded contractors from one or more of the following product categories:

1. Batteries
2. Furniture, Dispatch Consoles
4. Gateway Devices
5. Microwave Radios
6. Monitoring & Alarm
7. Power Systems
8. Test Equipment
9. Towers

New contracts may be established with other vendors as new equipment and additional product categories or subcategories are identified. This strategy will accommodate new technology introduced into the marketplace and made available to public safety customers.

1.2 CONTRACT SCOPE AND MODIFICATIONS

The DES reserves the right to modify this Contract by mutual agreement between the DES and the Contractor, so long as such modification is substantially within the scope of the original Contract. Such modifications will be evidenced by issuance of a written authorized amendment by the Contract Administrator.

1.3 RECITALS

The Department of Enterprise Services, an agency in the state of Washington (acting as the Lead State for NASPO ValuePoint), issued a Request for Proposal (RFP) for the purpose of purchasing equipment and services for public safety communication equipment in accordance with its authority under [Chapter 39.26 RCW](#).

Alcatel-Lucent USA, Inc. (part of Nokia Group) submitted a timely response to the DES's solicitation (incorporated by reference).

The DES evaluated all properly submitted responses to the above-referenced RFP and has identified *Alcatel-Lucent USA, Inc. (part of Nokia Group)* as one of the apparently successful Contractors.

The DES has determined that entering into a contract/master agreement with *Alcatel-Lucent USA, Inc. (part of Nokia Group)* will meet Purchaser's needs and will be in Purchaser's best interest.

NOW THEREFORE, DES awards to *Alcatel-Lucent USA, Inc. (part of Nokia Group)* this Contract/Master Agreement, the terms and conditions of which shall govern Contractor's furnishing to Purchasers the equipment and services identified herein. This Contract is not for personal use.

IN CONSIDERATION of the mutual promises as hereinafter set forth, the parties agree as follows:

1.4 ESTIMATED USAGE

Based on past and/or projected future usage, it is estimated that purchases over the initial two (2) year term of the contract may approximate an aggregate total of \$250,000,000 for contract products and services. This estimate was provided solely for the purpose of assisting bidders in preparing their response. Orders will be placed by Purchasers (Purchasing Entities) only on an as needed basis.

The State of Washington/NASPO ValuePoint does not represent or guarantee any minimum level of purchase.

1.5 CONTRACT TERM

The initial term of this Contract is for approximately two (2) years from the effective date of the Contract through June 30, 2018 with the option to extend for additional term(s) or portions thereof. Extension for each additional term shall be offered at the sole discretion of the DES and are subject to written mutual agreement. The total Contract term, including the initial term and all subsequent extensions, shall not exceed five (5) years unless an emergency exists and/or special circumstances require a partial term extension. The DES reserves the right to extend with all or some of the Contractors, solely determined by the DES.

1.6 PURCHASERS/PURCHASING ENTITIES

Purchasers/Purchasing Entities include members of the NASPO ValuePoint Cooperative Purchasing Program, a unified, nationally-focused cooperative purchasing program that potentially can leverage the collective expertise, experience, and demand of 50 states and their political subdivisions, and help spur innovation and competition in the marketplace.

NASPO ValuePoint Cooperative Purchasing Program is a cooperative group-contracting consortium for state governments, serving their departments, institutions, institutions of higher education, agencies and political subdivisions (e.g., school districts, counties, cities, etc.). All 50 states, the District of Columbia, US Territories and other public entities may participate in the use of ValuePoint contracts.

2.0 CONTRACT ADMINISTRATION

2.1 DES CONTRACT ADMINISTRATOR

The DES shall appoint a single point of contact that will be the Contract Administrator for this contract and will provide oversight of the activities conducted hereunder. The contract Administrator will be the principal contact for Contractor concerning business activities under this Contract. The DES will notify Contractor, in writing, when there is a new Contract Administrator assigned to this Contract.

2.2 ADMINISTRATION OF CONTRACT

Contract Administrator will maintain Contract information, Products and Pricing, and Authorized Subcontractors/Dealers/Distributors and make available on the NASPO ValuePoint web site.

2.3 CONTRACTOR SUPERVISION AND COORDINATION

Contractor shall:

1. Competently and efficiently, supervise and coordinate the implementation and completion of all Contract requirements specified herein;
2. Identify the Contractor's representative, who will be the principal point of contact for the DES Contract Administrator concerning Contractor's performance under this Contract.
3. Immediately notify the Contract Administrator in writing of any change of the designated Contractor's representative assigned to this Contract; and
4. Violation of any provision of this paragraph may be considered a material breach establishing grounds for Contract termination.
5. Be bound by all written communications given to or received from the Contractor's representative.

2.4 POST AWARD CONFERENCE

The Contractor may be required to attend a post award conference scheduled by the Procurement Coordinator to discuss contract performance requirements. The time and place of this conference will be scheduled following Contract award.

2.5 CONTRACTOR'S CONTRACT/MASTER AGREEMENT MANAGEMENT

Upon award of this Contract/Master Agreement, the Contractor shall:

1. Designate a single point of contract and alternate point of contract for the administration of this contract.
2. Review the impact of the award and take the necessary steps needed to ensure that contractual obligations will be fulfilled.
3. Promote and market the use of this Contract/Master Agreement to all authorized Contract/Master Agreement Purchasers/Purchasing Entities.
4. Ensure that those who endeavor to utilize this Contract/Master Agreement are authorized Purchasers/Purchasing Entities under the terms and conditions of this contract.
5. At no additional charge, assist Purchasers/Purchasing Entities in the following manner to make the most cost effective, value based, Purchases including, but not limited to:
 - a) Visiting the Purchaser/Purchasing Entities site and providing them with materials/supplies/equipment recommendations.
 - b) Providing Purchaser/Purchasing Entities with a detailed list of contract products and services including current Contract/Master Agreement pricing.
6. Provide contract customers with product and service information and assistance with order development, placement, and tracking. Provide Help Desk services for initial troubleshooting and possible resolution of the problems or for the initiation of repair or replacement services.
7. The Contractor shall designate a customer service representative who will be responsible for addressing Purchaser/Purchasing Entities issues including, but not limited to:
 - a) Logging requests for service, ensuring equipment repairs are completed in a timely manner, dispatching service technicians, and processing warranty claim documentation.
 - b) Providing Purchaser/Purchasing Entities with regular and timely status updates in the event of an order or repair fulfillment delay.
8. Acting as the lead and liaison between the Contractor and Purchaser/Purchasing Entities in resolving warranty claims for contract items purchased.

2.6 CHANGES

Alterations to any of the terms, conditions, or requirements of this Contract/Master Agreement shall only be effective upon written issuance of a mutually agreed Contract/Master Agreement amendment by the Contract Administrator, unless otherwise authorized within the Contract/Master Agreement. However, changes to point of contact information or other administrative changes may be updated without the issuance of a mutually agreed contract amendment.

2.7 NASPO ValuePoint eMARKET CENTER

Contractor will cooperate with NASPO ValuePoint and SciQuest (and any authorized agent or successor entity to SciQuest) with uploading a hosted catalog or integrating a punchout site. (Reference NASPO ValuePoint Master Agreement Terms and Conditions, Section 36, for the details of this requirement.)

2.8 NASPO ValuePoint CONTRACT ADMINISTRATION FEE

The Contract is subject to a NASPO ValuePoint Administration Fee. Contractor has included this fee in Contract pricing and will not list it as a separate line item on its invoices to Purchasers/Purchasing Entities. The Contractor will collect the fees and distribute the fees to NASPO ValuePoint Cooperative Purchasing Organization (or its assignee), as outlined below.

The NASPO ValuePoint Administration Fee will be one-quarter of one percent (0.25% or 0.0025) on all purchases made under authority of the Contract. Purchases are defined as total invoice price less any applicable sales tax. No taxes will be assessed against this NASPO ValuePoint Administration Fee.

The NASPO ValuePoint Administrative Fee shall be paid within sixty (60) days after the end of the calendar quarter. It is the Contractor's responsibility to calculate and remit the administrative fee since NASPO ValuePoint does not issue an invoice for this fee. Contractor shall indicate the Contract/Master Agreement number 05715 and include with the remittance, a quarterly sales report by NASPO ValuePoint Contract participant. The administrative fee shall be paid to:

NASPO VALUEPOINT COOPERATIVE PURCHASING ORGANIZATION
PROGRAM MANAGER
201 EAST MAIN STREET, SUITE 1450
LEXINGTON, KY 40507

In addition to the NASPO ValuePoint Administration Fee as stated above, some states may require an additional fee be paid directly to the state on purchases made by purchasing entities within that state. For all such requests, the fee level, payment method and schedule for such reports and payments will be incorporated into the Participating Addendum that is made a part of the Contract/Master Agreement. The Contractor may adjust the Contract/Master Agreement pricing accordingly for purchases made by Purchasers within the jurisdiction of the state. All such agreements may not affect the NASPO ValuePoint Administrative Fee or the prices paid by the purchasers outside the jurisdiction of the state requesting the additional fee.

2.9 NASPO ValuePoint CONTRACT/MASTER AGREEMENT SALES REPORTS

The Contractor shall submit summary sales data reports required by NASPO ValuePoint Master Agreement Terms and Conditions Section 27 directly to NASPO ValuePoint using the NASPO ValuePoint Quarterly Sales/Administrative Fee Reporting Tool found at <http://www.naspo.org/WNCPO/Calculator.aspx>. Any/all sales made under the Contract/Master Agreement shall be reported as cumulative totals by state. Even if Contractor experiences zero sales during a calendar quarter, a report is still required. Reports shall be due no later than 30 days following the end of the calendar quarter (as specified in the reporting tool).

2.10 WASHINGTON'S ELECTRONIC BUSINESS SOLUTION (WEBS)

Contractor shall be registered in the contractor registration system, Washington's Electronic Business Solution (WEBS) www.ga.wa.gov/webs, maintained by the Washington State Department of Enterprise Services. Contractors already registered need not re-register. It is the sole responsibility of Contractor to properly register with WEBS and maintain an accurate contractor profile in WEBS.

3.0 PRICING

3.1 PRICE PROTECTION

Contractor warrants that prices of materials, supplies, service and/or equipment with the same features and requirements set forth herein do not exceed those charged by the Contractor to any other customer purchasing the same under similar conditions and in like or similar quantities.

3.2 NO ADDITIONAL CHARGES

Unless otherwise specified herein, no additional charges by the Contractor will be allowed including, but not limited to: handling charges such as packing, wrapping, bags, containers, reels; or the processing fees associated with the use of credit cards. Notwithstanding the foregoing, in the event that market conditions, laws, regulations or other unforeseen factors dictate, at the Contract Administrator's sole discretion, additional charges may be allowed.

3.3 CONTRACT PRICING

During the term of the Contract/Master Agreement, Contractor must maintain the national published and/or web-posted product price list for all public safety communication equipment products and services identified in **Appendix H Price Worksheets** submitted with Contractor's response to RFP 05712. A copy must be made available to Purchasers upon request and at no additional charge. The price list in effect at the time of order placement shall be used when applying price discounts specified in Appendix H Price

Worksheets submitted with Contractor's response to RFP 05715. However, if the Contractor has provided a specific price quote to the Purchaser than the prices quoted must be held firm for a minimum period of sixty (60) days after the date of the quote.

3.4 VOLUME/PROMOTIONAL DISCOUNTS

Contract/Master Agreement prices and price discounts are the maximum or ceiling price Contractor can charge. The Contractor may also offer volume and/or promotional price discounts resulting in even lower prices to Purchasers/Purchasing Entities.

3.5 PRICE ADJUSTMENTS

Contractor may update or change its reference national published/posted product price list during the term of the Contract/Master Agreement as necessary to delete discontinued products/services, add newly introduced products/services, or to pass-through price changes applied to all customers purchasing from the price list. Contractor shall provide the Contract Administrator notification of price list changes. This notification shall be handled as an administrative change and shall not require the execution of a Contract amendment as called for in [section 2.6 Changes](#). Percentage discounts identified in Appendix H Price Worksheets submitted with Contractor's response to RFP 05715 shall remain unchanged.

A decrease in the level of price discount shall not be considered during the initial term of the Contract/Master Agreement nor for any subsequent Contract/Master Agreement extensions. However, an increase in the level of price discount may be considered at any time during the initial term of the Contract/Master Agreement and during each subsequent Contract /Maser Agreement extensions.

For services available through this Contract/Master Agreement, if pricing is listed at a per hour price (rather than as a percentage discount off list price) prices may be increased after initial term of the contract. A minimum of 60 calendar days advance written notice is required with accompanying sufficient documentation to justify the requested increase. Acceptance of the price increase will be at the discretion of the Contract Administrator and the adjusted price must not produce a higher profit margin that that established on the original contract pricing. Approved price increases must remain unchanged at least through the current extension term.

4.0 CONTRACTOR QUALIFICATIONS AND REQUIREMENTS

4.1 ESTABLISHED BUSINESS

Prior to commencing performance, or prior to that time if required by the DES, law or regulation, Contractor must be an established business firm with all required licenses, fees, bonding, facilities, equipment and trained personnel necessary to meet all requirements and perform the work as specified in the Solicitation. Contractor shall maintain compliance with these requirements throughout the life of this Contract/Master Agreement.

The DES reserves the right to require receipt of proof of compliance with said requirements within ten (10) calendar days from the date of request, and to terminate this Contract/Master Agreement as a material breach for noncompliance with any requirement of this paragraph.

4.2 USE OF SUBCONTRACTORS/DEALERS/DISTRIBUTORS

In accordance with RFP requirements, Contractor agrees to take complete responsibility for all actions of its subcontractors/dealers/distributors involved in the Contract /Master Agreement performance.

During Contract/Master Agreement performance, Contractor shall identify and make available to Purchasers upon request a list of subcontractors, dealers, and distributors who will supply products or perform services in fulfillment of Contract/Master Agreement requirements. Information shall include their name, the nature of services to be performed or products to be sold by product category/subcategory, address, telephone, facsimile, email, and federal tax identification number (TIN) (if the company is authorized to sell and invoice for products and services).

The Contract Administrator reserves the right to request the Contractor remove any subcontractor, dealer or distributor participating in the Contract. During the Contract Contractor may add or remove subcontractors, dealers or distributors participating in this Contract. All requests to add/delete subcontractor/dealer/distributor will be sent directly to the Contract Administrator for consideration. Upon Contract Administrator's approval, updated subcontractor/dealer/distributor list will be posted on the NASPO ValuePoint website.

Specific restrictions apply to contracting with current or former Washington state employees pursuant to [Chapter 42.52 RCW](#) and such restrictions may apply to contracting with current or former employees of other states.

4.3 ASSIGNMENT AND SUBCONTRACT/DEALER/DISTRIBUTOR INVOLVEMENT

Contractor shall not assign or otherwise transfer its obligations under this Contract/Master Agreement without the prior written consent of the Contract Administrator. Contractor shall provide a minimum of thirty (30) calendar days advance notification of intent to assign or otherwise transfer its obligations under this Contract/Master Agreement. Violation of this condition may be considered a material breach establishing grounds for Contract/Master Agreement termination.

The Contractor shall be responsible to ensure that all Contract/Master Agreement requirements are met whether performance is done by themselves or through designated and authorized subcontractors, dealers, or distributors also involved in the performance of this Contract/Master Agreement. In no event shall the involvement of a subcontractor, dealer, or distributor release or reduce the liability of Contractor to the Purchaser for any breach in the performance of the Contractor's duties.

If during the performance of the contract or a purchase order, any named individual specifically identified in the response to work on this engagement is not available, the Purchaser reserves the right to approve or reject any personnel substitutions.

4.4 CONTRACTOR AUTHORITY AND INFRINGEMENT

Contractor is authorized to sell under this Contract/Master Agreement, only those materials, supplies, services and/or equipment as stated herein and allowed for by the provisions of this Contract/Master Agreement. Contractor shall not represent to any Contract Purchaser/Purchasing Entity that they have the Contract/Master Agreement authority to sell any other materials, supplies, services and/or equipment. Further, Contractor may not intentionally infringe on other contracts established by Washington State or Participating Entities.

4.5 MATERIALS AND WORKMANSHIP

The Contractor shall be required to furnish all materials, supplies, equipment and/or services necessary to perform contractual requirements. Materials, supplies and workmanship used in the construction of equipment for this Contract/Master Agreement shall conform to all applicable federal, state, and local codes, regulations and requirements for such equipment, specifications contained herein, and the normal uses for which intended. Materials, supplies and equipment shall be manufactured in accordance with the best commercial practices and standards for this type of materials, supplies, and equipment.

4.6 MERCURY CONTENT AND PREFERENCE

Contractor shall provide mercury-free products when available. Should mercury-free products not exist, contractors shall provide products with the lowest mercury content available. Contractor shall disclose products that contain added mercury and provide an explanation that includes the amount or concentration of mercury, and justification as to why added mercury is necessary for the function or performance of the product.

The DES reserves the right to require receipt of proof of compliance with said requirements within ten (10) calendar days from the date of request, and to terminate this Contract/Master Agreement as a material breach for noncompliance with any requirement of this paragraph.

5.0 DELIVERY REQUIREMENTS

5.1 ORDER FULFILLMENT REQUIREMENTS

Authorized Purchasers/Purchasing Entities may place orders against this Contract/Master Agreement either in person, electronically, facsimile or by phone. Once an order is issued, the following shall apply:

1. For purposes of price verification and auditing, upon receipt of a purchase order the Contractor shall send the Purchaser an order confirmation notification that identifies applicable Contract prices to be applied to the order.
2. Upon the request of the Purchaser, the Contractor shall supply Purchaser documentation needed to verify Contract pricing compliance.
3. Product damaged prior to acceptance will either be replaced or repaired in an expedited manner at Contractor's expense. Alternatively, at the Purchaser's option, any possible damage to the product can be noted on the receiving report and the cost deducted from final payment.

The Contractor is responsible to verify delivery conditions/requirements with the Purchaser prior to the delivery.

5.2 SHIPPING AND RISK OF LOSS

Contractor shall ship all products purchased pursuant to this Contract, freight charges prepaid by the Contractor, F.O.B. Purchaser's specified destination with all transportation and handling charges included unless otherwise indicated in the Contractor's response to RFP 05715 appendix G Price worksheets.

The method of shipment shall be consistent with the nature of the products and hazards of transportation. Regardless of FOB point, Contractor agrees to bear all risks of loss, damage, or destruction of the products ordered hereunder that occurs prior to delivery, except loss or damage attributable to Purchaser's fault or negligence; and such loss, damage, or destruction shall not release Contractor from any obligation hereunder. After delivery, the risk of loss or damage shall be borne by Purchaser, except loss or damage attributable to Contractor's fault or negligence.

5.3 DELIVERY

Delivery of products must be made during Purchaser's normal work hours and within time frames mutually agreed in writing between the Purchaser and Contractor at the time of order placement.

Failure to comply with agreed upon delivery times may subject Contractor to damages. The Purchaser may refuse shipment when delivered after normal working hours. The Contractor shall verify specific working hours of individual Purchasers and instruct carrier(s) to deliver accordingly. The acceptance by the Purchaser of late performance, with or without objection or reservation by the Purchaser, shall not waive the right to claim damage for such breach, nor preclude the DES or Purchaser from pursuing any other remedy provided herein, including termination, nor shall such acceptance of late performance constitute a waiver of the requirements for the timely performance of any obligation remaining to be performed by Contractor.

All deliveries are to be made to the applicable delivery location as indicated in the order document. When applicable, the Contractor shall take all necessary actions to safeguard items during inclement weather. In no case shall the Contractor initiate performance prior to receipt of written or verbal authorization from authorized Purchasers. Expenses incurred otherwise shall be borne solely by the Contractor.

5.4 SITE SECURITY

While on Purchaser's premises, Contractor, its agents, employees, subcontractors, dealers or distributors shall conform in all respects with physical, fire, or other security regulations.

5.5 INSPECTION, ACCEPTANCE AND REJECTION

The Purchaser's inspection of all materials, supplies and equipment upon delivery is for the purpose of forming a judgment as to whether such delivered items are what was ordered, were properly delivered and

ready for acceptance. Such inspection shall not be construed as final acceptance, or as acceptance of the materials, supplies or equipment, if the materials, supplies or equipment does not conform to contractual requirements.

If there are any apparent defects in the materials, supplies, or equipment at the time of delivery, the Purchaser will promptly notify the Contractor. Without limiting any other rights, the Purchaser may require the Contractor to: (1) repair or replace, at Contractor's expense, any or all of the damaged goods; (2) refund the price of any or all of the damaged goods; or (3) accept the return of any or all of the damaged goods.

5.6 INSTALLATION

When applicable, installation shall be performed in a professional manner in accordance with industry standard best practices. The premises shall be left in a neat, clean, and undamaged condition. The Purchaser reserves the right to require Contractor to repair any damage caused during installation or provide full compensation as determined by the Purchaser.

5.7 TITLE TO PRODUCT

Upon delivery or Acceptance, whichever is applicable, Contractor shall convey to purchaser good title to the goods free and clear of all liens, pledges, mortgages, encumbrances, or other security interests.

5.8 TREATMENT OF ASSETS

1. Title to all property furnished by the Purchaser shall remain with the Purchaser, as appropriate. Title to all property furnished by the Contractor, the cost for which the Contractor is entitled to be reimbursed as a direct item of cost under this Contract, shall pass to and vests in the Purchaser upon delivery of such property by the Contractor and acceptance by the Purchaser. Title to other property, the cost of which is reimbursable to the Contractor under this Contract, shall pass to and vest in the Purchaser upon (i) issuance for use of such property in the performance of this Contract, or (ii) commencement of use of such property in the performance of this Contract, or (iii) reimbursement of the cost thereof by the Purchaser in whole or in part, whichever first occurs.
2. Any property of the Purchaser furnished to the Contractor shall, unless otherwise provided herein or approved by the Purchaser, be used only for the performance of this Contract.
3. The Contractor shall be responsible for damages as a result of any loss or damage to property of the Purchaser which results from the negligence of the Contractor or which results from the failure on the part of the Contractor to maintain, administer and protect that property in a reasonable manner and to the extent practicable in all instances.
4. If any Purchaser property is lost, destroyed, or damaged, the Contractor shall immediately notify the Purchaser and shall take all reasonable steps to protect the property from further damage.
5. The Contractor shall surrender to the Purchaser all property of the Purchaser prior to settlement upon completion, termination, or cancellation of this Contract.
6. All reference to the Contractor under this clause shall also include Contractor's employees, agents, subcontractors, dealers or distributors.

5.9 LABELING

Individual shipping cartons shall be labeled with the name of the ordering agency, order number, Contract number, Contractor, state stock numbers, and where applicable, date of manufacture, batch number, storage requirements, conditions, and recommended shelf life. Contractors are encouraged to offer product packaging with recycled content.

6.0 PAYMENT

6.1 ADVANCE PAYMENT PROHIBITED

No advance payment shall be made for the products and services furnished by Contractor pursuant to this Contract.

Notwithstanding the above, maintenance payments, if any, may be made on a quarterly basis at the beginning of each quarter.

6.2 IDENTIFICATION

All invoices, packing lists, packages, instruction manuals, correspondence, shipping notices, shipping containers, and other written materials associated with this Contract shall be identified by the Contract number and the applicable Purchaser's order number. Packing lists shall be enclosed with each shipment and clearly identify all contents and any backorders.

6.3 PAYMENT, INVOICING AND DISCOUNTS

Payment is the sole responsibility of, and will be made by, the Purchaser.

Contractor shall provide a properly completed invoice to Purchaser. All invoices are to be delivered to the address indicated in the purchase order.

Each invoice shall be identified by the associated NASPO ValuePoint Contract/Master Agreement number or the Participating Addendum number, and the Purchaser's Contract/Purchase Order number (as applicable), and shall be in U.S. dollars. Invoices shall be prominently annotated by the Contractor with all applicable prompt payment and/or volume or promotional discount(s). Hard copy credit memos are to be issued when the Purchaser has been overcharged.

Invoices for payment will accurately reflect all discounts due the Purchaser. Invoices will not be processed for payment, nor will the period of prompt payment discount commence, until receipt of a properly completed invoice denominated in U.S. dollars and until all invoiced items are received and satisfactory performance of Contractor has been accepted by the Purchaser. If an adjustment in payment is necessary due to damage or dispute, any prompt payment discount period shall commence on the date final approval for payment is authorized.

If Purchaser fails to make timely payment(s), Contractor may invoice for 1% per month on the amount overdue or a minimum of \$1.00. (In Washington State reference Chapter 39.76 RCW.) Payment will not be considered late if a check or warrant is mailed within the time specified. If no terms are specified, net 30 days will automatically apply. Payment(s) made in accordance with Contract terms shall fully compensate the Contractor for all risk, loss, damages or expense of whatever nature and acceptance of payment shall constitute a waiver of all claims submitted by Contractor.

Payment for materials, supplies and/or equipment received and for services rendered shall be made by Purchaser and be redeemable in U.S. dollars. Unless otherwise specified, the Purchaser's sole responsibility shall be to issue this payment. Any bank or transaction fees or similar costs associated with currency exchange procedures or the use of purchasing/credit cards shall be fully assumed by the Contractor.

6.4 TAXES, FEES AND LICENSES

Taxes:

Where required by statute or regulation, the Contractor shall pay for and maintain in current status all taxes that are necessary for Contract performance. Unless otherwise indicated, Washington purchasers agree to pay State of Washington taxes on all applicable materials, supplies, services and/or equipment purchased. Purchasers located in other states may be required to pay their own state and local taxes on the purchase as required by local state laws and regulations. No charge by the Contractor shall be made for federal excise taxes and the purchaser agrees to furnish Contractor with an exemption certificate where appropriate.

Collection of Retail Sales and Use Taxes:

In general, contractors engaged in retail sales activities within the State of Washington are required to collect and remit sales tax to Department of Revenue (DOR). In general, out-of-state contractors must collect and remit "use tax" to Department of Revenue if the activity carried on by the seller in the State of Washington is significantly associated with contractor's ability to establish or maintain a market for its

products in Washington State. Examples of such activity include where the contractor either directly or by an agent or other representative:

1. Maintains an in-state office, distribution house, sales house, warehouse, service enterprise, or any other in-state place of business;
2. Maintains an in-state inventory or stock of goods for sale;
3. Regularly solicits orders from purchasers located within the State of Washington via sales representatives entering the State of Washington;
4. Sends other staff into the State of Washington (e.g. product safety engineers, etc.) to interact with purchasers in an attempt to establish or maintain market(s); or
5. Other factors are identified applicable to Washington Purchasers are found in [WAC 458-20](#).

Washington State Department of Revenue Registration for Out-of-State Contractors:

Out-of-state contractors meeting any of the above criteria must register and establish an account with the Washington State Department of Revenue. Refer to [WAC 458-20-193](#), and call the Department of Revenue at 800-647-7706 for additional information. When out-of-state contractors are not required to collect and remit “use tax,” purchasers located in the State of Washington are responsible for paying this tax, if applicable, directly to the Department of Revenue.

Fees/Licenses:

After award of contract, and prior to commencing performance under the contract, the Contractor shall pay for and maintain in a current status any licenses, fees, assessments, permit charges, etc., which are necessary for contract performance. It is the Contractor's sole responsibility to maintain licenses and to monitor and determine any changes or the enactment of any subsequent regulations for said fees, assessments, or charges and to immediately comply with said changes or regulations during the entire term of this Contract.

Customs/Brokerage Fees:

Contractor shall take all necessary actions, including, but not limited to, paying all customs, duties, brokerage, and/or import fees, to ensure that materials, supplies, and/or equipment purchased under the Contract are expedited through customs. Failure to do so may subject Contractor to liquidated damages as identified herein and/or to other remedies available by law or contract. Neither the DES nor the purchaser will incur additional costs related to Contractor’s payment of such fees.

Taxes on Invoice:

Contractor shall calculate and enter the appropriate Washington State and local sales tax on all invoices. Tax is to be computed on new items after deduction of any trade-in in accordance with [WAC 458-20-247](#).

6.5 OVERPAYMENTS TO CONTRACTOR

Contractor shall refund to Purchaser the full amount of any erroneous payment or overpayment under this Contract within thirty (30) days’ written notice. If Contractor fails to make timely refund, Purchaser may charge Contractor one percent (1%) per month on the amount due, until paid in full.

6.6 AUDITS

The DES Contract Administrator and/or the Purchaser reserves the right to audit, or have a designated third party audit, applicable records to ensure that the Purchaser has been properly invoiced. Any remedies and penalties allowed by law to recover monies determined owed will be enforced. Repetitive instances of incorrect invoicing may be considered cause for complete contract termination.

7.0 QUALITY ASSURANCE

7.1 RIGHT OF INSPECTION

With reasonable advance notice, Contractor shall provide right of access to its facilities to DES, or any of DES's officers, or to any other authorized agent or official of the state of Washington or other Participating or Purchasing Entity, or the federal government, at all reasonable times, in order to monitor and evaluate performance, compliance, and/or quality assurance under this Contract.

7.2 CONTRACTOR COMMITMENTS, WARRANTIES AND REPRESENTATIONS

Any written commitment by Contractor within the scope of this Contract shall be binding upon Contractor. Failure of Contractor to fulfill such a commitment may constitute breach and shall render Contractor liable for damages under the terms of this Contract. For purposes of this section, a commitment by Contractor includes: (i) prices, discounts, and options committed to remain in force over a specified period of time; and (ii) any warranty or representation made by Contractor in its response or contained in any Contractor or manufacturer publications, written materials, schedules, charts, diagrams, tables, descriptions, other written representations, and any other communication medium accompanying or referred to in its response or used to effect the sale to Purchaser.

7.3 PRODUCT WARRANTY

Warranty(ies): Unless otherwise specified, full parts and labor warranty period shall be for a minimum period of one (1) year after receipt of materials or equipment by the Purchaser. All materials or equipment provided shall be new and unused (or like new with no blemishes or defects), of the latest model or design and of recent manufacture. A copy of the equipment warranty shall be provided with the equipment at the time of equipment delivery.

In the event of conflict between Contract terms and conditions and Contractor's submitted warranty, the Contract terms and conditions shall prevail; except, to afford the Purchaser maximum benefits, the Purchaser may avail itself of the Contractor's warranty if deemed more beneficial to the Purchaser.

7.4 WARRANTIES

Contractor warrants that all materials, supplies, services and/or equipment provided under this Contract shall be fit for the purpose(s) for which intended, for merchantability, and shall conform to the requirements and specifications herein. Acceptance of any materials, supplies, service and/or equipment, and inspection incidental thereto, by the Purchaser shall not alter or affect the obligations of the Contractor or the rights of the Purchaser.

The Contractor warrants for a period of one year from the date of receipt that: (a) the product performs according to all specific claims that the Contractor made in its response to the solicitation, (b) the product is suitable for the ordinary purposes for which such product is used, (c) the product is suitable for any special purposes identified in the solicitation or for which the Purchaser has relied on the Contractor's skill or judgment, (d) the product is designed and manufactured in a commercially reasonable manner, and (e) the product is free of defects. Upon breach of the warranty, the Contractor will repair or replace (at no charge to the Purchaser) the product whose nonconformance is discovered and made known to the Contractor. If the repaired and/or replaced product proves to be inadequate, or fails of its essential purpose, the Contractor will refund the full amount of any payments that have been made for the defective product. The rights and remedies of the parties under this warranty are in addition to any other rights and remedies of the parties provided by law or equity, including, without limitation, actual damages, and, as applicable and awarded under the law, to a prevailing party, reasonable attorneys' fees and costs.

7.5 DATE WARRANTY

Contractor warrants that all products provided under this Contract: (i) do not have a life expectancy limited by date or time format; (ii) will correctly record, store, process, and present calendar dates; (iii) will lose no functionality, data integrity, or performance with respect to any date; and (iv) will be interoperable with other software used by Purchaser that may deliver date records from the products, or interact with date records of the products ("date warranty"). In the event a date warranty problem is reported to Contractor

by Purchaser and such problem remains unresolved after three (3) calendar days, at Purchaser's discretion, Contractor shall send, at Contractor's sole expense, at least one (1) qualified and knowledgeable representative to Purchaser's premises. This representative will continue to address and work to remedy the failure, malfunction, defect, or nonconformity on Purchaser's premises. This date warranty shall last perpetually. In the event of a breach of any of these representations and warranties, Contractor shall indemnify and hold harmless Purchaser from and against any and all harm, injury, damages, costs, and expenses incurred by Purchaser arising out of said breach.

7.6 COST OF REMEDYING DEFECTS

Contractor shall repair or replace all defective products at its own expense.

7.7 TRAINING

Contractor shall provide Purchasers training as requested following equipment delivery on basic operations and at no additional cost. Specialized training is available at an additional charge as scheduled between Purchaser and Contractor as described in Appendix E Contract Management and Performance.

7.8 OPERATOR MANUAL

Instruction and maintenance manuals shall be furnished for all delivered Contract equipment. The most current manual must be provided at no cost upon customer request. Manuals shall contain, but not be limited to the following:

- A section describing the capability of the equipment.
- A section on equipment specifications.
- A section describing operating instructions.
- A section describing the use of the equipment.
- A section describing general maintenance instructions.
- A section describing software installation and user guides (if applicable).

8.0 INFORMATION AND COMMUNICATIONS

8.1 ADVERTISING

Contractor shall not publish or use any information concerning this Contract in any format or media for advertising or publicity without prior written consent from the DES Contract Administrator.

8.2 RETENTION OF RECORDS

The Contractor shall maintain all books, records, documents, data and other evidence relating to this Contract and the provision of materials, supplies, services and/or equipment described herein, including, but not limited to, accounting procedures and practices which sufficiently and properly reflect all direct and indirect costs of any nature expended in the performance of this Contract. Contractor shall retain such records for a period of seven (7) years following the date of final payment. At no additional cost and with reasonable advance notice, these records, including materials generated under the Contract, shall be subject at all reasonable times to inspection, review, or audit by the DES, personnel duly authorized by the DES, personnel duly authorized by the Purchaser, the Washington State Auditor's Office, and federal and state officials so authorized by law, regulation or agreement.

If any litigation, claim or audit is started before the expiration of the seven (7) year period, the records shall be retained until final resolution of all litigation, claims, or audit findings involving the records.

8.3 NON-ENDORSEMENT AND PUBLICITY

Neither the DES nor the Purchasers are endorsing the Contractor's products or services, nor suggesting that they are the best or only solution to their needs. Contractor agrees to make no reference to the state of Washington, DES, and Purchaser in any literature, promotional material, brochures, sales presentation or the like, regardless of method of distribution, without the prior review and express written consent of the DES and/or the impacted Participating Entity.

9.0 GENERAL PROVISIONS

9.1 NASPO ValuePoint MASTER AGREEMENT Terms and conditions

NASPO ValuePoint Master Agreement Terms and Conditions shall supplement the terms and conditions of this Contract. To the extent there is any inconsistent or conflicting term between the two, the conflict or inconsistency shall be resolved in a manner most favorable to a Purchaser or Purchasing Entity.

9.2 GOVERNING LAW/VENUE

This Contract shall be construed and interpreted in accordance with the laws of the State of Washington, and the venue of any action brought hereunder shall be in the Superior Court for Thurston County.

9.3 SEVERABILITY

If any provision of this Contract or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Contract that can be given effect without the invalid provision, and to this end the provisions of this Contract are declared to be severable.

9.4 SURVIVORSHIP

All transactions executed for products and services provided pursuant to the authority of this Contract shall be bound by all of the terms, conditions, prices and price discounts set forth herein, notwithstanding the expiration of the initial term of this Contract or any extension thereof. Further, the terms, conditions and warranties contained in this Contract that by their sense and context are intended to survive the completion of the performance, cancellation or termination of this Contract shall so survive. In addition, the terms of the sections titled Overpayments to Contractor; Contractor's Commitments, Warranties and Representations; Protection of Confidential and Personal Information; Order of Precedence, Incorporated Documents, Conflict and Conformity; Non-Endorsement and Publicity; Retention of Records; Proprietary or Confidential Information; Disputes and Remedies; and Limitation of Liability shall survive the termination of this Contract.

9.5 INDEPENDENT STATUS OF CONTRACTOR

In the performance of this Contract, the parties will be acting in their individual, corporate or governmental capacities and not as agents, employees, partners, joint venturers, or associates of one another. The parties intend that an independent contractor relationship will be created by this contract. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever. Contractor shall not make any claim of right, privilege or benefit which would accrue to an employee under [Chapter 41.06 RCW](#), or [Title 51 RCW](#).

9.6 GIFTS AND GRATUITIES

Contractor shall comply with all state laws regarding gifts and gratuities, including but not limited to: [RCW 39.26](#), [RCW 42.52.150](#), [RCW 42.52.160](#), and [RCW 42.52.170](#) under which it is unlawful for any person to directly or indirectly offer, give or accept gifts, gratuities, loans, trips, favors, special discounts, services, or anything of economic value in conjunction with state business or contract activities.

Under [RCW 39.26](#) and the Ethics in Public Service Law, [Chapter 42.52 RCW](#) state officers and employees are prohibited from receiving, accepting, taking or seeking gifts (except as permitted by [RCW 42.52.150](#)) if the officer or employee participates in contractual matters relating to the purchase of goods or services.

9.7 PERSONAL LIABILITY

It is agreed by and between the parties hereto that in no event shall any official, officer, employee or agent of the State of Washington when executing their official duties in good faith, be in any way personally liable or responsible for any agreement herein contained whether expressed or implied, nor for any statement or representation made herein or in any connection with this agreement.

9.8 NONDISCRIMINATION

During the performance of this Contract, the Contractor shall comply with all applicable federal and state nondiscrimination laws, regulations and policies, including, but not limited to, Title VII of the Civil Rights Act,

42 U.S.C. section 12101 et. seq.; the Americans with Disabilities Act (ADA); and, [Chapter 49.60 RCW](#), Discrimination – Human Rights Commission.

9.9 OSHA AND WISHA REQUIREMENTS

Contractor agrees to comply with conditions of the Federal Occupational Safety and Health Administration (OSHA) and, if manufactured or stored in the State of Washington, the Washington Industrial Safety and Health Act (WISHA) and the standards and regulations issued there under, and certifies that all items furnished and purchased will conform to and comply with said laws, standards and regulations. Contractor further agrees to indemnify and hold harmless DES and Purchaser from all damages assessed against Purchaser as a result of Contractor's failure to comply with those laws, standards and regulations, and for the failure of the items furnished under the Contract to so comply.

9.10 ANTITRUST

The DES maintains that, in actual practice, overcharges resulting from antitrust violations are borne by the purchaser. Therefore, the Contractor hereby assigns to the State of Washington any and/or Purchasing Entity all of the Contractor's claims for such price fixing or overcharges which arise under federal or state antitrust laws, relating to the materials, supplies, services and/or equipment purchased under this Contract.

9.11 WAIVER

Failure or delay of the DES or Purchaser to insist upon the strict performance of any term or condition of the Contract or to exercise any right or remedy provided in the Contract or by law; or the DES's or Purchaser's acceptance of or payment for materials, supplies, services and/or equipment, shall not release the Contractor from any responsibilities or obligations imposed by this Contract or by law, and shall not be deemed a waiver of any right of the DES or Purchaser to insist upon the strict performance of the entire agreement by the Contractor. In the event of any claim for breach of Contract against the Contractor, no provision of this Contract shall be construed, expressly or by implication, as a waiver by the DES or Purchaser of any existing or future right and/or remedy available by law.

10.0 DISPUTES AND REMEDIES

10.1 PROBLEM RESOLUTION AND DISPUTES

Problems arising out of the performance of this Contract shall be resolved in a timely manner at the lowest possible level with authority to resolve such problem. If a problem persists and cannot be resolved, it may be escalated within each organization.

In the event a bona fide dispute concerning a question of fact arises between DES or the Purchaser and Contractor and it cannot be resolved between the parties through the normal escalation processes, either party may initiate the dispute resolution procedure provided herein.

The initiating party shall reduce its description of the dispute to writing and deliver it to the responding party. The responding party shall respond in writing within three business days. The initiating party shall have three business days to review the response. If after this review a resolution cannot be reached, both parties shall have three business days to negotiate in good faith to resolve the dispute.

If the dispute cannot be resolved after three business days, a dispute resolution panel may be requested in writing by either party who shall also identify the first panel member. Within three business days of receipt of the request, the other party will designate a panel member. Those two panel members will appoint a third individual to the dispute resolution panel within the next three business days.

The dispute resolution panel will review the written descriptions of the dispute, gather additional information as needed, and render a decision on the dispute in the shortest practical time.

Each party shall bear the cost for its panel member and share equally the cost of the third panel member.

Both parties agree to exercise good faith in dispute resolution and to settle disputes prior to using a dispute resolution panel whenever possible.

Unless irreparable harm will result, neither party shall commence litigation against the other before the dispute resolution panel has issued its decision on the matter in dispute.

DES, the Purchaser and Contractor agree that, the existence of a dispute notwithstanding, they will continue without delay to carry out all their respective responsibilities under this Contract that are not affected by the dispute.

If the subject of the dispute is the amount due and payable by Purchaser for materials, supplies, services and/or equipment being provided by Contractor, Contractor shall continue providing materials, supplies, services and/or equipment pending resolution of the dispute provided Purchaser pays Contractor the amount Purchaser, in good faith, believes is due and payable, and places in escrow the difference between such amount and the amount Contractor, in good faith, believes is due and payable.

10.2 ADMINISTRATIVE SUSPENSION

When it is in the best interest of the state of Washington, the DES may at any time, and without cause, suspend the Contract or any portion thereof for a period of not more than thirty (30) calendar days per event by written notice from the Contract Administrator to the Contractor's representative. Contractor shall resume performance on the next business day following the 30th day of suspension unless an earlier resumption date is specified in the notice of suspension. If no resumption date was specified in the notice of suspension, the Contractor can be demanded and required to resume performance within the 30 day suspension period by the Contract Administrator providing the Contractor's representative with written notice of such demand.

10.3 FORCE MAJEURE

The term "force majeure" means an occurrence that causes a delay that is beyond the control of the party affected and could not have been avoided by exercising reasonable diligence. Force majeure shall include acts of God, war, riots, strikes, fire, floods, epidemics, or other similar occurrences.

Exceptions: Except for payment of sums due, neither party shall be liable to the other or deemed in breach under this Contract if, and to the extent that, such party's performance of this Contract is prevented by reason of force majeure.

Notification: If either party is delayed by force majeure, said party shall provide written notification within forty-eight (48) hours. The notification shall provide evidence of the force majeure to the satisfaction of the other party. Such delay shall cease as soon as practicable and written notification of same shall likewise be provided. So far as consistent with the Rights Reserved below, the time of completion shall be extended by Contract amendment for a period of time equal to the time that the results or effects of such delay prevented the delayed party from performing in accordance with this Contract.

Rights Reserved: The DES reserves the right to authorize an amendment to this Contract, terminate the Contract, and/or purchase materials, supplies, equipment and/or services from the best available source during the time of force majeure, and Contractor shall have no recourse against the Purchaser/Purchasing Entity.

10.4 ALTERNATIVE DISPUTE RESOLUTION FEES AND COSTS

In the event that the parties engage in arbitration, mediation or any other alternative dispute resolution forum to resolve a dispute in lieu of litigation, both parties shall share equally in the cost of the alternative dispute resolution method, including cost of mediator or arbitrator. In addition, each party shall be responsible for its own attorneys' fees incurred as a result of the alternative dispute resolution method.

10.5 NON-EXCLUSIVE REMEDIES

The remedies provided for in this Contract shall not be exclusive but are in addition to all other remedies available under law.

10.6 LIMITATION OF LIABILITY

The parties agree that neither Contractor, DES nor Purchaser shall be liable to each other, regardless of the form of action, for consequential, incidental, indirect, or special damages except a claim related to bodily injury or death, or a claim or demand based on patent, copyright, or other intellectual property right infringement, in which case liability shall be as set forth elsewhere in this Contract. This section does not modify any sections regarding liquidated damages or any other conditions as are elsewhere agreed to herein between the parties. The damages specified in the sections titled Termination for Default and Retention of Records are not consequential, incidental, indirect, or special damages as that term is used in this section.

Neither the Contractor, nor the DES, nor the Purchaser shall be liable for damages arising from causes beyond the reasonable control and without the fault or negligence of the Contractor, the DES or Purchaser. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of a governmental body other than the DES or the Purchaser acting in either its sovereign or contractual capacity, war, explosions, fires, floods, earthquakes, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case the delays must be beyond the reasonable control and without fault or negligence of the Contractor, the DES or the Purchaser, or their respective subcontractors.

If delays are caused by a subcontractor without its fault or negligence, Contractor shall not be liable for damages for such delays, unless the services to be performed were obtainable on comparable terms from other sources in sufficient time to permit Contractor to meet its required performance schedule.

Neither party shall be liable for personal injury to the other party or damage to the other party's property except personal injury or damage to property proximately caused by such party's respective fault or negligence.

10.7 FEDERAL FUNDING

In the event that a federally funded acquisition results from this procurement, the Contractor may be required to provide additional information (free of charge) at the request of the DES or Purchaser. Further, the Contractor may be subject to those federal requirements specific to the commodity.

10.8 FEDERAL RESTRICTIONS ON LOBBYING

Contractor certifies that under the requirements of Lobbying Disclosure Act, 2 U.S.C., Section 1601 et seq., no Federal appropriated funds have been paid or will be paid, by or on behalf of the contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

10.9 FEDERAL DEBARMENT AND SUSPENSION

The Contractor certifies, that neither it nor its "principals" (as defined in 49 CFR. 29.105 (p) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

11.0 CONTRACT TERMINATION

The following sections (11.1 – 11.9) may also apply to an executed Participating Addendum. The Participating State/Entity may exercise the following actions regarding the management and administration of its Participating Addendum between themselves and the Contractor and/or those specified in NASPO ValuePoint Master Agreement Terms and Conditions.

11.1 MATERIAL BREACH

A Contractor may be terminated for cause by the DES, at the sole discretion of the Contract administrator, for failing to perform a contractual requirement or for a material breach of any term or condition. Material breach of a term or condition of the Contract may include but is not limited to:

1. Contractor failure to perform services or deliver materials, supplies, or equipment by the date required or by an alternate date as mutually agreed in a written amendment to the Contract;
2. Contractor failure to carry out any warranty or fails to perform or comply with any mandatory provision of the Contract;
3. Contractor becomes insolvent or in an unsound financial condition so as to endanger performance hereunder;
4. Contractor becomes the subject of any proceeding under any law relating to bankruptcy, insolvency or reorganization, or relief from creditors and/or debtors that endangers the Contractor's proper performance hereunder;
5. Appointment of any receiver, trustee, or similar official for Contractor or any of the Contractor's property and such appointment endangers the Contractor's proper performance hereunder;
6. A determination that the Contractor is in violation of federal, state, or local laws or regulations and that such determination renders the Contractor unable to perform any aspect of the Contract.

11.2 OPPORTUNITY TO CURE

In the event that Contractor fails to perform a contractual requirement or materially breaches any term or condition, the DES may issue a written cure notice. The Contractor may have a period of time in which to cure. The DES is not required to allow the Contractor to cure defects if the opportunity for cure is not feasible as determined solely within the discretion of the DES. Time allowed for cure shall not diminish or eliminate Contractor's liability for liquidated or other damages, or otherwise affects any other remedies available against Contractor under the Contract or by law.

If the breach remains after Contractor has been provided the opportunity to cure, the DES may do any one or more of the following:

1. Exercise any remedy provided by law;
2. Terminate this Contract and any related contracts or portions thereof;
3. Procure replacements and impose damages as set forth elsewhere in this Contract;
4. Impose actual or liquidated damages;
5. Suspend or bar Contractor from receiving future solicitations or other opportunities;
6. Require Contractor to reimburse the state for any loss or additional expense incurred as a result of default or failure to satisfactorily perform the terms of the Contract.

11.3 TERMINATION FOR CAUSE

In the event the Contract Administrator, in its sole discretion, determines that the Contractor has failed to comply with the conditions of this Contract in a timely manner or is in material breach, the Contract Administrator has the right to suspend or terminate this Contract, in part or in whole. The Contract Administrator shall notify the Contractor in writing of the need to take corrective action. If corrective action is not taken within thirty (30) calendar days or as otherwise specified by the Contract Administrator, or if such corrective action is deemed by the Contract Administrator to be insufficient, the Contract may be terminated. The Contract Administrator reserves the right to suspend all or part of the Contract, withhold further payments, or prohibit the Contractor from incurring additional obligations of funds during investigation of the alleged breach and pending corrective action by the Contractor or a decision by the Contract Administrator to terminate the Contract.

In the event of termination, the DES shall have the right to procure for all Purchasers any replacement materials, supplies, services and/or equipment that are the subject of this Contract from other participating contractors, or if necessary, on the open market. In addition, the Contractor shall be liable for damages as

authorized by law including, but not limited to, any price difference between the original Contract and the replacement or cover contract and all administrative costs directly related to the replacement contract, e.g., cost of the competitive bidding, mailing, advertising and staff time.

If it is determined that: (1) the Contractor was not in material breach; or (2) failure to perform was outside of Contractor's or its subcontractor's control, fault or negligence, the termination shall be deemed to be a "Termination for Convenience". The rights and remedies of the DES and/or the Purchaser provided in this Contract are not exclusive and are in addition to any other rights and remedies provided by law.

11.4 TERMINATION FOR CONVENIENCE

Except as otherwise provided in this Contract, DES, at the sole discretion of the Contract Administrator, may terminate this Contract, in whole or in part by giving thirty (30) calendar days written notice beginning on the second day after mailing to the Contractor. If this Contract is so terminated, Purchaser shall be liable only for payment required under this Contract for properly authorized services rendered, or materials, supplies and/or equipment ordered prior to the effective date of Contract termination. Neither DES nor Purchaser shall have any other obligation whatsoever to Contractor for such termination. This Termination for Convenience clause may be invoked by DES when it is in the best interest of the State of Washington and/or NASPO ValuePoint.

11.5 TERMINATION FOR WITHDRAWAL OF AUTHORITY

In the event that the DES and/or Purchaser's authority to perform any of its duties is withdrawn, reduced, or limited in any way after the commencement of this Contract and prior to normal completion, the DES may terminate this Contract, in whole or in part, by thirty (30) calendar days written notice to Contractor.

11.6 TERMINATION FOR NON-ALLOCATION OF FUNDS

If funds are not allocated to Purchaser(s) to continue this Contract in any future period, DES may terminate this Contract by thirty (30) calendar days written notice to Contractor or work with Contractor to arrive at a mutually acceptable resolution of the situation. Purchaser will not be obligated to pay any further charges for materials, supplies, services and/or equipment including the net remainder of agreed to consecutive periodic payments remaining unpaid beyond the end of the then-current period. DES and/or Purchaser agrees to notify Contractor in writing of such non-allocation at the earliest possible time.

No penalty shall accrue to the Purchaser in the event this section shall be exercised. This section shall not be construed to permit DES to terminate this Contract in order to acquire similar materials, supplies, services and/or equipment from a third party.

11.7 TERMINATION FOR CONFLICT OF INTEREST

DES may terminate this Contract by written notice to Contractor if it is determined, after due notice and examination, that any party to this Contract has violated [Chapter 42.52 RCW](#), Ethics in Public Service, or any other laws regarding ethics in public acquisitions and procurement and performance of contracts. In the event this Contract is so terminated, the DES and /or Purchaser shall be entitled to pursue the same remedies against Contractor as it could pursue in the event that the Contractor breaches this Contract.

11.8 TERMINATION BY MUTUAL AGREEMENT

The DES and the Contractor may terminate this Contract in whole or in part, at any time, by mutual agreement.

11.9 TERMINATION PROCEDURE

In addition to the procedures set forth below, if the DES terminates this Contract, Contractor shall follow any procedures the Contract Administrator specifies in the termination notice.

Upon termination of this Contract and in addition to any other rights provided in this Contract, Contract Administrator may require the Contractor to deliver to the Purchaser any property specifically produced or

acquired for the performance of such part of this Contract as has been terminated. The provisions of the "Treatment of Assets" clause shall apply in such property transfer.

The Purchaser shall pay to the Contractor the agreed upon price, if separately stated, for completed work and service(s) Accepted by the Purchaser, and the amount agreed upon by the Contractor and the Purchaser for (i) completed materials, supplies, services rendered and/or equipment for which no separate price is stated, (ii) partially completed materials, supplies, services rendered and/or equipment, (iii) other materials, supplies, services rendered and/or equipment which are Accepted by the Purchaser, and (iv) the protection and preservation of property, unless the termination is for cause, in which case the DES and the Purchaser shall determine the extent of the liability of the Purchaser. Failure to agree with such determination shall be a dispute within the meaning of the "Disputes" clause of this Contract. The Purchaser may withhold from any amounts due the Contractor such sum as the Contract Administrator and Purchaser determine to be necessary to protect the Purchaser against potential loss or liability.

The rights and remedies of the DES and/or the Purchaser provided in this section shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

After receipt of a termination notice, and except as otherwise expressly directed in writing by the Contract Administrator, the Contractor shall:

1. Stop all work, order fulfillment, shipments, and deliveries under the Contract on the date, and to the extent specified, in the notice;
2. Place no further orders or subcontracts for materials, services, supplies, equipment and/or facilities in relation to the Contract except as is necessary to complete or fulfill such portion of the Contract that is not terminated;
3. Complete or fulfill such portion of the Contract that is not terminated in compliance with all contractual requirements;
4. Assign to the Purchaser, in the manner, at the times, and to the extent directed by the Contract Administrator on behalf of the Purchaser, all of the rights, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the Purchaser has the right, at its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts;
5. Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the Contract Administrator and/or the Purchaser to the extent Contract Administrator and/or the Purchaser may require, which approval or ratification shall be final for all the purposes of this clause;
6. Transfer title to the Purchaser and deliver in the manner, at the times, and to the extent directed by the Contract Administrator on behalf of the Purchaser any property which, if the Contract had been completed, would have been required to be furnished to the Purchaser;
7. Take such action as may be necessary, or as the Contract Administrator and/or the Purchaser may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the DES and/or the Purchaser has or may acquire an interest.

12.0 CONTRACT EXECUTION

12.1 PARTIES

This Contract/Master Agreement is entered into by and between the state of Washington, acting by and through the Department of Enterprise Services (DES), Master Contracts & Consulting (MCC), an agency of Washington State government ("DES" or "Lead State") located at 1500 Jefferson Street SE, Olympia WA 98501, and *Alcatel-Lucent USA, Inc. (part of Nokia Group), a Delaware corporation* licensed to

conduct business in the state of Washington (“Contractor”), located at *600-700 Mountain Avenue, Murray Hill, NJ 07974-0636* for the purpose of providing products and services for the public safety communication equipment.

12.2 ENTIRE AGREEMENT

This Contract/Master Agreement document and all subsequently issued amendments comprise the entire agreement between the DES and the Contractor. No other statements or representations, written or oral, shall be deemed a part of the Contract/Master Agreement.

This Contract sets forth the entire agreement between the parties with respect to the subject matter hereof and except as provided in the section titled **Contractor Commitments, Warranties and Representations**, understandings, agreements, representations, or warranties not contained in this Contract or a written amendment hereto shall not be binding on either party. Except as provided herein, no alteration of any of the terms, conditions, delivery, price, quality, or specifications of this Contract will be effective without the written consent of both parties.

12.3 ORDER OF PRECEDENCE, INCORPORATED DOCUMENTS, CONFLICT AND CONFORMITY

Incorporated Documents:

Each of the documents listed below is, by this reference, incorporated into this Contract/Master Agreement as though fully set forth herein.

1. The DES’s Solicitation document #05715 with all attachments and exhibits, and all amendments thereto
2. Approved portions of Contractor’s response to the Solicitation #05715;
3. A Participating Entity’s Participating Addendum (“PA”);
4. The terms and conditions contained on Purchaser’s Order Documents, if used; and
5. All Contractor or manufacturer publications, written materials and schedules, charts, diagrams, tables, descriptions, other written representations and any other supporting materials Contractor made available to Purchaser and used to affect the sale of the Product and /or Service to the Purchaser.

Order of Precedence:

In the event of a conflict in such terms, or between the terms and any applicable statute or rule, the inconsistency shall be resolved by giving precedence in the following order:

1. Applicable Federal statutes and regulations.
2. A Participating Entity’s Participating Addendum (“PA”), including amendments.
3. Mutually agreed written amendments to this Contract.
4. This Contract/Master Agreement Number 05715, including NASPO ValuePoint Master Agreement Terms and Conditions.
5. The accepted or executed Statement of Work, Work Order, or Order Documents.
6. The DES’s Solicitation document with all attachments and exhibits, and all amendments thereto.
7. Approved portions of Contractor’s response to the Solicitation, as revised (if applicable) by mutual agreement.
8. Any other provision, term, or materials incorporated into the Contract/Master Agreement by reference.

Conflict: To the extent possible, the terms of this Contract/Master Agreement shall be read consistently.

Conformity: If any provision of this Contract/Master Agreement violates any Federal or State of Washington statute or rule of law, it is considered modified to conform to that statute or rule of law. The Participating Entity's Participating Addendum shall be considered modified to conform to that state's statute or rule of law.

12.4 LEGAL NOTICES

Any notice or demand or other communication required or permitted to be given under this Contract or applicable law (except notice of malfunctioning Equipment) shall be effective only if it is in writing and signed by the applicable party, properly addressed, and either delivered in person, or by a recognized courier service, or deposited with the United States Postal Service as first-class mail, postage prepaid, via facsimile or by electronic mail, to the parties at the addresses, fax numbers, or e-mail addresses provided in this section. For purposes of complying with any provision in this Contract or applicable law that requires a "writing," such communication, when digitally signed with a Washington State Licensed Certificate, shall be considered to be "in writing" or "written" to an extent no less than if it were in paper form.

To Contractor at:

Alcatel-Lucent USA, Inc. (part of Nokia Group)
A Delaware corporation

Attn:

Scott Mehal
600-700 Mountain Ave
Murray Hill, NJ 07974-0636

Phone: (206) 465-7453

Fax: N/A

E-mail: scott.mehal@nokia.com

To DES at:

State of Washington
Department of Enterprise Services

Attn:

Neva Peckham
Mail: Post Office Box 41411
Olympia, Washington 98504-1411

Street: 1500 Jefferson Street SE
Olympia, WA 98501

Phone: (360) 407-9411

Fax: (360) 586-2426

E-mail: neva.peckham@des.wa.gov

Notices shall be effective upon receipt or four (4) Business Days after mailing, whichever is earlier. The notice address as provided herein may be changed by written notice given as provided above.

In the event that a subpoena or other legal process commenced by a third party in any way concerning the Equipment or Services provided pursuant to this Contract is served upon Contractor or DES, such party agrees to notify the other party in the most expeditious fashion possible following receipt of such subpoena or other legal process. Contractor and DES further agree to cooperate with the other party in any lawful effort by the other party to contest the legal validity of such subpoena or other legal process commenced by a third party.

12.5 LIENS, CLAIMS AND ENCUMBRANCES

All materials, equipment, supplies and/or services shall be free of all liens, claims, or encumbrances of any kind, and if the DES or the Purchaser requests, a formal release of same shall be delivered to the respective requestor.

12.6 AUTHORITY TO BIND

The signatories to this Contract/Master Agreement represent that they have the authority to bind their respective organizations to this Contract/Master Agreement.

12.7 COUNTERPARTS

This Contract may be executed in counterparts or in duplicate originals. Each counterpart or each duplicate shall be deemed an original copy of this Contract signed by each party, for all purposes.

SIGNATURES

In Witness Whereof, the parties hereto, having read this Contract in its entirety, including all attachments, do agree in each and every particular and have thus set their hands hereunto.

This Contract is effective upon last signature.

This is a Partial award for: Contract 05715

Approved (Lead State)

State of Washington
Department of Enterprise Services
1500 Jefferson Street SE
Olympia, WA 98501

Greg Tolbert

June 23, 2016

Signature

Date

Greg Tolbert

Print or Type Name

**Department of Enterprise Services,
Legal Services Manager**

Title

Approved

Alcatel-Lucent USA Inc. (part of Nokia Group) a
Delaware corporation
600-700 Mountain Ave
Murray Hill, NJ 07974-0636

Lynda Smith

July 13, 2016

Signature

Date

Lynda Smith

Print or Type Name

Contract Management Director

Title

Alcatel-Lucent USA Inc. (part of Nokia Group)

Vonja Shields-Fleet

07/13/2016

Signature

Date

Vonja Shields-Fleet

Print or Type Name

Contract Management Director

Title

STANDARD DEFINITIONS

APPENDIX B - STANDARD DEFINITIONS

This section contains definitions of terms commonly used in Solicitations conducted by the State of Washington, Master Contracts & Consulting. Additional definitions may also be found in [Chapter 39.26 RCW](#) and [WAC 200-300-015](#), and all terms contained herein will be read consistently with those definitions. Additional and supplemental definitions also appear in Appendix C NASPO ValuePoint Master Agreement Terms and Conditions, Section 2 Definitions.

Acceptance	The materials, supplies, services, and/or equipment have passed appropriate Inspection. In the event that there is a formal Acceptance Testing period required in the Solicitation document then acceptance is formalized in writing. If there is no Acceptance Testing, acceptance may occur when the Products are delivered and inspected.
Acceptance Testing	The process for ascertaining that the materials, supplies, services, and/or equipment meets the standards set forth in the Solicitation, prior to Acceptance by the Purchaser.
Agency	Includes State of Washington institutions, the offices of the elective state officers, the Supreme Court, the court of appeals, the administrative and other departments of state government, and the offices of all appointive officers of the state. In addition, colleges, community colleges, and universities who choose to participate in State Contract(s) are included. "Agency" does not include the legislature.
All or Nothing	<p>The result of a competitive Solicitation that requires that a Contract be executed with a single Bidder for delivery of goods and/or services. In the event that suppliers are unable to deliver the entirety of the goods and/or services required, no Contract is executed. No partial fulfillment opportunities are available as a result of the Solicitation. A method of award resulting from a competitive Solicitation by which the DES will award the resulting Contract to a single Bidder.</p> <p>Also, a designation the Bidder may use in its Bid or Response to indicate its offer is contingent upon full award and it will not accept a partial award.</p>
Amendment	A change to a legal document. For the purposes of a Solicitation document, an amendment shall be a unilateral change issued by the DES, at its sole discretion.
Authorized Representative	An individual designated by the Bidder or Contractor to act on its behalf and with the authority to legally bind the Bidder or Contractor concerning the terms and conditions set forth in Solicitation and Contract documents.
Bidder	A Vendor who submits a Proposal in reply to a Solicitation.
Business Days	Monday through Friday, 8:00 a.m. to 5:00 p.m., Pacific Time, except for holidays observed by the state of Washington or the state of the Purchaser, if applicable.

Calendar Days	Consecutive days of the year including weekends and holidays, each of which commence at 12:00:01 a.m. and end at Midnight, Pacific Time (or the time zone applicable to the Purchaser. When “days” are not specified, Calendar Days shall prevail.
Contract	Means the State of Washington Master Agreement Number 05715, set forth as a Model Contract in Appendix Q, as finally executed.
Contract Administrator	The person designated to manage the resultant Contract for the DES. The primary contact for the DES with Purchasers and Contractor on a specific Contract.
Contractor	Individual, company, corporation, firm, or combination thereof with which the DES develops a Contract for the procurement of materials, supplies, services, and/or equipment. It shall also include any Subcontractor retained by Contractor as permitted under the terms of the Contract.
DES	The Department of Enterprise Services and agency within the Washington authorized to develop and administer contracts for goods and services on behalf of state agencies, colleges and universities, non-profit organizations and local governments.
Equal	An offer of materials, supplies, services and/or equipment that meets or exceeds the quality, performance and use of the specifications identified in a Solicitation.
Help Desk	Shall mean a service provided by Vendor for the support of Vendor’s Products. Purchaser shall report warranty or maintenance problems to Vendor’s Help Desk for initial troubleshooting and possible resolution of the problems or for the initiation of repair or replacement services.
Inspection	An examination of delivered material, supplies, services, and/or equipment prior to Acceptance aimed at forming a judgment as to whether such delivered items are what was ordered, were properly delivered and ready for Acceptance. Inspection may include a high level visual examination or a more thorough detailed examination as is customary to the type of purchase, as set forth in the solicitation document and/or as agreed between the parties. Inspection shall be acknowledged by an authorized signature of the Purchaser.
Lead Time/After Receipt Of Order (ARO)	The period of time between when the Contractor receives the order and the Purchaser receives the materials, supplies, equipment, or services order.
Master Agreement	Means the underlying agreement executed by and between the NASPO ValuePoint contract administrator, normally the Lead State, acting in furtherance of the NASPO ValuePoint program, and the Contractor, as now or hereafter amended.
NASPO ValuePoint	The NASPO Cooperative Purchasing Organization LLC, doing business as NASPO ValuePoint, a 501(c)(3) limited liability company that is a subsidiary organization the National Association of State Procurement Officials (NASPO), the sole member of NASPO ValuePoint. NASPO

ValuePoint facilitates administration of the NASPO cooperative group contracting consortium of state chief procurement officials for the benefit of state departments, institutions, agencies, and political subdivisions and other eligible entities (i.e., colleges, school districts, counties, cities, some nonprofit organizations, etc.) for all states and the District of Columbia. NASPO ValuePoint is identified in the Master Agreement as the recipient of reports and may perform contract administration functions relating to collecting and receiving reports as well as other contract administration functions as assigned by the Lead State

Order Document	A written communication, submitted by a Purchaser to the Contractor, which details the specific transactional elements required by the Purchaser within the scope of the Contract such as delivery date, size, color, capacity, etc. An Order Document may include, but is not limited to field orders, purchase orders, work order or other writings as may be designated by the parties hereto. No additional or alternate terms and conditions on such written communication shall apply unless authorized by the Contract and expressly agreed between the Purchaser and the Contractor.
Procurement Coordinator	The individual authorized by the DES who is responsible for conducting a specific Solicitation.
Product	Materials, supplies, services, and/or equipment provided under the terms and conditions of this Contract.
Proposal	A sealed written offer to perform a Contract to supply materials, supplies, services, and/or equipment in reply to a Request For Proposal (RFP).
Purchaser	The authorized user of the Contract, as identified in the Solicitation, who may or actually does make purchases of material, supplies, services, and/or equipment under the resulting Contract.
Purchasing Entity	Has the same meaning as "Purchaser" in the State of Washington Contract and is a state, city, county, district, other political subdivision of a State, and a nonprofit organization under the laws of some states if authorized by a Participating Addendum, who issues a Purchase Order against the Master Agreement and becomes financially committed to the purchase.
Request For Proposal (RFP)	The form utilized to solicit Proposals in the formal, sealed Bid/Proposal procedure and any amendments thereto issued in writing by the DES. The specifications and qualification requirements are written in an outcome based form allowing for consideration of a broad range of different solutions to meet the procurement need.
Responsible	The ability, capacity, and skill to perform the Contract or provide the service required, including, but not limited to the character, integrity, reputation, judgment, experience, and efficiency of the Bidder; Further considerations may include, but are not limited to whether the Bidder can perform the contract within the time specified, the quality of performance of previous contracts or services, the previous and existing compliance by the Bidder with laws relating to the contract or services and such other information as may be secured having a bearing on the

decision to award the contract:

Responsive

A Proposal that meets all material terms of the Solicitation document.

Response

A Proposal.

Solicitation

The process of notifying prospective Bidders that the DES desires to receive competitive Proposals for furnishing specified materials, supplies, services, and/or equipment. Also includes reference to the actual documents used for that process, including: the Request For Proposals (RFP), along with all attachments and exhibits thereto.

Subcontractor

A person or business that is, or will be, providing or performing an essential aspect of the Contract under the direction and responsibility of the Contractor and with the agreement of the DES.

Vendor

A provider of materials, supplies, services, and/or equipment.

**Washington's
Electronic Business
Solution (WEBS)**

The Vendor registration and Bidder notification system maintained by the Washington State Department of Enterprise Services located at:
www.ga.wa.gov/webs.

NASPO VALUEPOINT MASTER AGREEMENT TERMS AND CONDITIONS

APPENDIX C - NASPO VALUEPOINT MASTER AGREEMENT TERMS AND CONDITIONS

1. MASTER AGREEMENT ORDER OF PRECEDENCE

a. Any Order placed under this Master Agreement shall consist of the following documents:

- (1) A Participating Entity's Participating Addendum ("PA");
- (2) NASPO ValuePoint Master Agreement Terms & Conditions;
- (3) A Purchase Order issued against the Master Agreement;
- (4) The Statement of Work;
- (5) The Solicitation; and
- (6) Contractor's response to the Solicitation, as revised (if permitted) and accepted by the Lead State.

b. These documents shall be read to be consistent and complementary. Any conflict among these documents shall be resolved by giving priority to these documents in the order listed above. Contractor terms and conditions that apply to this Master Agreement are only those that are expressly accepted by the Lead State and must be in writing and attached to this Master Agreement as an Exhibit or Attachment.

2. DEFINITIONS

Acceptance means a written notice from a Purchasing Entity to Contractor advising Contractor that the Product has passed its Acceptance Testing. Acceptance of a Product for which acceptance testing is not required shall occur following the completion of delivery, installation, if required, and a reasonable time for inspection of the Product, unless the Purchasing Entity provides a written notice of rejection to Contractor.

Acceptance Testing means the process for ascertaining that the Product meets the standards set forth in the section titled Standard of Performance and Acceptance, prior to Acceptance by the Purchasing Entity.

Contractor means the person or entity delivering Products or performing services under the terms and conditions set forth in this Master Agreement.

Embedded Software means one or more software applications which permanently reside on a computing device.

Intellectual Property means any and all patents, copyrights, service marks, trademarks, trade secrets, trade names, patentable inventions, or other similar proprietary rights, in tangible or intangible form, and all rights, title, and interest therein.

Lead State means the State centrally administering any resulting Master Agreement(s).

Master Agreement means the underlying agreement executed by and between the Lead State, acting in furtherance of the NASPO ValuePoint program, and the Contractor, as now or hereafter amended.

NASPO ValuePoint is the NASPO Cooperative Purchasing Organization LLC, doing business as NASPO ValuePoint, a 501(c)(3) limited liability company, is a subsidiary organization of the National Association of State Procurement Officials (NASPO) and the sole member of NASPO ValuePoint. NASPO ValuePoint facilitates administration of the NASPO cooperative group contracting consortium of state chief procurement officials for the benefit of state departments, institutions, agencies, and political subdivisions and other eligible entities (i.e., colleges, school districts, counties, cities, some nonprofit organizations, etc.) for all states and the District of Columbia. NASPO ValuePoint is identified in the

Master Agreement as the recipient of reports and may perform contract administration functions relating to collecting and receiving reports as well as other contract administration functions as assigned by the Lead State.

Order or Purchase Order means any purchase order, sales order, contract or other document used by a Purchasing Entity to order the Products.

Participating Addendum means a bilateral agreement executed by a Contractor and a Participating Entity incorporating this Master Agreement and any other additional Participating Entity specific language or other requirements, e.g. ordering procedures specific to the Participating Entity, other terms and conditions.

Participating Entity means a state, or other legal entity, properly authorized to enter into a Participating Addendum.

Participating State means a state, the District of Columbia, or one of the territories of the United States that is listed in the Request for Proposal as intending to participate. Upon execution of the Participating Addendum, a Participating State becomes a Participating Entity; however, a Participating State listed in the Request for Proposals is not required to later participate in the Master Agreement

Product means any equipment, software (including embedded software), documentation, service or other deliverable supplied or created by the Contractor pursuant to this Master Agreement. The term Products, supplies and services, and products and services are used interchangeably in these terms and conditions.

Purchasing Entity means a state, city, county, district, other political subdivision of a State, and a nonprofit organization under the laws of some states if authorized by a Participating Addendum, who issues a Purchase Order against the Master Agreement and becomes financially committed to the purchase.

3. TERM OF THE MASTER AGREEMENT

The initial term of this Master Agreement is for two (2) years or through June. This Master Agreement may be extended beyond the original contract period for three (3) additional years at the Lead State's discretion and by mutual agreement and upon review of requirements of Participating Entities, current market conditions, and Contractor performance.

4. AMENDMENTS

The terms of this Master Agreement shall not be waived, altered, modified, supplemented or amended in any manner whatsoever without prior written approval of the Lead State.

5. ASSIGNMENT/SUBCONTRACTS

a. Contractor shall not assign, sell, transfer, subcontract or sublet rights, or delegate responsibilities under this Master Agreement, in whole or in part, without the prior written approval of the Lead State Contract Administrator. See Section 4.3 of the Contract sets out additional requirements for assignment and subcontracting.

b. The Lead State reserves the right to assign any rights or duties, including written assignment of contract administration duties to NASPO Cooperative Purchasing Organization LLC, doing business as NASPO ValuePoint.

6. PRICE AND RATE GUARANTEE PERIOD

All prices and rates must be guaranteed for the initial term of the Master Agreement. Following the initial Master Agreement period, any request for price or rate adjustment must be for an equal guarantee period, and must be made at least 60 days prior to the effective date. Requests for price or rate adjustment must include sufficient documentation supporting the request. Any adjustment or amendment to the Master Agreement shall not be effective unless approved by the Lead State. No retroactive adjustments to prices or rates will be allowed.

7. CANCELLATION

Unless otherwise stated, this Master Agreement may be canceled by either party upon 60 days written notice prior to the effective date of the cancellation. Further, any Participating Entity may cancel its participation upon 30 days written notice, unless otherwise limited or stated in the Participating Addendum. Cancellation may be in whole or in part. Any cancellation under this provision shall not affect the rights and obligations attending orders outstanding at the time of cancellation, including any right of a Purchasing Entity to indemnification by the Contractor, rights of payment for Products delivered and accepted, and rights attending any warranty or default in performance in association with any Order. Cancellation of the Master Agreement due to Contractor default may be immediate.

8. CONFIDENTIALITY, NON-DISCLOSURE, AND INJUNCTIVE RELIEF

Section 8.4 of the Contract prescribes requirements for protection of confidential and personal information.

b. Purchasing Entity Law. These provisions shall be applicable only to extent they are not in conflict with the applicable public disclosure laws of any Purchasing Entity.

9. RIGHT TO PUBLISH

Throughout the duration of this Master Agreement, Contractor must secure from the Lead State prior approval for the release of any information that pertains to the potential work or activities covered by the Master Agreement. The Contractor shall not make any representations of NASPO ValuePoint's opinion or position as to the quality or effectiveness of the services that are the subject of this Master Agreement without prior written consent. Failure to adhere to this requirement may result in termination of the Master Agreement for cause.

10. DISPUTES, DEFAULTS, AND REMEDIES

Section 11 of the Contract sets forth the grounds, procedures, and notice required for termination of the Master Agreement by the Lead State Contract Administrator. Section 11 does not limit the right of cancellation in section 7 of these NASPO ValuePoint Master Agreement Terms and Conditions.

b. Unless otherwise specified in the Participating Addendum, in the event of a default under a Participating Addendum, a Participating Entity shall provide a written notice of default as described in this section and have all of the rights and remedies under this paragraph regarding its participation in the Master Agreement, in addition to those set forth in its Participating Addendum. Unless otherwise specified in a Purchase Order, a Purchasing Entity shall provide written notice of default as described in this section and have all of the rights and remedies under this paragraph and any applicable Participating Addendum with respect to an Order placed by the Purchasing Entity. Nothing in these Master Agreement Terms and Conditions shall be construed to limit the rights and remedies available to a Purchasing Entity under the applicable commercial code.

c. The disputes resolution panel provisions in section 10.1, Problem Resolution and Disputes, of the Contract shall govern only with respect to Purchasing Entities inside the State of Washington.

11. SHIPPING AND DELIVERY

The prices are the delivered price to any Purchasing Entity. All deliveries shall be F.O.B. destination, freight pre-paid, with all transportation and handling charges paid by the Contractor. Sections 5.2 and 5.3 of the Contract govern shipping, risk of loss, and delivery to Purchasing Entities.

All products must be delivered in the manufacturer's standard package. Costs shall include all packing and/or crating charges. Cases shall be of durable construction, good condition, properly labeled and suitable in every respect for storage and handling of contents. Each shipping carton shall be marked with the commodity, brand, quantity, item code number and the Ordering Entity's Purchase Order number.

12. CHANGES IN CONTRACTOR REPRESENTATION

The Contractor must notify the Lead State of changes in the Contractor's key administrative personnel, in writing within 10 calendar days of the change. The Lead State reserves the right to approve changes in key personnel, as identified in the Contractor's proposal. The Contractor agrees to propose replacement key personnel having substantially equal or better

education, training, and experience as was possessed by the key person proposed and evaluated in the Contractor's proposal.

13. FORCE MAJEURE

Neither party to this Master Agreement shall be held responsible for delay or default caused by acts of God, war, riots, strikes, fire, floods, epidemics, or other similar occurrences so long as they are beyond that party's reasonable control and could not have been avoided by exercising reasonable diligence. The provisions of section 10.3 of the Contract supplement these provisions. The Lead State Contract Administrator may terminate this Master Agreement after determining such delay or default will reasonably prevent successful performance of the Master Agreement.

14. INDEMNIFICATION

a. General immunity and hold harmless provisions applicable to the State of Washington agencies, officials, agents and employees are prescribed in section 9b of Appendix K, Washington State Supplemental Standard Terms and Conditions. With respect to other persons and entities, the Contractor shall defend, indemnify and hold harmless NASPO ValuePoint, Participating Entities, and Purchasing Entities, along with their officers, agents, and employees as well as any person or entity for which they may be liable, from and against claims, damages or causes of action including reasonable attorneys' fees and related costs for any death, bodily injury, or damage to property arising from act(s), error(s), or omission(s) of the Contractor, its employees or subcontractors or volunteers, at any tier, relating to the performance under the Master Agreement.

b. Indemnification – Intellectual Property. The Contractor shall defend, indemnify and hold harmless NASPO ValuePoint, the Lead State, Participating Entities, Purchasing Entities, along with their officers, agents, and employees as well as any person or entity for which they may be liable ("Indemnified Party"), from and against claims, damages or causes of action including reasonable attorneys' fees and related costs arising out of a third party claim that the Product or its use, infringes Intellectual Property rights ("Intellectual Property Claim").

(1) The Contractor's obligations under this section shall not extend to any combination of the Product with any other product, system or method, unless the Product, system or method is:

(a) provided by the Contractor or the Contractor's subsidiaries or affiliates;

(b) specified by the Contractor to work with the Product; or

(c) reasonably required, in order to use the Product in its intended manner, and the infringement could not have been avoided by substituting another reasonably available product, system or method capable of performing the same function; or

(d) It would be reasonably expected to use the Product in combination with such product, system or method.

(2) The Indemnified Party shall notify the Contractor within a reasonable time after receiving notice of an Intellectual Property Claim. Even if the Indemnified Party fails to provide reasonable notice, the Contractor shall not be relieved from its obligations unless the Contractor can demonstrate that it was prejudiced in defending the Intellectual Property Claim resulting in increased expenses or loss to the Contractor. If the Contractor promptly and reasonably investigates and defends any Intellectual Property Claim, it shall have control over the defense and settlement of it. However, the Indemnified Party must consent in writing for any money damages or obligations for which it may be responsible. The Indemnified Party shall furnish, at the Contractor's reasonable request and expense, information and assistance necessary for such defense. If the Contractor fails to vigorously pursue the defense or settlement of the Intellectual Property Claim, the Indemnified Party may assume the defense or settlement of it and the Contractor shall be liable for all costs and expenses, including reasonable attorneys' fees and related costs, incurred by the Indemnified Party in the pursuit of the Intellectual Property Claim. Unless otherwise agreed in writing, this section is not subject to

any limitations of liability in this Master Agreement or in any other document executed in conjunction with this Master Agreement.

15. INDEPENDENT CONTRACTOR

The Contractor shall be an independent contractor. Contractor shall have no authorization, express or implied, to bind the Lead State, Participating States, other Participating Entities, or Purchasing Entities to any agreements, settlements, liability or understanding whatsoever, and agrees not to hold itself out as agent except as expressly set forth herein or as expressly agreed in any Participating Addendum.

16. INDIVIDUAL CUSTOMERS

Except to the extent modified by a Participating Addendum, each Purchasing Entity shall follow the terms and conditions of the Master Agreement and applicable Participating Addendum and will have the same rights and responsibilities for their purchases as the Lead State has in the Master Agreement, including but not limited to, any indemnity or right to recover any costs as such right is defined in the Master Agreement and applicable Participating Addendum for their purchases. Each Purchasing Entity will be responsible for its own charges, fees, and liabilities. The Contractor will apply the charges and invoice each Purchasing Entity individually.

17. INSURANCE

a. Insurance provisions for the State of Washington are prescribed in section 10 of Appendix K of the solicitation, Washington State Supplemental Standard Terms and Conditions. Unless otherwise agreed in a Participating Addendum by other Participating Entities, Contractor shall, during the term of this Master Agreement, maintain in full force and effect, the insurance described in this section. Contractor shall acquire such insurance from an insurance carrier or carriers licensed to conduct business in each Participating Entity's state and having a rating of A-, Class VII or better, in the most recently published edition of Best's Reports. Failure to buy and maintain the required insurance may result in this Master Agreement's termination or, at a Participating Entity's option; result in termination of its Participating Addendum.

b. Coverage shall be written on an occurrence basis. The minimum acceptable limits shall be as indicated below for each of the following categories:

(1) Commercial General Liability covering premises operations, independent contractors, products and completed operations, blanket contractual liability, personal injury (including death), advertising liability, and property damage, with a limit of not less than \$1 million per occurrence/\$2 million general aggregate;

(2) Contractor must comply with any applicable State Workers Compensation or Employers Liability Insurance requirements.

c. Contractor shall pay premiums on all insurance policies.

d. Prior to commencement of performance, Contractor shall provide to the Lead State Contract Administrator a certificate of insurance evidencing the Contractor's general liability insurance policy or other documentary evidence acceptable to the Lead State Contract Administrator that (1) names the Participating States identified in the Request for Proposal as additional insureds, and (2) provides that the Contractor's liability insurance policy shall be primary, with any liability insurance of any Participating State as secondary and noncontributory. Unless otherwise agreed in any Participating Addendum, the Participating Entities rights and Contractor's obligations are the same as those specified in the first sentence of this subsection. Before performance of any Purchase Order issued after execution of a Participating Addendum authorizing it, the Contractor shall provide to a Purchasing Entity or Participating Entity who requests it the same information described in this subsection.

e. Contractor shall furnish to the Lead State, Participating Entity, and, on request, the Purchasing Entity copies of certificates of all required insurance within thirty (30) calendar days of the execution of this Master Agreement, the

execution of a Participating Addendum, or the Purchase Order's effective date and prior to performing any work. The insurance certificate shall provide the following information: the name and address of the insured; name, address, telephone number and signature of the authorized broker; name of the insurance company (authorized to operate in all states); list policy period, policy number, limits of liability. Copies of renewal certificates of all required insurance shall be furnished within thirty (30) days after any renewal date. Failure to provide evidence of coverage may, at sole option of the Lead State, or any Participating Entity, result in this Master Agreement's termination or the termination of any Participating Addendum.

f. Coverage and limits shall not limit Contractor's liability and obligations under this Master Agreement, any Participating Addendum, or any Purchase Order.

18. LAWS AND REGULATIONS

Any and all Products offered and furnished shall comply fully with all applicable Federal and State laws and regulations.

19. LICENSE OF PRE-EXISTING INTELLECTUAL PROPERTY

Contractor grants to the Purchasing Entity a nonexclusive, perpetual, royalty-free, limited license to publish, translate, reproduce, deliver, perform, display, and dispose of the Intellectual Property, and its derivatives, used or delivered under this Master Agreement, but not created under it ("Pre-existing Intellectual Property"). The license shall be subject to any third party rights in the Pre-existing Intellectual Property. Contractor shall obtain, at its own expense, on behalf of the Purchasing Entity, written consent of the owner for the licensed Pre-existing Intellectual Property.

20. NO WAIVER OF SOVEREIGN IMMUNITY

In no event shall this Master Agreement, any Participating Addendum or any contract or any Purchase Order issued thereunder, or any act of the Lead State, a Participating Entity, or a Purchasing Entity be a waiver of any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court.

This section applies to a claim brought against the Participating State only to the extent Congress has appropriately abrogated the Participating State's sovereign immunity and is not consent by the Participating State to be sued in federal court. This section is also not a waiver by the Participating State of any form of immunity, including but not limited to sovereign immunity and immunity based on the Eleventh Amendment to the Constitution of the United States.

21. ORDERING

a. Master Agreement order and purchase order numbers shall be clearly shown on all acknowledgments, shipping labels, packing slips, invoices, and on all correspondence.

b. The resulting Master Agreements permit Purchasing Entities to define project-specific requirements and preform an informal competition among the companies having a Master Agreement on an "as needed" basis. This procedure may also be used when requirements are aggregated or other firm commitments may be made to achieve reductions in pricing. This procedure may be modified in Participating Addenda and adapted to the Purchasing Entity's rules and policies. The Purchasing Entity may in its sole discretion determine which Master Agreement Contractors should be solicited for a quote. The Purchasing Entity may select the quote that it considers most advantageous, cost and other factors considered.

c. Each Purchasing Entity will identify and utilize its own appropriate purchasing procedure and documentation. Contractor is expected to become familiar with the Purchasing Entities' rules, policies, and procedures regarding the ordering of supplies and/or services contemplated by this Master Agreement.

d. Contractor shall not begin work without a valid Purchase Order or other appropriate commitment document compliance with the law of the Purchasing Entity.

e. Orders may be placed consistent with the terms of this Master Agreement during the term of the Master Agreement.

f. All Orders pursuant to this Master Agreement, at a minimum, shall include:

- (1) The services or supplies being delivered;
- (2) The place and requested time of delivery;
- (3) A billing address;
- (4) The name, phone number, and address of the Purchasing Entity representative;
- (5) The price per hour or other pricing elements consistent with this Master Agreement and the contractor's proposal;
- (6) A ceiling amount of the order for services being ordered; and
- (7) The Master Agreement identifier.

g. All communications concerning administration of Orders placed shall be furnished solely to the authorized purchasing agent within the Purchasing Entity's purchasing office, or to such other individual identified in writing in the Order.

h. Orders must be placed pursuant to this Master Agreement prior to the termination date thereof, but may have a delivery date or performance period up to 120 days past the then-current termination date of this Master Agreement. Contractor is reminded that financial obligations of Purchasing Entities payable after the current applicable fiscal year are contingent upon agency funds for that purpose being appropriated, budgeted, and otherwise made available.

i. Notwithstanding the expiration or termination of this Master Agreement, Contractor agrees to perform in accordance with the terms of any Orders then outstanding at the time of such expiration or termination. Contractor shall not honor any Orders placed after the expiration or termination of this Master Agreement, or otherwise inconsistent with its terms. Orders from any separate indefinite quantity, task orders, or other form of indefinite delivery order arrangement priced against this Master Agreement may not be placed after the expiration or termination of this Master Agreement, notwithstanding the term of any such indefinite delivery order agreement.

22. PARTICIPANTS

a. Contractor may not deliver Products under this Master Agreement until a Participating Addendum acceptable to the Participating Entity and Contractor is executed. The NASPO ValuePoint Master Agreement Terms and Conditions are applicable to any Order by a Participating Entity (and other Purchasing Entities covered by their Participating Addendum), except to the extent altered, modified, supplemented or amended by a Participating Addendum. By way of illustration and not limitation, this authority may apply to unique delivery and invoicing requirements, confidentiality requirements, defaults on Orders, governing law and venue relating to Orders by a Participating Entity, indemnification, and insurance requirements. Statutory or constitutional requirements relating to availability of funds may require specific language in some Participating Addenda in order to comply with applicable law. The expectation is that these alterations, modifications, supplements, or amendments will be addressed in the Participating Addendum or, with the consent of the Purchasing Entity and Contractor, may be included in the ordering document (e.g. purchase order or contract) used by the Purchasing Entity to place the Order.

b. Use of specific NASPO ValuePoint cooperative Master Agreements by state agencies, political subdivisions and other Participating Entities (including cooperatives) authorized by individual state's statutes to use state contracts are subject to the approval of the respective State Chief Procurement Official. Issues of interpretation and eligibility for participation are solely within the authority of the respective State Chief Procurement Official.

c. Obligations under this Master Agreement are limited to those Participating Entities who have signed a Participating Addendum and Purchasing Entities within the scope of those Participating Addenda. Financial obligations of Participating States are limited to the orders placed by the departments or other state agencies and institutions having

available funds. Participating States incur no financial obligations on behalf of other Purchasing Entities. Contractor shall email a fully executed PDF copy of each Participating Addendum to PA@wsca-naspo.org to support documentation of participation and posting in appropriate data bases.

d. NASPO Cooperative Purchasing Organization LLC, doing business as NASPO ValuePoint, is not a party to the Master Agreement. It is a nonprofit cooperative purchasing organization assisting states in administering the NASPO cooperative purchasing program for state government departments, institutions, agencies and political subdivisions (e.g., colleges, school districts, counties, cities, etc.) for all 50 states, the District of Columbia and the territories of the United States.

e. State Participating Addenda or other Participating Addenda shall not be construed to amend the terms of this Master Agreement between the Lead State and Contractor

f. Participating Entities who are not states may under some circumstances sign their own Participating Addendum, subject to the approval of the Chief Procurement Official of the state where the Participating Entity is located. Contractors may upon request obtain a copy of the written authorization from the Lead State Contract Administrator. Coordinate requests for authorization of such participation through NASPO ValuePoint. Any permission to participate through execution of a Participating Addendum is not a determination that procurement authority exists in the Participating Entity; the Participating Entity must ensure that they have the requisite procurement authority to execute a Participating Addendum.

23. PAYMENT

Payment for completion of a contract order is normally made within 30 days following the date the entire order is delivered or the date a correct invoice is received, whichever is later. After 45 days the Contractor may assess overdue account charges up to a maximum rate of one percent per month on the outstanding balance. Payments will be remitted by mail. Payments may be made via a State or political subdivision "Purchasing Card" with no additional charge.

24. PUBLIC INFORMATION

This Master Agreement and all related documents are subject to disclosure pursuant to the Purchasing Entity's public information laws.

25. RECORDS ADMINISTRATION AND AUDIT

a. The Contractor shall maintain books, records, documents, and other evidence pertaining to this Master Agreement and orders placed by Purchasing Entities under it to the extent and in such detail as shall adequately reflect performance and administration of payments and fees. Contractor shall permit the Lead State, a Participating Entity, a Purchasing Entity, the federal government (including its grant awarding entities and the U.S. Comptroller General), and any other duly authorized agent of a governmental agency, to audit, inspect, examine, copy and/or transcribe Contractor's books, documents, papers and records directly pertinent to this Master Agreement or orders placed by a Purchasing Entity under it for the purpose of making audits, examinations, excerpts, and transcriptions. This right shall survive for a period of seven (7) years following termination of this Agreement or final payment for any order placed by a Purchasing Entity against this Agreement, whichever is later, to assure compliance with the terms hereof or to evaluate performance hereunder. If any litigation, claim or audit is started before the expiration of the seven (7) year period, the records shall be retained until final resolution of all litigation, claims, or audit findings involving the records.

b. Without limiting any other remedy available to any governmental entity, the Contractor shall reimburse the applicable Lead State, Participating Entity, or Purchasing Entity for any overpayments inconsistent with the terms of the Master Agreement or Orders placed under a Participating Addendum or underpayment of fees found as a result of the examination of the Contractor's records.

c. The rights and obligations herein exist in addition to any quality assurance obligation in the Master Agreement requiring the Contractor to self-audit contract obligations and that permits the Lead State to review compliance with those obligations.

26. ADMINISTRATIVE FEES

a. The Contractor shall pay to NASPO ValuePoint, or its assignee, a NASPO ValuePoint Administrative Fee of one-quarter of one percent (0.25% or 0.0025) no later than sixty (60) days following the end of each calendar quarter. The NASPO ValuePoint Administrative Fee shall be submitted quarterly and is based on all sales of products and services under the Master Agreement (less any charges for taxes or shipping). The NASPO ValuePoint Administrative Fee is not negotiable. This fee is to be included as part of the pricing submitted with proposal.

b. Additionally, some states may require an additional fee be paid directly to the state only on purchases made by Purchasing Entities within that state. For all such requests, the fee level, payment method and schedule for such reports and payments will be incorporated into the Participating Addendum that is made a part of the Master Agreement. The Contractor may adjust the Master Agreement pricing accordingly for purchases made by Purchasing Entities within the jurisdiction of the state. All such agreements shall not affect the NASPO ValuePoint Administrative Fee percentage or the prices paid by the Purchasing Entities outside the jurisdiction of the state requesting the additional fee. The NASPO ValuePoint Administrative Fee in subsection 26a shall be based on the gross amount of all sales (less any charges for taxes or shipping) at the adjusted prices (if any) in Participating Addenda.

27. NASPO VALUEPOINT SUMMARY AND DETAILED USAGE REPORTS

In addition to other reports that may be required by this solicitation, the Contractor shall provide the following NASPO ValuePoint reports.

a. Summary Sales Data. The Contractor shall submit quarterly sales reports directly to NASPO ValuePoint using the NASPO ValuePoint Quarterly Sales/Administrative Fee Reporting Tool found at <http://www.naspo.org/WNCPO/Calculator.aspx>. Any/all sales made under this Master Agreement shall be reported as cumulative totals by state. Even if Contractor experiences zero sales during a calendar quarter, a report is still required. Reports shall be due no later than thirty (30) days following the end of the calendar quarter (as specified in the reporting tool).

b. Detailed Sales Data. Contractor shall also report detailed sales data by: (1) state; (2) entity/customer type, e.g. local government, higher education, K12, non-profit; (3) Purchasing Entity name; (4) Purchasing Entity bill-to and ship-to locations; (4) Purchasing Entity and Contractor Purchase Order identifier/number(s); (5) Purchase Order Type (e.g. sales order, credit, return, upgrade, determined by industry practices); (6) Purchase Order date; (7) Ship Date; (8) and line item description, including product number if used. The report shall be submitted in any form required by the solicitation. Reports are due on a quarterly basis and must be received by the Lead State and NASPO ValuePoint Cooperative Development Team no later than thirty (30) days after the end of the reporting period. Reports shall be delivered to the Lead State and to the NASPO ValuePoint Cooperative Development Team electronically through a designated portal, email, CD-Rom, flash drive or other method as determined by the Lead State and NASPO ValuePoint. Detailed sales data reports shall include sales information for all sales under Participating Addenda executed under this Master Agreement.

c. Reportable sales for the summary sales data report and detailed sales data report includes sales to employees for personal use where authorized by the solicitation and the Participating Addendum. Report data for employees should be limited to ONLY the state and entity they are participating under the authority of (state and agency, city, county, school district, etc.) and the amount of sales. No personal identification numbers, e.g. names, addresses, **social security numbers or any other numerical identifier**, may be submitted with any report.

d. Contractor shall provide the NASPO ValuePoint Cooperative Development Coordinator with an executive summary each quarter that includes, at a minimum, a list of states with an active Participating Addendum, states that Contractor is in negotiations with and any Participating Addendum roll out or implementation activities and issues. NASPO ValuePoint Cooperative Development Coordinator and Contractor will determine the format and content of the executive summary. The executive summary is due thirty (30) days after the conclusion of each calendar quarter.

e. Timely submission of these reports is a material requirement of the Master Agreement. The recipient of the reports shall have exclusive ownership of the media containing the reports. The Lead State and NASPO ValuePoint shall have a perpetual, irrevocable, non-exclusive, royalty free, transferable right to display, modify, copy, and otherwise use reports, data and information provided under this section.

28. INSPECTION AND ACCEPTANCE

a. The Purchasing Entity's inspection of all materials, supplies and equipment upon delivery is for the purpose of forming a judgment as to whether such delivered items are what was ordered, were properly delivered and ready for acceptance. Such inspection shall not be construed as final acceptance, or as acceptance of the materials, supplies or equipment, if the materials, supplies or equipment does not conform to contractual requirements.

b. If there are any apparent defects in the materials, supplies, or equipment at the time of delivery, the Purchaser will promptly notify the Contractor. Without limiting any other rights, the Purchaser may require the Contractor to: (1) repair or replace, at Contractor's expense, any or all of the damaged goods; (2) refund the price of any or all of the damaged goods; or (3) accept the return of any or all of the damaged goods.

c. Any standard of performance under this Master Agreement applies to all Products purchased under this Master Agreement, including any additional, replacement, or substitute Product(s) and any Product(s) which are modified by or with the written approval of Contractor after Acceptance by the Purchasing Entity. The Acceptance Testing period shall be thirty (30) calendar days or other time period identified in the solicitation or the Participating Addendum, starting from the day after the Product is delivered or, if installed, the day after the Product is installed and Contractor certifies that the Product is ready for Acceptance Testing. If the Product does not meet the standard of performance during the initial period of Acceptance Testing, Purchasing Entity may, at its discretion, continue Acceptance Testing on a day-to-day basis until the standard of performance is met. Upon rejection, the Contractor will have fifteen (15) calendar days to cure the standard of performance issue(s). If after the cure period, the Product still has not met the standard of performance, the Purchasing Entity may, at its option: (a) declare Contractor to be in breach and terminate the Order; (b) demand replacement Product from Contractor at no additional cost to Purchasing Entity; or, (c) continue the cure period for an additional time period agreed upon by the Purchasing Entity and the Contractor. Contractor shall pay all costs related to the preparation and shipping of Product returned pursuant to the section. No Product shall be accepted and no charges shall be paid until the standard of performance is met. The warranty period will begin upon Acceptance.

29. WARRANTY

Sections 7.3 and 7.4 of the Contract prescribe warranty requirements.

30. SYSTEM FAILURE OR DAMAGE

In the event of system failure or damage caused by the Contractor or its Product, the Contractor agrees to use its best efforts to restore or assist in restoring the system to operational capacity.

31. TITLE OF PRODUCT

Upon Acceptance by the Purchasing Entity, Contractor shall convey to Purchasing Entity title to the Product free and clear of all liens, pledges, mortgages, encumbrances, or other security interests. Transfer of title to the Product shall include an irrevocable and perpetual license to use any Embedded Software in the Product. If Purchasing Entity subsequently transfers title of the Product to another entity, Purchasing Entity shall have the right to transfer the license

to use the Embedded Software with the transfer of Product title. A subsequent transfer of this software license shall be at no additional cost or charge to either Purchasing Entity or Purchasing Entity's transferee.

32. WAIVER OF BREACH

Failure of the Lead State, Participating Entity, or Purchasing Entity to declare a default or enforce any rights and remedies shall not operate as a waiver under this Master Agreement or Participating Addendum. Any waiver by the Lead State, Participating Entity, or Purchasing Entity must be in writing. Waiver by the Lead State or Participating Entity of any default, right or remedy under this Master Agreement or Participating Addendum, or by Purchasing Entity with respect to any Purchase Order, or breach of any terms or requirements of this Master Agreement, a Participating Addendum, or Purchase Order shall not be construed or operate as a waiver of any subsequent default or breach of such term or requirement, or of any other term or requirement under this Master Agreement, Participating Addendum, or Purchase Order.

33. ASSIGNMENT OF ANTITRUST RIGHTS

Contractor irrevocably assigns to a Participating Entity any claim for relief or cause of action which the Contractor now has or which may accrue to the Contractor in the future by reason of any violation of state or federal antitrust laws (15 U.S.C. § 1-15 or a Participating Entity's state antitrust provisions), as now in effect and as may be amended from time to time, in connection with any goods or services provided to the Contractor for the purpose of carrying out the Contractor's obligations under this Master Agreement or Participating Addendum, including, at a Participating Entity's option, the right to control any such litigation on such claim for relief or cause of action.

34. DEBARMENT

The Contractor certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction (contract) by any governmental department or agency. This certification represents a recurring certification made at the time any Order is placed under this Master Agreement. If the Contractor cannot certify this statement, attach a written explanation for review by the Lead State.

35. GOVERNING LAW AND VENUE

a. The procurement, evaluation, and award of the Master Agreement shall be governed by and construed in accordance with the laws of the Lead State sponsoring and administering the procurement. The construction and effect of the Master Agreement after award shall be governed by the law of the state serving as Lead State (in most cases also the Lead State). The construction and effect of any Participating Addendum or Order against the Master Agreement shall be governed by and construed in accordance with the laws of the Participating Entity's or Purchasing Entity's State.

b. Unless otherwise specified in the RFP, the venue for any protest, claim, dispute or action relating to the procurement, evaluation, and award is in the Lead State. Venue for any claim, dispute or action concerning the terms of the Master Agreement shall be in the state serving as Lead State. Venue for any claim, dispute, or action concerning any Order placed against the Master Agreement or the effect of a Participating Addendum shall be in the Purchasing Entity's State.

c. If a claim is brought in a federal forum, then it must be brought and adjudicated solely and exclusively within the United States District Court for (in decreasing order of priority): the Lead State for claims relating to the procurement, evaluation, award, or contract performance or administration if the Lead State is a party; the Participating State if a named party; the Participating Entity state if a named party; or the Purchasing Entity state if a named party.

36. NASPO VALUEPOINT EMARKET CENTER

In July 2011, NASPO ValuePoint entered into a multi-year agreement with SciQuest, Inc. whereby SciQuest will provide certain electronic catalog hosting and management services to enable eligible NASPO ValuePoint customers to access a central online website to view and/or shop the goods and services available from existing NASPO ValuePoint Cooperative Contracts. The central online website is referred to as the NASPO ValuePoint eMarket Center.

The Contractor will have visibility in the eMarket Center through Ordering Instructions. These Ordering Instructions are available at no cost to the Contractor and provide customers information regarding the Contractors website and ordering information.

At a minimum, the Contractor agrees to the following timeline: NASPO ValuePoint eMarket Center Site Admin shall provide a written request to the Contractor to begin Ordering Instruction process. The Contractor shall have thirty (30) days from receipt of written request to work with NASPO ValuePoint to provide any unique information and ordering instructions that the Contractor would like the customer to have.

OR

a. In July 2011, NASPO ValuePoint entered into a multi-year agreement with SciQuest, Inc. whereby SciQuest will provide certain electronic catalog hosting and management services to enable eligible NASPO ValuePoint customers to access a central online website to view and/or shop the goods and services available from existing NASPO ValuePoint Cooperative Contracts. The central online website is referred to as the NASPO ValuePoint eMarket Center Contractor shall either upload a hosted catalog into the eMarket Center or integrate a punchout site with the eMarket Center.

b. Supplier's Interface with the eMarket Center. There is no cost charged by SciQuest to the Contractor for loading a hosted catalog or integrating a punchout site.

c. At a minimum, the Contractor agrees to the following:

(1) Implementation Timeline: NASPO ValuePoint eMarket Center Site Admin shall provide a written request to the Contractor to begin enablement process. The Contractor shall have fifteen (15) days from receipt of written request to work with NASPO ValuePoint and SciQuest to set up an enablement schedule, at which time SciQuest's technical documentation shall be provided to the Contractor. The schedule will include future calls and milestone dates related to test and go live dates. The contractor shall have a total of Ninety (90) days to deliver either a (1) hosted catalog or (2) punch-out catalog, from date of receipt of written request.

(2) NASPO ValuePoint and SciQuest will work with the Contractor, to decide which of the catalog structures (either hosted or punch-out as further described below) shall be provided by the Contractor. **Whether hosted or punch-out, the catalog must be strictly limited to the Contractor's awarded contract offering (e.g. products and/or services not authorized through the resulting cooperative contract should not be viewable by NASPO ValuePoint Participating Entity users).**

(a) Hosted Catalog. By providing a hosted catalog, the Contractor is providing a list of its awarded products/services and pricing in an electronic data file in a format acceptable to SciQuest, such as Tab Delimited Text files. In this scenario, the Contractor must submit updated electronic data [Insert Time Frame Here] to the eMarket Center for the Lead State's approval to maintain the most up-to-date version of its product/service offering under the cooperative contract in the eMarket Center.

(b) Punch-Out Catalog. By providing a punch-out catalog, the Contractor is providing its own online catalog, which must be capable of being integrated with the eMarket Center as a. Standard punch-in via Commerce eXtensible Markup Language (cXML). In this scenario, the Contractor shall validate that its online catalog is up-to-date by providing a written update [every Insert Time Frame Here] to the Lead State stating they have audited the offered products/services and pricing listed on its online catalog. The site must also return detailed UNSPSC codes (as outlined in line 3) for each line item. Contractor also agrees to provide e-Quote functionality to facilitate volume discounts.

d. Revising Pricing and Product Offerings: Any revisions (whether an increase or decrease) to pricing or product/service offerings (new products, altered SKUs, etc.) must be pre-approved by the Lead State and shall be subject to any other applicable restrictions with respect to the frequency or amount of such revisions. However, no cooperative contract enabled in the eMarket Center may include price changes on a more frequent basis than once per quarter. The following conditions apply with respect to hosted catalogs:

(1) Updated pricing files are required by the 1st of the month and shall go into effect in the eMarket Center on the [1st day of the following month (i.e. file received on 1/01/13 would be effective in the eMarket Center on 2/01/13)]. Files received after the 1st of the month may be delayed up to a month (i.e. file received on 11/06/09 would be effect in the eMarket Center on 1/01/10).

(2) Lead State-approved price changes are not effective until implemented within the eMarket Center. Errors in the Contractor's submitted pricing files will delay the implementation of the price changes in eMarket Center.

e. Supplier Network Requirements: Contractor shall join the SciQuest Supplier Network (SQSN) and shall use the SciQuest's Supplier Portal to import the Contractor's catalog and pricing, into the SciQuest system, and view reports on catalog spend and product/pricing freshness. The Contractor can receive orders through electronic delivery (cXML) or through low-tech options such as fax. More information about the SQSN can be found at: www.sciquest.com or call the SciQuest Supplier Network Services team at 800-233-1121.

f. Minimum Requirements: Whether the Contractor is providing a hosted catalog or a punch-out catalog, the Contractor agrees to meet the following requirements:

(1) Catalog must contain the most current pricing, including all applicable administrative fees and/or discounts, as well as the most up-to-date product/service offering the Contractor is authorized to provide in accordance with the cooperative contract; and

(2) The accuracy of the catalog must be maintained by Contractor throughout the duration of the cooperative contract between the Contractor and the Contract Administrator; and

(3) The Catalog must include a Lead State contract identification number; and

(4) The Catalog must include detailed product line item descriptions; and

(5) The Catalog must include pictures when possible; and

(6) The Catalog must include any additional NASPO ValuePoint and Participating Addendum requirements. Although suppliers in the SQSN normally submit one (1) catalog, it is possible to have multiple contracts applicable to different NASPO ValuePoint Participating Entities. For example, a supplier may have different pricing for state government agencies and Board of Regents institutions. Suppliers have the ability and responsibility to submit separate contract pricing for the same catalog if applicable. The system will deliver the appropriate contract pricing to the user viewing the catalog.

g. Order Acceptance Requirements: Contractor must be able to accept Purchase Orders via fax or cXML. The Contractor shall provide positive confirmation via phone or email within 24 hours of the Contractor's receipt of the Purchase Order. If the Purchasing Order is received after 3pm EST on the day before a weekend or holiday, the Contractor must provide positive confirmation via phone or email on the next business day.

h. UNSPSC Requirements: Contractor shall support use of the United Nations Standard Product and Services Code (UNSPSC). UNSPSC versions that must be adhered to are driven by SciQuest for the suppliers and are upgraded every year. NASPO ValuePoint reserves the right to migrate to future versions of the UNSPSC and the Contractor shall be required to support the migration effort. All line items, goods or services provided under the resulting statewide contract must be associated to a UNSPSC code. All line items must be identified at the most detailed UNSPSC level indicated by segment, family, class and commodity. More information about the UNSPSC is available at: <http://www.unspsc.com> and <http://www.unspsc.com/FAQs.asp#howdoesunspscwork>.

- i. Applicability: Contractor agrees that NASPO ValuePoint controls which contracts appear in the eMarket Center and that NASPO ValuePoint may elect at any time to remove any supplier's offering from the eMarket Center.
- j. The Lead State reserves the right to approve the pricing on the eMarket Center. This catalog review right is solely for the benefit of the Lead State and Participating Entities, and the review and approval shall not waive the requirement that products and services be offered at prices (and approved fees) required by the Master Agreement.
- k. Several NASPO ValuePoint Participating Entities currently maintain separate SciQuest eMarketplaces; these Participating Entities do enable certain NASPO ValuePoint Cooperative Contracts. In the event one of these entities elects to use this NASPO ValuePoint Cooperative Contract (available through the eMarket Center) but publish to their own eMarketplace, the Contractor agrees to work in good faith with the entity and NASPO ValuePoint to implement the catalog. NASPO ValuePoint does not anticipate that this will require substantial additional efforts by the Contractor; however, the supplier agrees to take commercially reasonable efforts to enable such separate SciQuest catalogs.

37. CONTRACT PROVISIONS FOR ORDERS UTILIZING FEDERAL FUNDS

Pursuant to Appendix II to 2 Code of Federal Regulations (CFR) Part 200, Contract Provisions for Non-Federal Entity Contracts Under Federal Awards, Orders funded with federal funds may have additional contractual requirements or certifications that must be satisfied at the time the Order is placed or upon delivery. These federal requirements may be proposed by Participating Entities in Participating Addenda and Purchasing Entities for incorporation in Orders placed under this master agreement.

(June 2015)

CONTRACTOR INFORMATION AND PROFILE

Alcatel-Lucent USA, Inc. (part of Nokia Group) company information, ordering, and payment information is below.



Bidder Information

CONTRACT MANAGEMENT AND PERFORMANCE PLAN

Alcatel-Lucent USA, Inc. (part of Nokia Group) response to their Contract Management and Performance Plan is included below.



Contract
Management and Per

CONTRACTOR NATIONWIDE DISTRIBUTION PLAN

Alcatel-Lucent USA, Inc. (part of Nokia Group) response to the nationwide distribution plan is below.



Nationwide
Distribution Plan

SUPPLIER DIVERSITY PLAN

Alcatel-Lucent USA, Inc. (part of Nokia Group) response to supplier diversity is below.



Supplier Diversity
Plan



Diversity Attachment

APPENDIX D- BIDDER INFORMATION AND PROFILE

Bidders shall provide the following required information. Where additional space is needed and/or where specifically requested, submit an additional letter.

1. **Company Name:** Alcatel-Lucent USA Inc. (part of Nokia Group)
Address: 600-700 Mountain Ave
City: Murray Hill State: NJ Zip: 07974-0636
Phone: (908) 582-3000 FAX (if any): (908) 582-8500
Washington State Department of Revenue Registration Tax number: UBI 601-680-615-1
Federal Tax ID No.: 22-3408857
Company Internet URL Address (if available): www.nokia.com

2. **Legal Status of the Bidder:**
Corporation: __X__ Partnership: _____ Sole Proprietor: _____ Other:

3. **Bidder's Authorized Representative:** (Reference Section 4.2 of the Solicitation Document and Section 2.3 of Appendix M - Model Contract)
Name: Scott Mehal
Title: Sr. Account Manager
Phone: 206- 465 7453 FAX: _____ E-mail: scott.mehal@nokia.com

4. **Orders to be sent to:**
Company Name: Alcatel-Lucent USA Inc
Address: c/o Order Administration, 600 March Road,
City: Ottawa State: Ontario, Canada Zip: K2K 2E6
Phone: 613-784-4227 or toll Free: 800-777-6804 FAX: 613-599-3632
E-mail: ordernow@alcatel-lucent.com
Internet address for company catalog (if available): _____
<https://fortress.wa.gov/ga/apps/ContractSearch/ContractSummary.aspx?c=02702>

5. **Billing will be from:**
Company Name: Alcatel-Lucent USA Inc
Address: 600-700 Mountain Ave
City: Murray Hill State: NJ Zip: 07974-0636
Phone: (908) 582-3000 FAX (if any): (908) 582-8500 E-mail: scott.mehal@nokia.com

6. **Payment to be sent to:**

Company Name: Alcatel-Lucent USA Inc.

Address: PO Box 911476 Accounts Receivable

City: Dallas State: Texas Zip: 75391-1476

Phone: 613-784-4227 FAX: 613-599-3632 E-mail: ordernow@alcatel-lucent.com

7. Minority/Women Owned Business (MWBE): (Reference Section 1.10 of the Solicitation Document)

Yes: No: (Check only one): Minority: Women:

Washington State Certification No: _____ Self-Certified: (check if applicable)

8. Reciprocity: Firms bidding from California only: Is your firm currently certified as a small business under California Code, Title 2, Section 1896.12? Yes No .

9. Payment Methods and Term:

Prompt Payment Discount 0 % 30 days or Net 30 days. Note: Prompt payment discount periods equal to (or greater than) 30 calendar days will receive consideration and proposal pricing will be reduced (for evaluation purposes only) by the amount of that discount(s). (Reference Section 4.8 Payment Terms of the Solicitation Document)

Purchasing (charge) Cards accepted: Yes No . Payment by Purchasing Card may qualify for Prompt Payment Discount and no additional card fee or processing charge shall be permitted. Bidder is to identify the purchasing (charge) cards they accept:

AMEX, Master Card, & Visa. ALU does not have a prompt payment discount.

10. Customer References (Reference Appendix I Customer Reference Questionnaire): Bidder has asked the following customer references to complete and submit customer reference questionnaires to the Procurement Coordinator and to identify the public safety communication equipment purchased from the company by category: Four returned reference questionnaires will be needed for each equipment category and the aggregate value of purchases must have exceeded \$250,000 during the past two years. (Reference Section 4.10 Customer References)

- Reference name: State of CO: Office of Information Technology Communications Services

Contact person and telephone: Balta Moreno 303-764-7979

Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM, Network Grade

- Reference name: City of San Diego

Contact person and telephone: Huw Williams 619-525-8582

Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM

- Reference name: City and County of San Francisco
 Contact person and telephone: Christopher Chamberlain 425-603-9629
 Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM, Network Grade
- Reference name: Washington State Department of Transportation
 Contact person and telephone: McDowet 360-705-7028
 Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM, Network Grade
- Reference name: City of Los Angeles, California USA
 Contact person and telephone: Duncan Angami 213-978-0870
 Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM
- Reference name: City of Dallas
 Contact person and telephone: CJ Holt 214-670-7979
 Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM, Network Grade
- Reference name: West Central Wireless
 Contact person and telephone: Michael Hegefeld 325-656-9490
 Equipment categories/subcategories: Carrier Grade Packet Data, Carrier Grade TDM, Network Grade
- Reference name: Grays Harbor PUD
 Contact person and telephone: Rob Hanny (360) 532-4220
 Equipment categories/subcategories: Carrier grade packet Data, Carrier grade TDM

11. Contract Savings:

Without benefit of this NASPO ValuePoint contract, Bidder would normally charge state/local government agency purchasers 20 % more than the pricing offered in response to this RFP for the following product categories/subcategories. (This question is being asked to assess the potential savings to the NASPO ValuePoint customers who may consider using this contract.)

APPENDIX E - CONTRACT MANAGEMENT AND PERFORMANCE PLAN

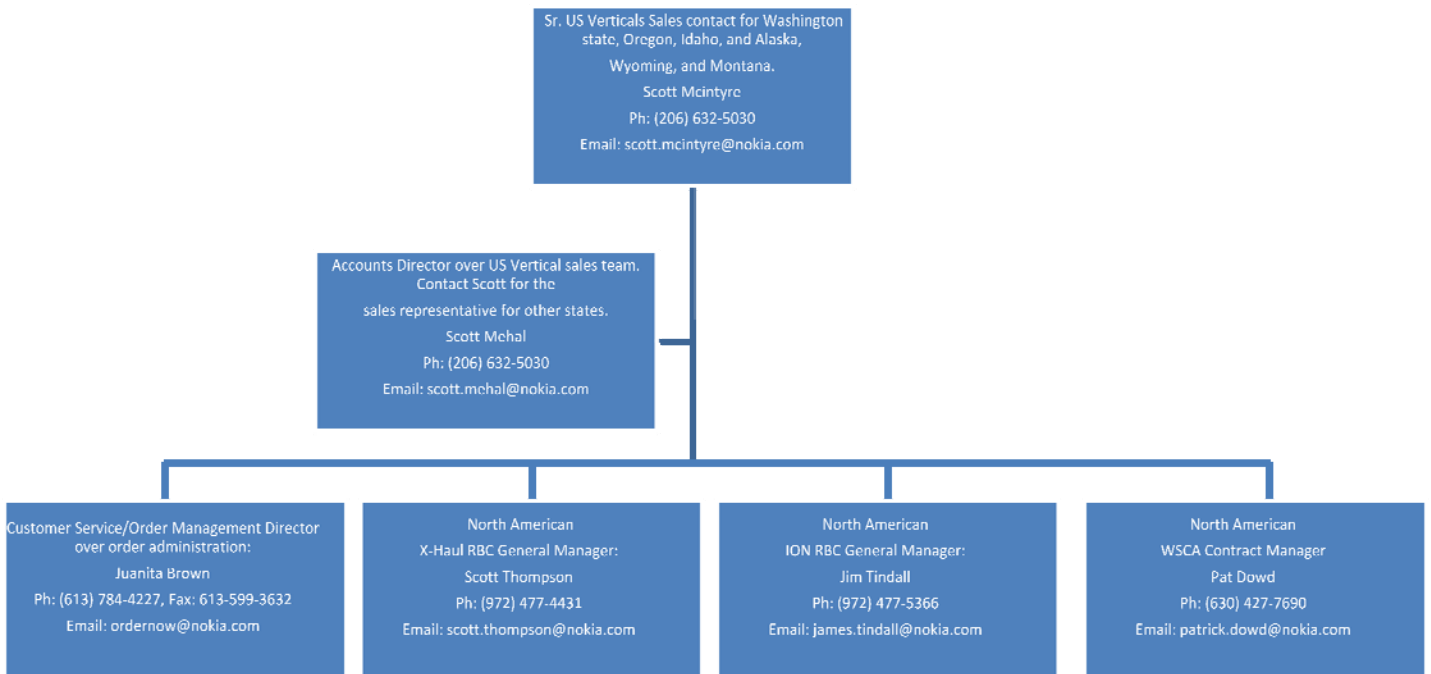
Bidders should provide responses to each of the following issues in an attachment to this Appendix. Restate the issue and provide your complete response. (Reference Section 5.1 Bidder's Contract Management and Performance Plan) Responses will be evaluated and scored in accordance with reference Section 8.1.8 Evaluation of Non-Cost Factors of this Solicitation Document.

The information provided below will apply the Bidder's plan to sell and service communication equipment in the following categories and subcategories:

- Batteries
 - Modular Flooded Lead Acid
 - Modular Valve Regulated Lead Acid
 - Mono-Block Valve Regulated Lead Acid
 - Portable Radio
- Equipment Shelters
 - Ballasted
 - Concrete
 - Fiberglass
 - Framed Light-Weight
 - Outdoor Cabinet
- Furniture, Dispatch Console
- Interoperability Gateway Devices
- Microwave Radios
 - Carrier Grade, Packet Data
 - Carrier Grade, Native Time Division Multiplex (TDM)
 - Network Grade
 - Native IP, Sub 5.9 GHz
 - Native IP, 900 MHz
- Monitoring & Alarm
 - Environmental
 - Radio Network
- Power Systems
 - DC Conversion
 - Fuel Cell
 - Electro-Mechanical Generators
 - Uninterruptable Power Supply (UPS)
 - Uninterruptable Power Supply (UPS)
- Test Equipment
 - Multifunction Radio Test Set
 - Specialized RF Instruments

- Multifunction Radio Test Set
- Towers
 - Accessories & Appurtenances
 - Deployable / Temporary
 - Guyed
 - Guyed, Light
 - Lattice
 - Lattice, Light
 - Monopole
 - Passive Microwave Repeater

1. Provide an organizational chart identifying key people to be involved in the performance of the contract in the event of award. Include job titles and a brief description of their proposed job duties for these key people.



2. Describe company experience and history supplying and servicing the equipment offered.

The formation of Alcatel-Lucent USA Inc. (part of Nokia Group) in 2016 created the world's first truly global communications solutions provider, with the most complete end-to-end portfolio of solutions and services in the industry. Alcatel-Lucent USA Inc. (part of Nokia Group) transcends national borders, with an extensive, well-balanced global presence in terms of resources and revenues, and one of the largest and most innovative R&D capabilities. While we are proud of our heritage and world-class leadership in multiple lines of business, we believe it is important to NASPO to understand our business with respect to our microwave radio products. Therefore this company history has two parts – first our legacy of development and innovation of world class microwave radio radios system, and second our overall corporate history in telecommunications.

Alcatel-Lucent USA Inc. (part of Nokia Group)'s Rich Microwave Radio Heritage

The North American operations of our Wireless Transmission Division is based in Plano, Texas and traces its roots to the Collins Radio Company, which was founded in 1933. Originally headquartered in Richardson, Texas, Collins Radio became a front runner in the development and production of microwave communications with some of the first industrial long haul radio systems introduce in the 1950's.

The first prototype of Collins commercial microwave equipment was placed in service between Dallas and Irving, Texas in the spring of 1954. By 1955 Collins was mass producing microwave equipment and was providing the FAA with microwave systems helping to create the largest communications and radar handling complex in the world. In 1960, Collins became the first company to transmit voices and pictures via satellite.

In 1973, Collins radio merged into Rockwell International and the Texas based organization ultimately became Rockwell's Network Transmission Systems Division (NTSD). During this period, we developed and marketed both analog and digital microwave radios, and we introduced fiber optic transmission systems and digital crossconnects. Our MDR-() series of radios was the first commercially viable high density microwave digital radio which used 8 PSK modulation to transmit 2 DS3 capacity or 1,344 voice channels. Over 7,900 transceivers of this family were delivered during the lifetime of the product line propelling us to become the world leader in microwave digital transmission systems.

In the early 1980's, we introduced our second generation family of high density radios, the MDR-2000 series, using 16 and 64 QAM modulation techniques for 135 Mb/s transmission. The MDR-2000 series was used by local and long distance carriers with routes crisscrossing the United States and Canada as well as international locations. Increasing demand for high capacity communications brought rapid turns in our microwave R&D department, which resulted in the introduction of our MDR-4000 series in 1987. The MDR-4000 radio family quickly became the leading high density radio in the U.S. with capacity for 1, 2 or 3 DS3. Further enhancements brought to market were the MDR-4000e enhanced with wayside DS1 capacity (1991), and the MDR-4000s SONET with OC-3 capacity (1993).

During this time, NTSD began to transition of our microwave manufacturing operations from Richardson to Longview, Texas. Steadily increasing demands on production saw three moves to larger facilities in Longview. Market demands for shorter delivery cycles, lower costs and high quality fostered start-to-finish production capability. This includes board-level manufacturing with surface-mount production lines all the way through final assembly and test – including a 24-hour burn-in chamber in which we cycle every radio shipped through the complete operating temperature range of the product two times.

Parallel to our success in the high capacity radio market, we introduced innovations in low capacity radios. Our MDR-3X18 operated at 18 GHz with capacity variations of 4, 8 or 12 DS1 or 1 DS3, and we also we introduced the first commercially viable 256 QAM radio, our MDR 5102, featuring 12 DS1 capacity within a 3.5 MHz bandwidth.

In 1991, Alcatel purchased NTSD from Rockwell International and combined it with Alcatel Network Systems Company to form Alcatel Network Systems, Inc. The acquisition was particularly exciting since it married two U.S. companies with strong presence in transmission systems with leading-edge components, technology and other assets from various segments of Alcatel's European operations. In addition, this acquisition brought rich resources to our North American microwave radio business unit through cross-functional development and collaboration with Alcatel's European microwave division which was internationally-known as the former Telettra.

Following the market acceptance of the MDR-5000, we released the MDR-6000 in 1995. This brought an exciting development in microwave radio technology, for the MDR-6000 was the industry's first radio to feature capacity upgrades without a complete changeout of modules. Alcatel's trademarked Capacity Key allowed a customer to start with a 2 DS1 radio and grow up to 16 DS1 with a simple replacement of a sub-board. Furthermore, customers could perform in-service capacity upgrades on hot-standby radio systems. In 1998, Alcatel-Lucent USA Inc. (part of Nokia Group) continued to introduce flexible radios with capacity keys in other bands such as the MDR-7000, with expanded frequency range of 15, 18, 23 and 38 GHz.

In 1999, Alcatel brought another industry first to the microwave radio industry with our MDR-8000. Covering the lower microwave frequency bands from 2 GHz to 11 GHz, the MDR 8000 product evolved to offer capacity options for 2 to 16 DS1, 1 to 3 DS3, or OC-3 SONET. This universal platform featured Capacity Key upgrades, commonality of RF modules for all capacities, high system gain, and a single compact frame measuring 12.25"x19"x16.26" (HxWxD). Furthermore, the MDR-8000 was the first and only TDM-based microwave radio to offer the ability to convert to IP transport with direct Ethernet interfaces without having to modify the radio chassis or replace the RF transceivers. The MDR-8000 continues in full production today, still serving the needs of Mobility and Mission Critical customers.

In 2006, facing an industry with intense competition and where operators were consolidating, Alcatel and Lucent Technologies announced plans to merge.

At the same time, Alcatel announced a deal to increase its shareholding and transfer its satellite subsidiaries, its railway signaling business and its critical security systems domains to Thales, a key player in the French defense industry.

On November 30, 2006, the merger between Alcatel and Lucent was completed, creating the world's first truly global communications solutions provider.

It is Alcatel-Lucent strategy to spark the transformation of their industry and remain at the forefront of the ever-evolving communications market. To that end Alcatel-Lucent entered into several joint ventures and made strategic acquisitions in key technologies.

The company acquired Nortel's UMTS radio access business to strengthen its leadership position in this technology at the end of 2006. During 2007 the company continued its focus on wireline technology, software and services expertise with acquisitions of Canadian metro WDM networking supplier Tropic Networks, Inc.; enterprise services gateway products developer NetDevices; IPTV software company Tamblin; and the telecommunications consulting practice Thompson Advisory Group, Inc. In addition, Alcatel-Lucent acquired Motive, Inc., a leading provider of service management software for broadband and mobile data services in 2008.

In the same year Alcatel and Lucent Technologies announced plans to merge we introduced a TDM-based variation of our 9500 microwave radio family – the 9500MXC – which featured a

Low to High Capacity, split architecture radio platform, with interface flexibility enabled through a modular indoor unit. This product line set the stage for the introduction in 2009 for the first all nodal packet radio in the market, the 9500MPR.

The 9500 MPR Microwave Packet Radio came on the scene in 2008 as the industry's first all-packet microwave radio. Initially released with a split architecture supporting nodal configurations for frequency bands from 6 GHz to 40 GHz, the 9500 MPR began to fill a vital need for highly reliable IP communications over microwave while allowing economical deployments for mobile backhaul and mission critical networks. Then in 2009, the 9500 MPR scored an additional first-to-market achievement when we introduced high power, all-indoor radio transceivers for the 6 and 11 GHz licensed bands as well as the 5.8 GHz unlicensed band. Now, network operators could meet their needs for native IP transport over long haul microwave links utilizing traditional waveguide and antennas. Continued evolution of the 9500 MPR and field-proven, first-to-market innovations have propelled Alcatel-Lucent to where it is the sole market leader for microwave radios in North America with a 31% market share . We continue to manufacture, test and ship all 9500 MPR radios from our facility in Austin, Texas.

Public Safety Focused

Public safety agencies are migrating their backhaul networks from TDM to packet for the efficient support of mission-critical LMR/TETRA applications and the eventual adoption of LTE mobile broadband. Agencies should ensure that their transformation to converged communications includes an IP/MPLS network because only IP/MPLS can provide the capability and reliability that is mandated by mission-critical services. The Alcatel-Lucent USA Inc. (part of Nokia Group) IP/MPLS network solution can help public safety agencies to extend and enhance their networks to support new IP-based applications while continuing to support TDM. These new technologies enable agencies to optimize their network flexibility and management and reduce CAPEX/OPEX without compromising safety, security or reliability. A microwave and service-aware IP/MPLS network enables the support of converged voice, data and video applications that can be managed using configurable QoS levels. The Alcatel-Lucent USA Inc. (part of Nokia Group) IP/MPLS network provides public safety agencies with:

- Reliable mission-critical services with high network availability
- Infrastructure sharing with VPNs
- Deterministic QoS for high-priority real-time applications
- Support for current and future mission-critical services
- Flexible time and frequency synchronization options
- Opportunities for reduced OPEX and CAPEX
- Preparation for eventual LTE adoption
- Strong security protection

Alcatel-Lucent USA Inc. (part of Nokia Group) has been providing networking infrastructure for the Municipal, State and Federal Public Sectors as well as public and private Hospitals and Education institutions for many years. The Microwave Division has products and services where mission critical infrastructure and converged networks are required. Our carrier grade products ensure even the most stringent reliability and maintainability requirements are met.

Alcatel-Lucent USA Inc. (part of Nokia Group), at the Origin of Telecommunications

Alcatel-Lucent USA Inc. (part of Nokia Group) has been at the forefront of telecommunications since the birth of the industry in the late 19th century. The company's roots span two continents and encompass two early pioneering companies — La Compagnie Générale d'Electricité (CGE) and the Western Electric Manufacturing Company.

Western Electric began in 1869 when Elisha Gray and Enos N. Barton started a small manufacturing firm based in Cleveland, Ohio. By 1880, the company had relocated to Chicago, Illinois, and become the largest electrical manufacturing company in the U.S. Western Electric was noted for its production of a variety of electrical equipment, including the world's first commercial typewriters, telegraph equipment and Thomas A. Edison's electric pen. In 1881 the American Bell Telephone Company — founded by Alexander Graham Bell and forerunner of American Telephone & Telegraph (AT&T) — purchased a controlling interest in Western Electric and made it the exclusive developer and manufacturer of equipment for the Bell telephone companies.

La Compagnie Générale d'Electricité (CGE) was formed in 1898 by French engineer Pierre Azaria to compete against AEG, Siemens and General Electric. Based in Alsace region of France, CGE was an industrial conglomerate involved in various activities such as electricity, transportation, electronics and telecommunications. CGE would become a leader in digital communications and would also be known for producing the "TGV" (train à grande vitesse) high speed trains in France.

In 1925, Bell Telephone Laboratories was created from the consolidation of the Western Electric Research Laboratories, formed in 1907, and part of the Engineering Department of AT&T. Bell Labs would go on to generate some of the most significant scientific and technological discoveries of the 20th century, including the transistor, the laser, the solar cell battery, the digital signal processor chip and the cellular concept of mobile telephone service. Bell Labs researchers would also garner 7 Nobel Prizes.

Also in 1925, Western Electric sold its International Western Electric Company subsidiary to ITT Corporation. CGE strengthened its leadership in digital communications in the mid-1980s when it bought the telecommunications part of ITT and changed the group's name to Alcatel Alsthom.

Changing and Expanding

The mid-1980s marked significant changes for both companies. In 1983, Alcatel Alsthom became one of the first foreign companies to establish itself in China, understanding the huge potential of the Asia Pacific market. Effective January 1, 1984, AT&T agreed to divest its local Bell telephone companies. As part of this divestiture, a new unit named AT&T Technologies (later to become Lucent Technologies), assumed Western Electric's charter.

The 1990s were a time of realignment and refocusing on telecommunications. AT&T launched Lucent Technologies in April 1996 with an initial public offering. The spinoff was completed in September 1996 when AT&T distributed its shares of Lucent to AT&T shareowners. In 1998 Alcatel Alsthom decided to concentrate on the telecommunications industry, spinning off its Alsthom activities and changing the company's name to Alcatel.

Alcatel made significant acquisitions in North America at the end of the 1990s and in the early 2000s. Acquisitions included: DSC in 1998; Newbridge and Genesys in 2000; Astral Point Communications in 2002; and Spatial Communications in 2005.

In 2002 Alcatel took control of its flagship subsidiary Alcatel Shanghai Bell (ASB), with the Chinese government owning the rest of this enterprise. This structure allowed Alcatel to uniquely position itself in a Chinese market experiencing rapid growth.

Looking Forward

Today

Alcatel-Lucent USA Inc. as part of Nokia Group will increase our position at the forefront of global communications, providing products and innovations in IP and cloud networking, as well as ultra-broadband fixed and wireless access to service providers and their customers, enterprises and institutions throughout the world.

Underpinning Alcatel-Lucent USA Inc. (part of Nokia Group) in driving the industrial transformation from voice telephony to high-speed digital delivery of data, video and information is Bell Labs, an integral part of Alcatel-Lucent USA Inc. (part of Nokia Group) and one of the world's foremost technology research institutes, responsible for countless breakthroughs that have shaped the networking and communications industry all in pursuit of the company's mission to expand the human possibilities of the connected world

Also describe your plans for:

- Collecting and reporting quarterly contract sales to Lead State and NASPO ValuePoint on quarterly basis, and to other Purchasing Entities under the terms of a completed Participating Addendum.

Orders received under the WSCA Agreement are "Noted" within our Ordering Systems by Contract Number. Order Reports are pulled from the corresponding Ordering System(s) for Orders received with the WSCA notation each month. A report is then created on each State's template in accordance with the State's Participating Addendum. A report is created within the WSCA-NASPO Website with each state total purchases, and a fee is paid accordingly.

- Paying quarterly contract administrative fees to NASPO ValuePoint, to Lead State (Washington) for in-state sales, and to other Purchasing Entities who require it under the terms of a completed Participating Addendum.

Comply.

3. Describe your plan to provide contract customers with product and service information and assistance with order development, placement, and tracking. If you plan to utilize a dedicated website in support of the contract, describe the details. Include how you plan to provide customers with telephone assistance with order development and placement.

A dedicated website is not available however the following sales contacts can assist if a customer has questions regarding their configurations, scope and quote request.

Alcatel-Lucent USA Inc. (part of Nokia Group) Sales Contacts:

Scott Mehal:

States Covered: Washington state, Oregon,

Idaho, Alaska, Wyoming , Montana,

Phone: 206-632-5030

Email: scott.mehal@nokia.com

Reno Moccia:

For all other states.

Phone: 403-213-9747

Email: reno.moccia@nokia.com

Describe Help Desk services available for initial troubleshooting and possible resolution of the problems or for the initiation of repair or replacement services.

Our Technical Support service is the focal point for all technical issues. These services may be contacted via phone or online. The Alcatel-Lucent USA Inc. (part of Nokia Group) Welcome Center or, if available, web on-line Customer Support provides access 24 hours a day and 365 days of the year in order to open an Assistance Request ("AR"). The Welcome Center will assign each AR a unique trackable number in order to facilitate communication and enable rapid assistance.

4. Describe your plan to provide contract customers assistance resolving invoicing and payment issues and problems.

When a customer Purchase Order is received our order management checks if the WSCA contract number is referenced on the Purchase Order which is included in a quarterly report of all PO's with the WSCA contract number reference. If any missing PO's are questioned we always pull a copy of the PO to check it. If the WSCA reference was not included or if there could be a data entry error ALU will make every effort to correct errors and provide the most current reporting. If the issue cannot be resolved the customer might need to escalate to the contracting state entity procurement directly for resolution.

5. Describe how customers will be provided support for the following:

- Equipment configuration and system design.

Contact Scott Mehal or Reno Moccia for a local sales representative. Customers will need to provide their system configurations, locations, and scope to request a quote for equipment configuration and system design.

- Technical support services.

Our Technical Support service is the focal point for all technical issues and is available for purchase. These services may be requested via phone contact and/or online. The Welcome Center or web on-line Customer Support provides access 24 hours a day and 365 days of the year in order to open an Assistance Request ("AR").

- Equipment installation services.

We provides full equipment installation services. Customers will need to provide their configurations, locations, and scope to request a quote for equipment installation.

- Training (no cost training and specialized training available at additional charge).

The Alcatel-Lucent USA Inc. (part of Nokia Group) University Microwave and IP Router Training pricing and discounts are provided in a separate University pricing spreadsheet. Specific course descriptions are available upon request. University Terms of Training are included with each request for quote.

- Equipment warranty.

Our Standard Warranty is for a period of one (1) year and includes Standard Repair services. Additional years of extended warranty has been offered.

- Equipment repair after warranty period.

Post-warranty repair services are available on an annual basis.

APPENDIX F - NATIONWIDE DISTRIBUTION PLAN

If the Bidder plans to use a nationwide network of subcontractors/dealers/distributors in the performance of this Contract, provide responses to each of the following issues in an attachment to this Appendix. Restate the issue and provide your complete response. (Reference Section 5.2 Nationwide Distribution Plan) Responses will be evaluated and scored in accordance with, reference Section 8.1.8 Evaluation of Non-Cost Factors of the Solicitation Document.

The information provided below will apply the Bidder's plan to sell and service communication equipment in the following categories and subcategories:

- Batteries
 - Modular Flooded Lead Acid
 - Modular Valve Regulated Lead Acid
 - Mono-Block Valve Regulated Lead Acid
 - Portable Radio
- Equipment Shelters
 - Ballasted
 - Concrete
 - Fiberglass
 - Framed Light-Weight
 - Outdoor Cabinet
- Furniture, Dispatch Console
- Interoperability Gateway Devices
- Microwave Radios
 - Carrier Grade, Packet Data
 - Carrier Grade, Native Time Division Multiplex (TDM)
 - Network Grade
 - Sub 5.9 GHz
 - 900 MHz
- Monitoring & Alarm
 - Environmental
 - Radio Network
- Power Systems
 - DC Conversion
 - Fuel Cell
 - Electro-Mechanical Generators
 - Uninterruptable Power Supply (UPS)
 - Uninterruptable Power Supply (UPS)
- Test Equipment
 - Multifunction Radio Test Set
 - Specialized RF Instruments

- Multifunction Radio Test Set
- Towers
 - Accessories & Appurtenances
 - Deployable / Temporary
 - Guyed
 - Guyed, Light
 - Lattice
 - Lattice, Light
 - Monopole
 - Passive Microwave Repeater

1. Describe your contract management and communication plan for supplying nationwide distribution of products and services offered.

Authorized Contractors are screened on a quarterly basis to ensure that contractual obligations are being achieved. We assign Channel Sales Managers (CSMs) to each authorized contractor. The role of the CSM is to ensure that the contractor is adhering to our standards in terms of quality, sales, relationship management and overall customer satisfaction. Areas of review can include, but are not limited to, sales volume, associated employee training and accreditation, and customer satisfaction.

2. Describe your plan to provide customers with local support in the performance of the contract.

Due to the custom nature of each unique microwave backhaul application, we prefer a direct business relationship with the public safety agency in order to ensure the quality of the engineering and design work. For these reasons, we will not include dealers/distributors at this time. On occasion, we may use subcontractors for installation and maintenance engagements. These subcontractors must go through a rigorous certification process and our program manager will lead these engagements. We remain the single point of contact for the entire engagement.

Our process for selecting and qualifying subcontractors is detailed below:

Step 1. Definition of our installation and maintenance standards. We have developed specific standards for installation, testing and maintenance of our equipment. We are in the unique position as the OEM to understand and define the standards for our equipment's installation and maintenance. These form the basis of our training and quality audit processes and ensure our customer's investment is optimized.

Step 2. Subcontractors must meet our supplier requirements including financial stability, specific levels of insurance and Environmental Health and Safety (EH&S) review that is specifically geared for subcontractors that perform tower climbing.

Step 3. Each subcontractor is required to participate in the Alcatel-Lucent USA Inc. (part of Nokia group) Microwave Installation and Test (I&T) Partner Training & Evaluation Program. This program ensures that the I&T Partners who install and maintain our Microwave products have been evaluated by us on their working I&T knowledge of a specific our Microwave product.

Highlight Notes:

- Current Microwave radio I&T course offerings include the MDR-8000 radio and the 9500MPR radio.
- The training aspect of the program encompasses all critical tasks related to the proper installation, testing, and commissioning of the targeted Microwave product.
- Various Microwave network configurations are covered in the training course (linear, ring, cluster, etc).
- Path alignment issues are covered.
- Related IP protocols are covered.
- The Evaluation aspect of the program requires participants to demonstrate their competency and ability to effectively install, test, and commission the Microwave product through a combination of written and practical examinations.

No paper certificates are given to 3rd party participants. They are notified electronically of their score results and certification status. The candidate is then entered into our Certification Database for later verification & compliance purposes.

Step 4. Quality Audits. We has developed a process where photo audits are performed by the subcontractor and submitted to our Subject Matter Experts for review. Detailed weekly reports are generated to allow rapid analysis and trending. We performed over 500 such audits in 2014. This type of program allows us to identify and correct defects before projects are finalized and teams have departed and also allows us to identify and focus on the most common issues and repeat offenders. Each customer gets the benefit of the entire microwave installation workforce's lessons learned. On-site audits are also performed on a case-by-case basis to ensure photo audits are not omitting possible quality defects.

Step 5. EH&S Audits. With a large national workforce, our company benefits from a dedicated EH&S team. In addition to technical quality audits, we have EH&S auditors that perform on-site safety audits to ensure compliance with Alcatel-Lucent USA Inc's (part of Nokia Group) and customer EH&S requirements.

Step 6. Supervision. In addition to setting standards, qualifying suppliers and performing quality audits, the Deployment Project Manager is a resource to assist the Installation & Test subcontractor throughout the deployment process. Years of experience with microwave provides a unique insight and skill-set to position us and our customers for a successful project.

Step 7. Repetition. High qualification standards, training, audits and supervision are all important, but the final critical element is practice. Our subcontractors specialize in microwave with a specific emphasis in microwave. This allows them to gain more experience which is especially critical as the most recent generation of Ethernet radios and routers require new IP skills that previous generations of microwave radio technicians did not require.

Step 8. We have a supplier strategy for microwave I&T services that develops the top tier subcontractors in terms of past performance, contractual compliance, insurance, safety and efficiency.

Each year the subcontractor's performance is reviewed and reassessed to promote the most qualified subcontractors while eliminating non-performing subcontractors. Through this process Alcatel-Lucent USA Inc. (a part of Nokia Group) and our customers benefit from the most qualified pool of microwave deployment subcontractors in the industry.

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output Power		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
5.8 GHz	5	4	30.0		-96.5	126.5		6.3	-22	>60	13.5	-18	
5.8 GHz	5	16	30.0		-89.5	119.5		14.3	-22	>60	21	-17	
5.8 GHz	5	32	30.0		-86.0	116.0		18.0	-22	>60	24.5	-16	
5.8 GHz	5	64	30.0		-83.5	113.5		22.0	-22	>60	27	-13	
5.8 GHz	5	128	30.0		-81.0	111.0		25.4	-22	>60	30	-10	
5.8 GHz	5	256	30.0		-78.0	108.0		28.8	-22	>60	32.5	-7	
5.8 GHz	5	512	30.0		-75.0	105.0		31.9	-22	>60	35.5	-4	
5.8 GHz	5	1024	30.0		-71.5	101.5		34.5	-22	TBD	38.5	TBD	
5.8 GHz	10	4	30.0		-93.0	123.0		14.7	-22	>60	13.5	-18	
5.8 GHz	10	16	30.0		-87.5	117.5		29.5	-22	>60	21	-17	
5.8 GHz	10	32	30.0		-84.0	114.0		36.8	-22	>60	24.5	-16	
5.8 GHz	10	64	30.0		-81.5	111.5		44.9	-22	>60	27	-13	
5.8 GHz	10	128	30.0		-79.0	109.0		52.0	-22	>60	29.5	-10	
5.8 GHz	10	256	30.0		-75.5	105.5		59.7	-22	>60	32.5	-7	
5.8 GHz	10	512	30.0		-73.0	103.0		66.5	-22	59	35.5	-4	
5.8 GHz	10	1024	30.0		-69.5	99.5		72.3	-22	57	39	-1	
5.8 GHz	30	4	30.0		-89.0	119.0		43.4	-22	>60	13.5	-20	
5.8 GHz	30	16	30.0		-83.0	113.0		90.2	-22	>60	20	-20	
5.8 GHz	30	32	30.0		-79.5	109.5		113.3	-22	>60	23.5	-18	
5.8 GHz	30	64	30.0		-77.5	107.5		136.4	-22	58	26	-16	
5.8 GHz	30	128	30.0		-74.5	104.5		161.0	-22	55	29	-15	
5.8 GHz	30	256	30.0		-71.5	101.5		183.1	-22	53	31.5	-13	
5.8 GHz	30	512	30.0		-68.5	98.5		205.5	-22	52	35	-10	
5.8 GHz	30	1024	30.0		-65.0	95.0		227.0	-22	49	38	-7	

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
L6 GHz	5	4	32.5	35.0	-96.5	129.0	131.5	6.3	-22	>60	13.5	-18	5.0
L6 GHz	5	16	32.5	35.0	-89.5	122.0	124.5	14.3	-22	>60	21	-17	12.0
L6 GHz	5	32	32.5	35.0	-86.0	118.5	121.0	18.0	-22	>60	24.5	-16	15.0
L6 GHz	5	64	32.5	35.0	-83.5	116.0	118.5	22.0	-22	>60	27	-13	17.0
L6 GHz	5	128	32.5	35.0	-81.0	113.5	116.0	25.4	-22	>60	30	-10	19.5
L6 GHz	5	256	32.5	34.0	-78.0	110.5	112.0	28.8	-22	>60	32.5	-7	21.5
L6 GHz	5	512	31.5	34.0	-75.0	106.5	109.0	31.9	-22	>60	35.5	-4	23.5
L6 GHz	5	1024	31.5	33.0	-71.5	103.0	104.5	34.5	-22	TBD	38.5	TBD	26.0
L6 GHz	10	4	32.5	35.0	-93.0	125.5	128.0	14.7	-22	>60	13.5	-18	10.5
L6 GHz	10	16	32.5	35.0	-87.5	120.0	122.5	29.5	-22	>60	21	-17	17.0
L6 GHz	10	32	32.5	35.0	-84.0	116.5	119.0	36.8	-22	>60	24.5	-16	19.5
L6 GHz	10	64	32.5	35.0	-81.5	114.0	116.5	44.9	-22	>60	27	-13	21.0
L6 GHz	10	128	32.5	35.0	-79.0	111.5	114.0	52.0	-22	>60	30	-10	20.5
L6 GHz	10	256	32.5	34.0	-75.5	108.0	109.5	59.7	-22	>60	32.5	-7	23.0
L6 GHz	10	512	31.5	34.0	-73.0	104.5	107.0	66.5	-22	59	35.5	-4	24.5
L6 GHz	10	1024	31.5	33.0	-69.5	101.0	102.5	72.3	-22	57	38.5	-1	26.0
L6 GHz	30	4	32.5	35.0	-89.0	121.5	124.0	43.4	-22	>60	13.5	-20	10.5
L6 GHz	30	16	32.5	35.0	-83.0	115.5	118.0	90.2	-22	>60	20	-20	15.0
L6 GHz	30	32	32.5	35.0	-79.5	112.0	114.5	113.3	-22	>60	23.5	-18	17.5
L6 GHz	30	64	32.5	35.0	-77.5	110.0	112.5	136.4	-22	58	26	-16	19.0
L6 GHz	30	128	32.5	35.0	-74.5	107.0	109.5	161.0	-22	55	29	-15	21.0
L6 GHz	30	256	32.5	34.0	-71.5	104.0	105.5	183.1	-22	53	31.5	-13	22.5
L6 GHz	30	512	31.5	34.0	-68.5	100.0	102.5	205.5	-22	52	35	-10	24.0
L6 GHz	30	1024	31.5	33.0	-65.0	96.5	98.0	227.0	-22	49	38	-7	26.0
L6 GHz	60	4	32.5	35.0	-87.0	119.5	122.0	80.3	-22	>60	13.5	-25	10.5
L6 GHz	60	16	32.5	35.0	-81.0	113.5	116.0	159.9	-22	58	20	-25	15.5
L6 GHz	60	32	32.5	35.0	-77.5	110.0	112.5	198.8	-22	54	24	-23	18.0
L6 GHz	60	64	32.5	35.0	-74.5	107.0	109.5	256.8	-22	50	26.5	-20	20.0
L6 GHz	60	128	32.5	35.0	-71.5	104.0	106.5	305.2	-22	48	29	-16	22.0
L6 GHz	60	256	32.5	34.0	-68.5	101.0	102.5	349.0	-22	46	32.5	-12	23.5
L6 GHz	60	512	31.5	34.0	-65.0	96.5	99.0	395.2	-22	44	35	-10	24.0
L6 GHz	60	1024	31.5	33.0	-61.5	93.0	94.5	434.5	-22	42	39	-7	26.5

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
U6 GHz	5	4	32.5	35.0	-96.5	129.0	131.5	6.3	-22	>60	13.5	-18	5.0
U6 GHz	5	16	32.5	35.0	-89.5	122.0	124.5	14.3	-22	>60	21	-17	12.0
U6 GHz	5	32	32.5	35.0	-86.0	118.5	121.0	18.0	-22	>60	24.5	-16	15.0
U6 GHz	5	64	32.5	35.0	-83.5	116.0	118.5	22.0	-22	>60	27	-13	17.0
U6 GHz	5	128	32.5	35.0	-81.0	113.5	116.0	25.4	-22	>60	30	-10	19.5
U6 GHz	5	256	32.5	34.0	-78.0	110.5	112.0	28.8	-22	>60	32.5	-7	21.5
U6 GHz	5	512	31.5	34.0	-75.0	106.5	109.0	31.9	-22	>60	35.5	-4	23.5
U6 GHz	5	1024	31.5	33.0	-71.5	103.0	104.5	34.5	-22	TBD	38.5	TBD	26.0
U6 GHz	10	4	32.5	35.0	-93.0	125.5	128.0	14.7	-22	>60	13.5	-18	10.5
U6 GHz	10	16	32.5	35.0	-87.5	120.0	122.5	29.5	-22	>60	21	-17	17.0
U6 GHz	10	32	32.5	35.0	-84.0	116.5	119.0	36.8	-22	>60	24.5	-16	19.5
U6 GHz	10	64	32.5	35.0	-81.5	114.0	116.5	44.9	-22	>60	27	-13	21.0
U6 GHz	10	128	32.5	35.0	-79.0	111.5	114.0	52.0	-22	>60	29.5	-10	20.5
U6 GHz	10	256	32.5	34.0	-75.5	108.0	109.5	59.7	-22	>60	32.5	-7	23.0
U6 GHz	10	512	31.5	34.0	-73.0	104.5	107.0	66.5	-22	59	35.5	-4	24.5
U6 GHz	10	1024	31.5	33.0	-69.5	101.0	102.5	72.3	-22	57	39	-1	26.0
U6 GHz	30	4	32.5	35.0	-89.0	121.5	124.0	43.4	-22	>60	13.5	-20	10.5
U6 GHz	30	16	32.5	35.0	-83.0	115.5	118.0	90.2	-22	>60	20	-20	15.0
U6 GHz	30	32	32.5	35.0	-79.5	112.0	114.5	113.3	-22	>60	23.5	-18	17.5
U6 GHz	30	64	32.5	35.0	-77.5	110.0	112.5	136.4	-22	58	26	-16	19.0
U6 GHz	30	128	32.5	35.0	-74.5	107.0	109.5	161.0	-22	55	29	-15	21.0
U6 GHz	30	256	32.5	34.0	-71.5	104.0	105.5	183.1	-22	53	31.5	-13	22.5
U6 GHz	30	512	31.5	34.0	-68.5	100.0	102.5	205.5	-22	52	35	-10	24.0
U6 GHz	30	1024	31.5	33.0	-65.0	96.5	98.0	227.0	-22	49	38	-7	26.0
UU6 GHz	25	4	32.5	35.0	-90.0	122.5	125.0	35.5	-22	>60	13.5	-18	10.5
UU6 GHz	25	16	32.5	35.0	-84.0	116.5	119.0	73.9	-22	>60	20	-17	15.0
UU6 GHz	25	32	32.5	35.0	-80.5	113.0	115.5	92.8	-22	>60	23.5	-16	18.0
UU6 GHz	25	64	32.5	35.0	-78.0	110.5	113.0	111.7	-22	60	26	-13	19.0
UU6 GHz	25	128	32.5	35.0	-75.0	107.5	110.0	131.9	-22	57	29	-10	21.0
UU6 GHz	25	256	32.5	34.0	-72.0	104.5	106.0	150.0	-22	55	31.5	-7	22.5
UU6 GHz	25	512	31.5	34.0	-69.5	101.0	103.5	168.3	-22	54	35	-4	24.0
UU6 GHz	25	1024	31.5	33.0	-65.5	97.0	98.5	186.0	-22	51	39	-1	26.0

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
7 GHz	5	4	30.5	34.0	-96.5	127.0	130.5	6.3	-22	>60	13.5	-18	5.0
7 GHz	5	16	30.5	34.0	-89.5	120.0	123.5	14.3	-22	>60	21	-17	12.0
7 GHz	5	32	30.5	34.0	-86.0	116.5	120.0	18.0	-22	>60	24.5	-16	15.0
7 GHz	5	64	30.5	34.0	-83.0	113.5	117.0	22.0	-22	>60	27	-13	17.0
7 GHz	5	128	30.5	34.0	-81.0	111.5	115.0	25.4	-22	>60	30	-10	19.5
7 GHz	5	256	30.5	33.0	-78.0	108.5	111.0	28.8	-22	>60	32.5	-7	21.5
7 GHz	5	512	29.5	33.0	-74.5	104.0	107.5	31.9	-22	>60	35.5	-4	23.5
7 GHz	5	1024	29.5	33.0	-71.5	101.0	104.5	34.5	-22	TBD	38.5	TBD	26.0
7 GHz	10	4	30.5	34.0	-93.0	123.5	127.0	14.7	-22	>60	13.5	-18	10.5
7 GHz	10	16	30.5	34.0	-87.0	117.5	121.0	29.5	-22	>60	21	-17	17.0
7 GHz	10	32	30.5	34.0	-83.5	114.0	117.5	36.8	-22	>60	24.5	-16	19.5
7 GHz	10	64	30.5	34.0	-81.0	111.5	115.0	44.9	-22	>60	27	-13	21.0
7 GHz	10	128	30.5	34.0	-78.5	109.0	112.5	52.0	-22	>60	29.5	-10	20.5
7 GHz	10	256	30.5	33.0	-75.5	106.0	108.5	59.7	-22	>60	32.5	-7	23.0
7 GHz	10	512	29.5	33.0	-72.5	102.0	105.5	66.5	-22	59	35.5	-4	24.5
7 GHz	10	1024	29.5	33.0	-69.0	98.5	102.0	72.3	-22	57	39	-1	26.0
7 GHz	30	4	30.5	34.0	-88.5	119.0	122.5	43.4	-22	>60	13.5	-20	10.5
7 GHz	30	16	30.5	34.0	-82.5	113.0	116.5	90.2	-22	>60	20	-20	15.0
7 GHz	30	32	30.5	34.0	-79.0	109.5	113.0	113.3	-22	>60	23.5	-18	17.5
7 GHz	30	64	30.5	34.0	-77.0	107.5	111.0	136.4	-22	58	26	-16	19.0
7 GHz	30	128	30.5	34.0	-74.0	104.5	108.0	161.0	-22	55	29	-15	21.0
7 GHz	30	256	30.5	33.0	-71.0	101.5	104.0	183.1	-22	53	31.5	-13	22.5
7 GHz	30	512	29.5	33.0	-68.0	97.5	101.0	205.5	-22	52	35	-10	24.0
7 GHz	30	1024	29.5	33.0	-64.5	94.0	97.5	227.0	-22	49	38	-7	26.0
8 GHz	5	4	30.5	34.0	-96.5	127.0	130.5	6.3	-22	>60	13.5	-18	5.0
8 GHz	5	16	30.5	34.0	-89.5	120.0	123.5	14.3	-22	>60	21	-17	12.0
8 GHz	5	32	30.5	34.0	-86.0	116.5	120.0	18.0	-22	>60	24.5	-16	15.0
8 GHz	5	64	30.5	34.0	-83.0	113.5	117.0	22.0	-22	>60	27	-13	17.0
8 GHz	5	128	30.5	34.0	-81.0	111.5	115.0	25.4	-22	>60	30	-10	19.5
8 GHz	5	256	30.5	33.0	-78.0	108.5	111.0	28.8	-22	>60	32.5	-7	21.5
8 GHz	5	512	29.5	33.0	-74.5	104.0	107.5	31.9	-22	>60	35.5	-4	23.5
8 GHz	5	1024	29.5	33.0	-71.5	101.0	104.5	34.5	-22	TBD	38.5	TBD	26.0

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
8 GHz	10	4	30.5	34.0	-93.0	123.5	127.0	14.7	-22	>60	13.5	-18	10.5
8 GHz	10	16	30.5	34.0	-87.0	117.5	121.0	29.5	-22	>60	21	-17	17.0
8 GHz	10	32	30.5	34.0	-83.5	114.0	117.5	36.8	-22	>60	24.5	-16	19.5
8 GHz	10	64	30.5	34.0	-81.0	111.5	115.0	44.9	-22	>60	27	-13	21.0
8 GHz	10	128	30.5	34.0	-78.5	109.0	112.5	52.0	-22	>60	29.5	-10	20.5
8 GHz	10	256	30.5	33.0	-75.5	106.0	108.5	59.7	-22	>60	32.5	-7	23.0
8 GHz	10	512	29.5	33.0	-72.5	102.0	105.5	66.5	-22	59	35.5	-4	24.5
8 GHz	10	1024	29.5	33.0	-69.0	98.5	102.0	72.3	-22	57	39	-1	26.0
8 GHz	30	4	30.5	34.0	-88.5	119.0	122.5	43.4	-22	>60	13.5	-20	10.5
8 GHz	30	16	30.5	34.0	-82.5	113.0	116.5	90.2	-22	>60	20	-20	15.0
8 GHz	30	32	30.5	34.0	-79.0	109.5	113.0	113.3	-22	>60	23.5	-18	17.5
8 GHz	30	64	30.5	34.0	-77.0	107.5	111.0	136.4	-22	58	26	-16	19.0
8 GHz	30	128	30.5	34.0	-74.0	104.5	108.0	161.0	-22	55	29	-15	21.0
8 GHz	30	256	30.5	33.0	-71.0	101.5	104.0	183.1	-22	53	31.5	-13	22.5
8 GHz	30	512	29.5	33.0	-68.0	97.5	101.0	205.5	-22	52	35	-10	24.0
8 GHz	30	1024	29.5	33.0	-64.5	94.0	97.5	227.0	-22	49	38	-7	26.0

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement
			Standard	High		Standard	High				Co-Chan (dB)	Adj-Chan (dB)	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)	Typical (dB)
10.5 GHz	5	1024	27.0		-71.0	98.0		34.5	-22	TBD	38.5	TBD	26.0
10.5 GHz	5	4	30.5		-96.0	126.5		6.3	-22	>60	13.5	-18	5.0
10.5 GHz	5	16	30.5		-89.0	119.5		14.3	-22	>60	21	-17	12.0
10.5 GHz	5	32	30.5		-85.5	116.0		18.0	-22	>60	24.5	-16	15.0
10.5 GHz	5	64	30.0		-83.0	113.0		22.0	-22	>60	27	-13	17.0
10.5 GHz	5	128	30.0		-80.5	110.5		25.4	-22	>60	30	-10	19.5
10.5 GHz	5	256	29.0		-77.5	106.5		28.8	-22	>60	32.5	-7	21.5
10.5 GHz	5	512	28.0		-74.5	102.5		31.9	-22	>60	35.5	-4	23.5
11 GHz	5	4	30.5	32.5	-96.0	126.5	128.5	6.3	-22	>60	13.5	-18	5.0
11 GHz	5	16	30.5	32.5	-89.0	119.5	121.5	14.3	-22	>60	21	-17	12.0
11 GHz	5	32	30.5	32.5	-85.5	116.0	118.0	18.0	-22	>60	24.5	-16	15.0
11 GHz	5	64	30.5	32.5	-83.0	113.5	115.5	22.0	-22	>60	27	-13	17.0
11 GHz	5	128	30.5	32.5	-80.5	111.0	113.0	25.4	-22	>60	30	-10	19.5
11 GHz	5	256	29.5	32.0	-77.5	107.0	109.5	28.8	-22	>60	32.5	-7	21.5
11 GHz	5	512	28.0	31.0	-74.5	102.5	105.5	31.9	-22	>60	35.5	-4	23.5
11 GHz	5	1024	27.5	30.0	-71.0	98.0	101.0	34.5	-22	TBD	38.5	TBD	26.0
11 GHz	10	4	30.5	32.5	-92.5	123.0	125.0	14.7	-22	>60	13.5	-18	10.5
11 GHz	10	16	30.5	32.5	-87.0	117.5	119.5	29.5	-22	>60	21	-17	17.0
11 GHz	10	32	30.5	32.5	-83.5	114.0	116.0	36.8	-22	>60	24.5	-16	19.5
11 GHz	10	64	30.5	32.5	-81.0	111.5	113.5	44.9	-22	>60	27	-13	21.0
11 GHz	10	128	30.5	32.5	-78.5	109.0	111.0	52.0	-22	>60	29.5	-10	20.5
11 GHz	10	256	29.5	32.0	-75.0	104.5	107.0	59.7	-22	>60	32.5	-7	23.0
11 GHz	10	512	28.0	31.0	-72.5	100.5	103.5	66.5	-22	59	35.5	-4	24.5
11 GHz	10	1024	27.5	30.0	-69.0	96.5	99.0	72.3	-22	57	39	-1	26.0

9500 MPR													
MPT-HLC Path Engineering specifications for Fixed/Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz													
General			Transmit Output		Receiver Threshold	System Gain		Radio Capacity	Receiver Overload	DFM	T/I		XPIC Improvement Factor
			Standard Power	High Power**		Standard Power	High Power**				Co-Chan	Adj-Chan	
RF Band	BW MHz	QAM (n)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Mbps	10-6 BER (dBm)	10-6 BER	Co-Chan	Adj-Chan	Typical (dB)
11 GHz	30	4	30.5	32.5	-88.5	119.0	121.0	43.4	-22	>60	13.5	-20	10.5
11 GHz	30	16	30.5	32.5	-82.5	113.0	115.0	90.2	-22	>60	20	-19	15.0
11 GHz	30	32	30.5	32.5	-79.0	109.5	111.5	113.3	-22	60	23.5	-18	17.5
11 GHz	30	64	30.5	32.5	-77.0	107.5	109.5	136.4	-22	58	26	-16	19.0
11 GHz	30	128	30.5	32.5	-74.0	104.5	106.5	161.0	-22	55	29	-15	21.0
11 GHz	30	256	29.5	32.0	-71.0	100.5	103.0	183.1	-22	53	31.5	-13	22.5
11 GHz	30	512	28.0	31.0	-68.0	96.0	99.0	205.5	-22	52	35	-10	24.0
11 GHz	30	1024	27.5	30.0	-64.5	92.0	94.5	227.0	-22	49	38	-7	26.0
11 GHz	40	4	30.5	32.5	-87.5	118.0	120.0	55.4	-22	>60	13.5	-18	10.5
11 GHz	40	16	30.5	32.5	-81.5	112.0	114.0	115.1	-22	58	20	-17	15.5
11 GHz	40	32	30.5	32.5	-78.0	108.5	110.5	144.5	-22	56	24	-16	18.5
11 GHz	40	64	30.5	32.5	-75.5	106.0	108.0	178.6	-22	55	26.5	-13	20.0
11 GHz	40	128	30.5	32.5	-72.5	103.0	105.0	207.3	-22	53	29	-10	21.5
11 GHz	40	256	29.5	32.0	-69.5	99.0	101.5	237.8	-22	51	32.5	-7	24.0
11 GHz	40	512	28.0	31.0	-66.5	94.5	97.5	267.2	-22	49	35	-4	24.5
11 GHz	40	1024	27.5	30.0	-63.0	90.5	93.0	294.3	-22	47	39	-1	27.0

**For NTIA applications, the high power 7 & 8 GHz units will have 1 dB less TX power and 1 dB less system gain, and are only available for 10 & 30 MHz channels.

Not all profiles may be available in current software release.
Transmit power is measured at the output of the power amplifier and receiver threshold is measured at the input of the radio receiver.
Specification values are typical. For guaranteed values, subtract 1 dB from typical TX power and add 1.5 dB to typical RX threshold.

9500 MPR												
MPT-HL Path Engineering specifications for Static Modulation, 5.8, 6, 7, 8, 10.5, 11 GHz												
General			Radio Capacity (Layer 2)	Transmit Output Power		Receiver Threshold	System Gain		Receiver Overload	DFM	T/I	
				Standard Power	High Power		Standard Power	High Power				
RF Band	BW MHz	QAM (n)	Mbps	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)
5.8 GHz	5	32	18.3	32		-85	117		-23	61	27	-8
5.8 GHz	5	128	25.8	31		-79	110		-24	58	33	-5
5.8 GHz	10	32	37.3	32		-82	114		-23	58	27	-8
5.8 GHz	10	128	52.6	31		-76	107		-24	55	33	-5
5.8 GHz	30	32	114.2	32		-77.5	109.5		-23	52	27	-8
5.8 GHz	30	128	160.2	31		-71	102		-24	50	33	-5
5.8 GHz	30	256	183.3	28		-67.5	95.5		-26.5	47	37	-2
L6 GHz	5	128	25.8	31	33	-79	110	112.0	-22	58	33	-5
L6 GHz	10	128	52.6	31	33	-76	107	109.0	-22	55	33	-5
L6 GHz	30	128	160.2	31	33	-71	102	104.0	-22	50	33	-5
L6 GHz	30	256	183.3	28	30	-67.5	95.5	97.5	-24.5	47	37	-2
U6 GHz	5	128	25.8	31	33	-79	110	112.0	-22	58	33	-5
U6 GHz	10	128	52.6	31	33	-76	107	109.0	-22	55	33	-5
U6 GHz	30	128	160.2	31	33	-71	102	104.0	-22	50	33	-5
U6 GHz	30	256	183.3	28	30	-67.5	95.5	97.5	-24.5	47	37	-2
7 GHz	5	32	18.3	33		-84	117		-21	61	27	-8
7GHz	5	128	25.8	32		-78	110		-24	58	33	-5
7GHz	10	32	37.3	33		-81	114		-21	58	27	-8
7GHz	10	128	52.6	32		-75	107		-24	55	33	-5
7GHz	30	32	114.2	33		-76.5	109.5		-21	52	27	-8
7GHz	30	128	160.2	32		-70	102		-24	50	33	-5
7GHz	30	256	183.3	29		-66.5	95.5		-25.5	47	37	-2
8 GHz	5	32	18.3	33		-84	117		-21	61	27	-8
8 GHz	5	128	25.8	32		-78	110		-24	58	33	-5
8 GHz	10	32	37.3	33		-81	114		-21	58	27	-8
8 GHz	10	128	52.6	32		-75	107		-24	55	33	-5
8 GHz	30	32	114.2	33		-76.5	109.5		-21	52	27	-8
8 GHz	30	128	160.2	32		-70	102		-24	50	33	-5
8 GHz	30	256	183.3	29		-66.5	95.5		-25.5	47	37	-2
10.5 GHz	5	128	25.8	29		-77.5	106.5		-24	58	33	-5

9500 MPR												
MPT-HL Path Engineering specifications for Static Modulation, 5.8, 6, 7, 8, 10.5, 11 GHz												
General			Radio Capacity (Layer 2)	Transmit Output Power		Receiver Threshold	System Gain		Receiver Overload	DFM	T/I	
				Standard Power	High Power		Standard Power	High Power				
RF Band	BW MHz	QAM (n)	Mbps	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)
11 GHz	5	32	18.3	30		-83.5	113.5		-23	61	27	-8
11 GHz	5	128	25.8	29		-77.5	106.5		-24	58	33	-5
11 GHz	10	32	37.3	30		-80.5	110.5		-23	58	27	-8
11 GHz	10	128	52.6	29		-74.5	103.5		-24	55	33	-5
11 GHz	30	32	114.2	30		-76	106		-23	52	27	-8
11 GHz	30	128	160.2	29		-69.5	98.5		-24	50	33	-5
11 GHz	30	256	183.3	26		-66	92		-27	47	37	-2
11 GHz	40	128	213.9	29		-68.5	97.5		-24	47	33	-5
11 GHz	40	256	245.2	26		-65	91		-27	41	37	-2

Not all profiles may be available in current software release.

Transmit power is measured at the output of the power amplifier and receiver threshold is measured at the input of the radio receiver.

Specification values are typical.

9500 MPR												
MPT-HL Path Engineering specifications for Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz												
General			Radio Capacity	Transmit Output Power		Receiver Threshold	System Gain		Receiver Overload	DFM	T/I	
				Standard Power	High Power		Standard Power	High Power				
RF Band	BW MHz	QAM (n)	Mbps	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)
5.8 GHz	30	4	44.9	32		-86	118		-23	65	18	-8
5.8 GHz	30	16	90.9	32		-80	112		-23	57	24.5	-8
5.8 GHz	30	64	136.9	31		-74	105		-23	52	30.5	-8
5.8 GHz	30	128	159.9	31		-70.5	101.5		-24	48	33.5	-5
5.8 GHz	30	256	182.9	28		-67	95		-26.5	44	37	-2
L6 GHz	30	4	44.9	32	34	-86	118	120.0	-21	65	18	-8
L6 GHz	30	16	90.9	32	34	-80	112	114.0	-21	57	24.5	-8
L6 GHz	30	64	136.9	31	33	-74	105	107.0	-21	52	30.5	-8
L6 GHz	30	128	159.9	31	33	-70.5	101.5	103.5	-22	48	33.5	-5
L6 GHz	30	256	182.9	28	30	-67	95	97.0	-24.5	44	37	-2
U6 GHz	30	4	44.9	32	34	-86	118	120.0	-21	65	18	-8
U6 GHz	30	16	90.9	32	34	-80	112	114.0	-21	57	24.5	-8
U6 GHz	30	64	136.9	31	33	-74	105	107.0	-21	52	30.5	-8
U6 GHz	30	128	159.9	31	33	-70.5	101.5	103.5	-22	48	33.5	-5
U6 GHz	30	256	182.9	28	30	-67	95	97.0	-24.5	44	37	-2
UU6 GHz	25	4	36		34	-86.5		120.5	-21	66	18	-7
UU6 GHz	25	16	73		34	-80.5		114.5	-21	58	24.5	-7
UU6 GHz	25	64	11		33	-74.5		107.5	-21	53	30.5	-7
UU6 GHz	25	128	130		33	-71		104.0	-22	49	33.5	-4
UU6 GHz	25	256	148		30	-67.5		97.5	-24.5	45	37	-1
7GHz	30	4	44.9	33		-85	118		-21	65	18	-8
7GHz	30	16	90.9	33		-79	112		-21	57	24.5	-8
7GHz	30	64	136.9	32		-73	105		-24	52	30.5	-8
7GHz	30	128	159.9	32		-69.5	101.5		-24	48	33.5	-5
7GHz	30	256	182.9	29		-66	95		-25.5	44	37	-2

9500 MPR												
MPT-HL Path Engineering specifications for Adaptive Modulation 5.8, 6, 7, 8, 10.5, 11 GHz												
General			Radio Capacity	Transmit Output Power		Receiver Threshold	System Gain		Receiver Overload	DFM	T/I	
				Standard Power	High Power		Standard Power	High Power				
RF Band	BW MHz	QAM (n)	Mbps	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	Typical (dBm)	10-6 BER (dBm)	10-6 BER (dB)	Co-Chan (dB)	Adj-Chan (dB)
8 GHz	30	4	44.9	33		-85	118		-21	65	18	-8
8 GHz	30	16	90.9	33		-79	112		-21	57	24.5	-8
8 GHz	30	64	136.9	32		-73	105		-24	52	30.5	-8
8 GHz	30	128	159.9	32		-69.5	101.5		-24	48	33.5	-5
8 GHz	30	256	182.9	29		-66	95		-25.5	44	37	-2
11 GHz	30	4	44.9	30		-85	115		-23	65	18	-8
11 GHz	30	16	90.9	30		-79	109		-23	57	24.5	-8
11 GHz	30	64	136.9	29		-73	102		-23	52	30.5	-8
11 GHz	30	128	159.9	29		-69.5	98.5		-24	48	33.5	-5
11 GHz	30	256	182.9	26		-66	92		-25.5	44	37	-2

Not all profiles may be available in current software release.
 Transmit power is measured at the output of the power amplifier and receiver threshold is measured at the input of the radio receiver.
 Specifications values are typical.

MPT-HL Typical Insertion Loss Table (Diplexers)

Frequency Band	Total Transmit Insertion Loss (Typical Values) -- dB*		Total Receive Insertion Loss (Typical Values) -- dB**		
	1+0	1+1	1+0	1+1 (Main)	1+1
5725-5850	1.7	2.2	1.9	2.5	12.1
5925-6425	1.3	1.8	1.6	2.1	11.7
6525-6875	1.3	1.9	2.3	2.8	11.9
7125-8500	1.8	2.7	2.1	2.7	12.1
10550-10680	2.4	3.1	2.9	3.4	12.9
10700-11700	1.4	2.1	1.7	2.2	11.7

*Includes diplexer, cable, and RF switch losses

**Includes diplexer, cable, isolator, and coupler losses

MPT-HL Typical Insertion Loss Table (Stacking Filters)***

Frequency Band	Total Transmit Insertion Loss (Typical Values) -- dB*		Total Receive Insertion Loss (Typical Values) -- dB**		
	1+0	1+1	1+0	1+1 (Main)	1+1 (Stby)
5725-5850	1.6	2.0	2.1	2.6	12.1
5925-6425	1.6	2.0	2.1	2.6	12.1
6525-6875	1.7	2.1	2.1	2.6	12.1
7125-8500	2.0	2.6	2.2	2.7	12.3
10700-11700	2.2	2.7	2.4	2.9	12.5

*Includes filter, cable, and RF switch losses

**Includes filter, cable, and isolator losses

***Refer to System Application Rules (3EM22784000BGZZA) for additional branching loss calculation

January 13, 2016

MPT-HC HQAM Specifications																	
General			Radio Capacity	Transmit Output Power	Receiver Threshold	System Gain	Receiver Overload	DFM	T/I		ATPC	RTPC	Supported Modulation				XPIC Improvement Factor
RF Band	BW MHz	Mod	Mbps	Typical [HC] (dBm)	Typical (dBm)	Typical (dBm)	Typical 10-6 BER (dBm)	Typical 10-6 BER (dB)	Typical Co-Chan (dB)	Typical Adj-Chan (dB)	Dynamic Range (dB)	Dynamic Range (dB)	Fixed	Adaptive	XPIC fixed	XPIC AM	Typical (dB)
L6 GHz	10	4QAM	14.16	26	-90.5	116.5	-20	> 68	15	-17	24	24	no	yes	N/A	N/A	N/A
L6 GHz	10	16QAM	28.65	25	-84.5	109.5	-20	> 68	21	-15	21	21	no	yes	N/A	N/A	N/A
L6 GHz	10	32QAM	35.95	25	-80.5	105.5	-20	> 68	25	-14	21	21	no	yes	N/A	N/A	N/A
L6 GHz	10	64QAM	45.15	23	-78.0	101.0	-20	> 68	28	-14	20	18	yes	yes	N/A	N/A	N/A
L6 GHz	10	128QAM	53.42	23	-75.5	98.5	-20	> 68	31	-10	20	18	yes	yes	N/A	N/A	N/A
L6 GHz	10	256QAM	61.04	23	-72.0	95.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
L6 GHz	10	512QAM	66.38	21	-70.5	91.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
L6 GHz	10	1024QAM	73.64	21	-67.0	88.0	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
L6 GHz	30	4QAM	44.08	26	-87.5	113.5	-20	> 66	15	-21	24	24	no	yes	no	yes	10
L6 GHz	30	16QAM	87.99	25	-80.5	105.5	-20	> 66	21	-19	21	21	no	yes	no	yes	16.5
L6 GHz	30	32QAM	109.43	25	-77.5	102.5	-20	65	25	-15	21	21	no	yes	no	yes	20
L6 GHz	30	64QAM	138.65	23	-74.5	97.5	-20	60	28	-15	20	18	yes	yes	yes	yes	22.5
L6 GHz	30	128QAM	163.18	23	-71.5	94.5	-20	57	31	-12	20	18	yes	yes	yes	yes	22.5
L6 GHz	30	256QAM	185.90	23	-68.5	91.5	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
L6 GHz	30	512QAM	208.79	21	-66.5	87.5	-20	53	36	-6	16	16	no	yes	no	yes	24
L6 GHz	30	1024QAM	231.63	21	-63.0	84.0	-20	51	40	-6	16	16	no	yes	no	yes	25
L6 GHz	30	2048QAM	256.53	21	-59.5	80.5	-20	48	43	-3	16	16	no	yes	N/A	N/A	N/A
L6 GHz	60	4QAM	81.02	26	-83.5	109.5	-20	> 63	15	-21	23	23	no	yes	no	yes	10
L6 GHz	60	16QAM	162.45	25	-78.5	103.5	-20	> 63	21	-19	20	17	no	yes	no	yes	16.5
L6 GHz	60	32QAM	200.73	25	-75.0	100.0	-20	56	25	-15	20	17	no	yes	no	yes	20
L6 GHz	60	64QAM	254.03	23	-72.5	95.5	-20	51	28	-15	20	15	no	yes	no	yes	22.5
L6 GHz	60	128QAM	299.29	23	-69.0	92.0	-20	48	31	-12	20	15	yes	yes	yes	yes	22.5
L6 GHz	60	256QAM	340.84	23	-66.0	89.0	-20	46	33	-9	18	15	yes	yes	yes	yes	22.3
L6 GHz	60	512QAM	382.93	21	-63.5	84.5	-20	44	37	-6	16	13	no	yes	no	yes	24
L6 GHz	60	1024QAM	415.81	21	-60.0	81.0	-20	41	40	-6	16	13	no	yes	no	yes	25
L6 GHz	60	2048QAM	461.36	21	-55.0	76.0	-20	38	43	-3	16	13	no	yes	NA	NA	N/A
U6 GHz	10	4QAM	14.16	26	-91.5	117.5	-20	> 68	15	-17	24	24	no	yes	N/A	N/A	N/A
U6 GHz	10	16QAM	28.65	25	-85.5	110.5	-20	> 68	21	-15	21	21	no	yes	N/A	N/A	N/A
U6 GHz	10	32QAM	35.95	25	-81.5	106.5	-20	> 68	25	-14	21	21	no	yes	N/A	N/A	N/A
U6 GHz	10	64QAM	45.15	23	-79.0	102.0	-20	> 68	28	-14	20	18	yes	yes	N/A	N/A	N/A
U6 GHz	10	128QAM	53.42	23	-76.5	99.5	-20	> 68	31	-10	20	18	yes	yes	N/A	N/A	N/A
U6 GHz	10	256QAM	61.04	23	-73.0	96.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
U6 GHz	10	512QAM	66.38	21	-71.5	92.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
U6 GHz	10	1024QAM	73.64	21	-67.5	88.5	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
U6 GHz	30	4QAM	44.08	26	-88.5	114.5	-20	> 66	15	-21	24	24	no	yes	no	yes	10
U6 GHz	30	16QAM	87.99	25	-81.5	106.5	-20	> 66	21	-19	21	21	no	yes	no	yes	16.5
U6 GHz	30	32QAM	109.43	25	-78.5	103.5	-20	65	25	-15	21	21	no	yes	no	yes	20
U6 GHz	30	64QAM	138.65	23	-75.5	98.5	-20	60	28	-15	20	18	yes	yes	yes	yes	22.5
U6 GHz	30	128QAM	163.18	23	-72.5	95.5	-20	57	31	-12	20	18	yes	yes	yes	yes	22.5
U6 GHz	30	256QAM	185.90	23	-69.0	92.0	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
U6 GHz	30	512QAM	208.79	21	-67.0	88.0	-20	53	36	-6	16	16	no	yes	no	yes	24
U6 GHz	30	1024QAM	231.63	21	-63.5	84.5	-20	51	40	-6	16	16	no	yes	no	yes	25
U6 GHz	30	2048QAM	256.53	21	-60.0	81.0	-20	48	43	-3	16	16	no	yes	NA	NA	N/A
7 GHz	10	4QAM	14.16	26	-90.5	116.5	-20	> 68	15	-17	24	24	no	yes	N/A	N/A	N/A
7 GHz	10	16QAM	28.65	25	-84.5	109.5	-20	> 68	21	-15	20	20	no	yes	N/A	N/A	N/A

7 GHz	10	32QAM	35.95	25	-80.5	105.5	-20	> 68	25	-14	20	20	yes	yes	N/A	N/A	N/A
7 GHz	10	64QAM	45.15	24	-78.0	102.0	-20	> 68	28	-14	19	19	yes	yes	N/A	N/A	N/A
7 GHz	10	128QAM	53.42	24	-75.5	99.5	-20	> 68	31	-10	19	19	yes	yes	N/A	N/A	N/A
7 GHz	10	256QAM	61.04	24	-72.0	96.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
7 GHz	10	512QAM	66.38	22	-70.5	92.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
7 GHz	10	1024QAM	73.64	22	-66.5	88.5	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
7 GHz	30	4QAM	44.08	26	-87.5	113.5	-20	> 66	15	-21	24	24	no	yes	no	yes	10
7 GHz	30	16QAM	87.99	25	-80.5	105.5	-20	> 66	21	-19	20	20	no	yes	no	yes	16.5
7 GHz	30	32QAM	109.43	25	-77.5	102.5	-20	65	25	-15	20	20	no	yes	no	yes	20
7 GHz	30	64QAM	138.65	24	-74.5	98.5	-20	60	28	-15	19	19	yes	yes	yes	yes	22.5
7 GHz	30	128QAM	163.18	24	-71.5	95.5	-20	57	31	-12	19	19	yes	yes	yes	yes	22.5
7 GHz	30	256QAM	185.90	24	-68.5	92.5	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
7 GHz	30	512QAM	208.79	22	-66.0	88.0	-20	53	36	-6	16	16	no	yes	no	yes	24
7 GHz	30	1024QAM	231.63	22	-62.5	84.5	-20	51	40	-6	16	16	no	yes	no	yes	25
7 GHz	30	2048QAM	256.53	22	-59.0	81.0	-20	48	43	-3	16	16	no	yes	NA	NA	N/A
8 GHz	10	4QAM	14.16	26	-90.5	116.5	-20	> 68	15	-17	24	24	no	yes	N/A	N/A	N/A
8 GHz	10	16QAM	28.65	25	-84.5	109.5	-20	> 68	21	-15	20	20	no	yes	N/A	N/A	N/A
8 GHz	10	32QAM	35.95	25	-80.5	105.5	-20	> 68	25	-14	20	20	yes	yes	N/A	N/A	N/A
8 GHz	10	64QAM	45.15	24	-78.0	102.0	-20	> 68	28	-14	19	19	yes	yes	N/A	N/A	N/A
8 GHz	10	128QAM	53.42	24	-75.5	99.5	-20	> 68	31	-10	19	19	yes	yes	N/A	N/A	N/A
8 GHz	10	256QAM	61.04	24	-72.0	96.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
8 GHz	10	512QAM	66.38	22	-70.5	92.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
8 GHz	10	1024QAM	73.64	22	-66.5	88.5	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
8 GHz	30	4QAM	44.08	26	-87.5	113.5	-20	> 66	15	-21	24	24	no	yes	no	yes	10
8 GHz	30	16QAM	87.99	25	-80.5	105.5	-20	> 66	21	-19	20	20	no	yes	no	yes	16.5
8 GHz	30	32QAM	109.43	25	-77.5	102.5	-20	65	25	-15	20	20	no	yes	no	yes	20
8 GHz	30	64QAM	138.65	24	-74.5	98.5	-20	60	28	-15	19	19	yes	yes	yes	yes	22.5
8 GHz	30	128QAM	163.18	24	-71.5	95.5	-20	57	31	-12	19	19	yes	yes	yes	yes	22.5
8 GHz	30	256QAM	185.90	24	-68.5	92.5	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
8 GHz	30	512QAM	208.79	22	-66.0	88.0	-20	53	36	-6	16	16	no	yes	no	yes	24
8 GHz	30	1024QAM	231.63	22	-62.5	84.5	-20	51	40	-6	16	16	no	yes	no	yes	25
8 GHz	30	2048QAM	256.53	22	-59.0	81.0	-20	48	43	-3	16	16	no	yes	NA	NA	N/A
11 GHz	10	4QAM	14.16	23	-91.0	114.0	-20	> 68	15	-17	24	21	no	yes	N/A	N/A	N/A
11 GHz	10	16QAM	28.65	22	-85.0	107.0	-20	> 68	21	-15	22	17	no	yes	N/A	N/A	N/A
11 GHz	10	32QAM	35.95	22	-81.0	103.0	-20	> 68	25	-14	22	17	no	yes	N/A	N/A	N/A
11 GHz	10	64QAM	45.15	21	-78.5	99.5	-20	> 68	28	-14	20	16	yes	yes	N/A	N/A	N/A
11 GHz	10	128QAM	53.42	21	-76.0	97.0	-20	> 68	31	-10	20	16	yes	yes	N/A	N/A	N/A
11 GHz	10	256QAM	61.04	21	-72.5	93.5	-20	> 68	33	-7	18	14	yes	yes	N/A	N/A	N/A
11 GHz	10	512QAM	66.38	19	-71.0	90.0	-20	> 68	36	-4	16	12	no	yes	N/A	N/A	N/A
11 GHz	10	1024QAM	73.64	19	-67.0	86.0	-20	66	40	-1	16	12	no	yes	N/A	N/A	N/A
11 GHz	30	4QAM	44.08	23	-88.0	111.0	-20	> 66	15	-21	24	21	no	yes	no	yes	10
11 GHz	30	16QAM	87.99	22	-81.0	103.0	-20	> 66	21	-19	22	17	no	yes	no	yes	16.5
11 GHz	30	32QAM	109.43	22	-77.5	99.5	-20	65	25	-15	22	17	yes	yes	yes	yes	20
11 GHz	30	64QAM	138.65	21	-75.0	96.0	-20	60	28	-15	20	16	yes	yes	yes	yes	22.5
11 GHz	30	128QAM	163.18	21	-71.5	92.5	-20	57	31	-12	20	16	yes	yes	yes	yes	22.5
11 GHz	30	256QAM	185.90	21	-68.5	89.5	-20	55	33	-9	18	14	yes	yes	yes	yes	22.3
11 GHz	30	512QAM	208.79	19	-66.5	85.5	-20	53	36	-6	16	12	no	yes	no	yes	24
11 GHz	30	1024QAM	231.63	19	-63.0	82.0	-20	51	40	-6	16	12	no	yes	no	yes	25
11 GHz	30	2048QAM	256.53	19	-59.5	78.5	-20	48	43	-3	16	12	no	yes	NA	NA	N/A
11 GHz	40	4QAM	60.28	23	-86.0	109.0	-20	> 64	15	-15	24	21	no	yes	no	yes	10
11 GHz	40	16QAM	120.93	22	-80.0	102.0	-20	> 64	21	-12	22	18	no	yes	no	yes	16.5
11 GHz	40	32QAM	151.75	22	-76.5	98.5	-20	60	25	-10	22	18	yes	yes	yes	yes	20
11 GHz	40	64QAM	190.31	21	-73.5	94.5	-20	55	28	-10	20	14.5	yes	yes	yes	yes	22.5
11 GHz	40	128QAM	224.97	21	-70.0	91.0	-20	53	31	-7	20	14.5	yes	yes	yes	yes	22.5

11 GHz	40	256QAM	251.63	21	-67.0	88.0	-20	51	33	-5	18	12.5	yes	yes	yes	yes	22.3
11 GHz	40	512QAM	279.44	19	-65.0	84.0	-20	48	37	-2	16	10.5	no	yes	no	yes	24
11 GHz	40	1024QAM	303.45	19	-62.0	81.0	-20	46	40	-2	16	10.5	no	yes	no	yes	25
11 GHz	40	2048QAM	336.69	19	-56.5	75.5	-20	44	43	1	16	10.5	no	yes	no	yes	N/A
15 GHz	10	4QAM	14.16	25	-90.5	115.5	-20	> 68	15	-17	24	24	yes	yes	N/A	N/A	N/A
15 GHz	10	16QAM	28.65	23	-84.5	107.5	-20	> 68	21	-15	22	19	yes	yes	N/A	N/A	N/A
15 GHz	10	32QAM	35.95	23	-80.5	103.5	-20	> 68	25	-14	22	19	yes	yes	N/A	N/A	N/A
15 GHz	10	64QAM	45.15	22	-78.0	100.0	-20	> 68	28	-14	21	18	yes	yes	N/A	N/A	N/A
15 GHz	10	128QAM	53.42	22	-75.0	97.0	-20	> 68	31	-10	21	18	yes	yes	N/A	N/A	N/A
15 GHz	10	256QAM	61.04	20	-72.0	92.0	-20	> 68	33	-7	19	16	yes	yes	N/A	N/A	N/A
15 GHz	10	512QAM	66.38	18	-69.5	87.5	-20	> 68	36	-4	17	14	no	yes	N/A	N/A	N/A
15 GHz	10	1024QAM	73.64	18	-65.5	83.5	-20	66	40	-1	17	14	no	yes	N/A	N/A	N/A
15 GHz	30	4QAM	44.08	25	-87.0	112.0	-20	> 66	15	-21	24	24	yes	yes	yes	yes	10
15 GHz	30	16QAM	87.99	23	-80.5	103.5	-20	> 66	21	-19	22	19	yes	yes	yes	yes	16.5
15 GHz	30	32QAM	109.43	23	-76.5	99.5	-20	65	25	-15	22	19	yes	yes	yes	yes	20
15 GHz	30	64QAM	138.65	22	-74.0	96.0	-20	60	28	-15	21	18	yes	yes	yes	yes	22.5
15 GHz	30	128QAM	163.18	22	-70.5	92.5	-20	57	31	-12	21	18	yes	yes	yes	yes	22.5
15 GHz	30	256QAM	185.90	20	-67.5	87.5	-20	55	33	-9	19	16	yes	yes	yes	yes	22.3
15 GHz	30	512QAM	208.79	18	-65.0	83.0	-20	53	36	-6	17	14	no	yes	no	yes	24
15 GHz	30	1024QAM	231.63	18	-61.5	79.5	-20	51	40	-6	17	14	no	yes	no	yes	25
15 GHz	30	2048QAM	256.53	18	-58.0	76.0	-20	48	43	-3	17	14	no	yes	NA	NA	N/A
15 GHz	40	4QAM	60.28	25	-85.5	110.5	-20	> 64	15	-15	24	24	yes	yes	yes	yes	10
15 GHz	40	16QAM	120.93	23	-79.0	102.0	-20	> 64	21	-12	22	19	yes	yes	yes	yes	16.5
15 GHz	40	32QAM	151.75	23	-75.5	98.5	-20	60	25	-10	22	19	yes	yes	yes	yes	20
15 GHz	40	64QAM	190.31	22	-72.5	94.5	-20	55	28	-10	21	16.5	yes	yes	yes	yes	22.5
15 GHz	40	128QAM	224.97	22	-69.5	91.5	-20	53	31	-7	21	16.5	yes	yes	yes	yes	22.5
15 GHz	40	256QAM	251.63	20	-66.0	86.0	-20	51	33	-5	19	14.5	yes	yes	yes	yes	22.3
15 GHz	40	512QAM	279.44	18	-63.5	81.5	-20	48	37	-2	17	12.5	no	yes	no	yes	24
15 GHz	40	1024QAM	303.45	18	-60.0	78.0	-20	46	40	-2	17	12.5	no	yes	no	yes	25
15 GHz	40	2048QAM	336.69	18	-55.0	73.0	-20	44	43	1	17	12.5	no	yes	NA	NA	N/A
15 GHz	50	4QAM	74.96	25	-84.5	109.5	-20	> 63	15	-19	24	21	yes	yes	yes	yes	10
15 GHz	50	16QAM	149.03	23	-78.0	101.0	-20	> 63	21	-16	22	16	yes	yes	yes	yes	16.5
15 GHz	50	32QAM	185.75	23	-74.5	97.5	-20	57	25	-13	22	16	yes	yes	yes	yes	20
15 GHz	50	64QAM	235.05	22	-71.5	93.5	-20	52	28	-12	21	15	yes	yes	yes	yes	22.5
15 GHz	50	128QAM	276.94	22	-68.0	90.0	-20	49	31	-11	21	15	yes	yes	yes	yes	22.5
15 GHz	50	256QAM	315.38	20	-65.0	85.0	-20	47	33	-8	19	13	yes	yes	yes	yes	22.3
15 GHz	50	512QAM	354.36	18	-62.5	80.5	-20	45	37	-5	17	11	no	yes	no	yes	24
15 GHz	50	1024QAM	384.77	18	-59.0	77.0	-20	42	40	-5	17	11	no	yes	no	yes	25
15 GHz	50	2048QAM	426.90	18	-54.0	72.0	-20	39	43	-2	17	11	no	yes	NA	NA	N/A
18 GHz	10	4QAM	14.16	22	-89.5	111.5	-20	> 68	15	-17	23	23	yes	yes	N/A	N/A	N/A
18 GHz	10	16QAM	28.65	20	-83.5	103.5	-20	> 68	21	-15	22	18	yes	yes	N/A	N/A	N/A
18 GHz	10	32QAM	35.95	20	-79.5	99.5	-20	> 68	25	-14	22	18	yes	yes	N/A	N/A	N/A
18 GHz	10	64QAM	45.15	19	-77.0	96.0	-20	> 68	28	-14	21	17	yes	yes	N/A	N/A	N/A
18 GHz	10	128QAM	53.42	19	-74.5	93.5	-20	> 68	31	-10	21	17	yes	yes	N/A	N/A	N/A
18 GHz	10	256QAM	61.04	18	-71.0	89.0	-20	> 68	33	-7	20	16	yes	yes	N/A	N/A	N/A
18 GHz	10	512QAM	66.38	16	-69.0	85.0	-20	> 68	36	-4	18	14	no	yes	N/A	N/A	N/A
18 GHz	10	1024QAM	73.64	16	-65.0	81.0	-20	66	40	-1	18	14	no	yes	N/A	N/A	N/A
18 GHz	30	4QAM	44.08	22	-86.5	108.5	-20	> 66	15	-21	23	23	yes	yes	yes	yes	10
18 GHz	30	16QAM	87.99	20	-79.5	99.5	-20	> 66	21	-19	22	18	yes	yes	yes	yes	16.5
18 GHz	30	32QAM	109.43	20	-76.5	96.5	-20	65	25	-15	22	18	yes	yes	yes	yes	20
18 GHz	30	64QAM	138.65	19	-73.5	92.5	-20	60	28	-15	21	17	yes	yes	yes	yes	21.5
18 GHz	30	128QAM	163.18	19	-70.0	89.0	-20	57	31	-12	21	17	yes	yes	yes	yes	19.5
18 GHz	30	256QAM	185.90	18	-67.0	85.0	-20	55	33	-9	20	16	yes	yes	yes	yes	23
18 GHz	30	512QAM	208.79	16	-64.5	80.5	-20	53	36	-6	18	14	no	yes	no	yes	24

18 GHz	30	1024QAM	231.63	16	-61.0	77.0	-20	51	40	-6	18	14	no	yes	no	yes	25
18 GHz	30	2048QAM	256.53	16	-57.5	73.5	-20	48	43	-3	18	14	no	yes	N/A	N/A	N/A
18 GHz	40	4QAM	60.28	22	-84.5	106.5	-20	> 64	15	-15	23	23	yes	yes	yes	yes	10
18 GHz	40	16QAM	120.93	20	-78.5	98.5	-20	> 64	21	-12	22	18	yes	yes	yes	yes	16.5
18 GHz	40	32QAM	151.75	20	-75	95.0	-20	60	25	-10	22	18	yes	yes	yes	yes	20
18 GHz	40	64QAM	190.31	19	-72	91.0	-20	55	28	-10	21	15.5	yes	yes	yes	yes	21.5
18 GHz	40	128QAM	224.97	19	-69	88.0	-20	53	31	-7	21	15.5	yes	yes	yes	yes	19.5
18 GHz	40	256QAM	251.63	18	-65.5	83.5	-20	51	33	-5	20	14.5	yes	yes	yes	yes	23
18 GHz	40	512QAM	279.44	16	-63	79.0	-20	48	37	-2	18	12.5	no	yes	no	yes	24
18 GHz	40	1024QAM	303.45	16	-59.5	75.5	-20	46	40	-2	18	12.5	no	yes	no	yes	25
18 GHz	40	2048QAM	336.69	16	-54.5	70.5	-20	44	43	1	18	12.5	no	yes	N/A	N/A	N/A
18 GHz	50	4QAM	74.96	22	-83.5	105.5	-20	> 63	15	-19	23	20	yes	yes	yes	yes	10
18 GHz	50	16QAM	149.03	20	-77.5	97.5	-20	> 63	21	-16	22	15	yes	yes	yes	yes	16.5
18 GHz	50	32QAM	185.75	20	-74.0	94.0	-20	57	25	-13	22	15	yes	yes	yes	yes	20
18 GHz	50	64QAM	235.05	19	-71.5	90.5	-20	52	28	-12	21	14	yes	yes	yes	yes	21.5
18 GHz	50	128QAM	276.94	19	-68	87.0	-20	49	31	-11	21	14	yes	yes	yes	yes	19.5
18 GHz	50	256QAM	315.38	18	-64.5	82.5	-20	47	33	-8	20	13	yes	yes	yes	yes	23
18 GHz	50	512QAM	354.36	16	-62.0	78.0	-20	45	37	-5	18	11	no	yes	no	yes	24
18 GHz	50	1024QAM	384.77	16	-58.5	74.5	-20	42	40	-5	18	11	no	yes	no	yes	25
18 GHz	50	2048QAM	426.90	16	-53.5	69.5	-20	39	43	-2	18	11	no	yes	NA	NA	N/A
23 GHz	10	4QAM	14.16	20	-90	110.0	-20	> 68	15	-17	23	23	yes	yes	N/A	N/A	N/A
23 GHz	10	16QAM	28.65	19	-84	103.0	-20	> 68	21	-15	22	19	yes	yes	N/A	N/A	N/A
23 GHz	10	32QAM	35.95	19	-80	99.0	-20	> 68	25	-14	22	19	yes	yes	N/A	N/A	N/A
23 GHz	10	64QAM	45.15	18	-77.5	95.5	-20	> 68	28	-14	20	18	yes	yes	N/A	N/A	N/A
23 GHz	10	128QAM	53.42	18	-75	93.0	-20	> 68	31	-10	20	18	yes	yes	N/A	N/A	N/A
23 GHz	10	256QAM	61.04	18	-71.5	89.5	-20	> 68	33	-7	19	18	yes	yes	N/A	N/A	N/A
23 GHz	10	512QAM	66.38	16	-69.5	85.5	-20	> 68	36	-4	17	16	no	yes	N/A	N/A	N/A
23 GHz	10	1024QAM	73.64	16	-65.5	81.5	-20	66	40	-1	17	16	no	yes	N/A	N/A	N/A
23 GHz	30	4QAM	44.08	20	-87	107.0	-20	> 66	15	-21	23	23	yes	yes	yes	yes	10
23 GHz	30	16QAM	87.99	19	-80	99.0	-20	> 66	21	-19	22	19	yes	yes	yes	yes	16.5
23 GHz	30	32QAM	109.43	19	-77	96.0	-20	65	25	-15	22	19	yes	yes	yes	yes	20
23 GHz	30	64QAM	138.65	18	-74	92.0	-20	60	28	-15	20	18	yes	yes	yes	yes	21.5
23 GHz	30	128QAM	163.18	18	-71	89.0	-20	57	31	-12	20	18	yes	yes	yes	yes	19.5
23 GHz	30	256QAM	185.90	18	-67.5	85.5	-20	55	33	-9	19	18	yes	yes	yes	yes	23
23 GHz	30	512QAM	208.79	16	-65	81.0	-20	53	36	-6	17	16	no	yes	no	yes	24
23 GHz	30	1024QAM	231.63	16	-61.5	77.5	-20	51	40	-6	17	16	no	yes	no	yes	25
23 GHz	30	2048QAM	256.53	16	-58.0	74.0	-20	48	43	-3	17	16	no	yes	N/A	N/A	N/A
23 GHz	40	4QAM	60.28	20	-85	105.0	-20	> 64	15	-15	23	23	yes	yes	yes	yes	10
23 GHz	40	16QAM	120.93	19	-79	98.0	-20	> 64	21	-12	22	17	yes	yes	yes	yes	16.5
23 GHz	40	32QAM	151.75	19	-75.5	94.5	-20	60	25	-10	22	17	yes	yes	yes	yes	20
23 GHz	40	64QAM	190.31	18	-72.5	90.5	-20	55	28	-10	20	16	yes	yes	yes	yes	21.5
23 GHz	40	128QAM	224.97	18	-69.5	87.5	-20	53	31	-7	20	16	yes	yes	yes	yes	19.5
23 GHz	40	256QAM	251.63	18	-66.5	84.5	-20	51	33	-5	19	16	yes	yes	yes	yes	23
23 GHz	40	512QAM	279.44	16	-63.5	79.5	-20	48	37	-2	17	14	no	yes	no	yes	24
23 GHz	40	1024QAM	303.45	16	-60.5	76.5	-20	46	40	-2	17	14	no	yes	no	yes	25
23 GHz	40	2048QAM	336.69	16	-55.0	71.0	-20	44	43	1	17	14	no	yes	N/A	N/A	N/A
23 GHz	50	4QAM	74.96	20	-84	104.0	-20	> 63	15	-19	23	20	yes	yes	yes	yes	10
23 GHz	50	16QAM	149.03	19	-78	97.0	-20	> 63	21	-16	22	16	yes	yes	yes	yes	16.5
23 GHz	50	32QAM	185.75	19	-74.5	93.5	-20	57	25	-13	22	16	yes	yes	yes	yes	20
23 GHz	50	64QAM	235.05	18	-72	90.0	-20	52	28	-12	20	15	yes	yes	yes	yes	21.5
23 GHz	50	128QAM	276.94	18	-68.5	86.5	-20	49	31	-11	20	15	yes	yes	yes	yes	19.5
23 GHz	50	256QAM	315.38	18	-65.5	83.5	-20	47	33	-8	19	15	yes	yes	yes	yes	23
23 GHz	50	512QAM	354.36	16	-62.5	78.5	-20	45	37	-5	17	13	no	yes	no	yes	24
23 GHz	50	1024QAM	384.77	16	-59	75.0	-20	42	40	-5	17	13	no	yes	no	yes	25

23 GHz	50	2048QAM	426.90	16	-54	70.0	-20	39	43	-2	17	13	no	yes	NA	NA	N/A
38 GHz	10	4QAM	14.16	18	-87	105.0	-20	> 68	15	-17	21	19	yes	yes	N/A	N/A	N/A
38 GHz	10	16QAM	28.65	16	-81	97.0	-20	> 68	21	-15	20	17	yes	yes	N/A	N/A	N/A
38 GHz	10	32QAM	35.95	16	-77	93.0	-20	> 68	25	-14	20	17	yes	yes	N/A	N/A	N/A
38 GHz	10	64QAM	45.15	14	-74.5	88.5	-20	> 68	28	-14	18	15	yes	yes	N/A	N/A	N/A
38 GHz	10	128QAM	53.42	14	-72	86.0	-20	> 68	31	-10	18	15	yes	yes	N/A	N/A	N/A
38 GHz	10	256QAM	61.04	13	-68.5	81.5	-20	> 68	33	-7	17	14	yes	yes	N/A	N/A	N/A
38 GHz	10	512QAM	66.38	11	-67	78.0	-20	> 68	36	-4	15	12	no	yes	N/A	N/A	N/A
38 GHz	10	1024QAM	73.64	11	-63	74.0	-20	66	40	-1	15	12	no	yes	N/A	N/A	N/A
38 GHz	30	4QAM	44.08	18	-84	102.0	-20	> 66	15	-21	21	19	yes	yes	yes	yes	10
38 GHz	30	16QAM	87.99	16	-77	93.0	-20	> 66	21	-19	20	17	yes	yes	yes	yes	16.5
38 GHz	30	32QAM	109.43	16	-74	90.0	-20	65	25	-15	20	17	yes	yes	yes	yes	20
38 GHz	30	64QAM	138.65	14	-71	85.0	-20	60	28	-15	18	15	yes	yes	yes	yes	21.5
38 GHz	30	128QAM	163.18	14	-68	82.0	-20	57	31	-12	18	15	yes	yes	yes	yes	19.5
38 GHz	30	256QAM	185.90	13	-65	78.0	-20	55	33	-9	17	14	yes	yes	yes	yes	23
38 GHz	30	512QAM	208.79	11	-62.5	73.5	-20	53	36	-6	15	12	no	yes	no	yes	24
38 GHz	30	1024QAM	231.63	11	-59	70.0	-20	51	40	-6	15	12	no	yes	no	yes	25
38 GHz	40	4QAM	60.28	18	-82	100.0	-20	> 64	15	-15	21	17	no	yes	no	yes	10
38 GHz	40	16QAM	120.93	16	-76	92.0	-20	> 64	21	-12	20	15	yes	yes	yes	yes	16.5
38 GHz	40	32QAM	151.75	16	-72.5	88.5	-20	60	25	-10	20	15	yes	yes	yes	yes	20
38 GHz	40	64QAM	190.31	14	-69.5	83.5	-20	55	28	-10	18	13	yes	yes	yes	yes	21.5
38 GHz	40	128QAM	224.97	14	-66.5	80.5	-20	53	31	-7	18	13	yes	yes	yes	yes	19.5
38 GHz	40	256QAM	251.63	13	-63.5	76.5	-20	51	33	-5	17	12	yes	yes	yes	yes	23
38 GHz	40	512QAM	279.44	11	-61	72.0	-20	48	37	-2	15	10	no	yes	no	yes	24
38 GHz	40	1024QAM	303.45	11	-57.5	68.5	-20	46	40	-2	15	10	no	yes	no	yes	25
38 GHz	50	4QAM	74.96	18	-81	99.0	-20	> 63	15	-19	21	16	yes	yes	yes	yes	10
38 GHz	50	16QAM	149.03	16	-75	91.0	-20	> 63	21	-16	20	14	yes	yes	yes	yes	16.5
38 GHz	50	32QAM	185.75	16	-72	88.0	-20	57	25	-13	20	14	yes	yes	yes	yes	20
38 GHz	50	64QAM	235.05	14	-69	83.0	-20	52	28	-12	18	12	yes	yes	yes	yes	21.5
38 GHz	50	128QAM	276.94	14	-65.5	79.5	-20	49	31	-11	18	12	yes	yes	yes	yes	19.5
38 GHz	50	256QAM	315.38	13	-63	76.0	-20	47	33	-8	17	11	yes	yes	yes	yes	23
38 GHz	50	512QAM	354.36	11	-60	71.0	-20	45	37	-5	15	9	no	yes	no	yes	24
38 GHz	50	1024QAM	384.77	11	-56.5	67.5	-20	42	40	-5	15	9	no	yes	no	yes	25

Transmit power, receiver threshold, system gain, T/I, DFM and Receiver Overload numbers are typical values and are referenced at the ODU antenna flange

For guaranteed value, subtract 2 dB from typical TX power and Receiver Overload, and add 2.5 dB to typical receiver thresholds

Receiver reporting accuracy / RSSI: +/-4dB over -33 to +55C temperature range for RSL levels between -25 dBm and -85 dBm (or threshold)

and +/-2dB over 0 to +35C temperature range for RSL between -40 and -70 dBm [+/-3dB for Lower and Upper 6GHz]

For Adaptive Modulation, preemptive switching points are: 2048 QAM: 3.5 dB, 1024 QAM: 3.5 dB, 512 QAM: 3.0 dB, 256 QAM: 3.0 dB, 128QAM: 3.0 dB, 64QAM: 3.0 dB, 32QAM: 3.0, 16QAM: 3.5 dB before thresholds

U6, 7/8, 15 and 23 GHz are preliminary

September 8, 2015

MPT-XP HQAM SPECIFICATIONS																	
General			Radio Capacity	Transmit Output Power	Receiver Threshold	System Gain	Receiver Overload	DFM	T/I		ATPC	RTPC	Supported Modulation				XPIC Improvement Factor
RF Band	BW MHz	Mod	Mbps	Typical [XP] (dBm)	Typical (dBm)	Typical (dBm)	Typical 10-6 BER (dBm)	Typical 10-6 BER (dB)	Typical Co-Chan (dB)	Typical Adj-Chan (dB)	Dynamic Range (dB)	Dynamic Range (dB)	Fixed	Adaptive	XPIC fixed	XPIC AM	Typical (dB)
L6 GHz	10	4QAM	14.16	32	-90.5	122.5	-20	> 68	15	-17	21	21	no	yes	N/A	N/A	N/A
L6 GHz	10	16QAM	28.65	31	-84.5	115.5	-20	> 68	21	-15	19	15	no	yes	N/A	N/A	N/A
L6 GHz	10	32QAM	35.95	31	-80.5	111.5	-20	> 68	25	-14	19	15	no	yes	N/A	N/A	N/A
L6 GHz	10	64QAM	45.15	29	-78.0	107.0	-20	> 68	28	-14	19	13	yes	yes	N/A	N/A	N/A
L6 GHz	10	128QAM	53.42	29	-75.5	104.5	-20	> 68	31	-10	19	13	yes	yes	N/A	N/A	N/A
L6 GHz	10	256QAM	61.04	28	-72.0	100.0	-20	> 68	33	-7	16	12	yes	yes	N/A	N/A	N/A
L6 GHz	10	512QAM	66.38	26	-70.5	96.5	-20	> 68	36	-4	14	10	no	yes	N/A	N/A	N/A
L6 GHz	10	1024QAM	73.64	26	-67.0	93.0	-20	66	40	-1	14	10	no	yes	N/A	N/A	N/A
L6 GHz	30	4QAM	44.08	32	-87.5	119.5	-20	> 66	15	-21	21	21	no	yes	no	yes	10
L6 GHz	30	16QAM	87.99	31	-80.5	111.5	-20	> 66	21	-19	19	15	no	yes	no	yes	16.5
L6 GHz	30	32QAM	109.43	31	-77.5	108.5	-20	65	25	-15	19	15	no	yes	no	yes	20
L6 GHz	30	64QAM	138.65	29	-74.5	103.5	-20	60	28	-15	19	13	yes	yes	yes	yes	22.5
L6 GHz	30	128QAM	163.18	29	-71.5	100.5	-20	57	31	-12	19	13	yes	yes	yes	yes	22.5
L6 GHz	30	256QAM	185.90	28	-68.5	96.5	-20	55	33	-9	16	12	yes	yes	yes	yes	22.3
L6 GHz	30	512QAM	208.79	26	-66.5	92.5	-20	53	36	-6	14	10	no	yes	no	yes	24
L6 GHz	30	1024QAM	231.63	26	-63.0	89.0	-20	51	40	-6	14	10	no	yes	no	yes	25
L6 GHz	30	2048QAM	256.53	26	-59.5	85.5	-20	48	43	-3	14	10	no	yes	N/A	N/A	N/A
L6 GHz	60	4QAM	81.02	32	-83.5	115.5	-20	> 63	15	-21	22	26	no	yes	no	yes	10
L6 GHz	60	16QAM	162.45	31	-78.5	109.5	-20	> 63	21	-19	20.5	15	no	yes	no	yes	16.5
L6 GHz	60	32QAM	200.73	31	-75.0	106.0	-20	56	25	-15	20.5	15	no	yes	no	yes	20
L6 GHz	60	64QAM	254.03	29	-72.5	101.5	-20	51	28	-15	19	13	no	yes	no	yes	22.5
L6 GHz	60	128QAM	299.29	29	-69.0	98.0	-20	48	31	-12	19	13	yes	yes	yes	yes	22.5
L6 GHz	60	256QAM	340.84	28	-66.0	94.0	-20	46	33	-9	16	12	yes	yes	yes	yes	22.3
L6 GHz	60	512QAM	382.93	26	-63.5	89.5	-20	44	37	-6	14	10	no	yes	no	yes	24
L6 GHz	60	1024QAM	415.81	26	-60.0	86.0	-20	41	40	-6	14	10	no	yes	no	yes	25
L6 GHz	60	2048QAM	461.36	26	-55.0	81.0	-20	38	43	-3	14	10	no	yes	NA	NA	N/A
U6 GHz	10	4QAM	14.16	32	-91.5	123.5	-20	> 68	15	-17	21	21	no	yes	N/A	N/A	N/A
U6 GHz	10	16QAM	28.65	32	-85.5	117.5	-20	> 68	21	-15	20	16	no	yes	N/A	N/A	N/A
U6 GHz	10	32QAM	35.95	31	-81.5	112.5	-20	> 68	25	-14	19	15	no	yes	N/A	N/A	N/A
U6 GHz	10	64QAM	45.15	29	-79.0	108.0	-20	> 68	28	-14	18	13	yes	yes	N/A	N/A	N/A
U6 GHz	10	128QAM	53.42	29	-76.5	105.5	-20	> 68	31	-10	18	13	yes	yes	N/A	N/A	N/A
U6 GHz	10	256QAM	61.04	28	-73.0	101.0	-20	> 68	33	-7	16	12	yes	yes	N/A	N/A	N/A
U6 GHz	10	512QAM	66.38	26	-71.5	97.5	-20	> 68	36	-4	14	10	no	yes	N/A	N/A	N/A
U6 GHz	10	1024QAM	73.64	26	-67.5	93.5	-20	66	40	-1	14	10	no	yes	N/A	N/A	N/A
U6 GHz	30	4QAM	44.08	32	-88.5	120.5	-20	> 66	15	-21	21	21	no	yes	no	yes	10
U6 GHz	30	16QAM	87.99	32	-81.5	113.5	-20	> 66	21	-19	20	16	no	yes	no	yes	16.5
U6 GHz	30	32QAM	109.43	31	-78.5	109.5	-20	65	25	-15	19	15	no	yes	no	yes	20
U6 GHz	30	64QAM	138.65	29	-75.5	104.5	-20	60	28	-15	18	13	yes	yes	yes	yes	22.5
U6 GHz	30	128QAM	163.18	29	-72.5	101.5	-20	57	31	-12	18	13	yes	yes	yes	yes	22.5
U6 GHz	30	256QAM	185.90	28	-69.0	97.0	-20	55	33	-9	16	12	yes	yes	yes	yes	22.3
U6 GHz	30	512QAM	208.79	26	-67.0	93.0	-20	53	36	-6	14	10	no	yes	no	yes	24
U6 GHz	30	1024QAM	231.63	26	-63.5	89.5	-20	51	40	-6	14	10	no	yes	no	yes	25
U6 GHz	30	2048QAM	256.53	26	-60.0	86.0	-20	48	43	-3	14	10	no	yes	NA	NA	N/A
7 GHz	10	4QAM	14.16	32	-90.5	122.5	-20	> 68	15	-17	22	22	no	yes	N/A	N/A	N/A
7 GHz	10	16QAM	28.65	32.0	-84.5	116.5	-20	> 68	21	-15	21.5	21.5	no	yes	N/A	N/A	N/A
7 GHz	10	32QAM	35.95	31	-80.5	111.5	-20	> 68	25	-14	21	21	yes	yes	N/A	N/A	N/A
7 GHz	10	64QAM	45.15	29	-78.0	107.0	-20	> 68	28	-14	19	19	yes	yes	N/A	N/A	N/A

7 GHz	10	128QAM	53.42	29	-75.5	104.5	-20	> 68	31	-10	19	19	yes	yes	N/A	N/A	N/A
7 GHz	10	256QAM	61.04	28	-72.0	100.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
7 GHz	10	512QAM	66.38	26	-70.5	96.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
7 GHz	10	1024QAM	73.64	26	-66.5	92.5	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
7 GHz	30	4QAM	44.08	32	-87.5	119.5	-20	> 66	15	-21	22	22	no	yes	no	yes	10
7 GHz	30	16QAM	87.99	32.0	-80.5	112.5	-20	> 66	21	-19	21.5	21.5	no	yes	no	yes	16.5
7 GHz	30	32QAM	109.43	31	-77.5	108.5	-20	65	25	-15	21	21	no	yes	no	yes	20
7 GHz	30	64QAM	138.65	29	-74.5	103.5	-20	60	28	-15	19	19	yes	yes	yes	yes	22.5
7 GHz	30	128QAM	163.18	29	-71.5	100.5	-20	57	31	-12	19	19	yes	yes	yes	yes	22.5
7 GHz	30	256QAM	185.90	28	-68.5	96.5	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
7 GHz	30	512QAM	208.79	26	-66.0	92.0	-20	53	36	-6	16	16	no	yes	no	yes	24
7 GHz	30	1024QAM	231.63	26	-62.5	88.5	-20	51	40	-6	16	16	no	yes	no	yes	25
7 GHz	30	2048QAM	256.53	26	-59.0	85.0	-20	48	43	-3	16	16	no	yes	NA	NA	N/A
8 GHz	10	4QAM	14.16	32	-90.5	122.5	-20	> 68	15	-17	22	22	no	yes	N/A	N/A	N/A
8 GHz	10	16QAM	28.65	32.0	-84.5	116.5	-20	> 68	21	-15	21.5	21.5	no	yes	N/A	N/A	N/A
8 GHz	10	32QAM	35.95	31	-80.5	111.5	-20	> 68	25	-14	21	21	yes	yes	N/A	N/A	N/A
8 GHz	10	64QAM	45.15	29	-78.0	107.0	-20	> 68	28	-14	19	19	yes	yes	N/A	N/A	N/A
8 GHz	10	128QAM	53.42	29	-75.5	104.5	-20	> 68	31	-10	19	19	yes	yes	N/A	N/A	N/A
8 GHz	10	256QAM	61.04	28	-72.0	100.0	-20	> 68	33	-7	18	18	yes	yes	N/A	N/A	N/A
8 GHz	10	512QAM	66.38	26	-70.5	96.5	-20	> 68	36	-4	16	16	no	yes	N/A	N/A	N/A
8 GHz	10	1024QAM	73.64	26	-66.5	92.5	-20	66	40	-1	16	16	no	yes	N/A	N/A	N/A
8 GHz	30	4QAM	44.08	32	-87.5	119.5	-20	> 66	15	-21	22	22	no	yes	no	yes	10
8 GHz	30	16QAM	87.99	32.0	-80.5	112.5	-20	> 66	21	-19	21.5	21.5	no	yes	no	yes	16.5
8 GHz	30	32QAM	109.43	31	-77.5	108.5	-20	65	25	-15	21	21	no	yes	no	yes	20
8 GHz	30	64QAM	138.65	29	-74.5	103.5	-20	60	28	-15	19	19	yes	yes	yes	yes	22.5
8 GHz	30	128QAM	163.18	29	-71.5	100.5	-20	57	31	-12	19	19	yes	yes	yes	yes	22.5
8 GHz	30	256QAM	185.90	28	-68.5	96.5	-20	55	33	-9	18	18	yes	yes	yes	yes	22.3
8 GHz	30	512QAM	208.79	26	-66.0	92.0	-20	53	36	-6	16	16	no	yes	no	yes	24
8 GHz	30	1024QAM	231.63	26	-62.5	88.5	-20	51	40	-6	16	16	no	yes	no	yes	25
8 GHz	30	2048QAM	256.53	26	-59.0	85.0	-20	48	43	-3	16	16	no	yes	NA	NA	N/A
11 GHz	10	4QAM	14.16	29	-91.0	120.0	-20	> 68	15	-17	21	20	no	yes	N/A	N/A	N/A
11 GHz	10	16QAM	28.65	29	-85.0	114.0	-20	> 68	21	-15	21	20	no	yes	N/A	N/A	N/A
11 GHz	10	32QAM	35.95	29	-81.0	110.0	-20	> 68	25	-14	21	20	no	yes	N/A	N/A	N/A
11 GHz	10	64QAM	45.15	28	-78.5	106.5	-20	> 68	28	-14	20	19	yes	yes	N/A	N/A	N/A
11 GHz	10	128QAM	53.42	28	-76.0	104.0	-20	> 68	31	-10	20	19	yes	yes	N/A	N/A	N/A
11 GHz	10	256QAM	61.04	27	-72.5	99.5	-20	> 68	33	-7	19	18	yes	yes	N/A	N/A	N/A
11 GHz	10	512QAM	66.38	25	-71.0	96.0	-20	> 68	36	-4	17	16	no	yes	N/A	N/A	N/A
11 GHz	10	1024QAM	73.64	25	-67.0	92.0	-20	66	40	-1	17	16	no	yes	N/A	N/A	N/A
11 GHz	30	4QAM	44.08	29	-88.0	117.0	-20	> 66	15	-21	21	20	no	yes	no	yes	10
11 GHz	30	16QAM	87.99	29	-81.0	110.0	-20	> 66	21	-19	21	20	no	yes	no	yes	16.5
11 GHz	30	32QAM	109.43	29	-77.5	106.5	-20	65	25	-15	21	20	yes	yes	yes	yes	20
11 GHz	30	64QAM	138.65	28	-75.0	103.0	-20	60	28	-15	20	19	yes	yes	yes	yes	22.5
11 GHz	30	128QAM	163.18	28	-71.5	99.5	-20	57	31	-12	20	19	yes	yes	yes	yes	22.5
11 GHz	30	256QAM	185.90	27	-68.5	95.5	-20	55	33	-9	19	18	yes	yes	yes	yes	22.3
11 GHz	30	512QAM	208.79	25	-66.5	91.5	-20	53	36	-6	17	16	no	yes	no	yes	24
11 GHz	30	1024QAM	231.63	25	-63.0	88.0	-20	51	40	-6	17	16	no	yes	no	yes	25
11 GHz	30	2048QAM	256.53	25	-59.5	84.5	-20	48	43	-3	17	16	no	yes	NA	NA	N/A
11 GHz	40	4QAM	60.28	29	-86.0	115.0	-20	> 64	15	-15	21	20	no	yes	no	yes	10
11 GHz	40	16QAM	120.93	29	-80.0	109.0	-20	> 64	21	-12	21	20	no	yes	no	yes	16.5
11 GHz	40	32QAM	151.75	29	-76.5	105.5	-20	60	25	-10	21	20	yes	yes	yes	yes	20
11 GHz	40	64QAM	190.31	28	-73.5	101.5	-20	55	28	-10	20	17.5	yes	yes	yes	yes	22.5
11 GHz	40	128QAM	224.97	28	-70.0	98.0	-20	53	31	-7	20	17.5	yes	yes	yes	yes	22.5
11 GHz	40	256QAM	251.63	27	-67.0	94.0	-20	51	33	-5	19	16.5	yes	yes	yes	yes	22.3
11 GHz	40	512QAM	279.44	25	-65.0	90.0	-20	48	37	-2	17	14.5	no	yes	no	yes	24
11 GHz	40	1024QAM	303.45	25	-62.0	87.0	-20	46	40	-2	17	14.5	no	yes	no	yes	25
11 GHz	40	2048QAM	336.69	25	-56.5	81.5	-20	44	43	1	17	14.5	no	yes	N/A	N/A	N/A

Transmit power, receiver threshold, system gain, T/I, DFM and Receiver Overload numbers are typical values and are referenced at the ODU antenna flange

For guaranteed value, subtract 2 dB from typical TX power and Receiver Overload, and add 2.5 dB to typical receiver thresholds

Receiver reporting accuracy / RSSI: +/-4dB over -33 to +55C temperature range for RSL levels between -25 dBm and -85 dBm (or threshold)

and +/-2dB over 0 to +35C temperature range for RSL between -40 and -70 dBm [+/-3dB for Lower and Upper 6GHz]

For Adaptive Modulation, preemptive switching points are: 2048 QAM: 3.5 dB, 1024 QAM: 3.5 dB, 512 QAM: 3.0 dB, 256 QAM: 3.0 dB, 128QAM: 3.0 dB, 64QAM: 3.0 dB, 32QAM: 3.0, 16QAM: 3.5 dB before thresholds
U6, 7 and 8 GHz are preliminary



9500 MPR Release 6.0

Alcatel-Lucent 9500 Microwave Packet Radio (MPR) is a solution for smooth transformation of backhaul networks from TDM/ATM to Ethernet. The 9500 MPR solution efficiently transports whatever multimedia traffic since it handles packets natively (packet mode) while still supporting legacy TDM traffic (hybrid mode), with the same Hardware. It also provides the Quality of Service (QoS) needed to satisfy end-users. This solution not only improves packet aggregation, but also increases the bandwidth and optimizes the Ethernet connectivity.

CONTENTS

1	INTRODUCTION.....	5
2	SYSTEM DESCRIPTION.....	6
2.2.1	Microwave Packet Transport.....	7
2.2.2	Microwave Service Switch indoor units.....	7
2.2.3	9500 MPR-e.....	7
3	9500 MPR: Main features	9
3.1	10G interfaces.....	9
3.2	TDM/SDH traffic management.....	12
3.2.1	MEF-8.....	12
3.2.2	BER performance	12
3.2.3	Packet Delay Variation control / Fragmentation	12
3.3	Multiservice Ring Protection (ITU-T G.8032v2).....	13
3.4	Ethernet features.....	15
3.4.1	Level-2 Addressing	15
3.4.2	IEEE 802.3x Flow control.....	15
3.4.3	VLAN MANAGEMENT.....	15
3.4.4	Quality of Service.....	17
3.4.5	Ethernet Service OAM - IEEE 802.3ag/Y.1731	17
3.4.6	Ethernet Link OAM – IEEE 802.1ah.....	18
3.5	Radio Encryption (AES).....	18
3.6	ADAPTIVE MODULATION	19
3.6.1	Configuration	19
3.6.2	Performances	20
3.7	ATPC.....	21
3.7.1	ATPC and ACM.....	21
3.8	Throughput Packet Booster.....	23
3.9	Multichannel.....	24
3.10	Synchronization.....	28
4	SYSTEM ARCHITECTURE.....	30
4.1	9500 MPR platform.....	30
4.1.1	MSS architecture	31
4.1.1	MPT architecture.....	32
5	MSS-1/8.....	33
5.1	MSS.....	33
5.2	Core Board	36
5.2.1	Core-E.....	36
5.2.2	CorEvo-10G board	37

5.2.3	CorEvo-1G	37
5.3	<i>PDH Access Board</i>	38
5.4	<i>EASv2</i>	39
5.5	<i>SFP Synch IN/OUT</i>	40
5.6	<i>2E1 SFP</i>	40
5.6	SDH Access Card	41
5.6.1	STM-1 mux/demux application	42
5.6.2	STM-1 transparent transport application	42
5.7	<i>EoSDH SFP</i>	43
5.8	<i>E3 SFP</i>	44
5.9	<i>MPT Access Card</i>	45
5.11	<i>Fan Boards</i>	47
5.12	<i>+24V integrated DC/DC converter</i>	49
6	MPT	50
6.1	<i>MPT-HC-HQAM</i>	51
6.1.1	Supported features	51
6.1.2	Connectivity	51
6.1.3	Radio Protection Switching (RPS)	51
6.2	<i>MPT-XP-HQAM</i>	52
6.2.1	Supported features	52
6.3	<i>MPT-MC</i>	53
6.3.1	Supported features	53
6.3.2	Connectivity	53
6.3.3	1+1 configuration	53
6.4	<i>MPT-HL</i>	54
6.4.1	Branching and indoor arrangement	55
6.5	Radio configurations and protection	56
6.6	<i>XPIC</i>	57
6.7	<i>Space diversity configuration</i>	57
6.8	<i>Couplers</i>	58
6.9	<i>Ortho-Mode Transducers (OMT)</i>	58
6.10	<i>4+0 or 2x(1+1) HSB dual pol integrated coupler</i>	59
6.11	<i>Power Injectors</i>	60
6.11.1	Power Injectors : Plug-in and Box	60
6.11.2	Electrical characteristics :	61
6.11.3	Connectors :	61
6.12	<i>MPT Power Unit</i>	62
6.12.1	Presentation:	62
6.13	<i>MPT Extended Power Unit</i>	62
6.13.1	Presentation :	62
6.14	<i>MPT-GM</i>	64
6.14.1	Main characteristics	65
6.14.2	Available Channel Bandwidth and Modulation	65
6.14.3	Power Supply	66

6.14.4	Available Configurations	66
6.14.6	Synchronization	67
6.14.7	Management System	68
6.14.8	Mechanical layout - Integrated antenna solutions	68
7	SMALL CELLS MPTs	69
7.1	<i>MPT-SUB6</i>	69
8	9500 MPR configuration & maintenance (ACTUAL)	75
8.1	<i>Overview</i>	75
8.2	<i>TCO</i>	75
8.3	<i>Network Element Overview – NEtO</i>	77
8.4	<i>9500 MPR WebEML supported features</i>	78
8.5	<i>Board-specific managed features</i>	81
8.6	<i>System Configuration options</i>	81
8.6.1	WT Performance Monitoring Suite	81
9	9500 MPR configuration & maintenance	84
10	RTU	89
11	Standards	92
11.1	<i>ITU-T & ITU-R standards</i>	92
11.2	<i>ETSI</i>	95
11.3	<i>EU directive</i>	96
11.4	<i>ECC</i>	96

1 INTRODUCTION

Scope of this document is to describe 9500 MPR platform , the main features supported and its architecture.

Some details on hardware components are provided and their application is explained.

The document is further completed by Technical Summary documents where all main technical characteristics are reported.

In general for each feature , components and frequencies availability please refer to product roadmap and to customer release note.

2 SYSTEM DESCRIPTION

2.1 9500 MPR solution portfolio

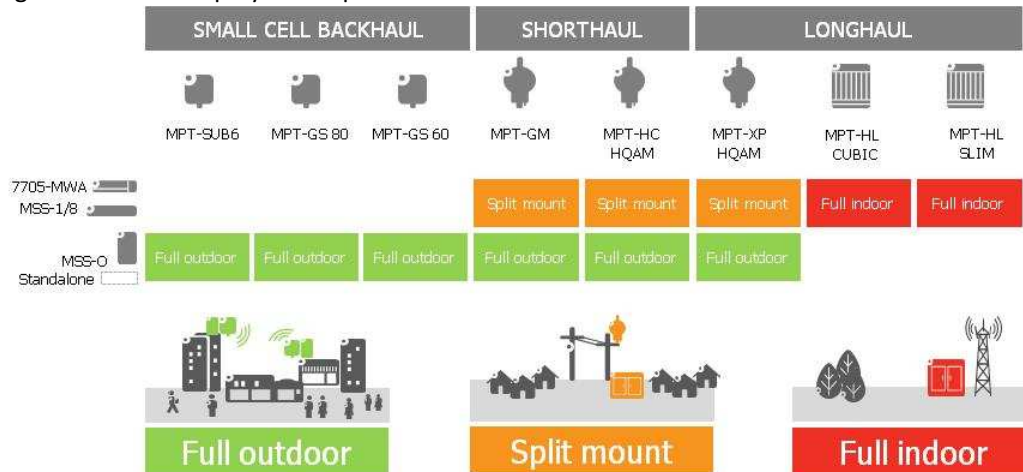
Alcatel-Lucent 9500 MPR solution consists of a combination of a radio unit (Microwave Packet Transceiver or MPT) and a networking unit (Microwave Service Switch or MSS) described in Figure 1. Three segments are served: small cell backhaul, shorthaul and longhaul. Several types of wireless cell site connection options are required to support mobile network capacity and coverage expansions. Alcatel-Lucent's 9500 MPR solutions support a full suite of wireless frequency options including 5.8-42GHz solutions for macro cell backhaul, 80GHz millimeter wave (e-band) solutions for both macro and small cells, unlicensed 60GHz millimeter wave (v-band) and sub-6GHz solutions that are typically used to support the backhaul of small cells.

Figure 1. Alcatel-Lucent 9500 MPR portfolio



Depending on the option chosen, the solution can be split-mount, full-indoor or full-outdoor, as shown in Figure 2. The solution can be used in tail, hub and longhaul packet microwave applications.

Figure 2. flexible deployment options



2.2 9500 MPR solution components

2.2.1 Microwave Packet Transport

9500 MPR Microwave Packet Transport (MPT) units all leverage the same software and technologies whether they are deployed in a split-mount, full-indoor, or full-outdoor configuration. This offers operators more deployment flexibility, minimizes spares inventory, and results in lower network TCO.

The MPTs support:

- Advanced packet compression
- Hitless, high order adaptive modulation
- IP along with legacy technologies
- Integrated cross-polarization to double capacity
- N+N hot standby with spatial diversity options
- Both short-haul (less than 20 km) and long-haul (greater than 20 km)

MPTs are available to address distance and availability needs.

2.2.2 Microwave Service Switch indoor units

Full-outdoor MPTs can be deployed independently (for example, connecting directly to an LTE eNode B mobile base station) or together with a Microwave Service Switch (MSS) indoor units that provide advanced Carrier Ethernet networking, aggregation and demarcation functions. Optimized to reduce space and power consumption, the MSS exists in different form factors to address all network sizes and locations, including tail, hub and backbone. The entire MSS family uses the same software and management systems, enabling consistent operations across end-to-end packet microwave networks.

The complete range of right-sized MSS microwave units addresses any site footprint requirement. The units are energy-efficient, extremely scalable and offer deployment flexibility. All indoor units support traditional services such as TDM, and newer Ethernet and IP services over a converged, packet-based, operationally efficient network.

To minimize operational complexity, the various MPTs and MSSs share common technology, software, and network and service management. They can be combined to support any wireless transmission application.

2.2.3 9500 MPR-e

The 9500 MPR-e is a full outdoor MPT solution set optimized for Ethernet-oriented all-outdoor deployments.

The 9500 MPR-e is fully integrated with the Alcatel-Lucent 7705 Service Aggregation Router (SAR) IP/MPLS portfolio, including support for the 9500 MPR-e as a native 7705 SAR microwave interface. Microwave-specific cards have been added to the 7705 SAR to support microwave protection and powering.

This level of integration offers unique capabilities for deploying IP/MPLS networking over microwave links:

- The solution offer is managed as a single network element, under common network management. This unique capability brings a number of OPEX advantages.

For example, regardless of how many radio instances exist, network element maintenance procedures, such as software upgrades and configuration backups, are done only once to all components.

- Microwave radios can be directly powered by IP/MPLS cell site devices, which provide lightning protection and voltage surge suppression. This simplifies and optimizes cell site battery feed planning and installation.
- Collapsing two platforms into a single compact and very flexible platform reduces real estate requirements, operations complexity and energy costs.

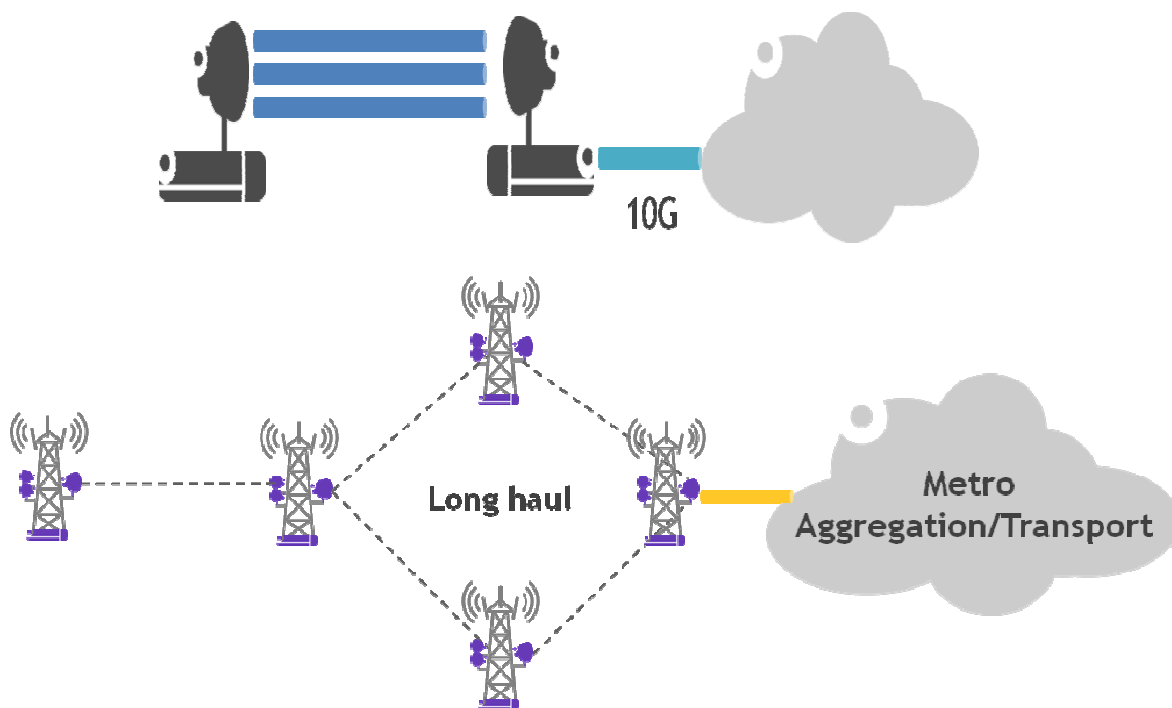
3 9500 MPR: Main features

3.1 10G interfaces

9500 MPR does offer full not-blocking 10 Gbit/sec capability. This is achieved using: corEvo card, that provides 2 x 10 Gbit/sec SFP+ interfaces and that does embedded a traffic matrix of 100 Gbit/sec
MSS-8 10G shelf, having a backpanel with 10 Gbit/sec connection among slot 1-6 and 2.5 Gbit/sec connection for slot 7-8

Typical usage of 10G interfaces is the handoff of aggregated traffic, see here below two use cases.

The first one is representing a split mount system that in a LAG L1 N+0 configuration does provide an air throughput greater than 1 Gbit/sec. In this case the best technical solution is to hand off traffic using a 10Gbit/sec interface. A similar case is represented by a long haul trunking system that usually it is designed and deployed to transport very high capacity, in the range of 4-5 Gbit/sec and above up to 10Gbit/sec: in this case it is obvious that the only reasonable technical solution to deliver this high capacity is through 1x 10G bit/sec interface



In this section we will discuss on the technical reasons for which using multiple 1 Gbit/sec user interfaces to deliver high capacity traffic is not the best technical solution.

TRAFFIC HANDOFF: MULTIPLE 1G INTERFACES EVENTUALLY LEAD TO PACKET LOSS

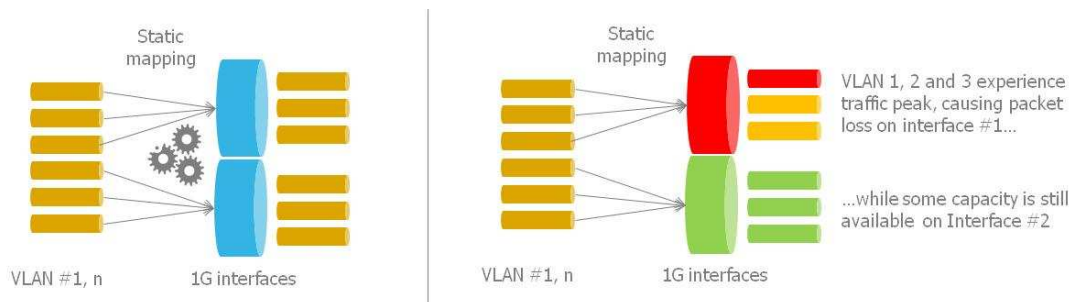
Let's imagine to have multiple 1 Gbit/sec interfaces in the indoor unit. This will actually create a number of issues. Let's make a very simple example: let's imagine having a radio throughput of 1.8 Gbit/sec to be handed off using 2 x 1 Gbps ports without a 10 Gbit/sec interface available. How this can be done? Two methods are usually proposed:

- A static assignment of VLAN to the two ports
- Ethernet LAG IEEE 802.3ad/802.1AX.

The first method, consists in assigning, among the whole set of Ethernet flows transported by the radios, a sub-set of VLANs to port #1 and a second sub-set of VLAN to port #2, in a static way through an explicit provisioning by the operator. What does this mean for the operator?

This brings a huge operational complexity - The radios transport an aggregated traffic, made by multiple services and by multiple VLAN. This means that the details of each VLAN labels transported over the radio must be known in order to assign them to a one of the two ports.

This static provisioning can lead to a loss of packet - Let's assume that the VLANs are statically mapped in order to balance the load on the two 1G interfaces. Each interface therefore carries around some 900 Mbit/sec (1 Gbit/sec being the limit is imposed by the physical port speed). As the LTE traffic is extremely bursty by nature, it is highly probable that some VLANs may experience traffic peak, making the overall traffic exceeding the 1Gbit/s. In that case, the egress traffic will be cut above 1 Gbit/sec with the serious consequence of loss of packets (even if the other port may still have available throughput).



Drawbacks of multiple 1G interfaces

The second method is the usage of IEEE 802.3ad/802.1AX Ethernet Link Aggregation for port #1 and port #2

This standard, introduced in mid 1990s consists in combining two (or even more) physical Ethernet links into one logical link via. The logical pipe is equivalent to the sum of the physical Ethernet links. The traffic is distributed "per-flow", since it is not allowed by the standard to send the same Ethernet flow (=VLAN) to different physical interfaces in order to avoid any possible disorder potentially introduced.

Operational complexity is solved - The assignment between VLAN and port is automatically done by a hashing algorithm, that "in average" or "statistically" split up the incoming Ethernet flows.

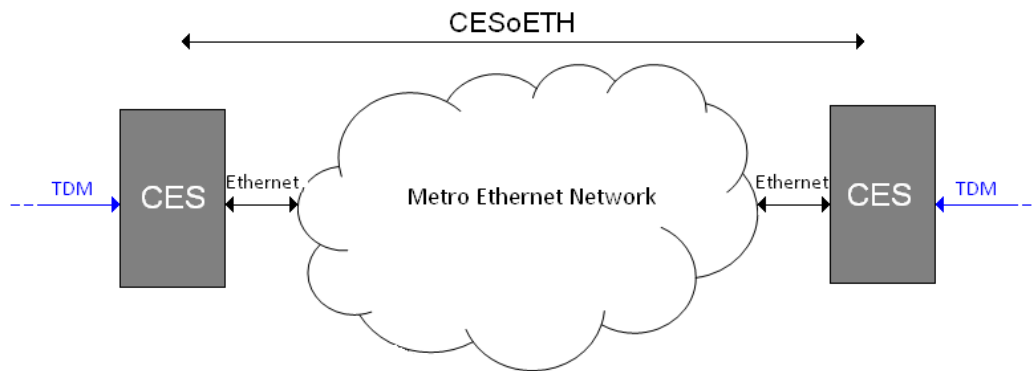
But Ethernet LAG can still lead to packet loss - While the load balancing is quite effective in the case multiple Ethernet flows (30+) with different MAC/VLAN values, it proves to be less than optimum or simply not effective in case of limited number of VLANs (less than 16). In particular, if only one or a few of the flows have relative higher throughput than the others, one port can be over-saturated by the Ethernet flows, whilst the second one still has spare capacity. In our example, 1.8Gb/s roughly corresponds to a dozen of LTE nodeB maximum.

So again, the bursty nature of LTE traffic will make the algorithm un-effective and will lead to packet loss.

3.2 TDM/SDH traffic management

3.2.1 MEF-8

As described in MetroEthernet Forum, MEF-8 is a standard for “implementing interoperable CES equipment that reliably transport TDM circuits across Metro Ethernet Networks while meeting the required performance of circuit emulated TDM services as defined in ITU-T and ANSI TDM standards”. The Circuit Emulation Service (CES) emulates a circuit network, by packetizing, encapsulating and tunneling the TDM traffic over Ethernet.



MEF-8 Service Definitions

Alcatel-Lucent 9500 MPR implements a proprietary technique that reduces the overhead to a low percentage, thus exploiting the maximum bandwidth on air when MEF-8 emulated circuits are transported. The improvement depends on the MEF-8 payload size and frame format: in case of TDM CES implemented inside 9500 MPR the efficiency is practically the same than a traditional TDM radio.

3.2.2 BER performance

When MEF-8 Ethernet frames are transmitted through a noisy medium (e.g. the Radio Physical Layer), bit errors may occur. If an Ethernet frame is affected by one error, this is detected and the entire frame is dropped. This affects the TDM traffic with a worse BER which, if compared with a traditional TDM transmission process, is higher, multiplied by a factor equal to the frame length.

In order to avoid such BER degradation a specific implementation is put in place such as for any reasonable BER on the Radio Channel, the TDM transported by MEF-8 CESoETH is affected by the same BER without any multiplication effect.

3.2.3 Packet Delay Variation control / Fragmentation

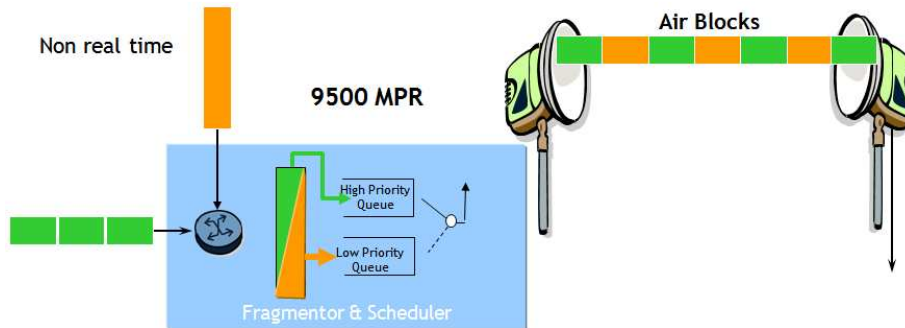
Mixing different Packet Based Services over a radio channel introduces a Packet Delay Variation (PDV) that affects TDM/Voice and any other high priority traffic, whatever the queuing mechanism.

Inside 9500 MPR a technique is implemented in order to control PDV affecting Ethernet frames.

Actually this mechanism is available for any kind of traffic (VoIP, TDM, ATM, Ethernet).

Long Ethernet frames are fragmented in fixed small size blocks before being transported into the air, then reassembled at receiver side.

With this technique the waiting time that affects high priority traffic is neither depending on the Ethernet frame length nor on the traffic load.



3.3 Multiservice Ring Protection (ITU-T G.8032v2)

Multiservice Ring Protection is based ITU-T G.8032 ERPS, and providee sub-50ms protection and recovery switching traffic in a ring topology .

Additionally to 8032v2 standard, the Multiservice ring protection implemented in the 9500 MPR offers the capability to protect all type of traffic: Ethernet, TDM E1/DS1 and SDH (planned in a future release)

Each Ethernet Ring Node is connected to adjacent Ethernet Ring Nodes participating in the same Ethernet Ring, using two independent links. A ring link is bounded by two adjacent Ethernet Ring Nodes, and a port for a ring link is called a ring port. The minimum number of Ethernet Ring Nodes in an Ethernet Ring is two.

The fundamentals of this ring protection switching architecture are:

- a) The principle of loop avoidance.
- b) The utilization of learning, forwarding, and Filtering Database (FDB) mechanisms defined in the Ethernet flow forwarding function (ETH_FF).

Loop avoidance in an Ethernet Ring is achieved by guaranteeing that, at any time, traffic may flow on all but one of the ring links. This particular link is called the Ring Protection Link (RPL), and under normal conditions this ring link is blocked, i.e. not used for service traffic. One designated Ethernet Ring Node, the RPL Owner Node, is responsible for blocking traffic at one end of the RPL. Under an Ethernet ring failure condition, the RPL Owner Node is responsible for unblocking its end of the RPL (unless the RPL has failed) allowing the RPL to be used for traffic. The other Ethernet Ring Node adjacent to the RPL, the RPL Neighbour Node, may also participate in blocking or unblocking its end of the RPL.

The event of an Ethernet Ring failure results in protection switching of the traffic. This is achieved under the control of the ETH_FF functions on all Ethernet Ring Nodes. An APS protocol is used to coordinate the protection actions over the ring.

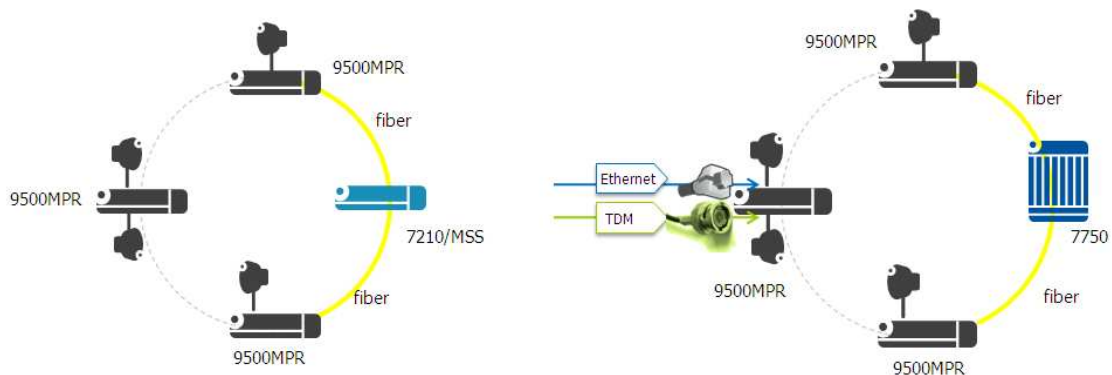
The ring is implemented by east and west facing radio directions

Traffic can follow on both ring directions: Clockwise direction & Counter-clockwise direction

Protection is triggered by physical criteria (no protocol intervention)

Protection is based on R-APS messages sent on both sides of the ring by the nodes detecting the failure. Traffic is redirected by each node of the ring locally, ensuring parallel processing to speed up protection time.

- G.8032v2 algorithm operates on VLAN, regardless the type of traffic transported: TDM (TDM2TDM and TDM2ETH) and Eth (Multiple CoS and services) traffic types can be protected
- Traffic flows (any type/priority) can be allocated on both ring directions to exploit the maximum ring bandwidth in normal conditions for best effort traffic and to limit packet delay when traffic enters from different points of the ring.
- G.8032v2 is supported on all MSS1/MSS8
- Synchronization is managed through SSM messages.
- Multichannel LAG L1 configuration can be supported inside the ring, with optionally error error free adaptive modulation configured. A LAG L1 link with N channels is declared “faulty” when all the N channels of the link are operationnally down
- 9500MPR does support ITU-T G.8032v2 in mixed configuration as well, meaning that some links can be microwave and some links can use fiber.
- With corEvo 10G card, the 9500 MPR offers 10G ring capability.(future release)



G.8032 Ring

3.4 Ethernet features

9500 MPR provides several service interfaces and it is also able to provide a wide-assortment of service interfaces by configuring appropriate service interface boards.

Frame size : The LAN interface supports jumbo frames up to 9280 bytes

3.4.1 Level-2 Addressing

The address management function is performed in the switch through the address table (Level-2 Table) that can manage up to 65536 entries in the switch . New entries are automatically learned when packet is received on port.

The aging process periodically removes dynamically learned addresses from the "address resolution table.;" default aging time is 300 sec. Aging time might be user configurable.

3.4.2 IEEE 802.3x Flow control

In case of incoming Ethernet traffic leading to exhaustion of buffers on input queues, PAUSE frames are transmitted from the switch to remote peer in order to slow down the traffic (if the peer supports flow control).

In the other direction, when the switch receives a pause frame on a specific port from peer equipment, the switch stops the packet transmission on that port until receives again a pause frame with resume transmission command.

Flow control to be fully effective (no packets lost inside the network) requires that all devices in the end-to-end path support flow control.

The flow control function is supported only when the capability is full duplex.

The flow control setting on the switch ports linked to user Ethernet ports must be consistent with the setting on the user ports.

Flow control is not supported on MPR-e.

3.4.3 VLAN MANAGEMENT

- **Supported services:**

- Ethernet services (EVCs)

- E-Line (Point-to-Point)
- E-LAN (Multipoint)

- **Support VLAN** 9500MPR does support up to 4096 VLANs

- **IEEE 802.1Q**

It allows of partition the switch ports into virtual private domains.

The IEEE 802.1Q tag VLAN feature can be enabled including between the other the stripping or adding of the TAG and VLAN lookups in addition to MAC lookups (this feature between the other can be useful for re-route TMN traffic to the controller).

The IEEE 802.1Q tag VLAN feature can be enabled or disabled (be transparent for the VLAN) including between the other the stripping or adding of the TAG and VLAN lookups in addition to MAC lookups (this feature can be useful to logically break a physical LAN into a few smaller logical LAN and to prevent data to flow between the sub-LAN), dropping NON-VLAN Frames.

- **Stacked VLAN (Q-in-Q): 802.1ad**

The switch supports double tagging according to 802.1ad, in particular:

- adding a service VLAN on the ingress traffic, per port of per service VLAN
- pbits value of service VLAN is a)user configurable b)same value of customer VLAN.

The EtherTypes supported are:

EtherType 0x8100

EtherType 0x9100

EtherType 0x88A8

- **Port based rate limiting**

It is possible, on per port basis, to define an ingress/egress port rate limiting. Per-port ingress rate control is used to meter and limit the rate of data stream input. If the ingress rate exceeds the limit configured, the switch can either transmit flow control or drop the frame. If the egress rate control is enabled, the traffic exceeding the configured threshold is dropped. Granularity is 64 kbit/sec.

Example:

-)it is possible to define an egress rate limiting on user port 1 at 15Mbps
-)it is possible to define an ingress rate limiting on user port 2 at 10Mbps

- **Per flow policer**

Ingress rate limiter per VLAN, dropping the traffic exceeding a given CIR value

- **Per CoS policer**

Ingress rate limiter per Class of service, dropping the traffic exceeding a given CIR value

The rate limiter is applied to a tagged Ethernet flow classified according to the value of VLAN ID and PCP fields of the VLAN Tag. One VLAN ID value and one PCP value identifies the flow.

- **Broadcast storm control**

Ingress rate limiter on broadcast traffic

- **Multicast storm control**

Ingress rate limiter on broadcast frames

- **Destination Lookup Failure (DLF) storm control**

DLF are frames having a unicast destination MAC address, which is not present in any port MAC lookup table. These packets are typically flooded to all switch ports.

The storm control limits the broadcast of such frames.

- **MAC address control list**

Only packet with SA inside a given list are transmitted towards the radio

- **Link Aggregation IEEE 802.1AX**

Link Aggregation allows two or more Ethernet links to be aggregated together to form a Link Aggregation Group (LAG), consisting of N parallel instances of full duplex point-to-point links operating at the same data rate. Link aggregation can be used for two main purposes:

1. Traffic Aggregation, using L2 hashing algorithm and spreading the traffic over multiple interfaces
2. Link Protection, achieved mainly with static LAG, where one link of the group is active and the other(s) is in stand-by condition

Frame distribution. Frame distribution over Ethernet interfaces inside the LAG is based on Ethernet switch hashing function. Two options can be selected for the hashing function:

1. L2 Hash (DMAC, SMAC, VLANID, Ethertype)
2. L3 Hash (IPdst, IPsrc, TCP/UDP dst port, TCP/UDP src port)

Link aggregation protocol. LACP is supported and can be configured in one of two modes: active or passive. In active mode it will always send frames along the configured links. In passive mode however, it acts as "speak when spoken to", and therefore can be used as a way of controlling accidental loops (as long as the other device is in active mode). Following options are

- Disabled, to configure Static Link Aggregation.
- Active :send LACPDUs automatically with the defined periodicity)
- Passive (send LACPDUs only if received by the Link Aggregation Partner).

3.4.4 Quality of Service

QoS management is supported by:

Scheduler queues: 8 queues

Scheduling: Strict priority, WFQ, Combination of Strict priority and WFQ

Frames discard: Tail drop

Buffer Sizes : 32 Mbit per queue, 8x32 Mbit=256 Mbit total

The frame buffer size as a function of the frame size.

- **Priority classification**

The priority to TC queue mapping is based on whether the port is trusted/tagged or not. The following options are supported:

- DSCP value in IP header
- Traffic Class field bits in MPLS header
- Reuse priority bits in C-tag (Q-tag, VLAN) or S-tag.

3.4.5 Ethernet Service OAM - IEEE 802.3ag/Y.1731

Ethernet Service OAM provides network end-to-end Ethernet L2 OAM capabilities. The supported Connectivity Fault Management (CFM) functions are:

- Continuity Check (CC). CC is a proactive OAM used to detect loss of continuity between pair of Maintenance End Points (MEPs). Optionally Port status TLV and Interface status TLV can be used to also supervise the status of the transmitting MEPs interface or switch port.
- Remote Defect Indication (RDI); proactive OAM function used by a MEP to communicate to its peer MEPs that a defect condition has been encountered.

- Loopback (LB) - unicast; on-demand OAM function used to verify connectivity of a MEP with its peer MEP (or a Maintenance Intermediate Point, MIP). A MEP can optionally use Data TLV, e.g. to verify connectivity for jumbo frames.
- Link Trace (LT); on-demand function used for fault localization.

3.4.6 Ethernet Link OAM - IEEE 802.1ah

Ethernet link layer OAM, based on the IEEE 802.3ah specification, enables service providers to monitor and troubleshoot a single Ethernet link.

The following features are supported

- Discovery: Identifies devices in the network and their OAM capabilities. It uses periodic OAM Protocol Data Units (PDUs) to advertise OAM mode, configuration, and capabilities; to advertise PDU configuration; and platform identity.
- Remote Loopback: Puts the remote link partner into loopback mode so that every frame received is transmitted back on the same port. This is used to ensure the quality of links during installation or troubleshooting

3.5 Radio Encryption (AES)

9500 MPR supports 256 Byte AES on the Radio Links, designed to comply with FIPS 197.

Encryption can be supported independently by each Radio direction and each radio direction has a unique AES Key, to be provisioned by the user.

Encryption does not affect the bandwidth transmitted over the radio interface and the ACM, ATPC, QoS and TMN functionalities.

Support for AES is available for the following radios:

- MPT-HCv2 / MPT-HC-HQAM / MPT-XP / MPT-XP-HQAM
- MPT-HLC (cubic)
- MPT-HLS (slim)

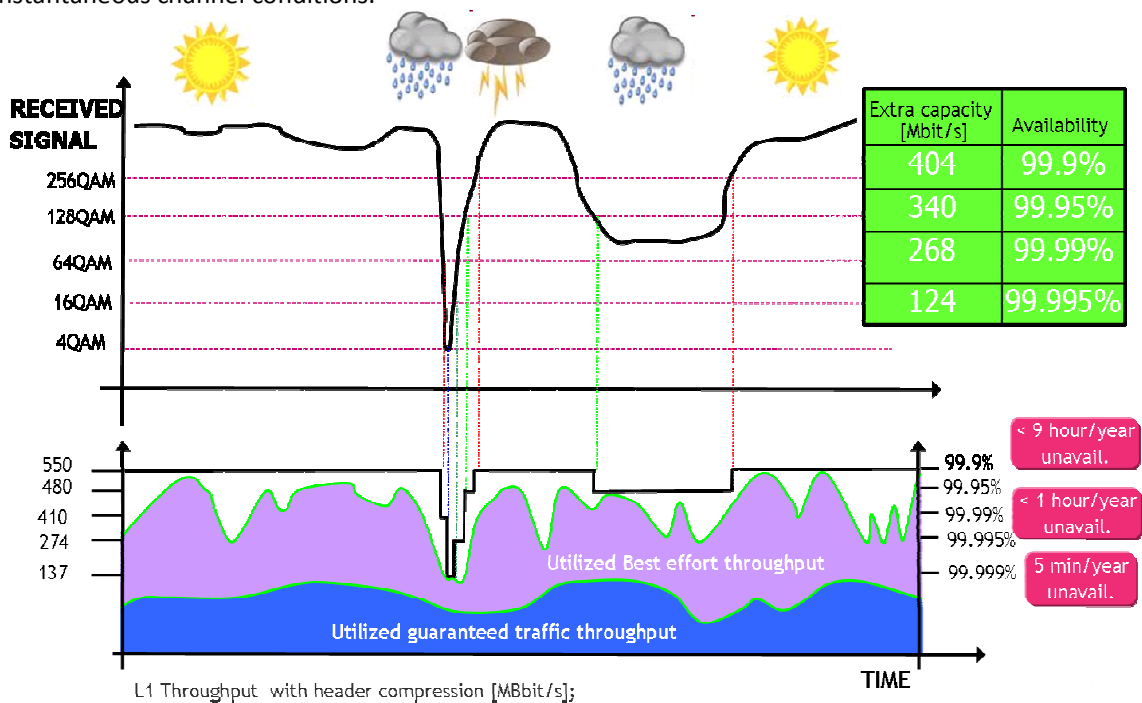
AES can be enabled in the following topologies:

MSS 1/8

MPR-e

3.6 ADAPTIVE MODULATION

In order to be able to fulfill the required quality of service (QoS) associated to the specific application, together with the goal of efficient usage of the available frequency spectrum under temporal variable channel conditions, the signal transmission is adapted to the near-instantaneous channel conditions.



3.6.1 Configuration

On the user interface it is possible to select the following parameters:

- modulation schemes in the ACM range (min, max modulations)
- reference modulation

The reference modulation corresponds to the modulation scheme used for identifying the equipment parameters needed for the radio link budget and link coordination, with predefined availability objective.

Minimum modulation scheme can be chosen to be equal but also lower than reference mode, in order to maximize traffic availability for a certain amount of high priority traffic. This is especially useful for LAG configurations, for which excess capacity on one link can compensate degradation of other links (down to minimum modulation scheme). In 1+1 configuration both receivers are measuring the MSE. Both values are reported to the transmitter, which is able to select the best one among the two. This allows the capability to deliver maximum capacity (because maximum possible modulation scheme is chosen) even when one of the two radio hops is degraded. On the user interface it is possible also to

change this strategy, thus forcing the transmitter to select the worst value among the two, switching down modulation scheme as soon as one receiver degrades. This is a conservative configuration which favours high priority traffic availability with respect to higher capacity.

3.6.2 Performances

9500 MPR allows to fully exploit the air bandwidth by changing modulation scheme according to the propagation availability, associating the available transported capacity to the different service quality. In fact the integrated QoS algorithm (with Strict Priority or DWRR scheduler) efficiently distributes input traffic adapting instantaneously to the radio channel conditions.

The ACM modulation switches are "error-less", which means that high priority traffic (PDH, SDH or Ethernet) fitting the capacity associated to the new modulation scheme is transported without errors. This implies that for this kind of traffic the availability is guaranteed for a higher percentage of time, according to predefined SLA (Service Level Agreement).

Instead lower priority traffic is carried with less availability, according to the link propagation performances with respect to QoS parameters.

The supported flat fading speed without errors on priority traffic is 100 dB/s.

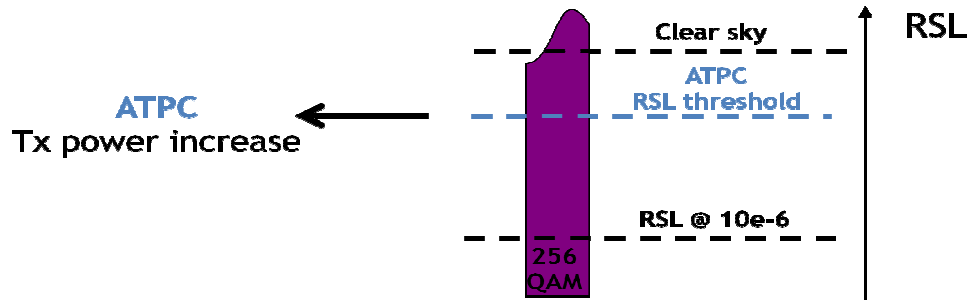
The adaptive modulation algorithm is fully compatible with the contemporary enabling of XPIC and/or ATPC (see "ATPC" chapter for details on ATPC+ACM). Another powerful capability of 9500 MPR, available for any radio, is to be able to automatically adapt transmitted power to the modulation scheme. Generally higher modulation schemes support lower output power, due to reduced backoff. MPR ACM algorithm is not penalizing lower modulation schemes for this reason, on the contrary is able to increase the Tx power while decreasing modulation scheme, adapting automatically while switching down the modulation scheme. This allows to guarantee maximum system gain (thus availability) when link fading increases.

3.7 ATPC

ATPC is a closed loop algorithm which regulates local transmitted power according to the remote receiver signal level (RSL), obtained through the radio link.

ATPC main objective is to reach a desired RSL value, allowing to keep Tx power as low as possible when field conditions are favourable and increasing Tx power only when needed to compensate for link fading. This enables an easier coordination and frequency reuse during network design phase, thanks to interference mitigation.

In case of link fading, Tx power starts to increase when “ATPC threshold” is crossed. Here is an example for RSL graph with fixed modulation (FCM):



To summarize, main benefits of ATPC usage are:

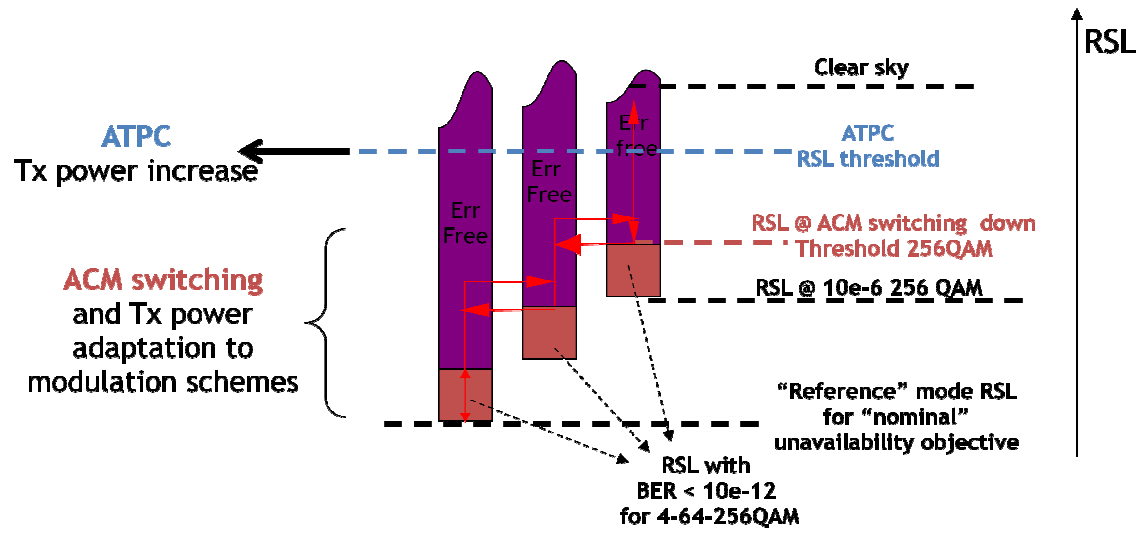
- better re-use of radio channels in a network, enhancing network density
- interference minimization, also as mitigation factor for sharing with other services
- to increase system gain as a countermeasure against rainfall attenuation

3.7.1 ATPC and ACM

ATPC and adaptive modulation can work together, efficiently regulating Tx power and transmitted modulation scheme at the same time in order to reach any possible advantage available from these features, mainly interference mitigation and guarantee for traffic availability/QoS at the same time.

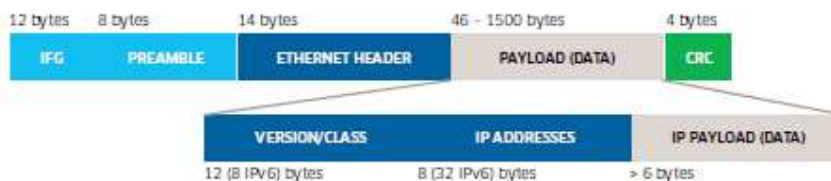
In fact the two algorithms work on two different RSL ranges: first ATPC compensates for link fading through power increase, then Adaptive modulation (when max power is reached) reduces available capacity maximizing availability of high priority traffic.

Here is an example for RSL graph with adaptive modulation (ACM):



3.8 Throughput Packet Booster

The fundamental objective behind the Alcatel-Lucent packet throughput boost feature on the 9500 MPR is to maximize the amount of traffic payload that traverses a link. This action is done by reducing the proportion of overhead required to transmit the payload. As most microwave links are point-to-point in nature and are not shared resources, there is significant opportunity to reduce unnecessary overhead. If we examine the content of a data packet, as shown in figure below, it is sometimes surprising to see the amount of overhead when compared to the actual user traffic contained in the IP payload field. The overhead fields are needed for routing, collision, and flow identification in complex topology LAN/WAN networks. But in a point-to-point radio link with full-duplex transmission where the medium is not shared by simultaneous users, overhead can be drastically reduced to improve and increase overall throughput over the air.



Significant benefits can be gained by reducing packet overhead, especially when small packets are considered. Let's take a look at each of the header fields in the basic Ethernet frame. The first two fields, Interframe Gap (IFG) and preamble, are not transmitted over the air and therefore not needed in a microwave transmission, so automatically 20 bytes can be entirely eliminated per Ethernet frame

- Interframe Gap (12 bytes). Ethernet devices must allow a minimum idle period between transmissions of Ethernet frames known as the Interframe Gap. IFG was introduced by IEEE 802.3 to avoid collision over a shared medium, such as the LAN.
- Preamble and Start of Frame Delimiter (8 bytes). These fields were added to the IEEE 802.3 standard to allow devices on the network to easily detect a new incoming frame. The remaining fields that are subject to compression but not automatically eliminated are:
 - Ethernet header (14 bytes). This is the information used to switch an Ethernet frame across a network segment:
 - Destination addresses (6 bytes)
 - Source addresses (6 bytes)
 - 802.1Q tag (4 bytes): Optional virtual LAN (VLAN) tag
 - EtherType/length (2 bytes); EtherType is a two-octet field in an Ethernet frame. It is used to indicate which protocol is encapsulated in the payload of an Ethernet frame.
 - Payload (46-1500 bytes): Contains user data and/or IP/Multi-Protocol Label Switching (MPLS) frames

IFG and preamble suppression operates automatically even if throughput packet booster is not enabled

Throughput packet booster identifies traffic flows and replaces the header fields with a "flow ID". This is done using an algorithm that learns unique flows and that in RX side is rebuilding the original packet header.

As summary, with the Alcatel-Lucent packet throughput boost feature, operators can transport up to 1 Gb/s of traffic on a single channel. Under the most favorable conditions, the gain achieved by the 9500 MPR exceeds 300 percent.

Throughput packet booster can be activated in presence of full Ethernet traffic or even in the case of mixed /E1/SDH/Ethernet traffic.

3.8.1 Throughput packet booster counters

9500 MPR provides counters when Packet Throughput Booster is enabled. This information can be used by operators to monitor network usage and capacity and to monitor the effectiveness of packet throughput booster algorithm

3.9 Multichannel

In previous chapter we have described techniques such as packet throughput booster aimed to increase channel capacity. However, at a certain point, the only way to get more microwave link bandwidth is to increase the number of radio channels used.

Modern methods that combine 2 or more microwave channels to create a higher capacity virtual link have several names, including channel bonding, radio link aggregation (LAG) and multichannel. Although all methods use multiple channels to scale microwave capacity, implementations and efficiency levels can differ. Here we are describing the multichannel packet microwave system as implemented on 9500 MPR. In particular we would like to show the advantage of this implementation on a real packet radio respect to a hybrid approach; in fact these systems offer a new way to bond microwave channels together in order to create higher capacity and more reliable microwave links.

Multichannel are designed to work with features such as:

- High-order adaptive modulation (AM)
- Carrying legacy time division multiplexing (TDM) services as packet traffic together with IP traffic

Multichannel systems give network operators new flexibility when it comes to designing microwave links and new ways to increase microwave capacity and availability:

- A multichannel approach creates a virtual link from 2 or more underlying channels. The resulting capacity is the sum of every channel's capacity.
- The individual channels in the multichannel bundle can have different profiles for frequency bands, modulation levels and capacities.
- Adaptive modulation can be enabled across all channels in the multichannel bundle. This creates room to increase capacity and service availability according to network design parameters.
- Because modern packet microwave systems packetize legacy TDM traffic, legacy and new IP traffic can use a multichannel virtual link as a whole.
- The rigid association between the capacity a service requires and the capacity a radio channel offers is removed. For example, a packetized synchronous digital hierarchy STM-1/OC-3 circuit can be spread across the channels in a multichannel bundle whose total capacity matches the capacity required.

Microwave link protection can move from a traditional N+1 spare channel approach to a more effective multichannel N+0 approach. An N+0 approach uses the entire virtual link capacity to increase availability.

In contrast, standard LAG techniques suffer from limitations when used in microwave environments:

- There is a rigid association between a flow and a specific channel in a virtual link. This is because standard LAG hashing algorithms use IP or Ethernet header fields to consistently map a flow to a channel. If these fields do not vary much in value, some channels in a virtual link can become congested while others are only lightly used. Low utilization is a particular challenge when packets are encapsulated in IPsec. In these cases, there is not enough variety in the fields used for hashing algorithms to optimally spread the load across a bundle of channels. As a result, the same channels in the bundle are always selected, leaving the other channels underutilized.
- Every channel in a virtual link must support the same capacity. In microwave networks, this is seldom possible due to the effects of adaptive modulation on individual channels.

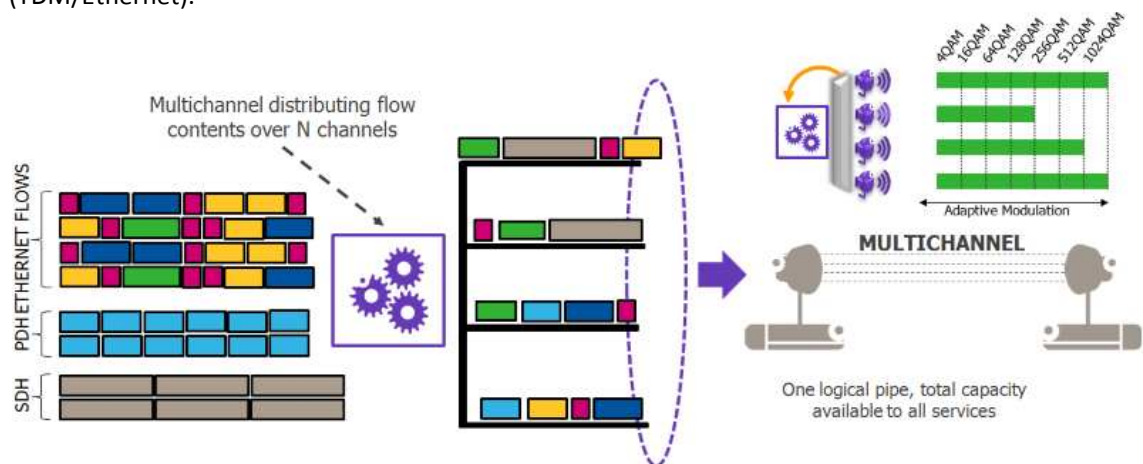
These limitations mean that channel capacity must be equal to, or greater than, the highest flow bandwidth. This constrains link dimensioning because radio capacities are typically not correlated with IP service flow capacities. As a result, in some network environments — LTE backhaul networks, for example — channel bundles are underused.

Multichannel radio LAG eliminates these issues because it:

- Distributes traffic load evenly based on algorithms that do not leave channels underutilized or impact services, even in the event of a channel failure
- Does not require each channel in a bundle to have the same capacity as the most demanding service

9500 MPR multichannel has a unique algorithm which outstands Native TDM or Hybrid technology provided by Alcatel-Lucent MW competitors in long haul. These legacy technologies supported by competitors statically allocate radio capacity per service type (TDM or Ethernet) leading to poor capacity repartition per services and possible waste of throughput. In fact, radio time-slot division implies a fixed granularity while distribute capacity to multiple services.

Instead, 9500 MPR fairly shares the entire radio available capacity of the aggregated channels on a byte per byte basis to all incoming services regardless their nature (TDM/Ethernet).



Service load balancing is so effective that L1 LAG reaches 99.9% of efficiency regardless packet size or TDM circuits bitrate (STM1/OC3 or E1/DS1).

The multichannel engine is aware of traffic flow quality of service (QoS) requirements to ensure that service level agreements (SLAs) are maintained. When multichannel link capacity varies, the multichannel engine uses the real-time status of the entire virtual link to adjust traffic distribution across the channel bundle and improve spectral efficiency.

Spare capacity, not spare protection

Unlike traditional N+1 techniques to scale microwave link capacity, multichannel systems do not require spare protection channels to protect link capacity. Instead, multichannel systems use the concept of spare capacity across a bundle of active channels.

When adaptive modulation is used, a channel does not have to be in an 'on' or an 'off' state; it can be in a partially working state, although at a reduced capacity. In the rare case where the capacity available in the multichannel bundle is lower than requested, high-priority committed traffic is preserved and only best-effort traffic is discarded.

From a network design standpoint, the probability of delivering the committed traffic is very high. That's because the degradation on one channel can be compensated for with the excess capacity available on other channels in the bundle.

On ALU implementation the adaptive modulation changes and the reallocation of traffic from one channel to the other is completely hitless on high priority traffic.

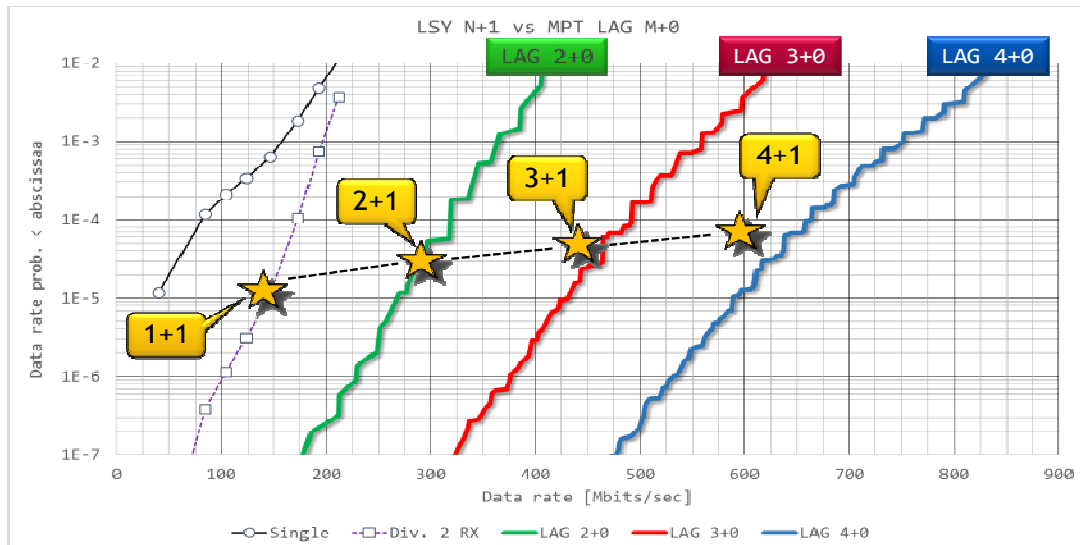
Traditional N+1 link protection mechanisms do not support the spare capacity concept when scaling and protecting microwave links. If channel capacity drops, all traffic is moved to a dedicated protection channel, stranding any remaining capacity on the degraded channel.

Increase microwave capacity and availability

There are 2 ways to take advantage of the benefits that multichannel provides:

- Increase availability and maintain the same capacity as a traditional microwave system
- Increase capacity and maintain the same availability as a traditional microwave system

Figure 2 shows a comparison between multichannel in 9500 MPR and performances of the previous legacy ALU platform where protection is based on a traditional N+1 mechanism.



Source: Alcatel-Lucent analysis

The behavior of a multichannel system is represented by a curve that is associated with the entire set of channel capacity and availability levels. It is not represented by a pre-defined single point as is the case with a traditional N+1 system. Availability in a multichannel system is strongly increased when compared to the capacity of an N+1 system with same number of channels.

If the goal is to maintain the same availability value, the multichannel system offers at least 25% more capacity than a 3+1 system, with the same number of channels used. This extra capacity can potentially lead to link redesign to reduce antenna size requirements, which can further minimize network total cost of ownership (TCO).

Multichannel benefits in case of SDH traffic vs hybrid solution

In 9500 MPR platform TDM and SDH traffic is carried packetized but performances are exactly the same as a native legacy microwave thanks to some proprietary mechanism that allow the radio to be aware about the services carried.

This solution is offering to customer the possibility to have a smooth migration from legacy services to Ethernet or IP without the need of changing the infrastructure when changes are needed.

Basically the main advantages on ALU solution respect to an hybrid approach can be summarize as follow:

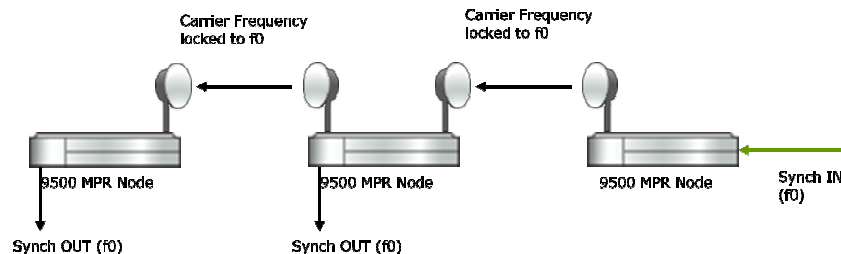
- No need of dedicated channel carrying SDH and other carrying packet traffic
- Better efficiency on the usage of all RF resources: all the capacity over the multiple radio can be shared between the different services without need of correspondence between flow and channel.
- All modulations scheme can be used up to 1024 QAM and the hitless mechanism of adaptive modulation is allowing to carry traffic according the correct priority.
- As all the services can be part of multichannel, the benefits described above are realized also when traditional TDM applications are carried. As already mentioned SDH traffic will have a better availability versus propagation issues. Let's consider the case of 2 RF channels: thanks to multichannel the STM-1 flow can be carried without any error also if fading is not allowing both channels to stay at high modulation scheme (128 QAM). The traffic can be carried by 2 channels at 32 QAM.

3.10 Synchronization

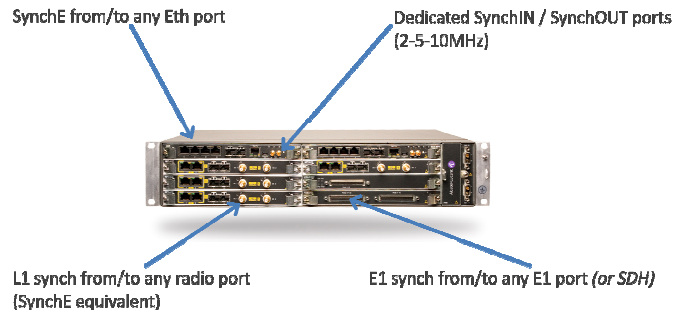
Synchronisation distribution is very often needed in transmission networks. The specific customer need depends on the final application, e.g. in the case of mobile backhauling networks 'frequency' or 'frequency and phase/ToD' synch distribution might be required depending on the RAN technology (e.g. LTE, 3G, 2G, ...). As a matter of fact multiple interfaces and multiple flavours of synch signals must be taken into account in a transmission network.

9500 MPR is fitting synchronisation requirements of any aggregation network (legacy SDH/PDH, Carrier Ethernet, MPLS) and of any base station technology (LTE, 3G, 2G, ...) thanks to the following feature set:

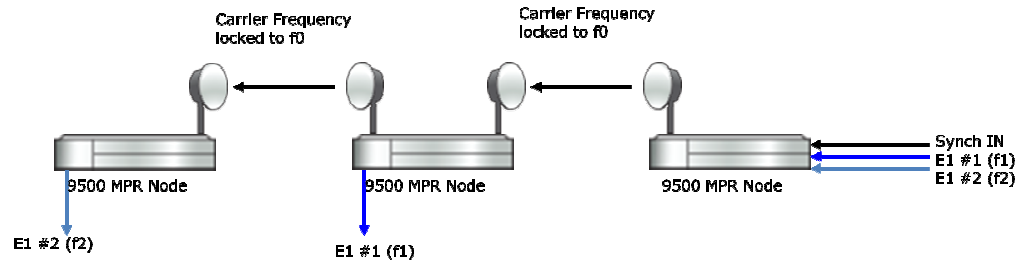
- 9500 MPR has been designed to be a synchronous node where synch signals are exchanged among nodes through the microwave carrier. Synchronization at physical level is a key point in achieving immunity against PDV and/or congestion.



- 9500 MPR has the capability to take any synch input (E1, 2 MHz, 10 MHz, SDH, Synchronous Ethernet, ...) and to deliver any synch out independently.



- 9500 MPR Ethernet ports support Synchronous Ethernet (SynchE), a mechanism to transfer frequency over the Ethernet physical layer as specified by G.8261. As SynchE uses the physical layer, it is immune to traffic load and packet delay variation. SSM according to G.8264 is supported.
- Synch distribution via E1s is possible and multiple synchronization domains are supported thanks to differential clock recovery.



- 1588v2 applications:
 - 9500 MPR implements a fragmentation method to support frequency and phase/ToD synch distribution via 1588. Mixing different Packet Based Services over a radio channel introduces a Packet Delay Variation (PDV) that affects any low/high priority traffic, whatever the Queuing Mechanism. High Priority Packets transporting Voice, Real time traffic, synch info are interleaved with Ethernet packets bringing Native Data. Without fragmentation, if low priority long frames data are present, real time traffic has to "wait" in the schedulers, as long as the length of the data packet. With 9500 MPR fragmentation low priority frames are fragmented into fixed small size blocks and scheduled in different priority queues before being transported into the air. In this way high priority 1588 packets are practically not affected by the PDV potentially introduced by long low priority Ethernet frames
 - Transparent Clock (TC) on-path support is supported on 9500 MPR Core10G board: the synch packets correction field is updated with the transit time, so the PDV normally caused by internal queues is removed.
 - 9500 MPR LAG L1 algorithms are 1588v2 aware: 1588v2 packets are recognised and given a preferred path in the LAG L1 packet distribution/rebuilding mechanisms.

4 SYSTEM ARCHITECTURE

4.1 9500 MPR platform

9500 MPR is very comprehensive and flexible platform applicable to all radio configuration keeping the same HW variant in all cases.

9500 MPR is composed by 2 main building blocks:

- **MSS:** indoor unit including all user interfaces, switching capability, multichannel functionalities and radio protection.
- **MPT:** transceiver part including radio and modem . This unit can be installed in indoor (MPT-HL) or in outdoor and can work connected to MSS or in stand alone mode. This change is only requiring a sw configuration.

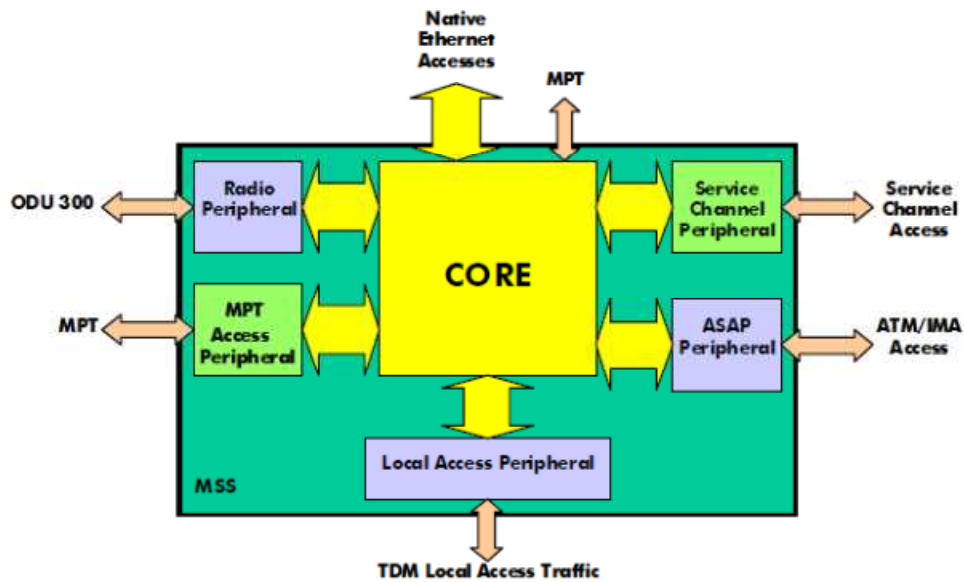
9500 MPR is able to support the following configurations:

- **Split mount Indoor/Outdoor (IDU/ODU):** the functions are split into IDU and ODU units; more configurations can be obtained configuring the equipment in a suitable way:
 - Terminal Configuration
 - Repeater Configuration
 - Node Configuration
- **Full Outdoor (MPT):** all the functions are in the outside unit next the antenna; two different configurations are supported:
 - MPT in 1+0 and 2x(1+0) XPIC
 - MPT Repeater
- **Full Indoor (IDU):** this is not a radio configuration. The radio interface is changed into a gigabit Ethernet lineside interface. It allows aggregation of different type of line-side traffic into a gigabit Ethernet line side traffic; only one configuration is forecasted: Stand alone IDU.

4.1.1 MSS architecture

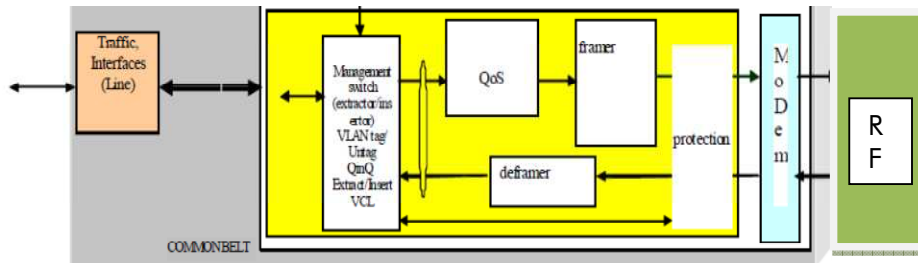
In the attached drawing it is reported the MSS diagram; IDU is able to manage multiple peripherals of different type (for example: local access TDM, Ethernet, radio interfaces towards MPTs) and to connect each of them to a Core. Up to six peripherals are supported in case of MSS-8.

The number and the type of peripherals can change according to the customer configuration.



4.1.1 MPT architecture

MPT scheme is reported in following diagram.



MPT can be connected to dedicated plug in (EASv2 or MPT access plug in) or directly to core card using optical or electrical G Ethernet cables according to specific kind of MPTs as described in next paragraphs.

5 MSS-1/8

5.1 MSS

MSS implements functionalities of grooming, routing, switching and protection, exploiting a packet-oriented technology.

The MSS is available in four different versions:

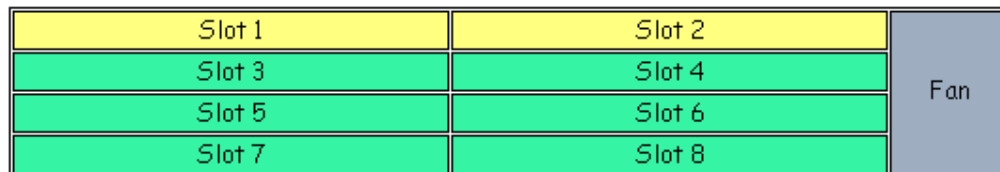
- **MSS-8** 2RU shelf to support up to 24 unprotected links, or up to 12 protected links, or a mix of them.



MSS-8

MSS-8 slots are reserved this way:

- Slot 1 is dedicated to the Core Main Board
- Slot 2 is dedicated to the Core Spare Board or to DC injector card
- Slots 3-8 are universal and can be used for transport and radio plug-ins



MSS-8 slot scheme

MSS-8 supports a double battery input.

- **MSS-1** ½ RU shelf to support up to 6 unprotected links , or up 3 protected 1+1 links, or a mix of them.



MSS-1

MSS-1 is a compact system, offering E1/DS1 , Ethernet connectivity

The interfaces currently available are:

- 16 ports E1/DS1
- 6 GETH ports, electrical and (2) optical
- 1 port for local craft terminal
- 1 port for housekeeping
- 2 PFoE (power feed other Ethernet) ports for MPT connection

Fan unit is not needed for MSS-1, that is able to operate in the wide range -40°C up to +65 °C.

MSS-1 supports a double battery input.

- **MSS-1c:** 1RU and ½ a rack width shelf to support up to 2 MPT



MSS-1c

9500 MPR MSS-1c is a compact system, offering E1/DS1 , Ethernet connectivity and up to 2 radio directions on a single hardware

The interfaces currently available are:

- 16 ports E1/DS1
- 4 GETH ports, electrical and optical
- 2 ports for NMS chaining
- 1 port for local craft terminal
- 1 PoE(power feed other Ethernet) ports for MPT connection
- 2 optical Gb Ethernet for MPT connection

Fan unit is optional and external to MSS-1c, requested for usage from 50°C to reach 65°C external temperature.

- **MSS-O** : an outdoor power injector and switch



MSS-O

MSS-O is a compact system, part of the MSS-x family, allowing networking and power injector functionalities. Optimised for outdoor usage, it can be also installed in an indoor environment.

It provides 4 user ports:

- 3 x 10/100/1000 Electrical - out of them: 2 with PoE capabilities to deliver data and power on a single cable
- 1 x 1000 SFP Optical

Each user port can be used to connect to:

- small cells, or metro/macro cells: to provide Eth data connectivity
- MPTs: in this case the MSS-O plus the MPTs behave as a standard 9500MPR split mount system
- third party ODUs.

Additional connectivity is assured by a RJ45 connector, supporting a 10/100 management interface for local TMN / debug.

5.2 Core Board

The Core Board provides the key node management, control functions and Ethernet User traffic management by performing the following macro functions:

- MSS Controller to manage all the peripheral modules. MSS has a one layer control architecture implemented by a microprocessor acting as Equipment Controller and Physical Machine Controller.
- Layer-2 Ethernet Switch performing Cross-Connect function between all the peripherals and Ethernet ports. The switch assures to the system a complete interconnections between all the boards connected into MSS node.
- Clock Reference Unit (CRU) with main function to generate the Network Element Clock.
- Ethernet interfaces can be optionally used or as user interfaces or to connect up to 6 MPT (Outdoor unit)

5.2.1 Core-E

The Frontal panel interfaces provide:

- 3 x 10/100/1000 Base – T Data Port
- 1 x 10/100/1000 Base – T configurable Data/NMS Port
- 2 x SFP ports (Optical or Electrical GETH)
- 1 x 10/100 Base-T LAN for 9500 MPR Craft Terminal or NMS
- 1 x Local CT Mini USB to upload Pre-Provisioning File (unused)
- 1 x Sync CK input via 1.0-2.3 coaxial connector that can be used as source for the Network Element clock
- 1 x Sync CK output via 1.0-2.3 coaxial connector that provides the NE Clock
- 5 LED indicators for test and status

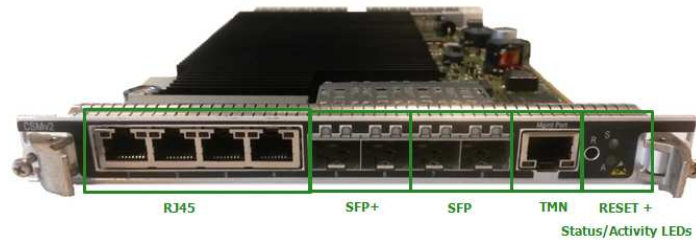


Core Board Frontal Panel

The core board could be protected through a Core “Spare” (same PN of Core “Main”) that can be added to provide Control platform redundancy and protection of aggregated data using an external switch.

5.2.2 CorEvo-10G board

The CorEvo-10G board provides node management, cross-connection between MSS plugins and Ethernet ports at 10 Gbit/sec. The CorEvo-10G board embeds a microSD Card, which among other things stores the terminal SW Configuration and the Node License.



CorEvo-10G Board

The Frontal panel interfaces provide:

- 4 x RJ45 10/100/1000 BaseT electrical ports
- 2 x SFP+ 1/10Gbps optical ports (electrical SFP 1Gbps can also be used)
- 2 x SFP electrical/optical GE ports
- 1 x RJ45 10/100 BaseT for TMN
- reset button and status/activity LEDs

CorEvo-10G provides HW support for 10Gbps user interfaces, 10Gbps ring, 1588v2 on path support and enhanced Ethernet features –pls see 9500MPR roadmap for availability.

5.2.3 CorEvo-1G

CorEvo-1G board is a cost optimised version of CorEvo-10G.

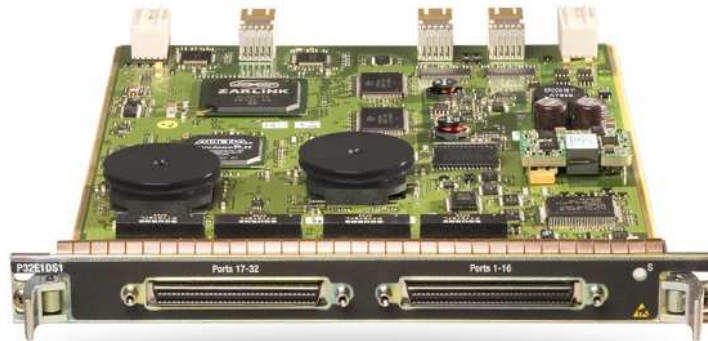
Feature level is the same apart from the 2xSFP+ ports that here are only 1Gbps capable.

5.3 PDH Access Board

The PDH Access Board has the aim to manage the specificities of the related external interface, to implement the adaptation function between the external interface and the boundary internal interface providing the consistency to the established SLA rules.

The PDH Access Board has two main functions:

- Termination or reconstruction of the E1 signal with the original PDH Timing meeting G823/824 Requirements.
- Encapsulation/Extraction of those PDH data flows into/from std Eth packets MEF8 Compliant



PDH Access Board

The Front Panel Interfaces include:

- 32xE1
- One Led indicator for status

In case of EPS line protection two boards will be plugged inside the sub rack and an additional protection panel will perform a 'Y' connection for both Tx and Rx PDH signals. The card version is 32-port adapter.

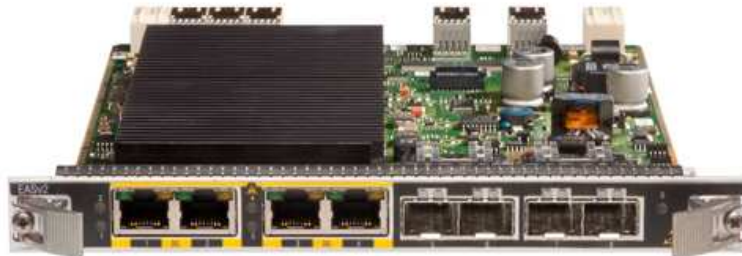
5.4 EASv2

EASv2 is a high connectivity board supporting Ethernet access and several radio configurations:

- 1+0 – applicable to MPT-xC, -HL Slim/Cubic
- 1+1 cross-EAS – applicable to MPT-HC optical, HL Slim/Cubic
- LAG L1 N+0 cross-EAS and intra EAS (N up to 8) – applicable to MPT-xC, HL Slim/Cubic
- LAG L1 N+N cross EAS (N up to 4) – applicable to MPT-HC optical, HLv2 Cubic
- Ring of LAG L1 – applicable to MPT HL Slim/Cubic (

Other features:

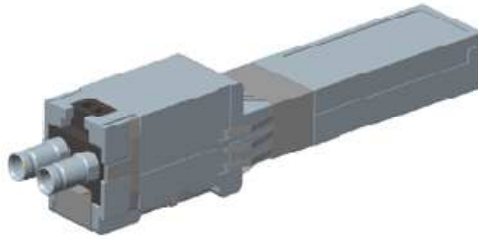
- Electrical ports with/without PfoE.
- Synchronous Eth on user ports (SynchE SFP, SynchE RJ45)
- SSM



5.5 SFP Synch IN/OUT

MSS can deliver or receive frequency synchronisation to/from an external device –like a BTS– via a dedicated SFP. This dedicated SFP can be plugged into CorEvo and MSS-1 standard SFP ports.

Electrical format can be 2.048MHz G.703 or 5/10MHz sine wave via two 1.0/2.3 coaxial connectors.



SFP Synch IN/OUT

5.6 2E1 SFP

In order to target applications where a few number of E1s are needed, a miniature E1 over GE converter is available. 2E1 SFP is SFP device that provides two G. 703 E1 interfaces, supporting the same functionalities of 32E1 PDH card. In addition, this device is able to generate a “dummy framed” E1 in order to provide synchronization to an external equipment (like a BTS).

This device can be used instead of 32E1 PDH card when the requested E1 connectivity is limited, saving in this way one slot in MSS8 that can be used by other cards.



2E1 SFP

2xE1 SFP can be plugged in one of the two SFP ports of Core card, providing two G. 703 E1 interfaces (up to 4xE1 in case Core Card hosts 2 SFP). EPS protection is available in case Core Card is protected: the secondary SFP is hosted by the stand-by Core, and a Y cable is provided to connect the 2 SFP.

5.6 SDH Access Card

9500MPR SDH Access card is the board that enables 9500 MPR to be connected to a SDH network.

The same board can be used in two different working modes, addressing two different network scenarios:

- STM-1 mux/demux
- STM-1 transparent transport over the radio



SDH Access Board

5.6.1 STM-1 mux/demux application

The STM-1 mux/demux behaves as a terminal multiplexer; it terminates or originates the SDH frame. It multiplexes up to 63xE1 into a STM-1 electrical/ optical line connection. Standard VC4 mapping of lower-order E1 traffic streams to/from STM-1 is applied, that means that a VC4 directly maps up to 63xVC12 into an STM-1 signal (in turn each VC12 contains 1xE1)

Typical application is a direct connection to SDH add-drop multiplexers (ADMs)

5.6.2 STM-1 transparent transport application

In this application the board has the aim to manage the specificities of the related external interface and to implement the adaptation function between the external interface and the boundary internal interface. Up to 2xSTM-1/OC-3 are transparently transported through a single radio link.

The card supports 1xSTM-1 in channelized mode or up to 2xSTM-1 interfaces in transparent transport mode (2 optical interfaces or 1 electrical interface)

The Front Panel Interfaces include:

- 2x SFP (optical LC connector or electrical 1.0/2.3 connector)
- One Led indicator for status

In case of EPS line protection two boards are plugged inside the sub rack. Optional splitter Y-cables are provided for both Tx and Rx SDH signals.

5.7 EoSDH SFP

Ethernet over SDH (EoSDH) SFP is miniature Gigabit Ethernet over STM-1/OC3 converter that bridges between GE networks and SDH networks providing simple and efficient Gigabit Ethernet connectivity over SDH.

The device offers a migration path for connecting future-ready IP devices to existing SDH/SONET networks



EoSDH SFP

EoS SFP supports the following basic features:

- Delivers Gigabit Ethernet traffic over a single STM-1/OC-3 link
- Supports standard GFP encapsulation according to G.7041/Y.1303: Gigabit Ethernet frames are mapped into VC-4 or STSc-3

Physical interface is 1xSTM-1 optical in a SFP cage with LC connector.

EoSDH SFP can be plugged in one of the two SFP ports of Core card (up to 2xSTM-1 in case Core Card hosts 2 SFP). EPS protection is available in case Core Card is protected: the secondary SFP is hosted by the stand-by Core, and an optical splitter is provided to connect the 2 SFP.

5.8 E3 SFP

E3 SFP is a TDM Pseudo wire access gateway extending TDM-based services over packet-switched networks.



E3 SFP

The device converts the data stream from its user E3 interface into packets for transmission over 9500 MPR network; the addressing scheme is MEF8. These packets are transmitted via the SFP port of the Core Board; a remote E3 SFP converts the packets back to TDM traffic.

Physical interface is 1xE3 electrical in a SFP cage with 1.0x2.3 connector.

E3 SFP can be plugged in one of the two SFP ports of Core card (up to 2xE3 in case Core Card hosts 2 SFP).

EPS protection is available in case Core Card is protected: the secondary SFP is hosted by the stand-by Core, and a Y cable is provided to connect the 2 SFP.

5.9 MPT Access Card

The MPT Access Card is dedicated to connect the MPT to MSS.

Up to two MPT can be connected to the MPT Access Card

Main physical characteristics:

- 2 x 10/100/1000 Base – T Port for electrical data to/from MPT. These ports can also power the MPT through the same CAT5 cable.
- 2 x SFP Optical GETH for optical data connectivity to/from MPT
- Double 50Ω QMA Connectors as an option for MPT Power feeding in case of optical connectivity



MPT Access Card

Main Functions:

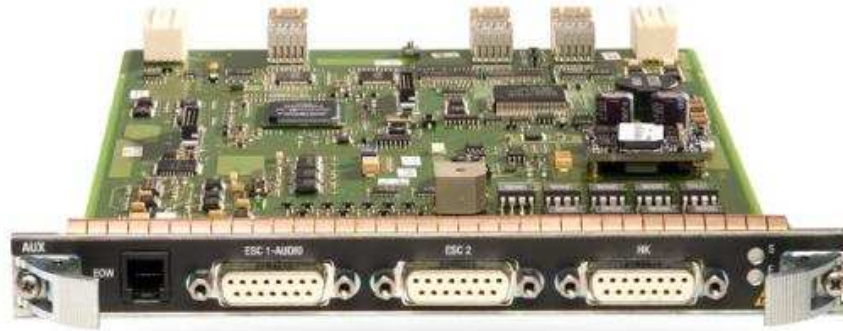
- Provide traffic interface between Core switch and MPT
- Provide the power supply interface to the MPT
- Lightning and surge protection for both electrical GETH and power interfaces that are connected to MPT
- MPT 1+1 protection management
- Clock distribution function
- Radio Link Quality notification through MPR Protection Protocol frames
- Communication with Core controller for provisioning and status report.

5.10 AUX board

Service channels accesses and housekeeping alarm are supported by auxiliary peripheral.

Auxiliary cards support two main functions:

- Auxiliary data channels management (2 x 64 Kbit/s service channels) – available with ODU300 only
- External I/O management



AUX Board

Auxiliary board front panel is equipped with four connectors:

- EOW connector
- Service channel interface #1 (RS422 V11 DCE 64 kbit/s)
- Service channel interface #2 (RS422 V11 DCE 64 kbit/s)
- Housekeeping interface (6 inputs + 7 outputs. The polarity of each alarm is user configurable and a user defined label could be added per each alarm)

Only one auxiliary card per NE can be equipped, and in a fixed position: it can be lodged in slot 8 (bottom right) of MSS-8 .

5.11 Fan Boards

MSS-8 must be always equipped with a fan card; two versions are available: 'Fan2U' and 'Fan Alarm Enh'. The Fan2U has three long-life axial fans, which are controlled and performance-monitored by the controller.



Fan2U Board

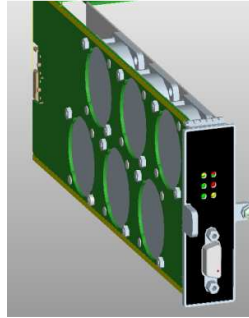
To have high reliability 3 fans are used with separate alarms in order to understand the urgency (two or three fans failed) or the not urgency condition (one fan failed).

The Unit is inserted from front side to avoid payload interruptions in case of fan maintenance. The Fan2U board is hot swappable and in-service replacement doesn't affect traffic.

The Fan Alarm Evo card can be plugged into the MSS-8 shelf and is the default choice in case of CorEvo. It hosts 6 long-life axial fans, which are controlled and performance-monitored by the controller. A Sub-D 15 poles connector provides 8 housekeeping IN and 3 housekeeping OUT signals.

6 leds provide equipment alarms and battery/fan module status.

This board is mandatory when +24V DC converter is equipped.



'Fan Alarm Evo' board

5.12 +24V integrated DC/DC converter

An optional +24V DC/DC converter is available for MSS-8 shelf

One or two converters are able to slide on the MSS chassis, side by side, in a single card slot. Unprotected converter kit will be used in configurations where single, non-redundant "A" battery feed is used. Protected converter kit will be used when dual, redundant, "A" and "B" battery feeds are used. In either configurations, the +24VDC to -48VDC converter kits use a single vacant slot of the MSS chassis.

There is no interconnection between the converter(s) and the MSS backplane. Both the +24 VDC input and -48 VDC output are available via 2 position connectors on the front of the unit.

The converter(s) will receive its input(s) from +24 VDC primary power feed(s) and the -48 VDC output(s) will be connected to the MSS -48 VDC inputs located on the right side of the MSS chassis via a short external power cable, providing -48 VDC to the MSS, in the same way the shelf is powered when -48 VDC primary is used as oppose to +24 VDC.

+24V DC/DC converter can power any module in the shelf (and of course related ODU connected to the module) up to a total power consumption of 348 watts.

When + 24V DC/DC converter is used, the 'Fan Alarm Enh' board must be equipped in the rack.

6 MPT

All 9500 MPR radio independently from the application are based on the same architecture called MPT.

In this model MPT contains not only the transceiver part but also the modem board.

MPT Unit is performing the following main five functionalities:

- Data interfaces and RPS protection
- Framing, QoS and modem functions with an integrated microprocessors capable to manage the antenna pointing and local management signal
- RF and IF functionalities
- Separation of radio TX and RX signal with diplexing functionalities. The diplexer is internal or external depending on the frequency : see 6.4 for further informations on diplexer.
- Remote-CPU function, able to control the switch on the MSS-1c access board.

There are four different MPT options :

- MPT-XP-HQAM
- MPT-HC-HQAM
- MPT-MC
- MPT-HL

The four variants are using a common architecture but they have different characteristics linked to different application. They can work in three modes :

- in split mount : connected to MSS1/8 and MSS-1c,
- or stand alone mode, called MPR-e,
- or integrated : connected to 7705 SAR to address MPLS converged networks.

6.1 MPT-HC-HQAM

6.1.1 Supported features

MPT-HC-HQAM supports the following configurations :

- capacity from 2xE1 to 160xE1
- throughput from 4,5 to 425 Mbps
- modulation rates : QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM, 1024QAM, 2048QAM without hardware change
- all channelization from 3.5 MHz up to 56 MHz
- available for all licensed frequency bands from 6 to 38 GHz : L6GHz, U6GHz, 7GHz, 8GHz, 11GHz, 13GHz, 15GHz, 18GHz, 23GHz, 25GHz, 38GHz
- Note : 5.8GHz & 10.5GHz frequency bands also available but limited to 256QAM modulation

6.1.2 Connectivity

Baseband signal coming from MSS is transported to MPT-HC-HQAM through optical or electrical connectivity.

MPT-HC-HQAM can support both electrical and optical connectivities.

In case of electrical connectivity, a single CAT5e cable connects an MPT to the MSS, which carries transmit and receive baseband signals, telemetry overheads, internal controls and MPT DC power.

In case of optical connectivity, two cables connect an MPT to the MSS:

- one cable is a 50 ohm coaxial cable to send the -48 V power supply to the MPT
- the second cable is an Ethernet optical cable that carries transmit and receive baseband signals, telemetry overheads and internal controls.

6.1.3 Radio Protection Switching (RPS)

Radio Protection Switching (RPS) functionality is used for 1+1 configuration.

This functionality is embedded for MPT-HC-HQAM and is available for all frequency bands. For specific cases, the 1+1 RPS can be implemented in two ways.

- the two mate MPTs can be interconnected through an optical cable to allow the exchange of signals needed or
- the two mate MPTs are exchanged the RPS signals in-band with the user traffic on the IDU-ODU cables between MSS and MPT, without any physical interconnection between the two mate MPTs

Note : for 5.8GHz & 10.5GHz bands only, RPS function can supported via a module which can be directly plugged onto the outdoor unit.

6.2 MPT-XP-HQAM

6.2.1 Supported features

MPT-XP-HQAM is the version of outdoor MPT-HC enhanced in order to offer in low frequency band higher output power. This is translated in an improvement of system gain making this version suitable for very long links. Output Power increase is compared to MPT-HC-HQAM from 5 to 8dB depending on modulation.

It supports the following configurations :

- capacity from 2xE1 to 160xE1
- throughput from 4,5 to 425 Mbps
- modulation rates : QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM, 512QAM, 1024QAM, 2048QAM without hardware change
- all channelization from 3.5 MHz up to 56 MHz
- available for all licensed frequency bands from 6 to 11 GHz : L6GHz, U6GHz, 7GHz, 8GHz, 11GHz

6.2.2 Extended Power

- Except for emission power and for system gain, MPT-XP-HQAM has the same performances than MPT-HC-HQAM.
- The interface is the same between MPT-XP-HQAM and HC-HQAM :
 - All MPT-XP-HQAM are using external diplexers that are compatible with MPT-HC-HQAM and MPT-MC.
 - The installation material is the same between MPT-XP-HQAM, MPT-HC-HQAM and MPT-MC.
- The MPT-XP is also the best in class for power consumption perspectives compared to the competition.
- The MPT-XP-HQAM can be powered with an MPT Extended Power Unit (see further section on this equipment).

6.2.3 Connectivity

Baseband signal coming from MSS is transported to MPT-XP-HQAM through optical or electrical connectivity.

MPT-XP-HQAM can support both electrical and optical connectivities.

In case of electrical connectivity, a single CAT5e cable connects an MPT to the MSS, which carries transmit and receive baseband signals, telemetry overheads, internal controls and MPT DC power.

In case of optical connectivity, two cables connect an MPT to the MSS:

- one cable is a 50 ohm coaxial cable to send the -48 V power supply to the MPT
- the second cable is an Ethernet optical cable that carries transmit and receive baseband signals, telemetry overheads and internal controls.

6.3 MPT-MC

6.3.1 Supported features

MPT-MC stands support the following configurations :

- split mount (connected to MSS-1 / 8), stand alone mode (called MPR-e) or integrated (connected to 7705 SAR)
- capacity from 2xE1 to 160xE1
- throughput from 4,5 to 425 Mbps
- modulation rates : QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM without hardware change
- all channelization from 3.5 MHz up to 56 MHz
- available for all licensed frequency bands from 6 to 38 GHz : L6GHz, U6GHz, 7GHz, 8GHz, 11GHz, 13GHz, 15GHz, 18GHz, 23GHz, 25GHz, 38GHz

6.3.2 Connectivity

Baseband signal coming from MSS is transported to MPT-MC through electrical connectivity. Optical connectivity is not proposed for this product.

A single CAT5e cable connects an MPT to the MSS, which carries transmit and receive baseband signals, telemetry overheads, internal controls and MPT DC power.

6.3.3 1+1 configuration

Radio Protection Switching (RPS) functionality is used for 1+1 configuration.

This functionality is available for all frequency bands for 1+1 HSB/SD/FD radio protection, the signals needed for RPS are exchanged between two mate MPTs through IDU/ODU cables and through MSS. This is leading to a cost optimized solution not only in term of cost but also in term of operations.



MPT-XP

6.4 MPT-HL

MPT-HL is part of MPT family with specific characteristics related to the need of long haul and high capacity network. MPT-HL has been designed in order to be installed in indoor or in outdoor cabinet.

MPT HL supports capacities from 9xE1 to 208xE1 (20 to 553 Mbps) and modulation rates QPSK, 16QAM, 32QAM, 64 QAM, 128 QAM, 256QAM, 512QAM, 1024 QAM without hardware change. All channelization from 28 MHz up to 56 MHz can also be used in the same platform through the usage of dedicated filters. MPT HL covers the full range of frequencies used for long haul application from 4 GHz to 13 GHz.

A single part number covers the full RF band and the frequency can be set by sw. The filters (narrow band) are external to the RT and tuned in factory at the exact frequency.

For the availability of each frequency please refer to the roadmap.



The connectivity between MSS and MPT HL is based on SFP Geth . Optical SFP or SFP cables can be used. MPT HL is powered through the dedicated backplane on the rear part of RT subrack. In a single RT subrack up to 10 RT can be hosted.



6.4.1 Branching and indoor arrangement



4 different ETSI racks are available for full indoor installation of MPT-HL:

2200 mm able to host up to 20 MPT HL on 2 different RT subracks.

2000 mm, 1700mm and 1300mm able to host up to 10 MPT-HL in 1 RT subrack.

Close to each subrack filters and branching for maximum 10 RT are located. Inside the ETSI rack the connection to antenna circulator positioned on the top is based on waveguide usage increasing the reliability and minimizing the losses.

Branching is based on narrow band filters and circulators.

Narrow band filters allow to use on same branching adjacent channels and offers very good performances in case of adjacent interference.

Inside a single rack repeater and /or nodal configurations can be hosted.

6.5 Radio configurations and protection

The following configurations are available for each radio path.

1+0

1+1

N+0 in multichannel arrangement

Following options are available for protected configuration:

- Hot Stand-by (with or w/o coupler)
- Frequency Diversity
- Polarization Diversity

1+1 Hot Standby

This method offers protection against HW failures providing two independent TX/RX chains. In (1+1)HSby one transmitter is working, while the other one is in stand-by; both receivers are active and the best ODU source is selected.

In case of 1+1 Hot Stand-by on single antenna, both Radio Units are connected to a coupler, balanced or un-balanced.

1+1 Frequency Diversity/Polarisation Diversity

This method offers protection against selective and temporary link quality degradation. In (1+1) Frequency Diversity, both radio paths are active in parallel using different frequencies; this method, based on memory buffer that guarantees the bit to bit alignment, can offer error free protection against fading (via a hitless switch) up to 100dB/sec.

Both two antennas and single antenna (dual polarized) mounting arrangements are available. (However, with FD, the usual arrangement is one antenna SP.)

(1+1) Polarization Diversity adopts the same concepts of FD, but in this case the same RF signal is transmitted on two different polarizations (H/V) by means of a single double polarized antenna.

Adjacent Channel Alternate Polarised (ACAP), Adjacent Channel Co Polarised (ACCP) and Co-Channel Dual Polarisation (CCDP) operations are supported

6.6 XPIC

Thanks to XPIC function, MPTs can provide twice the capacity in one frequency channel (Co-channel Dual Polarized) for any combination of Ethernet, PDH and SDH and for any modulation scheme.

XPIC is supported either in split-mount mode or in full-outdoor configuration (MPR-e). This functionality is embedded for MPT-HC-HQAM . MPT-XP.HQAM ans MPT-HL and is available for all frequency bands. The two mate MPTs are consequently interconnected through an optical cable to allow the exchange of signals needed to perform XPIC functionality. XPIC functionality activated by sw through a dedicated licence.

Note 1 : In case MPT HC and XP HQAM for 5.8GHz & 10.5GHz bands only, XPIC function is supported via a module which can be directly plugged onto the outdoor unit.

6.7 Space diversity configuration

Frequency-selective fading is a fade causing amplitude and group delay distortions across the channel bandwidth.

In the time domain it can be defined as the overall path delays between the first to the last pulses reaching the receiver (the multipath echo).

In MPT family an enhanced equalizer has been implemented that allows to have a very high resistance to selective fading.

Another way to counteract selective fading is to implement space diversity, which is based on the simultaneous reception of the transmitted signal at two vertically separated antennas, so that the channel effect on the two signals can be considered uncorrelated.

On MPT-HC-HQAM and MPT-XP-HQAM the space diversity configuration is realized coupling 2 ODUs connected to 2 different antenna. At receiver side an enhanced RPS mechanism is implemented that allows to select frame by frame the best received signal.

MPT-HL has a a dedicated RT version suitable for space diversity configuration with a second receiver added in factory.

MPT-HL implements baseband digital combiner, thus allowing:

- Better performance in the event of simultaneous impairments on both channels (see next slide)
- Deep selective fading on one channel + flat fading on the other channel
- Deep selective fading on both channels at the same time
- Automatic alignment to recover delay between main and diversity waveguides (up to 40m)

Space diversity option is available in conjunction with XPIC and adaptive modulation.

6.8 Couplers

A coupler is used to connect two ODU to a common antenna for protected or single antenna frequency diversity operation. Two versions are available, an equal-split 3/3dB coupler, and an unequal-split coupler with a nominal 1dB insertion loss to/from the main ODU, and 10 dB insertion loss to/from the standby ODU



MPT Coupler

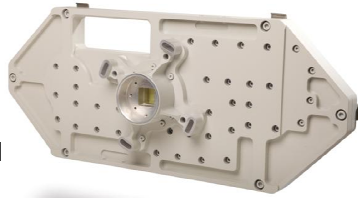
6.9 Ortho-Mode Transducers (OMT)

Using one OMT and two MPT, it is possible to have double polarization (DP) configurations with integrated antennas. With OMT we are offering the most compact and cost effective solution for double polarization applications.

An OMT is a kind of double polarization coupler. The frequencies can be different (in a same band) or identical (XPIC). By means of an interface, it is attached to the back plate of the antenna's circular waveguide feeder. This interface allows the rotation of the feeder for proper alignment of two facing DP antennas.

There are two OMT shapes depending on the frequency band, identical to couplers :

6L, 6U, 7, 8 GH



11, 13, 15,
18, 23, 25 and
38 GHz



Insertion loss from antenna to ODU is 0,5 dB, return loss 18 dB, Cross-polar discrimination (XPD) 30 dB, Inter-port Isolation (IPI) 35 dB.

6.10 4+0 or 2x(1+1) HSB dual pol integrated coupler

Mainly for N+0 configurations, a 3+0/4+0 dual pol integrated coupler is offered.

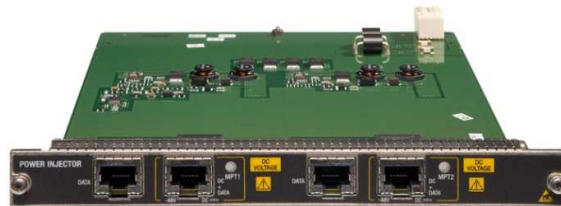


It is a very compact solution, allowing the usage of integrated antennas and avoiding the usage of not-integrated antennas with external couplers and flex twist.

6.11 Power Injectors

6.11.1 Power Injectors : Plug-in and Box

- Used to feed up to 2 MPT-MC / HC / HC-HQAM, with electrical connection (ethernet CAT5e cable), by means of PfoE (Power feed over Ethernet, proprietary)
- when MPT access card is not used on MSS (no PfoE functionality)
- can not be used with MPT-XP / MPT-XP-HQAM (MPT Extended Power Unit is necessary)
- The Power injector is presented in two different ways :
 - **Power Injector Plug-in / card :**
 - it can be plugged in any MSS 8 slots, included the one dedicated to core protection
 - when MPT is connected to CORE, Power Injector Plug-In is needed to provide power to the MPT at optimized price,
 - when MPT is connected to 7705SAR, Power Injector Plug-In can be used inside 7705 chassis to power MPT



Power injector plug in

- Power Injector Box :
 - when MPT is used in stand alone : available for all MPR-e applications
 - The Power Injector Box is delivered with a bracket for installation in a rack 19" and the total height is 1U.



Power injector box

6.11.2 Electrical characteristics :

- DC In & DC Out interfaces have the following Voltage range : -48V +/-20%
 - Embedded lightning and surge protections are included on each ODU output
- NOTE : for inputs, Ethernet lightning protection will be provided by IDU Ethernet access
- Isolation of the Ethernet connectivity between MSS and MPT
 - Hot Swap function (current limitation) allowing In Rush / Short Circuit protections
 - Reverse polarity protection on the -48V Power In side
 - Power O-Ring feature : introduced in order to feed the Power Injector from two independent battery power lines. Even if a battery breaks down, the management of the Power Supplies allows to power the 2 injectors of the Power Injector Unit.

For the PLUG-IN version, both battery power lines are provided through the single backplane connector.

6.11.3 Connectors :

- 2 x RJ45 as input connectors : data to be transmitted
- 2 x RJ45 as output connectors : data to be transmitted + DC battery out (-48V)
- DC connector
 - PLUG-IN : 1 x backpanel / SUB-D connector, located in the back for power from the backpanel
 - BOX : 2 x DC connectors (pairs), located in the front
- RJ45 standard supported : 100 Base-T & 1000 Base-T,
- Also available on the front panel : 2 x LEDs indicating the presence of DC voltage on each Ethernet Output
- Supported CAT5e cable length : 100m
- Power consumption : 1,3W MAX

6.12 MPT Power Unit

6.12.1 Presentation:

- The MPT Power Unit provides a compact solution to power up to 4 MPT-HC or MPT-HC-HQAM even with XPIC option, with integrated lightning arrestor and filters;
- Note: dual battery inputs are available as well:



6.13 MPT Extended Power Unit

6.13.1 Presentation :

- The MPT Extended Power Unit provides a compact solution to power up to 2 MPT-XP (Extended Power) or MPT-XP-HQAM even with XPIC option.
- Note: it can also be used to power MPT-HC (with or without XPIC module) or MPT-HC-HQAM.



- It includes a step-up converter to deliver a stabilized output voltage.

- N connectors are present on the front plate, in order to avoid the usage of pig-tails and allow direct connection of coaxial DC cable.
- The MPT Extended Power Unit is delivered with brackets for installation in a rack 19" and the total height is 1U.

6.14 MPT-GM

“E-BAND”, a new frontier of capacity

Most advanced radio and microelectronics technology today permits going beyond the traditional capacity frontier, using a new and really interesting frequency band - from 70GHz up to 90GHz - achieving ultra high capacities based on radio links: this frequency band is called “E-band”.

This “E-band” provides some big advantages in terms of radio propagation and telecommunications application:

First of all, the free space attenuation is in the range between 3×10^{-1} dB/km up to 5×10^{-1} dB/km, which is really comparable with highest “traditional” frequency bands attenuation (42GHz: up to 2×10^{-1} dB/km)

Second big advantage is that a frequency bandwidth of 10GHz is available for transmission – divided in lower bandwidth from 71GHz up to 76GHz and upper bandwidth from 81GHz up to 86GHz- channelized in steps of 250MHz channel bandwidth (250MHz, 500MHz, 750MHz, 1.000MHz), permitting huge capacities even transmitting with low level modulation schemes (e.g. BPSK, 4QAM)

Last, but definitely not least, to “E-band” light licensing schemes are applied, depending on countries, in order to foster deployments

ULTRA HIGH CAPACITY IP FULL OUTDOOR AND SPLIT MOUNT SOLUTION



MPT-GM is the Alcatel-Lucent solution for ultra high capacity applications in the “E-band” frequency spectrum.

The MPT-GM equipment provides today scalable data rates up to 2.5Gbps.

Modulation range, from BPSK up to 64QAM, with hitless Adaptive Code and Modulation, combines highest throughput with “in field reliability”.

MPT-GM provides a full set of Ethernet features and advanced switching capabilities to meet all the Next Generation Networks (4G/LTE) requirements in terms of high-capacity, synchronism transport, compactness and zero footprint, and cost saving.

MPT-GM is also addressing ultra-high capacity split mount solution, with direct connection to 9500 MPR indoor unit (MSS). With such configuration MPT-GM can exploit multi-service aggregation and features (such as G.8032 Ring protection) provided by nodal MSS equipment.

6.14.1 Main characteristics

Two MPT-GM HW versions are available:

- Electrical Gigabit version

- 2x 10/100/1000BaseT traffic/supervision ports with clock and synchronism recovery and PoE
- 1x “interconnection” port for internal communication between MPT-GM in 1+1 protected configuration

- Optical gigabit version

- 2x 1000BaseX traffic/supervision ports with clock and synchronism recovery
- 1x “interconnection” port for internal communication between MPT-GM in 1+1 protected configuration

All ports - electrical and optical - can be used as traffic ports and, in this case, supervision and management can be provided by using In-Band management.

In case that dedicated usage will be required, one of the Ethernet port(s) can be dedicated to supervision and management or to the synchronism transport and the others can be dedicated to traffic transport.

6.14.2 Available Channel Bandwidth and Modulation

MPT-GM can provide following channel bandwidth:

- 250MHz
- 500MHz

In terms of modulation scheme, BPSK-4QAMs-4QAM-16QAM-64QAM are available. 4QAMs is a stronger version of 4QAM, with a different FEC, allowing to improve availability for high priority traffic in case of fading. Below 4QAM modulations, the BPSK is also available for increasing even more the system gain and thus the in-field reliability: this additional profile achieves an even strong maximization of link availability, with a 3dB higher system gain.

MPT-GM implements top class MSE based Adaptive Code and Modulation, combining at the same time higher capacity in good propagation conditions and better availability with tough conditions.

Using the two available user ports, it is possible to reach 2Gbps throughput using 500MHz channel and 64QAM modulation scheme.

6.14.3 Power Supply

MPT-GM power consumption (<50W) is really performing and can be provided by a dedicated power supply cable as well as by a POE+ injector. By consequence, the power supply can be provided directly on the same CAT5 cable through which traffic is incoming in the 10/100/1000baseT port of the equipment.

In case that POE is not provided by the connected equipment (e.g. third party router/switch, eNodeB, etc...) or in case that external dedicated power supply is preferred, additional dedicated Power Supply Port can be used, with standard power supply of $-48V \pm 15\%$.



Figure 1 - Detail on MPT-GM connectors: two Ethernet IP65 connectors and, in the middle, the dedicated power supply.

6.14.4 Available Configurations

Following configurations are available for MPT-GM:

- 1+0
- 2+0 (LAG), or 2x(1+0)
- G.8032 ring protection (available only in split mount configuration)
- hybrid configurations (mixing traditional microwave and E-band radio), available only in split mount configuration

Split mount configurations implies connection to MSS-8 (Core board) or MSS-1.

6.14.5 Ethernet features

MPT-GM implements a multi-port store-and-forward Layer2 Switch. The embedded Switch supports the following Layer2 functionalities:

- MAC switching
- MAC Address learning and ageing
- Auto negotiation
- Layer 2 Flow Control / Back Pressure: MPT-GM implements flow control based on IEEE 802.3x (full-duplex operation) and Back Pressure (half-duplex operation) to prevent packet loss during traffic peak.
- IEEE 802.1q VLANs and VLAN stacking (Q in Q)
- EVPN profiling
 - Bandwidth limiting per VLAN
 - Bandwidth limiting per priority.
 - Frame fragmentation
 - VLAN rewriting
- Enhanced Ethernet prioritization based on MPLS “Exp bits”
- Selective QinQ based on VLAN and 802.1p priority
- QoS: 8 queues Ethernet scheduler towards radio interface. MPT-GM implementation manages Ethernet traffic classification according to 802.1p, 802.1q, IPv4 TOS or IPv6 TC (Layer3), MPLS “Exp bits”
 - Two scheduling algorithms are available in MPT-GM equipment: strict priority or WRR (SW selectable).
- Layer2 link aggregation
- G.8264 (“Distribution of timing information through packet networks”) support

6.14.6 Synchronization

Synchronization unit supports following functionalities:

- Synchronism source selection
- Quality estimation based on frequency
- Quality estimation based on information as per G.8264 standard.

Synchronism can be sourced from the incoming Ethernet flows (Synchronous Ethernet) and transported toward remote terminal by using the symbol rate.

Remote terminal can be therefore synchronized with the received symbol rate and synchronism is distributed to all egress Ethernet ports.

6.14.7 Management System

MPT-GM can be reached from network management system perspective either by establishing a DCN data channel over the Ethernet traffic interface (InBand management) or by provisioning a dedicated Ethernet port for management purpose (Out of band management).

InBand management uses a logical separation between payload traffic and DCN traffic using specific VLAN tag dedicated to supervision traffic.

MPT-GM is provided with an embedded SNMP agent fully compatible with existing Alcatel-Lucent's Network Management Systems and relevant management tools.

6.14.8 Mechanical layout - Integrated antenna solutions

The MPT-GM is provided as integrated antenna solution.

Applicable antenna diameters are 1 ft and 2ft. Bigger antennas are not in field applicable for pointing and alignment in field constraints.



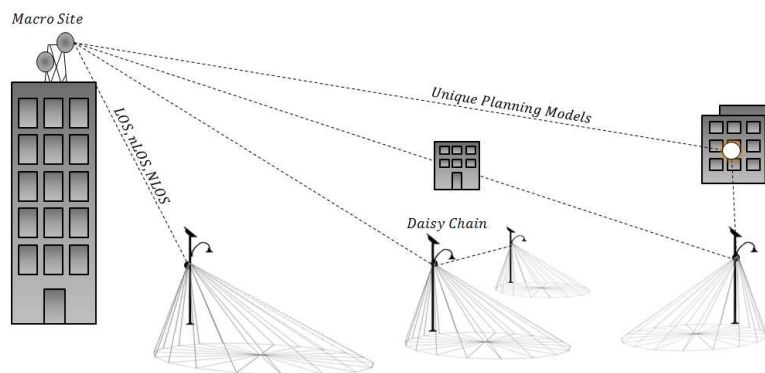
7 SMALL CELLS MPTs

7.1 MPT-SUB6

The MPT-SUB6 is a single carrier, NLOS backhaul platform suitable for small cells backhaul applications. It supports a net throughput of up to 350Mbps (aggregate) in a single 40MHz channel.

The MPT-SUB's high quality performance in NLOS conditions is achieved by two layers in the radio:

- MIMO / OFDM based PHY
- Proprietary advanced & robust Air Interface



The core competence of the air-interface is its dynamic adaptation, in a resolution of frame by frame, to the instantaneous changes in the link conditions optimizing the system performance to achieve maximum and stable capacity along with minimum latency.

In addition, the MPT-SUB6 introduces a Smart Antenna enabling the following capabilities:

- Increases system gain (higher fade margin), widens the NLOS deployment cases
- MIMO 3x3
- Beam forming
- Multipath aggregation
- Interference cancellation by spatial filtering
- Automatic alignment.

The smart antenna has a significant impact on the efficient use of the spectrum, the optimization of service quality, higher capacity and improved robustness. The antenna array adjusts its pattern and direction in real time and provides gain while simultaneously identifying and eliminating the interfering signal.

The air-interface controls the Modem and the Smart Antenna and adapts them to the dynamic changes in the channels.

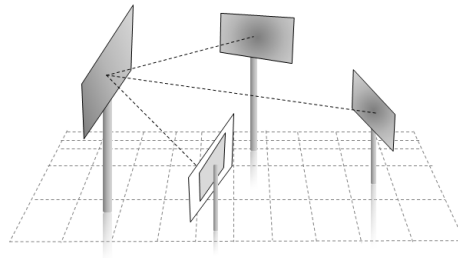
Their combined contributions are essential to overcome the NLOS deployment challenges.

The MPT-SUB6 works in PtMP and PtP mode. A PtP architecture is established using an HBS and a single remote unit (HSU), and can therefore further be scaled to support PtMP configuration by simply adding additional HSUs in the same sector. Using the new smart antenna allows the operator to maintain performance of PtMP similar of having multi PtP. The smart active antenna is aligned towards each HSU to achieve the best performance.

7.1.1 Configurations

The MPT-SUB6 employs a proprietary air interface protocol with unique interference mitigation mechanisms which ensure high quality and reliable delivery of the required services in license-exempt bands in nLOS and NLOS environments.

The MPT-SUB6 supports both PtMP and PtP configurations.



7.1.2 Ethernet traffic interfaces

The MPT-SUB6 has two LAN ports:

- Port 1 – Data & DC in (PoE)
- Port 2 – Local management & Data.



Note: the images above show a LAB radio whose LAN interfaces are without glands. Regular radios are equipped with open gland (LAN port 1) and covered gland (LAN port 2).

The ports are standard copper RJ45 Ethernet interface, supporting 10/100/1000 Base-T Auto-Negotiation (IEEE 802.3u). Configuring the LAN ports is done locally and remotely via the Manager (EMS) and 5620 SAM - Service Aware Manager.

7.1.3 Frequency band

The table below shows the supported frequencies. Additional sub-6 GHz bands can be supported per request.

The term Universal represents bands available under various local regulations, non-FCC and non-ETSI.

<i>Band and Regulation</i>	<i>Occupied Frequency Range (GHz)</i>
5.8 GHz FCC/IC	5.725 – 5.850
5.4 GHz FCC	5.480 – 5.715
5.4 GHz IC	5.480 – 5.715
5.4 GHz Universal	5.465 – 5.730
5.3 GHz FCC/IC	5.255 – 5.345
5.3 GHz Universal	5.140 – 5.345
5.8 GHz ETSI	5.725 – 5.875
5.4 GHz ETSI	5.475 – 5.720
5.3 GHz ETSI	5.150 – 5.350
3.6 GHz FCC/IC	3.650 – 3.700
3.5 GHz IC	3.475 – 3.650
3.5 GHz ETSI	3.4105 – 3.7025
3.5 GHz Universal	3.300 – 3.800
2.6 GHz Universal	TBD

7.1.4 Traffic Handling & Quality of Service

Advanced ARQ

It maintains a lossless data connection between the base and the remote unit while maintaining low delay and jitter and ensuring the QoS requirements.

The ARQ fully utilizes the available air interface capacity by avoiding unnecessary retransmission and reducing the feedback overhead.

The ARQ receives the Ethernet frame into the various CoS queues, based on the packet classification (802.1p or DiffServ) and the bridging (each queue is dedicated to a single remote radio and a single priority).

For each new burst dedicated to a remote radio the ARQ scheduler rebuilds the frame based on the data available in each of the queues at that time. The scheduler implements a byte oriented combine strict priority and Weighted

Fair Queuing (WFQ) algorithm based on the QoS parameters as defined by user per queue.

L2 Ethernet properties

MTU	2047 bytes. HW ready to support configurable size
Jumbo Frames	HW ready to support more than 9000 bytes
Buffer Size	32MB: 4 queues, each queue 8Mb 64MB: 8 queues, each queue 8MB (H1 2015)
Queue Drop	<u>Maximum TTL</u> : Enables efficient air channel by dropping

Mechanisms	<p>packets which are behind the pre-defined QoS level (above defined limit), hence the user saves air bandwidth and in parallel limits the latency per specific queue</p> <p><u>MIR:</u> The user can limit the Maximum Information Rate of each priority queue. The queue MIR cannot exceed the link MIR.</p> <p><u>Dynamic Buffer size per queue:</u> Actual buffer size is dynamically set (per queue/buffer) to achieve best performance (high TP with minimum packets drops and minimum latency).</p> <p>The buffer size is set according to the following parameters/attributes:</p> <ol style="list-style-type: none"> 1. Actual Air Interface 2. Actual TTL 3. Actual Link Conditions (PER, MCS) 4. QoS (number of queues, queue size and scheduler, all are user configured) <p>The dynamics of the buffer is a layer that supports all mentioned mechanisms and enables the radio to track the link fluctuations very fast, while keeping the minimum latency and high TP. This is a unique feature that increases the system robustness, especially in NLOS environment where there are many multipath beams or under interference.</p> <p>There are dedicated algorithms which continuously track channel conditions and quickly adjust the backhaul system radio parameters to provide the best performance possible at any instance</p>
VLAN ID	4096 VLANs
Classification	802.1P or DiffServ
VLAN Support	802.1Q, 802.1P, 802.1ad (QinQ), DiffServ (QoS Layer3)
Number of queues	4 queues 8 queues (H1, 2015)
Scheduler	WFQ, SP
Broadcast, Multicast, etc. flooding Control	<p>Multicast and Broadcast can be limited to 12.5% of downlink to avoid flooding the entire remote radios when a certain user is broadcasting or multicasting (user-configurable)</p> <p>Block interconnection between remote radios within a sector (user configurable)</p>
Handling LTE TCP/IP bursts	<ol style="list-style-type: none"> 1) 8 Byte oriented WFQ (user configurable) queues 2) The offered radio incorporates sufficient memory (64MB, 8MB per queue, H1 2015) to accommodate LTE TCP/IP bursts. 3) Other available mechanisms are :TTL, MIR, Dynamic Buffer size

VLAN

The following VLAN functionalities are supported:

- Dedicated VLAN for management traffic
- Transparent mode – in this mode all data is transparently delivered
- Provider mode (QinQ) – in this mode a provider tag is added / removed from the incoming / outgoing frame
- Tag mode – Includes:
 - Ingress - Transparent and Tag modes
 - Egress - Transparent, Tag, Untag all, Untag filter and filter modes.

7.1.5 Network Synchronization

The MPTSUB6 products support the following Synchronization solutions between sites:

- HSSoE (Intra-site TDD)
- Integrated GPS (Inter-site TDD)

The Sub-6GHz SCB products have the capability of distributing the clock over the Ethernet by using the following:

- 1588v2-TC
- SyncE, as required by Sync-E standards (G.8261, G.8262)

The solution supports Sync-E on both directions (Master <--> Slave) and allows to deliver 1588V2-TC and Sync-E simultaneously over the air by the same clock source.

Sync- E will be applicable for Ethernet speed of 1Gbps only.

The MPT-SUB6 implements a 1588 TC (Transparent Clock) of End-to-End type. The design goal of the 1588 V2 solution is to decrease the PVD over the wireless link as much as possible enhancing the clock recovery process of the connected Slaves devices. 1588 V2-TC will keep the same performance under adaptive modulation, packets retransmission and asymmetric configuration.

7.1.6 O&M interfaces

O&M is performed on the MPTSUB6 through the User Ethernet port, supporting in-band method.

Operator may access the equipment through the mentioned interfaces, configuring all the required parameter required for a proper link setup, including the VLAN ID and priority, for the in-band communication protocol.

Once logged-in into the NE, the following protocols can be configured for equipment maintenance:

- Telnet access (enabled/disabled) using the Telnet check-box
- Web Interface access (enabled/disabled) using the Web Interface check-box

SNMP v1/v3 interface is on by default and cannot be disabled; it is the default management interface, used by Manager and 5620 SAM.

7.1.7 Power supply and Consumption

Power is provided over CAT-5e cable using PoE.

Two power injectors are available:

- Outdoor PoE (AC only)
- Indoor PoE (AC and DC)

Type	AC\DC	Detailed Description	Temp. [Celsius]
Outdoor	AC	Outdoor PoE device 10/100/1000Base-T. Input voltage: 100-240VAC Nominal range 90-264VAC max range. The device can provide power of up to 35W	-40 to 60
Indoor	AC	Indoor PoE device 10/100/1000Base-T The device can provide high power of up to 55W. The device is supplied with AC power feeding	-5 to 40
Indoor	DC	Indoor PoE device 10/100/1000baseT interface for RADWIN radios (Includes JET). The device can provide high power of up to 55W. Input voltage is 20-60V	-5 to 40

Note: the MPT-SUB6 radio can be powered also by the 9500 MPR MSS-O.

8 9500 MPR configuration & maintenance (ACTUAL)

8.1 Overview

Taking as reference the suggested layering of the TMN management functions, included in ITU-T M.3010 recommendation, the Network Element Layer doesn't have an explicit model in terms of management functions.

Alcatel-Lucent foreseen the Craft Terminal application and the subsequent evolution of TCO and WebEML, for this purpose; in the following chapters, these applications will be described.

8.2 TCO

The TCO Tool Suite is implemented as an evolution of the Craft Terminal concept for the Alcatel-Lucent Wireless Transmission products.

TCO Software Suite allows the operator to access and configure the NE from its PC without the need of software installation; only Java JRE presence is mandatory. By default, the complete software package is available on the CD-ROM which is needed to start the application.

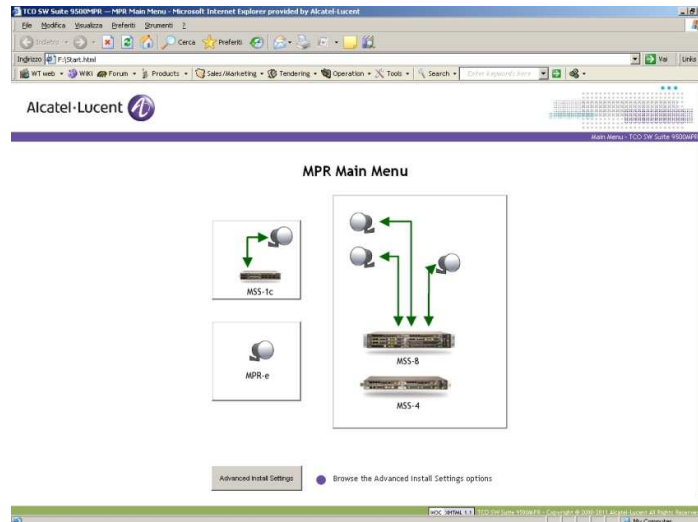
TCO Software Suite now supports the complete set of equipment which are part of the 9500 MPR family: MSS-4/8 based nodes, MSS-1c and MPR-e.

In a unique package, all the WebEML management applications are available, up to the latest software release.

TCO embeds the following tools:

- **Provisioning Tool:** it allows an easy configuration of Network Elements. No need of a device physically connected, allowing back-office activity in standalone mode.
- **Alarms & Settings:** the 'Alarms & Settings' button will connect to the NE Web server, allowing the alarms monitoring and some basic settings directly inside a common web browser. For this reason, the NE must be physically connected with PC running TCO. At this stage, the following configurations may be applied:
 - Date & Time settings
 - Get configuration file
 - Retrieve license info
 - DHCP settings
 - Community string
- **Operational & Maintenance tool:** it starts the WebEML application (former Equipment Craft Terminal), allowing the complete management of the NE it is connected to.
- **Advanced Install Settings** menu allows:
 - Install the right version of Sun Java Runtime Environment (JRE), needed to run the TCO package.

- o Obtaining a copy of the applications on the local PC (hard disk or USB key).



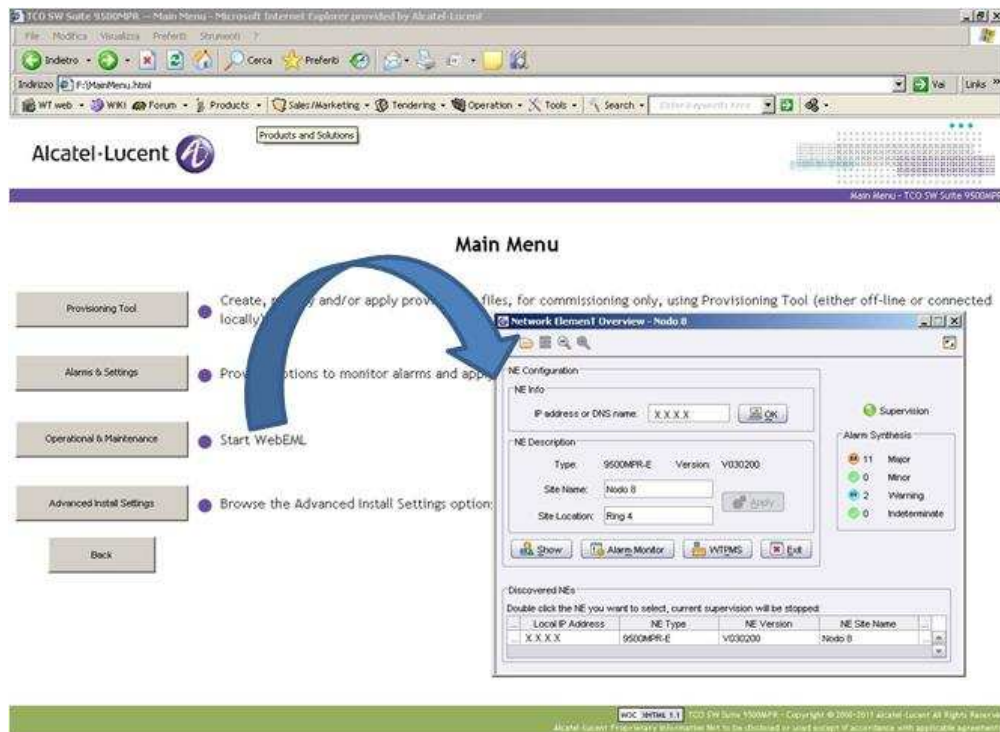
TCO Software Package starting page



Alarms & Settings window – NE connection active

8.3 Network Element Overview - NEtO

The Network Element Overview (NEtO) is the starting point of the Network Element Layer management application, 9500 MPR WebEML.

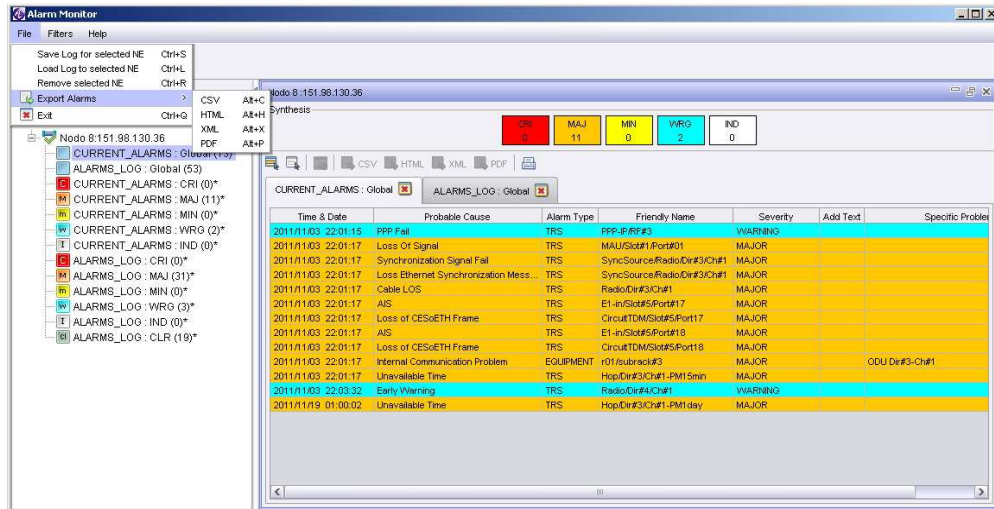


Start WebEML from TCO main menu – NEtO window appears

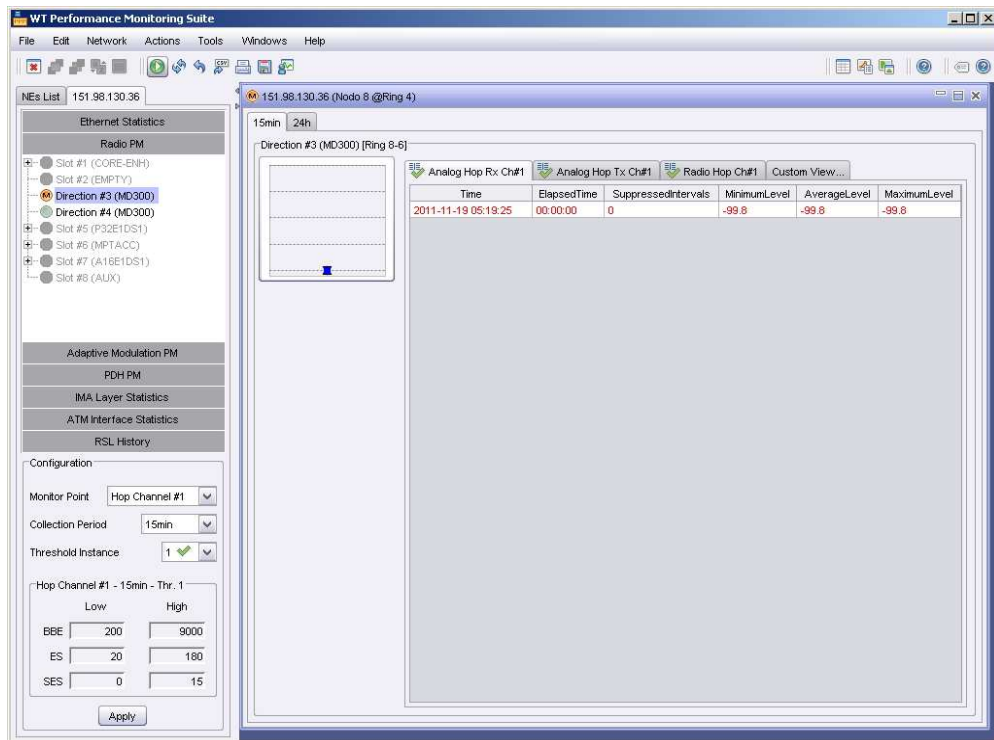
From NEtO main window is possible to:

- **Show** the equipment – it starts the WebEML applet.
- Start **Alarm Monitor** applet – the Alarm table of the NE under supervision is shown.
- Start the Performance Monitoring Suite (**WTPMS**) applet – allows the visualization/management of the PM data of the NE under supervision.

It's also possible to upload a list of NEs and to start the supervision of one or more of these NEs: in this case, Alarms and PM monitoring will be applied to multiple NEs at the same time.



Current Alarm table – export alarms menu



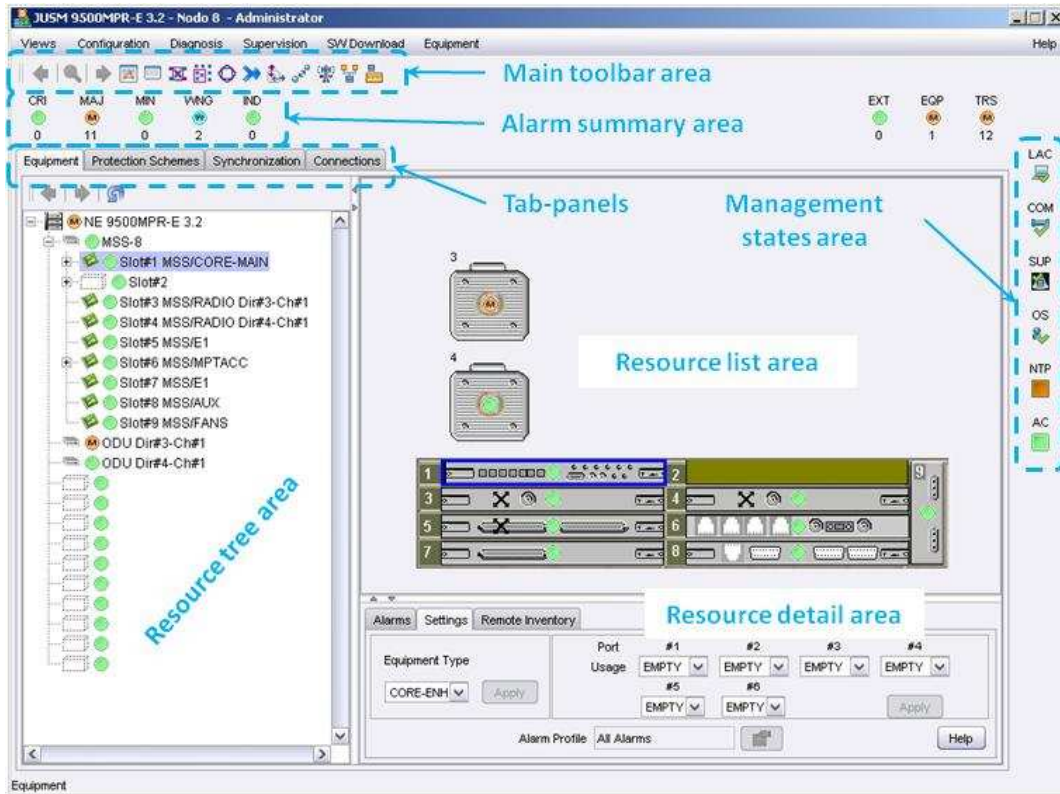
WTPMS – Analog Rx, sample measurement view

8.4 9500 MPR WebEML supported features

9500 MPR WebEML supports the complete Fault, Configuration and Performance Management, performed at Network Element Layer.

In-deep configuration can be performed on NEs from a PC connected both locally or remotely.

WebEML supplies a GUI for all the supported functions, starting with the Main View Area where all the domains and the summary of the Alarm statuses are presented. It is organized with tab panels, e.g. many windows placed one upon another allowing an immediate selection of the required one.



9500 MPR WebEML Main View Area

Tab-panels

All the tab-panels presented in the Main View, represent a set of functions immediately accessible; the choices are:

- Equipment – it allows the management of the equipment configuration
- Schemes – it allows the management of the supported protection schemes
- Synchronization – it allows the management of the synchronization options
- Connections – it allows the management of the cross-connections

The following areas are available for each tab-panel:

- Resource Tree area, displays all the available resources of the NE.
- Resource List area, may be represented by Tabular View or Graphical View, depending on the displayed resource (e.g. by selecting a 32 E1 TDM board, the area will represent a table with the available E1 and relevant configuration options, if any).
 - Resource Detail area: displays detailed information of an item, previously selected.

Inside the Equipment view, it's possible to configure all the supported boards with related resources i.e. Radio, PDH, SDH, EAS, ATM, AUX and Core-E views; each of these views, opens a management domain relevant to the selected board.

Main Toolbar Area

From the Main Toolbar is possible to launch the most important configuration applets like:

- Block Diagram View
- Current Configuration View
- Cross-Connections
- Segregated ports
- Ethernet Ring
- LAG Configuration
- QoS Configuration
- AUX Cross Connections
- XPIC Configuration
- VLAN management
- WT Performance Monitoring Suite

Alarm Summary area

The Alarm Summary area gives an immediate view on the general status of the NE under supervision, by indicating the severity of the different alarms in the NE as well as on the number of current alarms.

The meaning of the alarms indication, in terms of status and severity, is listed here below:

- **CRI** – Critical alarm. Red color. Synthesis of alarms that needs immediate troubleshooting, e.g. NE isolation.
- **MAJ** – Major (Urgent) alarm. Orange color. Synthesis of alarms that needs immediate troubleshooting.
- **MIN** – Minor (Not Urgent) alarm. Yellow color. Synthesis of alarms for which a deferred intervention can be decided.
- **WNG** – Warning alarm. Cyan color. Synthesis of alarms due to failure of other NE in the network.
- **IND** - Indeterminate alarm. Blue color. Synthesis of alarms not associated with the previous severities. Not operative.

Management States area

Icons in this area give an immediate view of the management states of the supervised NE. The meaning of the icons is explained here below:

- **LAC** icon: Local Access Control state. Indicates whether the NE is managed by a WebEML or by the OS.

- **COM** icon: Operational state. Indicates whether the communication with the NE is established or not.
- **SUP** icon: Supervision state. Indicates whether the NE is under supervision or not.
- **OS** icon: indicates whether or not the OS is connected.
- **NTP** icon: indicates whether or not the NTP Server is reachable.
- **AC** icon: abnormal condition state. Indicates whether some abnormal conditions have been recognized. The operator can visualize the Abnormal condition through the Diagnosis → Abnormal condition list menu.

8.5 Board-specific managed features

Each board supported by 9500 MPR has a specific set of supported features, starting from the configuration parameters.

8.6 System Configuration options

The configuration options applicable at system level are easily accessible in the main WebEML Toolbar area. The complete list is reported here below:

- Block Diagram View
- Current Configuration View
- Cross-Connections
- Segregated ports
- Ethernet Ring
- LAG Configuration
- QoS Configuration
- AUX Cross Connections
- XPIC Configuration
- VLAN management
- WT Performance Monitoring Suite

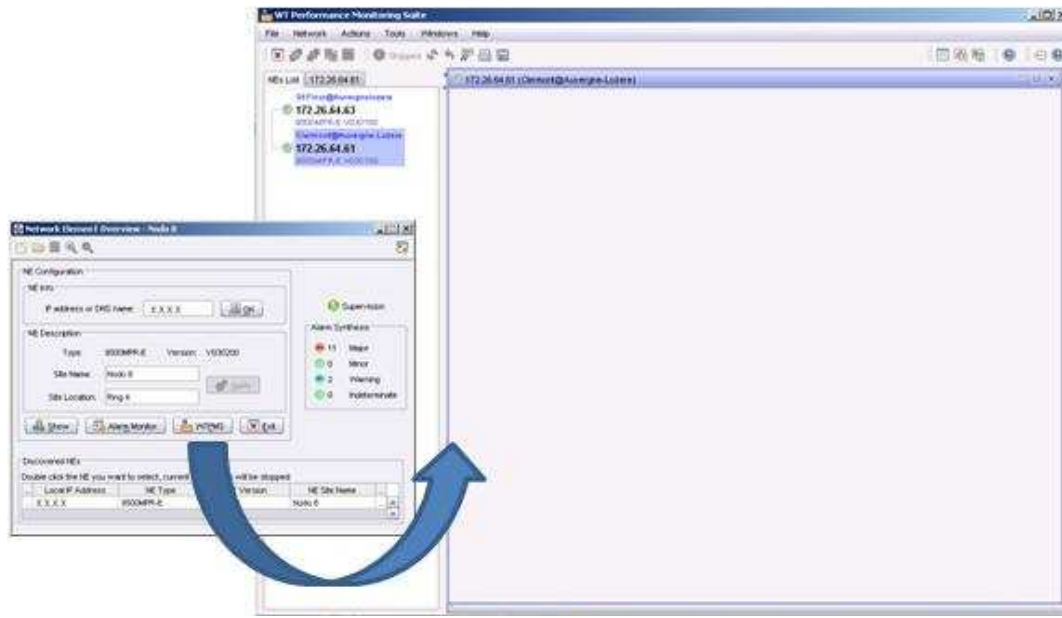
8.6.1 WT Performance Monitoring Suite

WTPMS is a Java based application, specifically designed for the Performance Monitoring handling.

Thanks to his graphical shape, it allows an easy management of all the PM data collected on a single NE or on a small 9500 MPR network.

Starting from NEtO window (from which is also possible to start the Alarm Monitor application) the WTPMS is opened on the NE under supervision.

It's also possible to start the WTPMS from WebEML, by clicking the dedicated icon in the Tool Bar or selecting it through the → Diagnosis → Performance Monitoring menu.

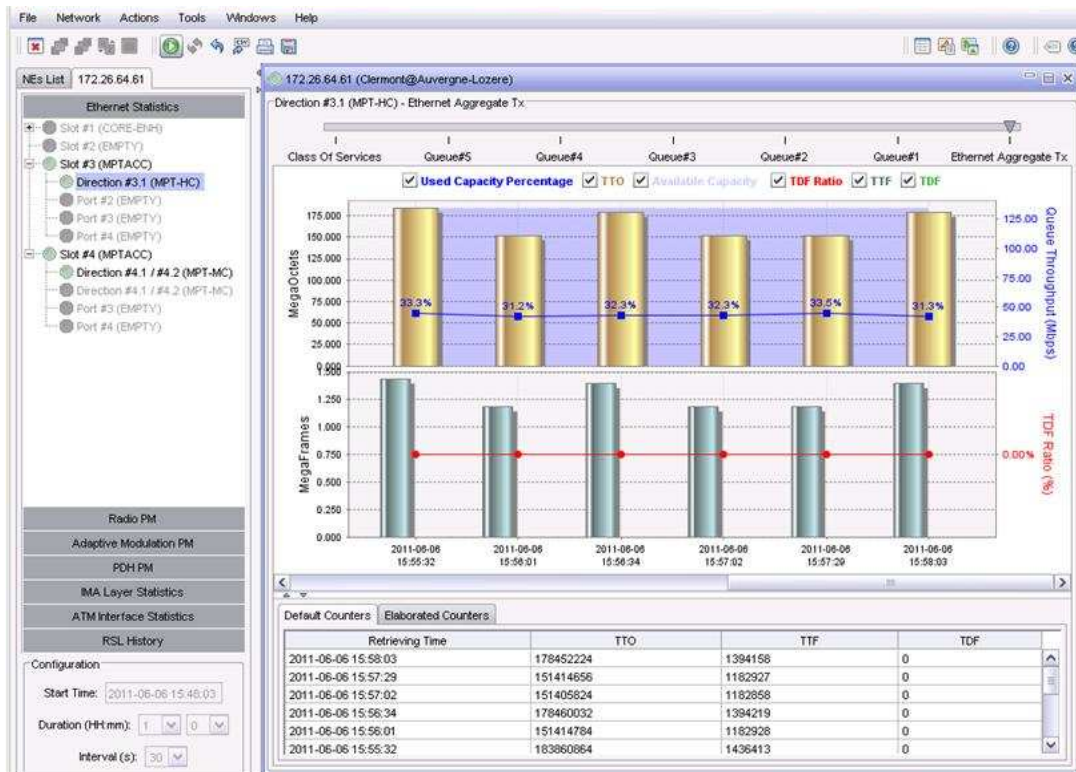


At this point, the starting window appears allowing a wide range of actions; directly from toolbar, amongst the other is possible to:

- Start/Stop the counters for the data collection, when the Current Data have been stopped or started;
- Refresh the current PM reports form NE and update the table view and chart view with the recently collected data;
- Reset the data collection and related counters;
- Export the generated reports;
- Print the user selected performance data;
- Turn on the Offline Mode, which allows an offline browsing of the saved PM data;
- Open the List View to display all the PM counters in a tabular format;
- Overview of all the PM counters in a graphic format;
- Open the Bird's Eye View, displaying the selected PM counter in a graphical format with a wide range of visualization and navigation facilities (zoom in/out, auto-range etc.);
- Open the Threshold Editor window, to change the predefined thresholds values for ITU-T G.826 based PM measurements.
 - Threshold setup triggers the Threshold Crossing Alarm (TCA)
 - Thresholds can be configured on the following counters: BBE, ES and SES.



Amongst the other, the Bird's Eye View allows browsing and visualizing the Ethernet statistics in an elaborated way (a sample picture is here below); in this windows the Tx Data queues are showed singularly or aggregated, supplying the output throughput in Mbps and the percentage of Tx discarded frames (TDF ratio). The latter value is a clear indication of possible issues in Tx side, due to traffic over commitment or Radio channel capacity saturation.

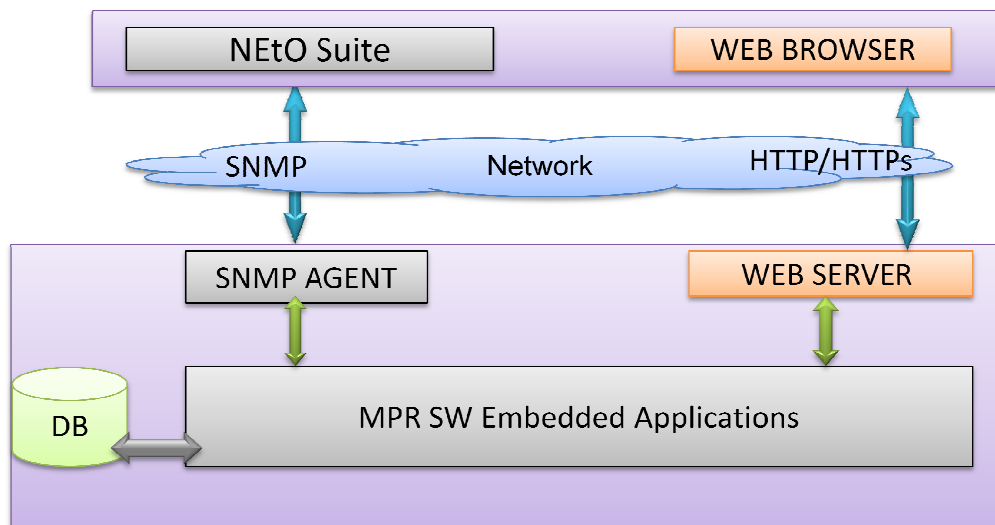


9 9500 MPR configuration & maintenance

A new management architecture allows the A full WEB solution provides the following improvements

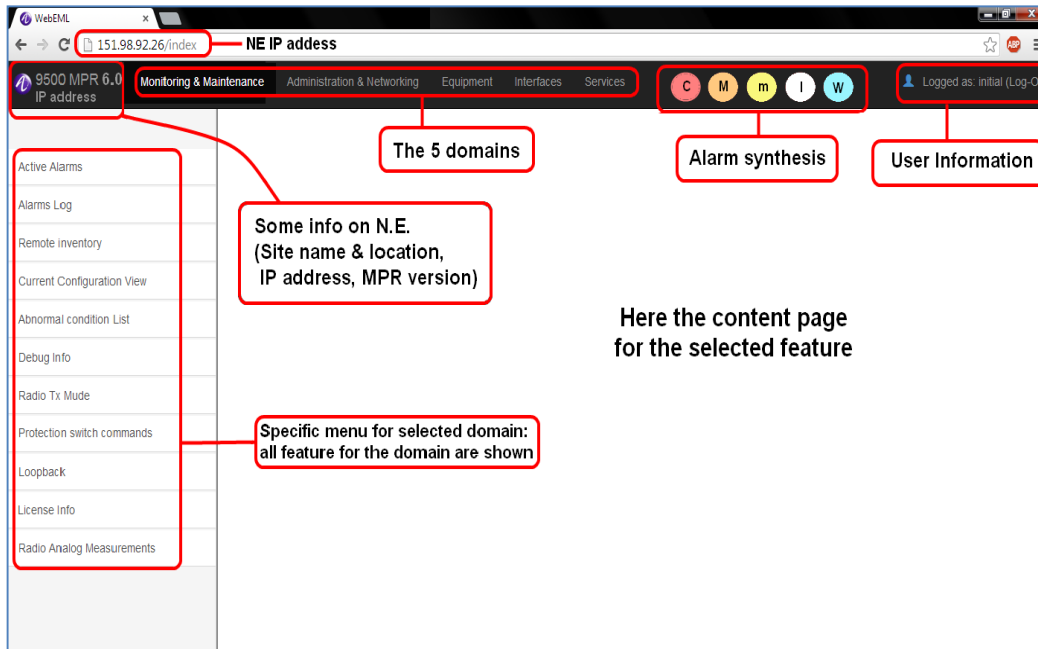
- Zero installation on user PC: WEB interface is loaded on Network Element
- JAVA installation not required
- No version compatibility between GUI and Embedded SW
- Performance improvement
- Simplified procedures for daily operation
- Cross-platform: no dependency from OS, device, browser

Some of the above feature might be available in the coming releases



General info on NE, Alarm synthesis and Connected User are always visible on top
Navigation is always performed starting from the Domains on the top bar, and then selecting the specific feature from the domain menu on the left.

Views and controls for the selected feature are shown in the content page.

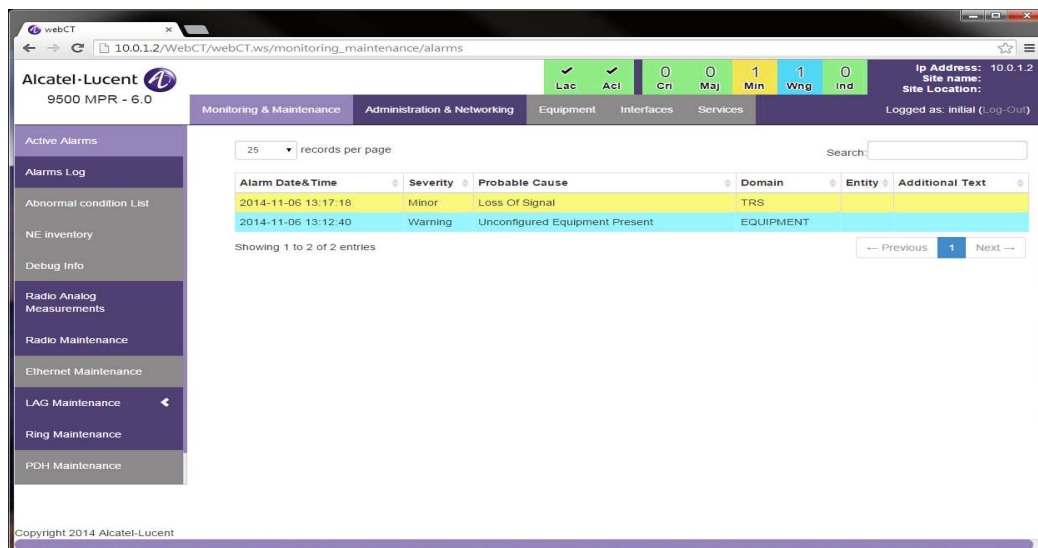


DOMAIN APPROACH

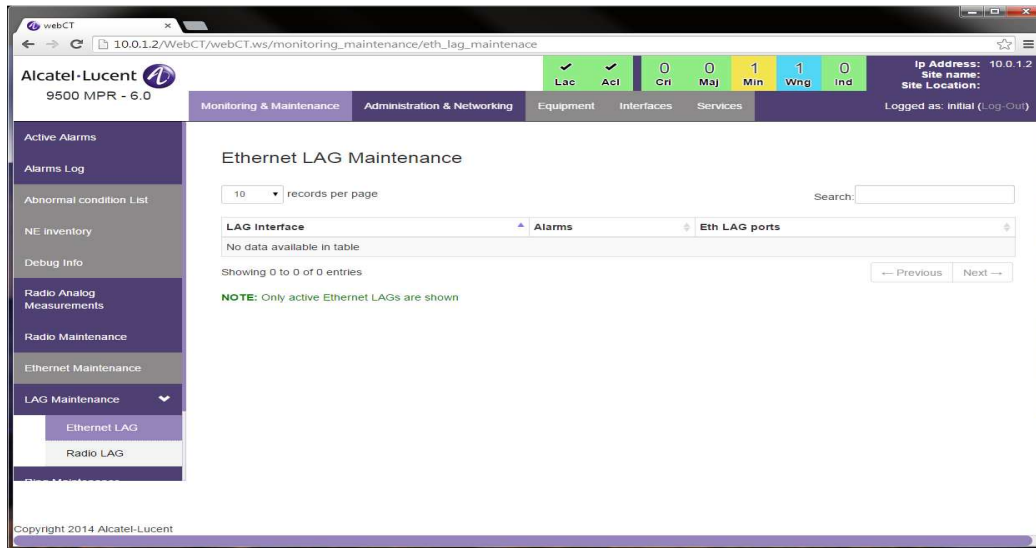
- MONITORING & MAINTENANCE

All the functionalities and tools which are useful to monitor the status of the NE and to operate some actions on interfaces, in order to maintain the working configuration.

Functions: Active Alarms, Alarms Log, Current Configuration View + Remote Inventory, Abnormal Condition List, NE inventory, Debug Info, Radio Analog Measurements, Loopback, Radio Tx Mute, Combiner Squelch, ACM Manual Operation, Protection Switch Commands, Ethernet Maintenance, LAG Maintenance



Monitoring & Maintenance: Active Alarms



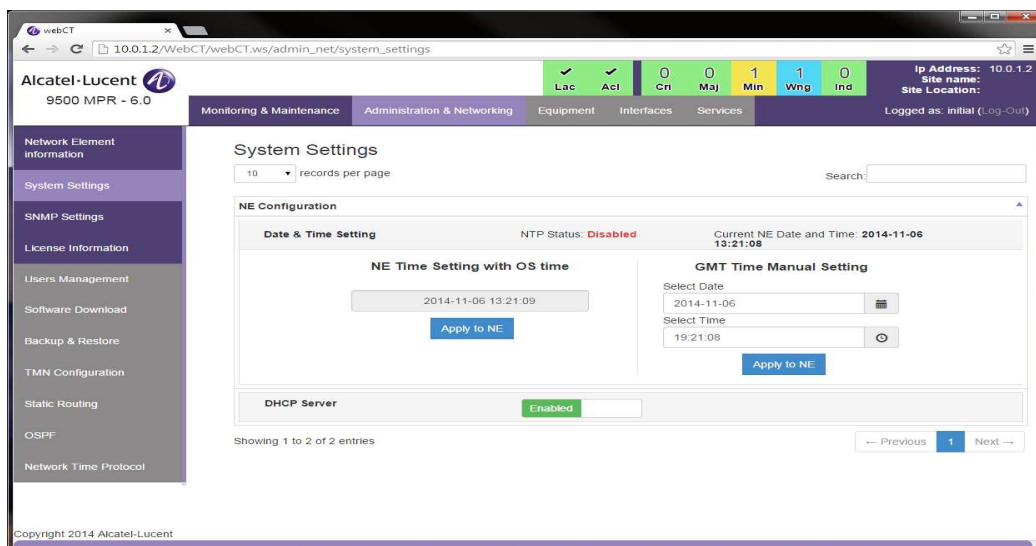
Monitoring & Maintenance: Ethernet LAG Maintenance

- ADMINISTRATION & NETWORKING

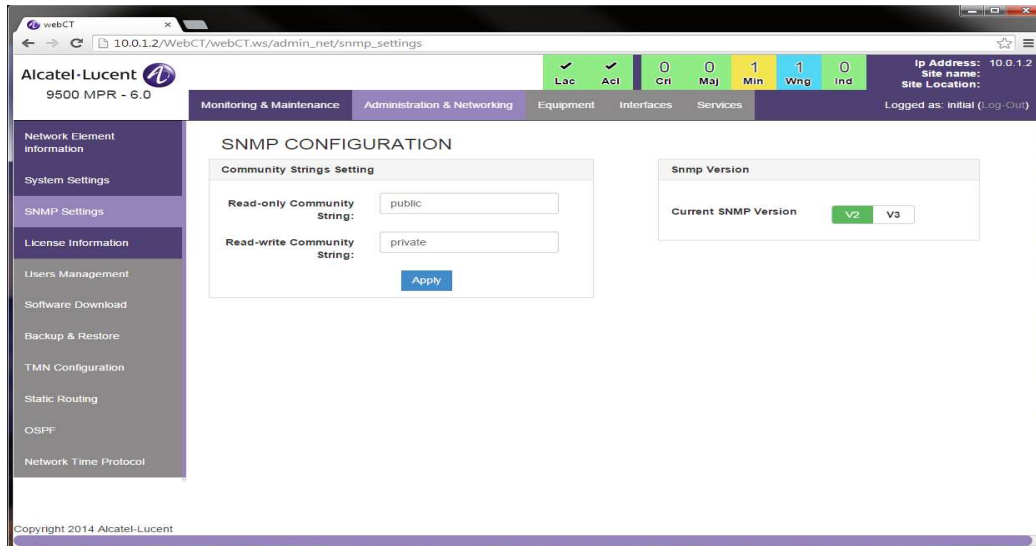
All the general settings on the NE: feature enabling, user and security management, SW downloads, networking configuration (Local IP, TMN, OSPF, Routing).

Administration Functions : Date & Time, DHCP enabling/disabling, SNMP version and community string, License, Users management, Backup & Restore, Alarms Severities, SW Download, System settings

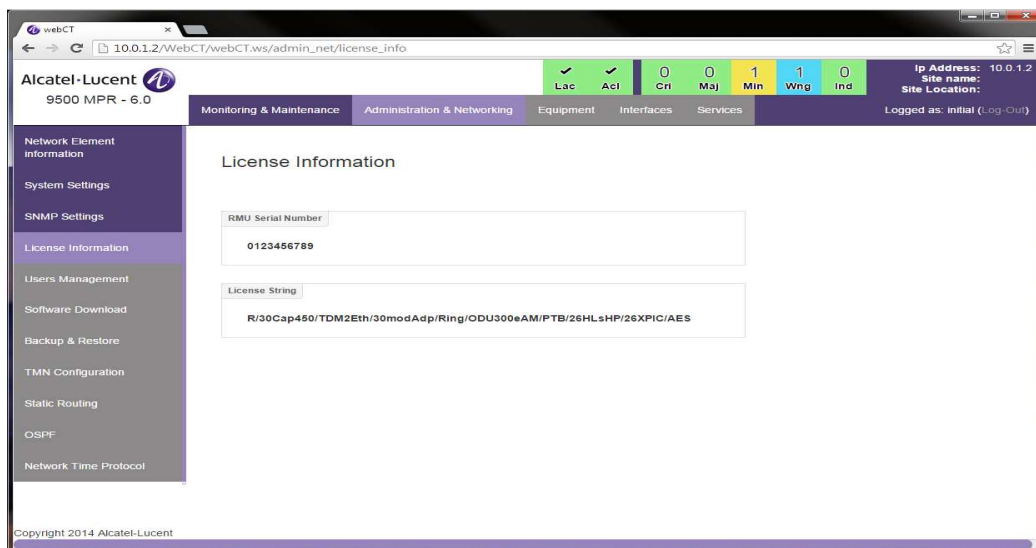
Networking Functions: Local Address Configuration, TMN configuration, OSPF v2/v3, Static Route, NTP, IPv6 management



Administration & Networking: System Settings



Administration & Networking: SNMP Settings



Administration & Networking: License Information

- COMMISSIONING – EQUIPMENT

All features which configure the HW level and make it operative and ready to be configured:
Boards, ODUs, protections.

Complete Equipment configuration, protection, synchronization, Power Over Ethernet

- COMMISSIONING – INTERFACES

All the feature which configure the parameters for transmission interfaces

Radio, Ethernet, E1/DS1, SDH, AUX interfaces complete configuration, Ring, LAG

- SERVICES

All the features that make the traffic running through the Network Element interfaces.

Cross-connections, VLAN configuration, Port Segregation

10RTU

This chapter describes the 9500 MPR Right To Use (RTU) policy. 9500 MPR offers a pay as-you-grow concept in which future capacity growth and additional functionality can be enabled through Right To Use.

Alcatel-Lucent provides a web-based system for managing activation keys (LKDI). This system enables authorized users to generate activation keys, which are generated per device serial number.

In order to upgrade an activation key, the activation key must be entered into the 9500 MPR. The system checks and implements the new activation key, enabling access to new capacities and/or features.

Here the list of RTU available with the current release

RTU name	RTU Application (Per radio/per node/per card)	Description	Applicability
RTU Packet Throughput Booster	Per node	It enables Packet Throughput Booster feature	Radio: All radios Indoor: MSS-1/8, MSS-1c, MPR-e & MSS-O
RTU encryption (AES)	Per node	It enables encryption AES	Radio: All radios except MPT-MC Indoor: MSS-1/8, MSS-1c, MPR-e & MSS-O
RTU Multi Service Ring Protection	Per node	It enables IEE G.8032 MultiService Ring Protection	Radio: All radios Indoor: MSS-1/8 & MSS-O
RTU SDH Channelized	Per card	It allows configuration of SDH plug-in in channelized (mux/demux) mode	Radio: All radios Indoor: MSS-8
RTU Synchronous Ethernet	Per node	It enables synchronous Ethernet functionality for Ethernet ports of : core card, EAS card, MSS1, MSS-O and MSS-1c	Radio : All radios Indoor: MSS-1/8, MSS-1c & MSS-O
RTU Multichannels	Per LAG group	It allows Multichannel	Radio : All radios

		LAG L1 up to 2+0 , up to 4+0, up to 8 +0 (using EASv2 card)	Indoor: MSS-8
RTU Adaptive Modulation	Per radio	It enables the usage of Adaptive Modulation	Radio : All radios Indoor: MSS-1/8, MSS-1c, MPR-e & MSS-O
RTU xx Mbps Capacity	Per radio	It allows a radio throughput (=net bit rate) up to xx Mbit/sec. Please refer to the below table for the association modem profiles vs required RTU	Radio : All radios Indoor: MSS-1/4/8, MSS-1c, MPR-e & MSS-O
RTU XPIC	Per radio	It enables XPIC	Radio : MPT-HQAM/ MPT-XP-HQAM / MPT-HL Indoor: MSS-1/4/8, MSS-1c, MPR-e & MSS-O
RTU xx Mbps Capacity per LAG group	Per LAG group	In case of channel in LAG L1 this licence is allowing to use a globale capacity up to xx Mbit/sec. This licence is used on top of the licence for multichannel features but replace the licence for capacity for each RT.	Radio : All radios Indoor: MSS8, MSS-O
RTU MPT HLs High power version	Per radio	It enables the possibility to reach PTx 35 dBm	Radio : MPT-HL Indoor: MSS-1/8
RTU 1588TC	Per node	It enables 1588 Transparent clock on core10G card and/or on the radios that can support 1588 TC (example: MPT-HQAM,...)	Radio : all Indoor: MSS-1/4/8, MSS-1c, MPR-e & MSS-O
RTU MSSOL1LAG	Per node	It enables LAG 2+0 feature on MSS-0	Radio : all Indoor: MSS-O

Note1: ODU300 not considered; please refer to user manual for details.

Note2: for “indoor” it is intended the boxconnected to the radio; usually it is indoor (hence the name) for split mount/full outdoor configurations, but it can be outdoor as well (MSS-O) or even missing (MPR-e, .i.e. all outdoor radios)

The following table describe the association between capacity RTU and modem profile. It shall be noted that

- Minimum capacity foreseen for MPT-HLs is 150 Mbit/sec;
- In case of a node with mixed MPT-XC and MPT-HL the capacity licence is related to the specific MPTs.
- In case of adaptive modulation, the capacity RTU defines implicitly the maximum modulation that can be used: as example, in 40 MHz channel spacing, 300 Mbit/sec RTU allows the usage of 1024QAM as maximum modulation scheme (2048QAM can not be used because it does require 350 Mbit/sec RTU)

	QPSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512 QAM	1024 QAM	2048 QAM
3,5 MHz	40	40	40	40	40	40	x	x	x
7 MHz	40	40	40	40	40	40	60	60	x
14 MHz	40	40	60	60	80	80	100	100	130
28 MHz	40	80	100	130	150	150	220	220	220
30 MHz	40	80	100	130	150	150	220	220	
40 MHz	60	130	150	150	220	300	300	300	350
50 MHz	80	150	220	220	300	350	350	450	450
56 MHz	80	150	220	220	300	350	450	450	500

11 Standards

Product family compliance to international standards and decision is reported in below tables.

For a specific mapping with respect to the different MPR subunits, pls refer to the MPR User Manual.

11.1 ITU-T & ITU-R standards

ITU-R

ITU-R F.382: Radio-frequency channel arrangements for fixed wireless systems operating in the 2 and 4 GHz bands.

ITU-R F.1099: Radio-frequency channel arrangements for high- and medium capacity digital fixed wireless systems in the upper 4 GHz (4 400-5 000 MHz) band.

ITU-R F.635: Radio-frequency channel arrangements based on a homogeneous pattern for fixed wireless systems operating in the 4 GHz (3 400-4 200 MHz) band.

ITU-R F.383: Radio-frequency channel arrangements for high-capacity fixed wireless systems operating in the lower 6 GHz (5 925 to 6 425 MHz) band.

ITU-R F.384: Radio-frequency channel arrangements for medium- and high capacity digital fixed wireless systems operating in the upper 6 GHz (6 425-7 125 MHz) band.

ITU-R F.385: Radio-frequency channel arrangements for fixed wireless systems operating in the 7 GHz (7 110-7 900 MHz) band.

ITU-R F.386: Radio-frequency channel arrangements for fixed wireless systems operating in the 8 GHz (7 725 to 8 500 MHz) band.

ITU-R F.387: Radio-frequency channel arrangements for fixed wireless systems operating in the 11 GHz band.

ITU-R F.497: Radio-frequency channel arrangements for fixed wireless systems operating in the 13 GHz (12.75-13.25 GHz) frequency band.

ITU-R F.636: Radio-frequency channel arrangements for fixed wireless systems operating in the 14.4-15.35 GHz band.

ITU-R F.595: Radio-frequency channel arrangements for fixed wireless systems operating in the 17.7-19.7 GHz frequency band.

ITU-R F.637: Radio-frequency channel arrangements for fixed wireless systems operating in the 21.2-23.6 GHz band.

- ITU-R F.746: Radio-frequency arrangements for fixed service systems.
- ITU-R F.748: Radio-frequency arrangements for systems of the fixed service operating in the 25, 26 and 28 GHz bands.
- ITU-R F.749: Radio-frequency arrangements for systems of the fixed service operating in sub-bands in the 36-40.5 GHz band.
- ITU-R F.2006: Radio-frequency channel arrangements for fixed wireless systems operating in the 71-76 and 81-86 GHz bands.
- ITU-R F.592 Vocabulary of terms for the fixed service
- ITU-R F.1101 Characteristics of digital fixed wireless systems below about 17 GHz
- ITU-R F.1102 Characteristics of fixed wireless systems operating in frequency bands above about 17 GHz
- ITU-R F.1191-1-2 Necessary and occupied bandwidths and unwanted emissions of digital fixed service systems
- ITU-R F.1330 Performance limits for bringing into service the parts of international PDH and SDH paths
- ITU-R F.1668 Error performance objectives for real digital fixed wireless links used in 27 500 km hypothetical reference paths and connections
- ITU-R F.1703 Availability objectives for real digital fixed wireless links used in 27 500 km hypothetical reference paths and connections

ITU-T

- ITU-T G.664 Optical safety procedures and requirements for optical transport systems
- ITU-T G.702 Digital hierarchy bit rates
- ITU-T G.703 Physical/electrical characteristics of hierarchical digital interfaces
- ITU-T G.704 Synchronous frame structures used at 1544, 2048 kbps hierarchical levels
- ITU-T G.706 Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704
- ITU-T G.707 Network node interface for the synchronous digital hierarchy (SDH)
- ITU-T G.775 Loss of Signal (LOS), Alarm Indication Signal (AIS) and Remote Defect Indication (RDI) defect detection and clearance criteria for PDH signals
- ITU-T G.781 Structure of Recommendations on equipment for the SDH

- ITU-T G.784 Management aspects of synchronous digital hierarchy (SDH) transport network elements
- ITU-T G.803 Architecture of transport networks based on the synchronous digital hierarchy
- ITU-T G.805 Generic functional architecture for transport networks
- ITU-T G.806 Characteristics of transport equipment - Description methodology and generic functionality
- ITU-T G.808-1 Generic protection switching
- ITU-T G.810 Definitions and terminology for synchronization networks
- ITU-T G.811 Timing requirements at the outputs of primary reference clocks suitable for pliesochronous operation of international digital links
- ITU-T G.812 Timing requirements at the outputs of slave clocks suitable for pliesochronous operation of international digital links
- ITU-T G.813 Timing characteristics of SDH equipment slave clocks (SEC)
- ITU-T G.821 Error performance of an international digital connection operating at a bit rate below the primary rate and forming part of an Integrated Services Digital Network
- ITU-T G.822 Controlled slip rate objectives on an international digital connection
- ITU-T G.823 The controls of jitter and wander within digital networks that are based on the 2048 kbps hierarchy
- ITU-T G.825 The control of jitter and wander within digital networks which are based on SDH
- ITU-T G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections
- ITU-T G.828 Error performance parameters and objectives for international, constant bit rate synchronous digital paths
- ITU-T G.829 Error performance events for SDH multiplex and regenerator sections
- ITU-T G.831 Management capabilities of transport networks based on the Synchronous Digital Hierarchy (SDH)
- ITU-T G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy
- ITU-T G.7043 Virtual concatenation of PDH signals
- ITU-T G.7710 Common equipment management function requirements
- ITU-T G.8010 Architecture of Ethernet layer networks

- ITU-T G.8011 Ethernet over Transport - Ethernet services framework
- ITU-T G.8011.1 Ethernet private line service
- ITU-T G.8011.2 Ethernet virtual private line service
- ITU-T G.8012 Ethernet UNI and Ethernet over transport NNI
- ITU-T G.8021 Characteristics of Ethernet transport network equipment functional blocks
- ITU-T G.8032 Ethernet ring protection switching
- ITU-T G.8261 Timing and synchronization aspects in packet networks
- ITU-T G.8262 Timing characteristics of a synchronous Ethernet equipment slave clock
- ITU-T G.8264 Distribution of timing through packet networks
- ITU-T Y.1291 An architectural framework for support of QoS in packet networks
- ITU-T Y.1541 Network performance objectives for IP-based services

11.2 ETSI

ETSI EN 302 217 – Parts 1,2,3,4 - Fixed Radio Systems; Characteristics and requirements for the use of equipment and antennas in system point-to-point

ETSI TR 101 506 - Fixed Radio Systems; basic definitions, terminology and applicability of the essential requirements given in Article 3.2 Directive 1999/05/EC on the fixed radio systems;

ETSI TR 101 036 - Fixed Radio Systems; basic definitions for standards relating to digital fixed radio systems (DFRS);

ETSI TR 102 243 - Fixed Radio Systems; Representative values for the transmitter power and antenna gain for the analysis of inter-and intra-compatibility and sharing;

ETSI EG 201 399 - Electromagnetic compatibility and ERM; Guidelines for the preparation of harmonized standards for application under the R & TTE Directive;

ETSI EN 300 019 : "Environmental Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment. Part 1-2-3

ETSI EN 301 126-1 : "Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment - Definitions, general requirements and test procedures

ETSI EN 301 126-3-1: "Fixed Radio Systems; Conformance testing; Part 3-1: Point-to-Point antennas; Definitions, general requirements and test procedures

11.3 EU directive

Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive).

11.4 ECC

ERC/REC 14-03 E - Harmonized arrangement of channels and blocks designed for low and medium capacity in the band of 3400-3600 MHz;

ERC/REC 12-08 E - Harmonized arrangement of channels and blocks designed for systems of small, medium and large capacity in the band of 3600-4200 MHz;

ERC/REC 14-01 E - Distribution of radio frequency channels for analog and digital radio relay systems in large capacity the band 5925-6425 MHz;

ERC/REC 14-02 E - Distribution of radio frequency channels of digital systems is large, medium and small capacity in fixed service in the band of 6425-7125 MHz;

ECC/REC/(02)06 - Distribution of channels for digital systems in the fixed service in the band 7125-8500 MHz;

ERC/REC 12-05 E - Harmonized radio frequency channel arrangement for digital terrestrial fixed systems in the band 10.0-10.68 GHz;

ERC/REC 12-06 E - Preferential distribution of channels for systems in the fixed service in the band of 10.7 - 11.7 GHz;

ERC/REC 12-02 E - Harmonized radio frequency channel arrangement for analogue and digital terrestrial fixed systems in the band 12.75-13.25 GHz;

ERC/REC 12-07 E - Harmonised radio frequency channel arrangement for digital terrestrial fixed systems in the band 14.5-14.62 GHz GHz paired with 15:23 to 15:35;

ERC/REC 12-03 E - Harmonized radio frequency channel arrangement for digital terrestrial fixed systems in the band 17.7-19.7 GHz;

T/R 13-02 E - Preferential distribution of channels for systems in the fixed service in the band 22.0-29.5 GHz;

REC T/R 12-01 - Preferential distribution of channels for systems in the fixed service in the band of 37-39.5 GHz;

ECC/REC/(09)01 - Use of the band 57-64 GHz for fixed wireless point-to-point systems;

ECC/REC/(05)02 - Use of the band 64-66 GHz for for fixed service;

ECC/REC/(05)07 - Distribution channel systems in the fixed service in the band 71-76 GHz and 81-86 GHz;

- 2.** ECC REP 124 - Coexistence of passive and fixed service in the bands 71-76/81-86 GHz;

IEC Standards

IEC 60153	Hollow metallic waveguide
IEC 60154 Parts1-7	Flanges for waveguides. Part 1-7
IEC 60529	Degrees of protection provided by enclosures (IP code).
IEC 60657	Non-ionizing radiation hazards in the frequency range 10 MHz to 300 000 MHz
IEC 60950-1	Information technology equipment – Safety Part 1: General requirements
IEC 61000-4	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques
IEC 721-3	1,2,3,4 Classes - Classification of environmental conditions including classes: 1K4, 1Z2, 1Z3, 1Z5, 1B2, 1C2, 1S3, 1M2 2K4, 2B2, 2C2, 2M2 3K5, 3Z2, 3Z4, 3B2, 3C2(3C1), 3S2, 3M2 4K2, 4Z5, 4Z7, 4B1, 4C2(4C3), 4S2, 4M5
IEC EN 55022	Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement
IEC EN 60825-1 and -2	Safety of laser Products
IEC EN 62311	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
IEC EN 60215	Safety requirements for radio transmitting equipment

IEEE standards

802.1ad	Virtual Bridge LAN - Am.4: Provider Bridge
802.1ag	Virtual Bridged LAN - Am.5: Connectivity Fault Management
802.1AX	Standard for Local and metropolitan area networks – Link Aggregation
802.1D	MAC Bridges (rollup of 802.1D-1998, 802.1t, 802.1w, P802.1y, and 802.11c)
802.1p	Traffic Class Expediting and Dynamic Multicast Filtering
802.1Q	Standard for Local and Metropolitan Area Networks---Virtual Bridged Local Area Networks
802.3	
802.3u	100BASE-TX, 100BASE-T4, 100BASE-FX Fast Ethernet at 100 Mbit/s (12.5 MB/s) w/autonegotiation - Media Access Control Parameters, physical layer, medium attachment units and repeater for 100Mb/s operation
802.3x	Full Duplex and flow control. A mechanism for pause-based flow control is also added. Standards for Local and Metropolitan Area Networks: Specification for 802.3 Full Duplex Operation
802.3z	1000BASE-X Gbit/s Ethernet over Fiber-Optic at 1 Gbit/s (125 MB/s)
802.3ac	Frame Extensions for Virtual Bridged Local Area Network (VLAN) Tagging on 802.3 Networ
802.3ah	Ethernet in the First Mile (OAM) Media Access Control Parameters, Physical layers, and Management Parameters for Subscriber Access Networks
802.3as	Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications (Frame format extensions)

IETF standards

IETF RFC 0768	UDP: User Datagram Protocol
IETF RFC 0791	IP: Internet Protocol
IETF RFC 0793	TCP: Transmission Control Protocol
IETF RFC 0826	Ethernet address resolution protocol
IETF RFC 1305	Network Time Protocol (Version 3) Specification, Implementation and Analysis
IETF RFC 2212	Specification of guaranteed quality of service
IETF RFC 2474	Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers
IETF RFC 2475	"An Architecture for Differentiated Services", December 1998.
IETF RFC 2544	Benchmarking Methodology for Network Interconnect Devices
IETF RFC 2597	Assured forwarding PHB group
IETF RFC 2616	HTTP: Hyper Text Transfer Protocol
IETF RFC 2819	Remote Network Monitoring Management Information Base
IETF RFC 3032	MPLS Label Stack Encoding
IETF RFC 3246	An expedited forwarding PHB (Per-hop behavior)
IETF RFC 3916	Requirements for pseudo-wire emulation edge-to-edge (PWE3)

Alcatel-Lucent 9500 Microwave Packet Radio

Microwave Service Switch | Release 6.0 (ANSI)

The Alcatel-Lucent 9500 Microwave Packet Radio (MPR) family includes a flexible range of Microwave Service Switch (MSS) indoor units that provide advanced Carrier Ethernet networking, aggregation and demarcation functions. Optimized to reduce space and power consumption, the MSS exists in different form factors to address all network sizes and locations, including tail, hub and backbone. The entire MSS family uses the same software and management systems, enabling consistent operations across end-to-end packet microwave networks. Combined with the 9500 MPR Microwave Packet Transport (MPT), the MSS sets the standard for delivering fast, efficient wireless transmission links with flexible networking and simple operations.



	MSS-O	MSS-1	MSS-8
Chassis	<ul style="list-style-type: none"> • Fixed • Environmentally hardened for outdoor usage • IP67 compliant 	<ul style="list-style-type: none"> • Fixed • No slots • Fanless 	<ul style="list-style-type: none"> • Modular: Eight slots • Two core slots • Six interface slots
Dimensions	<ul style="list-style-type: none"> • 345 mm x 190 mm x 65 mm (13.6 in. x 7.5 in. x 2.6 in.) 	<ul style="list-style-type: none"> • ½ RU 	<ul style="list-style-type: none"> • 2 RU
Nodal capability	<ul style="list-style-type: none"> • Three radios 	<ul style="list-style-type: none"> • Six radios 	<ul style="list-style-type: none"> • Twenty-four radios
Switching capability	<ul style="list-style-type: none"> • 16 Gb/s 	<ul style="list-style-type: none"> • 16 Gb/s 	<ul style="list-style-type: none"> • 100 Gb/s
Weight	<ul style="list-style-type: none"> • 4.2 kg (9.3 lb) 	<ul style="list-style-type: none"> • 2 kg (4.4 lb) 	<ul style="list-style-type: none"> • Chassis: 3.6 kg (7.9 lb)
Interfaces	<ul style="list-style-type: none"> • 2 x 10/100/1000 RJ-45 with PoE support • 1 x 10/100/1000 RJ-45 • 1 x SFP 	<ul style="list-style-type: none"> • 16 DS1 • 4 x 10/100/1000 RJ-45 • 2 x SFP 	<ul style="list-style-type: none"> • Up to 192 DS1, 12 DS3, 12 OC-3, 54 GE • 2 x 10 Gb/s SFP+ ports
Power supply	<ul style="list-style-type: none"> • AC: 110 V to 230 V nominal • DC: 48 V nominal 	<ul style="list-style-type: none"> • Dual feeds: Wide range (+24 V DC nominal) 	<ul style="list-style-type: none"> • Dual feeds: -48 V DC or optional integrated +24 V DC
Temperature	<ul style="list-style-type: none"> • -40°C to +55°C (-40°F to +131°F) 	<ul style="list-style-type: none"> • -40°C to +65°C (-40°F to +149°F) 	<ul style="list-style-type: none"> • -40°C to +65°C (-40°F to +149°F)

Technical specifications

Indoor/outdoor connections

GE electrical or optical cable

Synchronization

- Performance according to ITU-T G.813, G.823, G.8264
- Clock distribution options
 - DS1/OC-3
 - External reference sync-in/sync-out (2 MHz, 5 MHz, 10 MHz)
 - Sync E + SSM
 - ITU-T G.8264
 - Built-in Stratum 3 clock
 - OC-3 line clock
- IEEE 1588v2: PTP

Standards compliance

Environmental

- Telcordia® GR-63, GR-1089
- GR-3108
 - MSS-O: Class 4
 - MSS-1, MSS-8: Class 2
- EMC: EN 55022 Class B, EN 301 489-1, EN 301 489-4

Safety

- EN 60950-1

Ecological

- ECMA TR/70

Networking and services

- IEEE 802.1p, 802.1Q: VLAN tagging
- IEEE 802.3: Ethernet
- IEEE 802.3u: 100Base-TX
- IEEE 802.3z: 1000Base-SX/LX
- IEEE 802.3ab: 1000Base-T
- IEEE 802.3x: Flow control
- IEEE 802.1D: MAC bridges
- IEEE 802.1AX-2008: Link aggregation
- IEEE 802.1ag: Ethernet OAM
- MEF CE 2.0: Carrier Ethernet
- MEF 8, MEF 9, MEF 14, MEF 22
- ITU-T G.7041: GFP
- ITU-T G.8032v2: ERPS
- ITU-T G.813: Timing characteristics
- ITU-T G.823: Control of jitter
- ITU-T G.8264: Distribution of timing information
- ITU-T Y.1731: OAM functions

Traffic management and QoS

- Marking based on:
 - Layer 2 (IEEE 802.1p)
 - Layer 3 (DiffServ)

Network and element management

- Console, management, alarm
- Optional 256-bit AES Encryption compliant with FIPS PUB 140-2
- Secure FTP for software download and backup
- IPv4/IPv6 management
- Integrated network management in a Microsoft® Windows® environment
- Embedded web browser for network element supervision
- PC software-based configuration
- Intuitive supervision systems
- SNMP agent with TCP/IP rerouting capability
- Alcatel-Lucent 5620 Service Aware Manager
- Alcatel-Lucent TSM-8000 Fault Management System

Services

- Architecture and design
- Equipment and site engineering
- Installation services
- Integration services
- Performance analysis, network assessment, DCN, synchronization and QoS assessment
- Migration to packet microwave management
- Maintenance
 - 24x7 technical support
 - Return for repair or advanced exchange



Alcatel-Lucent 9500 Microwave Packet Radio

Microwave packet transport for shorthaul | Release 6.0

ANSI

The Alcatel-Lucent 9500 Microwave Packet Radio (MPR) family includes a range of Microwave Packet Transport (MPT) units for shorthaul applications. These MPT units operate in the standard frequency bands and are designed to provide high-capacity reliable backhaul for wireless 3G and 4G macro cells and segments applications. The MPT-HC-HQAM units are integrated in the Alcatel-Lucent 5620 Service Aware Manager for common management with the rest of the 9500 MPR portfolio, enabling consistent operations across end-to-end packet microwave networks. Combined with the 9500 MPR Microwave Service Switch (MSS), the MPT sets the standard for delivering fast, efficient wireless transmission links with flexible networking and simple operations.



MPT-HC-HQAM



Pole-mounted MPT-HC-HQAM

MPT-HC-HQAM

Application	<ul style="list-style-type: none">• Macro cell backhaul (access and hub)• Split-mount or standalone configuration
Physical	<ul style="list-style-type: none">• 235 mm x 235 mm x 130 mm (9.2 in. x 9.2 in. x 5.1 in.) with external diplexer• 235 mm x 235 mm x 150 mm (9.2 in. x 9.2 in. x 5.9 in.) with internal diplexer
Interfaces	<ul style="list-style-type: none">• Two GE ports (RJ45 PfoE and SFP optical plug-in)
Radio	<ul style="list-style-type: none">• 5.8 GHz to 38 GHz (FDD)• 470 Mb/s standard• Support for packet compression• Channels: 10 MHz to 60 MHz
Modulation	<ul style="list-style-type: none">• 4 QAM to 2048 QAM
Weight	<ul style="list-style-type: none">• 7.8 kg (1.2 lb) with external diplexer• 6 kg (13.2 lb) with internal diplexer
Power	<ul style="list-style-type: none">• PfoE• -48 V +/-20%, +24V +/-20% optional• 36 W nominal (full-outdoor and split-mount modes)

Technical specifications

Indoor/outdoor connections

- Maximum cable length
 - 100 m (328 ft) with Cat5e cable
 - 450 m (1476 ft) with optical connectivity

Radio

- 1+0/1+1 HSB/SD/FD
- N+0 LAG L1 with or without SD
- Integrated XPIC (greener and more reliable)
- Maximum Tx power: Up to 32 dBm
- Support for adaptive coding and modulation (ACM)
- Duplex technology: FDD
- Encryption: AES-256
- Timing transport: IEEE 1588v2 PTP, SyncE
- ITU-T G.8264 support

Networking

- Ethernet interface: One electrical 100/1000BaseT, one optical SFP plug-in
- Advanced QoS: Support for IEEE 802.1p, Diffserv, TTL and strict priority
- Dynamic scheduling according to air interface changes
- VLAN: IEEE 802.1P, IEEE 802.1Q, Q-in-Q support
- ERPS: ITU-T G.8032
- Ethernet OAM (IEEE 802.1ag, ITU-T Y.1731, IEEE 802.3ah)

Environmental

- Operating temperature: -33°C to +55°C (-27°F to 131°F)

Standards compliance

Regulatory

- FCC Part 101, Industry Canada SRSP

Safety

- Telcordia® GR-1089

EMC

- GR-1089, GR-63

Metro Ethernet Forum

- MEF 2.0, MEF 8, MEF 9, MEF 14, MEF 22

Services

- Architecture and design
- Network planning
- Equipment and site engineering
- Installation services
- Integration services
- Performance analysis, network assessment, DCN, synchronization and QoS assessment
- Migration to packet microwave management
- Maintenance
 - 24x7 technical support
 - Return for repair or advanced exchange



APPENDIX G – SPECIFICATIONS, REVISED 12/26/15

BIDDER INSTRUCTIONS:

Bidders will provide the following information as instructed below. Bidder is not required to bid every category. Bidders must indicate their choice by indicating, NO BID, as shown in the sample below for categories Bidder chooses not to submit a bid. Failure to provide information as instructed may result in rejection and will not be further evaluated. The state reserves the right to seek clarification, if needed, and Bidder will designate a single point of contact to be available during the Evaluation Phase for this specific purpose. All clarifications will be requested via email to the contact email provided by the Bidder below. When seeking clarification, the state will make a single attempt to contact the designated person. It is the Bidder’s responsibility to ensure the validity of the email address. Response to clarifying email is expected within 2 hours of receipt of email.

- 1) In each Category, identify the Manufacturer in the space provided.
- 2) Identify the Product Model Name/ Number in the space provided.
- 3) Indicate how Bidder meets or exceeds each mandatory requirement in the space provided.

Sample:

Manufacturer:	NO BID
Product Model Name/Number:	

Single Point of Contact for clarifying question during evaluation: **Contact email address:**

1. BATTERIES, MODULAR FLOODED LEAD ACID

Category Definition: Low-maintenance, long-life lead acid battery cells and assemblies, along with all associated installation and maintenance hardware, supplies, and tools.

Example Product: Quantity one (1) — 48 volt / 1000 Amp-Hour battery assembly in floor-mount rack

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	ASSEMBLY of 24 flooded cells to produce ~48 volt, Includes buss bars to connection batteries	
1.1.	Capacity: > 1000 Amp/Hours @ 25°C	
1.2.	Design life expectancy: 20 years @ 25°C / 1200 cycles at 80% DOD	
1.3.	Floor-mount frame/rack, seismic rated (Vendor Supplied)	
1.4.	Protective covers to prevent accidental contact with battery terminals.	
2.	GENERAL FEATURES	

2.1.	Low Maintenance design, 1-3 year watering	
2.2.	Leak-proof post seals	
2.3.	Easy to fill caps, with flame arrestor vent	
2.4.	ISO 9001 Quality Management within manufacturing process	
2.5.	ISO 14001 Environmental Management within manufacturing process	
3.	WARRANTY - 100% coverage during the first 3 years, with proration thereafter for the design life.	
4.	DOCUMENTATION -Vendor shall maintain on their website current versions of all instructions, specifications, MSDS, and certifications.	
5.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

2. BATTERIES, MODULAR VALVE REGULATED LEAD ACID

Category Definition: Low-maintenance, long life, Absorbed Glass Mat (AGM) battery cells and assemblies, along with all associated installation and maintenance hardware and tools.

Example Product: Quantity one (1) — 48 volt / 1000 Amp-Hour battery assembly in floor-mount rack

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	ASSEMBLY of 24 VRLA cells to produce ~48 volt, Includes buss bars to connection batteries	
1.1.	Capacity: > 1000 Amp/Hours @ 25°C	
1.2.	Design life expectancy: 20 years @ 25°C / 1200 cycles at 80% DOD	
1.3.	Floor-mount frame/rack, seismic rated (Vendor Supplied)	
1.4.	Framework disassembles for transport into individual cases	
1.5.	Protective covers to prevent accidental contact with	

	battery terminals.	
2.	GENERAL FEATURES	
2.1.	Maintenance-free design, no filling	
2.2.	One-way, self-resealing safety vents, with high opening pressure to minimize battery gassing.	
2.3.	ISO 9001 Quality Management within manufacturing process	
2.4.	ISO 14001 Environmental Management within manufacturing process	
3.	WARRANTY: 100% coverage during the first 3 years, with proration thereafter for the design life.	
4.	DOCUMENTATION: Vendor shall maintain on their website current versions of all instructions, specifications, MSDS, and certifications.	
5.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

3. BATTERIES, MONO-BLOCK VALVE REGULATED LEAD ACID

Category Definition: Low-maintenance Absorbed Glass Mat (AGM) and Gel battery blocks of various voltage and capacity configurations, along with all associated installation and maintenance hardware and tools.

Example Product: Quantity one (1) — 48 volt / 100 Amp-Hour battery assembly to mount in 19” equipment

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	ASSEMBLY of four (4) batteries to produce ~ 48 volt, Includes buss bars to connection batteries	
1.1.	Capacity: > 100 Amp/Hours @ 25°C	
1.2.	Design life expectancy: minimum 10 years @ 25°C	
1.3.	Width: < 4.4 inch per battery, 17.6 inch total (Customer supplied 19” equipment rack shelf)	
1.4.	Front accessible battery terminals, with safety covers	
2.	GENERAL FEATURES	
2.1.	Maintenance-free design, no filling	

2.2.	One-way, self-resealing safety vents, with high opening pressure to minimize battery gassing.	
2.3.	Heavy-duty carrying handles	
2.4.	ISO 9001 Quality Management within manufacturing process	
2.5.	ISO 14001 Environmental Management within manufacturing process	
3.	WARRANTY: 100% coverage during the first 3 years, with proration thereafter for the design life.	
4.	DOCUMENTATION: Vendor shall maintain on their website current versions of all instructions, specifications, MSDS, and certifications.	
5.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

4. BATTERIES, PORTABLE RADIO

Category Definition: high-capacity rechargeable batteries for public safety grade radios, along with single and multi-unit chargers, and all associated accessories and supplies.

Example Product: Quantity 200 — 3000 mAh, 7.4 volt battery for Motorola APX6000 and/or APX7000 portable radio.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	FUNCTIONAL REQUIREMENTS	
1.1.	Battery shall be 7.4V @ 3000mAh, Lithium Ion or Lithium Ion Polymer, with case and contacts to fit Motorola APX6000 or APX7000 portable radio.	
1.2.	Battery shall operate to a wide temperature range (-10°C to +60°C). Operation at cold temperature limit shall provide a minimum of 1 hour of performance.	
2.	BATTERY CONSTRUCTION Vendor shall supply detailed evidence sufficient to verify	

	compliance with the following requirements. Evidence shall include photographs of battery dissection and/or assembly process, and may include construction/assembly drawings as needed to fully evidence quality.	
2.1.	Batteries shall be constructed with polycarbonate plastic and ultrasonically sealed. – Verification per above	
2.2.	Battery shall be constructed with flexible or printed circuit board with copper circuitry to make electrical connections between components and cells and tolerate higher levels of impact force. Wire interconnects will not be accepted. – Verification per above	
2.3.	Batteries shall be constructed with shock-absorbing materials to protect the cell pack, circuitry, dampen shock and vibration inside the battery and reduce negative effects of sudden impact. – Verification per above	
2.4.	Batteries shall be constructed to fit securely to the radio and to release easily. Latches shall attach to radio with audible latching sound and shall be robust sufficient to endure wear and tear from normal usage over 4 year warranty period. – Verification per above	
2.5.	Battery pack label shall show a unique serial number with imbedded date code for determining warranty status and tracking inventory. – Vendor shall provide information for identifying date codes.	
3.	TESTING & CERTIFICATION:	

3.1.	<p>Battery cells shall be certified to IEC62133 (or) UL1642 for cell safety.</p> <ul style="list-style-type: none"> - Vendor shall provide documentation from an accredited testing laboratory. 	
3.2.	<p>Battery pack shall be certified to UL2054 for safety.</p> <ul style="list-style-type: none"> - Vendor shall provide documentation from an accredited testing laboratory. 	
3.3.	<p>Batteries shall pass stringent electrostatic discharge test that meets Electro-Technical Commission (IE C6100-4-2). Batteries shall be tested for electrostatic discharge tests for both contact discharge (10 discharges each at three different voltages, up to 8kV of both positive and negative polarity) on each battery contact and for air discharge (10 discharges each at five different voltages, up to 15kV of both positive and negative polarity) per the standard.</p> <ul style="list-style-type: none"> - Vendor shall provide documentation from an accredited testing laboratory. 	
3.4.	<p>Plastic housing shall meet UL94V0 specification for flammability related to Lithium battery pack plastics.</p> <ul style="list-style-type: none"> - Vendor shall provide documentation from an accredited testing laboratory. 	
3.5.	<p>Batteries shall meet DOT Certification UN38.3 for transport of Lithium batteries including test results for altitude, vibration, shock, external short circuit, crush, overcharge and forced discharge.</p> <ul style="list-style-type: none"> - Vendor shall provide documentation from an accredited testing laboratory. 	
4.	WARRANTY:	
4.1.	<p>Batteries shall be warranted for 48 months against any defects in manufacturing or workmanship, with no proration.</p>	

4.2.	Batteries shall be warranted to maintain a minimum of	
4.3.	80% of rated capacity for 18 months from date of shipment, under normal condition, with no proration.	
4.4.	Vendor shall describe RMA policy.	
5.	DELIVERY: Vendor shall guarantee delivery within 30 days ARO on all orders of less than 1000 batteries.	
6.	DOCUMENTATION: Vendor shall maintain on their website current versions of all instructions, specifications, MSDS, and certifications.	
7.	RECYCLING: Vendor shall provide free recycling service according to all federal, state and local regulations.	
8.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

5. EQUIPMENT SHELTERS, BALLASTED

Category Definition: Equipment shelters of various sizes specifically designed and constructed for extreme installation locations and to be installed with minimal soil disruption and without site-build foundation; along with necessary accessories and appurtenances, including antenna mast, RF shielding, and grounding systems.

Example Product: Quantity one (1) — 40 ft.² equipment shelter equipped for helicopter transport.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SHELTER AREA: ~40 ft. ² (±10%)	
2.	SHELTER HEIGHT: >7 ft	
3.	TEMPERATURE RANGE: -50°F to +150°F	
4.	RATED WIND VELOCITY: (2” radial ice): >150 mph	
5.	DESIGN AND CONSTRUCTION	
5.1	Shelter shall be impact resistant to flying debris at the rated wind velocity.	
5.2	Shelter shall be installed without conventional foundation	

	and with only minimal ground disruption – for installation in sensitive locations.	
5.3	Shelter shall provide for lightning protection and grounding features that meet or exceed current industry applicable standards.	
5.4	Floor Load: >180 lbs-ft. ²	
5.5	Roof Load: >100 lbs-ft. ²	
5.6	Roof Impact Resistance: >100 lbs-ft. ² with no damage to exterior or interior of the roof or shelter.	
5.7	Roof and wall exteriors shall be constructed to provide full weather resistance and resistance to flying embers from adjacent fire; asphalt roofing and other combustible materials shall not be used.	
5.8	Screened Ventilation shall adequately provide to permit occupancy by persons in the event adverse weather prohibits travel.	
5.9	Cable entry panel: two each, 4-inch ports	
5.10	Vendor shall note that compliance with state specific requirements for Factory Assembled Structures will be addressed in individual state Participating Agreements.	
6.	Vendor may offer integration of components from other manufacturers (HVAC, generators, UPS, equipment racks, cable trays, etc.) as an additional service so as to deliver a complete shelter.	
7.	Warranty: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
8.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

6. EQUIPMENT SHELTERS, CONCRETE

Category Definition: Equipment shelters of various sizes constructed of precast concrete, specifically designed and constructed for extreme installation locations.

Example Product = Quantity one (1) — 40 ft.² equipment shelter

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Shelter area: ~40 ft. ² (±10%)	
2.	Shelter height: >7 ft	
3.	Temperature range: -50°F to +150°F	
4.	Rated Wind Velocity: (2” radial ice): >150 mph	
5.	DESIGN AND CONSTRUCTION	
5.1	Shelter shall be impact resistant to flying debris at the rated wind velocity and bullet resistant (30:06 @ point-blank range)	
5.2	Floor Load: >200 lbs-ft. ²	

5.3	Roof Load: >100 lbs-ft. ²	
5.4	Roof Impact Resistance: >200 lbs-ft. ² with no damage to exterior or interior of the roof or shelter.	
5.5	Adequate Screened Ventilation shall be provided to permit occupancy by persons in the event adverse weather prohibits travel.	
5.6	The structure shall be of precast steel reinforced concrete (5000 psi) panels with welded connections.	
5.7	All exterior metallic components and fasteners shall be stainless steel or hot-dipped galvanized.	
5.8	Roof shall be coated/sealed with an elastomeric coating.	
5.9	All joints shall be sealed inside and outside with an elastomeric caulking.	
5.10	Flooring: commercial grade floor tile	
5.11	Doors: galvanized steel primed & painted, 16-gauge door with 14-gauge frame.	
5.12	Cable entry panel: six each, 4-inch ports	
5.13	Shelter shall provide for Lightning Protection and grounding features that meet or exceed current industry applicable standards	
5.14	Vendor shall supply Foundation Design based on customer supplied soils report.	
5.15	Vendor shall note that compliance with state specific requirements for Factory Assembled Structures will be addressed in individual state Participating Agreements.	
6.	Vendor may offer integration of components from other manufacturers (HVAC, generators, UPS, equipment racks, cable trays, etc.) as an additional service so as to deliver a complete shelter.	
7.	Warranty: Three (3) Years	

	(Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
8.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

7. EQUIPMENT SHELTERS, FIBERGLASS

Category Definition: Equipment shelters of molded fiberglass construction, specifically designed and constructed for extreme installation locations.

Example Product: Quantity one (1) — 40 ft.² equipment shelter equipped for helicopter transport.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Shelter area: ~40 ft. ² (±10%)	
2.	Shelter height: >7 ft	
3.	Temperature range: -50°F to +150°F	
4.	Rated wind velocity: (2” radial ice): >150 mph	
5.	DESIGN AND CONSTRUCTION	
5.1	Shelter design and construction shall be impact resistant to flying debris at the rated wind velocity	
5.2	Adequate screened ventilation shall be provided to permit occupancy by persons in the event adverse weather prohibits travel.	

5.3	The primary structure shall be a one-piece Fiber Reinforce Plastic (FRP) structural laminate with foam insulating core.	
5.4	All metallic components shall be stainless steel.	
5.5	All doors and access panels will be locked	
5.6	Shelter shall provide for lightning protection and grounding features that meet or exceed current industry applicable standards	
5.7	Vendor shall supply foundation design based on customer supplied soils report.	
6.	Vendor may offer integration of components from other manufacturers (HVAC, generators, UPS, equipment racks, cable trays, etc.) as an additional service so as to deliver a complete shelter.	
7.	Warranty: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
8.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

8. EQUIPMENT SHELTERS, FRAMED LIGHT-WEIGHT

Category Definition: Equipment shelters of framed construction; with metal, cement board, or other composite exterior; specifically designed and constructed for extreme installation locations.

Example Product: Quantity one (1) — 40 ft.² equipment shelter

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Shelter area: ~40 ft. ² (±10%)	
2.	Shelter height: >7 ft	
3.	Temperature range: -50°F to +150°F	
4.	Rated Wind Velocity (2” radial ice): >100 mph	
5.	DESIGN AND CONSTRUCTION	
5.1	Shelter design and construction shall be impact resistant to flying debris at the rated wind velocity.	
5.2	Floor Load: >180 lbs-ft. ²	

5.3	Roof Load: > 80 lbs-ft. ²	
5.4	Roof Impact Resistance: 100 lbs-ft. ² with no damage to exterior or interior of the roof or shelter.	
5.5	Adequate screened ventilation shall be provided to permit occupancy by persons in the event adverse weather prohibits travel.	
5.6	Insulation shall be installed between interior and exterior wall providing a value of >R13.	
5.7	All exterior metallic components and fasteners shall be stainless steel or hot-dipped galvanized.	
5.8	Roof and wall exteriors shall be constructed to provide full weather resistance and resistance to flying embers from adjacent fire; asphalt roofing and other combustible materials shall not be used.	
5.9	All joints/seams shall be sealed and fully weather-tight.	
5.10	Flooring: commercial grade floor tile	
5.11	Doors: galvanized steel primed & painted, 16-gauge door with 14-gauge frame.	
5.12	Cable entry panel: six each, 4-inch ports or equivalent grounded multipoint entry panel	
5.13	Shelter shall provide for lightning protection and grounding features that meet or exceed current industry applicable standards.	
5.14	Vendor shall supply foundation design based on customer supplied soils report.	
5.15	Vendor shall note that compliance with state specific requirements for Factory Assembled Structures will be addressed in individual state Participating Agreements.	
6.	Vendor may offer integration of components from other manufacturers (HVAC, generators, UPS, equipment racks, cable trays, etc.) as an additional service so as to deliver a	

	complete shelter.	
7.	Warranty: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
8.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

9. EQUIPMENT SHELTERS, OUTDOOR CABINET

Category Definition: Equipment cabinets of single and multiple widths of EIA standard 19” and 23” rack, in various depths and heights; , specifically designed and constructed for extreme installation locations; providing protection conforming to NEMA-3R, UL50, and UL50E standards, along with associated components and hardware.

Example Product: Quantity one (1) — Single width, 19” - 84 RU cabinet of 25 inch depth.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	CABINET DIMENSIONS	
1.1.	Width: EIA standard 19” rack, single width, ~25 inches	
1.2.	Height: 42 Rack Units (RU), ~ 78 inches	
1.3.	Depth: ~25 inches	
2.	CONSTRUCTION – resistant to impact and corrosion	
2.1.	Exterior: high strength aluminum	
2.2.	Hardware: stainless steel	
2.3.	Weather-tight: NEMA 3R standard	

3.	RACK RAILS: 2 pair, individually depth adjustable	
3.1.	Two pair,	
3.2.	Fully drilled and tapped	
4.	THERMAL PROTECTION	
4.1.	Solar shield roof with air gap to dissipate radiant heat.	
4.2.	Solar shield vent and perimeter screened to prevent insect entry.	
4.3.	Insulation bonded to interior walls.	
4.4.	Exhaust fans: 12 VDC, with thermostat.	
4.5.	Cabinet shall provide for lightning protection and grounding features that meet or exceed current industry applicable standards.	
5.	DOORS	
5.1.	Two (2) doors, front and back	
5.2.	Continuous hinge	
5.3.	Three point locking mechanism	
5.4.	Internal lock or external padlock	
6.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
7.	SHIPPING: F.O. B. All Destinations	

10. FURNITURE, DISPATCH CONSOLE

Category Definition: Specialized dispatch center workstations, CPU enclosures, and auxiliary furniture such as storage units, printer cabinets, files, and tables.

Example Product: Quantity one (1) — 911-Center Dispatch Workstation with partitioned screens.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	WORKSTATION DESCRIPTION	
1.1.	Workstation is one position of a 10-position dispatch center.	
1.2.	Workstation display area supports five – 23 inch flat-panel monitors on a single level.	
1.3.	Workstation enclosure supports three standard CPU units.	
1.4.	– Workstation input area supports two full-size keyboards and three pointing devices (mouse or trackball)	
2.	REQUIREMENT SUMMARY	
2.1.	The workstation is designed specifically for 24/7	

	<p>operations in an Emergency Communications Center environment.</p> <ul style="list-style-type: none"> - Usage is 5-times normal office environment. <p>Office furniture systems will not be considered.</p>	
2.2.	The workstation shall meet ANSI/HFES 100-2007, ANSI/BIFMA X5.5-1998(Desk Products).	
2.3.	The workstation shall meet all ADA guidelines and requirements.	
2.4.	The lifecycle of the workstation shall be no less than 10 years, encompassing over 80,000 hours of use.	
3.	STABILITY - FUNCTIONALITY	
3.1.	Console furniture is modular in design for ease of reconfiguration and upgrading. Technology and personal storage units should have the ability to be field removed or replaced without deconstruction of the console unit.	
3.2.	Sit-to-stand legs are bolted into the console undercarriage with a footprint designed to allow maximum stability based on the overall size of the Input Support Surface. Free standing leg and feet systems will not be acceptable.	
3.3.	There are no obstructions for side-to-side movement by the user within the console footprint. Knee space must be a minimum of 70% of the consoles overall width.	
3.4.	Horizontal work surfaces are supported by a steel tubular sub-frame for maximum durability.	
3.5.	Must be strong and rigid and able to meet all required standards for furniture construction.	
4.	INPUT SUPPORT (KEYBORAD AND MOUSE) SURFACE	
4.1.	Must provide a level platform to provide (a) be wide enough design to accommodate and	
4.1.1.	At least 200 square inches of writing surface.	
4.1.2.	At least two (2) full-size keyboards with numerical	

	keypad.	
4.1.3.	At least three (3) pointing devices (mouse, trackball, or touchpad).	
4.2.	Surface mounted, user-configurable, user-accessible voice and data connections must be available and accessible from the front of the console. (PSB, CAT-6, USB)	
4.3	Must lower to 22" from the floor to accommodate the 5th percentile seated female per ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.2.4.3	
4.4.	Must raise to 48" above the floor to accommodate the 95th percentile standing male per ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.2.4.3	
4.5.	Provide infinite adjustment throughout the entire range, a critical function to meet ergonomic standards and reduce repetitive strain injuries and carpal tunnel syndrome.	
4.6.	Must place input devices with primary and secondary work zones to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.1	
4.7.	Must maintain elbow angles between 70 and 135 degrees to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.1.1	
4.8.	Electronic work surface adjustment must be independent of the monitor support adjustment. Other adjustment methods will be deemed unacceptable.	
4.9.	Adjustment controls to be easily accessible, provide digital readout and have a smooth surface for easy cleaning and sanitizing.	
4.10.	Must adjust simultaneously with the monitor support in order to retain relative positioning between both surfaces when changing from sitting to standing. Allowing quick shifting from sitting to standing work postures.	

4.11.	Entire surface and all environmental controls shall move with the input surface to maintain the work environment settings.	
4.12.	Static load capacity of 1200 lbs. and an equipment load capacity of 500 lbs to accommodate all types and quantities of input devices.	
4.13.	Must provide a safety sensor in order to detect obstacles and prevent damage or injury.	
4.14.	A minimum safety clearance of 1.25" shall be required between all moving surfaces. ANSI- HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.1.2	
4.15.	All cabling required to operate the consoles features must be completely concealed.	
4.16.	Input surface should have lifting columns integrated into the storage cavities with no exposed leg sets.	
4.17.	Mechanism must leave an unobstructed knee clearance in the seated operating position in accordance with ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.2.1	
4.18.	All electrical components must be UL listed and CSA certified.	
4.19.	Must utilize an integrated brake for stability and prevention of binding. Braking system must lock surface into place when the brake is released.	
4.20.	All moveable components of the console shall be designed and tested to at least 40,000 cycle full range adjustments.	
5.	MONITORING VIEWING SUPPORT	
5.1.	Provide adjustment of monitors so that the gaze angle to the center of the screen ranges between 15° and 20° below horizontal eye level. ANSI-HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.3.	

5.2.	Must allow adjustment of the line-of-sight (viewing) distance between the eyes and front surface of the viewable display area within the range of 19" and 31" to meet ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 5.2.4.2.	
5.3.	Design accommodates use of up to five (5) 23" widescreen LCD flat panel monitors on a single tier, and up to (10) 23" widescreen LCD flat panel monitors in a stacked configuration, with independent angle adjustment.	
5.4.	Surface mounted, user-configurable, user-accessible power and video connections must be available and accessible from the front of the console. (VGA, HDMI, DVI)	
5.5.	Array should allow for concurrent focal depth movement of at least 4 monitors at once and a minimum of 12" of travel. Array depth adjustment must lock into fixed position after adjustment to prevent accidental movement.	
5.6.	Adjustment controls to be flush mounted into surface or underneath the work surface and have a smooth surface for easy cleaning and sanitizing.	
5.7.	All electrical components must be UL listed and CSA certified.	
5.8.	Must be independently adjustable in relation to the Input Support Surface.	
5.9.	All moveable components of the console shall be designed and tested to at least 40,000 cycle full range adjustments.	
6.	SUPPORT ADJUSTMENT	
6.1.	Adjustment speed shall not be less than 1.25" per second and not greater than 1.5" per second.	
6.2.	Adjustment controls to be flush mounted into surface or	

	beneath work surface and have a smooth surface for easy cleaning.	
6.3.	Lifting system must operate quietly. Max sound level of 50db.	
7.	EQUIPMENT ENCLOSURES	
7.1.	Enclosures must be accessible from both the front and the rear.	
7.2.	Enclosures must be external from the primary work surface for minimal user disruption.	
7.3.	Must be available in two heights for small format and tower CPU configurations.	
7.4.	Must be available in multiple widths to accommodate different CPU configurations.	
7.5.	Must be available in two depths.	
7.6.	Enclosures must be stackable to allow additional technology storage or personal storage with taking up additional floor space.	
7.7.	All equipment enclosures are must utilize an active cooling system to ensure technology performing at optimum temperature.	
7.8.	Cooling system must feature a thermostatically controlled cooling system, activating at 85 degrees Fahrenheit. This ensures proper cooling without the need to have the cooling fans run continuously.	
7.9.	Switchable enclosure illumination must be provided.	
7.10.	Must incorporate an integrated horizontal a horizontal cable management system with a minimum capacity of (80) CAT5 cables.	
8.	PARTITION SCREEN	
8.1.	Frame to be constructed of steel components for maximum strength and durability.	
8.2.	All steel components must be powder coated for	

	durability. Enamel paint not acceptable.	
8.3.	External Screen components must be available in abrasion resistant fabric covering.	
8.4.	Internal Screen materials must have a NRC rating of at least .75 and SAA rating of .78 to help reduce ambient noise levels.	
8.5.	Screening system as a whole must be tested in an independent laboratory and have a acoustical NRC rating of .75 or greater.	
8.6.	Internal components must be consist of environmentally safe, with a minimum of 75% recycled materials	
8.7.	Screen/partition system must be within the console footprint to maximize floor space.	
8.8.	All fasteners must be completely concealed.	
8.9.	All components must be field replaceable.	
8.10.	Must be available in multiple heights for maximum sound reduction and maximum sight lines. For bidding purposes: vendor shall provide pricing for a	
8.11.	Must be available with a 12" glass upper section to help maintain sight lines.	
9.	MATERIALS	
9.1.	Wood Part	
9.1.1.	Wood parts are constructed of 45 lb. density 1-1/8" thick wood core material, pressure bonded with a high-pressure laminate surface on both sides.	
9.2.	Surfaces	
9.2.1.	All monitor and input surfaces are 45 lb. density, 3/4" thick wood core material, pressure bonded with a high-pressure horizontal grade laminate top and sealing horizontal grade backing sheet of laminate on the underside to prevent deflection.	
9.3.	Edge Material	

9.3.1.	All storage units and pedestals must use a 1.5mm thick thermoplastic vinyl extrusion with self-healing properties for maximum durability.	
9.3.2.	All Input Support Surfaces must use a 3mm thick thermoplastic vinyl extrusion with self-healing properties for maximum durability. Must have a minimum of a 3mm radius on front edge. ANSI/HFES 100-2007 Human Factors Engineering of Computer Workstations 8.3.1.4	
9.4.	Laminates	
9.4.1	High pressure laminate meets ANSI/ASME A 17.1; 1986 requirements for Class "B" laminate and ASTM D523-89, providing a non-glare matte finish.	
9.4.2.	All monitor and input surfaces are .0625" thickness horizontal grade laminate on the top surface, and on the backing sheet, all to prevent deflection.	
9.4.3.	Thermally fused laminate meets NEMA LI-1-1998. Low pressure laminate is not acceptable.	
9.5	Fabric	
9.5.1.	Abrasion resistance at a minimum meets ASTM D-3597 MVPTS-198 standards.	
9.5.2.	Flammability requirements adhere to ASTM E-84 (Tunnel Test) or Class A or 1 and the State of California Technical Bulletin 117 Sec. E (SC-191-53).	
9.5.3.	Fabric is made with a minimum of 75% recycled materials	
9.6.	Powder Coat	
9.6.1.	Must meet ASTM D3359-09 adhesion standard for durability.	
9.6.2.	Must meet PCI #8 Solvent Cure Test for durability	
10.	ELECTRICAL REQUIREMENTS	
10.1.	Power Distribution & Load	
10.1.1.	Every console will have (2) Power Distribution Units (PDU). Single phase 15A 120V. Each PDU Unit must	

	provide (13) NEMA 5-15R outlets and a NEMA 5-15P input. PDU unit must include a 15 foot cord. PDU must be UL listed and CSA rated.	
10.1.2.	Total power draw for an individual console will not exceed 13 amps. Total draw includes console lifting system and all environmental controls.	
10.2.	Wire and Cable Management	
10.2.1.	Must include two cable access drops with energy chains for vertical cable management from Input Support Surface to equipment enclosures.	
10.2.2.	Must include energy chains for vertical cable management from Monitor Support to Input Support Surface	
10.2.3.	Must include energy chains for horizontal cable management between moving surface and fixed surface.	
10.2.4.	A quick connect user-accessible interface with accommodations for up to 10 configurable ports must be available and must include full kits including ports, jacks and cables for: USB-A, PS/2, RJ45, RJ11/12 and 3.5mm stereo audio connection kits.	
10.2.5.	The quick connect interface base unit must also provide cable management for the equipment it serves, and the console infrastructure must support cable management from the user's position to the CPUs inside the console.	
10.2.6.	Must provide a horizontal cable raceway for long cable runs.	
10.2.7.	Horizontal cable raceway must be easily accessible and allow drop-in cable runs.	
10.2.8.	Cables routed within a furniture panel system will not be acceptable.	
11.	ENVIRONMENTAL CONTROL SYSTEM	
11.1.	Control Panel	

11.1.1.	Control panel for all environmental settings (task lighting, heating controls and air distribution) must be an integral part of the user interface and be mechanically fastened to the input surface.	
11.1.2.	Must be within primary reach zone (24") of the user.	
11.2.	ADA Compliance	
11.2.1.	System must offer an optional electronic adjustment control located within reach of a wheelchair to meet ADA requirements.	
11.3.	Air Distribution	
11.3.1.	System shall offer user-adjustable fans for circulating fresh air, with a minimum of 2 speed settings.	
11.3.2.	Fans shall be incorporated into the furniture design, providing maximum individualized control within the users primary work zone.	
11.4.	Lighting Levels	
11.4.1.	System shall provide indirect ambient lighting.	
11.4.2.	System shall provide flexible gooseneck style task lighting to allow proper placement of light over work area.	
11.4.3.	Lighting shall be mechanically fastened to console to prevent removal. Lights should be removable for maintenance.	
11.4.4.	System shall use integrated 12VDC LED lighting solutions.	
11.5.	Personal Heating	
11.5.1.	System shall provide two ceramic forced heating sources located under the Input Support Surface. 400 watts maximum to keep from working against the building HVAC.	
11.5.2.	Floor mounted heating solutions will not be acceptable.	
11.3.	Power Requirements	
11.6.1.	115 VAC, 60Hz	

11.6.2.	15 ft. power cord with 3-prong plug	
11.6.3.	0.3 amperes minimum draw, 6.0 amperes maximum draw	
12.	DOCUMENTATION	
12.1.	One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	
13.	WARRANTY	
13.1.	Warranty = Five (5) Years (Vendor shall specify standard warranty and the extended warranty to provide 5 year total warranty coverage.)	
14.	MAINTENANCE	
14.1.1.	Summary of Preventative Maintenance	
14.1.2.	The Vendor will provide Preventative Maintenance to support the lifecycle of the furniture and to maintain the healthy work environment of the dispatch center.	
14.1.3	Services will be twice-yearly throughout the warranty period, with the option of an ongoing service agreement to cover the expected ten year lifecycle of the furniture.	
14.1.4.	Services will be provided either directly by the vendor or through an authorized subcontractor-dealer network.	
14.2.	Detail of Maintenance	
14.2.1.	Clean and vacuum cabinetry inside and out	
14.2.2.	Vacuum fabric panels front and rear	
14.2.3.	Attempt to remove stains from fabric panels	
14.2.4.	Inspect and repair edge molding on top and bottom of fabric panels	
14.2.5.	Vacuum under cavity shelves	
14.2.6.	Vacuum under console, utilizing specialized tool, for discarded food and particles than can cause allergens and attract pests.	
14.2.7.	Clean and wipe down all counters in and around the	

	console	
14.2.8.	Clean and disinfect all high touch areas	
14.2.9.	Clean and disinfect all peripherals including keyboards, mice, phone, and input surfaces.	
14.2.10.	Inspect and/or replace post caps	
14.2.11.	Inspect alignment and fit of work surfaces to side surfaces	
14.2.12.	Re-level and orient primary surfaces	
14.2.13.	Inspect all consoles for level, return consoles to level	
14.2.14.	Align individual positions to room if necessary	
14.2.15.	Align and inspect doors under consoles and rear access doors	
14.2.16.	Inspect and/or replace door stops on foundation	
14.2.17.	We visually inspect all electrical (CPU, radio, USB, Ethernet and monitor) equipment for any anomalies including physical connections, frayed wires and other defects. Repair if furniture related; document and refer if not.	
14.2.18.	Re-fasten leg and comfort control wires	
14.2.19.	Replace broken wire management pieces and tie down wiring related to the mechanical lift portion of the console only.	
14.2.20.	Inspect all filters in the air controls units, replace filters as needed (for an additional cost)	
14.2.21.	Inspect and repair duct arms	
14.2.22.	Inspect fans and control units	
14.2.23.	Tuck and tighten cloth on panels.	
14.2.24.	Inspect and/or re-hang panels to posts	
14.2.25.	Tighten screws or bolts on mechanical parts or wire management.	
14.2.26.	Inspect all console lights and replace light bulbs as needed	

14.2.27.	Clean and disinfect keyboards, mice and monitors. Document defects and refer as needed.	
14.3.	Process and Equipment — as maintenance and cleaning will take place in an operating dispatch center, the follow are required to minimize disruption.	
14.3.1.	All maintenance personnel must satisfy the security requirements of the dispatch center.	
14.3.2.	Cleaning to be completed with fragrance-free, minimal-odor, environmentally safe, bio-degradable products. MSDS Sheets will be available for inspection when requested.	
14.3.3.	Vacuum cleaning equipment shall utilize HEPA filtration (<i>99.9% of particles 1-micron or larger</i>) and operate at less than 68-dB (A) sound level.	
14.3.4.	SHIPPING REQUIREMENTS – Contiguous U.S., F.O.B. All Destinations Non-contiguous U.S., F.O.B. Port	

11. INTEROPERABILITY GATEWAY DEVICES

Category Definition: Devices that interface multiple radios, of multiple makes and models, to analog telephones, to IP telephone networks, and to other devices; allowing multiple simultaneous voice communications to facilitate incident interoperability between respondents equipped with otherwise incompatible technologies; fixed, mobile, and portable devices; analog, digital, or IP-based devices; along with associated firmware and software, interface devices, connecting cables, and accessories.

Example Product: Quantity one (1) — IP Gateway Device Configured to Support a Mobile Command Post

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

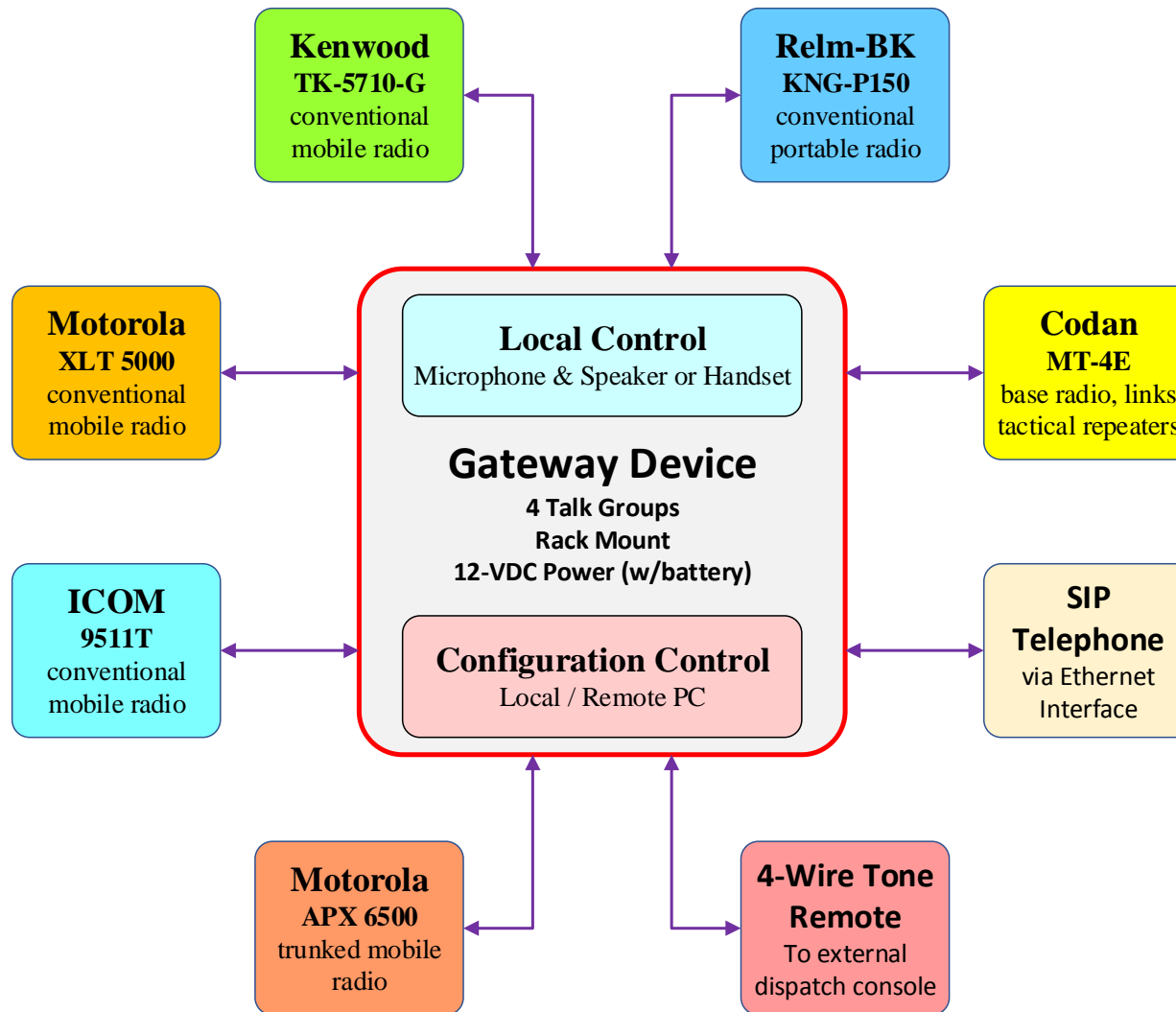
Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	GENERAL FEATURES	
1.1.	The device creates a Local Interoperability System, linking devices such as radios, telephones, or satellite phones into a unified communications system.	
1.2.	The device shall be configured with software control, supporting remote radios, SIP devices, and connections to other Local Interoperability Systems.	
1.3.	The device shall be capable of interfacing any standard	

	radio, as described above, to any analog or digital public telephone network (PSTN) or private branch exchange (PBX).	
1.4.	The device shall allow a minimum of four (4) cross-connect nets at one time (Talk-groups).	
2.	MOUNTING	
2.1.	Customer supplied standard 19 inch equipment rack (84 inch tall)	
3.	POWER	
3.1.	~12 VDC from Customer supplied power system	
3.2.	AC powered equipment shall be provided with an inverter to support operation on DC power.	
4.	CONTROLLER / OPERATING SYSTEM	
4.1.	The Operating System shall use a current version Windows-based operating system to provide a user-friendly interface depicting system operations, allowing programming of features, and providing password protection of features. (Customer supplied PC.)	
4.2.	The Operating System shall allow connection or disconnection of any channel to any other channel.	
4.3.	The Operating System shall provide for the programming of all interface features, such as public telephone interface, SATCOM interface, cellular interface, and two-way radio interface.	
4.4.	The Operating System shall provide the ability to create and store specific interoperability response combinations for pre-planning.	
4.5.	All Call: the Operating System shall provide for a quick	

	and easy broadcast of emergency messages over all channels simultaneously.	
4.6.	IP (RoIP) Interface	
4.7.	RJ-45 connector	
4.8.	10/100 base-T Ethernet, 100 Mbps	
4.9.	Audio delay and jitter buffers to handle network latency	
4.10.	Embedded COR, PTT, and audio vocoder	
5.	LOCAL OPERATOR CONTROL	
5.1.	Local control to modify configuration or select from available stored configurations	
5.2.	Local speaker, with volume control and speaker on/off	
5.3.	Microphone input with PTT	
5.4.	Headphone connection	
6.	IP TELEPHONE (SIP) INTERFACE	
6.1.	Standard: RFC 3261 or current modifications	
6.2.	SIP Support Vcoders: GSM and G711u, with auto-detect/select if the primary codec is not available.	
7.	TONE REMOTE INTERFACE (analog)	
7.1.	Standard: EIA tone remote	
7.2.	RJ-11 jack or terminals	
7.3.	Interface: selectable 2-Wire or 4-Wire, with selectable 600 ohm termination or hi-Z for parallel operation.	
7.4.	Levels: -20 dBm to +10 dBm, with AGC and/or compression to compensate for variations.	
8.	RADIO INTERFACES	

8.1.	Bidder shall supply interface cables to connect a wide range of user radios to the Gateway system.	
9.	SERVICE MANUAL - One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	
10.	WARRANTY – Five (5) Years (specify standard warranty and the extended warranty to provide 5 year total warranty coverage that includes all firmware and software updates.)	
11.	CONFIGURATION: Bidder shall provide the following configuration a hypothetical mobile command post for a multi-agency event. (<i>See illustration</i>)	
11.1.	Interface to one (1) Kenwood TK-5710-G conventional mobile radio	
11.2.	Interface to one (1) Motorola XLT 5000 conventional mobile radio	
11.3.	Interface to one (1) ICOM 9511T conventional mobile radio	
11.4.	Interface to one (1) Motorola APX 6500 trunked mobile radio	
11.5.	Interface to one (1) Relm-BK KNG-P150 conventional portable radio	
11.6.	Interface to one (1) Codan/Daniels MT-4E base radio, which links to tactical repeaters	
11.7.	Interface to one (1) SIP telephone	
11.8.	Interface to one (1) Tone Remote external dispatch console	
11.9.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	



12. CATEGORY: MICROWAVE RADIOS, CARRIER GRADE, PACKET DATA

Category: Microwave Radios, Carrier Grade, Packet Data — includes: Point-to-Point digital microwave radio equipment to operate on Part 101 licensed frequencies above 5925 MHz; available in all-indoor or split system , capable of space diversity, fixed or adaptive modulation,; providing native IP with minimum MTU size of 2048, capable of transporting emulated TDM, with high throughput capacity; supporting N+1 hot standby, and/or XPIC, and/or ring redundancy; along with required bandwidth management / routing equipment and software; and with antennas, feedline systems, hardware (which may be from other manufacturers) to provide a complete system.

Example Product: 6 GHz microwave radio, all-indoor installation, space diversity, providing 150 Mbps data throughput, and 1+1 hot-standby. All antenna system components and hardware, and routing equipment provided by the customer.

The following specifications and equipment configuration describes requirements for a target product Mission Critical Public Safety Equipment. . It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis.

Manufacturer:	Alcatel-Lucent USA Inc. (part of Nokia Group)
Product Model Name/Number:	9500 MPR

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	General Description	
1.1	Frequency Range: 5925 – 6425 MHz (Lower 6 GHz band) Plus 11 and 18 GHz Part 101 frequency bands	Exceeds Requirement. The MPR 9500 MPR supports the Lower 6 GHz, 11 and 18 GHz bands however exceeds the requirement with support for the Upper 6 GHz, 23 GHz, 60 GHz and 80 GHz FCC 101 Bands, 5.8 GHz FCC Part 15 and NTIA 7/8 GHz bands. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.2	Radio Type: Packet Data	Exceeds Requirement. The MPR 9500 MPR is the world leader in fully digital packet microwave point to point radio Please refer to attached 9500 MPR Technical Description for details.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.3	Link Throughput: 150 Mb per second data minimum	Exceeds Requirement. The 9500 MPR offers 150 Mbps however exceeds the requirement by supporting a range of 40 Mbps up to 500 Mbps. Throughput is enabled with Right To Use (RTU) licenses per RF unit. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.4	Operate on a 30MHz RF channel, at 128QAM.	Exceeds Requirement. The 9500 MPR supports operation on a 30 MHz channel at 128 QAM however exceeds the requirement by supporting 5 to 60 MHz channels and modulations from 4 QPSK to 2048 QAM. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.5	Configuration: All-Indoor Installation	Exceeds Requirement. The 9500 MPR can be install all indoor, indoor/outdoor, or all outdoor. Please refer to attached 9500 MPR Technical Description for details.
1.6	Indoor Mounting: Customer supplied standard 19 inch wide — 84 inch tall equipment rack	Exceeds Requirement. The 9500 MPR was designed to fit into a 19in x 84 in rack. Adapters are available for 23in x 84 in racks.
1.7	Electrical Power: Customer Supplied -48 VDC	Exceeds Requirement. The 9500 MPR works with voltages from -48 VDC and +24 VDC.
1.8	Licensing: Bidder to assume coordination and licensing have been successfully completed.	Meets Requirement. Bidder assumes coordination and licensing to have been successfully completed.
2.	Technical Standards	
2.1	Frequency Tolerance: per FCC 101.107	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.2	Channel Bandwidth: per FCC 101.109	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.3	Emission limitations: per FCC 101.111	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.4	Transmit Power: per FCC 101.113	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.5	Operating Environment: per Telcordia GR-63 as applicable	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
3.	OPERATIONAL PARAMETERS	
3.1	Transmit RF Power: < 22 dBm optional > 30 dBm	Meets Requirement. The 9500 offers transmit power ranging from 15 dBm to 35 dBm Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
3.2	Should be Capable of Automatic TX Power Control.	Exceeds Requirement. The 9500 MPR supports ATPC per TSB-10F that includes a five minute timer to protect against unintentional interference conditions Please refer to attached 9500 MPR Technical Specifications Datasheet for details.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
3.3	Minimum Receive Threshold Level at TX/RX Unit Port: <-65dBm	Exceeds Requirement. The 9500 MPR provides exceptional Receiver Threshold down to -96 dBm Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
4.	Resiliency and Protection	
4.1	1+1 Hot Standby TX/RX plus Space Diversity	Exceeds Requirement. The 9500 MPR provides 1+0, 1+1, N:N where N = 0 through 4. All with space diversity. As well as a dual digital combiner receiver incorporating two receivers in one unit. Please refer to attached 9500 MPR Technical Description for details.
5.	Network	
5.1	Interface: Copper Gig E Port or Optical Port	Exceeds Requirement. The MPR 9500 provides both a Copper and Optical Port however exceeds the requirement by supporting up to up to 54 Gig E connections. Please refer to attached 9500 MPR Technical Description for details.
5.2	Monitoring: SNMP Traps	Exceeds Requirement. The 9500 supports SNMP Version 1, 2, and 3. Please refer to attached 9500 MPR Technical Description for details.
6.	One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	Meets Requirement. A comprehensive document set outlining the 9500 MPR overall product and feature sets, theory of operation, test and turn up and troubleshooting tasks.
7.	Warranty – Five (5) Years (specify standard warranty and the extended warranty to provide 5 year total warranty coverage that includes all firmware and software updates.)	Meets Requirement. The 9500MPR standard warranty is twelve months. An extended warranty for additional four years is offered including both firmware and software updates
8.	SHIPPING REQUIREMENTS: F.O.B. Destination Contiguous US F.O.B. Port Non-Contiguous US	Meets Requirement.

13. CATEGORY: MICROWAVE RADIOS, CARRIER GRADE, NATIVE TIME DIVISION MULTIPLEX (TDM)

Category: Microwave Radios, Carrier Grade, TDM — includes: Point-to-Point digital microwave radio equipment to operate on Part 101 licensed frequencies above 5925 MHz; available in all-indoor or split system , capable of space diversity, fix or adaptive modulation; providing native TDM interface with high throughput capacity; supporting N+1 hot standby, and/or XPIC, and/or ring redundancy; along with required bandwidth management / routing equipment and software; and with antennas, feedline systems, hardware (which may be from other manufacturers) to provide a complete system.

Example Product: Lower 6 GHz microwave radio, all-indoor installation, space diversity, providing three (3) DS-3 throughput, and 1+1 hot-standby. All antenna system components and hardware, and routing equipment provided by the customer.

The following specifications and equipment configuration describes requirements for a target product Mission Critical Public Safety Equipment. . It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis.

Manufacturer:	Alcatel-Lucent USA Inc. (part of Nokia Group)
Product Model Name/Number:	9500 MPR

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	General Description	
1.1	Frequency Range: 5925 – 6425 MHz (Lower 6 GHz band) plus 11 and 18 GHz Part 101 frequency bands	Exceeds Requirement. The MPR 9500 MPR supports the Lower 6 GHz, 11 GHz and 18 GHz bands however exceeds the requirement with support for the Upper 6 GHz, 23 GHz, 60 GHz and 80 GHz FCC 101 Bands, 5.8 GHz FCC Part 15 and NTIA 7/8 GHz bands. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.2	Radio Type: Native Time Division Multiplexed (TDM)	Meets Requirement. The MPR 9500 MPR provides Native Time Division Multiplexed (TDM) interfaces Please refer to attached 9500 MPR Technical Description for details.
1.3	Link Throughput: Three(3) DS-3	Exceeds Requirement. The 9500 MPR can supports up to 12 DS3 in a single MSS-8 shelf Please refer to attached 9500 MPR Technical Description for details.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.4	Operate on a 30MHz RF channel, at 128QAM.	Exceeds Requirement. The 9500 MPR supports operation on a 30 MHz channel at 128 QAM however exceeds the requirement by supporting 5 to 60 MHz channels and modulations from 4 QPSK to 2048 QAM. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.5	Configuration: All-Indoor Installation	Exceeds Requirement. The 9500 MPR can be install all indoor, indoor/outdoor, or all outdoor. Please refer to attached 9500 MPR Technical Description for details.
1.6	Indoor Mounting: Customer supplied standard 19 inch wide — 84 inch tall equipment rack	Exceeds Requirement. The 9500 MPR was designed to fit into a 19in x 84 in rack. Adapters are available for 23in x 84 in racks.
1.7	Electrical Power: Customer Supplied -48 VDC	Exceeds Requirement. The 9500 MPR works with voltages from -48 VDC and +24 VDC.
1.8	Licensing: Bidder to assume coordination and licensing have been successfully completed.	Meets Requirement. Bidder assumes coordination and licensing to have been successfully completed by the State entity.
2.	Technical Standards	
2.1	Frequency Tolerance: per FCC 101.107	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.2	Channel Bandwidth: per FCC 101.109	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.3	Emission limitations: per FCC 101.111	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.4	Transmit Power: per FCC 101.113	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.5	Operating Environment: per Telcordia GR-63 as applicable	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
3.	OPERATIONAL PARAMETERS	
3.1	Transmit RF Power: >28 dBm _r -optional <30 dBm	Meets Requirement. The 9500 offers transmit power ranging from 15 dBm to 35 dBm
3.2	Should be Capable of Automatic TX Power Control.	Exceeds Requirement. The 9500 MPR supports ATPC per TSB-10F that includes a five minute timer to protect against unintentional interference conditions
3.3	Minimum Receive Threshold Level at TX/RX Unit Port: <-65dBm	Exceeds Requirement. The 9500 MPR provides exceptional Receiver Threshold down to -96 dBm Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
4.	Resiliency and Protection	
4.1	1+1 Hot Standby TX/RX plus Receive Diversity	Exceeds Requirement. The 9500 MPR provides 1+0, 1+1, N:N where N = 0 through 8. Space diversity and a dual digital combiner receiver incorporating two receivers in one unit is supported. Please refer to attached 9500 MPR Technical Description for details.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
5.	Network	
5.1	Interface: Copper DS-3	Meets Requirement. The 9500 MPR provides native Copper DS3 interfaces
5.2	Monitoring: SNMP Traps	Exceeds Requirement. The 9500 supports SNMP Version 1, 2, and 3. Please refer to attached 9500 MPR Technical description for details.
5.3.	Optional DS-3 to T1 Multiplex	Meets Requirement. Optional external M13's can be provided. The 9500 MPR can provide up to 12 OC3 or 12 DS3 or 192 DS1's negating the need of an M13.
6.	One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	Meets Requirement. A comprehensive document set outlining the 9500 MPR overall product and feature sets, theory of operation, test and turn up and troubleshooting tasks
7.	Warranty – Five (5) Years (specify standard warranty and the extended warranty to provide 5 year total warranty coverage that includes all firmware and software updates.)	Meets Requirement. The 9500MPR standard warranty is twelve months. An extended warranty for additional four years is offered including both firmware and software updates
8.	SHIPPING REQUIREMENTS: F.O.B. Destination Contiguous US F.O.B. Port Non-Contiguous US	Meets Requirement.

14. MICROWAVE RADIOS, NETWORK GRADE

Category: Microwave Radios, Network Grade— includes: Point-to-Point digital microwave radio equipment to operate on Part 101 licensed frequencies above 5925 MHz; capable of fix or adaptive modulation, RF power above +15 dBm; providing native packet data with high throughput capacity supporting emulated TDM over packet data; minimum MTU size of 2048; integrated or non-integrated antenna systems ; along with required bandwidth management / routing equipment and software; and with antennas, feedline systems, hardware (which may be from other manufacturers) to provide a complete system.

Example Product: 11 GHz microwave radio, split indoor-outdoor installation, providing 100 Mbps raw data throughput, non-integrated antenna system. All antenna system components and hardware, and routing equipment provided by the customer.

The following specifications and equipment configuration describes requirements for a target product Network Grade Public Safety Equipment. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis

Manufacturer:	Alcatel-Lucent USA Inc. (part of Nokia Group)
Product Model Name/Number:	9500 MPR

Item #	Description	Item #
1.	General Description	
1.1	Frequency Range: 5925-6425 MHz (6 GHz band) 10.7 – 11.7 GHz (11 GHz band)	Exceeds Requirement. The MPR 9500 MPR supports the Lower 6 GHz, and 11 GHz bands however exceeds the requirement with support for the Upper 6 GHz, 18 GHz, 23 GHz, 60 GHz and 80 GHz FCC 101 Bands, 5.8 GHz FCC Part 15 and NTIA 7/8 GHz bands. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.2	Radio Type: IP Packet	Exceeds Requirement. The MPR 9500 MPR is the world leader in fully digital packet microwave point to point radio Please refer to attached 9500 MPR Technical Description for details.
1.3	Link Throughput: 100 Mb per second raw data	Exceeds Requirement. The 9500 MPR throughput is available in the range of 40 Mbps up to 500 Mbps. Throughput is enabled with Right To Use (RTU) licenses per RF unit. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.

1.4	Modulation & Bandwidth: as determined by bidder to achieve the specified link throughput	Exceeds Requirement. The 9500 MPR supports 5 to 60 MHz channels and modulations from 4 QPSK to 2048 QAM. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
1.5	Configuration: Split Indoor-Outdoor Installation	Exceeds Requirement. The 9500 MPR can be install all indoor, indoor/outdoor, or all outdoor. Please refer to attached 9500 MPR Technical Description for details.
1.6	Indoor Mounting: Customer supplied standard 19 inch wide — 84 inch tall equipment rack	Exceeds Requirement. The 9500 MPR was designed to fit into a 19in rack. Adapters are available for 23in racks.
1.7	Outdoor Mounting: feed location of antenna (antenna make and model shall be specified but not priced to provide equal comparison)	Exceeds Requirement. The 9500 MPR Outdoor unit is capable of interfacing with commercially off the shelf (RFS, Commscope) antennas. Integrated ODU/antennas where the Outdoor unit mounts directly to the rear of the antenna are also available. Make and model is included under the Microwave Ancillary section. Please refer to attached 9500 MPR Technical Description for details.
1.8	Electrical Power: Customer Supplied -48 VDC	Exceeds Requirement. The 9500 MPR works with voltages from -48 VDC and +24 VDC.
1.9	Licensing: Bidder to assume coordination and licensing have been successfully completed.	Meets Requirement. Bidder assumes coordination and licensing to have been successfully completed by the State entity.
2.	Technical Standards	
2.1	Frequency Tolerance: per FCC 101.107	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.2	Channel Bandwidth: per FCC 101.109	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.3	Emission limitations: per FCC 101.111	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.4	Transmit Power: per FCC 101.113	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
2.5	Operating Environment: per Telcordia GR-63 and IEC 60721 class 4M5 IP67 as applicable	Meets Requirement Please refer to attached 9500 MPR Technical Specifications Datasheet
3.	OPERATIONAL PARAMETERS	
3.1	Transmit RF Power: >15 dBm minimum	Meets Requirement. The 9500 offers transmit power ranging from 15 dBm to 35 dBm Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
3.2	Should be Capable of Automatic TX Power Control	Exceeds Requirement. The 9500 MPR supports ATPC per TSB-10F that includes a five minute timer to protect against unintentional interference conditions Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
4.	Network	

4.1	Interface: Copper Gig E Port or Optical Port	Exceeds Requirement. The MPR 9500 provides both a Copper and Optical Port however exceeds the requirement by supporting up to up to 54 Gig E connections. Please refer to attached 9500 MPR Technical Description for details.
4.2	Monitoring: SNMP Traps	Exceeds Requirement. The 9500 supports SNMP Version 1, 2, and 3. Please refer to attached 9500 MPR Technical Specifications Datasheet for details.
5.	One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	Meets Requirement. A comprehensive document set outlining the 9500 MPR overall product and feature sets, theory of operation, test and turn up and troubleshooting tasks.
6.	Warranty – Five (5) Years (specify standard warranty and the extended warranty to provide 5 year total warranty coverage that includes all firmware and software updates.)	Meets Requirement. The 9500MPR standard warranty is twelve months. An extended warranty for additional four years is offered including both firmware and software updates
7.	SHIPPING REQUIREMENTS: F.O.B. Destination Contiguous US F.O.B. Port Non-Contiguous US	Meets Requirement.

15. MICROWAVE RADIO, NATIVE IP, SUB 5.9 GHz

Category Definition: Point-to-Point digital microwave radio equipment to operate on Part 15 unlicensed frequencies and on Part 90 and Part 101 licensed frequencies above 1 GHz and below 5.9 GHz; capable of RF power above +20 dBm; providing native packet data and analog interfaces; with mid to high throughput capacity; minimum MTU size of 2048; along with required bandwidth management / routing equipment and software.

Example Product: Quantity one (1) Terminal – 4.9 GHz microwave radio, providing 20 Mbps data throughput.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	GENERAL DESCRIPTION	
1.1.	Frequency Range: 4940 – 4990 MHz (4.9 GHz licensed public safety band)	
1.2.	Radio Type: Packet Data	
1.3.	Link Throughput: >20 Mb per second data	
1.4.	Modulation & Bandwidth: as determined by bidder to achieve the specified link throughput	
1.5.	Indoor Mounting: Customer supplied standard 19 inch	

	wide — 84 inch tall equipment rack	
1.6.	Outdoor Mounting: feed location of antenna (antenna make and model shall be specified but not priced to provide equal comparison)	
1.7.	Electrical Power: Customer Supplied -48 VDC	
2.	TECHNICAL STANDARDS	
2.1.	Frequency Tolerance: per FCC 90.1201 through 90.1217 or most current standards	
2.2.	Channel Bandwidth: per FCC 90.1201 through 90.1217 or most current standards	
2.3.	Emission limitations: per FCC 90.1201 through 90.1217 or most current standards	
2.4.	Transmit Power: per FCC 90.1201 through 90.1217 or most current standards	
2.5.	Operating Environment: per Telcordia GR-63 as applicable and IEC 60721 class 4M5 IP67	
3.	OPERATIONAL PARAMETERS	
3.1.	Transmit RF Power: >15 dBm	
3.2.	Manual Transmitter Power Adjustment	
4.	NETWORK	
4.1.	Interface: Interface should be capable of supporting copper Ethernet or Optical interface supporting IP	
4.2.	Monitoring: SNMP Traps	
5.	SERVICE MANUAL - One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by supporting technician.	
6.	WARRANTY – Five (5) Years	

	(specify standard warranty and the extended warranty to provide 5 year total warranty coverage that includes all firmware and software updates.)	
7.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

16. MICROWAVE RADIO, NATIVE IP, 900 MHz

Category Definition: Point-to-Point digital radio equipment to operate on Part 90 and Part 101 licensed frequencies below 3 GHz; capable of RF power above +25 dBm; providing native packet data with low throughput capacity; minimum MTU size of 2048; with digital and analog interfaces; along with antennas and associated hardware.

Example Product: Quantity one (1) Terminal – 900 MHz digital radio, providing >300 Kbps data throughput.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	GENERAL DESCRIPTION	
1.1.	Frequency Range: 928 - 960 MHz (900 MHz licensed OFS band with 9 MHz T-R split)	
1.2.	Radio Type: Packet Data	
1.3.	Link Throughput: >300 Kb per second data	
1.4.	Modulation & Bandwidth: as determined by bidder to achieve the specified link throughput	
1.5.	Indoor Mounting: Customer supplied standard 19 inch	

	wide — 84 inch tall equipment rack	
1.6.	Outdoor Mounting: feed location of antenna (antenna make and model shall be specified but not priced to provide equal comparison)	
1.7.	Electrical Power: Customer Supplied -48 VDC	
2.	TECHNICAL STANDARDS	
2.1.	Frequency Tolerance: per FCC 101.107 or most current standards	
2.2.	Channel Bandwidth: per FCC 101.109 or most current standards	
2.3.	Emission limitations: per FCC 101.111 or most current standards	
2.4.	Transmit Power: per FCC 101.113 or most current standards	
2.5.	Operating Environment: per Telcordia GR-63 as applicable and IEC 60721 class 4M5 IP67 or most current Operating Environment standards	
3.	OPERATIONAL PARAMETERS	
3.1.	Transmit RF Power: >25 dBm	
3.2.	TX Power Control Range: >15 dB Capability of manual transmitter power adjustment	
3.2	Optional N+1 redundancy and receive diversity	
4.	NETWORK	
4.1.	Interface: Capable of supporting copper Ethernet or Optical interface supporting IP	
4.2.	Monitoring: SNMP Traps	
5.	SERVICE MANUAL - One (1) set system documentation,	

	operations and service manuals, printed or electronic copy, for technician.	
6.	WARRANTY – Five (5) Years, includes all firmware and software updates.	
7.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

17. MONITORING & ALARM, ENVIRONMENTAL

Category Definition: Automated communication systems for collecting and transmitting environmental data for emergency notification (fire, flood, volcanic eruption, tsunami, etc.), along with all associated hardware, software, and accessories to complete and maintain the system.

Example Product: Quantity one (1) — Remote Automated Weather Station (RAWS) per NFDRS Standards

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Remote Automatic Weather Station should include the following: National Fire Danger Rating System NFDRS Remote automated Weather Station (RAWS) per National Wildfire Coordination Group standard PMS 426-3	
2.	Dedicated Data Acquisition System for AWS. (data logger)	
3.	The data logger should have battery-backed SRAM for CPU usage, program storage, and data storage for up to at least one million data values with upgradeable memory size at a later date without any hardware replacements and with inherent noise reducing facility. It should be compatible	

	<p>with 12VDC power supply and should have programming and math functions capability for deriving calculated parameters with high program execution rate of up to 100 Hz for making fast measurements. It should have ability to implement conditional statements in the data logger programming. The Histogram instruction is required to process input data as either a standard histogram (frequency distribution) or a weighted value histogram. It should be possible to calculate the standard deviation of the Source over the output interval and store the results in a Data Table. The data logger should have ability to reject the 50Hz noise for accurate measurements. Special Software with Data logger should be provided to monitor various sensors.</p>	
4.	<p>Software: Special Software should be provided with Data logger to monitor various sensors.</p>	
5.	<p>Range and Auto Ranging: Support of +/-5VDC range and should have auto ranging facility apart from making measurements on following ranges specific to a channel: e.g., ±5000 mv, ±2500 mv, ±250 mv, ±25 mv, ±7.5 mv, ±2.5 mv, with resolution on the most sensitive range better than 0.5 microvolt.</p>	
6.	<p>Switched voltage excitations: The system should have switched outputs provided for precision excitation voltages.</p>	
7.	<p>DIGITAL I/O PORTS: Minimum eight ports should be provided for frequency measurements, digital control, and triggering.</p>	
8.	<p>SWITCHED 12 VOLT: Two independent 12 V unregulated sources switched on & off under program control.</p>	
9.	<p>Operating Temperature Range: -55° to +50°C</p>	
10.	<p>Enclosure: The data logger should be housed in a weatherproof enclosure of NEMA-IV rating.</p>	

11.	Power Supply: Charger/Regulator 12VDC	
12.	Wall Adaptor AC-DC 120 VAC to 18 VDC	
13.	Cord with type-C plug	
14.	Battery 12V 7AH (minimum)	
15.	Sensors: (All sensors should be compatible with data logger, include mounting hardware and have a cable sufficient to allow mounting, and Operating Temperature: (40° to +60°C).	
16.	Air Temperature & Relative Humidity Sensor Combined:	
16.1.	Relative Humidity Measurement Range:0 to 100% RH, non-condensing	
16.2.	Output Signal Range: 0 to 2 V dc max.	
16.3.	Typical Long-Term Stability: Better than 1% RH per year	
16.4.	Voltage: 12 V dc Nominal or equivalent	
16.5.	Current Consumption: max 4 mA	
16.6.	PRT based Measurement Range: -40° to +60°C	
16.7.	Output signal range: 0 to 1.0 V	
17.	ATMOSPHERIC PRESSURE SENSOR:	
17.1.	Pressure Range 600 to 1100 hPa (mbar)	
17.2.	Operating Temperature -50 to +60°C Accuracy at least ±0.5 hPa (mbar) at -50 to +60°C.	
18.	SOLAR RADIATION SENSOR: - Pyranometer based	
18.1.	Light Spectrum Waveband: 400 to 1100 nm	
18.2.	Sensitivity: Typically 80 per1000	
18.3.	Wm-2 Linearity: Maximum deviation of 1% up to 3000 W	

	m-2 Accuracy: $\pm 5\%$	
18.4.	Tipping Bucket Rain Gauge	
18.5.	Tips at 0.1 mm increments (0.004 in) Orifice diameter is max 24.5 cm (9.66 in) Accuracy is $\pm 1\%$ at rates up to 1 in per hr.	
18.6.	Output: Momentary switch closure activated by tipping bucket mechanism.	
18.7.	Environmental Limits: Temperature: 0° to +50°C and Humidity: 0 to 100% The bucket should have leveling arrangement for horizontal mounting.	
19.	WIND SPEED AND DIRECTION SENSOR: (Identify type, ie propeller, ultra sonic, etc.) (The sensor should be made out of rigid UV-stabilized thermoplastic with corrosion proof stainless steel and anodized aluminum fittings. The sensor should have stainless steel precision-grade ball bearings for the propeller shaft and vertical shaft bearings.)	
19.1.	Wind Speed Range: 0-100 m/s	
19.2.	Accuracy: ± 0.3 m s	
19.3.	Starting threshold: 1.0 m/s	
19.4.	Wind Direction Range: 0-360°	
19.5.	Accuracy: $\pm 3^\circ$ Starting threshold: 1.1 m/s	
19.6.	Damping ratio: max 0.25 Output: Analog dc voltage from potentiometer linearity 0.25%	
20.	OPERATORS MANUAL - Operator manual shall identify the location of all switches, controls, indicators, and contain step-by-step instructions for operation of all capabilities.	
21.	WARRANTY - Contractor is responsible for all warranties required herein. Any warranty offered by the original goods	

	manufacturer shall not relieve contractor of this responsibility.	
21.1.	Base warranty 2 year minimum	
21.2.	Extended warranty up to 60 months	
21.3.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

18. MONITORING & ALARM, RADIO NETWORK

Category Definition: IP and analog radio network monitoring software & hardware, SCADA software & hardware, SNMP manager and agent software & hardware, remote terminal units (RTU), RF and radio site sensors.

Example Product: Quantity one (1) — Hypothetical radio system monitoring (RSM) configuration.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	OVERALL SPECIFICATION	
1.1.	The RSM shall provide indications, alarms and status of the equipment and systems being monitored that facilitate timely, precise interpretation of abnormal or	

	failed conditions within the radio network	
1.2.	The RSM shall consist of (a) server software {physical or virtual servers}, (b) IP and analog transmission paths, and (c) interfaces to remote equipment and/or sensors.	
1.3.	The RSM shall integrate into a single unified system alarm and status messages from multiple types of equipment from multiple manufacturers — such as radio repeaters, microwave radios, IP switches, power supplies, solar controllers, generators, HVAC equipment, and access control systems.	
1.4.	The RSM shall be designed to minimize the loss of status, alarm, and event messages during transmission to the server.	
1.5.	The RSM shall easily configured and expanded to accommodate additional inputs and monitored sites.	
2.	RSM Server	
2.1.	The RSM server software shall operate on a virtual-server environment. (Customer supplied and managed server.)	
2.2.	The RSM server shall operate within the network security and antivirus requirements of the customer agency. (Customer supplied and managed firewall and antivirus.)	
2.3.	The RSM server shall support multiple simultaneous access to status and alarm information	
2.3.1.	– Interface via a PC client for configuration and monitoring	
2.3.2.	– Interface via web client for access to monitoring.	
2.3.3.	– Interface via smart phone application for access to monitoring.	
2.4.	The RSM server shall support multiple password protected user accounts to manage system access	

2.4.1.	– Control access to (a) specific monitored equipment, (b) specific types of groups of equipment, or (c) specific sites, or (d) any combination.	
2.4.2.	– Provide multiple levels of access: (a) view only, (b) view and remote control, (c) view, remote control, and configure.	
2.5.	The RSM server software shall record and process alarm and status data according to individualized and categorized scripts, which include: severity of alarm, time of day, season, and on-call duty assignments.	
2.5.1.	RSM software shall provide logs of monitored parameters, alarms, and alarm responses. (Log capacity not specified; assumed to be a server capacity issue.)	
2.6.	The RSM server shall provide external messaging in response to alarm and status data:	
2.6.1.	– Messaging via SMTP (email)	
2.6.2.	– Messaging via SMS (text)	
2.6.3.	– Messaging via SNMP traps (to other systems)	
2.6.4.	– Messaging via SIP phone (voice messages).	
2.7.	The RSM server shall provide response escalation, sending additional messages and including additional recipients if the required acknowledgment is not received in the defined response time.	
2.8.	The RSM configuration shall be expandable to accommodate future additional sites and monitor inputs.	
3.	HYPOTHETICAL RADIO SYSTEM — The hypothetical radio system consists of a central dispatch center and two radio sites, with a separate radio shop that maintains the radio system.	
4.	Radio Shop — located on the same campus and with IP network connectivity to, the Dispatch Center. The radio	

	shop has the following resources that shall be integrated into RSM:	
4.1.	PC workstation (customer supplied) dedicated to configuration and monitoring of RSM.	
4.2.	Test radio for evaluation and maintenance of the radio system. RSM shall be configured to provide off-site access to the test radio for radio system evaluation as follows:	
4.2.1.	– Channel Change, via four separate contact closures to steer channel selection.	
4.2.2.	– PTT, via contact closure	
4.2.3.	– Transmit Indicator (TX)	
4.2.4.	– Receive Signal Strength Indicator (RSSI)	
5.	Dispatch Center — site is AC powered with backup generator, UPS, and DC power system. RSM shall monitor the following equipment and test points:	
5.1.	Backup Generator, which communicates using MOD BUSS protocol. RSM shall display the following: (all sensors provided as part of generator)	
5.1.1.	– Fuel Level	
5.1.2.	– Engine Temperature	
5.1.3.	– Oil Pressure	
5.1.4.	– Output Voltage	
5.1.5.	– Output Current	
5.2.	Uninterruptible Power System, which communicates using SNMP. RSM shall display the following:	
5.2.1.	– Incoming AC Line Voltage	
5.2.2.	– Output AC line voltage	
5.2.3.	– Output AC load	
5.3.	12VDC Power System with battery backup. RSM shall display the following:	

5.3.1.	– Output DC voltage	
5.3.2.	– Output DC current	
5.3.3.	– Battery Load Current (0-30 A)	
5.4.	Equipment Room Sensors	
5.4.1.	– Room Temperature Sensor	
5.4.2.	– Door Alarm (contact closure, customer supplied)	
5.4.3.	– Room smoke alarm (contact closure, customer supplied)	
5.5.	Codan MT-4E base radio, which provides analog link to radio #1 at site #1. RSM shall display the following:	
5.5.1.	– Transmit Indicator (TX)	
5.5.2.	– Receive Signal Strength Indicator (RSSI)	
5.5.3.	– Forward & Reflected RF Power — antenna line sensor installed at the output of filter cavities and circulators, which provides RS232 and Ethernets port – UDP/IP or SNMP interfaces (customer supplied)	
5.6.	IP Microwave to Radio Site #2, which communicates using SNMP. RSM shall report alarm indications provided by the SNMP.	
6.	Radio Site #1 — site is a solar powered with 12 VDC power system. Site communicates with Dispatch Center via analog radio. RSM shall monitor the following equipment and test points:	
6.1.	MorningStar Pro-Star solar power controller. RSM shall display the following:	
6.1.1.	– Solar Array Voltage (0-150 V)	
6.1.2.	– Output Voltage (nominal 12 V)	
6.1.3.	– Charge Current (0-30 A)	
6.1.4.	– Battery Load Current (0-30 A)	

6.2.	Building Alarms	
6.2.1.	– Room Temperature Sensor	
6.2.2.	– Door Alarm (contact closure, customer supplied)	
6.2.3.	– Smoke Alarm (contact closure, customer supplied)	
6.2.4.	– Water Intrusion Alarm (contact closure, customer supplied)	
6.3.	Codan MT-4E repeater radio.. RSM shall display the following:	
6.3.1.	– Transmit Indicator (TX)	
6.3.2.	– Receive Signal Strength Indicator (RSSI)	
6.3.3.	– Forward & Reflected RF Power — antenna line sensor installed at the output of filter cavities and circulators, which provides RS232 and Ethernets port – UDP/IP or SNMP interfaces (customer supplied)	
7.	Radio Site #2 — site is AC powered with 12 VDC and 48 VDC power systems. Site communicates with Dispatch Center via ethernet microwave. RSM shall monitor the following equipment and test points:	
7.1.	Backup Generator, which communicates using MOD BUSS protocol. RSM shall display the following: (all sensors provided as part of generator)	
7.1.1.	– Fuel Level	
7.1.2.	– Engine Temperature	
7.1.3.	– Oil Pressure	
7.1.4.	– Output Voltage	
7.1.5.	– Output Current	
7.2.	+12VDC Power System with battery backup. RSM shall display the following:	
7.2.1.	– Output DC voltage	

7.2.2.	- Output DC current	
7.2.3.	- Battery Load Current (0-60 A)	
7.3.	-48VDC Power System with battery backup. RSM shall display the following:	
7.3.1.	- Output DC voltage	
7.3.2.	- Output DC current	
7.3.3.	- Battery Load Current (0-60 A)	
7.4.	Building Alarms	
7.4.1.	- Room Temperature Sensor	
7.4.2.	- Door Alarm (contact closure, customer supplied)	
7.4.3.	- Smoke Alarm (contact closure, customer supplied)	
7.4.4.	- Water Intrusion Alarm (contact closure, customer supplied)	
7.5.	IP Microwave to Radio Site #1, which communicates using SNMP. RSM shall report alarm indications provided by the SNMP.	
7.6.	Quantity = 3, Motorola Quantar base radios, configured with RF combiner and receive multicoupler with one transmit and one receive antenna.	
7.6.1.	- Transmit Indicator (TX) {one per radio}	
7.6.2.	- Receive Signal Strength Indicator (RSSI) {one per radio}	
7.6.3.	- Forward & Reflected RF Power — TX antenna line sensor installed at the output of filter cavities and circulators, which provides RS232 and Ethernets port – UDP/IP or SNMP interfaces (customer supplied)	
8.	OPERATORS MANUAL: Operator manual shall identify the location of all switches, controls, indicators, and contain step-by-step instructions for operation of all capabilities.	
9.	WARRANTY: Three (3) Years	

	(Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
10.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

19. POWER SYSTEMS, DC CONVERSION

Category Definition: AC/DC converters, battery chargers, DC/DC converters, along with low voltage disconnect, DC breakers, power distribution panels, and associated hardware and software.

Example Product: Quantity one (1) — 12VDC 75 AMP Battery Charger

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Operates under extreme environmental Conditions	
1.1.	Automatic Power Factor Correction	
1.2.	Minimum average monthly PF of 0.95	
2.	Electrical	
2.1.	Input 120VAC 18.2 AMP	
2.2.	Output 13.6 VDC 75 AMP	
2.3.	Short Circuit Protection	
2.4.	Overload Protection	

2.5.	Thermal Protection	
2.6.	Temperature Range 32 to 104 degrees F	
3.	CORD CONFIGURATION: 1 NEMA 5-20P for a 20A receptacle	
4.	OPERATORS MANUAL: Operator manual shall identify the location of all switches, controls, indicators, and contain step-by-step instructions for operation of all capabilities.	
5.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
6.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

20. POWER SYSTEMS, FUEL CELL

Category Definition: Fuel-cell generators using either gaseous hydrogen or methanol fuel, along with specialized racks and/or cabinets, fuel storage subsystems, and installation materials.

Example Product: Quantity one (1) — 2.5 Kw Fuel Cell Backup DC Power Generator

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Maximum power 2,500W per chassis	
1.1.	Output voltage: 48 VDC nominal	
1.2.	Rated current: 52.5A @ 48V nominal	
1.3.	Fuel: Industrial grade hydrogen (99.95%)	
1.4.	Mounting: standard 23” equipment rack	
1.5.	Location: Indoors	
1.6.	Ambient Operating Temperature: 23°F to 122°F	

1.7.	Relative Humidity: 0-95% non-condensing	
1.8.	Altitude: < 13,800 ft	
1.9.	Emissions: water vapor < 32mL / kWh	
1.10.	Remote Monitoring: Provides system configuration, status, operational, and historical data	
1.11.	Communications: USB and Ethernet, SNMP and web interface	
2.	DOCUMENTATION: One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by technician.	
3.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
4.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

21. POWER SYSTEMS, ELECTRO-MECHANICAL GENERATORS

Category Definition: AC and DC power generators operating with diesel, gasoline or propane fuel. Indoor or Outdoor installation systems to include transfer switches, panels, monitoring, and controlling accessories including timing and sensing functions with related hardware and software.

Example Product: Quantity one (1) — 45KW propane fueled outdoor cabinet with automatic transfer switch, remote monitoring and control.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Backup Generator Set	
1.1.	Operates under extreme environmental conditions	
1.2.	Certified per latest EPA, UL and IBC Seismic standards	
1.3.	Meets or exceeds NFPA 110 Level 1 UL 2200	
1.4.	Meets FCC Title47 part 15 class B Radio Frequency Emissions	
1.5.	Meets EFP emissions, emergency, stationary, 40CFR60	
1.6.	Single fuel - propane field selectable	
1.7.	Meets WSDA Forest Service Sep-3001-1	

1.8.	Closed coolant recover system	
1.9.	Extended Oil and Coolant drains	
2.	Enclosure	
2.2.	Metal meets ASCE7-10 wind loads	
2.3.	Removable panels for easy repair/service	
2.4.	Designed with residential grade sound attenuation.	
2.5.	Rodent guards	
2.6.	Lockable door latches	
2.7.	Fade and Corrosion resistant finish	
3.	Electrical	
3.1.	One Phase 120/240 volt AC	
3.2.	60 Hz	
3.3.	175 amps (a 45KW generator will provide 188 amps)	
4.	Remote: Control / Monitoring System	
4.1.	Provide total system integration for ATS signaling auto start utility failure applications	
4.1.1.	Remote communications and adjustments via RS232 and/or Ethernet.	
4.1.2.	PC Control Software	
4.2.	Alarm and status message display, Data Logging and Fault Protection	
4.3.	Output metering	
4.4.	Remote starting/stopping	
4.5.	Frequency and voltage regulation	
4.6.	Auto-shutdown at fault detection	

4.6.1.	Engine protection faults to include, over speed, low oil pressure, High coolant Temp, Low coolant level, low coolant Temp, high and low battery voltage, over crank shut down, common fault relay with 3 configurable relays.	
4.7.	Meet NFPA 110 Level 1	
5.	Automatic Transfer Switch	
5.1.	One Phase 120/240 volt AC service rated 200 AMP with status relays	
5.2.	NEMA/UL Type 3 enclosure with lockable doors and controls	
5.3.	Functions	
5.3.1.	Utility voltage drop out, adjustable	
5.3.2.	Utility voltage pickup, adjustable	
5.3.3.	Timer to generator start adjustable, adjustable	
5.3.4.	Re-transfer time delay, adjustable	
5.3.5.	Engine cool down timer, adjustable	
5.3.6.	Exerciser , adjustable and optional remote capability	
6.	Operators Manual For Generator /ATS	
6.1.	Operator manual shall identify the location of all switches, controls, indicators, and contain step-by-step instructions for operation of all capabilities.	
6.1.1.	Parts and Service Manual at no charge	
6.2.	Owner Training: At site start-up and instructions, upon completion of installation, using existing building loads.	
6.3.	County of origin documentation (for Federally funded projects)	
7.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total	

	warranty coverage.)	
	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

22. POWER SYSTEMS, UNINTERRUPTIBLE POWER SUPPLY (UPS)

Category Definition: Uninterruptible Power Systems, AC to AC, AC to DC double conversion on line, with associated installation wiring components, hardware and software, rack mount, vertical tower, free standing.

Example Product: Quantity one (1) — Uninterruptible Power System Double Conversion on line 120 VAC input 120VAC output 2100 watts/ 3000 VA.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Operates under extreme environmental Conditions	
1.1.	Temperature 32 to 104 degrees F	
1.2.	Elevation up to 10,000 ft.	
1.3.	Humidity 0% to 95%	
2.	Electrical	
2.1.	Power Factor Correcting	
2.1.	Input 120VAC NEMA L5-30P	
2.2.	Output (6) NEMA 5-15R (2) NEMA 5-20R	

2.3.	Internal Bypass (automatic and manual)	
3.	Run Time	
3.1.	4 Minutes Minimum Internal Battery 100% Load	
3.2.	90 Minutes Additional External battery 100% Load	
4.	Battery	
4.1.	Maintenance-free sealed lead-Acid	
4.2.	Recharge time 3.00 hours	
5.	Operators Manual - Operator manual shall identify the location of all switches, controls, indicators, and contain step-by-step instructions for operation of all capabilities.	
6.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
7.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

23. TEST EQUIPMENT, MULTIFUNCTION RADIO TEST SET

Category Definition: Specialized high-accuracy multi-function test instrument for the testing of two way radios. Includes: portable instruments, rugged field service instruments, laboratory instruments, along with related test adapters and accessories.

Example Product: Quantity one (1) — Compact multifunction instrument for testing and alignment of two-way radios (AKA: Radio Service Monitor)

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	Summary of Functions	
1.1.	AM/FM/P-25 Monitor	
1.2.	AM/FM/P-25 Generator	
1.3.	Duplex Generator	
1.4.	Signal Strength Meter	
1.5.	RF Power Meter	
1.6.	Spectrum Analyzer	

1.7.	Tracking Generator	
1.8.	RF Cable Fault Locator	
1.9.	Frequency Counter	
1.10.	Frequency Error Meter	
1.11.	AM Modulation Meter	
1.12.	FM Deviation Meter	
1.13.	SINAD/Distortion Meter	
1.14.	Audio Synthesizer	
1.15.	Oscilloscope	
1.16.	Digital Voltmeter	
2.	Time-Base	
2.1.	Temperature Stability = ± 0.15 ppm at -20° C to 70° C	
2.2.	Aging = 0.5 ppm First Year / 0.3 ppm After First Year	
3.	RF Generator (Receiver Test)	
3.1.	Port Input Protection	
3.1.1.	GEN Port: +20 dBm (Input Power Alarm Typical)	
3.1.2.	T/R Port: +49 dBm CW (Input Power Alarm Typical)	
3.1.3.	T/R Port: $>+90^{\circ}$ C (Temperature Alarm Typical)	
3.2.	Frequency	
3.2.1.	Range = 2 MHz to 1000 MHz <2 MHz to 100 kHz Usable Range	

3.2.2.	Accuracy = Same as time-base	
3.3.3	Resolution = 1 Hz	
3.3.	Output Level	
3.3.1	Range <ul style="list-style-type: none"> - T/R Port: -50 to -125 dBm - ANT Port: -30 to -90 dBm - GEN Port: -5 to -65 dBm 	
3.3.2	Accuracy = ± 2 dB / ± 3 dB <-100 dBm	
3.3.3	Resolution = 1 dB	
3.4.	Signal Purity	
3.4.1.	Port VSWR < 1.5:1 (all ports)	
3.4.2.	SSB Phase Noise = -90 dBc/Hz at 20 kHz offset	
3.4.3.	Spurious <ul style="list-style-type: none"> - Harmonics = -30 dBc maximum, - Non-Harmonics = -40 dBc maximum (±20 kHz offset from carrier; 0 to 1 GHz)	
3.4.4.	Residual FM <ul style="list-style-type: none"> - <20 Hz rms in 300 Hz to 3 kHz BW - <4 Hz rms, <100 MHz - <6 Hz rms, <800 MHz - <11 Hz rms, >800 MHz 	
3.4.5.	Residual AM <1% rms in 300 Hz to 3 kHz BW	
3.5.	ModulationTypes	

3.5.1.	1 kHz Tone	
3.5.2.	Private Line	
3.5.3.	Digital Private Line (w/ DPL Invert)	
3.5.4.	Single Tone	
3.5.5.	DTMF	
3.5.6.	Paging - Two-Tone & 5/6 Tone	
3.5.7.	External microphone & input connector	
3.6.	FM Modulation	
3.6.1.	Deviation Range = 0 to 75 kHz	
3.6.2.	Total Harmonic Distortion < 3%	
3.6.3.	Resolution < 10 Hz	
3.6.4.	Accuracy < ±10% (2 kHz to 50 kHz deviation)	
3.7.	AM Modulation	
3.7.1.	Range = 0 to 100%	
3.7.2.	Resolution < 1%	
3.7.3.	Total Harmonic Distortion < 3% (20% to 90% mod)	
3.7.4.	Accuracy < 10% of setting (20% to 90% mod)	
4.	RF RECEIVER (TRANSMITTER TEST)	
4.1.	Port Input Protection	
4.1.1.	ANT Port: +20 dBm (Input Power Alarm Typical)	
4.1.2.	T/R Port: +49 dBm CW (Input Power Alarm Typical)	

4.1.3.	T/R Port: >+90° C (Temperature Alarm Typical)	
4.2.	Frequency	
4.2.1.	Range = 2 MHz to 1000 MHz <2 MHz to 100 kHz Usable Range	
4.2.2.	Accuracy = Same as Time-base	
4.2.3.	Resolution = 1 Hz	
4.3.	Input Amplitude	
4.3.1.	Sensitivity <ul style="list-style-type: none"> - ANT: -110 dBm for 10 dB SINAD - T/R: -40 dBm for 10 dB SINAD 	
4.3.2.	Minimum Level Receiver Measurements <ul style="list-style-type: none"> - ANT: -80 dBm for RF Error Meter - T/R: -40 dBm for RF Error Meter 	
4.3.3.	DEMODO Meters <ul style="list-style-type: none"> - Modulation - Distortion - SINAD - AF Counter 	
4.4.	IF Bandwidth	
4.4.1.	FM: <ul style="list-style-type: none"> - 5 kHz, - 6.25 kHz, - 10 kHz, - 12.5 kHz, 	

	<ul style="list-style-type: none"> - 25 kHz, 	
4.4.2.	<p>AM:</p> <ul style="list-style-type: none"> - 5 kHz, - 6.25 kHz, - 10 kHz, - 12.5 kHz, - 25 kHz, - 30 kHz 	
4.5.	RF Frequency Error Meter	
4.5.1.	Units = Hz, PPM	
4.5.2.	Range = ± 200 kHz, ± 1000 PPM	
4.5.3.	Resolution = 1 Hz	
4.5.4.	Accuracy = Time-base ± 1 Hz	
4.6.	RF Power Meter (RF Power Into T/R Port)	
4.6.1.	Maximum Input Level = 50 Watts continuous	
4.6.2.	Input RF Power Alarm = +49 dBm	
4.6.3.	Temperature Alarm > +90° C	
4.6.4.	Meter Range = +20 to +53 dBm	
4.6.5.	Display Units = Watts, dBm	
4.6.6.	Resolution = 0.01 W, 0.1 dBm	
4.6.7.	Accuracy < 10% of reading	
4.7	FM Deviation Meter	
4.7.1.	Range = ± 500 Hz to ± 100 kHz	

4.7.2.	Meter Type = Peak+, Peak-, (Peak-Peak)/2, RMS	
4.7.3.	Resolution = 0.1 Hz	
4.7.4.	Accuracy < ±5% of reading, 1 kHz to 10 kHz Dev.	
4.8	AM Percent Meter	
4.8.1.	Range = 5% to 100%	
4.8.2.	Meter Type = Peak+, Peak-, (Peak-Peak)/2, RMS	
4.8.3.	Resolution = 0.001%	
4.8.4.	Accuracy = ±5% of reading	
4.9	SINAD Meter	
4.9.1.	Measurement Sources = Audio IN, DEMOD	
4.9.2.	Audio Frequency Notch = 1 kHz	
4.9.3.	Reading Range = 0 dB to 60 dB	
4.9.4.	Resolution = 0.001 dB	
4.9.5.	Accuracy < ±1.5 dB,	
4.10.	Distortion Meter	
4.10.1.	Measurement Sources = AUD IN, DEMOD	
4.10.2.	Audio Frequency Notch = 1 kHz	
4.10.3.	Reading Range = 0% to 100%	
4.10.4.	Resolution = 0.001%	
4.10.5	Accuracy = ±10% of reading	
4.11.	Audio Frequency Counter	

4.11.1.	Measurement Sources = AUD IN, DEMOD	
4.11.2.	Frequency Range = 15 Hz to 20 kHz	
4.11.3.	Resolution = 0.1 Hz	
4.11.4	Accuracy < ± 1 Hz	
4.12.	Audio Frequency Level Meter	
4.12.1.	Measurement Sources = AUD IN, SCOPE	
4.12.2.	Input Range = <ul style="list-style-type: none"> - Audio In Range = 3 V, 30 V - Scope Range = 2 VDC, 40 VDC 	
4.12.3.	Frequency Range = 200 Hz to <5 kHz	
4.12.4.	Display Unit Resolution <ul style="list-style-type: none"> - Volts = 0.001 V - mV = 0.001 mV - dBuV = 0.001 dBuV - dBm = 0.001 dBm - Watts = 0.001 W 	
4.12.5.	Accuracy < $\pm 5\%$ AUD IN Port	
4.13.	Oscilloscope	
4.13.1.	Source = SCOPE, AUD IN, DEMOD	
4.13.2.	Bandwidth = 5 kHz	
4.14.	Digital Multimeter (DMM)	
4.14.1.	Functions <ul style="list-style-type: none"> - AC/DC Voltmeter 	

	<ul style="list-style-type: none"> - AC/DC Ammeter - Ohmmeter 	
4.14.2.	Resolution = 3-1/2 digits (2000 counts)	
4.14.3.	Accuracy < ±5% AC, < ±2% DC	
4.15.	POWER	
4.15.1.	AC Input Voltage Range =100 to 240 VAC @ 47 Hz to 63 Hz (110-220 nominal)	
4.15.2.	DC Input Voltage Range = 12 to 32 VDC (12-24 nominal)	
4.15.3.	Battery Power, with full display backlight = 1.5 hours or more (Lithium-Ion battery)	
4.15.4	Battery Recharge, with unit on = 4 hours or less	
4.16.	ENVIRONMENTAL — tested in accordance with MIL-PRF-28800F, Class 3	
4.16.1.	Storage Temperature = -20° C to +60° C	
4.16.2.	Operating Temperature = 0°C to +40°C	
4.16.3.	Operating Relative Humidity = 5% to 80%	
4.16.4.	Operating Altitude = up to 10,000 feet	
4.16.5.	Shock = 30 G (Functional Shock)	
4.16.6.	Vibration = 5 to 500 Hz random vibrations	
4.17.	PHYSICAL	
4.17.1.	Dimensions = less than 14 in x 12 in x 8 in (width x height, depth)	
4.17.2.	Weight = less than 20 pounds	

4.17.3.	Case = Hard transit case	
5.	DOCUMENTATION - One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by technician.	
6.	WARRANTY – Five (5) Years, includes scheduled calibration and software/firmware updates. (Specify standard warranty and the extended warranty to provide 5 year total warranty coverage.)	
7.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

24. TEST EQUIPMENT, SPECIALIZED RF INSTRUMENTS

Category Definition: Specialized high-accuracy radio frequency instrument for the analysis of radio systems. Includes: Signal generators, signal analyzers, spectrum analyzers, vector network analyzers, power meters, antenna measurement instruments; and related specialized instruments, configured as portable instruments, rugged field service instruments, laboratory instruments; along with related test adapters and required accessories.

Example Product: Quantity one (1) — Portable & Spectrum Analyzer — a field instrument for the analysis of RF systems and the identification of interference.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	PHYSICAL /ENVIRONMENTAL	
1.1.	Dimensions: < 12” x 12” x 4”	
1.2.	Weight: < 8 lbs	
1.3.	Transit Shock/Drop: MIL-PRF-28800F Class 2	
1.4.	Operating Temperature: -10°C to +55°C	
1.5.	Operating Altitude: > 12,000 feet	
1.6.	RF Port Connectors: Type N, Female, 50 ohm	

1.7.	RF Input: > +20 dBm (100 mw)	
2.	POWER	
2.1.	External AC: 110/220 V nominal	
2.2.	External DC = 12 V nominal	
2.3.	Internal Battery > 3 hours run time	
3.	USER INTERFACE	
3.1.	Display: <ul style="list-style-type: none"> - > 6.5" flat panel, - Daylight viewable, - 99.999% good pixels. 	
3.2.	Intuitive User menus	
3.3.	Help files accessible from the user screen	
3.4.	PC Interface to configure and access files	
3.5.	Output files in standard format (PDF, DOC, etc.)	
3.6.	Data Interface: USB port	
3.7.	Data Storage, Internal: > 150 traces & settings	
3.8.	Data Storage, External: USB device capacity > 16GB	
4.	SPECTRUM ANALYZER	
4.1.	Frequency Range: > 100 kHz to 3.0 GHz	
4.2.	Reference Aging: ± 1 ppm / year	
4.3.	Tuning Resolution: 1 Hz	
4.4.	Spectral Purity: < -85 dBc @ 30 kHz	
4.5.	Sweep Time: 2.0 s, full span; 1 ms, zero span	
4.6.	Resolution Bandwidth: 100 Hz to 1 MHz RBW	

4.7.	Video Bandwidth: 10 Hz to 300 kHz VBW	
4.8.	Amplitude Accuracy: $< \pm 1.5$ dB	
4.9.	Dynamic Range: > 60 dB, intermod-free	
4.10.	Noise Floor: -135 dBm	
5.	DOCUMENTATION: One (1) set system documentation, operations and service manuals, printed or electronic copy, for use by technician.	
6.	WARRANTY: Five (5) Years, includes scheduled calibration and software/firmware updates. (Specify standard warranty and the extended warranty to provide 5 year total warranty coverage.)	
7.	SHIPPING REQUIREMENTS: F.O.B. All Destinations	

25. TOWERS, OVERALL SPECIFICATION

The following overall specification shall apply to all sub-category of tower product, as referenced within each specification below. ALL components must be new.

NOTE: In the event of conflict between specifications and the codes, standards, and practices here in, the most stringent requirement shall govern.

Item #	Description
1.	CODES AND STANDARDS
1.1.	American Institute of Steel Construction (AISC) — Manual of Steel Construction
1.2.	Electronic Industries Association (EIA) Standard RS-222 — Structural Standards for Antenna Towers and Antenna Supporting Structures
1.3.	American Welding Society (AWS) D1.1 — Structural Welding Code
1.4.	FAA Advisory Circular #AC 70/7460 — Obstruction Marking and Lighting
1.5.	National Electric Code (NEC) — Tower Lighting Kits
1.6.	American Institute of Steel Construction (AISC) — Specification for Structural Joints using ASTM A325 or A490 Bolts
1.7.	Federal Communications Commission Rules and Regulations - Part 17
1.8.	American Concrete Institute ACI 318 — Building Code Requirements for Reinforced Concrete
1.9.	American Society for Testing and Materials (ASTM) for:
1.10	A-36, A-50, A441 and A572 — Structural Steel
1.10.1.	A-123 — Zinc (hot-dipped galvanized coatings on products fabricated from rolled, pressed, and forged steel shapes, plates, bars and strips)
1.10.2.	A-153 — Zinc Coatings (hot-dip) on Iron and Steel Hardware
1.10.3.	B-695 — Coatings of Zinc Mechanically Deposited on Iron and Steel (minimum thickness 0.0026")
1.10.4.	A-385 — Zinc Coatings (hot-dip) on Assembled Steel Products
1.10.5.	A-307 — Low-Carbon Steel Externally and Internally Threaded Standard Fasteners
1.10.6.	A-325 — High Strength Steel Bolts

1.10.7.	A-615 and A-706 — Reinforcing Bars
1.10.8.	ASTM C-9 — Ready-mixed Concrete
1.11.	The customer will arrange for building permits and advise the tower manufacturer of local codes and regulations that affect this specification.
1.12.	Where local ordinances specify higher standards than those represented in this specification, the local ordinances shall govern. Pertinent sections of those codes shall be provided by the customer to the tower manufacturer.
1.13.	The customer will report the results of special air navigational studies for marking and lighting towers. If special navigational reports are not a part of the contract, the tower vendor will apply the standards rules of the FAA, FCC and NEC when specified by the customer.
2.	ANALYSIS AND DESIGN
2.1.	Towers shall be designed by or under the direct supervision of a registered professional engineer, specifically experienced in the design of radio and microwave towers.
2.2.	All design and analysis computations and installation drawings shall be certified and stamped by a licensed Professional Engineer.
2.3.	The structure shall be designed to support all specified antennas, including future antennas, and to hold all antennas on path within the twist, sway and displacement limits of EIA RS-222. Where multiple frequencies are specified, the most critical twist, sway and displacement limits shall govern.
2.4.	The tower, when fully loaded with antenna assemblies, waveguide, and other appurtenances, shall be designed for the minimum wind loads as specified by EIA RS-222, unless otherwise specified.
2.5.	When specified by the customer, tower designs shall consider the concurrent accumulation of radial ice to all parts of the tower, antennas, and accessories. Loadings shall take into account both the resultant added wind load and dead load.
2.6.	Under wind pressures up to 35 mph (5 pst), all horizontal members shall be capable of supporting a 250 lb. vertical load at mid-span, in addition to all other design loads.
2.7.	Tower deflection limits are to be held both vertically and horizontally. Deflection must be determined at each specific point on the tower where an antenna is attached. The twist and sway of the tower at all antenna mounting elevations shall be determined by analytical methods and shall be noted on the formal stress analysis.
2.8.	The antenna loading (present and future) to be applied to the structure is as follows: (Customer to specify).
2.9.	The allowable unit stresses and the actual member stresses resulting from the specified design loads shall not exceed those given in the AISC specifications.
2.10.	All members of the structure shall be considered primary members for the purpose of establishing allowable compressive stresses per AISC,

	except those members whose sole function is to reduce the kl/r ratio of primary members.															
2.11.	For self-supporting and guyed tower footings, the safety factor for uplift shall be as described in EIA RS-222, latest edition.															
2.12.	Foundations shall be designed with sufficient reserve capacity to match the least tower leg reserve capacity.															
2.13.	Combined tower wind loads and antenna loads shall be applied in combination such that the maximum axial forces are produced in girts, diagonals, and legs. Multiple analyses may be necessary to ensure that worst case design conditions have been investigated.															
3.	TOWER PRODUCTS															
3.1.	Fabrication															
3.1.1.	All fabrication, erection and identification of structural steel shall conform to AISC specifications.															
3.1.2.	Under no circumstances shall "dissimilar metals" be used in contact with one another.															
3.1.3.	Hot-dipped galvanizing of tubular sections shall be inside and outside per standards and methods listed elsewhere in this specification.															
3.1.4.	Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."															
3.1.5.	Properly mark and match-mark materials for field assembly. Fabricate for a delivery sequence which will expedite erection and minimize field handling of materials.															
3.1.6.	If a round or tubular tower is provided vendor must supply a moisture drain hole at the base of the tower to ensure any accumulated moisture can drain from the bottom of the tower leg.															
3.2.	Connections and Locking Devices															
3.2.1.	No field welding shall be permitted unless specifically approved in writing.															
3.2.2.	All members shall be connected with galvanized structural bolts unless otherwise approved															
3.2.3.	The vendor shall provide bolts, nuts and lock-washers in a quantity in excess of the actual bolt count, for each size required for each tower site. <table border="1" data-bbox="321 1062 1085 1276"> <thead> <tr> <th>Bolt Count</th> <th>Percentage Excess</th> <th>Minimum Excess</th> </tr> </thead> <tbody> <tr> <td>0-200</td> <td>5%</td> <td>1</td> </tr> <tr> <td>200-500</td> <td>4 %</td> <td>10</td> </tr> <tr> <td>500-1000</td> <td>3%</td> <td>20</td> </tr> <tr> <td>1000 and over</td> <td>2 %</td> <td>30</td> </tr> </tbody> </table>	Bolt Count	Percentage Excess	Minimum Excess	0-200	5%	1	200-500	4 %	10	500-1000	3%	20	1000 and over	2 %	30
Bolt Count	Percentage Excess	Minimum Excess														
0-200	5%	1														
200-500	4 %	10														
500-1000	3%	20														
1000 and over	2 %	30														
3.2.4.	All towers will be provided with the correct size and length of anchor bolts necessary to carry the anticipated tower loads. If the tower loads															

	require more than one bolt per leg, they shall be shop welded into a cluster to eliminate the need for a template during field installation.
3.2.5.	All threaded fasteners shall extend not less than 1-1/2 threads beyond nuts and locking devices.
3.3	Climbing Ladders
3.3.1.	All climbing ladders will have an anti climb cover at the base of the tower that can be locked to prevent unauthorized use of the ladder.
3.4	Rest Platforms
3.4.1.	For towers greater than 50 feet in height, rest platforms shall be placed at intervals no greater than 50 feet.
3.4.2.	A rest platform will consist of a level platform of grating which allows room for one person to sit or stand.
3.5.	Work Platforms
3.5.1.	When work platforms are required they shall consist of level platforms of grating. They shall be either walkways with a minimum width of 24 inches or full coverage platforms and they shall provide reasonable access to appropriate work areas.
3.5.2.	Safety handrails shall be provided around the perimeter of the platforms with the upper railing at 42 inches above the deck and the intermediate rail approximately halfway between the top rail and the deck.
3.5.3.	Tower diagonals may be used to support platform handrails.
3.5.4.	When platform access is via an inside climbing ladder, a hatch shall be provided to eliminate the hazard of an access opening in the work area.
3.5.6.	Work platforms shall be designed to support two concentrated live loads of 250 lbs. each. Live loads imposed by persons on the platform shall be considered to concentrate at such points that will cause maximum stress in the structural members being considered.
3.6.	Finishes
3.6.1.	All steel members and fasteners shall be galvanized (zinc coated) per standards in Section 2.0 of this specification.
3.6.2.	Under no circumstances shall any coating on any metal member or fastener be cathodic relative to the base material.
3.6.3.	Use "Devcon", or equivalent, zinc rich paint, or approved equal, to touch up damaged galvanizing. Touch up may be done by either a spray or brush application.
3.6.4.	When required, tower structures shall be painted per FAA specification AC70/7460.
3.6.5.	All painting shall be performed in the shop using an acrylic latex paint specifically formulated for application to galvanized material.
3.6.6.	Field painting shall be limited to touch-up of paint damaged during transportation and erection. Use the same paint as was used in the shop to touch up damaged paint and provide the same protection as original shop painting.
4.	TOWER ACCESSORIES

4.1.	Tower Lighting
4.1.1.	When required, an obstruction lighting system shall be supplied with the tower and installed as required by FAA.
4.1.2.	All obstruction lighting equipment shall be FAA approved.
4.1.3.	Lighting shall be activated and deactivated by photoelectric control for unattended stations, and the method of activation for attended stations is to be specified.
4.1.4.	All wire shall be copper type THW-MTW grade 600 volt insulation installed in galvanized rigid conduit. All electrical installation shall conform to the National Electric Code requirements for outdoor installation.
4.1.5.	In accordance with FAA Circular 70/7460, towers in excess of 300 feet require multiple side lights. If the future tower height requires a side light configuration different than that being initially constructed, junction boxes will be placed at those points along the tower light conduit where future side lights would eventually be placed, along with necessary electrical wiring.
4.2.	Lightning Protection
4.2.1.	All towers shall be supplied with a complete grounding system which conforms to the minimum requirements of EIA RS-222, Section 12, and "Protective Grounding".
4.2.2.	Each tower with a height greater than 30 feet must be equipped with a lightning rod fastened at the extreme top of the tower.
4.2.3.	A galvanized steel lightning rod, with minimum dimensions of 5/8 inch diameter by 4 feet long, shall be attached so as to extend a minimum of 18 inches above the highest point of the tower, including all attachments.
4.2.4.	Ground rods shall be 5/8 inch diameter, 8 feet long, copper clad, and shall be driven not less than 8 feet into the ground.
4.2.5.	If ground rods cannot be driven to the full 8 foot depth, they may be driven on an angle or buried in a horizontal trench to allow the full 8 foot length to be buried.
4.2.6.	All grounding wire shall be not less than number 6 bare copper, and connected by use of the proper mechanical connectors.
4.2.7.	Any and all equipment mounted on the tower shall be so fastened as to be effectively grounded.
4.2.8.	Testing of grounding systems are the responsibility of the radio installer or others, not that of the tower vendor.
4.3.	Antenna Mounts
4.3.1.	Pipe mounts shall be plumb in each axis unless specified otherwise.
4.3.2.	Pipe mounts shall be positioned to prevent the antenna feed horn assembly from being directly opposite a tower member. Pipe mount positioning should not prevent direct waveguide installation to any antenna.

4.3.3.	Mounts and stiff arm support locations shall meet or exceed the standards specified by the antenna manufacturer in their latest installation bulletin.
4.3.4.	Waveguide support shall be engineered to provide supports at intervals not greater than 4 feet O.C. This support can be in the form of leg clamps, waveguide ladders or horizontal bridges.
4.3.5.	Waveguide support capacity shall provide for one waveguide run for each present and future antenna, unless otherwise specified.
4.3.6.	The waveguide bridge shall provide support and protection of waveguide runs between the tower and building structures.
4.3.7.	Waveguide support structures shall be grounded in accordance with the tower grounding specification.
4.3.8.	Wall entries must be specified by the customer in terms of sizes and number of openings required. They shall be designed and installed to be completely weatherproof and to accommodate all present and future waveguide runs.
5.	FOUNDATION DESIGN
5.1.	The vendor will be required to develop foundation designs based on soil conditions reported by the customer.
5.2.	Foundation recommendations contained within soils reports are general in nature and are made without benefit of tower reaction information. The ultimate authority and responsibility for the foundation design rests with the vendor.
5.3.	In the absence of a customer furnished soils report, normal soil conditions as described in EIA Standard RS-222 will be assumed .for the foundation design.
5.4.	Foundation designs should utilize, as a minimum, 3000 psi concrete and grade 40 reinforcing steel. When specified, a concrete mix design shall be submitted to the tower engineer to ensure that materials are proportioned by weight to produce concrete with a minimum compressive strength at 28 days of 3000 psi.
5.5.	Where a soil investigation indicates that adequate rock conditions exist, grouted anchors may be designed. Field tension testing shall be done when specified.
5.6.	When abnormal soil conditions are encountered to the extent that additional charges may be incurred, the customer must verify said conditions. Soil tests shall be provided by the customer.

26. TOWERS, ACCESSORIES & APPURTENANCES

Category Definition: Radio tower accessories, antenna stand-offs, antenna array mounts, ice shields, cable bridges, grounding materials, cable entry-panels, non-penetrating and ballasted antenna mounts, anti-climb panels, and related products.

Example Product: Quantity one (1) — Non-penetrating/ballasted antenna mount.

For Bidding Purposes: vendor shall assume that (1) customer will resolve all the building structural capacity issues, (2) manage all permits, (3) provide ballast material, and (4) contract for erection services.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	DESCRIPTION	
1.1.	Non-penetrating mount that provides a single mast	
1.2.	Load = One (1) panel antenna	
1.3.	Antenna Height = 10 feet	
1.4.	Roof Protection pads (1/2” rubber mat) are required	
2.	Conform to “OVERALL SPECIFICATION” requirements.	

3.	SITE INFORMATION	
3.1.	Location = Oregon, Willamette Valley, Portland metropolitan area	
3.2.	Flat roof of a typical warehouse building	
4.	ANTENNA DETAILS	
4.1.	Panel Antenna	
4.1.1.	Maximum Gust Speed = 200 kph	
4.1.2.	Wind Loading = 630 N @ 160 km/h	
4.1.3.	Wind Survival = 250 kph	
4.1.4.	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
4.1.5.	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
4.1.6.	Weight = 7.5 kgs Including Mounting Brackets	
4.1.7.	Lateral thrust (100 mph No Ice) 122 lbs	
4.1.8.	Torsional moment (100 mph No Ice) 132 ft-lbs	
4.1.9.	Bending moment (100 mph No Ice) 701 ft-lbs	
5.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
6.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

27. TOWERS, DEPLOYABLE / TEMPORARY

Category Definition: Deployable radio towers designed and constructed for temporary installation, fixed or transportable configurations, along with specially configured transport vehicles, accessories and appurtenances.

Example Product: Quantity one (1) — 40-foot extendable tower mounted on 16 foot enclosed cargo trailer for rapid deployment to tactical events.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	TOWER	
1.1.	Structure type: extendable guy wire supported	
1.2.	Maximum height: 40 feet	
1.3.	Maximum payload: > 120 pounds	
1.4.	Maximum antenna load: >15 ft. ²	
1.5.	Rated wind speed: 70 mph	
1.6.	Antenna mount: 2 inch diameter pipe, with > 72” extending above the tower.	

2.	TOWER MOUNTING / DEPLOYMENT	
2.1.	When retracted the tower shall tilt to horizontal position for transport atop the trailer.	
2.2.	A carried mechanism shall allow the tower to move from the stored position to a position where it can be tilted for deployment.	
2.3.	When in the vertical position, the tower sections shall be extended by means of a 12 V DC electric winch, with manual override.	
2.4.	All guy wire materials shall be supplied with the tower.	
2.5.	Guy wire anchors for normal soil conditions shall be supplied with the tower. (Other anchor configurations shall be available as options.)	
3.	TRAILER	
3.1.	Gross vehicle weight rating (GCWR): > 6500 lbs	
3.2.	Number of axles: 2 (tandem)	
3.3.	Overall width: < 102 inches	
3.4.	Overall length, excluding coupler: <22 feet	
3.5.	Coupler Size: Standard ball @ 2-5/16 inches	
3.6.	Electrical connector: Standard 7-pin	
3.7.	Electric brakes: all wheels	
3.8.	All DOT required lighting (LED), safety change, and breakaway switch with battery shall be included.	
3.9.	The trailer interior shall be open space ready for customization	
3.9.1.	Interior width: 96 inches	

3.9.2.	Interior height: > 76 inches	
3.9.3.	Interior length: > 200 inches	
3.10.	Doors: rear = full width; right front equal 36 inch	
4.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
5.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

28. TOWERS, GUYED

Category Definition: Guy wire supported type towers, tower engineering and design, foundation engineering and design, along with associated components and hardware.

Example Product: Quantity one (1) — 140-foot guy-wire-supported communications tower.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services. Note: (4) antenna mounts, stand-offs, ice-shields, and waveguide bridges are be specified and priced under a separate sub-category.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Tower Type = Guy-Wire-Supported	
1.3.	Overall height = 140 feet, excluding lightning rod	

2.	Conform to “OVERALL SPECIFICATION” requirements.	
3.	SITE INFORMATION	
3.1.	Location = Oregon, east side of Willamette Valley, Cascade foothills	
3.2.	Topographical Category 3, located at the top of a hill <ul style="list-style-type: none"> - Ground Elevation = 3000 feet - 3.2x above Average Surrounding Terrain 	
3.3.	Exposure Classification C, open terrain without forest or significant structures.	
3.4.	Geotechnical = TIA 222 - Rev G “Presumptive Soil”	
3.5.	Site Access = gravel road	
3.6.	FAA Clearance = lighting not required	
4.	HEIGHT & LOAD INFORMATION <ul style="list-style-type: none"> - includes future capacity - refer to antenna details (section 5) 	
4.1.	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 220° (per 5.1 below)	
4.2.	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 130° (per 5.1 below)	
4.3.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 100° (per 5.4 below)	
4.4.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 180° (per 5.4 below)	
4.5.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 270° (per 5.4 below)	

4.6.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 0° (per 5.3 below)	
4.7.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 120° (per 5.3 below)	
4.8.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 240° (per 5.3 below)	
4.9.	@110-feet = Panel antenna, with mounts – orientation = 40° (per 5.2 below)	
4.10.	@110-feet = Panel antenna, with mounts – orientation = 160° (per 5.2 below)	
4.11.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 0° (per 5.3 below)	
4.12.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 120° (per 5.3 below)	
4.13.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 240° (per 5.3 below)	
4.14.	@140-feet = Lightning Rod > 10-feet, to extend above topmost antenna.	
5.	ANTENNA DETAILS	
5.1.	Microwave Antenna	

5.2.	Antenna Diameter = 6 feet	
5.3.	Mounting Pipe Diameter = 4.5 in	
5.4.	Net Weight = 254 lbs	
5.5.	Wind Velocity Operational = 68 mph	
5.6.	Wind Velocity Survival Rating = 124 mph	
5.7.	<p>Wind Forces At Wind Velocity Survival Rating</p> <ul style="list-style-type: none"> - Angle α for MT Max = -130 ° - Axial Force (FA) = 1741 lbf - Side Force (FS) = 862 lbf - Twisting Moment (MT) = 2955 N/m - Weight with 1/2 in (12 mm) Radial Ice = 518 lbs - Zcg with 1/2 in (12 mm) Radial Ice = 26 in - Zcg without Ice = 18 in 	
5.8.	Panel Antenna	
5.8.1	Maximum Gust Speed = 200 kph	
5.8.2	Wind Loading = 630 N @ 160 km/h	
5.8.3	Wind Survival = 250 kph	
5.8.4	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
5.8.5	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
5.8.9	Weight = 7.5 kgs Including Mounting Brackets	
5.9.	Base Radio Antenna (Open Dipole)	

5.9.1	Depth = 4 in	
5.9.2	Length/ Height = 240 in	
5.9.3	Width = 26.5 in	
5.9.4	Base pipe diameter = 2.38 in	
5.9.5	Weight = 57.5 lbs	
5.9.6	Temperature range -40 to +140 °F	
5.9.7	Wind Loading Area (Flat Plate Equivalent) 3.34 ft ²	
5.9.8	Wind Loading Area (1/2" ice) 5.67 ft ²	
5.9.10.	Rated wind velocity (no ice) 135 mph	
5.9.11.	Rated wind velocity (1/2" radial ice) 95 mph	
5.9.12.	Lateral thrust (100 mph No Ice) 122 lbs	
5.9.13	Torsional moment (100 mph No Ice) 132 ft-lbs	
5.9.14	Bending moment (100 mph No Ice) 701 ft-lbs	
5.10.	Enclosed Yagi Antenna	
5.10.1	Depth = 11.5 in	
5.10.2	Length/ Height = 34.13 in	
5.10.3	Width = 11.5 in	
5.10.4	Base pipe diameter = 2.38 in	
5.10.5	Base pipe mounting length = 10.25 in	
5.10.6	Weight = 7.5 lbs	
5.10.7	Weight iced = 27.7 lbs	

5.10.8	Wind Loading Area (Flat Plate Equivalent) = 1.42 ft ²	
5.10.9	Wind Loading Area (1/2" ice) = 1.77 ft ²	
5.10.10.	Rated wind velocity (no ice) = 195 mph	
5.10.11.	Rated wind velocity (1/2" radial ice) = 175 mph	
5.10.12.	Lateral thrust (100 mph No Ice) 49.9 = lbs	
5.10.13.	Bending moment (100 mph No Ice) = 69 ft-lbs	
6.	Climb-Safety per " OVERALL SPECIFICATIONS "	
7.	Foundation design per " OVERALL SPECIFICATION " and identified site conditions.	
8.	PE stamped plans per " OVERALL SPECIFICATIONS "	
9.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
10.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

29. TOWERS, GUYED, LIGHT

Category Definition: Light duty lattice type towers, tower engineering and design, foundation engineering and design, and associated components and hardware.

Example Product: Quantity one (1) — Light duty 60-foot self-supported communications tower.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services. Note: (4) antenna mounts, stand-offs, ice-shields, and waveguide bridges are to be specified and priced under a separate sub-category.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Tower Type = Self-Supported	
1.3.	Overall height = 60 feet, excluding lightning rod	

2.	Conform to “OVERALL SPECIFICATION” requirements.	
3.	LIGHT DUTY DEFINITION	
3.1.	Decreased height and loading requirements	
3.2.	Component transport in units of 10-feet or less	
3.3.	Erection can be accomplished without the use of heavy equipment	
4.	SITE INFORMATION	
4.1.	Location = Oregon, east side of Willamette Valley, Cascade foothills	
4.2.	Topographical Category 3, located at the top of a hill – Ground Elevation = 3000 feet – 3.2x above Average Surrounding Terrain	
4.3.	Exposure Classification C, open terrain without forest or significant structures.	
4.4.	Geotechnical = TIA 222 - Rev G “Presumptive Soil”	
4.5.	Site Access = gravel road	
4.6.	FAA Clearance = lighting not required	
5.	HEIGHT & LOAD INFORMATION – includes future capacity – refer to antenna details (refer to antenna details in section 6)	
5.1.	@40-feet = Enclosed Yagi antenna, with mounts – orientation = 100° (per 6.3 below)	
5.2.	@40-feet = Enclosed Yagi antenna, with mounts –	

	orientation = 200° (per 6.3 below)	
5.3.	@40-feet = Panel antenna, with mounts – orientation = 40° (per 6.1 below)	
5.4.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 0° (per 6.2 below)	
5.5.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 180° (per 6.2 below)	
5.6.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 240° (per 6.2 below)	
6.	ANTENNA DETAILS	
6.1.	Panel Antenna	
6.1.1.	Maximum Gust Speed = 200 kph	
6.1.2.	Wind Loading = 630 N @ 160 km/h	
6.1.3.	Wind Survival = 250 kph	
6.1.4.	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
6.1.5.	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
6.1.6.	Weight = 7.5 kgs Including Mounting Brackets	
6.2.	Base Radio Antenna (Open Dipole)	
6.2.1.	Depth = 4 in	

6.2.2.	Length/ Height = 240 in	
6.2.3.	Width = 26.5 in	
6.2.4.	Base pipe diameter = 2.38 in	
6.2.5.	Weight = 57.5 lbs	
6.2.6.	Temperature range -40 to +140 °F	
6.2.7.	Wind Loading Area (Flat Plate Equivalent) 3.34 ft ²	
6.2.8.	Wind Loading Area (1/2" ice) 5.67 ft ²	
6.2.9.	Rated wind velocity (no ice) 135 mph	
6.2.10.	Rated wind velocity (1/2" radial ice) 95 mph	
6.2.11.	Lateral thrust (100 mph No Ice) 122 lbs	
6.2.12.	Torsional moment (100 mph No Ice) 132 ft-lbs	
6.2.13.	Bending moment (100 mph No Ice) 701 ft-lbs	
6.3.	Enclosed Yagi Antenna	
6.3.1.	Depth = 11.5 in	
6.3.2.	Length/ Height = 34.13 in	
6.3.3.	Width = 11.5 in	
6.3.4.	Base pipe diameter = 2.38 in	
6.3.5.	Base pipe mounting length = 10.25 in	
6.3.6.	Weight = 7.5 lbs	
6.3.7.	Weight iced = 27.7 lbs	
6.3.8.	Wind Loading Area (Flat Plate Equivalent) = 1.42 ft ²	

6.3.9.	Wind Loading Area (1/2" ice) = 1.77 ft ²	
6.3.10	Rated wind velocity (no ice) = 195 mph	
6.3.11.	Rated wind velocity (1/2" radial ice) = 175 mph	
6.3.12.	Lateral thrust (100 mph No Ice) 49.9 = lbs	
6.3.13.	Bending moment (100 mph No Ice) = 69 ft-lbs	
7.	Climb-Safety per " Overall Specifications "	
8.	Foundation design per " Overall Specification " and identified site conditions.	
9.	PE stamped plans per " Overall Specifications "	
10.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
11.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

30. TOWERS, LATTICE

Category Definition: Self-supporting type towers (3-leg and 4 leg), tower engineering and design, foundation engineering and design, and associated components and hardware.

Example Product: Quantity one (1) — 140-foot self-supporting communications tower.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services. Note: (4) antenna mounts, stand-offs, ice-shields, and waveguide bridges are be specified and priced under a separate sub-category.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Tower Type = Self-Supporting, 3-Leg	
1.3.	Overall height = 140 feet, excluding lightning rod	
2.	Conform to “OVERALL SPECIFICATION” requirements.	

3.	SITE INFORMATION	
3.1.	Location = Oregon, east side of Willamette Valley, Cascade foothills	
3.2.	Topographical Category 3, located at the top of a hill <ul style="list-style-type: none"> – Ground Elevation = 3000 feet – 3.2x above Average Surrounding Terrain 	
3.3.	Exposure Classification C, open terrain without forest or significant structures.	
3.4.	Geotechnical = TIA 222 - Rev G “Presumptive Soil”	
3.5.	Site Access = gravel road	
3.6.	FAA Clearance = lighting not required	
4.	HEIGHT & LOAD INFORMATION <ul style="list-style-type: none"> – includes future capacity – refer to antenna details (section 5) 	
4.1.	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 220° (per section 5.1 below)	
4.2.	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 130° (per section 5.1 below)	
4.3.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 100° (per section 5.4 below)	
4.4.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 180° (per section 5.4 below)	
4.5.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 270° (per section 5.4 below)	
4.6.	@80-feet = Base Radio antenna, with bottom and top	

	mounts and 4-foot side arms – orientation = 0° (per section 5.3 below)	
4.7.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 120° (per section 5.3 below)	
4.8.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 240° (per section 5.3 below)	
4.9.	@110-feet = Panel antenna, with mounts – orientation = 40° (per section 5.2 below)	
4.10.	@110-feet = Panel antenna, with mounts – orientation = 160° (per section 5.2 below)	
4.11.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 0° (per section 5.3 below)	
4.12.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 120° (per section 5.3 below)	
4.13.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 240° (per section 5.3 below)	
5.	ANTENNA DETAILS	
5.1.	Microwave Antenna	
5.1.1.	Antenna Diameter = 6 feet	
5.1.2.	Mounting Pipe Diameter = 4.5 in	

5.1.3.	Net Weight = 254 lbs	
5.1.4.	Wind Velocity Operational = 68 mph	
5.1.5.	Wind Velocity Survival Rating = 124 mph	
5.1.6.	<p>Wind Forces At Wind Velocity Survival Rating</p> <ul style="list-style-type: none"> - Angle α for MT Max = -130 ° - Axial Force (FA) = 1741 lbf - Side Force (FS) = 862 lbf - Twisting Moment (MT) = 2955 N/m - Weight with 1/2 in (12 mm) Radial Ice = 518 lbs - Zcg with 1/2 in (12 mm) Radial Ice = 26 in - Zcg without Ice = 18 in 	
5.2.	Panel Antenna	
5.2.1.	Maximum Gust Speed = 200 kph	
5.2.2.	Wind Loading = 630 N @ 160 km/h	
5.2.3.	Wind Survival = 250 kph	
5.2.4.	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
5.2.5.	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
5.2.6.	Weight = 7.5 kgs Including Mounting Brackets	
5.3.	Base Radio Antenna (Open Dipole)	
5.3.1.	Depth = 4 in	
5.3.2.	Length/ Height = 240 in	

5.3.3.	Width = 26.5 in	
5.3.4.	Base pipe diameter = 2.38 in	
5.3.5.	Weight = 57.5 lbs	
5.3.6.	Temperature range -40 to +140 °F	
5.3.7.	Wind Loading Area (Flat Plate Equivalent) 3.34 ft ²	
5.3.8.	Wind Loading Area (1/2" ice) 5.67 ft ²	
5.3.9.	Rated wind velocity (no ice) 135 mph	
5.3.10.	Rated wind velocity (1/2" radial ice) 95 mph	
5.3.11.	Lateral thrust (100 mph No Ice) 122 lbs	
5.3.12.	Torsional moment (100 mph No Ice) 132 ft-lbs	
5.3.13.	Bending moment (100 mph No Ice) 701 ft-lbs	
5.4.	Enclosed Yagi Antenna	
5.4.1.	Depth = 11.5 in	
5.4.2.	Length/ Height = 34.13 in	
5.4.3.	Width = 11.5 in	
5.4.4.	Base pipe diameter = 2.38 in	
5.4.5.	Base pipe mounting length = 10.25 in	
5.4.6.	Weight = 7.5 lbs	
5.4.7.	Weight iced = 27.7 lbs	
5.4.8.	Wind Loading Area (Flat Plate Equivalent) = 1.42 ft ²	
5.4.9.	Wind Loading Area (1/2" ice) = 1.77 ft ²	

5.4.10.	Rated wind velocity (no ice) = 195 mph	
5.4.11.	Rated wind velocity (1/2" radial ice) = 175 mph	
5.4.12.	Lateral thrust (100 mph No Ice) 49.9 = lbs	
5.4.13.	Bending moment (100 mph No Ice) = 69 ft-lbs	
6.	Climb-Safety per " Overall Specifications "	
7.	Foundation design per " Overall Specification " and identified site conditions.	
8.	PE stamped plans per " Overall Specifications "	
9.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
10.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

31. TOWERS, LATTICE, LIGHT

Category Definition: Light duty lattice type towers, tower engineering and design, foundation engineering and design, and associated components and hardware.

Example Product: Quantity one (1) — Light duty 60-foot self-supported communications tower.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services. Note: (4) antenna mounts, stand-offs, ice-shields, and waveguide bridges are to be specified and priced under a separate sub-category.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Tower Type = Self-Supported	
1.3.	Overall height = 60 feet, excluding lightning rod	

2.	Conform to “OVERALL SPECIFICATION” requirements.	
3.	LIGHT DUTY DEFINITION	
3.1.	Decreased height and loading requirements	
3.2.	Component transport in units of 10-feet or less	
3.3.	Erection can be accomplished without the use of heavy equipment	
4.	SITE INFORMATION	
4.1.	Location = Oregon, east side of Willamette Valley, Cascade foothills	
4.2.	Topographical Category 3, located at the top of a hill <ul style="list-style-type: none"> - Ground Elevation = 3000 feet - 3.2x above Average Surrounding Terrain 	
4.3.	Exposure Classification C, open terrain without forest or significant structures.	
4.4.	Geotechnical = TIA 222 - Rev G “Presumptive Soil”	
4.5.	Site Access = gravel road	
4.6.	FAA Clearance = lighting not required	
5.	HEIGHT & LOAD INFORMATION <ul style="list-style-type: none"> - includes future capacity - refer to antenna details (section 6) 	
5.1.	@40-feet = Enclosed Yagi antenna, with mounts – orientation = 100° (per section 6.3 below)	
5.2.	@40-feet = Enclosed Yagi antenna, with mounts – orientation = 200° (per section 6.3 below)	

5.3.	@40-feet = Panel antenna, with mounts – orientation = 40° (per section 6.1 below)	
5.4.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 0° (per section 6.2 below)	
5.5.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 180° (per section 6.2 below)	
5.6.	@50-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 240° (per section 6.2 below)	
5.7.	@60-feet = Lightning Rod > 10-feet, to extend above topmost antenna.	
6.	ANTENNA DETAILS	
6.1.	Panel Antenna	
6.1.1.	Maximum Gust Speed = 200 kph	
6.1.2.	Wind Loading = 630 N @ 160 km/h	
6.1.3.	Wind Survival = 250 kph	
6.1.4.	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
6.1.5.	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
6.1.6.	Weight = 7.5 kgs Including Mounting Brackets	
6.2.	Base Radio Antenna (Open Dipole)	

6.2.1.	Depth = 4 in	
6.2.2.	Length/ Height = 240 in	
6.2.3.	Width = 26.5 in	
6.2.4.	Base pipe diameter = 2.38 in	
6.2.5.	Weight = 57.5 lbs	
6.2.6.	Temperature range -40 to +140 °F	
6.2.7.	Wind Loading Area (Flat Plate Equivalent) 3.34 ft ²	
6.2.8.	Wind Loading Area (1/2" ice) 5.67 ft ²	
6.2.9.	Rated wind velocity (no ice) 135 mph	
6.2.10.	Rated wind velocity (1/2" radial ice) 95 mph	
6.2.11.	Lateral thrust (100 mph No Ice) 122 lbs	
6.2.12.	Torsional moment (100 mph No Ice) 132 ft-lbs	
6.2.13.	Bending moment (100 mph No Ice) 701 ft-lbs	
6.3.	Enclosed Yagi Antenna	
6.3.1.	Depth = 11.5 in	
6.3.2.	Length/ Height = 34.13 in	
6.3.3.	Width = 11.5 in	
6.3.4.	Base pipe diameter = 2.38 in	
6.3.5.	Base pipe mounting length = 10.25 in	
6.3.6.	Weight = 7.5 lbs	
6.3.7.	Weight iced = 27.7 lbs	

6.3.8.	Wind Loading Area (Flat Plate Equivalent) = 1.42 ft ²	
6.3.9.	Wind Loading Area (1/2" ice) = 1.77 ft ²	
6.3.10.	Rated wind velocity (no ice) = 195 mph	
6.3.11.	Rated wind velocity (1/2" radial ice) = 175 mph	
6.3.12.	Lateral thrust (100 mph No Ice) 49.9 = lbs	
6.3.13.	Bending moment (100 mph No Ice) = 69 ft-lbs	
7.	Climb-Safety per " Overall Specifications "	
8.	Foundation design per " Overall Specification " and identified site conditions.	
9.	PE stamped plans per " Overall Specifications "	
10.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
11.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

32. TOWERS, MONOPOLE

Category Definition: Monopole type towers, tower engineering and design, foundation engineering and design, and associated components and hardware.

Example Product: Quantity one (1) — 140-foot monopole communications tower.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services. Note: (4) antenna mounts, stand-offs, ice-shields, and waveguide bridges are to be specified and priced under a separate sub-category.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Tower Type = Monopole	
1.3.	Overall height = 140 feet, excluding lightning rod	
2.	Conform to “ OVERALL SPECIFICATION ” requirements.	
3.	SITE INFORMATION	

3.1	Location = Oregon, east side of Willamette Valley, Cascade foothills	
3.2	Topographical Category 3, located at the top of a hill <ul style="list-style-type: none"> - Ground Elevation = 3000 feet - 3.2x above Average Surrounding Terrain 	
3.3	Exposure Classification C, open terrain without forest or significant structures.	
3.4	Geotechnical = TIA 222 - Rev G "Presumptive Soil"	
3.5	Site Access = gravel road	
3.6	FAA Clearance = lighting not required	
4.	HEIGHT & LOAD INFORMATION <ul style="list-style-type: none"> - includes future capacity - refer to antenna details (section 15) 	
4.1	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 220° (per section 15.1 below)	
4.2	@40-feet = Microwave antenna, with mounts and ice shield – orientation = 130° (per section 15.1 below)	
4.3.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 100° (per section 15.4 below)	
4.4.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 180° (per section 15.4 below)	
4.5.	@60-feet = Enclosed Yagi antenna, with mounts and ice shield – orientation = 270° (per section 15.4 below)	
4.6.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 0° (per section 15.3 below)	

4.7.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 120° (per section 15.3 below)	
4.8.	@80-feet = Base Radio antenna, with bottom and top mounts and 4-foot side arms – orientation = 240° (per section 15.3 below)	
4.9.	@110-feet = Panel antenna, with mounts – orientation = 40° (per section 15.2 below)	
4.10	@110-feet = Panel antenna, with mounts – orientation = 160° (per section 15.2 below)	
4.11.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 0° (per section 15.3 below)	
4.12.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 120° (per section 15.3 below)	
4.13.	@130-feet = Base Radio antenna, with bottom and center mounts and 4-foot side arms – orientation = 240° (per section 15.3 below)	
5.	ANTENNA DETAILS	
5.1.	Microwave Antenna	
5.1.1.	Antenna Diameter = 6 feet	
5.1.2.	Mounting Pipe Diameter = 4.5 in	
5.1.3.	Net Weight = 254 lbs	
5.1.4.	Wind Velocity Operational = 68 mph	
5.1.5.	Wind Velocity Survival Rating = 124 mph	

5.1.6.	<p>Wind Forces At Wind Velocity Survival Rating</p> <ul style="list-style-type: none"> - Angle α for MT Max = -130 ° - Axial Force (FA) = 1741 lbf - Side Force (FS) = 862 lbf - Twisting Moment (MT) = 2955 N/m - Weight with 1/2 in (12 mm) Radial Ice = 518 lbs - Zcg with 1/2 in (12 mm) Radial Ice = 26 in - Zcg without Ice = 18 in 	
5.2	Panel Antenna	
5.2.1.	Maximum Gust Speed = 200 kph	
5.2.2.	Wind Loading = 630 N @ 160 km/h	
5.2.3.	Wind Survival = 250 kph	
5.2.4.	Mounting = Twin Vertically Spaced Clamps for Attachment to 20-115 mm Mounting Pipe	
5.2.5.	Dimensions: W x H x T = 930 x 500 x 60 mm (+ Mounting Brackets)	
5.2.6.	Weight = 7.5 kgs Including Mounting Brackets	
5.3	Base Radio Antenna (Open Dipole)	
5.3.1.	Depth = 4 in	
5.3.2.	Length/ Height = 240 in	
5.3.3.	Width = 26.5 in	
5.3.4.	Base pipe diameter = 2.38 in	
5.3.5.	Weight = 57.5 lbs	
5.3.6.	Temperature range -40 to +140 °F	

5.3.7.	Wind Loading Area (Flat Plate Equivalent) 3.34 ft ²	
5.3.8.	Wind Loading Area (1/2" ice) 5.67 ft ²	
5.3.9.	Rated wind velocity (no ice) 135 mph	
5.3.10.	Rated wind velocity (1/2" radial ice) 95 mph	
5.3.11.	Lateral thrust (100 mph No Ice) 122 lbs	
5.3.12.	Torsional moment (100 mph No Ice) 132 ft-lbs	
5.3.13.	Bending moment (100 mph No Ice) 701 ft-lbs	
5.4.	ENCLOSED YAGI ANTENNA	
5.4.1.	Depth = 11.5 in	
5.4.2.	Length/ Height = 34.13 in	
5.4.3.	Width = 11.5 in	
5.4.4.	Base pipe diameter = 2.38 in	
5.4.5.	Base pipe mounting length = 10.25 in	
5.4.6.	Weight = 7.5 lbs	
5.4.7.	Weight iced = 27.7 lbs	
5.4.8.	Wind Loading Area (Flat Plate Equivalent) = 1.42 ft ²	
5.4.9.	Wind Loading Area (1/2" ice) = 1.77 ft ²	
5.4.10.	Rated wind velocity (no ice) = 195 mph	
5.4.11.	Rated wind velocity (1/2" radial ice) = 175 mph	
5.4.12.	Lateral thrust (100 mph No Ice) 49.9 = lbs	
5.4.13.	Bending moment (100 mph No Ice) = 69 ft-lbs	
6.	Climb-Safety per " OVERALL SPECIFICATIONS "	

7.	Foundation design per “ OVERALL SPECIFICATION ” and identified site conditions.	
8.	PE stamped plans per “ OVERALL SPECIFICATIONS ”	
9.	WARRANTY: Minimum One (1) Year (Vendor shall specify standard warranty and additional extended warranty options)	
10.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	

33. TOWERS, PASSIVE MICROWAVE REPEATER

Category Definition: Passive microwave repeater (reflector) structures, structure engineering and design, foundation engineering and design, and associated components and hardware.

Example Product: One - 20 foot by 32 foot passive microwave repeater.

For Bidding Purposes: Vendor shall assume that (1) customer will supply geotechnical report, (2) manage all permits, and (3) contract for foundation and tower erection services.

The following specifications and equipment configuration describes requirements for the EXAMPLE PRODUCT. It is the Bidder’s responsibility to fully describe or explain how the product offered meets or exceeds each identified requirement. If more space is needed, Bidders may submit additional pages (up to a maximum equivalent of five single-sided pages – 12 point font). Only one product may be offered to meet or exceed these specifications on a pass/fail basis. (Reference Section 4.15 Specifications, Part I Solicitation Document)

Manufacturer:	NO BID
Product Model Name/Number:	

Vendors should submit descriptive literature for the product offered confirming its compliance with specifications.

Note: Symbols for less-than (<) or greater-than (>) shall be interpreted to include equal-to the specified value. The symbol for approximate (~) indicates an imprecise or nominal value where variations will be acceptable.

Item #	Description	Describe/explain how Vendor meets or exceeds specifications
1.	SUMMARY DESCRIPTION	
1.1.	ANSI/EIA/TIA-222-G or current nationally approved standard, Structure Classifications III, Essential Communications.	
1.2.	Structure Type = Passive Microwave Repeater (Reflector)	
1.3.	Size = 20 feet by 32 feet	
2.	Conform to “OVERALL SPECIFICATION” requirements.	

3.	SITE INFORMATION	
3.1.	Location = Oregon, east side of Willamette Valley, Cascade foothills	
3.2.	Topographical Category 3, located at the top of a hill <ul style="list-style-type: none"> - Ground Elevation = 3000 feet - 3.2x above Average Surrounding Terrain 	
3.3.	Exposure Classification C, open terrain without forest or significant structures.	
3.4.	Geotechnical = TIA 222 - Rev G "Presumptive Soil"	
3.5.	Site Access = gravel road	
4.	Foundation design per " OVERALL SPECIFICATION " and identified site conditions.	
5.	PE stamped plans per " OVERALL SPECIFICATIONS "	
6.	WARRANTY: Three (3) Years (Vendor shall specify standard warranty and the extended warranty to provide 3 year total warranty coverage.)	
7.	SHIPPING REQUIREMENTS: Contiguous U.S., F.O.B. All Destinations Non-Contiguous U.S., F.O.B. Port	



ALCATEL-LUCENT USA INC. (PART OF NOKIA GROUP)
Other Products and Services – Category 12
Updated Products and Pricing, effective 30May2017



Mobile Networks

**Customer: The State of Washington Department of Enterprise Services on behalf of
NASPO ValuePoint Cooperative Purchasing Program**

Public Safety Communication Support Equipment 05715

Notes:

- 1) Prices valid until contract expiration.
- 2) Prices shown for "drop ship" only. Does not include Taxes or any other configurations.
- 3) Prices shown are for FOB origin, Freight Prepaid and Charged.
- 4) The following items are optional purchases necessary to the functionality of a microwave system (as defined by the purchasing agency), and not an accessory that is optional to the product's intended purpose.

The 9500 MPR Family

Part No	Description	Spare	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price	
RACKS - Table K						
694-9000-006	Standard Rack, 7' tall, 19" wide	N	\$ 900.00	65%	\$ 315.00	
1AD014120046	Seismic Rack, 7.0'	N	\$ 3,000.00	65%	\$ 1,050.00	
690-1125-003	Rack Extension Kit - 19" rack	N	\$ 460.00	65%	\$ 161.00	
3EM13317AB	Power Distribution Panel with Fuse Alarm Card included	N	\$ 910.00	65%	\$ 318.50	
3EM13317AC	Power Distribution Panel with Relay Alarm Card included	N	\$ 1,310.00	65%	\$ 458.50	
690-4373-001	Kit AC Outlet	N	\$ 210.00	65%	\$ 73.50	
695-1001-006	Aluminum Rack Screw Kit	N	\$ 100.00	65%	\$ 35.00	
695-1001-007	Seismic Rack Screw Kit	N	\$ 110.00	65%	\$ 38.50	New Effective 5/30/2017
695-1001-005	Seismic Rack Grounding Kit	N	\$ 300.00	65%	\$ 105.00	New Effective 5/30/2017
694-9004-001	Adjacent Rack Attachment Assy (without rack extensions)	N	\$ 50.00	65%	\$ 17.50	
694-9004-002	Adjacent Rack Attachment Assy (with rack extensions)	N	\$ 50.00	65%	\$ 17.50	
3EM19148AD	Laptop Shelf Assy	N	\$ 600.00	65%	\$ 210.00	New Effective 5/30/2017
RACKS - Table K1						
695-0905-003	Standard Rack, 7' tall, 23" wide	N	\$ 1,000.00	65%	\$ 350.00	
694-8873-005	Adapters for 23", 2 RU (PDU two required)	N	\$ 60.00	65%	\$ 21.00	
CABINETS						
3MU00079AA	9500 MPR Flx16WS 1 MSS	N	\$ 42,000.00	65%	\$ 14,700.00	
3MU00079AB	9500 MPR Flx16WS 2 MSS	N	\$ 46,000.00	65%	\$ 16,100.00	
3MU00079AC	9500 MPR Flx16WS Empty	N	\$ 35,000.00	65%	\$ 12,250.00	
Cabinets - Wall and H-Frame Mounting						
3EM24726AA	Kit, Wall Mount, ATT FTTC	N	\$ 3,238.48	65%	\$ 1,133.47	
3MV00159AB	Kit, Wall Mount, FLX16WS, Battery Base	N	\$ 6,641.32	65%	\$ 2,324.46	
3MV00159AC	Kit, Wall Mtg, FTTC, 90Deg	N	\$ 8,864.10	65%	\$ 3,102.44	
Cabinets - Pole Mounting Kits						
3MV00159AD	Kit, Pole Mnt, FTTC	N	\$ 11,183.84	65%	\$ 3,914.34	
3MV00159AE	Kit, Pole Mnt, FTTC, 90Deg	N	\$ 11,907.00	65%	\$ 4,167.45	
3MV00159AF	Kit, Banded, Pole Mnt, FTTC	N	\$ 10,150.32	65%	\$ 3,552.61	
3MV00159AG	Kit, Mounting, 3-1/2 Pole, FLX12WS	N	\$ 4,376.70	65%	\$ 1,531.85	
Cabinets - Pad Mount Kits						
3MV00159AH	Kit, ASSY, Plinth, 4" High, FTTC	N	\$ 5,978.96	65%	\$ 2,092.64	
3MV00159AJ	Kit, ASSY, Plinth, 14" High, FTTC	N	\$ 6,484.30	65%	\$ 2,269.51	
3MV00159AK	ASSY, Plate, Anchor, FLX, FTTC	N	\$ 4,553.40	65%	\$ 1,593.69	
1AD165490001	Kit, 1/2-13 hardware, FTTC, CAB to CAB	N	\$ 333.18	65%	\$ 116.61	
Cabinets - MPT-HL Flex 25						
3MU00119AA	9500 MPR-FLX25 MPT-HL Cabinet with MSS	N	\$ 54,644.00	65%	\$ 19,125.40	Effective 5/30/2017
3MU00119CA	9500 MPR FLX25 MPT-HL Cabinet with MSS	N	\$ 54,644.00	65%	\$ 19,125.40	New Effective 5/30/2017
Cabinets - MPT-HL Flex 25 Mounting Option						
3MU00127AA	Flex25 14" Plinth Base	N	\$ 3,879.00	65%	\$ 1,357.65	
3MU00128AA	Flex25 Pole Mount Kit	N	\$ 3,884.00	65%	\$ 1,359.40	
Cabinets - Eyebolt FRU Kit						
1AD165480001	LIFT BOLTS 1/2 9412	N	\$ 483.60	65%	\$ 169.26	
MSS SHELF OPTIONS - Table A						
1AB405070001	DS1 Patch Panel D1M-1C2036	N	\$ 6,600.00	65%	\$ 2,310.00	
1AB404960001	DS1 Circuit Protection RH33250-000	N	\$ 2,800.00	65%	\$ 980.00	
MSS SHELF OPTIONS - Table A						
3EM22715AE	9500 MPR Shelf Kit w/Alarm FAN - HS	N	\$ 2,150.00	65%	\$ 752.50	Effective 5/30/2017
3EM22715AF	9500 MPR Shelf Kit w/Alarm FAN - HSv2	N	\$ 2,150.00	65%	\$ 752.50	Effective 5/30/2017
3EM22715AG	9500 MPR Shelf Kit w/FanEvo - HSv2	N	\$ 2,150.00	65%	\$ 752.50	Effective 5/30/2017
3EM22715AH	9500 MPR Shelf Kit w/FanEvo - HSv2	N	\$ 2,150.00	65%	\$ 752.50	New Effective 5/30/2017
3EM24463AA	9500 MPR Shelf Kit (MSS-4)	N	\$ 364.29	65%	\$ 127.50	
3DB18163AB	MSS Slot Cover - Blank Plate 1/2H	N	\$ 40.60	65%	\$ 14.21	
3EM24105AA	Fan Alarm Cable - 25 foot	N	\$ 175.00	65%	\$ 61.25	
3EM24105AB	Fan Alarm Cable - 50 foot	N	\$ 250.00	65%	\$ 87.50	
3DB05594AA	AUX Cable for Housekeeping	N	\$ 74.00	65%	\$ 25.90	
3EM24631AA	AUX Cable for Housekeeping 6'	N	\$ 85.00	65%	\$ 29.75	
3EM24631AB	AUX Cable for Housekeeping 50'	N	\$ 215.00	65%	\$ 75.25	
MSS SHELF OPTION SPARES - Table A						
3DB18485CA	9500 MSS-8 Shelf HS (Spare)	N	\$ 1,332.00	65%	\$ 466.20	Note MSS shelf Option Spares
3DB18485DA	9500 MSS-8 Shelf HSv2 (Spare)	N	\$ 1,332.00	65%	\$ 466.20	Effective 5/30/2017
3DB18485EA	9500 MSS-8 Shelf HSv3 (Spare)	N	\$ 1,332.00	65%	\$ 466.20	New Effective 5/30/2017
3EM223911AA	MSS Fan Unit w/Alarm (Spare)	N	\$ 575.00	65%	\$ 201.25	Effective 5/30/2017
3EM223911BB	MSS Fan Alarm Evo (Spare)	Y	\$ 400.00	65%	\$ 140.00	
3DB18218AD	MSS-4 FAN (Spare)	Y	\$ 330.00	65%	\$ 115.50	
3MU00153AA	MSS Power Supply Cable Kit (Spare)	N	\$ 121.10	65%	\$ 42.39	
3EM24095AB	MPT-HL & HLC Power Cable (Spare)	N	\$ 216.00	65%	\$ 75.60	
3EM24040AA	MPT-HL Air Filter (Spare)	N	\$ 30.00	65%	\$ 10.50	
3DB80367AA	MPT-HLC Air Filter Assembly (Spare)	Y	\$ 350.00	65%	\$ 122.50	
MSS1 - Table A1						
3DB19015AA	MSS1 Spare ONLY	N	\$ 3,200.00	65%	\$ 1,120.00	Effective 5/30/2017

3DB19015AB	MSS1 Spare ONLY	Y	\$ 3,200.00	65%	\$ 1,120.00	New Effective 5/30/2017
3MU00109AA	MSS1 Kit	Y	\$ 3,250.00	65%	\$ 1,137.50	Effective 5/30/2017
3MU00109AB	MSS1 Kit	Y	\$ 3,250.00	65%	\$ 1,137.50	New Effective 5/30/2017
1AC007800068	cable to power MSS-1c (2 conductors, 1mm sq) GLP is per foot	N	\$ 0.77	65%	\$ 0.27	
MSS-O - Table A1						
3DB19159AA	MSS-O Kit, include Pole/Wall Mounting	Y	\$ 3,375.00	65%	\$ 1,181.25	
3DB19281AA	MSS-O DC Kit, include Pole/Wall Mounting	Y	\$ 3,375.00	65%	\$ 1,181.25	New Effective 5/30/2017
3DB19158AA	Pole/wall IM for MSS-O, Spare ONLY	N	\$ 275.00	65%	\$ 96.25	
1AB150990012	RFE protection connector MSS-O	Y	\$ 42.00	65%	\$ 14.70	
1AB150990013	fiber extension tube for MSS-O	N	\$ 187.00	65%	\$ 65.45	
1AC052600002	Outdoor AC Power Cable (meter)	N	\$ 7.25	65%	\$ 2.54	
1AC057660001	Outdoor DC Power Cable (meter)	N	\$ 22.29	65%	\$ 7.80	New Effective 5/30/2017
3CC50271AA	Triple Grounding Kit	N	\$ 324.00	65%	\$ 113.40	
3CC52210AA	MM Fiber, LC/LC for MSS-O, 5m	N	\$ 135.00	65%	\$ 47.25	
3CC52210AB	MM Fiber, LC/LC for MSS-O, 10m	N	\$ 157.00	65%	\$ 54.95	
3CC52210AC	MM Fiber, LC/LC for MSS-O, 25m	N	\$ 245.00	65%	\$ 85.75	
MSS SHELF OPTIONS - Table A						
3DB18326AC	Core Enhanced Module w 6 GbE ports (CORE-E) - TH/Clei	Y	\$ 1,363.40	65%	\$ 477.19	
3DB18788AC	CorEvo-10G	Y	\$ 3,010.00	65%	\$ 1,053.50	Effective 5/30/2017
3DB18788BA	CorEvo-10G	Y	\$ 3,010.00	65%	\$ 1,053.50	New Effective 5/30/2017
3DB18206AC	Ethernet Access Module w 8 GbE port	Y	\$ 993.29	65%	\$ 347.65	Effective 5/30/2017
3DB18126AE	32xT1 TDM Module - TH/Clei	Y	\$ 2,030.00	65%	\$ 710.50	
3DB18194AC	2xDS3 TDM Module	Y	\$ 2,075.00	65%	\$ 726.25	
3DB18634AB	MPT-Access with PoE	Y	\$ 1,754.00	65%	\$ 613.90	
3DB18236AB	AUX Housekeeping	Y	\$ 950.00	65%	\$ 332.50	
3DB18735AA	2xOC3 Module	Y	\$ 1,879.00	65%	\$ 657.65	
3DB19017AB	Ethernet Access Module Version2 with PoE	Y	\$ 2,400.00	65%	\$ 840.00	
3DB78017AA	Sync In/Out SFP for MSS-1/CorEvo-10G	Y	\$ 1,200.00	65%	\$ 420.00	
Optical Coupler for CoreE Protection						
3EM09257AA	Fiber Management Panel	N	\$ 150.00	65%	\$ 52.50	
1AB432200001	Splitter/Combiner unit for 2x4 Management Panel (LC)	N	\$ 1,200.00	65%	\$ 420.00	
1AB123320023	Splitter/Combiner unit for 2x4 Management Panel (SC)	N	\$ 1,000.00	65%	\$ 350.00	
DC Power Injector for MPT-HC						
3CC50129AA	DC injector Box	Y	\$ 250.00	65%	\$ 87.50	
3CC50120AA	DC injector plug-in	Y	\$ 250.00	65%	\$ 87.50	
3CC50173AA	MPT Power Unit	Y	\$ 877.50	65%	\$ 307.13	
3CC50174AA	MPT Extended Power Unit	Y	\$ 1,252.25	65%	\$ 438.29	
DC-DC Power Converter MSS Version						
3DB18862AA	+24 /-48 Vdc Two converters with chassis (Requires 1 MSS Slot)	N	\$ 2,790.00	65%	\$ 976.50	
3DB18863AA	+24 /-48 Vdc Single converter with chassis (Requires 1 MSS Slot)	N	\$ 1,371.00	65%	\$ 479.85	
MPT-HL Shelf Kit - Table F						
3EM24238AA	MPT-HL Shelf Kit Single T-R	N	\$ 1,730.00	65%	\$ 605.50	
3EM24238AB	MPT-HL Shelf Kit Dual T-R	N	\$ 1,790.00	65%	\$ 626.50	
MPT-HL MODULES - Table F1						
3EM22617AA	MPT-HL XCVR ASSY 5725-6425 MHZ STD PWR	Y	\$ 5,733.86	65%	\$ 2,006.85	
3EM22617AB	MPT-HL XCVR ASSY 6425-6930 MHZ STD PWR	Y	\$ 5,733.86	65%	\$ 2,006.85	
3EM22617AC	MPT-HL XCVR ASSY 5725-6425 MHZ HI PWR	Y	\$ 6,937.46	65%	\$ 2,428.11	
3EM22617AD	MPT-HL XCVR ASSY 6425-6930 MHZ HI PWR	Y	\$ 6,937.46	65%	\$ 2,428.11	
3EM22617AE	MPT-HL XCVR ASSY 6875-7125 MHZ HI PWR	Y	\$ 6,937.46	65%	\$ 2,428.11	
3EM23888AA	MPT-HL XCVR ASSY 10.4-10.7 GHZ	Y	\$ 6,258.43	65%	\$ 2,190.45	
3EM23888AB	MPT-HL XCVR ASSY TX 10.7-11.2 GHZ RX HI	Y	\$ 6,257.80	65%	\$ 2,190.23	
3EM23888AC	MPT-HL XCVR ASSY TX 11.2-11.7 GHZ RX LO	Y	\$ 6,257.80	65%	\$ 2,190.23	
MPT-HLC MODULES - Table F1						
3DB19060AA	MPT-HLC XCVR L6 GHZ	Y	\$ 12,000.00	65%	\$ 4,200.00	
3DB19060BA	MPT-HLC XCVR L6 GHZ WITH COMBINER	Y	\$ 15,000.00	65%	\$ 5,250.00	
3DB19060CA	MPT-HLC XCVR L6 GHZ HP	Y	\$ 16,500.00	65%	\$ 5,775.00	
3DB19060DA	MPT-HLC XCVR L6 GHZ HP WITH COMBINER	Y	\$ 19,500.00	65%	\$ 6,825.00	
3DB76047AA	MPT-HLC XCVR U6 GHZ	Y	\$ 12,000.00	65%	\$ 4,200.00	
3DB76047BA	MPT-HLC XCVR U6 GHZ WITH COMBINER	Y	\$ 15,000.00	65%	\$ 5,250.00	
3DB76047CA	MPT-HLC XCVR U6 GHZ HP	Y	\$ 16,500.00	65%	\$ 5,775.00	
3DB76047DA	MPT-HLC XCVR U6 GHZ HP WITH COMBINER	Y	\$ 19,500.00	65%	\$ 6,825.00	
3DB76048AA	MPT-HLC XCVR 7 GHZ	Y	\$ 14,000.00	65%	\$ 4,900.00	Effective 5/30/2017
3DB76048BA	MPT-HLC XCVR 7 GHZ WITH COMBINER	Y	\$ 17,000.00	65%	\$ 5,950.00	Effective 5/30/2017
3DB76048CA	MPT-HLC XCVR 7 GHZ HP	Y	\$ 18,500.00	65%	\$ 6,475.00	Effective 5/30/2017
3DB76048DA	MPT-HLC XCVR 7 GHZ HP WITH COMBINER	Y	\$ 21,500.00	65%	\$ 7,525.00	Effective 5/30/2017
3DB76049AA	MPT-HLC XCVR 8 GHZ	Y	\$ 14,000.00	65%	\$ 4,900.00	Effective 5/30/2017
3DB76049BA	MPT-HLC XCVR 8 GHZ WITH COMBINER	Y	\$ 17,000.00	65%	\$ 5,950.00	Effective 5/30/2017
3DB76049CA	MPT-HLC XCVR 8 GHZ HP	Y	\$ 18,500.00	65%	\$ 6,475.00	Effective 5/30/2017
3DB76049DA	MPT-HLC XCVR 8 GHZ HP WITH COMBINER	Y	\$ 21,500.00	65%	\$ 7,525.00	Effective 5/30/2017
3DB76078AA	MPT-HLC XCVR 10.5 GHZ	Y	\$ 13,000.00	65%	\$ 4,550.00	
3DB76078BA	MPT-HLC XCVR 10.5 GHZ WITH COMBINER	Y	\$ 16,000.00	65%	\$ 5,600.00	
3DB76050AA	MPT-HLC XCVR 11 GHZ	Y	\$ 13,000.00	65%	\$ 4,550.00	
3DB76050BA	MPT-HLC XCVR 11 GHZ WITH COMBINER	Y	\$ 16,000.00	65%	\$ 5,600.00	
3DB76050CA	MPT-HLC XCVR 11 GHZ HP TX LOW	Y	\$ 17,500.00	65%	\$ 6,125.00	
3DB76050DA	MPT-HLC XCVR 11 GHZ HP W/COMBINER TX LO	Y	\$ 20,500.00	65%	\$ 7,175.00	
3DB76050EA	MPT-HLC XCVR 11 GHZ HP TX HIGH	Y	\$ 17,500.00	65%	\$ 6,125.00	
3DB76050FA	MPT-HLC XCVR 11 GHZ HP W/COMBINER TX HI	Y	\$ 20,500.00	65%	\$ 7,175.00	
3CC50210AA	MPT-HLC Antenna Alignment Cable	N	\$ 55.00	65%	\$ 19.25	New Effective 5/30/2017
MPT-HLC XPIC Cables						
3CC52204AA	XPIC cable RJ45-RJ45, 3 m	N	\$ 300.00	65%	\$ 105.00	
3CC52204AB	XPIC cable RJ45-RJ45, 5 m	N	\$ 440.00	65%	\$ 154.00	

3CC52204AC	XPIC cable RJ45-RJ45, 10 m	N	\$ 600.00	65%	\$ 210.00	
3CC52204AD	XPIC cable RJ45-RJ45, 0.5 m	N	\$ 150.00	65%	\$ 52.50	
3CC52204AE	XPIC cable RJ45-RJ45, 1 m	N	\$ 200.00	65%	\$ 70.00	
	MPT-HL Transmit Monitor Port Kit					
3EM24447AA	6 GHz Transmit Monitor Port Kit	Y	\$ 4,000.00	65%	\$ 1,400.00	
3EM24447AB	11 GHz Transmit Monitor Port Kit	Y	\$ 5,000.00	65%	\$ 1,750.00	
	Diplexer Bracket Kits - Table F2					
3EM23465AA	6/11 GHz Hot Standby 1:10 Coupler Diplexer Bracket	N	\$ 1,229.00	65%	\$ 430.15	
3EM23465AB	6/11 GHz Hot Standby Space Diversity Diplexer Bracket	N	\$ 1,250.00	65%	\$ 437.50	
3EM23465AC	6/11 GHz 1+0 (Non-Standby) Diplexer Bracket	N	\$ 262.00	65%	\$ 91.70	
3EM23465AD	6/11 GHz Single Shelf Repeater Diplexer Bracket	N	\$ 451.00	65%	\$ 157.85	
3EM23465AE	1+1 HSB, SD w/ Combiner	N	\$ 1,425.00	65%	\$ 498.75	New Effective 5/30/2017
3EM23465AF	2x(1+0), SD w/ Combiner	N	\$ 825.00	65%	\$ 288.75	New Effective 5/30/2017
3EM23465AG	1+0, SD w/ Combiner	N	\$ 400.00	65%	\$ 140.00	
3EM23465AH	Expansion to 2x(1+0), SD w/ Combiner	N	\$ 345.00	65%	\$ 120.75	New Effective 5/30/2017
	Diplexer Clamp and Isolator Kits -Lower 6Ghz - Table F3					
3EM23466AA	L6 GHz Hot Standby 1:10 Coupler Diplexer Clamp and Isolator Kits	N	\$ 547.00	65%	\$ 191.45	
3EM23466AB	L6 GHz Hot Standby Space Diversity Diplexer Clamp and Isolator Kits	N	\$ 500.00	65%	\$ 175.00	
3EM23466AC	L6 GHz 1+0 (Non-Standby) Diplexer Clamp and Isolator Kits	N	\$ 264.00	65%	\$ 92.40	
3EM23466AD	L6 GHz Single Shelf Repeater Diplexer Clamp and Isolator Kits	N	\$ 636.00	65%	\$ 222.60	
3EM23466AN	L6 GHz 1+1 HSB, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,025.00	65%	\$ 358.75	New Effective 5/30/2017
3EM23466AP	L6 GHz 2x(1+0), SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,145.00	65%	\$ 400.75	New Effective 5/30/2017
3EM23466AQ	L6 GHz 1+0, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 535.00	65%	\$ 187.25	
3EM23466AR	L6 GHz Expansion to 2x(1+0), SD w/ Combiner Dplxr Clamp & Iso Kit	N	\$ 575.00	65%	\$ 201.25	New Effective 5/30/2017
	Dplxr Clamp, Isoltr & Cable Kits -L6Ghz 60 MHz Channels - Table F3					
3DB76116AA	L6 GHz, 60 MHz Hot Standby 1:10 Coupler	N	\$ 2,275.00	65%	\$ 796.25	
3DB76119AA	L6 GHz, 60 MHz Hot Standby Space Diversity	N	\$ 1,650.00	65%	\$ 577.50	
3DB76117AA	L6 GHz, 60 MHz 1+0 (Non-Standby)	N	\$ 750.00	65%	\$ 262.50	
3DB76120AA	L6 GHz, 60 MHz Single Shelf Repeater	N	\$ 1,125.00	65%	\$ 393.75	
3DB76115AA	L6 GHz, 60 MHz 1+1 HSB, SD w/ Combiner	N	\$ 7,500.00	65%	\$ 2,625.00	
3DB76121AA	L6 GHz, 60 MHz 2x(1+0), SD w/ Combiner	N	\$ 1,225.00	65%	\$ 428.75	
3DB76118AA	L6 GHz, 60 MHz 1+0, SD w/ Combiner	N	\$ 750.00	65%	\$ 262.50	
	Diplexer Clamp and Isolator Kits -Upper 6Ghz - Table F3					
3EM23466AE	U6 GHz Hot Standby 1:10 Coupler Diplexer Clamp and Isolator Kits	N	\$ 564.00	65%	\$ 197.40	
3EM23466AF	U6 GHz Hot Standby Space Diversity Diplexer Clamp and Isolator Kits	N	\$ 514.00	65%	\$ 179.90	
3EM23466AG	U6 GHz 1+0 (Non-Standby) Diplexer Clamp and Isolator Kits	N	\$ 273.00	65%	\$ 95.55	
3EM23466AH	U6 GHz Single Shelf Repeater Diplexer Clamp and Isolator Kits	N	\$ 653.00	65%	\$ 228.55	
3EM23466AA	U6 GHz 1+1 HSB, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 4,625.00	65%	\$ 1,618.75	New Effective 5/30/2017
3EM23466AT	U6 GHz 2x(1+0), SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,335.00	65%	\$ 467.25	New Effective 5/30/2017
3EM23466AU	U6 GHz 1+0, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 675.00	65%	\$ 236.25	
3EM23466AV	U6 GHz Expansion to 2x(1+0), SD w/ Combiner Dplxr Clamp & Iso Kit	N	\$ 665.00	65%	\$ 232.75	New Effective 5/30/2017
	Diplexer Clamp and Isolator Kits -Upper 5.8Ghz - Table F3					
3EM23466AJ	5.8 GHz Hot Standby 1:10 Coupler Diplexer Clamp and Isolator Kits	N	\$ 1,355.00	65%	\$ 474.25	
3EM23466AK	5.8 GHz Hot Standby Space Diversity Diplexer Clamp and Isolator Kits	N	\$ 485.00	65%	\$ 169.75	
3EM23466AL	5.8 GHz 1+0 (Non-Standby) Diplexer Clamp and Isolator Kits	N	\$ 253.00	65%	\$ 88.55	
3EM23466AM	5.8 GHz Single Shelf Repeater Diplexer Clamp and Isolator Kits	N	\$ 505.00	65%	\$ 176.75	
3EM23466AW	5.8 GHz 1+1 HSB, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 3,875.00	65%	\$ 1,356.25	
3EM23466AY	5.8 GHz 2x(1+0), SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 785.00	65%	\$ 274.75	
3EM23466AZ	5.8 GHz 1+0, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 370.00	65%	\$ 129.50	
3EM23466BA	5.8 GHz Expansion to 2x(1+0), SD w/ Combiner Dplxr Clamp & Iso Kit	N	\$ 395.00	65%	\$ 138.25	New Effective 5/30/2017
	Diplexer Clamp and Isolator Kits - 10.5 Ghz - Table F3					
3EM24188BA	10.5 GHz Hot Standby 1:10 Coupler Diplexer Clamp and Isolator Kits	N	\$ 620.00	65%	\$ 217.00	
3EM24188BB	10.5 GHz Hot Standby Space Diversity Diplexer Clamp and Isolator Kits	N	\$ 565.00	65%	\$ 197.75	
3EM24188BC	10.5 GHz 1+0 (Non-Standby) Diplexer Clamp and Isolator Kits	N	\$ 300.00	65%	\$ 105.00	
3EM24188BD	10.5 GHz Single Shelf Repeater Diplexer Clamp and Isolator Kits	N	\$ 718.00	65%	\$ 251.30	
3EM24188BE	10.5 GHz 1+1 HSB, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 2,295.00	65%	\$ 803.25	New Effective 5/30/2017
3EM24188BF	10.5 GHz 2x(1+0), SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,295.00	65%	\$ 453.25	New Effective 5/30/2017
3EM24188BG	10.5 GHz 1+0, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 605.00	65%	\$ 211.75	
3EM24188BH	10.5 GHz Expansion to 2x(1+0), SD w/ Combiner Dplxr Clamp & Iso Kit	N	\$ 650.00	65%	\$ 227.50	New Effective 5/30/2017
	Diplexer Clamp and Isolator Kits - 11 Ghz - Table F3					
3EM24188CA	11 GHz Hot Standby 1:10 Coupler Diplexer Clamp and Isolator Kits	N	\$ 620.00	65%	\$ 217.00	
3EM24188CB	11 GHz Hot Standby Space Diversity Diplexer Clamp and Isolator Kits	N	\$ 565.00	65%	\$ 197.75	
3EM24188CC	11 GHz 1+0 (Non-Standby) Diplexer Clamp and Isolator Kits	N	\$ 300.00	65%	\$ 105.00	
3EM24188CD	11 GHz Single Shelf Repeater Diplexer Clamp and Isolator Kits	N	\$ 718.00	65%	\$ 251.30	
3EM24188CE	11 GHz 1+1 HSB, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,215.00	65%	\$ 425.25	New Effective 5/30/2017
3EM24188CF	11 GHz 2x(1+0), SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 1,295.00	65%	\$ 453.25	New Effective 5/30/2017
3EM24188CG	11 GHz 1+0, SD w/ Combiner Diplexer Clamp and Isolator Kit	N	\$ 650.00	65%	\$ 227.50	New Effective 5/30/2017
3EM24188CH	11 GHz Expansion to 2x(1+0), SD w/ Combiner Dplxr Clamp & Iso Kit	N	\$ 650.00	65%	\$ 227.50	New Effective 5/30/2017
	RF Diplexer Filters - Table G					
3EM24458AA	RF Diplexer Filter Xmt 5725-5755, Rcv 5790-5820, 30MHz	N	\$ 1,000.00	65%	\$ 350.00	
3EM24458AB	RF Diplexer Filter Xmt 5755-5785, Rcv 5820-5850, 30MHz	N	\$ 1,000.00	65%	\$ 350.00	
3EM24458AC	RF Diplexer Filter Xmt 5725-5755, Rcv 5820-5850, 30MHz	N	\$ 1,000.00	65%	\$ 350.00	
3EM16710AB	RF Diplexer Filter Xmt 5925-6175, Rcv 6175-6425, 10 MHz BW	N	\$ 1,500.00	65%	\$ 525.00	
3EM16710AC	RF Diplexer Filter Xmt 6175-6425, Rcv 5925-6175, 10 MHz BW	N	\$ 1,500.00	65%	\$ 525.00	
3EM24335AA	RF Diplexer Filter 5925-6425, 30MHz, Symmetrical	N	\$ 1,500.00	65%	\$ 525.00	
3DB76188AA	RF Diplexer Filter Xmt 5925-6175, Rcv 6175-6425, 60 MHz BW	N	\$ 2,000.00	65%	\$ 700.00	
3DB76189AA	RF Diplexer Filter Xmt 6175-6425, Rcv 5925-6175, 60 MHz BW	N	\$ 2,000.00	65%	\$ 700.00	
3EM09730AA	RF Diplexer Filter Xmt 6525-6875, Rcv 6525-6875, 10 MHz BW	N	\$ 800.00	65%	\$ 280.00	
3EM24333AA	RF Diplexer Filter Xmt 6525-6875, 30MHz, Symmetrical	N	\$ 1,500.00	65%	\$ 525.00	
967-1585-002	RF Diplexer Filter Xmt 6440-6750, Rcv 6440-6750, 10 MHz BW	N	\$ 1,500.00	65%	\$ 525.00	
967-1585-003	RF Diplexer Filter Xmt 6440-6750, Rcv 6750-7080, 10 MHz BW	N	\$ 1,200.00	65%	\$ 420.00	

967-1585-004	RF Diplexer Filter Xmt 6750-7080, Rcv 6440-6750, 10 MHz BW	N	\$ 1,200.00	65%	\$ 420.00
967-1585-005	RF Diplexer Filter Xmt 6750-7080, Rcv 6750-7080, 10 MHz BW	N	\$ 1,200.00	65%	\$ 420.00
3EM04024AC	RF Diplexer Filter Xmt 6440-6580, Rcv 6740-6920, 30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM04024AD	RF Diplexer Filter Xmt 6581-6740, Rcv 6921-7080, 30MHz	N	\$ 850.00	65%	\$ 297.50
3EM04024AE	RF Diplexer Filter Xmt 6740-6920, Rcv 6440-6580, 30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM04024AF	RF Diplexer Filter Xmt 6921-7080, Rcv 6581-6740, 30MHz	N	\$ 850.00	65%	\$ 297.50
3EM24078AA	RF Diplexer Filter 10550-10680, 10 MHz BW, Symmetrical	N	\$ 1,500.00	65%	\$ 525.00
3EM24081AA	RF Diplexer Filter 10700-11700, 30 MHz, Symmetrical	N	\$ 1,500.00	65%	\$ 525.00
	RF Space Filters - Table G1				
3EM11649AA	RF Diplexer Space Diversity Filter 5725-5755/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM11649AB	RF Diplexer Space Diversity Filter 5755-5785/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM11649AC	RF Diplexer Space Diversity Filter 5790-5820/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM11649AD	RF Diplexer Space Diversity Filter 5820-5850/30MHz	N	\$ 1,500.00	65%	\$ 525.00
967-0506-002	RF Diplexer Space Diversity Filter 5925-6175 /10MHz BW	N	\$ 1,500.00	65%	\$ 525.00
967-0506-003	RF Diplexer Space Diversity Filter 6175-6425 /10MHz BW	N	\$ 1,500.00	65%	\$ 525.00
3EM04182AA	RF Diplexer Space Diversity Filter 5925-6050/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM04182AB	RF Diplexer Space Diversity Filter 6050-6175/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM04182AC	RF Diplexer Space Diversity Filter 6175-6300/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3EM04182AD	RF Diplexer Space Diversity Filter 6300-6425/30MHz	N	\$ 1,500.00	65%	\$ 525.00
3DB76113AA	RF Diplexer Space Diversity Filter 5925-6175 /60MHz BW	N	\$ 725.00	65%	\$ 253.75
3DB76114AA	RF Diplexer Space Diversity Filter 6175-6425 /60MHz BW	N	\$ 725.00	65%	\$ 253.75
3EM19463AA	RF Diplexer Space Diversity Filter 6525-6875 / 10MHz BW	N	\$ 700.00	65%	\$ 245.00
3EM04235AA	RF Diplexer Space Diversity Filter 6525-6710/30MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM04235AB	RF Diplexer Space Diversity Filter 6710-6875/30MHz	N	\$ 1,000.00	65%	\$ 350.00
967-0506-004	RF Diplexer Space Diversity Filter 6440-6750/10MHz	N	\$ 1,750.00	65%	\$ 612.50
967-0506-005	RF Diplexer Space Diversity Filter 6750-7080/10MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM04235AC	RF Diplexer Space Diversity Filter 6440-6580/30MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM04235AD	RF Diplexer Space Diversity Filter 6580-6740/30MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM04235AE	RF Diplexer Space Diversity Filter 6740-6920/30MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM04235AF	RF Diplexer Space Diversity Filter 6920-7080/30MHz	N	\$ 1,000.00	65%	\$ 350.00
3EM24614AA	RF Diplexer Space Diversity Filter 10550-10680 / 10 MHz	N	\$ 1,400.00	65%	\$ 490.00
3EM24310AA	RF Diplexer Space Diversity Filter 10700-11200 / 30 MHz	N	\$ 875.00	65%	\$ 306.25
3EM24310AB	RF Diplexer Space Diversity Filter 11200-11700 / 30 MHz	N	\$ 875.00	65%	\$ 306.25
	Waveguide Transition Kits - Table G2				
3EM23511AA	Diplexer Transition Assy A2 (6Ghz) Position Kit	N	\$ 500.00	65%	\$ 175.00
3EM23511AB	Diplexer Transition Assy A3 (6Ghz) Position Kit	N	\$ 300.00	65%	\$ 105.00
3EM23511AC	Diplexer Transition Assy A4 (6Ghz) Position Kit	N	\$ 663.00	65%	\$ 232.05
3EM23511AD	Diplexer Transition Assy A5 (6Ghz) Position Kit	N	\$ 541.00	65%	\$ 189.35
3EM23511AE	Flat Bracket Kit	N	\$ 116.00	65%	\$ 40.60
3EM23511AF	Diplexer Transition Assy A2 (11 Ghz) Position Kit	N	\$ 550.00	65%	\$ 192.50
3EM23511AG	Diplexer Transition Assy A3 (11 Ghz) Position Kit	N	\$ 350.00	65%	\$ 122.50
3EM23511AH	Diplexer Transition Assy A4 (11 Ghz) Position Kit	N	\$ 725.00	65%	\$ 253.75
3EM23511AJ	Diplexer Transition Assy A5 (11 Ghz) Position Kit	N	\$ 600.00	65%	\$ 210.00
	Waveguide Transition Kits - Table G3 (note 1007)				
1AB077940016	Diplexer to Transition Cable Assy 228.6mm	N	\$ 50.00	65%	\$ 17.50
1AB077940017	Diplexer to Transition Cable Assy 304.8mm	N	\$ 55.00	65%	\$ 19.25
1AB077940018	Diplexer to Transition Cable Assy 381mm	N	\$ 75.00	65%	\$ 26.25
	Stacking Filter Waveguide Kits - Lower 6 Ghz - Table H				
3EM24123DA	Stacking Filter L6 GHz Hot Standby W/G Kit 1st MPT	N	\$ 2,372.00	65%	\$ 830.20
3EM24123DB	Stacking Filter L6 GHz Hot Standby W/G Kit 1st & 2nd MPT	N	\$ 3,124.00	65%	\$ 1,093.40
3EM24123DC	Stacking Filter L6 GHz Hot Sby W/G Kit 3rd MPT	N	\$ 2,369.00	65%	\$ 829.15
3EM24123DD	Stacking Filter L6 GHz Hot Sby W/G Kit 3rd & 4th MPT	N	\$ 3,084.00	65%	\$ 1,079.40
3EM24123DE	Stacking Filter L6 GHz Hot Sby W/G Kit Add-On 3rd MPT	N	\$ 1,575.00	65%	\$ 551.25
3EM24123DF	Stacking Filter L6 GHz Hot Sby W/G Kit Add-On 3rd & 4th MPT	N	\$ 1,725.00	65%	\$ 603.75
3EM24123DG	Stacking Filter L6 GHz Hot Sby W/G Kit Add-On 2nd or 4th MPT	N	\$ 625.00	65%	\$ 218.75
	Stacking Filter Waveguide Kits - Upper 6 Ghz - Table H				
3EM24123EA	Stacking Filter U6 GHz Hot Standby W/G Kit 1st MPT	N	\$ 2,372.00	65%	\$ 830.20
3EM24123EB	Stacking Filter U6 GHz Hot Standby W/G Kit 1st & 2nd MPT	N	\$ 3,124.00	65%	\$ 1,093.40
3EM24123EC	Stacking Filter U6 GHz Hot Sby W/G Kit 3rd MPT	N	\$ 2,369.00	65%	\$ 829.15
3EM24123ED	Stacking Filter U6 GHz Hot Sby W/G Kit 3rd & 4th MPT	N	\$ 3,084.00	65%	\$ 1,079.40
3EM24123EE	Stacking Filter U6 GHz Hot Sby W/G Kit Add-On 3rd MPT	N	\$ 1,600.00	65%	\$ 560.00
3EM24123EF	Stacking Filter U6 GHz Hot Sby W/G Kit Add-On 3rd & 4th MPT	N	\$ 1,800.00	65%	\$ 630.00
3EM24123EG	Stacking Filter U6 GHz Hot Sby W/G Kit Add-On 2nd or 4th MPT	N	\$ 675.00	65%	\$ 236.25
	Stacking Filter Waveguide Kits - 6 Ghz - Table H				
3EM24123AE	Stacking Filter 6 GHz Add-on Space Kit 1st MPT (HSB)	N	\$ 2,045.00	65%	\$ 715.75
3EM24123AF	Stacking Filter 6 GHz Add-on Space Kit 1st & 2nd MPT (HSB)	N	\$ 2,540.00	65%	\$ 889.00
3EM24123BF	Stacking Filter 6 GHz Add-on Space Kit 3rd MPT (HSB)	N	\$ 1,450.00	65%	\$ 507.50
3EM24123BG	Stacking Filter 6 GHz Add-on Space Kit 3rd & 4th MPT (HSB)	N	\$ 1,550.00	65%	\$ 542.50
3EM24123AG	Stacking Filter 6 GHz Add-on Space Kit 3rd MPT (HSB)	N	\$ 2,257.00	65%	\$ 789.95
3EM24123AH	Stacking Filter 6 GHz Add-on Space Kit 3rd & 4th MPT (HSB)	N	\$ 2,597.00	65%	\$ 908.95
3EM24123BR	Stacking Filter 6 GHz Add-on Space Kit 2nd or 4th MPT (HSB)	N	\$ 600.00	65%	\$ 210.00
3EM24123AJ	Stacking Filter Initial Bracket Kit	N	\$ 145.00	65%	\$ 50.75
3EM24123AK	Stacking Filter Flat Bracket Kit	N	\$ 65.00	65%	\$ 22.75
3EM24123AW	Stacking Filter Stacker Bracket Kit	N	\$ 165.00	65%	\$ 57.75
3EM24123AL	Stacking Filter Add-on Xmt & Rev Circulators	N	\$ 963.00	65%	\$ 337.05
3EM24123AY	Stacking Filter 6 GHz Freq Div W/G Kit 1st MPT 1x(1+0)	N	\$ 7,025.00	65%	\$ 2,458.75
3EM24123AM	Stacking Filter 6 GHz Freq Div W/G Kit 1st MPT 2x(1+0)	N	\$ 5,470.00	65%	\$ 1,914.50
3EM24123AZ	Stacking Filter 6 GHz Freq Div W/G Kit 1st & 2nd MPT 3x(1+0)	N	\$ 7,750.00	65%	\$ 2,712.50
3EM24123AN	Stacking Filter 6 GHz Freq Div W/G Kit 1st & 2nd MPT 4x(1+0)	N	\$ 6,354.00	65%	\$ 2,223.90
3EM24123BA	Stacking Filter 6 GHz Freq Div W/G Kit 3rd MPT 2nd dir 1x(1+0)	N	\$ 7,250.00	65%	\$ 2,537.50
3EM24123AP	Stacking Filter 6 GHz Freq Div W/G Kit 3rd MPT 2nd dir 2x(1+0)	N	\$ 5,723.00	65%	\$ 2,003.05
3EM24123BB	Stacking Filter 6 GHz Freq Div W/G Kit 3rd & 4th MPT 2nd dir 3x(1+0)	N	\$ 7,975.00	65%	\$ 2,791.25
3EM24123AQ	Stacking Filter 6 GHz Freq Div W/G Kit 3rd & 4th MPT 2nd dir 4x(1+0)	N	\$ 6,947.00	65%	\$ 2,431.45
3EM24123BV	Stacking Filter 6 GHz Freq Div W/G Kit 2nd MPT 2nd Dir 2x(1+0)	N	\$ 4,875.00	65%	\$ 1,706.25

New Effective 5/30/2017

3EM24123BU	Stacking Filter 6 GHz Freq Div W/G Kit 2nd MPT 2nd Dir 1x(1+0)	N	\$ 4,700.00	65%	\$ 1,645.00
3EM24123BC	Stckg Fltr 6 GHz Freq Div W/G Kit Add-on 2nd/4th MPT Grow to 3x(1+0)	N	\$ 1,650.00	65%	\$ 577.50
3EM24123BD	Stckg Fltr 6 GHz Freq Div W/G Kit Add-on 2nd/4th MPT Grow to 4x(1+0)	N	\$ 1,625.00	65%	\$ 568.75
3EM24123BE	Stacking Filter 6 GHz Freq Div W/G Kit Add-On Kit Grow 2nd or 4th MPT	N	\$ 825.00	65%	\$ 288.75
3EM24123BH	1st MPT Add Space Div to 1x(1+0) Kit (SD FD)	N	\$ 2,950.00	65%	\$ 1,032.50
3EM24123BJ	1st MPT Add Space Div to 2x(1+0) Kit (SD FD)	N	\$ 2,900.00	65%	\$ 1,015.00
3EM24123BK	1st & 2nd MPT Add Space Div to 3x(1+0) Kit (SD FD)	N	\$ 2,850.00	65%	\$ 997.50
3EM24123BL	1st & 2nd MPT Add Space Div to 4x(1+0) Kit (SD FD)	N	\$ 2,825.00	65%	\$ 988.75
3EM24123BM	3rd MPT Add Space Div to 1x(1+0) Kit (SD FD)	N	\$ 2,350.00	65%	\$ 822.50
3EM24123BN	3rd MPT Add Space Div to 2x(1+0) Kit (SD FD)	N	\$ 2,325.00	65%	\$ 813.75
3EM24123BP	3rd & 4th MPT Add Space Div to 3x(1+0) Kit (SD FD)	N	\$ 2,750.00	65%	\$ 962.50
3EM24123BQ	3rd & 4th MPT Add Space Div to 4x(1+0) Kit (SD FD)	N	\$ 2,725.00	65%	\$ 953.75
3EM24123BS	Field Add-On 2nd MPT to 1x(1+0) Kit or 4th MPT to 3x(1+0) (SD FD)	N	\$ 425.00	65%	\$ 148.75
3EM24123BT	Field Add-On 3rd MPT to 2x(1+0) Kit (SD FD)	N	\$ 875.00	65%	\$ 306.25
Waveguide Extention Kits - Table L					
3EM24123AR	6 GHz W/G Extension Kit Xmt/Rcv A8-A11	N	\$ 2,250.00	65%	\$ 787.50
3EM24123AS	6 GHz W/G Extension Kit Space Div A8-A11 (MPT-HL)	N	\$ 1,850.00	65%	\$ 647.50
3EM24123AV	6 GHz W/G Extension Kit Space Div A8-A11 (MPT-HLC)	N	\$ 2,885.00	65%	\$ 1,009.75
3EM24123AU	6 GHz W/G Extension A8 to Top (Xmt/Rcv or Space Div)	N	\$ 1,050.00	65%	\$ 367.50
3EM24123AT	6 GHz W/G Extension A3 to A8, A5 to A10 (Xmt/Rcv or Space Div)	N	\$ 600.00	65%	\$ 210.00
3EM17592AA	Bracket, WG Support (1 hole)	N	\$ 50.00	65%	\$ 17.50
3EM17592AB	Bracket, WG Support (2 hole)	N	\$ 56.00	65%	\$ 19.60
3EM23867AC	Bracket, WG Support (2 hole)	N	\$ 110.00	65%	\$ 38.50
Stacking Filter Waveguide Kits- 11 Ghz - Table H					
3EM24166AA	Stacking Filter WG Initial Comb Assy 11 GHz 1st MPT HSB	N	\$ 2,609.00	65%	\$ 913.15
3EM24166AB	Stacking Filter WG Initial Comb Assy 11 GHz 1st & 2nd MPT HSB	N	\$ 3,436.00	65%	\$ 1,202.60
3EM24166AC	Stacking Filter WG Add-on Assy 11 GHz 3rd MPT HSB	N	\$ 2,605.00	65%	\$ 911.75
3EM24166AD	Stacking Filter WG Add-on Assy 11 GHz 3rd & 4th MPT HSB	N	\$ 3,392.00	65%	\$ 1,187.20
3EM24166DE	Stacking Filter 11 GHz Hot Stby W/G Kit Add-On 3rd MPT	N	\$ 2,290.00	65%	\$ 801.50
3EM24166DF	Stacking Filter 11 GHz Hot Stby W/G Kit Add-On 3rd & 4th MPT	N	\$ 2,915.00	65%	\$ 1,020.25
3EM24166DG	Stacking Filter 11 GHz Hot Stby W/G Kit Add-On 2nd or 4th MPT	N	\$ 875.00	65%	\$ 306.25
3EM24166AE	Stacking Filter WG Add SD Assy 11 GHz 1st MPT (HSB)	N	\$ 2,249.00	65%	\$ 787.15
3EM24166AF	Stacking Filter WG Add SD Assy 11 GHz 1st & 2nd MPT (HSB)	N	\$ 2,794.00	65%	\$ 977.90
3EM24166BF	Stacking Filter 11 GHz Add-on Space Kit 3rd MPT (HSB)	N	\$ 1,395.00	65%	\$ 488.25
3EM24166BG	Stacking Filter 11 GHz Add-on Space Kit 3rd & 4th MPT (HSB)	N	\$ 1,995.00	65%	\$ 698.25
3EM24166AG	Stacking Filter WG Add SD Assy 11 GHz 3rd MPT (HSB)	N	\$ 2,482.00	65%	\$ 868.70
3EM24166AH	Stacking Filter WG Add SD Assy 11 GHz 3rd & 4th MPT (HSB)	N	\$ 2,856.00	65%	\$ 999.60
3EM24166BR	Stacking Filter 11 GHz Add-on Space Kit 2nd or 4th MPT (HSB)	N	\$ 950.00	65%	\$ 332.50
3EM24166AJ	Stacking Filter Initial Bracket Kit	N	\$ 159.00	65%	\$ 55.65
3EM24123AK	Stacking Filter Flat Bracket Kit	N	\$ 65.00	65%	\$ 22.75
3EM24123AW	Stacking Filter Stacker Bracket Kit	N	\$ 165.00	65%	\$ 57.75
3EM24166AK	Stacking Filter Add-on XMT & RCV Circulators	N	\$ 1,059.00	65%	\$ 370.65
3EM24166AY	Stacking Filter 11 GHz Freq Div W/G Kit 1st MPT 1x(1+0)	N	\$ 5,450.00	65%	\$ 1,907.50
3EM24166AL	Stacking Filter 11 GHz Freq Div W/G Kit 1st MPT 2x(1+0)	N	\$ 6,017.00	65%	\$ 2,105.95
3EM24166AZ	Stacking Filter 11 GHz Freq Div W/G Kit 1st & 2nd MPT 3x(1+0)	N	\$ 7,250.00	65%	\$ 2,537.50
3EM24166AM	Stacking Filter 11 GHz Freq Div W/G Kit 1st & 2nd MPT 4x(1+0)	N	\$ 6,989.00	65%	\$ 2,446.15
3EM24166BA	Stacking Filter 11 GHz Freq Div W/G Kit 3rd MPT 2nd dir 1x(1+0)	N	\$ 6,150.00	65%	\$ 2,152.50
3EM24166AN	Stacking Filter 11 GHz Freq Div W/G Kit 3rd MPT 2x(1+0)	N	\$ 6,295.00	65%	\$ 2,203.25
3EM24166BB	Stacking Filter 11 GHz Freq Div W/G Kit 3rd & 4th MPT 2nd dir 3x(1+0)	N	\$ 7,850.00	65%	\$ 2,747.50
3EM24166AP	Stacking Filter 11 GHz Freq Div W/G Kit 3rd & 4th MPT 4x(1+0)	N	\$ 7,641.00	65%	\$ 2,674.35
3EM24166BV	Stacking Filter 11 GHz Freq Div W/G Kit 2nd MPT 2nd Dir 2x(1+0)	N	\$ 5,500.00	65%	\$ 1,925.00
3EM24166BU	Stacking Filter 11 GHz Freq Div W/G Kit 2nd MPT 2nd Dir 1x(1+0)	N	\$ 4,700.00	65%	\$ 1,645.00
3EM24166BC	Stckg Fltr 11 GHz Freq Div W/G Kit Add-on 2nd/4th MPT Grow to 3x(1+0)	N	\$ 1,825.00	65%	\$ 638.75
3EM24166BD	Stckg Fltr 11 GHz Freq Div W/G Kit Add-on 2nd/4th MPT Grow to 4x(1+0)	N	\$ 1,775.00	65%	\$ 621.25
3EM24166BE	Stacking Filter 11 GHz Freq Div W/G Kit Add-On Kit Grow 2nd MPT	N	\$ 1,425.00	65%	\$ 498.75
3EM24166BW	Stacking Filter 11 GHz Freq Div W/G Kit Add-On Kit Grow 4th MPT	N	\$ 1,275.00	65%	\$ 446.25
3EM24166BH	1st MPT Add Space Div to 1x(1+0) Kit (SD FD)	N	\$ 2,145.00	65%	\$ 750.75
3EM24166BJ	1st MPT Add Space Div to 2x(1+0) Kit (SD FD)	N	\$ 2,550.00	65%	\$ 892.50
3EM24166BK	1st & 2nd MPT Add Space Div to 3x(1+0) Kit (SD FD)	N	\$ 3,000.00	65%	\$ 1,050.00
3EM24166BL	1st & 2nd MPT Add Space Div to 4x(1+0) Kit (SD FD)	N	\$ 3,200.00	65%	\$ 1,120.00
3EM24166BM	3rd MPT Add Space Div to 1x(1+0) Kit (SD FD)	N	\$ 1,975.00	65%	\$ 691.25
3EM24166BN	3rd MPT Add Space Div to 2x(1+0) Kit (SD FD)	N	\$ 2,375.00	65%	\$ 831.25
3EM24166BP	3rd & 4th MPT Add Space Div to 3x(1+0) Kit (SD FD)	N	\$ 2,850.00	65%	\$ 997.50
3EM24166BQ	3rd & 4th MPT Add Space Div to 4x(1+0) Kit (SD FD)	N	\$ 3,000.00	65%	\$ 1,050.00
3EM24166BS	Field Add-On 2nd MPT to 1x(1+0) Kit (SD FD)	N	\$ 725.00	65%	\$ 253.75
3EM24166BY	Field Add-On 4th MPT to 3x(1+0) Kit (SD FD)	N	\$ 635.00	65%	\$ 222.25
3EM24166BT	Field Add-On 3rd MPT to 2x(1+0) Kit (SD FD)	N	\$ 900.00	65%	\$ 315.00
Waveguide Extention Kits - Table L					
3EM24166AQ	11 GHz WG Ext Xmt-Rcv Kit Positions A8-A11 Left or Right	N	\$ 1,016.00	65%	\$ 355.60
3EM24166AR	11 GHz W/G Extension Kit Space Div A8-A11 (MPT-HL)	N	\$ 1,118.00	65%	\$ 391.30
3EM24166AV	11 GHz W/G Extension Kit Space Div A8-A11 (MPT-HLC)	N	\$ 1,825.00	65%	\$ 638.75
RF Stacking Filters - 6 GHz Table J					
3EM16948AG	RCV RF Stacking Filter 5725-5850 MHz	N	\$ 900.00	65%	\$ 315.00
3EM16949AG	XMT RF Stacking Filter 5725-5850 MHz	N	\$ 900.00	65%	\$ 315.00
3EM16948AA	RCV RF Stacking Filter 5925-6175 MHz	N	\$ 1,100.00	65%	\$ 385.00
3EM16949AB	XMT RF Stacking Filter 6175-6425 MHz	N	\$ 1,150.00	65%	\$ 402.50
3EM16948AB	RCV RF Stacking Filter 6175-6425 MHz	N	\$ 1,200.00	65%	\$ 420.00
3EM16949AA	XMT RF Stacking Filter 5925-6175 MHz	N	\$ 1,650.00	65%	\$ 577.50
3DB76113AA	RF Stacking Filter 5925-6175 MHz (XMT or RCV)	N	\$ 725.00	65%	\$ 253.75
3DB76114AA	RF Stacking Filter 6175-6425 MHz (XMT or RCV)	N	\$ 725.00	65%	\$ 253.75
3DB76092AA	60 MHz Filter Flange Adapter Kit	N	\$ 7,500.00	65%	\$ 2,625.00
3EM16948AD	RCV RF Stacking Filter 6525-6875 MHz	N	\$ 950.00	65%	\$ 332.50
3EM16949AD	XMT RF Stacking Filter 6525-6875 MHz	N	\$ 950.00	65%	\$ 332.50
3EM16948AE	RCV RF Stacking Filter 6440-6740 MHz	N	\$ 1,700.00	65%	\$ 595.00
3EM16949AF	XMT RF Stacking Filter 6740-7080 MHz	N	\$ 1,250.00	65%	\$ 437.50
3EM16948AF	RCV RF Stacking Filter 6740-7080 MHz	N	\$ 1,250.00	65%	\$ 437.50

3EM16949AE	XMT RF Stacking Filter 6440-6740 MHz	N	\$ 850.00	65%	\$ 297.50	
	RF Stacking Filters - 11 GHz - Table J					
3EM05115AA	RCV RF Stacking Filter 10700-11200 MHz	N	\$ 1,500.00	65%	\$ 525.00	
3EM05115AC	RCV RF Stacking Filter 11200-11700 MHz	N	\$ 1,500.00	65%	\$ 525.00	
3EM05114AA	XMT RF Stacking Filter 10700-11200 MHz	N	\$ 1,500.00	65%	\$ 525.00	
3EM05114AC	XMT RF Stacking Filter 11200-11700 MHz	N	\$ 1,500.00	65%	\$ 525.00	
	Cable Kits - Table J1					
3EM23523AJ	Stacking Cable Assy Hot Standby 1:10 Coupler	N	\$ 1,145.00	65%	\$ 400.75	
3EM23523AK	Stacking Cable Assy Hot Standby W/ Space Diversity	N	\$ 1,150.00	65%	\$ 402.50	
3EM23523AL	Stacking Cable Assy Freq Diversity 2x(1+0)	N	\$ 450.00	65%	\$ 157.50	
3EM23523AM	Stacking Cable Assy 1+0 Non-Standby Circulators Right-Rear	N	\$ 200.00	65%	\$ 70.00	New Effective 5/30/2017
3EM23523AN	Stacking Cable Assy 1+0 Non-Standby Circulators Left-Rear	N	\$ 235.00	65%	\$ 82.25	
3EM23523AP	Stacking Cable Assy Expansion to 2x(1+0) Circulators Right-Rear	N	\$ 235.00	65%	\$ 82.25	
3EM23523AQ	Stacking Cable Assy Expansion to 2x(1+0) Circulators Left-Rear	N	\$ 200.00	65%	\$ 70.00	
3EM23523AR	Stacking Cable Assy Hot-Standby, Space Div with Combiner	N	\$ 1,345.00	65%	\$ 470.75	
3EM23523AS	Stacking Cable Assy Freq Diversity 2x(1+0), Space Div with Combiner	N	\$ 500.00	65%	\$ 175.00	
3EM23523AT	Freq Div 1x(1+0), Space Div w/Combiner Circulators Right-Rear	N	\$ 285.00	65%	\$ 99.75	
3EM23523AU	Freq Div 1x(1+0), Space Div w/Combiner Circulators Left-Rear	N	\$ 350.00	65%	\$ 122.50	
3EM23523AV	Expansion to 2x(1+0), SD w/ Combiner Circulators Right-Rear	N	\$ 345.00	65%	\$ 120.75	
3EM23523AW	Expansion to 2x(1+0), SD w/ Combiner Circulators Left-Rear	N	\$ 290.00	65%	\$ 101.50	
3EM23523AY	Hot Standby w/ Transmitter Diversity Antenna	N	\$ 915.00	65%	\$ 320.25	New Effective 5/30/2017
	Isolator Kits - L6 - Table J2					
3EM23524AA	Isolator Assy Lower 6 GHz Hot Standby 1:10 Coupler	N	\$ 461.00	65%	\$ 161.35	
3EM23524AB	Isolator Assy Lower 6 GHz Hot Standby Space Diversity or FD	N	\$ 449.00	65%	\$ 157.15	
3EM23524AC	Isolator Assy Lower 6 GHz 1+0 (Non-Standby)	N	\$ 224.00	65%	\$ 78.40	
3EM23524AG	Isolator Assy Lower 6 GHz 1+1 HSB, Space Div w/ Combiner	N	\$ 840.00	65%	\$ 294.00	New Effective 5/30/2017
3EM23524AH	Isolator Assy Lower 6 GHz 2x(1+0), Space Div w/ Combiner	N	\$ 650.00	65%	\$ 227.50	
3EM23524AJ	Isolator Assy Lower 6 GHz 1+0, Space Div w/ Combiner	N	\$ 325.00	65%	\$ 113.75	
3EM23524AK	Isolator Assy Lower 6 GHz Hot-Standby w/ Transmit Diversity Antenna	N	\$ 750.00	65%	\$ 262.50	
	Isolator Kits - U6 - Table J2					
3EM23524AD	Isolator Assy Upper 6 GHz Hot Standby 1:10 Coupler	N	\$ 479.00	65%	\$ 167.65	
3EM23524AE	Isolator Assy Upper 6 GHz Hot Standby Space Diversity or FD	N	\$ 466.00	65%	\$ 163.10	
3EM23524AF	Isolator Assy Upper 6 GHz 1+0 (Non-Standby)	N	\$ 233.00	65%	\$ 81.55	
3EM23524AL	Isolator Assy Upper 6 GHz 1+1 HSB, Space Div w/ Combiner	N	\$ 925.00	65%	\$ 323.75	New Effective 5/30/2017
3EM23524AM	Isolator Assy Upper 6 GHz 2x(1+0), Space Div w/ Combiner	N	\$ 725.00	65%	\$ 253.75	New Effective 5/30/2017
3EM23524AN	Isolator Assy Upper 6 GHz 1+0, Space Div w/ Combiner	N	\$ 365.00	65%	\$ 127.75	New Effective 5/30/2017
3EM23524AP	Isolator Assy Upper 6 GHz Hot-Standby w/ Transmit Diversity Antenna	N	\$ 895.00	65%	\$ 313.25	New Effective 5/30/2017
	Isolator Kits - 10.5/11 GHz - Table J2					
3EM24189AA	Isolator Assy 10.5/11 GHz Hot Standby 1:10 Coupler	N	\$ 526.00	65%	\$ 184.10	
3EM24189AB	Isolator Assy 10.5/11 GHz Hot Standby Space Diversity or FD	N	\$ 512.00	65%	\$ 179.20	
3EM24189AC	Isolator Assy 10.5/11 GHz 1+0 (Non-Standby)	N	\$ 256.00	65%	\$ 89.60	
3EM24189AD	Isolator Assy 10.5/11 GHz 1+1 HSB, Space Div w/ Combiner	N	\$ 750.00	65%	\$ 262.50	
3EM24189AE	Isolator Assy 10.5/11 GHz 2x(1+0), Space Div w/ Combiner	N	\$ 625.00	65%	\$ 218.75	
3EM24189AF	Isolator Assy 10.5/11 GHz 1+0, Space Div w/ Combiner	N	\$ 325.00	65%	\$ 113.75	
3EM24189AH	Isolator Assy 10.5 GHz Hot-Standby w/ Transmit Diversity Antenna	N	\$ 850.00	65%	\$ 297.50	
3EM24189AG	Isolator Assy 11 GHz Hot-Standby w/ Transmit Diversity Antenna	N	\$ 850.00	65%	\$ 297.50	
	Flange Adapter Kit - Table J3					
3DH04122HA	Flange Adapter CPR-137 1PORT, 6Ghz	N	\$ 250.00	65%	\$ 87.50	
3DH04122HB	Flange Adapter CPR-137 2PORT, 6Ghz	N	\$ 500.00	65%	\$ 175.00	
3DH04122HC	Flange Adapter CPR-137 3PORT, 6Ghz	N	\$ 600.00	65%	\$ 210.00	
3DH04122HD	Flange Adapter CPR-159 1PORT, 6Ghz	N	\$ 200.00	65%	\$ 70.00	
3DH04122HE	Flange Adapter CPR-159 2PORT, 6Ghz	N	\$ 500.00	65%	\$ 175.00	
3DH04122HF	Flange Adapter CPR-159 3PORT, 6Ghz	N	\$ 600.00	65%	\$ 210.00	
3DH04122HG	Flange Adapter CMR-159 1PORT, 6Ghz	N	\$ 200.00	65%	\$ 70.00	
3DH04122HH	Flange Adapter CMR-159 2PORT, 6Ghz	N	\$ 350.00	65%	\$ 122.50	
3DH04122HJ	Flange Adapter CMR-159 3PORT, 6Ghz	N	\$ 450.00	65%	\$ 157.50	
3DH04122HN	Flange Adapter CPR-90 1PORT, 11Ghz	N	\$ 250.00	65%	\$ 87.50	
3DH04122HP	Flange Adapter CPR-90 2PORT, 11Ghz	N	\$ 500.00	65%	\$ 175.00	
3DH04122HQ	Flange Adapter CPR-90 3PORT, 11Ghz	N	\$ 600.00	65%	\$ 210.00	
3DH04122HR	Flange Adapter CMR-90 1PORT, 11Ghz	N	\$ 150.00	65%	\$ 52.50	
3DH04122HS	Flange Adapter CMR-90 2PORT, 11Ghz	N	\$ 350.00	65%	\$ 122.50	
3DH04122HT	Flange Adapter CMR-90 3PORT, 11Ghz	N	\$ 450.00	65%	\$ 157.50	
	Waveguide - Table H					
3EM24197AA	6 GHz WAVEGUIDE, STRAIGHT	N	\$ 350.00	65%	\$ 122.50	
3EM24197AB	6 GHz WAVEGUIDE, STRAIGHT	N	\$ 475.00	65%	\$ 166.25	
3EM24191AA	6 GHz E-E BEND WAVEGUIDE ADAPTER	N	\$ 650.00	65%	\$ 227.50	
3EM24191AB	6 GHz E-E BEND WAVEGUIDE ADAPTER	N	\$ 650.00	65%	\$ 227.50	
3EM24197AC	6 GHz WAVEGUIDE, STRAIGHT	N	\$ 750.00	65%	\$ 262.50	
3EM24190AA	6 GHz E-E-H-H BEND WAVEGUIDE ADAPTER	N	\$ 1,150.00	65%	\$ 402.50	
3EM24190AB	6 GHz E-E-H-H BEND WAVEGUIDE ADAPTER	N	\$ 1,150.00	65%	\$ 402.50	
3EM24190AD	6 GHz E-E-H-H BEND WAVEGUIDE ADAPTER	N	\$ 1,150.00	65%	\$ 402.50	
	ACCP Lower 6 GHz					
3DB76151AA	KIT SUPPORT WAVEGUIDE UP/DOWN	N	\$ 445.00	65%	\$ 155.75	
3DB76151AB	KIT SUPPORT WG R70 UP/DOWN	N	\$ 801.43	65%	\$ 280.50	New Effective 5/30/2017
3DB76152AA	KIT BRANCHING CH1 UP	N	\$ 1,550.00	65%	\$ 542.50	
3DB76152AB	KIT BRANCHING CH1 SIDE UP	N	\$ 1,835.00	65%	\$ 642.25	New Effective 5/30/2017
3DB76153AA	KIT BRANCHING CH1 DOWN	N	\$ 1,800.00	65%	\$ 630.00	
3DB76153AB	KIT BRANCHING CH1 DOWN	N	\$ 2,150.00	65%	\$ 752.50	New Effective 5/30/2017
3DB76154AA	KIT EXPANSION BRACKETS EVEN CHANNELS	N	\$ 375.00	65%	\$ 131.25	
3DB76154AB	KIT EXPANSION BRACKETS CHANNELS 3-5-7 UP/DOWN	N	\$ 385.00	65%	\$ 134.75	New Effective 5/30/2017
3DB76155AA	KIT EXPANSION TX-RX CHANNELS 3-5-7	N	\$ 525.00	65%	\$ 183.75	
3DB76156AA	KIT EXPANSION TX-RX CH.2-4-6-8	N	\$ 400.00	65%	\$ 140.00	

3DB76157AA	KIT BRANCHING RX DIV. CH1 UP	N	\$ 575.00	65%	\$ 201.25	
3DB76157AB	KIT BRANCHING RX-DIV CH1 UP	N	\$ 575.00	65%	\$ 201.25	New Effective 5/30/2017
3DB76158AA	KIT BRANCHING RX-DIV CH1 DOWN	N	\$ 975.00	65%	\$ 341.25	
3DB76158AB	KIT BRANCHING RX-DIV CH1 DOWN	N	\$ 1,175.00	65%	\$ 411.25	New Effective 5/30/2017
3DB76159AA	KIT EXTENSION RX DIV. CHANNELS 3-5-7	N	\$ 250.00	65%	\$ 87.50	
3DB76161AA	KIT EXTENSION RX-DIV.CHANNELS 2-4-6-8 UP/DOWN	N	\$ 200.00	65%	\$ 70.00	
3DB01184AA	5.6-6.4 GHz circulator	N	\$ 200.00	65%	\$ 70.00	
3DB01185AA	WR137 Power Absorber 5.6-7.1 GHz	N	\$ 95.00	65%	\$ 33.25	
3DB02412AA	FLANGED STUB L=47MM (x CH2)	N	\$ 55.00	65%	\$ 19.25	
3DB02414AA	FLANGED STUB L=141 MM (x CH3)	N	\$ 70.00	65%	\$ 24.50	
3DB02415AA	FLANGED STUB L=188 MM (x CH4)	N	\$ 80.00	65%	\$ 28.00	
3DB02417AA	FLANGED STUB L=282 MM (x CH5)	N	\$ 100.00	65%	\$ 35.00	
3DB02418AA	FLANGED STUB L=329 MM (x CH6)	N	\$ 115.00	65%	\$ 40.25	
3DB24240AA	FLANGED STUB L=423 MM (x CH7)	N	\$ 135.00	65%	\$ 47.25	
3DB76146AA	FLANGED STUB R70 L=470 MM (x CH8)	N	\$ 200.00	65%	\$ 70.00	
3DB76145AA	FLANGED STUB R70 (CPR137)	N	\$ 225.00	65%	\$ 78.75	
3DB76246AA	FLANGED STUB R70 (L=210mm) (CMR137)	N	\$ 160.29	65%	\$ 56.10	New Effective 5/30/2017
3DB76131AA	TUNED 6 CAV FILTER 5.90-6.20 GHz CH 30 MHz	N	\$ 775.00	65%	\$ 271.25	New Effective 5/30/2017
3DB76132AA	TUNED 6 CAV FILTER 6.15-6.45 GHz CH 30 MHz	N	\$ 775.00	65%	\$ 271.25	New Effective 5/30/2017
3DB76197AA	REJECTION FILTER 3 cav. 6L INF	N	\$ 475.00	65%	\$ 166.25	
3DB76198AA	REJECTION FILTER 3 cav. 6L SUP	N	\$ 475.00	65%	\$ 166.25	
3DB76113AA	RF Stacking Filter 5925-6175 MHz (XMT or RCV) 60 MHz	N	\$ 725.00	65%	\$ 253.75	New Effective 5/30/2017
3DB76114AA	RF Stacking Filter 6175-6425 MHz (XMT or RCV) 60 MHz	N	\$ 725.00	65%	\$ 253.75	New Effective 5/30/2017
3DB76199AA	REJECTION FILTER 6 CAV. 6L INF (Only for Ch 60 Mhz)	N	\$ 425.00	65%	\$ 148.75	
3DB76200AA	REJECTION FILTER 6 CAV. 6L SUP (Only for Ch 60 Mhz)	N	\$ 425.00	65%	\$ 148.75	
3CC50266AB	KIT SCREW FOR DOUBLE REJECTION FILTERS	N	\$ 5.00	65%	\$ 1.75	
3DB80438AA	SHORTING PLATE KIT	N	\$ 55.00	65%	\$ 19.25	
3DB76258AA	KIT BRANCHING TX SPLIT ON RXD 1+0 UP	N	\$ 3,050.00	65%	\$ 1,067.50	New Effective 5/30/2017
3DB76259AA	KIT BRANCHING TX SPLIT ON RXD 1+0 DOWN	N	\$ 1,800.00	65%	\$ 630.00	New Effective 5/30/2017
3DB76261AA	KIT EXP. CONFIG. 3+0 5+0 7+0 UP/DOWN	N	\$ 935.00	65%	\$ 327.25	New Effective 5/30/2017
3DB76260AA	KIT EXP. CONFIG. 2+0 4+0 6+0 8+0 UP/DOWN	N	\$ 815.00	65%	\$ 285.25	New Effective 5/30/2017
3DB76162AA	KIT FIXING BRACKET BRANCH. CONFIG. 5+0 7+0	N	\$ 85.00	65%	\$ 29.75	New Effective 5/30/2017
3DB76262AA	KIT FIX BRACKETS TX ON RXD FOR EVEN CONFIGURATION	N	\$ 95.00	65%	\$ 33.25	New Effective 5/30/2017
	ACCP Cable Kits Lower 6 GHz					
3EM23523CA	MPT-HLC ACCP Ch 1, 3, 5, 7 Cable Kit	N	\$ 160.00	65%	\$ 56.00	
3EM23523CB	MPT-HLC ACCP Ch 2, 4, 6, 8 Cable Kit	N	\$ 160.00	65%	\$ 56.00	
3EM23523CC	6 G MPT-HLC ACCP SD Ch 1,3,5,7 Cable Kit	N	\$ 80.00	65%	\$ 28.00	
3EM23523CD	6 G MPT-HLC ACCP SD Ch 2,4,6,8 Cable Kit	N	\$ 80.00	65%	\$ 28.00	
	ACCP 11 GHz					
3DB76201AA	KIT BRANCHING TX-RX CH1 SIDE UP 11 GHz	N	\$ 1,850.00	65%	\$ 647.50	
3DB76202AA	KIT BRANCHING CH1 SIDE DOWN 11 GHz	N	\$ 1,775.00	65%	\$ 621.25	
3DB76203AA	KIT EXT. BRACKETS CHANNELS 3-5-7 11 GHz	N	\$ 350.00	65%	\$ 122.50	
3DB76204AA	KIT EXT. TX-RX CH 3-5-7 UP/DOWN 11 GHz	N	\$ 945.00	65%	\$ 330.75	
3DB76205AA	KIT EXT. TX-RX CH 2-4-6-8 UP/DOWN 11GHz	N	\$ 600.00	65%	\$ 210.00	
3DB76206AA	KIT BRANCHING RX-DIV CH1 UP 11 GHz	N	\$ 785.00	65%	\$ 274.75	
3DB76207AA	KIT BRANCHING RX-DIV CH1 DOWN 11 GHz	N	\$ 815.00	65%	\$ 285.25	
3DB76208AA	KIT EXT RX-DIV. CH 3-5-7 UP/DOWN 11 GHz	N	\$ 475.00	65%	\$ 166.25	
3DB76209AA	KIT EXT RX-DIV.CH 2-4-6-8 UP/DOWN 11 GHz	N	\$ 300.00	65%	\$ 105.00	
3DB02132AA	11 GHZ CIRCULATOR	N	\$ 300.00	65%	\$ 105.00	
3DB80566AA	FILTER 11.2-11.7 GHz 6 CAV.BW 40 MHZ	N	\$ 853.60	65%	\$ 298.76	New Effective 5/30/2017
3DB80567AA	FILTER 10.7-11.2 GHz 6 CAV.BW 40 MHZ	N	\$ 853.60	65%	\$ 298.76	New Effective 5/30/2017
3DB76228AA	FILTER 11.2-11.7 GHz 6 CAV.BW 40 MHZ	N	\$ 1,325.00	65%	\$ 463.75	New Effective 5/30/2017
3DB76229AA	FILTER 10.7-11.2 GHz 6 CAV.BW 40 MHZ	N	\$ 1,325.00	65%	\$ 463.75	New Effective 5/30/2017
3DB02189AA	TERMINATION 11-13GHz WR75	N	\$ 125.00	65%	\$ 43.75	
3DB76215AA	FLANGED STUB R120 L=261mm (TX-RX and RXD - UP)	N	\$ 172.00	65%	\$ 60.20	New Effective 5/30/2017
3DB76223AA	DOUBLE BEND E PLANE R120 (TX-RX - DOWN)	N	\$ 485.00	65%	\$ 169.75	New Effective 5/30/2017
3DB76224AA	DOUBLE BEND E PLANE R120 (RXD - DOWN)	N	\$ 485.00	65%	\$ 169.75	New Effective 5/30/2017
3DB76222AA	FLANGED STUB R120 L=39mm (2CH)	N	\$ 145.00	65%	\$ 50.75	New Effective 5/30/2017
3DB76216AA	FLANGED STUB R120 L=141mm (3CH)	N	\$ 150.00	65%	\$ 52.50	New Effective 5/30/2017
3DB76217AA	FLANGED STUB R120 L=180mm (4CH)	N	\$ 150.00	65%	\$ 52.50	New Effective 5/30/2017
3DB76218AA	FLANGED STUB R120 L=282mm (5CH)	N	\$ 165.00	65%	\$ 57.75	New Effective 5/30/2017
3DB76219AA	FLANGED STUB R120 L=321mm (6CH)	N	\$ 165.00	65%	\$ 57.75	New Effective 5/30/2017
3DB76220AA	FLANGED STUB R120 L=423mm (7CH)	N	\$ 165.00	65%	\$ 57.75	New Effective 5/30/2017
3DB76221AA	FLANGED STUB R120 L=462mm (8CH)	N	\$ 175.00	65%	\$ 61.25	New Effective 5/30/2017
	ACCP Cable Kits 11 GHz					
3EM23523CE	MPT-HLC ACCP Ch 1, 3, 5, 7 Cable Kit	N	\$ 160.00	65%	\$ 56.00	New Effective 5/30/2017
3EM23523CF	MPT-HLC ACCP Ch 2, 4, 6, 8 Cable Kit	N	\$ 160.00	65%	\$ 56.00	New Effective 5/30/2017
3EM23523CG	11 G MPT-HLC ACCP SD Ch 1,3,5,7 Cable Kit	N	\$ 80.00	65%	\$ 28.00	New Effective 5/30/2017
3EM23523CH	11 G MPT-HLC ACCP SD Ch 2,4,6,8 Cable Kit	N	\$ 80.00	65%	\$ 28.00	New Effective 5/30/2017
	MPT-HCv2 5.8G 64MHz					
3DB20913BA	MPT-HC V2 5.8GHz 5725.5-5785.5	Y	\$ 9,230.00	65%	\$ 3,230.50	
3DB20914BA	MPT-HC V2 5.8GHz 5789.5-5849.5	Y	\$ 9,230.00	65%	\$ 3,230.50	
3DB20913BB	MPT-HC V2 5.8GHz 5725.5-5785.5 (GR-3108 version)	Y	\$ 9,230.00	65%	\$ 3,230.50	
3DB20914BB	MPT-HC V2 5.8GHz 5789.5-5849.5 (GR-3108 version)	Y	\$ 9,230.00	65%	\$ 3,230.50	
	MPT-HCv2 5.8 GHz Diplexers- Table E4					
3DB20752BA	5.8GHz CH1-1P P.SH.64MHz 5725.5-5755.5 / 5789.5-5819.5	N	\$ 874.29	65%	\$ 306.00	
3DB20752BB	5.8GHz CH2-2P P.SH.64MHz 5755.5-5785.5 / 5819.5-5849.5	N	\$ 874.29	65%	\$ 306.00	
3DB20752BC	5.8GHz CH1-1P P.SH.64MHz 5725.5-5755.5 / 5789.5-5819.5 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00	
3DB20752BD	5.8GHz CH2-2P P.SH.64MHz 5755.5-5785.5 / 5819.5-5849.5 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00	
	MPT-HCv2 L6GHz 252.04MHz - Table E4					
3DB20800BA	MPT-HC L6GHz 5929.96-6168	Y	\$ 4,483.14	65%	\$ 1,569.10	Effective 5/30/2017
3DB20802BA	MPT-HC L6GHz 6182-6420.04	Y	\$ 4,483.14	65%	\$ 1,569.10	Effective 5/30/2017
3DB20800BB	MPT-HC L6GHz 5929.96-6168 (GR-3108 version)	Y	\$ 4,483.14	65%	\$ 1,569.10	
3DB20802BB	MPT-HC L6GHz 6182-6420.04 (GR-3108 version)	Y	\$ 4,483.14	65%	\$ 1,569.10	

MPT-XP L6GHz 252.04MHz - Table E4					
3DB20760BA	MPT-XP L6GHz 5929.96-6168	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20761BA	MPT-XP L6GHz 6182-6420.04	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20760BB	MPT-XP L6GHz 5929.96-6168 (GR-3108 version)	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20761BB	MPT-XP L6GHz 6182-6420.04 (GR-3108 version)	Y	\$ 5,698.07	65%	\$ 1,994.33
MPT-HCv2 L6 GHz Diplexers- Table E4					
3DB20753BA	5929.96-6050 / 6182-6302.04	N	\$ 874.29	65%	\$ 306.00
3DB20753BB	6032.96-6168 / 6285-6420.04	N	\$ 874.29	65%	\$ 306.00
3DB20753BD	5929.96-6050 / 6182-6302.04 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00
3DB20753BE	6032.96-6168 / 6285-6420.04 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00
MPT-HCv2 U6GHz 160/340MHz - Table E4					
3DB20804BA	MPT-HCv2 6420-6775	Y	\$ 4,483.14	65%	\$ 1,569.10
3DB20806BA	MPT-HCv2 6710-7115	Y	\$ 4,483.14	65%	\$ 1,569.10
3DB20804BB	MPT-HCv2 6420-6775 (GR-3108 version)	Y	\$ 4,483.14	65%	\$ 1,569.10
3DB20806BB	MPT-HCv2 6710-7115 (GR-3108 version)	Y	\$ 4,483.14	65%	\$ 1,569.10
MPT-XP U6GHz 160/340MHz - Table E4					
3DB20763BA	MPT-XP 6420-6775	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20764BA	MPT-XP 6710-7115	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20763BB	MPT-XP 6420-6775 (GR-3108 version)	Y	\$ 5,698.07	65%	\$ 1,994.33
3DB20764BB	MPT-XP 6710-7115 (GR-3108 version)	Y	\$ 5,698.07	65%	\$ 1,994.33
MPT-HCv2 U6 160GHz Diplexers- Table E4					
3DB20756BA	6540-6610 / 6710-6780	N	\$ 874.29	65%	\$ 306.00
3DB20756BB	6590-6660 / 6750-6820	N	\$ 874.29	65%	\$ 306.00
3DB20756BC	6640-6710 / 6800-6870	N	\$ 874.29	65%	\$ 306.00
3DB20756BD	6540-6610 / 6710-6780 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00
3DB20756BE	6590-6660 / 6750-6820 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00
3DB20756BF	6640-6710 / 6800-6870 (GR-3108 version)	N	\$ 874.29	65%	\$ 306.00
MPT-HCv2 U6 340 GHz Diplexers- Table E4					
3DB20755BA	6420-6600, 1 / 6760-6940, 1P (for HC only)	N	\$ 874.29	65%	\$ 306.00
3DB20755BB	6565-6720, 2 / 6905-7060, 2P (for HC only)	N	\$ 874.29	65%	\$ 306.00
3DB20755BC	6595-6775, 3 / 6935-7115, 3P (for HC only)	N	\$ 874.29	65%	\$ 306.00
3DB20755BG	6420-6600, 1 / 6760-6940, 1P (for HC & XP)	N	\$ 874.29	65%	\$ 306.00
3DB20755BH	6565-6720, 2 / 6905-7060, 2P (for HC & XP)	N	\$ 874.29	65%	\$ 306.00
3DB20755BJ	6595-6775, 3 / 6935-7115, 3P (for HC & XP)	N	\$ 874.29	65%	\$ 306.00
MPT-HCv2 11GHz 490/500MHz - Table E4					
3DB20371BB	MPT-HC 11GHz 10695-10961	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20547BB	MPT-HC 11GHz 11199-11485	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20546BB	MPT-HC 11GHz 10933-11200	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20548BB	MPT-HC 11 GHz 11430-11705	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20371BC	MPT-HC 11GHz 10695-10961 (GR-3108)	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20547BC	MPT-HC 11GHz 11199-11485 (GR-3108)	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20546BC	MPT-HC 11GHz 10933-11200 (GR-3108)	Y	\$ 5,357.43	65%	\$ 1,875.10
3DB20548BC	MPT-HC 11 GHz 11430-11705 (GR-3108)	Y	\$ 5,357.43	65%	\$ 1,875.10
MPT-HCv2 18GHz 1560 MHz - Table E4					
3DB20432BC	MPT-HC 18GHz 17700-18140,5 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20433BC	MPT-HC 18GHz 19260-19700,5 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
MPT-HCv2 23GHz 1200/1232 MHz - Table E4					
3DB20473BA	MPT-HC 23GHz 21198-21819	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20475BA	MPT-HC 23GHz 22400-23019	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20473BB	MPT-HC 23GHz 21198-21819 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20475BB	MPT-HC 23GHz 22400-23019 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20474BD	MPT-HC 23GHz 21781-22400 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20476BD	MPT-HC 23GHz 22981-23600 (GR-3108)	Y	\$ 9,200.00	65%	\$ 3,220.00
MPT-HC Modules - Table E5					
3DB20116BB	MPT-HC XPIC Module	Y	\$ 1,385.00	65%	\$ 484.75
3DB20117BB	MPT-HC RPS Module (GR-3108)	Y	\$ 250.00	65%	\$ 87.50
3DB20116BC	MPT-HC XPIC Module (GR-3108)	Y	\$ 1,385.00	65%	\$ 484.75
MPT-HC/XP-HQAM 6Ghz					
3DB20800DA	MPT-HC-HQAM L6GHz low	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB20802DA	MPT-HC-HQAM L6GHz high	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB20760DA	MPT-XP-HQAM L6GHz low	Y	\$ 11,730.00	65%	\$ 4,105.50
3DB20761DA	MPT-XP-HQAM L6GHz high	Y	\$ 11,730.00	65%	\$ 4,105.50
3DB20804DA	MPT-HC-HQAM U6GHz low	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB20806DA	MPT-HC-HQAM U6GHz high	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB20763DA	MPT-XP-HQAM U6GHz low	Y	\$ 11,730.00	65%	\$ 4,105.50
3DB20764DA	MPT-XP-HQAM U6GHz high	Y	\$ 11,730.00	65%	\$ 4,105.50
MPT-HC/XP-HQAM 11Ghz					
3DB22000DA	MPT-HC-HQAM 11GHz low	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB22001DA	MPT-HC-HQAM 11GHz high	Y	\$ 9,230.00	65%	\$ 3,230.50
3DB22002DA	MPT-XP-HQAM 11GHz low	Y	\$ 11,730.00	65%	\$ 4,105.50
3DB22003DA	MPT-XP-HQAM 11GHz high	Y	\$ 11,730.00	65%	\$ 4,105.50
MPT-HC/XP-HQAM 18Ghz					
3DB20432DA	MPT-HC-HQAM 18GHz 1560 1/P	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20433DA	MPT-HC-HQAM 18GHz 1560 1P/1	Y	\$ 9,200.00	65%	\$ 3,220.00
MPT-HC/XP-HQAM 23Ghz					
3DB20473DA	MPT-HC-HQAM 23GHz 1200 1/P	Y	\$ 9,200.00	65%	\$ 3,220.00

Effective 5/30/2017
Effective 5/30/2017

3DB20474DA	MPT-HC-HQAM 23GHz 1200 2/2P	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20475DA	MPT-HC-HQAM 23GHz 1200 1P/1	Y	\$ 9,200.00	65%	\$ 3,220.00
3DB20476DA	MPT-HC-HQAM 23GHz 1200 2P/2	Y	\$ 9,200.00	65%	\$ 3,220.00
	MPT-HC/XP-HQAM 11 GHz Diplexer				
3DB20991BD	11 GHz : 10695 - 10961 / 11199 - 11485	Y	\$ 1,800.00	65%	\$ 630.00
3DB20991BE	11 GHz : 10933 - 11200 / 11430 - 11705	Y	\$ 1,800.00	65%	\$ 630.00
3DB20991BF	11GHz CH3-3P SH.490-530MHz (ANSI special apps)	Y	\$ 1,800.00	65%	\$ 630.00
	MPT-HC Coupler Equal 3:3 Table E10				
3CC58276AA	5.8GHz 3dB coupler	N	\$ 1,080.00	65%	\$ 378.00
3CC58056AA	6GHz 3dB coupler	N	\$ 983.68	65%	\$ 344.29
3CC14140AA	11GHz 3dB coupler	N	\$ 1,822.50	65%	\$ 637.88
3CC13473AA	18-25GHz 3dB coupler	N	\$ 1,316.86	65%	\$ 460.90
3CC13474AA	28-38GHz 3dB coupler	N	\$ 1,080.00	65%	\$ 378.00
3CC58276AC	coupler 3 dB 5.7-7.1 GHz GR3108	N	\$ 1,080.00	65%	\$ 378.00
3CC58224AB	coupler 3 dB 10-11.7 GHz flat GR3108	N	\$ 1,964.00	65%	\$ 687.40
3CC13473AC	18/23/25 GHz 3dB COUPLER GR3108	N	\$ 405.00	65%	\$ 141.75
3CC13474AC	38GHz 3dB coupler GR3108	N	\$ 1,350.00	65%	\$ 472.50
	MPT-HC Coupler Unequal 1:10 Table E9				
3CC58276AB	5.8GHz 10dB coupler	N	\$ 1,024.00	65%	\$ 358.40
3CC58056AB	6GHz 10dB coupler	N	\$ 856.45	65%	\$ 299.76
3CC13473AB	18-25GHz 10dB coupler	N	\$ 652.48	65%	\$ 228.37
3CC13474AB	28-38GHz 10dB coupler	N	\$ 1,024.00	65%	\$ 358.40
3CC58056AD	Coupler 10dB 6 GHz GR3108	N	\$ 1,082.43	65%	\$ 378.85
3CC58276AD	coupler 10 dB 5.7-7.1 GHz GR3108	N	\$ 1,316.35	65%	\$ 460.72
3CC14140AD	11GHz 10dB coupler GR3108	N	\$ 1,894.12	65%	\$ 662.94
3CC58226AB	coupler 10 dB 10-11.7 GHz flat GR3108	N	\$ 1,964.00	65%	\$ 687.40
3CC13473AD	18/23/25 GHz 10dB COUPLER GR3108	N	\$ 675.27	65%	\$ 236.34
3CC13474AD	Coupler 38 GHz 10dB GR3108	N	\$ 1,271.23	65%	\$ 444.93
	MPT-HC 4x OMT Table E12				
3CC58244AA	OMT-C 6LGHz	N	\$ 10,064.25	65%	\$ 3,522.49
3CC58266AA	OMT-C U6 GHz	N	\$ 10,064.25	65%	\$ 3,522.49
3CC58200AA	OMT-C 11GHz	N	\$ 2,236.28	65%	\$ 782.70
3CC58201AA	OMT-C 18GHz	N	\$ 6,638.49	65%	\$ 2,323.47
3CC58202AA	OMT-C 23GHz	N	\$ 2,236.28	65%	\$ 782.70
	MPT-HC 2xOMT Table E11				
3CC58134AA	OMT 6LGHz	N	\$ 2,370.00	65%	\$ 829.50
3CC58186AA	OMT 6UGHz	N	\$ 2,370.00	65%	\$ 829.50
3CC58161AA	OMT 11GHz	N	\$ 1,555.00	65%	\$ 544.25
3CC58229AA	OMT 11 GHz - flat	N	\$ 1,555.00	65%	\$ 544.25
3CC58164AA	OMT 18GHz	N	\$ 1,555.00	65%	\$ 544.25
3CC58165AA	OMT 23GHz	N	\$ 1,555.00	65%	\$ 544.25
	MPT-HC OMT Coupler Termination Table E13				
3CC58225AA	6 GHz 50 Ohm Termination	N	\$ 405.00	65%	\$ 141.75
3CC58223AA	11 GHz 50 Ohm Termination	N	\$ 405.00	65%	\$ 141.75
3CC58221AA	18/25 GHz 50 Ohm Termination	N	\$ 405.00	65%	\$ 141.75
3CC58220AA	38 GHz 50 Ohm Termination	N	\$ 405.00	65%	\$ 141.75
	MPT-HC Mounting Table E7				
3DB10137AB	Non-integrated Pole Mount (GR-3108)	N	\$ 300.00	65%	\$ 105.00
3CC50172AA	5.8 GHz N-Type nose adapter	N	\$ 503.00	65%	\$ 176.05
3DB01460AB	6 GHz Nose for not integrated ant	N	\$ 283.50	65%	\$ 99.23
3CC50125AA	11GHz nose WR90 (flange UBR100)	N	\$ 270.00	65%	\$ 94.50
3CC50178AA	18-23 GHz nose adapter	N	\$ 520.00	65%	\$ 182.00
3DB02082AA	38 GHz nose adapter	N	\$ 560.00	65%	\$ 196.00
3EM24705AA	Rack mount panel / Star adapter kit	N	\$ 490.00	65%	\$ 171.50
3EM24705AB	ODU RACK MOUNT MPT-HC/MPRe 6 GHz	N	\$ 490.00	65%	\$ 171.50
	Outdoor PoE				
3DB19194AA	PD-9501GO/FP/AC-NA	N	\$ 850.00	65%	\$ 297.50
3DB19195AA	PD-OUT-MBK	N	\$ 160.00	65%	\$ 56.00
	MPT-HC Cables				
3CC52191AA	Light Service alignment kit with LEMO connector	N	\$ 284.00	65%	\$ 99.40
	MPT-HC CAT5e IM Table A6				
1AC016760006	Cat5e cable - GLP is per foot	N	\$ 1.15	65%	\$ 0.40
1AD040130004	Ground kit - (qty 3 per run, based on length)	N	\$ 58.52	65%	\$ 20.48
3CC50251AA	Ground kit, 2M - (qty 3 per run, based on length)	N	\$ 60.00	65%	\$ 21.00
1AB074610027	RJ-45 connector for indoor and outdoor ends of cat5e	N	\$ 8.17	65%	\$ 2.86
1AB150990002	R2CT connector protection for RJ45 outdoor	N	\$ 34.36	65%	\$ 12.03
1AD160490001	Tool HIROSE RJ45 IDU-ODU cable assembling	N	\$ 2,064.15	65%	\$ 722.45
	MPT-HC CAT5e Cords A4				
3CC52199AE	3m Preassembled CAT5e R2TC/RJ45	N	\$ 232.00	65%	\$ 81.20
3CC52199AF	5m Preassembled CAT5e R2TC/RJ45	N	\$ 244.00	65%	\$ 85.40
3CC52199AG	10m Preassembled CAT5e R2TC/RJ45	N	\$ 272.00	65%	\$ 95.20
3CC52199AH	18m Preassembled CAT5e R2TC/RJ45	N	\$ 308.00	65%	\$ 107.80
3CC52199AA	25m Preassembled CAT5e R2TC/RJ45	N	\$ 418.00	65%	\$ 146.30
3CC52199AJ	40m Preassembled CAT5e R2TC/RJ45	N	\$ 500.00	65%	\$ 175.00
3CC52199AB	50m Preassembled CAT5e R2TC/RJ45	N	\$ 745.00	65%	\$ 260.75
3CC52199AC	75m Preassembled CAT5e R2TC/RJ45	N	\$ 1,081.00	65%	\$ 378.35
3CC52199AD	100m Preassembled CAT5e R2TC/RJ45	N	\$ 1,408.00	65%	\$ 492.80
	MPT-HC CAT5e Cords A4				

New Effective 5/30/2017

Effective 5/30/2017

Effective 5/30/2017

New Effective 5/30/2017

3CC52170BA	Preassembled fiber cord LC-LC/Q-XCO 80m (multimode)	N	\$ 875.00	65%	\$ 306.25
3CC52170BB	Preassembled fiber cord LC-LC/Q-XCO 100m (multimode)	N	\$ 895.00	65%	\$ 313.25
3CC52170BC	Preassembled fiber cord LC-LC/Q-XCO 120m (pref) (multimode)	N	\$ 901.75	65%	\$ 315.61
3CC52170BD	Preassembled fiber cord LC-LC/Q-XCO 140m (multimode)	N	\$ 1,034.00	65%	\$ 361.90
3CC52170BE	Preassembled fiber cord LC-LC/Q-XCO 160m (multimode)	N	\$ 1,141.00	65%	\$ 399.35
3CC52170BF	Preassembled fiber cord LC-LC/Q-XCO 180m (multimode)	N	\$ 1,248.50	65%	\$ 436.98
3CC52170BG	Preassembled fiber cord LC-LC/Q-XCO 200m (pref) (multimode)	N	\$ 1,357.50	65%	\$ 475.13
3CC52170BH	Preassembled fiber cord LC-LC/Q-XCO 220m (multimode)	N	\$ 1,470.00	65%	\$ 514.50
3CC52170BY	Preassembled fiber cord LC-LC/Q-XCO 250m (multimode)	N	\$ 1,631.80	65%	\$ 571.13
3CC52170BL	Preassembled fiber cord LC-LC/Q-XCO 300m (multimode)	N	\$ 1,901.20	65%	\$ 665.42
3CC52170BM	Preassembled fiber cord LC-LC/Q-XCO 50m (multimode)	N	\$ 851.00	65%	\$ 297.85
3CC52170BN	Preassembled fiber cord LC-LC/Q-XCO 25m (multimode)	N	\$ 729.00	65%	\$ 255.15
3CC52212AB	Preassembled fiber cord LC-LC/Q-XCO 400m (singlemode)	N	\$ 1,810.00	65%	\$ 633.50
3CC52212AC	Preassembled fiber cord LC-LC/Q-XCO 480m (singlemode)	N	\$ 2,100.00	65%	\$ 735.00
3CC50097AA	Fiber storage -pole/wall mount (100m)	N	\$ 199.26	65%	\$ 69.74
3CC50095AA	Fiber storage - rack mount (25 m)	N	\$ 313.71	65%	\$ 109.80
MPT-HC RPS Cables Table E5					
3CC52169BA	RPS LC-LC optical jumper preassembled L=1m	N	\$ 161.33	65%	\$ 56.47
3CC52169BB	RPS LC-LC optical jumper preassembled L=10m	N	\$ 229.50	65%	\$ 80.33
3CC52169BC	RPS LC-LC optical jumper preassembled L=20m	N	\$ 290.25	65%	\$ 101.59
MPT-HC XPIC Cables Table E5					
3CC52186CA	XPIC cable 1 m	N	\$ 140.94	65%	\$ 49.33
3CC52186CB	XPIC cable 2.5 m	N	\$ 318.50	65%	\$ 111.48
3CC52186CC	XPIC cable 8 m	N	\$ 295.00	65%	\$ 103.25
MPT-HC Battery IM					
3CC50030AA	Lightning Arrester when batt on coaxial cable	N	\$ 218.74	65%	\$ 76.56
1AB251350001	LPF for batt, 2 wire N adapter (filters 48v from ODU)	N	\$ 295.00	65%	\$ 103.25
1AB328430001	Lightning arrester RJ-45 router output (MPRe)	N	\$ 725.25	65%	\$ 253.84
3CC50158AA	Support for 1AB37230001 LA, max 8 LA	N	\$ 56.00	65%	\$ 19.60
3CC52188AA	N- to Free Wire	N	\$ 85.73	65%	\$ 30.01
3CC52159AA	Pig-tail, 2 wires to N-connector, 4 m (batt to N then LA, LPF...)	N	\$ 113.00	65%	\$ 39.55
3CC52167AA	N- to RJ45	N	\$ 182.00	65%	\$ 63.70
SOFTWARE R6.x.x - Table B					
3DB23386AAAC	9500 MPR R6.0.0 uSD Card for CorEvo-10G	N	\$ 100.00	65%	\$ 35.00
3DB18970BHAC	9500 MPR R6.0 SW CD Kit (MSS1/4/8)	N	\$ 1,500.00	65%	\$ 525.00
3DB18970CHAC	9500 MPR R6.0 SW CD Kit (MSS Q)	N	\$ 1,500.00	65%	\$ 525.00
3DB18970BHBC	9500 MPR R6.0 SW Electronic Delivery Kit	N	\$ 1,000.00	65%	\$ 350.00
3EM23086ASAC	9500 MPR R6.0.0 Flash Card	N	\$ 100.00	65%	\$ 35.00
3DB23386ABAB	9500 MPR R6.1.0 uSD Card for CorEvo-10G ICS02	N	\$ 100.00	65%	\$ 35.00
3DB18970BJAB	9500 MPR R6.1 SW CD Kit (MSS1/4/8) ICS02	N	\$ 1,500.00	65%	\$ 525.00
3DB18970BJBB	9500 MPR R6.1 SW Electronic Delivery Kit ICS02	N	\$ 1,000.00	65%	\$ 350.00
3EM23086ATAB	9500 MPR R6.1.0 Flash Card ICS02	N	\$ 100.00	65%	\$ 35.00
SOFTWARE R7.x.x - Table B					
3DB23386ACAB	9500 MPR R7.0.0 uSD Card for CorEvo-10G ICS02	N	\$ 100.00	65%	\$ 35.00
3DB18970BKAB	9500 MPR R7.0 SW CD Kit (MSS1/4/8) ICS02	N	\$ 1,500.00	65%	\$ 525.00
3DB18970BKBB	9500 MPR R7.0 SW Electronic Delivery Kit ICS02	N	\$ 1,000.00	65%	\$ 350.00
3EM23086AUB	9500 MPR R7.0.0 Flash Card ICS02	N	\$ 100.00	65%	\$ 35.00
3DB23386ADAB	9500 MPR R7.1.0 uSD Card for CorEvo-10G ICS02	N	\$ 100.00	65%	\$ 35.00
3DB18970BLAB	9500 MPR R7.1 SW CD Kit ICS02	N	\$ 1,500.00	65%	\$ 525.00
3DB18970BLBB	9500 MPR R7.1 SW Electronic Delivery Kit ICS02	N	\$ 1,000.00	65%	\$ 350.00
3EM23086AVAB	9500 MPR R7.1.0 Flash Card ICS02	N	\$ 100.00	65%	\$ 35.00
MISC RTU					
3EM23067AAAA	9500 MPR CT License (Per PC Installed)	N	\$ 500.00	65%	\$ 175.00
3EM24226AA	Microwave Factory Test Certificate	N	\$ 1,500.00	65%	\$ 525.00
3EM24592AAAB	9500 MPR Software Subscription (Per Node)	N	\$ 500.00	65%	\$ 175.00
3EM24745AAAA	9500 MPR OS License	N	\$ 1,500.00	65%	\$ 525.00
3MU00146AAAA	MPT on MSS-O RTU	N	\$ 3,000.00	65%	\$ 1,050.00
3MU00147AAAA	MPT Spectrum Analyzer Tool RTU	N	\$ 3,000.00	65%	\$ 1,050.00
RTU's - per ODU or RF Transceiver - Table B1					
3EM23068AAAA	RTU 40Mbps TRX Capacity	N	\$ 75.00	65%	\$ 26.25
3EM23068ABAA	RTU 80Mbps TRX Capacity	N	\$ 500.00	65%	\$ 175.00
3EM23068ACAA	RTU 120Mbps TRX Capacity	N	\$ 2,000.00	65%	\$ 700.00
3EM23068ADAA	RTU 160Mbps TRX Capacity	N	\$ 3,500.00	65%	\$ 1,225.00
3EM23068AFAA	RTU 220Mbps TRX Capacity	N	\$ 4,250.00	65%	\$ 1,487.50
3EM23068AEAA	RTU 320Mbps TRX Capacity	N	\$ 5,000.00	65%	\$ 1,750.00
3EM23068AGAA	RTU 450Mbps TRX Capacity	N	\$ 6,500.00	65%	\$ 2,275.00
3EM23068AHAA	RTU 500Mbps TRX Capacity	N	\$ 300.00	65%	\$ 105.00
3EM23261AAAA	9500 MPR 5.8GHz Unlicensed RTU (MPT-HL only)	N	\$ 1,500.00	65%	\$ 525.00
3EM23073AAAA	9500 MPR Adaptive Modulation RTU	N	\$ 1,500.00	65%	\$ 525.00
3MU00086AAAA	9500 MPR MSP Ring RTU	N	\$ 1,500.00	65%	\$ 525.00
3MU00092AAAA	9500 MPR Packet Throughput Booster RTU	N	\$ 4,000.00	65%	\$ 1,400.00
3MU00122AAAA	9500 MPR XPIC RTU	N	\$ 1,200.00	65%	\$ 420.00
3MU00121AAAA	9500 MPR AES RTU	N	\$ 5,000.00	65%	\$ 1,750.00
3MU00148AAAA	1588 TC RTU	N	\$ 1,500.00	65%	\$ 525.00
3MU00149AAAA	1588 BC RTU (MPR 7.1 and greater)	N	\$ 2,000.00	65%	\$ 700.00
3MU00154AAAA	9500 MPR RTU 10G Interface	N	\$ 2,500.00	65%	\$ 875.00
3MU00155AAAA	9500 MPR RTU MSS-O L1 LAG	N	\$ 1,000.00	65%	\$ 350.00
3MU00156AAAA	9500 MPR RTU 5+ L1 LAG	N	\$ 5,500.00	65%	\$ 1,925.00
Upgrade RTU's - Table B2					
3EM23577AAAA	RTU 40Mbps TRX Capacity Upgrade	N	\$ 80.00	65%	\$ 28.00
3EM23577ABAA	RTU 80Mbps TRX Capacity Upgrade	N	\$ 500.00	65%	\$ 175.00
3EM23577ACAA	RTU 120Mbps TRX Capacity Upgrade	N	\$ 2,000.00	65%	\$ 700.00

New Effective 5/30/2017

Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

3EM23577ADAA	RTU 160Mbps TRX Capacity Upgrade	N	\$ 3,500.00	65%	\$ 1,225.00
3EM23577BBAA	RTU 220Mbps TRX Capacity Upgrade	N	\$ 4,250.00	65%	\$ 1,487.50
3EM23577AEAA	RTU 320Mbps TRX Capacity Upgrade	N	\$ 5,000.00	65%	\$ 1,750.00
3EM23577BCAA	RTU 450Mbps TRX Capacity Upgrade	N	\$ 6,500.00	65%	\$ 2,275.00
3EM23577BTAA	RTU 500Mbps TRX Capacity Upgrade	N	\$ 7,000.00	65%	\$ 2,450.00
3EM23577AFAA	9500 MPR Adaptive Modulation RTU Upgrade	N	\$ 1,500.00	65%	\$ 525.00
3EM23577AGAA	9500 MPR 5.8GHz Unlicensed RTU Upgrade	N	\$ 1,500.00	65%	\$ 525.00
3EM23577AUA	9500 MPR MSP Ring RTU Upgrade	N	\$ 1,500.00	65%	\$ 525.00
3EM23577AVAA	9500 MPR Packet Throughput Booster RTU Upgrade	N	\$ 4,000.00	65%	\$ 1,400.00
3EM23577AYAA	9500 MPR XPIC RTU Upgrade	N	\$ 1,200.00	65%	\$ 420.00
3EM23577AZAA	9500 MPR AES RTU Upgrade	N	\$ 5,000.00	65%	\$ 1,750.00
3EM23577BPAA	1588 TC Upgrade	N	\$ 1,500.00	65%	\$ 525.00
3EM23577BQAA	1588 BC Upgrade (MPR 7.1 and greater)	N	\$ 2,000.00	65%	\$ 700.00
3EM23577BUAA	9500 MPR RTU 10G Interface Upgrade	N	\$ 2,500.00	65%	\$ 875.00
3EM23577BVAA	9500 MPR RTU MSS-O L1 LAG Upgrade	N	\$ 1,000.00	65%	\$ 350.00
3EM23577BWAA	9500 MPR RTU 5+ L1 LAG Upgrade	N	\$ 5,500.00	65%	\$ 1,925.00
Capacity Upgrades - Table B3					
3EM23577AHAA	Capacity Upgrade MPR-TR-40T80	N	\$ 420.00	65%	\$ 147.00
3EM23577AJAA	Capacity Upgrade MPR-TR-40T120	N	\$ 1,920.00	65%	\$ 672.00
3EM23577AKAA	Capacity Upgrade MPR-TR-40T160	N	\$ 3,420.00	65%	\$ 1,197.00
3EM23577ALAA	Capacity Upgrade MPR-TR-40T320	N	\$ 4,920.00	65%	\$ 1,722.00
3EM23577AMAA	Capacity Upgrade MPR-TR-80T120	N	\$ 1,500.00	65%	\$ 525.00
3EM23577ANAA	Capacity Upgrade MPR-TR-80T160	N	\$ 3,000.00	65%	\$ 1,050.00
3EM23577APAA	Capacity Upgrade MPR-TR-80T320	N	\$ 4,500.00	65%	\$ 1,575.00
3EM23577AQAA	Capacity Upgrade MPR-TR120T160	N	\$ 1,500.00	65%	\$ 525.00
3EM23577ARAA	Capacity Upgrade MPR-TR120T320	N	\$ 3,000.00	65%	\$ 1,050.00
3EM23577ASAA	Capacity Upgrade MPT-TR160T320	N	\$ 1,500.00	65%	\$ 525.00
3EM23577BDAA	Capacity Upgrade MPR-TR-40T220	N	\$ 4,170.00	65%	\$ 1,459.50
3EM23577BEAA	Capacity Upgrade MPR-TR-80T220	N	\$ 3,750.00	65%	\$ 1,312.50
3EM23577BFAA	Capacity Upgrade MPR-TR-120T220	N	\$ 2,250.00	65%	\$ 787.50
3EM23577BGAA	Capacity Upgrade MPR-TR-160T220	N	\$ 750.00	65%	\$ 262.50
3EM23577BHAA	Capacity Upgrade MPR-TR-40T450	N	\$ 6,420.00	65%	\$ 2,247.00
3EM23577BJAA	Capacity Upgrade MPR-TR-80T450	N	\$ 6,000.00	65%	\$ 2,100.00
3EM23577BKAA	Capacity Upgrade MPR-TR-120T450	N	\$ 4,500.00	65%	\$ 1,575.00
3EM23577BLAA	Capacity Upgrade MPR-TR-160T450	N	\$ 3,000.00	65%	\$ 1,050.00
3EM23577BMAA	Capacity Upgrade MPR-TR-220T450	N	\$ 2,250.00	65%	\$ 787.50
3EM23577BNAA	Capacity Upgrade MPR-TR-320T450	N	\$ 1,500.00	65%	\$ 525.00
3EM23577BYAA	Capacity Upgrade MPR-TR-40T500	N	\$ 6,920.00	65%	\$ 2,422.00
3EM23577BZAA	Capacity Upgrade MPR-TR-80T500	N	\$ 6,500.00	65%	\$ 2,275.00
3EM23577CAAA	Capacity Upgrade MPR-TR-120T500	N	\$ 5,000.00	65%	\$ 1,750.00
3EM23577CBAA	Capacity Upgrade MPR-TR-160T500	N	\$ 3,500.00	65%	\$ 1,225.00
3EM23577CCAA	Capacity Upgrade MPR-TR-220T500	N	\$ 2,750.00	65%	\$ 962.50
3EM23577CDA	Capacity Upgrade MPR-TR-320T500	N	\$ 2,000.00	65%	\$ 700.00
3EM23577CEAA	Capacity Upgrade MPR-TR-450T500	N	\$ 500.00	65%	\$ 175.00
DOCUMENTATION (1 Per NE) - Table K3					
3DB19275AAAA	9500 MPR 6.0 O&M Manual Electronic Delivery O LCS	N	\$ 90.00	65%	\$ 31.50
3DB19275ACAA	9500 MPR 7.0 O&M Manual Electronic Delivery O LCS	N	\$ 90.00	65%	\$ 31.50
3DB19275ADAA	9500 MPR 7.1 O&M Manual Electronic Delivery O LCS	N	\$ 90.00	65%	\$ 31.50
Tributary Options OPTICS - Table A1					
3EM20277AA	Optics SFP GigE 850 NM Multimode 550 Meter	Y	\$ 424.29	65%	\$ 148.50
3EM20277AB	Optics SFP GigE 1310 NM Singlemode 10 Kilometer	Y	\$ 424.29	65%	\$ 148.50
3EM20277AC	Optics SFP GigE 1310 NM Singlemode 40 Kilometer	Y	\$ 565.71	65%	\$ 198.00
3EM20277AD	Optics SFP GigE 1550 NM Singlemode 80 Kilometer	Y	\$ 848.57	65%	\$ 297.00
3EM23141AA	SFP Copper Cable, 0.5 M	N	\$ 377.14	65%	\$ 132.00
3EM23141AB	SFP Copper Cable, 1.0 M	N	\$ 396.00	65%	\$ 138.60
3EM23141AC	SFP Copper Cable, 1.5 M	N	\$ 405.43	65%	\$ 141.90
3EM23141AG	SFP Copper Cable, 2.0 M	N	\$ 414.86	65%	\$ 145.20
3EM23141AD	SFP Copper Cable, 3.0 M	N	\$ 424.29	65%	\$ 148.50
1AB383760001	Optical SFP (F850 MM) for use in ODU - MPT-HC	Y	\$ 132.00	65%	\$ 46.20
3CC50167AA	Optical SFP (850 MM) for use in ODU - MPT-HC	Y	\$ 132.00	65%	\$ 46.20
3CC50168AA	Opt SFP 1000Base-LX for use in ODU - MPT-HC	Y	\$ 424.29	65%	\$ 148.50
3CC50169AA	Copper SFP (Finisar) - not for use on ODU	Y	\$ 237.60	65%	\$ 83.16
1AB194670005	OC3 optical SFP, L.1.1	Y	\$ 580.80	65%	\$ 203.28
3CC50165AA	OC3 optical SFP, S.1.1	Y	\$ 103.71	65%	\$ 36.30
3AL82027AA	SFP+ 10GBASE-SR	Y	\$ 652.46	65%	\$ 228.36
3AL82026AA	SFP+ 10GBASE-LR	Y	\$ 995.66	65%	\$ 348.48
3CC50183AA	SFP 1000Base-BX20-U	Y	\$ 437.49	65%	\$ 153.12
3CC50184AA	SFP 1000Base-BX20-D	Y	\$ 437.49	65%	\$ 153.12
3CC50198AA	SFP 1000Base-BX40-U	Y	\$ 550.63	65%	\$ 192.72
3CC50199AA	SFP 1000Base-BX40-D	Y	\$ 550.63	65%	\$ 192.72
Tributary Options DS1 Cables/Supplies - Table A1					
1AF15245AB	32 E1/T1 Protection Panel - RJ45	N	\$ 1,371.22	65%	\$ 479.93
3DB16102AA	32 E1/T1 Protection Panel - D-Connector	N	\$ 1,220.06	65%	\$ 427.02
3DB16109AA	D-Connector Rack Mount Bracket	N	\$ 78.26	65%	\$ 27.39
3CC52118AA	E1/T1 SCSI-SCSI Interface Cable (16 T1/E1 per Cable)	N	\$ 250.93	65%	\$ 87.83
3EM21339AA	16 DS1 Cable Stub (SCSI-Open) 25' Main Side	N	\$ 505.37	65%	\$ 176.88
3EM21339AB	16 DS1 Cable Stub (SCSI-Open) 25' Spare Side	N	\$ 505.37	65%	\$ 176.88
3EM21339AC	16 DS1 Cable Stub (SCSI-Open) 50' Main Side	N	\$ 908.91	65%	\$ 318.12
3EM21339AD	16 DS1 Cable Stub (SCSI-Open) 50' Spare Side	N	\$ 908.91	65%	\$ 318.12
3EM23110AA	8 DS1 Cable Assembly (D-Open) 15'	N	\$ 264.00	65%	\$ 92.40
3EM23110AB	8 DS1 Cable Assembly (D-Open) 30'	N	\$ 422.40	65%	\$ 147.84
3EM23110AC	8 DS1 Cable Assembly (D-Open) 50'	N	\$ 505.37	65%	\$ 176.88
3EM23110AD	8 DS1 Cable Assembly (D-Open) 100'	N	\$ 1,131.43	65%	\$ 396.00
Tributary Options DS3 Cables/Supplies - Table A1					
3EM22900AA	DS3 Protection Splitter Cable	N	\$ 282.86	65%	\$ 99.00

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

3EM22687AA	DS3 BNC to Mini-BNC Cable - 2 Meter	N	\$ 94.29	65%	\$ 33.00
3EM22687AB	DS3 BNC to Mini-BNC Cable - 5 Meter	N	\$ 205.54	65%	\$ 71.94
3EM24462AA	DS3 Grooming Panel Kit	N	\$ 141.43	65%	\$ 49.50
Tributary Options Sync Cables - Table A1					
3DB05850AA	9500 MPR Sync Cable	N	\$ 32.06	65%	\$ 11.22
3DB18204AA	9500 MPR Sync Y-Cable	N	\$ 188.57	65%	\$ 66.00
3DB04295AA	9500 MPR Sync Cable (1.0/2.3 - 1.0/2.3) 1.1m	N	\$ 75.43	65%	\$ 26.40
3DB02901AA	9500 MPR Sync Cable (1.0/2.3 - 1.0/2.3) 6.0m	N	\$ 132.00	65%	\$ 46.20
3CC52203AA	9500 MPR Sync Cable for Sync SFP	N	\$ 62.23	65%	\$ 21.78
Tributary Options Ethernet Cables/Supplies - Table A1					
3MU00085AA	1 ft RJ45 Cat5e Cable	N	\$ 56.57	65%	\$ 19.80
3MU00085AB	2 ft RJ45 Cat5e Cable	N	\$ 66.00	65%	\$ 23.10
3MU00085AC	3 ft RJ45 Cat5e Cable	N	\$ 75.43	65%	\$ 26.40
3MU00085AD	6 ft RJ45 Cat5e Cable	N	\$ 84.86	65%	\$ 29.70
3MU00085AE	10 ft RJ45 Cat5e Cable	N	\$ 94.29	65%	\$ 33.00
3MU00085AF	20 ft RJ45 Cat5e Cable	N	\$ 103.71	65%	\$ 36.30
3MU00085AG	30 ft RJ45 Cat5e Cable	N	\$ 113.14	65%	\$ 39.60
3MU00085AH	50 ft RJ45 Cat5e Cable	N	\$ 169.71	65%	\$ 59.40
3MU00085AJ	70 ft RJ45 Cat5e Cable	N	\$ 226.29	65%	\$ 79.20
3MU00085AK	100 ft RJ45 Cat5e Cable	N	\$ 282.86	65%	\$ 99.00
3MU00085AL	200 ft RJ45 Cat5e Cable	N	\$ 471.43	65%	\$ 165.00
3MU00085AM	300 ft RJ45 Cat5e Cable	N	\$ 660.00	65%	\$ 231.00
ODU Coax Supplies - Table E2					
409072808	6 GHz FlexTwist 2' WR137 CPR - Andrew F137CCS2	N	\$ 744.86	65%	\$ 260.70
409072832	6 GHz FlexTwist 4' WR137 CPR - Andrew F137CCS5	N	\$ 1,027.71	65%	\$ 359.70
1AF02957ABAA	11 GHz FlexTwist	N	\$ 984.60	65%	\$ 344.61
409072766	11 GHz FlexTwist 2' WR90 CPR - Andrew F090CCS2	N	\$ 707.14	65%	\$ 247.50
409072774	11 GHz FlexTwist 3' WR90 CPR - Andrew F090CCS3	N	\$ 810.86	65%	\$ 283.80
409072824	11 GHz FlexTwist 4' WR90 CPR - Andrew F090CCS5	N	\$ 1,414.29	65%	\$ 495.00
3DB00683AA	18/23 GHz FlexTwist G.O.	N	\$ 754.29	65%	\$ 264.00
Fiber Optic Jumpers - Table A1					
3EM23272AA	KIT SUPPORT FOR 3 CORDS N/QMA IDU	N	\$ 30.17	65%	\$ 10.56
3EM23311AA	N Jack Bulkhead to QMA Plug (14 inch)	N	\$ 130.68	65%	\$ 45.74
3EM23311AB	N Jack Bulkhead to QMA Plug (108 inch)	N	\$ 833.49	65%	\$ 291.72
1AB388100001	SMA to QMA Adaptor	N	\$ 339.43	65%	\$ 118.80
1AC014320002	Coaxial Cable LMR-400 FR - price per foot	N	\$ 3.77	65%	\$ 1.32
357-9194-000	STRAIGHT MALE N MALE N COAXIAL Barrel	N	\$ 56.57	65%	\$ 19.80
1AB095530045	Connector N PPC Straight Male	N	\$ 67.89	65%	\$ 23.76
1AB095530044	Connector N PPC Right Angle Male	N	\$ 111.26	65%	\$ 38.94
1AB095530046	Connector N PPC Straight Female	N	\$ 67.89	65%	\$ 23.76
1AB383930001	Compression Tool for PPC	N	\$ 1,408.63	65%	\$ 493.02
1AB350440001	LMR grounding kit	N	\$ 113.14	65%	\$ 39.60
3CC50015AA	LIGHTNING ARREST 9913 INU/IDU&ODU-ARREST	N	\$ 437.49	65%	\$ 153.12
3CC50030AA	Single Lightning Arrest Kit	N	\$ 218.74	65%	\$ 76.56
3CC50029AA	Single Lightning Arrest Bracket	N	\$ 18.86	65%	\$ 6.60
Fiber Optic Jumpers - Table A1					
3EM07641AC	Fiber Optic Jumper Cable, LC to LC, 3 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07641AD	Fiber Optic Jumper Cable, LC to LC, 5 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07641AE	Fiber Optic Jumper Cable, LC to LC, 10 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AC	Fiber Optic Jumper Cable, LC to SC, 3 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AD	Fiber Optic Jumper Cable, LC to SC, 5 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AE	Fiber Optic Jumper Cable, LC to SC, 10 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AC	Fiber Optic Jumper Cable, LC to FC, 3 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AD	Fiber Optic Jumper Cable, LC to FC, 5 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AE	Fiber Optic Jumper Cable, LC to FC, 10 meter, multi mode	N	\$ 377.14	65%	\$ 132.00
3EM07641AH	Fiber Optic Jumper Cable, LC to LC, 3 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07641AJ	Fiber Optic Jumper Cable, LC to LC, 5 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07641AK	Fiber Optic Jumper Cable, LC to LC, 10 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AH	Fiber Optic Jumper Cable, LC to SC, 3 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AJ	Fiber Optic Jumper Cable, LC to SC, 5 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07646AK	Fiber Optic Jumper Cable, LC to SC, 10 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AH	Fiber Optic Jumper Cable, LC to FC, 3 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AJ	Fiber Optic Jumper Cable, LC to FC, 5 meter, single mode	N	\$ 377.14	65%	\$ 132.00
3EM07651AK	Fiber Optic Jumper Cable, LC to FC, 10 meter, single mode	N	\$ 377.14	65%	\$ 132.00
Accessories					
3EM16790RA	VoIP OrderWire, -48Vdc	N	\$ 11,116.00	65%	\$ 3,890.60
3EM16790RB	VoIP Orderwire Dual -48V Offset	N	\$ 14,356.00	65%	\$ 5,024.60

New Effective 5/30/2017

Effective 5/30/2017

New Effective 5/30/2017

END of 9500 MPR Family Price Catalog



This section is a duplicate of items in the 9500MPR Family tab.

9500MPR LKDI RTU

Part No	Description	NASPO-ValuePoint MSRP	Discount %	NASPO-ValuePoint Unit Price	
Capacity RTU – New Path					
3EM23577AAAA	RTU 40Mbps TRX Capacity Upgrade	\$80.00	65%	\$ 28.00	Duplicate
3EM23577ABAA	RTU 80Mbps TRX Capacity Upgrade	\$500.00	65%	\$ 175.00	Duplicate
3EM23577ACAA	RTU 120Mbps TRX Capacity Upgrade	\$2,000.00	65%	\$ 700.00	Duplicate
3EM23577ADAA	RTU 160Mbps TRX Capacity Upgrade	\$3,500.00	65%	\$ 1,225.00	Duplicate
3EM23577BBAA	RTU 220Mbps TRX Capacity Upgrade	\$4,250.00	65%	\$ 1,487.50	Duplicate
3EM23577AEAA	RTU 320Mbps TRX Capacity Upgrade	\$5,000.00	65%	\$ 1,750.00	Duplicate
3EM23577BCAA	RTU 450Mbps TRX Capacity Upgrade	\$6,500.00	65%	\$ 2,275.00	Duplicate
3EM23577BTAA	RTU 500Mbps TRX Capacity Upgrade	\$7,000.00	65%	\$ 2,450.00	Duplicate
Optional Features					
3EM23577AFAA	9500 MPR Adaptive Modulation RTU Upgrade	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577AGAA	9500 MPR 5.8GHz Unlicensed RTU Upgrade	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577AUAU	9500 MPR MSP Ring RTU Upgrade	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577AVAA	9500 MPR Packet Throughput Booster RTU Upgrade	\$4,000.00	65%	\$ 1,400.00	Duplicate
3EM23577AWAA	9500MPR ODU300 Enhanced AM RTU Upgrade	\$1,000.00	65%	\$ 350.00	Duplicate
3EM23577AYAA	9500 MPR XPIC RTU Upgrade	\$1,200.00	65%	\$ 420.00	Duplicate
3EM23577AZAA	9500 MPR AES RTU Upgrade	\$5,000.00	65%	\$ 1,750.00	Duplicate
3EM23577BPAA	1588 TC Upgrade	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577BQAA	1588 BC Upgrade	\$2,000.00	65%	\$ 700.00	Duplicate
3EM23577BRAA	1588 TC-BC Upgrade	\$500.00	65%	\$ 175.00	Duplicate
3EM23577BUAA	9500 MPR RTU 10G Interface Upgrade	\$2,500.00	65%	\$ 875.00	Duplicate
3EM23577BVAA	9500 MPR RTU MSS-O L1 LAG Upgrade	\$1,000.00	65%	\$ 350.00	Duplicate
3EM23577BWAA	9500 MPR RTU 5+ L1 LAG Upgrade	\$5,500.00	65%	\$ 1,925.00	Duplicate
Added Features RTU's					
3EM23577AHAA	Capacity Upgrade MPR-TR-40T80	\$420.00	65%	\$ 147.00	Duplicate
3EM23577AJAA	Capacity Upgrade MPR-TR-40T120	\$1,920.00	65%	\$ 672.00	Duplicate
3EM23577AKAA	Capacity Upgrade MPR-TR-40T160	\$3,420.00	65%	\$ 1,197.00	Duplicate
3EM23577ALAA	Capacity Upgrade MPR-TR-40T320	\$4,920.00	65%	\$ 1,722.00	Duplicate
3EM23577AMAA	Capacity Upgrade MPR-TR-80T120	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577ANAA	Capacity Upgrade MPR-TR-80T160	\$3,000.00	65%	\$ 1,050.00	Duplicate
3EM23577APAA	Capacity Upgrade MPR-TR-80T320	\$4,500.00	65%	\$ 1,575.00	Duplicate
3EM23577AQAA	Capacity Upgrade MPR-TR120T160	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577ARAA	Capacity Upgrade MPR-TR120T320	\$3,000.00	65%	\$ 1,050.00	Duplicate
3EM23577ASAA	Capacity Upgrade MPR-TR160T320	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577BDAA	Capacity Upgrade MPR-TR-40T220	\$4,170.00	65%	\$ 1,459.50	Duplicate
3EM23577BEAA	Capacity Upgrade MPR-TR-80T220	\$3,750.00	65%	\$ 1,312.50	Duplicate
3EM23577BFAA	Capacity Upgrade MPR-TR-120T220	\$2,250.00	65%	\$ 787.50	Duplicate
3EM23577BGAA	Capacity Upgrade MPR-TR-160T220	\$750.00	65%	\$ 262.50	Duplicate
3EM23577BHAA	Capacity Upgrade MPR-TR-40T450	\$6,420.00	65%	\$ 2,247.00	Duplicate
3EM23577BJAA	Capacity Upgrade MPR-TR-80T450	\$6,000.00	65%	\$ 2,100.00	Duplicate
3EM23577BKAA	Capacity Upgrade MPR-TR-120T450	\$4,500.00	65%	\$ 1,575.00	Duplicate
3EM23577BLAA	Capacity Upgrade MPR-TR-160T450	\$3,000.00	65%	\$ 1,050.00	Duplicate
3EM23577BMAA	Capacity Upgrade MPR-TR-220T450	\$2,250.00	65%	\$ 787.50	Duplicate
3EM23577BNAA	Capacity Upgrade MPR-TR-320T450	\$1,500.00	65%	\$ 525.00	Duplicate
3EM23577BYAA	Capacity Upgrade MPR-TR-40T500	\$6,920.00	65%	\$ 2,422.00	Duplicate
3EM23577BZAA	Capacity Upgrade MPR-TR-80T500	\$6,500.00	65%	\$ 2,275.00	Duplicate
3EM23577CAAA	Capacity Upgrade MPR-TR-120T500	\$5,000.00	65%	\$ 1,750.00	Duplicate
3EM23577CBAA	Capacity Upgrade MPR-TR-160T500	\$3,500.00	65%	\$ 1,225.00	Duplicate
3EM23577CCAA	Capacity Upgrade MPR-TR-220T500	\$2,750.00	65%	\$ 962.50	Duplicate
3EM23577CDAA	Capacity Upgrade MPR-TR-320T500	\$2,000.00	65%	\$ 700.00	Duplicate
3EM23577CEAA	Capacity Upgrade MPR-TR-450T500	\$500.00	65%	\$ 175.00	Duplicate
END-of-9500 LKDI RTU Price Catalog					



DC Plant

Part No	Description	Spare	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price
Rectifier Systems					
1AF29973AAAA	Shelf, 240759, 19", No Rack 2-40amp HE Rectifier	N	\$13,566.00	65%	\$ 4,748.10
1AF29974AAAA	Shelf, 240766, 23", No Rack 2-40amp HE Rectifier	N	\$13,566.00	65%	\$ 4,748.10
1AF06633AAAA	Bay, 240776, 7' Rack, 19", 2-40amp HE Rectifier	N	\$15,888.00	65%	\$ 5,560.80
1AF06314ABAA	Bay, 240782, 7' Rack, 23", 2-40amp HE Rectifier	N	\$15,888.00	65%	\$ 5,560.80
1AF17590AAAA	Smartpack WEB/SNMP Eltek 242100.118	Y	\$ 1,680.00	65%	\$ 588.00
409097698	HE Rectifier, 241115.105, 42amp, FP2 HE	Y	\$ 1,320.00	65%	\$ 462.00
1AF06632AAAA	Blank Panel for Empty Rectifier Slots	Y	\$ 72.00	65%	\$ 25.20
409108727	Battery Tray 19", Heavy Duty Eltek 217035 If Loose or additional trays are required	N	\$ 720.00	65%	\$ 252.00
409077419	BATTERY TRAY 23" HEAVY DUTY Eltek 504880 If Loose or additional trays are required	N	\$ 720.00	65%	\$ 252.00
409072048	Battery Cable #1 125A with connectors If one battery and tray is required	N	\$ 342.00	65%	\$ 119.70
409072030	Battery Cable #2 125A with connectors If second battery and tray is required Eltek 503852	N	\$ 342.00	65%	\$ 119.70
409108735	Battery Cable #4 125A with connectors, 6.5', 1/4 Lugs If 3rd and 4th battery and tray is required Eltek 503850	N	\$ 390.00	65%	\$ 136.50
1AB346630001	100A Battery Breaker Order 1 per additional battery tray and Cable ordered	Y	\$ 108.00	65%	\$ 37.80
409077393	19" standard Relay rack	N	\$ 1,795.20	65%	\$ 628.32
409116183	23" standard Relay rack	N	\$ 1,908.00	65%	\$ 667.80
1AF29975AAAA	19" Zone 4 seismic Relay rack	N	\$ 8,232.00	65%	\$ 2,881.20
408917870	23" Zone 4 seismic Relay rack	N	\$ 3,840.00	65%	\$ 1,344.00
409108768	Batt Shield, 19"W X 27.25"D X 6" Rail	N	\$ 468.00	65%	\$ 163.80
409071925	AC Line Cord 12' 14awg 5-15P	N	\$ 156.00	65%	\$ 54.60
Batteries					
1AF29422AAAA	Battery Plant, 48V, EnerSys 12HX205 45AH 10Yr	N	\$ 2,376.00	65%	\$ 831.60
1AF29423AAAA	Battery Plant, 48V, EnerSys 12HX300 70AH Top Terminal 10Yr	N	\$ 2,856.00	65%	\$ 999.60
1AF29425AAAA	BATTERY LEAD-ACID, 48VE95, 48 V, 320 LB, 96AH, (4) 12 VOLT BATTERIES	N	\$ 3,504.00	65%	\$ 1,226.40
1AF29426AAAA	Battery Plant, 48V, EnerSys 12HX540 125AH Top Terminal 10Yr	N	\$ 4,992.00	65%	\$ 1,747.20
409071768	Battery Plant, 48V, EnerSys 12V92F 92AH Front Terminal 10Yr	N	\$ 4,622.40	65%	\$ 1,617.84
409071776	Battery Plant, 48V, EnerSys 48V125F 125AH Front Terminal 10Yr	N	\$ 6,192.72	65%	\$ 2,167.45
409073962	Battery Plant, 48V, EnerSys 2DDmP50-09 200AH 20yr	N	\$22,176.00	65%	\$ 7,761.60
409074036	Battery Plant, 48V, EnerSys 2DDmP85-27 1105AH 20yr	N	\$64,368.00	65%	\$22,528.80

End of DC Plant

9500 MPR
MPT-HC / MPR-e INTEGRATED ANTENNAS FROM RFS

Freq Band (GHz)	Part Number	Model Number	Freq Range (GHz)	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price	
5.8	10038562	SB2-57AMPT	5725 - 5850	\$ 2,040.80	65%	\$ 714.28	
6	10038135	SC3-W60AMPT	5925 - 7125	\$ 2,571.43	65%	\$ 900.00	New Effective 5/30/2017
	10042012	SCX3-W60AMPT	5925 - 7125	\$ 2,702.86	65%	\$ 946.00	New Effective 5/30/2017
	40041915	SB4-W60CMPT	5925 - 7125	\$ 5,192.00	65%	\$ 1,817.20	Effective 5/30/2017
	10044144	SB4-W60DMPT	5925 - 7125	\$ 5,192.00	65%	\$ 1,817.20	New Effective 5/30/2017
	40041960	SBX4-W60CMPT	5925 - 7125	\$ 5,702.86	65%	\$ 1,996.00	Effective 5/30/2017
	10044581	SBX4-W60DMPT	5925 - 7125	\$ 5,702.86	65%	\$ 1,996.00	New Effective 5/30/2017
	10041047	SB6-W60CMPT	5925 - 7125	\$ 11,188.57	65%	\$ 3,916.00	
	10041951	SBX6-W60CMPT	5925 - 7125	\$ 12,194.34	65%	\$ 4,268.02	
	40039090	SC2-W71BMPT	7125 - 8500	\$ 1,616.00	65%	\$ 565.60	Effective 5/30/2017
	40039143	SCX2-W71BMPT	7125 - 8500	\$ 1,776.00	65%	\$ 621.60	Effective 5/30/2017
7	40036360	SB3-W71AMPT	7125 - 8500	\$ 4,528.00	65%	\$ 1,584.80	Effective 5/30/2017
	40036552	SBX3-W71AMPT	7125 - 8500	\$ 4,928.00	65%	\$ 1,724.80	Effective 5/30/2017
	40036364	SB4-W71AMPT	7125 - 8500	\$ 5,188.57	65%	\$ 1,816.00	Effective 5/30/2017
	40036811	SBX4-W71AMPT	7125 - 8500	\$ 5,702.86	65%	\$ 1,996.00	Effective 5/30/2017
	40041048	SB6-W71CMPT	7125 - 8500	\$ 10,760.00	65%	\$ 3,766.00	Effective 5/30/2017
	40037102	SBX6-W71AMPT	7125 - 8500	\$ 11,728.00	65%	\$ 4,104.80	Effective 5/30/2017
	10039091	SC2-W100BMPT	10000 - 11700	\$ 1,617.14	65%	\$ 566.00	
	10039144	SCX2-W100BMPT	10000 - 11700	\$ 1,777.14	65%	\$ 622.00	
	10038136	SC3-W100AMPT	10700 - 11700	\$ 3,200.00	65%	\$ 1,120.00	
	10039907	SCX3-W100AMPT	10000 - 11700	\$ 4,754.34	65%	\$ 1,664.02	
11	10044145	SB4-W100DMPT	10000 - 11700	\$ 5,085.71	65%	\$ 1,780.00	New Effective 5/30/2017
	40041902	SB4-W100CMPT	10000 - 11700	\$ 5,085.66	65%	\$ 1,779.98	Effective 5/30/2017
	40041961	SBX4-W100CMPT	10000 - 11700	\$ 5,342.86	65%	\$ 1,870.00	Effective 5/30/2017
	10044601	SBX4-W100DMPT	10000 - 11700	\$ 5,342.86	65%	\$ 1,870.00	New Effective 5/30/2017
	10041049	SB6-W100CMPT	10000 - 11700	\$ 10,760.00	65%	\$ 3,766.00	
	10041952	SBX6-W100CMPT	10000 - 11700	\$ 11,725.66	65%	\$ 4,103.98	
	10039702	SB1-142CMPT	14200 - 15350	\$ 1,102.86	65%	\$ 386.00	
	10039093	SC2-142BMPT	14200 - 15350	\$ 1,417.14	65%	\$ 496.00	
	10039147	SCX2-142BMPT	14200 - 15350	\$ 1,491.43	65%	\$ 522.00	
	10038138	SC3-142AMPT	14200 - 15350	\$ 3,062.88	65%	\$ 1,072.01	
15	10039909	SCX3-142AMPT	14200 - 15350	\$ 4,152.00	65%	\$ 1,453.20	
	40041903	SB4-142CMPT	14200 - 15350	\$ 4,496.00	65%	\$ 1,573.60	Effective 5/30/2017
	10044147	SB4-142DMPT	14200 - 15350	\$ 4,496.00	65%	\$ 1,573.60	New Effective 5/30/2017
	40041962	SBX4-142CMPT	14200 - 15350	\$ 4,944.00	65%	\$ 1,730.40	Effective 5/30/2017
	10044603	SBX4-142DMPT	14200 - 15350	\$ 4,944.00	65%	\$ 1,730.40	New Effective 5/30/2017
	10041061	SB6-142CMPT	14200 - 15350	\$ 8,736.00	65%	\$ 3,057.60	
	10041953	SBX6-142CMPT	14200 - 15350	\$ 9,588.57	65%	\$ 3,356.00	
	10039703	SB1-190CMPT	17700 - 19700	\$ 1,102.86	65%	\$ 386.00	
	10039800	SBX1-190CMPT	17700 - 19700	\$ 1,160.00	65%	\$ 406.00	
	10039094	SC2-190BMPT	17700 - 19700	\$ 1,417.14	65%	\$ 496.00	
18	10039148	SCX2-190BMPT	17700 - 19700	\$ 1,491.43	65%	\$ 522.00	
	10038139	SC3-190AMPT	17700 - 19700	\$ 3,062.86	65%	\$ 1,072.00	
	10039910	SCX3-190AMPT	17700 - 19700	\$ 4,154.34	65%	\$ 1,454.02	
	40041906	SB4-190CMPT	17700 - 19700	\$ 4,497.14	65%	\$ 1,574.00	Effective 5/30/2017
	10044148	SB4-190DMPT	17700 - 19700	\$ 4,497.14	65%	\$ 1,574.00	New Effective 5/30/2017
	40041963	SBX4-190CMPT	17700 - 19700	\$ 4,942.86	65%	\$ 1,730.00	Effective 5/30/2017
	10044604	SBX4-190DMPT	17700 - 19700	\$ 4,942.86	65%	\$ 1,730.00	New Effective 5/30/2017
	10041062	SB6-190CMPT	17700 - 19700	\$ 8,737.14	65%	\$ 3,058.00	
	10041954	SBX6-190CMPT	17700 - 19700	\$ 9,137.14	65%	\$ 3,198.00	New Effective 5/30/2017
	40037098	SBX6-190AMPT	17700 - 19700	\$ 9,588.57	65%	\$ 3,356.00	Effective 5/30/2017
23	10039350	SB1-220CMPT	21200 - 23600	\$ 1,102.86	65%	\$ 386.00	
	10039801	SBX1-220CMPT	21200 - 23600	\$ 1,160.00	65%	\$ 406.00	
	10039095	SC2-220BMPT	21200 - 23600	\$ 1,417.14	65%	\$ 496.00	
	10039150	SCX2-220BMPT	21200 - 23600	\$ 1,491.43	65%	\$ 522.00	
	40036863	SB2-220AMPT	21200 - 23600	\$ 1,371.43	65%	\$ 480.00	Effective 5/30/2017
	40036864	SBX2-220AMPT	21200 - 23600	\$ 1,440.00	65%	\$ 504.00	Effective 5/30/2017
	10038150	SC3-220AMPT	21200 - 23600	\$ 3,062.86	65%	\$ 1,072.00	
	10039911	SCX3-220AMPT	21200 - 23600	\$ 4,152.00	65%	\$ 1,453.20	
	40041930	SB4-220CMPT	21200 - 23600	\$ 4,496.00	65%	\$ 1,573.60	Effective 5/30/2017
	10044149	SB4-220DMPT	21200 - 23600	\$ 4,496.00	65%	\$ 1,573.60	New Effective 5/30/2017
38	40041964	SBX4-220CMPT	21200 - 23600	\$ 4,942.86	65%	\$ 1,730.00	Effective 5/30/2017
	10044605	SBX4-220DMPT	21200 - 23600	\$ 4,942.86	65%	\$ 1,730.00	New Effective 5/30/2017
	40036203	SB6-220AMPT	21200 - 23600	\$ 8,737.14	65%	\$ 3,058.00	Effective 5/30/2017
	40037097	SBX6-220AMPT	21200 - 23600	\$ 9,588.57	65%	\$ 3,356.00	Effective 5/30/2017
	10039707	SB1-380CMPT	37000 - 39500	\$ 1,104.00	65%	\$ 386.40	
	10039805	SBX1-380CMPT	37000 - 39500	\$ 1,160.00	65%	\$ 406.00	New Effective 5/30/2017
	10039099	SC2-380BMPT	37000 - 39500	\$ 1,234.32	65%	\$ 432.01	
	10039155	SCX2-380BMPT	37000 - 39500	\$ 1,352.00	65%	\$ 473.20	

END of RFS DM MPT-HC Antenna Price Catalog



**9500 MPR
NON-INTEGRATED ANTENNA SYSTEMS**

Part No	Description	Spare	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price
Microwave Antennas					
10031452	UXA6-107BC1SG	N	\$23,707.44	65.0%	\$8,297.60
10031625	UXA6-107BC1S1 10.7-11.7GHZ	N	\$17,237.47	65.0%	\$6,033.12
10031862	SU6-107BC1S1 10.7-11.7 GHZ	N	\$10,562.28	65.0%	\$3,696.80
10032048	UXA2-190CB1S1 17.7-19.7 GHz	N	\$4,428.05	65.0%	\$1,549.82
10032174	SUX6-107BC1S1 10.7-11.7GHZ	N	\$14,344.86	65.0%	\$5,020.70
10032175	UA6-59BC1S1 5.925-6.425GHZ	N	\$14,213.57	65.0%	\$4,974.75
10032192	DA6-W57BC1S1 5.725-6.875	N	\$12,632.64	65.0%	\$4,421.42
10032195	UXA2-220CB1S1 21.2-23.6 GHz	N	\$4,428.05	65.0%	\$1,549.82
10032475	UXA6-65BC1S1 6.425-7.125 GHz	N	\$17,237.47	65.0%	\$6,033.12
10033548	UXA4 107BC1S1-10.7-11.7 GHZ	N	\$40,642.50	65.0%	\$14,224.88
10033549	UXA4 107BD1S1-10.7-11.7GHZ	N	\$40,642.50	65.0%	\$14,224.88
10033555	UXA4 190BB1S1-17.7-19.7 GHz	N	\$10,859.67	65.0%	\$3,800.89
10033556	UXA4 220BB1S1-21.2-23.6 GHz	N	\$10,859.67	65.0%	\$3,800.89
10033576	SU4 107BB	N	\$5,657.14	65.0%	\$1,980.00
10033577	SU4 107BD1S1-10.7-11.7 GHz	N	\$5,657.14	65.0%	\$1,980.00
10033578	SU4 107BC1S1-10.7-11.7 GHz	N	\$5,657.14	65.0%	\$1,980.00
10033579	SUX4 107BD	N	\$9,608.49	65.0%	\$3,262.87
10033584	SUX4 107BC1S1-10.7-11.7GHZ	N	\$9,608.49	65.0%	\$3,262.87
10034275	PA4-W57BC1S 5.725-6.875 GHZ	N	\$4,972.16	65.0%	\$1,740.26
10034276	UXA4 107BC1SG	N	\$15,125.31	65.0%	\$5,293.86
10034277	SUX4 107BC1SG	N	\$11,514.96	65.0%	\$4,030.24
10034284	SB4 190STX	N	\$4,416.81	65.0%	\$1,545.89
10034330	SB4 190BB	N	\$3,520.00	65.0%	\$1,232.00
10034490	DA8-107AC41S1 10.7-11.7GHz	N	\$17,324.37	65.0%	\$6,063.53
10034902	UXA4 142CB1S1-14.2-15.35 GHz	N	\$10,859.67	65.0%	\$3,800.89
10035491	SB6 190ASTX	N	\$8,269.35	65.0%	\$2,929.27
10035768	SB6 W71AMPT	N	\$40,567.86	65.0%	\$14,698.75
10035964	SC2 142AMPT	N	\$1,391.81	65.0%	\$487.14
10036040	SBX1-190CB	N	\$2,155.14	65.0%	\$754.30
10036041	SBX1-220CB	N	\$2,020.39	65.0%	\$707.14
10036115	SPE2-52CN1S 5.25-5.85 GHZ	N	\$2,141.86	65.0%	\$749.65
10036139	SB6 142AMPT	N	\$8,580.00	65.0%	\$3,003.00
10036174	PADX6-W57AC1S 5.725-6.875	N	\$12,453.57	65.0%	\$4,358.75
10036176	PADX8-W57AC1S 5.725-6.425	N	\$14,406.62	65.0%	\$5,042.32
10036178	PADX10-W57AC1S 5.725-6.875	N	\$18,655.14	65.0%	\$6,529.30
10036204	SB6 190AMPT	N	\$8,581.40	65.0%	\$3,003.39
10036307	SUX3-107BFC1SG	N	\$8,289.29	65.0%	\$2,901.25
10036364	SB4 W71AMPT	N	\$5,095.91	65.0%	\$1,783.57
10036265	SB4 142AMPT	N	\$4,415.71	65.0%	\$1,545.50
10036266	SB4 190AMPT-17.7-19.97 GHz	N	\$4,416.81	65.0%	\$1,545.89
10036267	SB4 220AMPT	N	\$4,415.71	65.0%	\$1,545.50
10036420	SB4 W100AMPT	N	\$4,994.86	65.0%	\$1,748.20
10036558	SBX4 142AMPT	N	\$4,855.71	65.0%	\$1,699.50
10036560	SBX4 190AMPT	N	\$4,854.61	65.0%	\$1,699.12
10036843	SB6 W100AMPT	N	\$10,567.86	65.0%	\$3,698.75
10036863	SB2 220AMPT	N	\$1,346.95	65.0%	\$471.43
10036951	SC2-380AMPT	N	\$1,212.28	65.0%	\$424.30
10037080	SBX4 190AB	N	\$8,950.39	65.0%	\$3,132.64
10037098	SBX6 190AMPT	N	\$9,417.34	65.0%	\$3,296.07
10037099	SBX6 142AMPT	N	\$9,420.71	65.0%	\$3,297.25
10037404	SBX6 W100AMPT	N	\$14,516.29	65.0%	\$5,030.70
10037161	UXA6-W57AC 5.725-6.875 GHz	N	\$17,405.85	65.0%	\$6,092.05
10037162	UXA8-W57AC 5.725-6.875 GHz	N	\$22,617.34	65.0%	\$7,916.07
10037163	UXA10-W57AC 5.725-6.875 GHz	N	\$26,265.33	65.0%	\$9,192.87
10037262	SB4 W60AMPT	N	\$5,099.29	65.0%	\$1,784.75
10037263	SBX4 W60AMPT	N	\$5,601.04	65.0%	\$1,960.37
10037266	SBX6 W100AC	N	\$13,476.40	65.0%	\$4,716.64
10037268	SBX4 W100AMPT-10.7-11.7 GHz	N	\$5,247.47	65.0%	\$1,826.62
10037325	SU6-107BC1SG	N	\$13,918.38	65.0%	\$4,871.43
10037385	SBX4 190AB	N	\$8,648.44	65.0%	\$3,026.95
10037704	SB4 W71BC	N	\$6,157.17	65.0%	\$2,155.01
10037829	SB6 W71AD	N	\$11,223.38	65.0%	\$3,928.18
10038090	UXA6-U57AC 5.725-7.125 GHz	N	\$22,204.52	65.0%	\$7,771.58
10038091	UXA8-U57AC 5.725-7.125 GHz	N	\$27,614.79	65.0%	\$9,665.18
10038092	UXA10-U57AC 5.725-7.125 GHz	N	\$33,482.11	65.0%	\$11,718.74
10038093	PADX6-U57AC 5.725-7.125 GHz	N	\$15,584.88	65.0%	\$5,454.71
10038094	PADX8-U57AC 5.725-7.125 GHz	N	\$19,119.26	65.0%	\$6,691.74
10038095	PADX10-U57AC 5.725-7.125 GHz	N	\$22,529.57	65.0%	\$7,885.35
10038135	SC3 W60AMPT	N	\$3,030.58	65.0%	\$1,060.70
10038136	SC3 W100AMPT	N	\$3,142.86	65.0%	\$1,100.00
10038138	SC3 142AMPT	N	\$3,008.19	65.0%	\$1,052.87
10038139	SC3 190AMPT	N	\$3,008.19	65.0%	\$1,052.87
10038150	SC3 220AMPT	N	\$3,008.19	65.0%	\$1,052.87
10038464	UXA6-U57AC1SG 5.725-7.125 GHz	N	\$22,740.85	65.0%	\$7,959.30
10038465	UXA8-U57AC1SG 5.725-7.125 GHz	N	\$28,353.05	65.0%	\$9,923.57
10038466	UXA10-U57AC1SG 5.725-7.125 GHz	N	\$34,414.29	65.0%	\$12,045.00
10038562	SB2 57AMPT	N	\$2,806.40	65.0%	\$982.14
10038668	SB6 W71AC	N	\$11,223.38	65.0%	\$3,928.18
10038933	UXA6-W57AC1SG	N	\$27,401.79	65.0%	\$9,590.63
10038950	UXA8-W57AC1SG	N	\$36,150.16	65.0%	\$12,652.56
10038951	UXA8-59BC1SG	N	\$35,321.79	65.0%	\$12,362.63
10038970	SB4 W60AC	N	\$6,157.17	65.0%	\$2,155.01
10039090	SC2 W71BMPT	N	\$1,588.24	65.0%	\$555.89
10039091	SC2 W100BMPT	N	\$1,588.24	65.0%	\$555.89
10039093	SC2 142BMPT	N	\$1,391.81	65.0%	\$487.14
10039094	SC2 190BMPT	N	\$1,391.81	65.0%	\$487.14

10039095	SC2-220BMPT	N	\$1,291.81	65.0%	\$487.14	Duplicate
10039099	SC2-380BMPT	N	\$1,212.28	65.0%	\$424.29	Duplicate
10039144	SCX2-W100BMPT	N	\$1,745.29	65.0%	\$610.89	Duplicate
10039147	SCX2-142BMPT	N	\$1,464.81	65.0%	\$512.68	Duplicate
10039148	SCX2-190BMPT	N	\$1,464.81	65.0%	\$512.68	Duplicate
10039150	SCX2-220BMPT	N	\$1,464.81	65.0%	\$512.68	Duplicate
10039174	SC2-190BB	N	\$1,866.86	65.0%	\$653.40	
10039175	SC2-220BB	N	\$1,866.86	65.0%	\$653.40	
10039191	SCX2-190BB	N	\$2,591.21	65.0%	\$906.92	
10039192	SCX2-220BB	N	\$2,384.09	65.0%	\$834.43	
10039244	SB4-W100AC	N	\$6,515.85	65.0%	\$2,280.55	Effective 5/30/2017
10039243	SBX4-W100AC	N	\$7,239.81	65.0%	\$2,533.92	Effective 5/30/2017
10039278	SC2-190BXTX	N	\$1,264.06	65.0%	\$442.42	
10039323	SCX2-W100BC	N	\$3,003.39	65.0%	\$1,051.19	
10039343	SB6-W60BMPT	N	\$10,988.76	65.0%	\$3,846.07	Effective 5/30/2017
10039344	SB6-W60BC	N	\$13,172.05	65.0%	\$4,610.57	Effective 5/30/2017
10039350	SB1-220CMPT	N	\$4,083.19	65.0%	\$379.12	Duplicate
10039354	SBX6-W60BMPT	N	\$11,976.56	65.0%	\$4,191.80	Effective 5/30/2017
10039352	SBX6-W60BC	N	\$14,016.59	65.0%	\$4,905.81	Effective 5/30/2017
10039504	SC3-190AB	N	\$2,323.44	65.0%	\$813.20	
10039507	SC3-190ASTX	N	\$3,715.33	65.0%	\$1,300.37	
10039524	SC3-220ASTX	N	\$2,506.43	65.0%	\$877.25	
10039527	SCX3-190AB	N	\$5,443.90	65.0%	\$1,905.37	
10039528	SCX3-220AB	N	\$5,443.90	65.0%	\$1,905.37	
10039614	SB4-W100ASTX	N	\$3,674.63	65.0%	\$1,286.12	Effective 5/30/2017
10039703	SB1-190CMPT	N	\$4,083.19	65.0%	\$379.12	Duplicate
10039707	SB1-380CMPT	N	\$4,084.29	65.0%	\$379.50	Duplicate
10039792	SB1-220CSTX	N	\$1,083.19	65.0%	\$379.12	
10039800	SBX1-190CMPT	N	\$1,139.29	65.0%	\$398.75	Duplicate
10039804	SBX1-220CMPT	N	\$1,139.29	65.0%	\$398.75	Duplicate
10039824	SB1-190CB	N	\$1,227.36	65.0%	\$429.58	
10039825	SB1-220CB	N	\$1,227.36	65.0%	\$429.58	
10039907	SCX3-W100AMPPT	N	\$4,669.42	65.0%	\$1,634.20	Duplicate
10039909	SCX3-142AMPPT	N	\$4,077.86	65.0%	\$1,427.25	Duplicate
10039910	SCX3-190AMPPT	N	\$4,080.14	65.0%	\$1,428.05	Duplicate
10039914	SCX3-220AMPPT	N	\$4,077.86	65.0%	\$1,427.25	Duplicate
10039950	SCX3-W100AC	N	\$2,980.14	65.0%	\$1,043.05	
10039985	SC3-W100AC	N	\$2,475.00	65.0%	\$866.25	
10039986	SC2-W100BC	N	\$2,752.83	65.0%	\$963.49	
10040784	SCX3-W100AC2	N	\$2,374.48	65.0%	\$2,581.07	Effective 5/30/2017
10041443	SCX3-W100AC8	N	\$3,929.67	65.0%	\$1,375.39	
10042010	SC3-W60AC	N	\$2,879.09	65.0%	\$1,007.68	
10042011	SCX3-W60AC	N	\$3,535.71	65.0%	\$1,237.50	
10042012	SCX3-W60AMPPT	N	\$3,591.81	65.0%	\$1,257.14	Duplicate
37200021	SPF3-52CNIS 5.25-5.85 GHz	N	\$3,165.33	65.0%	\$1,107.87	
37300096	SPF4-52CNIS 5.25-5.85 GHz	N	\$3,956.62	65.0%	\$1,384.82	
37300101	SDF4-52CNIS1 5.25-5.85GHz	N	\$5,432.66	65.0%	\$1,901.43	
37400110	PAD6-59BCIS 5.925-6.425	N	\$6,519.15	65.0%	\$2,281.70	
37400111	PAD6-65BCIS 6.425-7.125GHz	N	\$6,519.15	65.0%	\$2,281.70	
37400112	SPF6-52CNIS 5.25-5.85 GHz	N	\$5,270.26	65.0%	\$1,844.59	
37400121	PAD6-W57BCIS 5.725-6.875	N	\$6,923.24	65.0%	\$2,423.14	
37400125	PADX6-107BCIS 10.7-11.7GHz	N	\$10,748.57	65.0%	\$3,762.00	
37400130	UXA6-W59BCIS1 5.925-6.875	N	\$17,405.85	65.0%	\$6,092.05	
37400137	PAD6-107BCIS 10.7-11.7 GHz	N	\$6,519.15	65.0%	\$2,281.70	
37500025	UXA8-W59ACIS1 5.925-6.875	N	\$21,825.49	65.0%	\$7,638.92	
37500030	PAD8-W57ACIS 5.725-6.875 GHz	N	\$9,940.39	65.0%	\$3,479.14	
37500031	PAD8-59ACIS 5.925-6.425GHz	N	\$9,671.04	65.0%	\$3,384.87	
37500033	PAD8-65ACIS 6.425-7.125GHz	N	\$9,671.04	65.0%	\$3,384.87	
37500035	PAD8-107ACIS 10.7-11.7 GHz	N	\$9,671.04	65.0%	\$3,384.87	
37500040	PADX8-107ACIS 10.7-11.7GHz	N	\$13,038.38	65.0%	\$4,563.43	
37500064	UXA8-107ACISG 10.7-11.7GHz	N	\$29,562.74	65.0%	\$10,346.96	
37600032	PAD10-59ACIS 5.925-6.425	N	\$13,873.44	65.0%	\$4,855.70	
37600033	PAD10-65ACIS 6.425-7.125	N	\$13,873.44	65.0%	\$4,855.70	
37600037	Pad10-W57acIs 5.725-6.875	N	\$14,142.86	65.0%	\$4,950.00	
37600039	PADX10-107ACIS 10.7-11.7	N	\$17,213.90	65.0%	\$6,024.87	
37600055	UXA10-W59ACIS1 5.925-6.875	N	\$26,265.33	65.0%	\$9,192.87	
37700040	UXA12-W59ACIS1 5.925-6.875	N	\$35,773.02	65.0%	\$12,520.56	
MA0528-23AN	PANEL 23 DBI 5.25-5.825GHz	N	\$1,582.66	65.0%	\$553.93	
MA0528-28AN-W	PANEL 28 DBI 5.25-5.825GHz	N	\$2,215.71	65.0%	\$775.50	
Microwave Antennas, Radome and Sway Bar Kits (1 Strut)						
10033669	DA4-W57BCIS1 5.725-6.875	N	\$6,956.95	65.0%	\$2,434.93	
10015299	UXA10-65ACIS1 6.425-7.125	N	\$26,251.81	65.0%	\$9,188.14	
10025486	DA8-59ACIS1 5.925-6.425 GHz	N	\$15,459.48	65.0%	\$5,410.82	
10025490	UA8-59ACIS1 5.925-6.425GHz	N	\$17,749.29	65.0%	\$6,212.25	
10025500	DAX8-59ACIS1 5.925-6.425 GHz	N	\$16,297.99	65.0%	\$5,704.30	
10025520	DA8-65ACIS1 6.425-7.125 GHz	N	\$15,459.48	65.0%	\$5,410.82	
10025523	UA8-65ACIS1 6.425-7.125GHz	N	\$17,749.29	65.0%	\$6,212.25	
10025533	DAX8-65ACIS1 6.425-7.125 GHz	N	\$16,302.47	65.0%	\$5,705.87	
10025535	UXA8-65ACIS1 6.425-7.125 GHz	N	\$21,657.11	65.0%	\$7,579.99	
10025548	DA8-107ACIS1 10.7-11.7 GHz	N	\$15,459.48	65.0%	\$5,410.82	
10025551	UXA8-107ACIS1 10.7-11.7GHz	N	\$21,657.11	65.0%	\$7,579.99	
10025552	DAX8-107ACIS1 10.7-11.7GHz	N	\$16,297.99	65.0%	\$5,704.30	
10025665	DA10-W57ACIS1 5.725-6.875 GHz	N	\$19,818.54	65.0%	\$6,936.49	
10025668	DA10-59ACIS1 5.925-6.425 GHz	N	\$19,641.76	65.0%	\$6,874.62	
10025673	DA10-65ACIS1 6.425-7.125 GHz	N	\$19,641.76	65.0%	\$6,874.62	
10025679	DA10-107ACIS1 10.7-11.7 GHz	N	\$19,641.76	65.0%	\$6,874.62	
10025682	UXA12-59ACIS1 5.925-6.425	N	\$38,932.14	65.0%	\$13,626.25	Effective 5/30/2017
10025683	DA12-65ACIS1 6.425-7.125 GHz	N	\$29,065.61	65.0%	\$10,172.97	
10027421	DA8-W71ACIS1 7.125-8.5 GHz	N	\$15,627.86	65.0%	\$5,469.75	
10027481	DA10-W71ACIS1 7.125-8.5GHz	N	\$24,010.41	65.0%	\$8,403.64	
10027913	DA12-59ACIS1 5.925-6.425 GHz	N	\$29,065.85	65.0%	\$10,173.05	
10027932	DA8-W57ACIS1 5.725-6.875	N	\$15,627.86	65.0%	\$5,469.75	
10027937	DAX10-59ACIS1 5.925-6.425 GHz	N	\$21,232.83	65.0%	\$7,431.49	
10027938	DAX10-65ACIS1 6.425-7.125	N	\$21,232.83	65.0%	\$7,431.49	
10028076	UXA10-107ACIS1 10.7-11.7	N	\$26,251.81	65.0%	\$9,188.14	
10028081	UXA12-65ACIS1 6.425-7.125	N	\$38,932.14	65.0%	\$13,626.25	
10030666	SU6-107BBIS1	N	\$10,562.28	65.0%	\$3,696.80	
10030667	SUX6-107BBIS1	N	\$14,344.86	65.0%	\$5,020.70	
10030822	UXA6-107BDIS1 10.7-11.7 GHz	N	\$17,237.47	65.0%	\$6,033.12	
10031083	UXA6-65BDIS1 6.425-7.125 GHz	N	\$17,237.47	65.0%	\$6,033.12	

10036066	SUX4-107BC1S1T 10.7-11.7 GHz (Teflon)	N	\$14,726.49	65.0%	\$5,154.27	Effective 5/30/2017	
10036067	SUX6-107BC1S1T 10.7-11.7 GHz (Teflon)	N	\$17,501.16	65.0%	\$6,125.41		
10038411	DA8-107AC1S1T 10.7-11.7 GHz (Teflon)	N	\$24,020.39	65.0%	\$8,407.14		
10038430	UXA6-107BC1S1T 10.7-11.7 GHz (Teflon)	N	\$24,278.57	65.0%	\$8,497.50		
10038431	UXA8-107AC1S1T 10.7-11.7 GHz (Teflon)	N	\$29,845.91	65.0%	\$10,446.07		
37300102	SU4-107BC1S1T 10.7-11.7 GHz (Teflon)	N	\$10,400.58	65.0%	\$3,640.20		Effective 5/30/2017
37400176	SU6-107BC1S1T 10.7-11.7GHz (Teflon)	N	\$14,268.57	65.0%	\$4,994.00		
10038096	PADX6-U57AC1S1R 5.725-7.125	N	\$17,778.75	65.0%	\$6,222.56		
10038097	PADX8-U57AC1S1R 5.725-7.125	N	\$22,292.68	65.0%	\$7,802.44		
10038098	PADX10-U57AC1S1R 5.725-7.125	N	\$27,376.49	65.0%	\$9,581.77		
10036116	SPF2-52CN1S1R 5.25-5.85GHz	N	\$3,236.51	65.0%	\$1,132.78		
10038461	PADX6-U57AC1SGR 5.725-7.125A	N	\$18,360.49	65.0%	\$6,426.17		
10038462	PADX8-U57AC1SGR 5.725-7.125	N	\$23,078.08	65.0%	\$8,077.33		
10038463	PADX10-U57AC1S1R 5.725-7	N	\$28,366.56	65.0%	\$9,928.30		
37400140	PAD6-59BC1S1R	N	\$9,105.33	65.0%	\$3,186.87		
37400161	PAD6-65BC1SGR	N	\$11,222.83	65.0%	\$3,927.99		
37400155	PADX6-W59BC1S1R	N	\$14,349.42	65.0%	\$5,022.30		
37400201	PAD6-W57BC1SGR	N	\$13,142.72	65.0%	\$4,599.95		
37400208	PADX6-107BB1S1R	N	\$13,996.95	65.0%	\$4,898.93		
37500055	PAD8-59AC1S1R	N	\$13,363.90	65.0%	\$4,677.37		
37500130	PADX8-W59AC1S1R	N	\$19,306.10	65.0%	\$6,757.14		
37500133	PAD8-65AC1SGR	N	\$15,723.79	65.0%	\$5,503.33		
10036175	PADX6-W57AC1S1R	N	\$15,040.85	65.0%	\$5,264.30		
10038010	PADX6-W57AC1SGR 5.725-6.875 GHz	N	\$18,222.99	65.0%	\$6,378.05		
10036177	PADX8-W57AC1S1R	N	\$27,146.43	65.0%	\$9,501.25		
10038119	PADX8-W57AC1SGR	N	\$22,959.67	65.0%	\$8,035.89		
10036179	PADX10-W57AC1S1R	N	\$24,065.33	65.0%	\$8,422.87		
10036470	PADX6-107BC1S1R	N	\$15,417.76	65.0%	\$5,396.22		
Microwave Antennas, Radome and Sway Bar Kits (2 Struts)							
37400097	PAD6-W57BC7S1R	N	\$10,450.79	65.0%	\$3,657.78		
37600066	PAD10-59AC7S1R	N	\$20,131.34	65.0%	\$7,045.97		
37500079	PAD8-W57AC7S1R	N	\$13,961.67	65.0%	\$4,886.59		
37500082	PAD8-59AC7S1R	N	\$14,486.53	65.0%	\$5,070.29		
10036350	SU6-107BC7S1	N	\$11,750.20	65.0%	\$4,112.57		
37400100	PAD6-59BC7S1R	N	\$10,260.88	65.0%	\$3,591.31		
10036722	PAD6-65BC7S1R	N	\$10,260.88	65.0%	\$3,591.31		
10036753	PADX6-W57AC7S1R	N	\$16,228.85	65.0%	\$5,680.10		
10036754	PADX8-W57AC7S1R	N	\$20,630.58	65.0%	\$7,220.70		
10038231	PADX6-U57AC7S1R	N	\$18,966.75	65.0%	\$6,638.36		
10038232	PADX8-U57AC7S1R	N	\$23,541.34	65.0%	\$8,239.47		
10038233	PADX10-U57AC7S1R	N	\$28,625.06	65.0%	\$10,018.77		
37600094	PAD10-W57AC7S1R	N	\$21,049.29	65.0%	\$7,367.25		
10039071	PADX10-W57AC7SGR	N	\$28,663.72	65.0%	\$10,032.30		
10036663	PAD10-65AC7S1R	N	\$20,529.14	65.0%	\$7,185.20		
10037381	UXA6-W57AC7S1	N	\$19,226.98	65.0%	\$6,729.44		
10037382	UXA8-W57AC7S1	N	\$23,863.56	65.0%	\$8,352.25		
10037383	UXA10-W57AC7S1	N	\$28,463.84	65.0%	\$9,962.34		
10038274	UXA6-U57AC7S1	N	\$23,103.38	65.0%	\$8,086.18		
10038276	UXA8-U57AC7S1	N	\$28,346.37	65.0%	\$9,921.23		
10036720	UXA6-W59BC7S1	N	\$18,593.85	65.0%	\$6,507.85		
10036721	UXA8-W59AC7S1	N	\$23,068.49	65.0%	\$8,073.97		
37600089	UXA8-107AC7SG 10.7-11.7GHz	N	\$31,040.90	65.0%	\$10,864.32		
10037284	SUX4-107BC7S1	N	\$10,483.71	65.0%	\$3,660.30	Effective 5/30/2017	
Radomes and Sway Kits							
10011400	Kit Sway Bar 4ft SL (SMA-WK-4) SB	N	\$892.03	65.0%	\$312.21		
10031054	Kit Sway Bar 6ft Refl (SMA-SK-60-2000A)	N	\$1,296.00	65.0%	\$453.60		
10031053	Kit Sway Bar 8-12ft Refl (SMA-SK-60-3000A)	N	\$1,356.00	65.0%	\$474.60		
310770-003-W	4ft Unheated Radome, Fiberglass (white) (310770-003) - non-shrouded antennas such as PAD, SPF, PA	N	\$1,856.06	65.0%	\$649.62		
311793-003-W	6ft Unheated Radome, Fiberglass (white deep) (311793-003) - PADs ONLY (use 310771-003-W non-shrouded antennas such as PAD, SPF, PA)	N	\$2,676.17	65.0%	\$936.66		
310772-003-W	8ft Unheated Radome, Fiberglass (white) (310772-003) - non-shrouded antennas such as PAD, SPF, PA	N	\$4,028.57	65.0%	\$1,410.00		
310773-003-W	10ft Unheated Radome, Fiberglass (white) (310773-003) - non-shrouded antennas such as PAD, SPF, PA	N	\$5,904.77	65.0%	\$2,066.67		
310774-003-W	12ft Unheated Radome, Fiberglass (white) (310774-003) - non-shrouded antennas	N	\$10,733.31	65.0%	\$3,756.66		
Dehydrator and Manifolds							
920635-C	Automatic Dehydrator, APD20 w/out factory installed Bleeder Valve, 115 volts (920635-C)	N	\$6,744.51	65.0%	\$2,260.58	Effective 5/30/2017	
10042202	Automatic Dehydrator, APD20-D-35XH0R00S0	N	\$8,100.00	65.0%	\$2,835.00	New Effective 5/30/2017	
940098-W	Dehydrator Wall Shelf for APD 20, 7x (940098)	N	\$610.92	65.0%	\$214.82	Effective 5/30/2017	
20040835	SHELF, WALL / RACK MOUNT, PAINTED	N	\$501.51	65.0%	\$175.53	New Effective 5/30/2017	
920202-W	Gas Distribution Manifold, 2 Port, 0-15PSIG (920202)	N	\$743.91	65.0%	\$260.37		
920204-W	Gas Distribution Manifold, 4 Port, 0-15PSIG (920204)	N	\$1,508.57	65.0%	\$528.00		
920206-W	Gas Distribution Manifold, 6 Port, 0-15PSIG (920206)	N	\$1,388.57	65.0%	\$486.00		
920208-W	Gas Distribution Manifold, 8 Port, 0-15PSIG (920208)	N	\$1,818.34	65.0%	\$636.42		
Waveguide, Connectors and Associated Parts							
810265-001	Standard Elliptical Waveguide, E60 (5.6 - 6.425 GHz)	N	\$43.80	65.0%	\$15.33		
810265-002	Premium Elliptical Waveguide, EP60 (5.6 - 6.425 GHz)	N	\$47.74	65.0%	\$16.71		
399269-101	Connector, Tunable / CPR137G (bottom) (C137-060TG)	N	\$1,385.14	65.0%	\$484.80		
399269-103	Connector, Non-Tunable / CPR137G (top) (C137-060FG)	N	\$1,277.14	65.0%	\$447.00		
916534-158	Hoisting Grip (HOIST1-158L) - Lace-up (LCF158.HCA158.E60.EP60.EP65)	N	\$62.83	65.0%	\$21.99		
921234-061	Grounding Kit - 60in wire, E60 (GKIT-60-060)	N	\$76.37	65.0%	\$26.73		
920981-003	Hanger Kit for E60 (CLAMP-060) (10 pack, bolt-on)	N	\$117.72	65.0%	\$41.20		
915255	Angle Member Adapter Kit, 3/8in Stainless Steel (ANGLE-CLPI) (10 pack)	N	\$151.63	65.0%	\$53.07		
CEIL12-51	Ceiling Adapter Kit, 12in (CEIL12-51.514608-003) (5 pack) - waveguide only	N	\$131.49	65.0%	\$46.02		
920831	Wall/Roof Feed Thru E/EP60 (WFT-060) - 1 per boot	N	\$194.74	65.0%	\$68.16		
400108	Pressure Window (WPW-137EP) - mates to CPR137G	N	\$113.83	65.0%	\$39.84		
915663	4in Boot with 1 Hole for E60 (BOOT4-060)	N	\$163.97	65.0%	\$57.39		
815487-001	Standard Elliptical Waveguide E105 (10.0 - 11.7 GHz)	N	\$48.00	65.0%	\$16.80		
815487-002	Premium Elliptical Waveguide EP105 (10.0 - 11.7 GHz)	N	\$41.66	65.0%	\$14.58		
399503-101	Connector, Tunable (C90-105TG)	N	\$912.17	65.0%	\$319.26		
399503-103	Connector, Non-Tunable (top) (C90-105FG)	N	\$912.17	65.0%	\$319.26		
916533-108	Hoisting Grip (HOIST1-105L) - Lace-up (E105,E78)	N	\$67.08	65.0%	\$23.48		
921234-108	Grounding Kit - 60in wire, E105 (GKIT-60-105)	N	\$82.32	65.0%	\$28.81		
920981-007	Hanger Kit for E105, 7/8in coax (CLAMP-105) (10 pack, bolt-on)	N	\$77.52	65.0%	\$27.13		
920745	Wall/Roof Feed Thru E/EP105 - 1 per boot (WFT-105)	N	\$174.26	65.0%	\$60.99		
400130	Pressure Window (WPW-090EP) - mates to CPR90G	N	\$93.00	65.0%	\$32.55		
400124	2R Twistflex (TF090-CC1-024L) - CPR90G/CPR90G	N	\$1,059.17	65.0%	\$370.71		
915665	4in Boot with 1 Hole for E105 (BOOT4-105)	N	\$163.97	65.0%	\$57.39		
810261-001	Standard Elliptical Waveguide, E65 (5.9 - 7.125 GHz)	N	\$39.17	65.0%	\$13.71		
810261-002	Premium Elliptical Waveguide, EP65 (5.9 - 7.125 GHz)	N	\$40.37	65.0%	\$14.13		

399289-101	Connector, Tunable / CPRI37G (C137-065TG)	N	\$934.37	65.0%	\$327.03
399289-103	Connector, Non-Tunable (top) (C137-065FG)	N	\$934.37	65.0%	\$327.03
921234-065	Grounding Kit - 60in wire, E65 (GKIT-60-065)	N	\$58.80	65.0%	\$20.58
920981-004	Hanger Kit for E65-70 (CLAMP-114) (10 pack, bolt-on, 1.25in)	N	\$70.97	65.0%	\$24.84
920738	Wall/Roof Feed Thru E/EP65 (WFT-065) - 1 per boot	N	\$194.74	65.0%	\$68.16
915006-W	Hardware Kit, HDWK3/8-16X1, 3/8 - 16 x 1 bolt (915006) - 10 each lock washers, hex nuts and fillister head screws	N	\$43.44	65.0%	\$15.20
915751	4in Boot with 1 Hole for E65 (BOOT4-065)	N	\$163.97	65.0%	\$57.39
810268-001	Standard Elliptical Waveguide, E185 (17.3 - 19.7 GHz)	N	\$26.23	65.0%	\$9.18
810268-002	Premium Elliptical Waveguide, EP185 (17.3 - 19.7 GHz)	N	\$28.37	65.0%	\$9.93
399422-101	Connector, Tunable (top and bottom) (the only turnable connector for this WG is UG flange, which mates with PBR220) (G595)	N	\$881.66	65.0%	\$308.58
916534-012	Hoisting Grip (HOIST1-185L) - Lace-up (L12,E185)	N	\$35.66	65.0%	\$12.48
921234-191	Grounding Kit, 60in wire, E185 (GKIT-60-185)	N	\$47.49	65.0%	\$16.62
920981-010	Hanger Kit for E185 (CLAMP-185) (10 pack, bolt-on)	N	\$40.71	65.0%	\$14.25
920726	Wall/Roof Feed Thru (WF-185) - 1 per boot	N	\$174.26	65.0%	\$60.99
400184	Pressure Window (PW-BW220) PBR220/UBR220	N	\$285.17	65.0%	\$99.81
15399166	2ft Twistflex (TF220-BW2-060M) - PBR220/UBR220	N	\$829.37	65.0%	\$290.28
915664	4in Boot with 1 Hole for E185 (BOOT4-185)	N	\$129.86	65.0%	\$45.45
914791-W	Load Termination WR-90 / CPR90G Flange (91479)	N	\$1,328.57	65.0%	\$465.00
915422-W	Load Termination WR-137 / CPRI37G Flange (915422)	N	\$414.86	65.0%	\$145.20
311370-W	Cover Plate kit WR-90 / CPR90G Flange (311370)	N	\$244.89	65.0%	\$85.71
311372-W	Cover Plate kit WR-137 / CPRI37G Flange (311372)	N	\$143.91	65.0%	\$50.37
10037095	Cover Plate kit WR-42 / PBR220 or UBR220 Flange (10037095)	N	\$275.49	65.0%	\$96.42
10037094	Cover Plate kit WR-90 / PDR100 or UDR100 Flange (10037094)	N	\$275.49	65.0%	\$96.42
913412	CPRI37G Flange Rebuild Kit (when reusing antennas OR waveguide) (used at end only) (913412)	N	\$75.94	65.0%	\$26.58
913409	CPR90G Flange Rebuild Kit (when reusing antennas OR waveguide) (used at end only) (913409)	N	\$56.91	65.0%	\$19.92
Twistflex, Hanger Kits and Accessories					
916705-W	Twistflex hanger kit WR90 (916705)	N	\$170.83	65.0%	\$59.79
1AF15840AAAA	Twistflex Hanger Kit WR42 (PBR220) - RFS does not have a 220 hanger - Andrew part: (244106A-220)	N	\$235.71	65.0%	\$82.50
916933-W	Twistflex hanger kit WR137 (916933)	N	\$256.20	65.0%	\$89.67
400015	3ft Twistflex (TF137-CC1-036I) - CPRI37G/CPRI37G	N	\$1,261.20	65.0%	\$441.42
400125	3ft Twistflex (TF090-CC1-036I) - CPR90G/CPRI90G	N	\$1,212.26	65.0%	\$424.29
45399167	3ft Twistflex (TF220-BW2-090M) - PBR220/UBR220	N	\$4,019.23	65.0%	\$1,356.73
10038689	Flexible Waveguide for Microwave Radio System, 11GHz, 1.2m	N	\$494.97	65.0%	\$173.24
15399144	3ft Twistflex (TF100-DV2-900mm) - PDR100/UDR100	N	\$1,190.06	65.0%	\$416.52
15399132	3ft Twistflex (TF070-DV2-090M) - PDR70/UDR70	N	\$1,442.49	65.0%	\$504.87
400013	1ft Twistflex (TF137-CC1-012I) - CPRI37G/CPRI37G	N	\$967.97	65.0%	\$338.79
916626	CLAMP SNAP-IN LCF158 Stack Kit 10 - HANGER, STACKABLE 1-5/8 10 KIT	N	\$87.43	65.0%	\$30.60
HOIST2-L01	Hoisting Grip (HOIST2-L01) - Lace-up, 2 loop	N	\$292.80	65.0%	\$102.48
916132	Weatherproofing kit (WPGF-1) - 1 for every 2 cables	N	\$50.74	65.0%	\$17.76
3CC50015AA	Lightning Arrest 9913-INDU and ODU Arrest	N	\$1,062.86	65.0%	\$372.00
Times Microwave Systems (TMS) LMR Parts and Accessories					
1AC014320002	LMR400 (HS: 2 runs, NS: 1 run) + (if non-integ, dual pol and 2 channels: 2 runs) (TMS)	N	\$12.69	65.0%	\$4.44
1AB095530045	PPC Connector (compression) - straight male (3 per LMR run) (TMS)	N	\$60.77	65.0%	\$21.27
1AB095530046	PPC Connector (compression) - straight female (1 per LMR run) (TMS)	N	\$69.43	65.0%	\$24.30
1AB383930001	PPC Compression Tool (1 per deployment) (TMS)	N	\$1,802.49	65.0%	\$630.87
1AB350440001	LMR grounding kit (GKS400TT) (TMS)	N	\$243.00	65.0%	\$85.05
SitePro1 (Valmont) Ice Shields, Tieback Steel, Parts and Accessories					
1AF28452AAAA	Valmont flat Ice Shield - 2ft (MIS24, xxxxxx)	N	\$2,082.86	65.0%	\$729.00
409081593	Valmont flat Ice Shield - 4ft (ISMD4, 800250) ADD PIPE MOUNT	N	\$8,825.86	65.0%	\$3,089.05
409081601	Valmont flat Ice Shield - 6ft (ISMD6, 800251) ADD PIPE MOUNT	N	\$11,751.63	65.0%	\$4,113.07
409081619	Valmont flat Ice Shield - 8ft (ISMD8, 800252) ADD PIPE MOUNT AND WELDMENT	N	\$14,823.67	65.0%	\$5,188.28
1AF19234AAAA	Valmont flat Ice Shield - 10ft (ISMD10, 800253) ADD PIPE MOUNT AND WELDMENT	N	\$21,727.13	65.0%	\$7,604.50
409108073	Valmont Pipe Mount Extension weldment for Ice Shields (PME2, B1935)	N	\$1,316.57	65.0%	\$460.80
1AF24588AAAA	Valmont ice shield KIT - 4ft (ISMD4-R5LL = 800250 (ice shield) + 409081365 (leg mount))	N	\$14,770.29	65.0%	\$5,169.60
1AF24589AAAA	Valmont ice shield KIT - 6ft (ISMD6-R5LL = 800251 (ice shield) + 409081365 (leg mount))	N	\$18,104.91	65.0%	\$6,336.72
1AF24587AAAA	Valmont ice shield KIT - 8ft (ISMD8-R5LL = 800252 (ice shield) + 409081365 (leg mount))	N	\$21,667.89	65.0%	\$7,583.76
1AF24586AAAA	Valmont ice shield KIT - 10ft (ISMD10-R5LL = 800253 (ice shield) + 409081365 (leg mount))	N	\$23,091.43	65.0%	\$8,082.00
1AF28451AAAA	Tieback Steel - Bulk Angle 4" X 4" X 1/4" x 20' (ANG414) - (1 per antenna)	N	\$3,515.66	65.0%	\$1,230.48
SitePro1 (Valmont) Misc. Microwave Parts and Accessories					
409081510	LMR Cushion Hanger (4 hole) - (Valmont: B1676, SRLR44-K) - complete with clamp and clamp head (5 per package)	N	\$190.08	65.0%	\$66.53
1AD173640001	BRL Cushion BC141X 1-5/8,10@0.24,10p (Valmont BC1410)	N	\$185.14	65.0%	\$64.80
1AF25490ABAA	Angle Member Adapter Kit, 3/8in Stainless Steel (Valmont ADAP-O) (10 pack)	N	\$351.77	65.0%	\$123.12
1AF19821AAAA	Cushion hangers - (4) 9.9mm and (5) 6.1mm barrel cushion that fits into 1/8in snap-in (Qty. 10) - (Valmont BC144384)	N	\$151.61	65.0%	\$53.06
916555-038	405 Coax Hoisting Grip (HOIST1-38C) 3.8in RGC8 Prefaced	N	\$86.80	65.0%	\$30.28

Effective 5/30/2017

New Effective 5/30/2017

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END OF NON-INTEGRATED ANTENNA SYSTEMS Price Catalog



**9500 MPR
COMMSCOPE ANTENNA SYSTEMS**

Part No	CommScope P/N	Description	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price
402059869	55001-137	PRESSURE WINDOW ASSEMBLY (CPR137) - WR137 PRESSURE WINDOW	\$ 226.80	65%	\$ 79.38
409072873	6600D-6	6-PORT MANIFOLD, 0-15 PSISIX OUTLET GAS MANIFOLD	\$ 2,238.00	65%	\$ 783.30
402093116	55001-90	Pressure Window	\$ 456.00	65%	\$ 159.60
402167829	31771-4	Ceiling Adapter Kit (Threaded rod kit)	\$ 327.30	65%	\$ 114.56
402662936	EW52	Andrew EW52 Heliax per foot	\$ 71.70	65%	\$ 25.10
405423773	42396A-8	Hanger Kit	\$ 147.60	65%	\$ 51.66
406936799	EW63	Andrew EW63 Heliax per foot	\$ 62.30	65%	\$ 21.81
407415645	EW90	Andrew EW90 Heliax per foot	\$ 56.20	65%	\$ 19.67
407494418	241088-2	2-Hole Grounding Kit 24"	\$ 159.50	65%	\$ 55.83
408668911	6600D-2	2-Port Manifold, 0-15 PSI	\$ 1,146.00	65%	\$ 401.10
408781177	29958	Hoisting Grip	\$ 165.30	65%	\$ 57.86
408805240	WGB5-52	4" Boot	\$ 306.00	65%	\$ 107.10
408985216	31768A	Angle Member Adapter	\$ 308.10	65%	\$ 107.84
409072758	F090CCB2	2' Twistflex	\$ 2,250.00	65%	\$ 787.50
409073038	PAR6-59-PXA/B	Andrew 6' Standard Antenna, Single Polarized, CPR137G Input, Cat. A	\$ 13,054.50	65%	\$ 4,569.08
409073053	PAR8-59-PXA	Andrew 8' Standard Antenna, Single Polarized, CPR137G Input, Cat. AFREQ. RANGE: 5	\$ 19,597.50	65%	\$ 6,859.13
409073061	PAR8-65-PXA	Andrew 8' FREQ. RANGE: 6.425 - 7.125	\$ 19,597.50	65%	\$ 6,859.13
409073269	WGB4-90	4" Boot	\$ 320.40	65%	\$ 112.14
409083169	PAR6-59W-PXA/A	Andrew 6' Standard Wide Band Antenna, Single Polarized, CPR137G Input, Cat. A	\$ 13,054.50	65%	\$ 4,569.08
409083920	42396A-7	Hanger Kit	\$ 147.60	65%	\$ 51.66
409083938	EWSH-90	Hanger Kit	\$ 460.80	65%	\$ 161.28
409084142	WGB5-63	4" Boot	\$ 306.00	65%	\$ 107.10
409084225	R6E	Andrew 6' Radome	\$ 3,874.50	65%	\$ 1,356.08
409084308	220498	1 5/8 Grounding Kit (EW52, EW63, EW64), 60: Field attach lug	\$ 163.60	65%	\$ 57.26
409084498	34769-5	3/8"x3/4"HANGER ATTACHMENT HARDWARE,10EA	\$ 46.80	65%	\$ 16.38
409084506	204673-1	Wall/Roof Feed Thru	\$ 192.60	65%	\$ 67.41
409084605	520570-2	Andrew fixed inboard Strut Kit for 6' Antennas	\$ 877.50	65%	\$ 307.13
409084613	520570-3	Andrew fixed outboard Strut Kit for 8', 10', 12' Antennas	\$ 1,372.50	65%	\$ 480.38
409085107	252SE	Connector	\$ 1,788.80	65%	\$ 626.08
409085255	6600D-4	4-Port Manifold, 0-15 PSI	\$ 1,608.00	65%	\$ 562.80
409085271	AE01D-D1658-100	Dehydrator Wall Shelf, MT050/MT/XT300	\$ 1,110.00	65%	\$ 388.50
409085313	MT050B-81315	Dehydrator, 5 PSI, 115VAC / 60HZ, 1.2A, NSD	\$ 18,195.10	65%	\$ 6,368.29
1AF24848ABAA		Dehydrator MT050C, 115/230 Vac, 50/60 Hz	\$ 13,750.00	65%	\$ 4,812.50
409085370	39099-137	Waveguide Termination	\$ 415.80	65%	\$ 145.53
409093101	190SE	Connector	\$ 1,232.00	65%	\$ 431.20
408781177	L2SGRIP	Hoisting Grip	\$ 101.40	65%	\$ 35.49
405858168	SG12-06B2A	Grounding Kit	\$ 90.20	65%	\$ 31.57
409085123	163SE	Connector, Tunable / CPR137G (bottom & top) (163SE)	\$ 1,155.20	65%	\$ 404.32
900358177	24312A	Hoisting Grip (24312A) - Lace-up (1-5/8" coax,EW44,EW52,EW63)	\$ 194.00	65%	\$ 67.90
409084381	204673-1	Wall/Roof Feed Thru, 4" (204673-1) - 1 per boot	\$ 192.60	65%	\$ 67.41
1AF13516AAAA	31769-1	Hardware Kit- 3/8" x 1" for Hangers (31769-1) (10 pack)	\$ 48.60	65%	\$ 17.01
409072790	F137CCD2	2' Twistflex (F137CCD2) - CPR137G/CPR137G	\$ 2,500.00	65%	\$ 875.00
409073244	WGB4-52	4" Boot (WGB4-52) - for EW52	\$ 320.40	65%	\$ 112.14
408948867	220497	Grounding kit (220497) (5/8", 7/8" coax, EW85,90,127,132), 60", Field attach lug	\$ 155.40	65%	\$ 54.39
408944288	42396A-5	Hanger Kit for EW90 / EW85 (42396A-5) (10 pack)	\$ 149.60	65%	\$ 52.36
409085388	39099-90	Waveguide Termination Load (39099-90) - CPR90G	\$ 415.80	65%	\$ 145.53
409107786	F090CHB3	3' Twistflex (F090CHB3) - CPR90G/PDR100 - narrowband: 10.7 - 11.7	\$ 2,575.00	65%	\$ 901.25
409073269	WGB4-90 (replaces 204679)	4" Boot (WGB4-90) - for EW90	\$ 320.40	65%	\$ 112.14
409116100	MT050B-81315	Dehydrator, Full Alarm (MT050B-81315)	\$ 18,195.10	65%	\$ 6,368.29
1AF24848ABAA		Dehydrator MT050C, 115/230 Vac, 50/60 Hz	\$ 13,750.00	65%	\$ 4,812.50
409072873	6600D-6	Gas Distribution Manifold, 6 Port (6600D-6)	\$ 2,238.00	65%	\$ 783.30
1AF10251AAAA	PARX6-59W-PXA/A	PARX6-59W-PXA/A - 6' Std, CPR137G, Dual Pol Ant., Includes Radome, 1 inboard str	\$ 25,200.00	65%	\$ 8,820.00
409082898	UHX6-59W-P3A/B	UHX6-59W-P3A/B - 6' Hi Perf, CPR137G, Dual Pol Ant., Includes Radome (Teglar), 1 in	\$ 41,500.00	65%	\$ 14,525.00
1AF20518AAAA	VHLPX3-11W-6WH	VHLPX3-11W-6WH - 3' Hi Perf, CPR90G, Dual Pol Ant., Includes Radome (White), NC	\$ 9,000.00	65%	\$ 3,150.00
1AF24251AAAA	VHLPX4-11W-6WH	VHLPX4-11W-6WH - 4' Hi Perf, CPR90G, Dual Pol Ant., Includes Radome (White), 1 in	\$ 14,760.00	65%	\$ 5,166.00
1AF29757AAAA	520919-2	FEED ASSY, 59 SERIES, D/P, FOCAL PLANE	\$ 12,240.00	65%	\$ 4,284.00
409072832	F137CCS5	WR137 FLEX TWIST,1200 MM,CPR137G/CPR137G	\$ 2,726.00	65%	\$ 954.10

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END of COMMSCOPE ANTENNA SYSTEMS Price Catalog

TSM-8000 Network Management System

Part No	Description	NASPO ValuePoint MSRP	Discount %	NASPO ValuePoint Unit Price
TSM-8000 Fully Redundant Workstation Kit				
3EM16790EP	Server Wkstn Kit, Win Server, 110 VAC	\$55,200	65%	\$ 19,320.00
3EM16790EQ	Server Wkstn Kit, Win Server, 220 VAC	\$61,053	65%	\$ 21,368.40
TSM-8000 Single Client Workstation Kit				
3EM16790BV	Single Client as Server Wkstn Kit, Win , 110 VAC	\$34,779	65%	\$ 12,172.80
3EM16790ES	Single Client as Server Wkstn Kit, Win Pro, 220 VAC	\$39,305	65%	\$ 13,756.80
TSM-8000 SNMP / TL1 Workstation Kit				
3EM16790GW	Server Wkstn Kit, 1U, Win Server, 110 VAC	\$45,723	65%	\$ 16,003.20
TSM-8000 Server ONLY				
3EM16790DH	Server workstation (rack mount) - with 17" LCD monitor, WIN Server OS 110 VAC	\$28,800	65%	\$ 10,080.00
3EM16790DJ	Server workstation (rack mount) - with 17" LCD monitor, WIN Server OS 220 VAC	\$29,623	65%	\$ 10,368.00
3EM16790GY	Server, 1U High (rack mount) SNMP Only, WIN Server OS 110 VAC	\$14,606	65%	\$ 5,112.00
SNMP Software				
3EM16790BA	Server License, 24 NE Ltd, SNMP	\$23,657	65%	\$ 8,280.00
3EM16790BB	Server License, 32 NE Ltd, SNMP	\$30,857	65%	\$ 10,800.00
3EM16790BC	Server License, 64 NE Ltd, SNMP	\$51,429	65%	\$ 18,000.00
3EM16790BD	Server License, 128 NE Ltd, SNMP	\$90,000	65%	\$ 31,500.00
3EM16790FS	Server License, 256 NE Ltd, SNMP	\$119,571	65%	\$ 41,850.00
3EM16790FM	Server License, 512 NE Ltd, SNMP	\$134,357	65%	\$ 47,025.00
3EM16790BE	Server License, 1024 NE, SNMP	\$149,143	65%	\$ 52,200.00
MCS-11 + TL1 Software				
3EM16790BF	Server License, 24 NE Ltd, MCS/TL1	\$18,000	65%	\$ 6,300.00
3EM16790BG	Server License, 32 NE Ltd, MCS/TL1	\$23,143	65%	\$ 8,100.00
3EM16790BH	Server License, 64 NE Ltd, MCS/TL1	\$33,429	65%	\$ 11,700.00
3EM16790BJ	Server License, 128 NE Ltd, MCS/TL1	\$48,857	65%	\$ 17,100.00
3EM16790FU	Server License, 256 NE Ltd, MCS-11/TL1	\$69,429	65%	\$ 24,300.00
3EM16790FP	Server License, 512 NE Ltd, MCS-11/TL1	\$79,714	65%	\$ 27,900.00
3EM16790BK	Server License, 1024 NE, MCS-11/TL1	\$90,000	65%	\$ 31,500.00
SNMP + MCS-11 + TL1 Software				
3EM16790BL	Server License, 24 NE Ltd, SNMP/MCS/TL1	\$30,857	65%	\$ 10,800.00
3EM16790BM	Server License, 32 NE Ltd, SNMP/MCS/TL1	\$43,714	65%	\$ 15,300.00
3EM16790BN	Server License, 64 NE Ltd, SNMP & MCS/TL1	\$66,857	65%	\$ 23,400.00
3EM16790BP	Server License, 128 NE Ltd, SNMP & MCS/TL1	\$113,143	65%	\$ 39,600.00
3EM16790FT	Server License, 256 NE Ltd, SNMP & MCS/TL1	\$155,571	65%	\$ 54,450.00
3EM16790FN	Server License, 512 NE Ltd, SNMP & MCS/TL1	\$176,786	65%	\$ 61,875.00
3EM16790BQ	Server License, 1024 NE, SNMP & MCS/TL1	\$198,000	65%	\$ 69,300.00
SNMP Upgrade Pricing - From MCS-11+ TL1 to SNMP + MCS-11 + TL1				
3EM16790CA	Client License and Software SNMP Upgrade	\$5,657	65%	\$ 1,980.00
3EM16790CC	Server License Upgrade, 24 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$13,371	65%	\$ 4,680.00
3EM16790CD	Server License Upgrade, 32 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$20,571	65%	\$ 7,200.00
3EM16790CE	Server License Upgrade, 64 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$33,429	65%	\$ 11,700.00
3EM16790CF	Server License Upgrade, 128 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$64,286	65%	\$ 22,500.00
3EM16790FV	Server License Upgrade, 256 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$86,143	65%	\$ 30,150.00
3EM16790FQ	Server License Upgrade, 512 NE Ltd, MCS-11/TL1 to SNMP & MCS-11/TL1	\$97,071	65%	\$ 33,975.00
3EM16790CG	Server License Upgrade, 1024 NE, MCS-11/TL1 to SNMP & MCS-11/TL1	\$108,000	65%	\$ 37,800.00
MCS-11+TL1 Upgrade Pricing - From SNMP Only to SNMP+ MC-11 + TL1				
3EM16790CB	Client Log-in License, MCS-11/TL-1 Upgrade	\$5,143	65%	\$ 1,800.00
3EM16790EY	Server License Upgrade, 24 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$7,714	65%	\$ 2,700.00
3EM16790EW	Server License Upgrade, 32 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$12,857	65%	\$ 4,500.00
3EM16790EV	Server License Upgrade, 64 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$18,000	65%	\$ 6,300.00
3EM16790EU	Server License Upgrade, 128 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$25,714	65%	\$ 9,000.00

3EM16790FW	Server License Upgrade, 256 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$38,571	65%	\$ 13,500.00
3EM16790FR	Server License Upgrade, 512 NE Ltd, SNMP to SNMP & MCS-11/TL1	\$45,000	65%	\$ 15,750.00
3EM16790ET	Server License Upgrade, 1024 NE, SNMP to SNMP & MCS-11/TL1	\$51,429	65%	\$ 18,000.00
NE Upgrade - Only from same Software type				
3EM16790HA	NE Upgrade 24 NE to 32 NE	\$8,023	65%	\$ 2,808.00
3EM16790HB	NE Upgrade 32 NE to 64 NE	\$16,457	65%	\$ 5,760.00
3EM16790HC	NE Upgrade 64 NE to 128 NE	\$33,943	65%	\$ 11,880.00
3EM16790HD	NE Upgrade 128 NE to 256 NE	\$28,800	65%	\$ 10,080.00
3EM16790HE	NE Upgrade 256 NE to 512 NE	\$14,400	65%	\$ 5,040.00
3EM16790HF	NE Upgrade 512 NE to 1000 NE	\$14,400	65%	\$ 5,040.00
TSM-8000 Software Feature Options				
3EM16790BS	SNMP Upstream Reporting	\$25,714	65%	\$ 9,000.00
3EM16790GJ	Web Interface Feature, All Protocols	\$25,714	65%	\$ 9,000.00
3EM16790GP	Interactive Voice Response System	\$30,857	65%	\$ 10,800.00
3EM16790HM	Farscan Monitor License	\$42,857	65%	\$ 15,000.00
3EM16790HQ	Badger Monitor License	\$42,857	65%	\$ 15,000.00
3EM16790HG	TSM-8000 Non-ALU NE Support RTU	\$2,571	65%	\$ 900.00
3EM16790HN	TSM-8000 Software Subscription	\$51,429	65%	\$ 18,000.00
TSM-8000 Client Software / Misc				
3EM16790BR	Client Log-in License	\$18,514	65%	\$ 6,480.00
3EM16790CH	MG Soft License, Additional	\$129	65%	\$ 45.00
TSM-8000 Documentation				
3EM13847AA	TSM-8000 Instruction Book (paper copy)	\$411	65%	\$ 144.00
TSM-8000 Software Upgrades				
3EM16790HW	TSM-8000 Version 5.6 Upgrade	\$17,143	65%	\$ 6,000.00
3EM16790HY	TSM-8000 Version 5.7 Upgrade	\$17,143	65%	\$ 6,000.00
3EM16790HZ	TSM-8000 Version 6.0 Upgrade	\$17,143	65%	\$ 6,000.00
3EM16790JB	TSM-8000 Version 7.0 Upgrade	\$17,143	65%	\$ 6,000.00
3EM16790JC	TSM-8000 Version 7.1 Upgrade	\$17,143	65%	\$ 6,000.00
TSM-8000 Client Workstations - Optional				
3EM16790AC	Client workstation (tower) - Non-redundant, with 19" LCD monitor, WIN XP PRO, 110 VAC	\$14,400	65%	\$ 5,040.00
TSM-8000 Spares Kits				
3EM16790EJ	Server Spares Kit	\$6,747	65%	\$ 2,361.60
3EM16790EK	Client Spares Kit	\$4,875	65%	\$ 1,706.40
Standard Workstation Accessories				
3EM16790AD	Printer (Laser), 110 VAC	\$8,667	65%	\$ 3,033.60
3EM16790AE	Printer (Laser Desktop), 110 VAC	\$2,647	65%	\$ 926.40
3EM16790AG	Server LAN Switch, 16 Ports, 110 VAC	\$1,440	65%	\$ 504.00
3EM16790AH	Server Remote Access Modem, 110 VAC	\$741	65%	\$ 259.20
3EM16790AJ	Cable set	\$617	65%	\$ 216.00
3EM16790AK	CDs for backup (50 each)	\$123	65%	\$ 43.20
3EM16790GZ	Server Rack Mount Key board and Tray	\$1,299	65%	\$ 454.80
Workstation Accessories - 220 VAC				
3EM16790DV	Printer (Laser), 220 VAC	\$12,669	65%	\$ 4,434.00
3EM16790DW	Printer (Laser Desktop), 220 VAC	\$5,115	65%	\$ 1,790.40
3EM16790EA	Server LAN Switch, 16 Ports, 220 VAC	\$1,749	65%	\$ 612.00
3EM16790EB	Server Remote Access Modem, 220 VAC	\$1,461	65%	\$ 511.20
Server Workstation Spares				
3EM16790AL	Server Motherboard, incl. video and NIC functions	\$1,749	65%	\$ 612.00
3EM16790AM	Server Processor w/Fan	\$1,275	65%	\$ 446.40
3EM16790AN	Server Memory 1024MB ea	\$864	65%	\$ 302.40
3EM16790CW	Server Removable Hard Drive (cloned)	\$1,131	65%	\$ 396.00
3EM16790GM	Hard Drive Bay Spare	\$823	65%	\$ 288.00
3EM16790AQ	Server Removable Power Supply	\$1,399	65%	\$ 489.60
3EM16790AS	Server 4 Port Serial Card	\$1,749	65%	\$ 612.00
3EM16790CV	Server Dual Power Supply w/Cage	\$2,551	65%	\$ 892.80

Effective 5/30/2017

New Effective 5/30,
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Effective 5/30/2017

3EM16790HL	Server 8 port Serial Card	\$3,682	65%	\$ 1,288.80
Spare Server/Client Computers				
3EM16790FB	Spare Server computer (rack mount) - with keyboard, WIN 2003, 110 VAC	\$25,385	65%	\$ 8,884.80
3EM16790FC	Spare Server computer (rack mount) - with keyboard, WIN 2003, 220 VAC	\$26,002	65%	\$ 9,100.80
Monitors				
3EM16790EE	Server Monitor, LCD, 17", with bezel, 110 VAC	\$3,415	65%	\$ 1,195.20
3EM16790EF	Server Monitor, LCD, 17", with bezel, 220 VAC	\$3,621	65%	\$ 1,267.20
3EM16790EG	Client/TSM2532 Monitor, LCD, 19", 110 VAC	\$4,526	65%	\$ 1,584.00
3EM16790EH	Client/TSM2532 Monitor, LCD, 19", 220 VAC	\$4,731	65%	\$ 1,656.00
Client Workstation Spares				
3EM16790AT	Client Motherboard	\$926	65%	\$ 324.00
3EM16790AU	Client Processor w/Fan	\$987	65%	\$ 345.60
3EM16790AV	Client Memory 512MB ea	\$453	65%	\$ 158.40
3EM16790EC	Client Hard Drive (cloned)	\$926	65%	\$ 324.00
3EM16790AY	Client Power Supply	\$411	65%	\$ 144.00
3EM16790AZ	Client Network Card	\$453	65%	\$ 158.40
3EM16790ED	Client Video Card	\$720	65%	\$ 252.00
Polling Engine				
3EM16790CL	Model 2601, MCS-11 Polling Engine, Linear, TSM-8000 only, 110 VAC	\$8,640	65%	\$ 3,024.00
3EM16790CM	Model 2601, MCS-11 Polling Engine, Linear, TSM-8000 only, 220 VAC	\$8,846	65%	\$ 3,096.00
3EM16790CN	Model 2602, MCS-11 Polling Engine, Ring, TSM-8000 only, 110 VAC	\$8,640	65%	\$ 3,024.00
3EM16790CP	Model 2602, MCS-11 Polling Engine, Ring, TSM-8000 only, 220 VAC	\$8,846	65%	\$ 3,096.00
3EM16790CQ	Model 2603, MCS-11 Polling Engine, High Stability Clk, Linear, TSM-8000 only, 110 VAC	\$9,463	65%	\$ 3,312.00
3EM16790CR	Model 2603, MCS-11 Polling Engine, High Stability Clk, Linear, TSM-8000 only, 220 VAC	\$9,669	65%	\$ 3,384.00
3EM16790CS	Model 2604, MCS-11 Polling Engine, High Stability Clk, Ring, TSM-8000 only, 110 VAC	\$9,463	65%	\$ 3,312.00
3EM16790CT	Model 2604, MCS-11 Polling Engine, High Stability Clk, Ring, TSM-8000 only, 220 VAC	\$9,669	65%	\$ 3,384.00
3EM18968BP	Model 2610, Cooperative Polling Engine	\$9,051	65%	\$ 3,168.00
3EM16790CJ	2601 Polling Engine EPROMs	\$741	65%	\$ 259.20
3EM16790CK	2602 Polling Engine EPROMs	\$741	65%	\$ 259.20
IP Tunnels				
3EM18968BQ	Model 2701, IP Tunnel, 1 port	\$8,229	65%	\$ 2,880.00
3EM18968BR	Model 2705, IP Tunnel, 5 port	\$9,874	65%	\$ 3,456.00
Alarm Encoders				
3EM18968BN	Analog Card for MCS-11, SNMP or LSP Alarm Encoder (s)	\$2,263	65%	\$ 792.00
3EM18968BA	Model 2310, MCS-11 Alarm Encoder with LEDs and analog option	\$10,286	65%	\$ 3,600.00
3EM18968BB	Model 2310, MCS-11 Alarm Encoder	\$8,229	65%	\$ 2,880.00
3EM18968BC	Model 2310, MCS-11 Alarm Encoder with analog option	\$10,491	65%	\$ 3,672.00
3EM18968BD	Model 2310AL, MCS-11 Alarm Encoder with LEDs	\$8,990	65%	\$ 3,146.40
3EM18968BE	Model 2310AL, MCS-11 Alarm Encoder with LEDs and analog option	\$11,109	65%	\$ 3,888.00
3EM18968BF	Model 2311, SNMP Alarm Encoder	\$7,406	65%	\$ 2,592.00
3EM18968BG	Model 2311, SNMP Alarm Encoder with analog option	\$9,874	65%	\$ 3,456.00
3EM18968BK	Model 2315, LSP Alarm Encoder	\$8,846	65%	\$ 3,096.00
3EM18968BL	Model 2315, LSP Alarm Encoder with analog option	\$11,109	65%	\$ 3,888.00
3EM18968DU	Model 2314, SNMP Alarm Encoder	\$3,497	65%	\$ 1,224.00
3EM18968DV	2314 66M Punch Block w/ 5ft cable	\$266	65%	\$ 93.00
3EM18968DW	2314 66M Punch Block w/ 25ft cable	\$386	65%	\$ 135.00
Other Fial Devices				
3EM18968AT	Model 2015, LSP to MCS-11 Protocol Converter	\$9,051	65%	\$ 3,168.00
3EM18968AU	Model 2070, TBOS to MCS-11 Protocol Converter	\$9,463	65%	\$ 3,312.00
3EM18968AV	Model 2110/C, 5 port MCS-11 Bridge/Buffer	\$8,640	65%	\$ 3,024.00
3EM18968AW	Model 2120, 2 port MCS-11 Bridge/Buffer	\$6,583	65%	\$ 2,304.00
3EM18968AY	Model 2130, ELMC Bridge/Buffer	\$8,640	65%	\$ 3,024.00
3EM18968AZ	Model 2135, LSP Five Port Bridge/Buffer	\$9,257	65%	\$ 3,240.00
3EM18968BY	Model 5115, MCS-11 Test Set USB Adaptor Kit w/ Laptop S/W (WIN 2000 or XP only)	\$2,057	65%	\$ 720.00
3EM18968BZ	Model 5100, Test Set & Model 5115 Adaptor w/ Laptop S/W (WIN 2000 or XP only), 110 VAC	\$9,463	65%	\$ 3,312.00
3EM18968CQ	Model 5100, Test Set & Model 5115 Adaptor w/ Laptop S/W (WIN 2000 or XP only), 220 VAC	\$10,286	65%	\$ 3,600.00
3EM18968CA	Model 5560, Contact Alarm Conditioner	\$2,469	65%	\$ 864.00
3EM18968CB	Model 5561, Server Fail Safe Device	\$3,703	65%	\$ 1,296.00
3EM18968DT	Model 2136 MCS-11 Async Digital Bridge	\$9,257	65%	\$ 3,240.00

Notes:

1. Typical TSM-8000 systems consist of one Workstation Kit and one Network Element license. Systems monitoring MCS-11 protocol Network Elements also require a polling engine. Client Workstations are bid as options.
2. The TSM-8000 Server Workstation Kits include one TSM-8000 Client license and software.
3. The TSM-8000 SC (single client) workstation kits combine the client and server on a single machine. The single client system is limited to one user. Single client workstations can be converted to client workstation for a regular TSM-8000.
4. Includes Window 2003 Server License, 10 Windows 2003 Server Client Access Licenses and TSM-8000 Workstation Accessories.
5. Additional Windows 2003 Server Client Access Licenses are available through Microsoft.
6. Includes Windows XP Pro software and license.
7. Includes Windows 2003 Server license and software, and 10 Windows 2003 Server Client Access Licenses.
8. Additional Windows 2003 Server Client Access Licenses are available through Microsoft.
9. Includes Windows XP Pro software and license.
10. Client license is a software key on the server. Client software installations are unlimited if MG Soft license fee is paid.
11. Client license includes three MG soft licenses. One is needed for each client installation. A

Additional MG soft licenses may be purchased as APN 3EM16790CH.

END of TSM-8000 Price Catalog

Part No	Description	NASPO MSRP	Discount %	Unit Price	
7450 ESS/7750 SR					
Chassis Bundles					
3HE09266AA	BNDL 7450 ESS-7 Chassis + SFM5/CPM5	\$ 130,892	65%	\$ 45,812	New Effective 5/30/2017
3HE09267AA	BNDL -7450 ESS-12 Chassis + SFM5/CPM5	\$ 204,000	65%	\$ 71,400	New Effective 5/30/2017
3HE11362AA	BNDL 7450 ESS SR-7-B Chassis SFM5/CPM5	\$ 154,700	65%	\$ 54,145	New Effective 5/30/2017
3HE11363AA	BNDL 7450 ESS SR-12-B Chassis SFM5/CPM5	\$ 241,995	65%	\$ 84,698	New Effective 5/30/2017
Software					
3HE00241RA	OS - 7450 ESS-6/6v/7/12 R14.0 OS LICENSE	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE00241TA	OS - 7450 ESS-7/12 R15.0 OS LICENSE	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE10641AA	RTU - SROS ADV DC GW and Svc Chain	\$ 68,000	65%	\$ 23,800	
3HE06486AA	RTU - 7x50 ESM BASE LICENSE	\$ 34,000	65%	\$ 11,900	
3HE06487AA	RTU - 7x50 ESM LICENSE - 4K SUB-HOSTS	\$ 6,800	65%	\$ 2,380	
3HE06488AA	RTU - 7x50 ESM LICENSE - 16K SUB-HOSTS	\$ 20,400	65%	\$ 7,140	
3HE06489AA	RTU - 7x50 ESM LICENSE - 32K SUB-HOSTS	\$ 34,000	65%	\$ 11,900	
3HE06490AA	RTU - 7x50 ESM LICENSE - 64K SUB-HOSTS	\$ 54,400	65%	\$ 19,040	
3HE06491AA	RTU - 7x50 ESM LICENSE - 128K SUB-HOSTS	\$ 102,000	65%	\$ 35,700	
3HE09287AA	RTU - 7x50 ESM LICENSE - 256K SUB-HOSTS	\$ 170,000	65%	\$ 59,500	
3HE06493AA	RTU - 7x50 LI LICENSE	\$ 34,000	65%	\$ 11,900	
SR-OS OpenFlow Switch Licenses					
3HE09028AA	RTU - SROS Hybrid OpenFlow Switch	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
Switch Fabric/Control Processor Module (SF/CPMs)					
3HE09262AA	SFM - 7450 ESS SFM5-12 + CPM5	\$ 176,800	65%	\$ 61,880	New Effective 5/30/2017
3HE09263AA	SFM - 7450 ESS SFM5-7 + CPM5	\$ 92,650	65%	\$ 32,428	New Effective 5/30/2017
Input/Output Module (IOMs)					
3HE08427AA	IOM - 7450 ESS IOM3-XP-C	\$ 63,750	65%	\$ 22,313	New Effective 5/30/2017
3HE09648AA	IOM - 7750 SR IOM4-e L3HQ	\$ 718,250	65%	\$ 251,388	
3HE09648BA	IOM - 7750 SR IOM4-e L3BQ	\$ 212,500	65%	\$ 74,375	
3HE09648CA	IOM - 7750 SR IOM4-e L2HQ	\$ 425,000	65%	\$ 148,750	
3HE10717AA	IOM - 7750 SR IOM4-e-B L3HQ	\$ 718,250	65%	\$ 251,388	New Effective 5/30/2017
3HE10717BA	IOM - 7750 SR IOM4-e-B L3BQ	\$ 212,500	65%	\$ 74,375	New Effective 5/30/2017
3HE10717CA	IOM - 7750 SR IOM4-e-B L2HQ	\$ 425,000	65%	\$ 148,750	New Effective 5/30/2017
Integrated Media Modules GE (IMM's)					
3HE10014AA	IMM - 160-PT GE cSFP/80-pt GE SFP - L3HQ	\$ 969,000	65%	\$ 339,150	
3HE10014BA	IMM - 160-PT GE cSFP/80-pt GE SFP - L3BQ	\$ 550,800	65%	\$ 192,780	
3HE10014CA	IMM - 160-PT GE cSFP/80-pt GE SFP - L2HQ	\$ 734,400	65%	\$ 257,040	
3HE09279AA	IMM - 7x50 48-PT GE Rev C SFP - L3HQ	\$ 484,500	65%	\$ 169,575	
3HE09279BA	IMM - 7x50 48-PT GE Rev C SFP - L3BQ	\$ 229,500	65%	\$ 80,325	
3HE09279CA	IMM - 7x50 48-PT GE Rev C SFP - L2HQ	\$ 263,500	65%	\$ 92,225	
3HE05995AA	IMM - 7x50 48 PT GE SFP - L2HQ	\$263,500	65%	\$ 92,225	Effective 5/30/2017
Integrated Media Modules 10GE (IMM's)					
3HE07158CA	IMM 7x50 12-PT 10GE MultiCore SFP+ L2HQ	\$ 612,000	65%	\$ 214,200	
3HE07158BA	IMM 7x50 12-PT 10GE MultiCore SFP+ L3BQ	\$ 459,000	65%	\$ 166,650	
3HE07158AA	IMM 7x50 12-PT 10GE MultiCore SFP+ L3HQ	\$ 807,500	65%	\$ 282,625	
3HE07305CA	IMM - 7x50 20-PT 10GE SFP+ - L2HQ	\$ 918,000	65%	\$ 321,300	
3HE07305BA	IMM - 7x50 20-PT 10GE SFP+ - L3BQ	\$ 688,500	65%	\$ 240,975	
3HE07305AA	IMM - 7x50 20-PT 10GE SFP+ - L3HQ	\$ 1,211,250	65%	\$ 423,938	
Integrated Media Modules 40GE (IMM's)					
3HE07304CA	IMM - 7x50 6-PT 40GE QSFP+ - L2HQ	\$ 918,000	65%	\$ 321,300	
3HE07304BA	IMM - 7x50 6-PT 40GE QSFP+ - L3BQ	\$ 688,500	65%	\$ 240,975	
3HE07304AA	IMM - 7x50 6-PT 40GE QSFP+ - L3HQ	\$ 1,211,250	65%	\$ 423,938	
Integrated Media Modules Combo (IMM's)					
3HE08020CA	IMM -7750 1-PT 100GE + 10-PT 10GE- L2HQ	\$ 1,091,400	65%	\$ 381,990	
3HE08020BA	IMM -7750 1-PT 100GE + 10-PT 10GE - L3BQ	\$ 829,600	65%	\$ 290,360	
3HE08020AA	IMM -7750 1-PT 100GE + 10-PT 10GE - L3HQ	\$ 1,339,600	65%	\$ 468,860	
3HE08174AA	IMM - 7x50 10-PT 10GE + 20-PT GE L3HQ	\$ 850,000	65%	\$ 297,500	
3HE08174BA	IMM - 7x50 10-PT 10GE + 20-PT GE L3BQ	\$ 552,500	65%	\$ 193,375	
3HE08174CA	IMM - 7x50 10-PT 10GE + 20-PT GE L2HQ	\$ 680,000	65%	\$ 238,000	
3HE08175AA	IMM - 7x50 3-PT 40GE + 20-PT GE L3HQ	\$ 850,000	65%	\$ 297,500	
3HE08175BA	IMM - 7x50 3-PT 40GE + 20-PT GE L3BQ	\$ 552,500	65%	\$ 193,375	
3HE08175CA	IMM - 7x50 3-PT 40GE + 20-PT GE L2HQ	\$ 680,000	65%	\$ 238,000	
Integrated Media Modules 100GE (IMM's)					
3HE07159CA	IMM 7x50 1-PT 100GE MultiCore CFP L2HQ	\$ 841,500	65%	\$ 294,525	
3HE07159BA	IMM 7x50 1-PT 100GE MultiCore CFP L3BQ	\$ 646,000	65%	\$ 226,100	
3HE07159AA	IMM 7x50 1-PT 100GE MultiCore CFP L3HQ	\$ 977,500	65%	\$ 342,125	
3HE07303CA	IMM - 7x50 2-PT 100GE CFP L2HQ	\$ 1,262,250	65%	\$ 441,788	
3HE07303BA	IMM - 7x50 2-PT 100GE CFP L3BQ	\$ 969,000	65%	\$ 339,150	
3HE07303AA	IMM - 7x50 2-PT 100GE CFP L3HQ	\$ 1,466,250	65%	\$ 513,188	
3HE08019CA	IMM -7750 1-PT 100GE DWDM TUN - L2HQ	\$2,210,000	65%	\$ 773,500	Effective 5/30/2017
3HE08019BA	IMM -7x50 1-PT 100GE DWDM TUN - L3BQ	\$1,989,000	65%	\$ 696,150	Effective 5/30/2017
3HE08019AA	IMM -7x50 1-PT 100GE DWDM TUN - L3HQ	\$2,431,000	65%	\$ 850,850	Effective 5/30/2017
1AB396080001	FAST-EVOA SFP	\$4,967	65%	\$ 1,739	Effective 5/30/2017

Integrated Media Modules (IMM's) - IMM SW License Upgrades				
3HE08176AA	RTU - IMM 6x40G LIC UP - L2HQ to L3HQ	\$ 450,500	65%	\$ 157,675
3HE08177AA	RTU - IMM 6x40G LIC UP - L3BQ to L3HQ	\$ 790,500	65%	\$ 276,675
3HE05889AC	RTU - IMM 48x1G LIC UP - L2HQ to L3HQ	\$ 255,000	65%	\$ 89,250
3HE05889BC	RTU - IMM 48x1G LIC UP - L3BQ to L3HQ	\$ 289,000	65%	\$ 101,150
3HE06304AA	RTU - IMM 12x10GE LIC UP - L2HQ to L3HQ	\$ 229,500	65%	\$ 80,325
3HE06305AA	RTU - IMM 12x10GE LIC UP - L3BQ to L3HQ	\$ 399,500	65%	\$ 139,825
3HE10425AA	RTU - IMM 160xGE LIC UP - L2HQ to L3HQ	\$ 297,500	65%	\$ 104,125
3HE10426AA	RTU - IMM 160xGE LIC UP - L3BQ to L3HQ	\$ 527,000	65%	\$ 184,450
3HE08178AA	RTU - IMM 20x10GE LIC UP - L2HQ to L3HQ	\$ 382,500	65%	\$ 133,875
3HE08179AA	RTU - IMM 20x10GE LIC UP - L3BQ to L3HQ	\$ 663,000	65%	\$ 232,050
3HE06306AA	RTU - IMM 1x100G LIC UP - L2HQ to L3HQ	\$ 161,500	65%	\$ 56,525
3HE06307AA	RTU - IMM 1x100G LIC UP - L3BQ to L3HQ	\$ 382,500	65%	\$ 133,875
Integrated Service Adapters (ISA) + Integrated Service Module (MS-ISM) + Combo IMM + ISA2				
3HE09117AA	ISM- 7x50 Multiservice ISM-MS	\$ 272,000	65%	\$ 95,200
3HE09118AA	ISM - 7x50 Multiservice ISM-MS-E	\$ 272,000	65%	\$ 95,200
3HE10427AA	ISA - 7750 SR ISA2-MS	\$ 85,000	65%	\$ 29,750
3HE10428AA	ISA - 7750 SR ISA2-MS-E	\$ 85,000	65%	\$ 29,750
3HE09192AA	IMM - 7x50 ISA2 + 1-pt 100GE CFP L3HQ	\$ 1,113,500	65%	\$ 389,725
3HE09192BA	IMM - 7x50 ISA2 + 1-pt 100GE CFP L3BQ	\$ 782,000	65%	\$ 273,700
3HE09192CA	IMM - 7x50 ISA2 + 1-pt 100GE CFP L2HQ	\$ 977,500	65%	\$ 342,125
3HE09193AA	IMM - 7x50 ISA2 + 10-pt 10GE SFP+ L3HQ	\$ 807,500	65%	\$ 282,625
3HE09193BA	IMM - 7x50 ISA2 + 10-pt 10GE SFP+ L3BQ	\$ 510,000	65%	\$ 178,500
3HE09193CA	IMM - 7x50 ISA2 + 10-pt 10GE SFP+ L2HQ	\$ 646,000	65%	\$ 226,100
3HE09253AA	IMM 7x50 MS-ISA2-E + 1pt 100GE CFP L3HQ	\$ 1,113,500	65%	\$ 389,725
3HE09253BA	IMM 7x50 MS-ISA2-E + 1pt 100GE CFP L3BQ	\$ 782,000	65%	\$ 273,700
3HE09253CA	IMM 7x50 MS-ISA2-E + 1pt 100GE CFP L2HQ	\$ 977,500	65%	\$ 342,125
3HE09254AA	IMM 7x50 MS-ISA2-E + 10pt 10G SFP+ L3HQ	\$ 807,500	65%	\$ 282,625
3HE09254BA	IMM 7x50 MS-ISA2-E + 10pt 10G SFP+ L3BQ	\$ 510,000	65%	\$ 178,500
3HE09254CA	IMM 7x50 MS-ISA2-E + 10pt 10G SFP+ L2HQ	\$ 646,000	65%	\$ 226,100
3HE09120AA	RTU - 12M flow NAT License	\$ 93,500	65%	\$ 32,725
3HE09121AA	RTU - 24M flow NAT License	\$ 170,000	65%	\$ 59,500
3HE05143AA	RTU - AA first 1G Identification & CNTL	\$ 1,700	65%	\$ 595
3HE05144AA	RTU - AA Identification only - per 1G	\$ 13,600	65%	\$ 4,760
3HE05145AA	RTU - AA Identification only per 10G	\$ 68,000	65%	\$ 23,800
3HE04930AA	RTU - AA Res Aggregate CNTL per 1G	\$ 3,400	65%	\$ 1,190
3HE04927AA	RTU - AA Res Aggregate CNTL per 10G	\$ 17,000	65%	\$ 5,950
3HE05146AA	RTU - AA Subscriber/Site CNTL per 1G	\$ 20,400	65%	\$ 7,140
3HE05147AA	RTU - AA Subscriber/Site CNTL per 10G	\$ 68,000	65%	\$ 23,800
3HE05149AA	RTU - Video base software license	\$ 51,000	65%	\$ 17,850
3HE05151AA	RTU - FCC/RET license - 1K subscribers	\$ 11,050	65%	\$ 3,868
3HE05152AA	RTU - FCC/RET license 10K subscribers	\$ 68,000	65%	\$ 23,800
3HE07279AA	RTU - AA RTP Performance per 1G	\$ 8,500	65%	\$ 2,975
3HE06418AA	RTU - AA RTP Performance per 10G	\$ 42,500	65%	\$ 14,875
3HE06520AA	RTU - Enable RTP Performance	\$ -	65%	\$ -
3HE07777AA	RTU - AA Stateful Firewall per 10G	\$ 85,000	65%	\$ 29,750
3HE08228AA	RTU IBN Res 10k Subs	\$ 17,000	65%	\$ 5,950
3HE05148AA	RTU - IPsec software license	\$ 51,000	65%	\$ 17,850
3HE07776AA	RTU - IPsec Multi-Chassis Redundancy	\$ 8,500	65%	\$ 2,975
3HE09017AA	RTU - IPsec IKEv2 - 1K -Tunnel	\$ 2,550	65%	\$ 893
3HE09018AA	RTU - IPsec IKEv2 - 10K Tunnels	\$ 20,400	65%	\$ 7,140
3HE09285AA	RTU - IPsec License per ISA2	\$ 314,500	65%	\$ 110,075
3HE09286AA	RTU - IPsec ISA2 MultiChassis License	\$ 51,000	65%	\$ 17,850
3HE09968AA	RTU AA URL Filter Res 10k Subs	\$ 17,000	65%	\$ 5,950
3HE09969AA	RTU AA URL Filter 10 Gbps	\$ 17,000	65%	\$ 5,950
3HE10017AA	RTU AA ICAP control Res 10K Subs	\$ 170,000	65%	\$ 59,500
Ethernet MDA-e				
3HE10429AA	MDA-e - 7750 SR 6-port 10GE SFP+ MDA-e	\$ 147,900	65%	\$ 51,765
3HE09649AA	MDA-e - 7750 SR 10-port 10GE SFP+ MDA-e	\$ 246,500	65%	\$ 86,275
3HE09881AA	MDA-e - 7750 SR 1-port 100GE CFP2 MDA-e	\$ 314,500	65%	\$ 110,075
3HE11030AA	MDA-e 2-PT 100GE CFP4 MDA-e	\$ 408,000	65%	\$ 142,800
3HE11031AA	MDA-e 2-PT 100GE QSFP28 MDA-e	\$ 408,000	65%	\$ 142,800
3HE10016AA	RTU - Enable OTN support MDA-e	\$ 59,500	65%	\$ 20,825
Ethernet MDA-XP				
3HE03614AA	MDA - 7450 10-PT GE MDA -XP SFP	\$ 20,392	65%	\$ 7,137
3HE03615AA	MDA - 7450 20-PT GE MDA-XP SFP	\$ 49,292	65%	\$ 17,252
3HE03687AA	MDA - 7450 ESS 2-PT 10G MDA-XP - XFP	\$ 103,692	65%	\$ 36,292
3HE03688AA	MDA - 7450 ESS 4-PT 10G MDA-XP - XFP	\$ 168,292	65%	\$ 58,902
3HE04273AA	MDA - 7450 ESS 1-PT 10G MDA-XP - XFP	\$ 47,592	65%	\$ 16,657
3HE05159AA	MDA - 7450 48-PT 10/100/1000-TX MDA-XP	\$ 103,692	65%	\$ 36,292
3HE07283AA	MDA 7450 2x10GE XFP + 12x1GE SFP MDA-XP	\$ 112,192	65%	\$ 39,267
3HE07285AA	MDA - 7450 ESS 12-pt 1GE MDA-XP	\$ 33,992	65%	\$ 11,897
SONET MDAs				
3HE06383AA	MDA - 7450 4-PT OC-48c/STM-16c POS	\$ 271,142	65%	\$ 94,900

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

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New Effective 5/30/2017

New Effective 5/30/2017

3HE06382AA	MDA – 7450 16-PT OC-3/12c STM-1/4c POS	\$ 271,312	65%	\$ 94,959
Services Modules				
3HE05942AA	VSM - 7x50 VSM-XP	\$ 68,000	65%	\$ 23,800
Cables				
3HE05550AA	CBL - 10/100/1000 MINI-RJ21 - RJ45 2m	\$ 1,020	65%	\$ 357
3HE05551AA	CBL - 10/100/1000 MINI-RJ21 - RJ45 5m	\$ 1,360	65%	\$ 476
Electrical Optics Modules				
3HE06562AA	SFP - STM1 Electrical -40/ 85C	\$ 1,870	65%	\$ 655
100/1000Base Ethernet Optics Modules				
3HE05164AA	SFP - 100/1000 LX SGMII 10KM DDM R6/6	\$ 2,040	65%	\$ 714
GigE Optics Modules				
3HE00027CA	SFP - GIGE SX - LC ROHS 6/6 DDM -40/85C	\$ 587	65%	\$ 205
3HE00028CA	SFP - GIGE LX - LC ROHS 6/6 DDM -40/85C	\$ 1,692	65%	\$ 592
3HE00029CA	SFP - GIGE ZX - LC ROHS 6/6 DDM -40/85C	\$ 8,492	65%	\$ 2,972
3HE00062CB	SFP - GIGE BASE-T RJ45 R6/6 DDM -40/85C	\$ 680	65%	\$ 238
3HE00070CA	SFP GIGE CWDM-1471 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CB	SFP GIGE CWDM-1491 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CC	SFP GIGE CWDM-1511 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CD	SFP GIGE CWDM-1531 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CE	SFP GIGE CWDM-1551 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CF	SFP GIGE CWDM-1571 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CG	SFP GIGE CWDM-1591 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00070CH	SFP GIGE CWDM-1611 120K R6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE00867CA	SFP - GIGE EX - LC ROHS 6/6 DDM -40/85C	\$ 3,392	65%	\$ 1,187
3HE00868CA	SFP - GIGE BX10-U - LC R6/6 DDM -40/85C	\$ 2,380	65%	\$ 833
3HE00868CB	SFP - GIGE BX10-D - LC R6/6 DDM -40/85C	\$ 2,380	65%	\$ 833
3HE01389CA	SFP - GIGE EZX - LC ROHS 6/6 DDM -40/85C	\$ 12,750	65%	\$ 4,463
3HE04324AA	SFP - GIGE BX40-U ROHS-6/6 - LC	\$ 4,420	65%	\$ 1,547
3HE04324AB	SFP - GIGE BX40-D ROHS-6/6 - LC	\$ 4,420	65%	\$ 1,547
3HE04939CA	SFP GIGE CWDM-1471 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CB	SFP GIGE CWDM-1491 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CC	SFP GIGE CWDM-1511 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CD	SFP GIGE CWDM-1531 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CE	SFP GIGE CWDM-1551 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CF	SFP GIGE CWDM-1571 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CG	SFP GIGE CWDM-1591 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE04939CH	SFP GIGE CWDM-1611 40K R6/6 DDM 0/70C	\$ 4,420	65%	\$ 1,547
3HE05936CA	SFP GIGE CWDM-1471 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CB	SFP GIGE CWDM-1491 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CC	SFP GIGE CWDM-1511 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CD	SFP GIGE CWDM-1531 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CE	SFP GIGE CWDM-1551 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CF	SFP GIGE CWDM-1571 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CG	SFP GIGE CWDM-1591 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
3HE05936CH	SFP GIGE CWDM-1611 80KM R6/6 DDM -0/70C	\$ 8,492	65%	\$ 2,972
10GigE Optics Modules (XFP)				
3HE00564CA	XFP - 10GE LR - LC ROHS 6/6 0/70C	\$ 6,792	65%	\$ 2,377
3HE00566CA	XFP - 10GE SR - LC ROHS 6/6	\$ 5,092	65%	\$ 1,782
3HE00876CA	XFP - 10GE ER - LC ROHS 6/6 0/70C	\$ 20,392	65%	\$ 7,137
3HE01545CA	XFP - 10GE ZR - LC ROHS 6/6	\$ 33,992	65%	\$ 11,897
3HE05761CA	XFP - 10GE EZX - LC ROHS6/6 0/70C	\$ 49,300	65%	\$ 17,255
3HE05830CA	XFP - 10GE SR - LC ROHS 6/6 -40/85C	\$ 5,092	65%	\$ 1,782
3HE05831CA	XFP - 10GE LR - LC ROHS 6/6 -40/85C	\$ 6,792	65%	\$ 2,377
3HE05832CA	XFP - 10GE ER - LC ROHS 6/6 -40/85C	\$ 20,392	65%	\$ 7,137
3HE05833CA	XFP - 10GE ZR - LC ROHS 6/6 -40/85C	\$ 33,992	65%	\$ 11,897
3HE04999CA	XFP - 10G DWDM TUNABLE - LC R6/6 0/70C	\$ 46,750	65%	\$ 16,363
3HE06310CA	XFP 10GE CWDM 1471 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CB	XFP 10GE CWDM 1491 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CC	XFP 10GE CWDM 1511 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CD	XFP 10GE CWDM 1531 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CE	XFP 10GE CWDM 1551 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CF	XFP 10GE CWDM 1571 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CG	XFP 10GE CWDM 1591 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE06310CH	XFP 10GE CWDM 1611 40KM R6/6 DDM -40/85C	\$ 20,392	65%	\$ 7,137
3HE08411CA	XFP 10GE CWDM 1471 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CB	XFP 10GE CWDM 1491 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CC	XFP 10GE CWDM 1511 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CD	XFP 10GE CWDM 1531 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CE	XFP 10GE CWDM 1551 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CF	XFP 10GE CWDM 1571 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CG	XFP 10GE CWDM 1591 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
3HE08411CH	XFP 10GE CWDM 1611 70KM R6/6 DDM -40/85C	\$ 33,992	65%	\$ 11,897
10GigE Optics Modules (SFP+)				
3HE04824AA	SFP+ 10GE SR - LC ROHS6/6 0/70C	\$ 5,092	65%	\$ 1,782

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

3HE04823AA	SFP+ 10GE LR - LC ROHS6/6 0/70C	\$ 6,792	65%	\$ 2,377	
3HE05036AA	SFP+ 10GE ER - LC ROHS6/6 0/70C	\$ 20,392	65%	\$ 7,137	
3HE05894AA	SFP+ 10GE ZR - LC ROHS6/6 0/70C	\$ 33,992	65%	\$ 11,897	
3HE07161CA	SFP+ 10GE CWDM 1471 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CB	SFP+ 10GE CWDM 1491 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CC	SFP+ 10GE CWDM 1511 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CD	SFP+ 10GE CWDM 1531 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CE	SFP+ 10GE CWDM 1551 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CF	SFP+ 10GE CWDM 1571 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CG	SFP+ 10GE CWDM 1591 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE07161CH	SFP+ 10GE CWDM 1611 40km R6/6 DDM 0/70C	\$ 20,392	65%	\$ 7,137	
3HE05037AA	SFP+ 10GE BX10-U LC ROHS6/6 0/70C	\$ 6,792	65%	\$ 2,377	
3HE05037AB	SFP+ 10GE BX10-D LC ROHS6/6 0/70C	\$ 6,792	65%	\$ 2,377	
3HE10365CA	SFP+ 10GE CWDM 1471 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CB	SFP+ 10GE CWDM 1491 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CC	SFP+ 10GE CWDM 1511 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CD	SFP+ 10GE CWDM 1531 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CE	SFP+ 10GE CWDM 1551 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CF	SFP+ 10GE CWDM 1571 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CG	SFP+ 10GE CWDM 1591 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE10365CH	SFP+ 10GE CWDM 1611 70km R6/6 DDM 0/70C	\$ 33,992	65%	\$ 11,897	New Effective 5/30/2017
3HE08142AA	SFP+ 10G DWDM TUN LC HIGH PWR 0/70C	\$ 46,750	65%	\$ 16,363	
40GE Optics Modules (QSFP+)					
3HE06485AA	QSFP - 40GE LR4 10KM LC ROHS6/6 0/70	\$ 51,000	65%	\$ 17,850	
100GE Optics Modules (CFP)					
3HE04821BA	CFP - 100G LR4 10KM LC LOW PWR 0/70C	\$ 127,500	65%	\$ 44,625	
3HE06699BA	CFP - 100G ER4 40KM LC LOW PWR 0/70C	\$ 425,000	65%	\$ 148,750	
3HE06771AA	CFP - 100GE SR10 MPO ROHS6/6 0/70C	\$ 29,750	65%	\$ 10,413	
3HE09437AA	CFP - 100G ZR 80KM LC R6/6 0/70C	\$ 306,000	65%	\$ 107,100	New Effective 5/30/2017
100GE Optics Modules (CFP2)					
3HE08312AA	CFP2 - 100GE SR10 MPO ROHS6/6 0/70C	\$ 59,500	65%	\$ 20,825	
3HE08217AA	CFP2 - 100G LR4 10KM LC ROHS6/6 0/70C	\$ 102,000	65%	\$ 35,700	
3HE09255AA	CFP2 - OTU4 ER4 40KM LC ROHS6/6 0/70C	\$ 297,500	65%	\$ 104,125	
SONET Optics Modules					
3HE00034CA	SFP - OC-3/STM-1 MM-LC R6/6 DDM -40/85C	\$ 2,040	65%	\$ 714	
3HE00035CA	SFP - OC-3/STM-1 IR-1 R6/6 DDM -40/85C	\$ 2,040	65%	\$ 714	
3HE00036CA	SFP - OC-3/STM-1 LR-1 R6/6 DDM -40/85C	\$ 2,720	65%	\$ 952	
3HE00041CA	SFP - OC-12/STM-4 IR-1 R6/6 DDM -40/85C	\$ 2,550	65%	\$ 893	
3HE00045CA	SFP - OC-48/STM-16 SR-1 R6/6 DDM -40/85C	\$ 8,500	65%	\$ 2,975	
3HE00046CA	SFP - OC-48/STM-16 IR-1 R6/6 DDM -40/85C	\$ 11,050	65%	\$ 3,868	
3HE00410CA	SFP - OC-48/STM-16 LR-2 R6/6 DDM -40/85C	\$ 20,400	65%	\$ 7,140	
3HE00042CA	SFP - OC-12/STM-4 LR-2 R6/6 DDM -40/85C	\$ 6,120	65%	\$ 2,142	
Upgrade Kits					
3HE04141AA	UPG - 7450 ESS-12 PEM-3 + IMP PNL	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE04142AA	UPG -7450 ESS-7 PEM-3 + IMP PNL	\$ 10,200	65%	\$ 3,570	New Effective 5/30/2017
Chassis Power (Power Entry Modules)					
3HE03664AA	PEM - 7450 ESS-7 100A DC PEM-3 SLOT 2	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE03665AA	PEM - 7450 ESS-7 100A DC PEM-3 SLOT 1	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE03666AA	PEM - 7450 ESS-12 175A DC PEM-3	\$ 6,800	65%	\$ 2,380	New Effective 5/30/2017
3HE04500AA	PWR FLT - 7450 ESS-7 100 AMP PWR FILTER	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE04517AA	PEM 7450 ESS-7 Slot 1 DC PEM-3 + PWR FLT	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE04518AA	PEM 7450 ESS-7 Slot 2 DC PEM-3 + PWR FLT	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
Chassis Power (External Power)					
3HE02786BA	REC - SR/ESS-6/6v/7 VAL AC PWR SHELF	\$ 4,250	65%	\$ 1,488	
3HE02787AA	REC - SR/ESS VAL 2.5KW AC PW SUP	\$ 3,400	65%	\$ 1,190	
3HE02944AA	REC - SR/ESS AC PWR SHELF BLANKS	\$ 255	65%	\$ 89	
3HE03065BA	REC -SR/ESS-7 AC PWR BN DL - INTL	\$ 17,850	65%	\$ 6,248	
3HE04172AA	REC - ESS/SR-12 VAL AC UN-SPLIT SHELF	\$ 4,250	65%	\$ 1,488	
3HE04174AA	REC - ESS/SR-12 VAL AC BN DL - INTL	\$ 37,145	65%	\$ 13,001	
Power Cords and Status Cables					
3HE00514AA	CBL - AC PWR CBL 220V	\$ 128	65%	\$ 45	
3HE02945AA	CBL - SR/ESS-6 AC REC STATUS CBL	\$ 213	65%	\$ 74	New Effective 5/30/2017
3HE02946AA	CBL - SR/ESS 2500W AC VAL PWR CORD INT	\$ 128	65%	\$ 45	
3HE02947AA	CBL -VAL SPLIT SHELF STAT CBL	\$ 213	65%	\$ 74	
3HE04173AA	CBL - SR/ESS-12 AC REC STATUS CBL	\$ 213	65%	\$ 74	
3HE04519AA	CBL -SR/ESS-7 VAL SPLIT SHELF STAT CBL	\$ 213	65%	\$ 74	
Spare Parts					
3HE10852AA	CH-BN - 7750 SR-7-B DC w/PEM3 + EFT	\$ 69,360	65%	\$ 24,276	New Effective 5/30/2017
3HE10854AA	CH-BN - 7750 SR-12-B W/PEM3 + EFT	\$ 102,000	65%	\$ 35,700	New Effective 5/30/2017
3HE10766AA	CHAS - 7750 SR-7-B CHASSIS SPARE ROHS6/6	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE10768AA	CHAS - 7750 SR-12-B CHASSIS SPARE ROHS6/6	\$ 76,500	65%	\$ 26,775	New Effective 5/30/2017
3HE08431AA	SFM - 7450 ESS SFM5-7	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE08432AA	CPM - 7450 ESS CPM5	\$ 102,000	65%	\$ 35,700	New Effective 5/30/2017
3HE08430AA	SFM - 7450 ESS SFM5-12	\$ 93,500	65%	\$ 32,725	New Effective 5/30/2017

3HE00014AA	FLT - 7x50 ESS-6v/12 SR-12 AIR FILTER	\$ 170	65%	\$ 60	
3HE00190AA	FLT - 7x50 SR/ESS-7 AIR FILTER	\$ 153	65%	\$ 54	
3HE00245AA	CHAS - 7450 ESS-7 AC/DC CHASSIS SPARE	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE00387DB	CH-BN - 7450 ESS-7 w/PEM3 + EFT	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE10312AA	ACC - IOM4e/SRe MDA IMP PNL	\$ 1,190	65%	\$ 417	
3HE01053AA	ACC - 7450 MDA SLOT BLANK	\$ 170	65%	\$ 60	New Effective 5/30/2017
3HE01674AA	ACC -SR/ESS-7 MOUNT BRACKET	\$ 213	65%	\$ 74	New Effective 5/30/2017
3HE08703AA	SAR-W/Wx - CONSOLE CBL, 5 FT w RJ45 to DB9 adapter.	\$ 85	65%	\$ 30	
3HE01881AA	LUG - SR/ESS-6/7 GD/PWR LUGS-5	\$ 213	65%	\$ 74	
3HE01881CA	LUG - SR/ESS-7 GD/PWR LUGS-5	\$ 213	65%	\$ 74	
3HE01882BA	LUG - SR/ESS-12 GD/PWR LUGS-5 FOR PEM-3	\$ 213	65%	\$ 74	
3HE07757AA	ACC - 7x50 Power Terminal Cover (2 pack)	\$ 255	65%	\$ 89	
3HE02033CA	CH-BN - 7450 ESS-12 w/PEM3 + EFT	\$ 86,692	65%	\$ 30,342	New Effective 5/30/2017
3HE02036AA	CHAS - 7450 ESS-12 CHASSIS & FLT	\$ 56,950	65%	\$ 19,933	New Effective 5/30/2017
3HE02943AA	ESS-12 MOUNTING BRACKETS SPARE	\$ 298	65%	\$ 104	New Effective 5/30/2017
3HE04149AA	ACC - 7450 ESS IMP PNL - 1	\$ 255	65%	\$ 89	New Effective 5/30/2017
3HE04150AA	ACC - 7450 ESS IMP PNL - 5	\$ 1,275	65%	\$ 446	New Effective 5/30/2017
3HE04608AA	ACC - 7450 ESS-12 SLOT PEM-3 UPGRADE	\$ 213	65%	\$ 74	New Effective 5/30/2017
3HE04609AA	ACC - 7450 ESS-7 SLOT PEM-3 UPGRADE	\$ 213	65%	\$ 74	New Effective 5/30/2017
3HE04707AA	CF - 4GB COMPACT FLASH	\$ 2,380	65%	\$ 833	
3HE04708AA	CF - 8GB COMPACT FLASH	\$ 3,910	65%	\$ 1,369	
3HE06083AA	CF - 32GB COMPACT FLASH	\$ 11,900	65%	\$ 4,165	
3HE05107AA	FAN - 7450 ESS-12 Enhanced Fan Tray	\$ 4,930	65%	\$ 1,726	New Effective 5/30/2017
3HE05181AA	FAN - 7450 ESS-7 Enhanced Fan Tray	\$ 8,160	65%	\$ 2,856	New Effective 5/30/2017
3HE07904AA	ACC - Dust Cover - CFP (x2)	\$ 510	65%	\$ 179	
3HE07905AA	ACC - Dust Cover - SFP (x20)	\$ 510	65%	\$ 179	
3HE07906AA	ACC - Dust Cover - XFP/QSFP+ (x10)	\$ 510	65%	\$ 179	
3HE07907AA	ACC - Dust Cover - CXP (x10)	\$ 510	65%	\$ 179	
3HE09904AA	ACC - Dust Cover - CFP2 (x4)	\$ 510	65%	\$ 179	
3HE09905AA	ACC - Dust Cover - CFP4 (x10)	\$ 510	65%	\$ 179	
3HE09976AA	ACC - Compact Flash cover CPM2/3/4 10pkg	\$ 1,615	65%	\$ 565	New Effective 5/30/2017
3HE09977AA	ACC - Compact Flash cover CPM5 10pkg	\$ 1,615	65%	\$ 565	New Effective 5/30/2017
3HE11379AA	7750 SR-7/ 7450 ESS-7 INPUT POWER RATING	\$ 2	65%	\$ 1	New Effective 5/30/2017
Chassis Bundles					
3HE09264AA	BNDL 7750 SR-7 Chassis + SFM5/CPM5	\$ 146,200	65%	\$ 51,170	
3HE11175AA	BNDL - 7750 SR-7-B Chassis + SFM5/CPM5	\$ 154,700	65%	\$ 54,145	New Effective 5/30/2017
3HE09265AA	BNDL -7750 SR-12 Chassis + SFM5/CPM5	\$ 229,500	65%	\$ 80,325	
3HE11176AA	BNDL - 7750 SR-12-B Chassis + SFM5/CPM5	\$ 241,995	65%	\$ 84,698	New Effective 5/30/2017
3HE09000AA	BNDL - 7750 SR12e CHAS BNDL (SFM5/CPM5)	\$ 467,500	65%	\$ 163,625	
3HE10476AA	BNDL-7750 SR12e SFM5/CPM5 CHAS AC	\$ 467,500	65%	\$ 163,625	
3HE10477AA	BNDL-7750 SR12e SFM5/CPM5 CHAS 60-80A DC	\$ 467,500	65%	\$ 163,625	
3HE12034AA	BNDL-7750 SR12e SFM5/CPM5 HVDC	\$ 467,500	65%	\$ 163,625	New Effective 5/30/2017
Software					
3HE00107RA	OS - 7750 SR-7/12/12e R14.0 OS LICENSE	\$ 17,000	65%	\$ 5,950	
3HE00107TA	OS - 7750 SR-7/12/12e R15.0 OS LICENSE	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE00107PA	OS - 7750 SR-7/12/12e R13.0 OS LICENSE	\$ 17,000	65%	\$ 5,950	
3HE10877AA	RTU - UPnP IGD License	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE10878AA	RTU - vRGW BRG authentication LIC	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE10640AA	RTU - SROS GMPLS-UNI	\$ 42,500	65%	\$ 14,875	
3HE03982AA	DHCP USER DB LICENSE-20K USERS	\$ 42,500	65%	\$ 14,875	
3HE03983AA	DHCP USER DB LICENSE-156K USERS	\$ 198,900	65%	\$ 69,615	
3HE03984AA	DHCP USER DB LIC UPGRD-20K TO 156K	\$ 156,400	65%	\$ 54,740	
WLAN/Wifi Offload Licenses					
3HE07310AA	RTU - Base WIFI aggregation License	\$ 102,000	65%	\$ 35,700	
3HE07310AB	RTU - Diameter Credit Control License	\$ 34,000	65%	\$ 11,900	
3HE07310AC	RTU - Multiple SSID Support License	\$ 34,000	65%	\$ 11,900	
3HE07310AD	RTU - Inter-AP WIFI Mobility License	\$ 34,000	65%	\$ 11,900	
3HE07310AE	RTU -WIFI Agg. 4K - shaped AP tunnels	\$ 6,800	65%	\$ 2,380	
3HE07310AF	RTU -WIFI Agg. 8K - shaped AP tunnels	\$ 10,200	65%	\$ 3,570	
3HE07310AG	RTU -WIFI Agg. 16K - shaped AP tunnels	\$ 17,000	65%	\$ 5,950	
3HE07310AH	RTU -WIFI Agg. 32K - shaped AP tunnels	\$ 34,000	65%	\$ 11,900	
3HE07310AJ	RTU -WIFI Agg. 64K - shaped AP tunnels	\$ 51,000	65%	\$ 17,850	
3HE07310AK	RTU -WIFI Agg. 128K - shaped AP tunnels	\$ 102,000	65%	\$ 35,700	
3HE07310AL	RTU - WLAN to 3G/4G Interworking License	\$ 85,000	65%	\$ 29,750	
3HE07310AM	RTU - WLAN to 3G/4G - 4K Bearers	\$ 6,800	65%	\$ 2,380	
3HE07310AN	RTU - WLAN to 3G/4G - 8K Bearers	\$ 13,600	65%	\$ 4,760	
3HE07310AP	RTU - WLAN to 3G/4G - 16K Bearers	\$ 27,200	65%	\$ 9,520	
3HE07310AR	RTU - WLAN to 3G/4G - 32K Bearers	\$ 42,500	65%	\$ 14,875	
3HE07310AT	RTU - WLAN to 3G/4G - 64K Bearers	\$ 85,000	65%	\$ 29,750	
3HE07310AU	RTU - WLAN to 3G/4G - 128K Bearers	\$ 127,500	65%	\$ 44,625	
3HE07310AV	RTU - WLAN to 3G/4G - 256K Bearers	\$ 170,000	65%	\$ 59,500	
3HE09288AA	RTU - Selective offload with single IP	\$ 127,500	65%	\$ 44,625	
3HE09289AA	RTU - WIFI-GW Inter-chass Redundancy	\$ 42,500	65%	\$ 14,875	
3HE09290AA	RTU - WIFI Migrant User Support	\$ 42,500	65%	\$ 14,875	

3HE09291AA	RTU – WIFI 256K migrant Users	\$ 34,000	65%	\$ 11,900
3HE09292AA	RTU – WIFI 512K migrant Users	\$ 68,000	65%	\$ 23,800
3HE09293AA	RTU – WIFI 1M migrant Users	\$ 102,000	65%	\$ 35,700
3HE09294AA	RTU – WIFI 2M migrant Users	\$ 136,000	65%	\$ 47,600
Distributed Subscriber Management Licenses				
3HE09295AA	RTU - 7x50 Base DSM feature license	\$ 34,000	65%	\$ 11,900
3HE09296AA	RTU - 7x50 64K DSM hosts	\$ 42,500	65%	\$ 14,875
3HE09297AA	RTU - 7x50 128K DSM hosts	\$ 85,000	65%	\$ 29,750
3HE09298AA	RTU - 7x50 256K DSM hosts	\$ 144,500	65%	\$ 50,575
3HE09299AA	RTU - 7x50 512K DSM hosts	\$ 289,000	65%	\$ 101,150
3HE09300AA	RTU - 7x50 1M DSM hosts	\$ 595,000	65%	\$ 208,250
3HE09301AA	RTU - 7x50 2M DSM hosts	\$ 1,190,000	65%	\$ 416,500
3HE10020AA	RTU - 7x50 3M DSM hosts	\$ 1,700,000	65%	\$ 595,000
3HE10021AA	RTU - 7x50 4M DSM hosts	\$ 2,380,000	65%	\$ 833,000
3HE10022AA	RTU - 7x50 5M DSM hosts	\$ 2,975,000	65%	\$ 1,041,250
3HE10023AA	RTU - 7x50 6M DSM hosts	\$ 3,570,000	65%	\$ 1,249,500
Switch Fabric/Control Processor Module (SF/CPMs)				
3HE09261AA	SFM - 7750 SR SFM5-7 + CPM5	\$ 92,650	65%	\$ 32,428
3HE09260AA	SFM - 7750 SR SFM5-12 + CPM5	\$ 176,800	65%	\$ 61,880
3HE09001AA	SFM - 7750 SR SFM5-12e + CPM5	\$ 272,000	65%	\$ 95,200
3HE08422AA	SFM - 7750 SR Mini-SFM5-12e	\$ 144,500	65%	\$ 50,575
Input/Output Module (IOMs)				
3HE08426AA	IOM - 7750 SR IOM3-XP-C	\$ 127,500	65%	\$ 44,625
Integrated Media Modules 10GE (IMM's)				
3HE08424AA	IMM - 7x50 40-PT 10GE SFP+ - L3HQ IMM	\$ 2,180,250	65%	\$ 763,088
3HE08424BA	IMM - 7x50 40-PT 10GE SFP+ - L3BQ IMM	\$ 1,239,300	65%	\$ 433,755
3HE08424CA	IMM - 7x50 40-PT 10GE SFP+ - L2HQ IMM	\$ 1,652,400	65%	\$ 578,340
Integrated Media Modules 100GE (IMM's)				
3HE09645AA	IMM - 7x50 4-PT 100GE CFP4 - L3HQ IMM	\$ 2,380,000	65%	\$ 833,000
3HE09645BA	IMM - 7x50 4-PT 100GE CFP4 - L3BQ IMM	\$ 1,598,000	65%	\$ 559,300
3HE09645CA	IMM - 7x50 4-PT 100GE CFP4 - L2HQ IMM	\$ 2,082,500	65%	\$ 728,875
3HE08425AA	IMM - 7x50 4-PT 100GE CXP - L3HQ IMM	\$ 2,380,000	65%	\$ 833,000
3HE08425BA	IMM - 7x50 4-PT 100GE CXP - L3BQ IMM	\$ 1,598,000	65%	\$ 559,300
3HE08425CA	IMM - 7x50 4-PT 100GE CXP - L2HQ IMM	\$ 2,082,500	65%	\$ 728,875
3HE09436AA	IMM -7x50 1-PT 100GE INT DWDM - L3HQ	\$ 1,295,400	65%	\$ 453,390
3HE09436BA	IMM -7x50 1-PT 100GE INT DWDM - L3BQ	\$ 960,500	65%	\$ 336,175
3HE09436CA	IMM -7x50 1-PT 100GE INT DWDM - L2HQ	\$ 1,157,700	65%	\$ 405,195
Integrated Media Modules (IMM's) - IMM SW License Upgrades				
3HE08180AA	RTU IMM 1x100G + 10x10G LIC L2HQ - L3HQ	\$ 351,900	65%	\$ 123,165
3HE08181AA	RTU IMM 1x100G + 10x10G LIC L3BQ - L3HQ	\$ 714,000	65%	\$ 249,900
3HE08182AA	RTU - IMM 2x100G LIC UP - L2HQ to L3HQ	\$ 314,500	65%	\$ 110,075
3HE08183AA	RTU - IMM 2x100G LIC UP - L3BQ to L3HQ	\$ 722,500	65%	\$ 252,875
3HE06289AA	RTU - 7x50 IMM 50G LIM VPRN LIC	\$ 25,500	65%	\$ 8,925
3HE06290AA	RTU - 7x50 IMM 50G FULL VPRN LIC	\$ 76,500	65%	\$ 26,775
3HE06291AA	RTU - 7x50 IMM 100G LIM VPRN LIC	\$ 42,500	65%	\$ 14,875
3HE06292AA	RTU - 7x50 100G FULL VPRN LIC	\$ 127,500	65%	\$ 44,625
3HE10423AA	RTU - 7x50 IMM 160G LIM VPRN LIC	\$ 54,400	65%	\$ 19,040
3HE10424AA	RTU - 7x50 IMM 160G FULL VPRN LIC	\$ 170,000	65%	\$ 59,500
3HE08233AA	RTU - 7x50 200G LIM VPRN LIC	\$ 68,000	65%	\$ 23,800
3HE08311AA	RTU - 7x50 200G FULL VPRN LIC	\$ 212,500	65%	\$ 74,375
3HE10111AA	RTU - 7x50 IMM 400G LIM VPRN LIC	\$ 119,000	65%	\$ 41,650
3HE10112AA	RTU - 7x50 IMM 400G FULL VPRN LIC	\$ 408,000	65%	\$ 142,800
3HE09002AA	RTU - IMM 40x10GE LIC UP - L2HQ to L3HQ	\$ 977,500	65%	\$ 342,125
3HE09003AA	RTU - IMM 40x10GE LIC UP - L3BQ to L3HQ	\$ 629,000	65%	\$ 220,150
3HE09004AA	RTU - IMM 4x100G LIC UP - L2HQ to L3HQ	\$ 374,000	65%	\$ 130,900
3HE09005AA	RTU - IMM 4x100G LIC UP - L3BQ to L3HQ	\$ 867,000	65%	\$ 303,450
Integrated Service Adapters (ISA) + Integrated Service Module (MS-ISM) + Combo IMM + ISA2				
3HE09119AA	RTU - IP Tunneling software license per 10G capacity	\$ 34,000	65%	\$ 11,900
3HE05150AA	RTU - ADI per splice license	\$ 10,625	65%	\$ 3,719
3HE04923AA	RTU - L2 Aware NAT License	\$ 17,000	65%	\$ 5,950
3HE05153AA	RTU - 6M flow NAT License	\$ 51,000	65%	\$ 17,850
3HE04925AA	RTU - LNS software License	\$ 17,000	65%	\$ 5,950
3HE09980AA	RTU AA URL Filter Wifi 10k Subs	\$ 4,250	65%	\$ 1,488
3HE10212AA	RTU AA ICAP control Wifi 10k Subs	\$ 17,000	65%	\$ 5,950
3HE10018AA	RTU AA ID & Control Wifi 10k Subs	\$ 17,000	65%	\$ 5,950
3HE10019AA	RTU IBN Wifi 10K Subs	\$ 4,250	65%	\$ 1,488
Ethernet MDA-e				
3HE10642AA	MDA-e - 7750 SR 40cSFP/20SFP GE MDA-e	\$ 102,000	65%	\$ 35,700
Ethernet MDA-XP				
3HE03611AA	MDA - 7750 10-PT GE MDA-XP SFP	\$ 85,000	65%	\$ 29,750
3HE03612AA	MDA - 7750 20-PT GE MDA-XP - SFP	\$ 170,000	65%	\$ 59,500
3HE03685AA	MDA - 7750 SR 2-PT 10G MDA-XP - XFP	\$ 169,150	65%	\$ 59,203
3HE03686AA	MDA - 7750 SR 4-PT 10G MDA-XP - XFP	\$ 272,000	65%	\$ 95,200
3HE04274AA	MDA - 7750 SR 1-PT 10G MDA-XP - XFP	\$ 85,000	65%	\$ 29,750

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

New Effective 5/30/2017

3HE05160AA	MDA - 7750 48-PT 10/100/1000-TX MDA-XP	\$ 272,000	65%	\$ 95,200	
3HE07282AA	MDA 7750 2x10GE XFP + 12x1GE SFP MDA-XP	\$ 221,000	65%	\$ 77,350	
3HE07284AA	MDA - 7750 SR 12-pt 1GE MDA-XP	\$ 102,000	65%	\$ 35,700	
Chanelized MDAs					
3HE01364AA	MDA - 7750 SR 4-PT CH OC3/STM1 ASAP SFP	\$ 221,000	65%	\$ 77,350	
3HE02499AA	MDA - 7750 SR 1-PT CH OC12/STM4 ASAP SFP	\$ 221,000	65%	\$ 77,350	
3HE02500AA	MDA - 77x0 SR 12-PT DS3/E3 ASAP	\$ 221,000	65%	\$ 77,350	
3HE02501AA	MDA - 77x0 SR 4-PT CH DS3/E3 ASAP	\$ 68,000	65%	\$ 23,800	
SONET and ATM MDAs					
3HE05943AA	MDA - 7750 16-PT OC3/12-STM1/4 POS	\$ 305,150	65%	\$ 106,803	
3HE05946AA	MDA - 7750 4-PT OC48/STM16 POS	\$ 305,150	65%	\$ 106,803	
3HE05947AA	MDA 7750 SR 2-PT OC192/STM64 MDA-XP XFP	\$ 561,000	65%	\$ 196,350	
Cables					
3HE00106AA	CBL - DS3/E3 COAX CBL 10-FT10	\$ 510	65%	\$ 179	
3HE01049AA	CBL - 7X50 CONSOLE CABLE - 6FT	\$ 85	65%	\$ 30	
3HE00271AH	CBL-AC APEQ POWER CBL USA	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE00271AJ	CBL-AC APEQ POWER CBL EUR	\$ 850	65%	\$ 298	New Effective 5/30/2017
SONET Optics Modules					
3HE06588CA	XFP - 10GE LR OC192 SR1 R6/6 0/70C	\$ 8,160	65%	\$ 2,856	
3HE06589CA	XFP - 10GE ER OC192 IR2 R6/6 0/70C	\$ 17,000	65%	\$ 5,950	
3HE06590CA	XFP - 10GE ZR OC192 LR2 R6/6 0/70C	\$ 23,800	65%	\$ 8,330	
100/1000Base Ethernet Optics Modules					
3HE05163AA	SFP - 100/1000 EX SGMII 40KM ROHS 6/6	\$ 3,825	65%	\$ 1,339	
100Mb Optics Modules					
3HE00024CA	SFP - 100M FX - LC ROHS 6/6 DDM -40/85C	\$ 680	65%	\$ 238	
3HE00869CA	SFP - 100M BX10-U - LC R6/6 DDM -40/85C	\$ 1,020	65%	\$ 357	
3HE00869CB	SFP - 100M BX10-D - LC R6/6 DDM -40/85C	\$ 1,020	65%	\$ 357	
3HE01454CA	SFP - 100M EX - LC ROHS 6/6 DDM -40/85C	\$ 2,040	65%	\$ 714	
Compact GigE Optics Modules (cSFP)					
3HE08313AA	cSFP - GIGE BX10-U - LC R6/6 DDM -40/85C	\$ 4,590	65%	\$ 1,607	
3HE08313BA	cSFP - GIGE BX10-D - LC R6/6 DDM -40/85C	\$ 4,590	65%	\$ 1,607	
3HE08314AA	cSFP - GIGE BX40-U - LC R6/6 DDM -40/85C	\$ 7,650	65%	\$ 2,678	
3HE08314BA	cSFP - GIGE BX40-D - LC R6/6 DDM -40/85C	\$ 7,650	65%	\$ 2,678	
10GigE Optics Modules (SFP+)					
3HE08142BA	SFP+ - 10G DWDM TUN LC LOW PWR 0/70C	\$ 46,750	65%	\$ 16,363	
3HE09326AA	SFP+ 10GE SR - LC ROHS6/6 -40/85C	\$ 5,092	65%	\$ 1,782	
3HE09327AA	SFP+ 10GE LR - LC ROHS6/6 -40/85C	\$ 6,792	65%	\$ 2,377	
3HE09328AA	SFP+ 10GE ER - LC ROHS6/6 -40/85C	\$ 20,392	65%	\$ 7,137	
3HE09329AA	SFP+ 10GE ZR - LC ROHS6/6 -40/85C	\$ 33,992	65%	\$ 11,897	
3HE10452AA	SFP+ 10GE BX40-U LC ROHS6/6 -40/85C	\$ 10,192	65%	\$ 3,567	New Effective 5/30/2017
3HE10452AB	SFP+ 10GE BX40-D LC ROHS6/6 -40/85C	\$ 10,192	65%	\$ 3,567	New Effective 5/30/2017
40GE Optics Modules (QSFP+)					
3HE07928AA	QSFP+ - 40G SR4 100m, MPO ROHS6/6 0/70C	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE11240AA	QSFP+ - 40G ER4 40KM LC ROHS6/6 0/70C	\$ 64,600	65%	\$ 22,610	New Effective 5/30/2017
100GE Optics Modules (CXP)					
3HE07267AA	CXP - 100GE SR10 MPO ROHS6/6 0/70C	\$ 14,450	65%	\$ 5,058	
100GE Optic Modules (CFP4)					
3HE09498AA	CFP4 - 100G LR4 10KM LC ROHS6/6 0/70C	\$ 102,000	65%	\$ 35,700	
100GE Optics Modules (QSFP28)					
3HE10551AA	QSFP28 - 100G SR4 100m, MPO ROHS6/6 0/70C	\$ 11,050	65%	\$ 3,868	New Effective 5/30/2017
3HE10550AA	QSFP28 - 100G LR4 10KM LC ROHS6/6 0/70C	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
Upgrade Kits					
3HE04137AA	UPG - 7750 SR-12 PEM-3 + IMP PNL	\$ 13,600	65%	\$ 4,760	
3HE04138AA	UPG - 7750 SR-7 PEM-3 + IMP PNL	\$ 10,200	65%	\$ 3,570	
Chassis Power (Power Entry Module)					
3HE07114AA	APEQ-DC-2000 Power Equalizer Module	\$ 12,750	65%	\$ 4,463	
3HE09423AA	APEQ-AC-3000 Power Equalizer Module	\$ 16,150	65%	\$ 5,653	
3HE10431AA	APEQ-HVDC-3000 Power Equalizer Module	\$ 19,550	65%	\$ 6,843	New Effective 5/30/2017
3HE09422AA	APEQ-DC-2200-2800 Power Equalizer Module	\$ 16,150	65%	\$ 5,653	
3HE03661AA	PEM - 7750 SR-7 100A DC PEM-3 SLOT 2	\$ 2,550	65%	\$ 893	
3HE03662AA	PEM - 7750 SR-7 100A DC PEM-3 SLOT 1	\$ 2,550	65%	\$ 893	
3HE03663AA	PEM - 7750 SR-12 175A DC PEM-3	\$ 6,800	65%	\$ 2,380	
3HE04498AA	PWR FLT - 7750 SR-7 100 AMP PWR FILTER	\$ 2,550	65%	\$ 893	
3HE04521AA	PEM 7750 SR-7 Slot 1 DC PEM-3 + PWR FLT	\$ 5,100	65%	\$ 1,785	
3HE04522AA	PEM 7750 SR-7 Slot 2 DC PEM-3 + PWR FLT	\$ 5,100	65%	\$ 1,785	
Power Cords and Status Cables					
3HE00271AA	CBL - AC PWR CBL 110V USA	\$ 128	65%	\$ 45	
3HE00271AB	CBL - AC PWR CBL 220V USA	\$ 128	65%	\$ 45	
3HE00271AC	CBL - AC PWR CBL 220V EUR	\$ 128	65%	\$ 45	
3HE00271AD	CBL - AC PWR CBL 220V GBR	\$ 128	65%	\$ 45	
3HE00271AE	CBL - AC PWR CBL 220V USA	\$ 128	65%	\$ 45	
3HE00271AF	CBL - AC PWR CBL 110V USA	\$ 128	65%	\$ 45	
Spare Parts					
3HE08423AA	CPM - 7750 SR CPM5	\$ 102,000	65%	\$ 35,700	

3HE08428AA	SFM - 7750 SR SFM5-12	\$ 93,500	65%	\$ 32,725	
3HE08429AA	SFM - 7750 SR SFM5-7	\$ 59,500	65%	\$ 20,825	
3HE08421AA	SFM - 7750 SR SFM5-12e	\$ 187,000	65%	\$ 65,450	
3HE10475AA	ACC 7750 SR-12e 80A breakers (x16)	\$ 1,615	65%	\$ 565	
3HE10114AA	ACC 7750 SR-12e AC bezel	\$ 2,975	65%	\$ 1,041	
3HE00104AA	CHAS - 7750 SR-12 CHASSIS SPARE	\$ 59,500	65%	\$ 20,825	
3HE00183CA	CH-BN - 7750 SR-12 w/PEM3 + EFT	\$ 89,505	65%	\$ 31,327	
3HE00186AA	CHAS - 7750 SR-7 CHASSIS SPARE	\$ 42,500	65%	\$ 14,875	
3HE00192AA	ACC-7750 SR-12 CBL MGMT KIT	\$ 1,615	65%	\$ 565	
3HE00272DB	CH-BN - 7750 SR-7 DC w/PEM3 + EFT	\$ 60,860	65%	\$ 21,301	
3HE01051AA	ACC-7750 SR MDA SLT BLNK	\$ 170	65%	\$ 60	
3HE01672AA	ACC-7750 SR-7 MOUNT BRACKET	\$ 213	65%	\$ 74	
3HE01673AA	ACC-7750 SR-12 MOUNT BRACKET	\$ 298	65%	\$ 104	
3HE04147AA	ACC - 7750 SR IMP PNL - 1	\$ 255	65%	\$ 89	
3HE04148AA	ACC - 7750 SR IMP PNL - 5	\$ 1,275	65%	\$ 446	
3HE04606AA	ACC - 7750 SR-12 SLOT PEM-3 UPGRADE	\$ 213	65%	\$ 74	
3HE04607AA	ACC - 7750 SR-7 SLOT PEM-3 UPGRADE	\$ 213	65%	\$ 74	
3HE01619AA	CF - 2GB COMPACT FLASH	\$ 1,615	65%	\$ 565	
3HE05106AA	FAN - 7750 SR-12 Enhanced Fan Tray	\$ 4,930	65%	\$ 1,726	
3HE05180AA	FAN - 7750 SR-7 Enhanced Fan Tray	\$ 8,160	65%	\$ 2,856	
3HE07165AA	CH-BN - 7750 SR12e Integrated Chassis	\$ 153,000	65%	\$ 53,550	
3HE07168AA	FAN - 7750 SR12e Fan Tray	\$ 7,395	65%	\$ 2,588	
3HE07440AB	CH-BN - 7750 SR12e Spare Chassis	\$ 144,500	65%	\$ 50,575	New Effective 5/30/2017
3HE07457AA	ACC - 7750 SR12e Air & APEQ Filter (x5)	\$ 6,800	65%	\$ 2,380	
3HE07460AA	ACC - 7750 SR12e Accessory Kit	\$ 935	65%	\$ 327	
3HE07442AA	ACC - 7750 SR-12e LUG KIT	\$ 2,550	65%	\$ 893	
3HE06062AA	FLT - 7x50 OCF68/STM256 AIR FILTER 5PKG	\$ 842	65%	\$ 295	
3HE07440AA	CH-BN - 7750 SR12e Spare Chassis	\$ 144,500	65%	\$ 50,575	
7750 SRe					
Chassis Bundles					
3HE10468AA	BNDL - 7750 SR-1e DC PSU bundle	\$ 100,000	65%	\$ 35,000	New Effective 5/30/2017
3HE10469AA	BNDL - 7750 SR-1e AC PSU bundle	\$ 100,000	65%	\$ 35,000	New Effective 5/30/2017
3HE10470AA	BNDL - 7750 SR-2e DC PSU bundle	\$ 120,000	65%	\$ 42,000	New Effective 5/30/2017
3HE10471AA	BNDL - 7750 SR-2e AC PSU bundle	\$ 120,000	65%	\$ 42,000	New Effective 5/30/2017
3HE10472AA	BNDL - 7750 SR-3e DC PSU bundle	\$ 140,000	65%	\$ 49,000	New Effective 5/30/2017
3HE10473AA	BNDL - 7750 SR-3e AC PSU bundle	\$ 140,000	65%	\$ 49,000	New Effective 5/30/2017
Software					
3HE10671RA	OS - 7750 SR-1e/2e/3e R14.0 OS LICENSE	\$ 13,000	65%	\$ 4,550	New Effective 5/30/2017
3HE10671TA	OS - 7750 SR-1e/2e/3e R15.0 OS LICENSE	\$ 13,000	65%	\$ 4,550	New Effective 5/30/2017
CPM-e					
3HE10310AA	CPM - 7750 SR-e CPM-e	\$ 75,000	65%	\$ 26,250	New Effective 5/30/2017
Chassis Control Module (CCM-e)					
3HE10309AA	CCM - 7750 SR-e CCM-e	\$ 9,000	65%	\$ 3,150	New Effective 5/30/2017
IOM-e					
3HE10311AA	IOM - 7750 SR IOM-e L3HQ	\$ 340,000	65%	\$ 119,000	New Effective 5/30/2017
3HE10311BA	IOM - 7750 SR IOM-e L2HQ	\$ 200,000	65%	\$ 70,000	New Effective 5/30/2017
3HE10311CA	IOM - 7750 SR IOM-e L3BQ	\$ 120,000	65%	\$ 42,000	New Effective 5/30/2017
Spare Parts					
3HE10301AA	CHAS - 7750 SR-1e Chassis Spare	\$ 52,700	65%	\$ 18,445	New Effective 5/30/2017
3HE10302AA	CHAS - 7750 SR-2e Chassis Spar	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE10303AA	CHAS - 7750 SR-3e Chassis Spare	\$ 62,900	65%	\$ 22,015	New Effective 5/30/2017
3HE09548AA	PSU - 7750 SR-e -48V DC PSU	\$ 4,590	65%	\$ 1,607	New Effective 5/30/2017
3HE09549AA	PSU - 7750 SR-e AC PSU	\$ 5,440	65%	\$ 1,904	New Effective 5/30/2017
3HE10304AA	FAN - 7750 SR-1e Fan Tray	\$ 12,240	65%	\$ 4,284	New Effective 5/30/2017
3HE10305AA	FAN - 7750 SR-2e Fan Tray	\$ 13,430	65%	\$ 4,701	New Effective 5/30/2017
3HE10306AA	FAN - 7750 SR-3e Fan Tray	\$ 15,130	65%	\$ 5,296	New Effective 5/30/2017
3HE10295AA	ACC - 7750 SR-e CCM Impedance Panel	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE10296AA	ACC - 7750 SR-e CPM Impedance Panel	\$ 1,360	65%	\$ 476	New Effective 5/30/2017
3HE10297AA	ACC - 7750 SR-e IOM Impedance Panel	\$ 1,530	65%	\$ 536	New Effective 5/30/2017
3HE10298AA	ACC - 7750 SR-1e Air Filters (5 pack)	\$ 3,230	65%	\$ 1,131	New Effective 5/30/2017
3HE10299AA	ACC - 7750 SR-2e Air Filters (5 pack)	\$ 3,570	65%	\$ 1,250	New Effective 5/30/2017
3HE10300AA	ACC - 7750 SR-3e Air Filters (5 pack)	\$ 4,250	65%	\$ 1,488	New Effective 5/30/2017
3HE11169AA	ACC-7750 SR-1e ETSI Adapter Bracket Kit	\$ 612	65%	\$ 214	New Effective 5/30/2017
3HE11170AA	ACC-7750 SR-2e ETSI Adapter Bracket Kit	\$ 646	65%	\$ 226	New Effective 5/30/2017
3HE11171AA	ACC-7750 SR-3e ETSI Adapter Bracket Kit	\$ 680	65%	\$ 238	New Effective 5/30/2017
7750 SRa					
Chassis Bundles					
3HE09242AA	BNDL - 7750SR-a4 DC Bundle	\$ 59,500	65%	\$ 20,825	
3HE09243AA	BNDL - 7750SR-a4 AC Bundle	\$ 60,350	65%	\$ 21,123	
3HE09244AA	BNDL - 7750SR-a8 DC Bundle	\$ 74,800	65%	\$ 26,180	
3HE09245AA	BNDL - 7750SR-a8 AC Bundle	\$ 75,650	65%	\$ 26,478	
CPM-a Options					
3HE09201AA	CPM - 7750 SR-a	\$ 15,810	65%	\$ 5,534	
IOM-a Options					

3HE09202CA	IOM - 7750 SR-a - L2HQ	\$ 39,100	65%	\$ 13,685	
3HE09202BA	IOM - 7750 SR-a - L3BQ	\$ 66,300	65%	\$ 23,205	
3HE09202AA	IOM - 7750 SR-a - L3HQ	\$ 112,200	65%	\$ 39,270	
3HE09551AA	UPG - SR-a IOM-a - L2HQ to L3BQ	\$ 30,600	65%	\$ 10,710	
3HE09552AA	UPG - SR-a IOM-a - L3BQ to L3HQ	\$ 49,300	65%	\$ 17,255	
3HE09553AA	UPG - SR-a IOM-a - L2HQ to L3HQ	\$ 76,500	65%	\$ 26,775	
MDA-a Options					
3HE09203AA	MDA-a XP - 7750 SR 1-PT 100G CFP	\$ 52,700	65%	\$ 18,445	
3HE10421AA	MDA-a XP - 7750 SR 1-PT 100G CFP2	\$ 52,700	65%	\$ 18,445	New Effective 5/30/2017
3HE10422AA	MDA-a XP - 7750 SR 1-PT 100G CFP4	\$ 52,700	65%	\$ 18,445	New Effective 5/30/2017
3HE09204AA	MDA-a XP - 7750 SR 10-PT 10GE SFP+	\$ 49,300	65%	\$ 17,255	
3HE09205AA	MDA-a - 7750 SR 2-PT 10GE SFP+ 12-PT GESFP	\$ 29,240	65%	\$ 10,234	
3HE09206AA	MDA-a - 7750 SR 20-PT 10/100/1000TX RJ45	\$ 23,120	65%	\$ 8,092	
3HE09207AA	MDA-a - 7750 SR 44-PT 1GE SFP	\$ 29,920	65%	\$ 10,472	
3HE09240AA	MDA-a - 7750 SR 4-PT-10GE SFP+	\$ 27,200	65%	\$ 9,520	
3HE09241AA	MDA-a XP - 7750 SR 6-PT 10GE SFP+ 40GE QSFP	\$ 49,300	65%	\$ 17,255	
SW Licenses					
3HE09550CA	OS - 7750 SRa4/8 R14.0 OS LICENSE	\$ 8,500	65%	\$ 2,975	
3HE09550TA	OS - 7750 SRa4/8 R15.0 OS LICENSE	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE09550BA	OS - 7750 SRa4/8 R13.0 OS LICENSE	\$8,500.00	65%	\$ 2,975	
3HE09753AA	DHCP USER DB LICENSE-50K USERS	\$ 76,500	65%	\$ 26,775	
3HE09754AA	DHCP USER DB LICENSE-100K USERS	\$ 127,500	65%	\$ 44,625	
3HE09755AA	DHCP USER DB LIC UPGRD-20K TO 50K	\$ 34,000	65%	\$ 11,900	
3HE09756AA	DHCP USER DB LIC UPGRD-20K TO 100K	\$ 85,000	65%	\$ 29,750	
3HE09757AA	DHCP USER DB LIC UPGRD-50K TO 100K	\$ 51,000	65%	\$ 17,850	
Accessories & Spares					
3HE09195AA	CHAS - 7750 SR-a4 CHASSIS SPARE	\$ 27,200	65%	\$ 9,520	
3HE09196AA	CHAS - 7750 SR-a8 CHASSIS SPARE	\$ 32,300	65%	\$ 11,305	
3HE09197AA	FAN - 7750 SR-a4 Fan Tray	\$ 2,890	65%	\$ 1,012	
3HE09198AA	FAN - 7750 SRa8 Fan Tray	\$ 3,910	65%	\$ 1,369	
3HE09199AA	PSU - 7750 SR-a DC -48V	\$ 4,590	65%	\$ 1,607	
3HE09200AA	PSU - 7750 SR-a AC	\$ 5,440	65%	\$ 1,904	
3HE09608AA	ACC - 7750/7705/7210 Vert Rack	\$ 11,815	65%	\$ 4,135	
3HE09609AA	ACC - 7750/7705/7210 Cbl Mgmt	\$ 4,726	65%	\$ 1,654	
3HE10937AA	ACC-7750 SR-a4 ETSI Adapter Bracket Kit	\$ 289	65%	\$ 101	New Effective 5/30/2017
3HE11168AA	ACC-7750 SR-a8 ETSI Adapter Bracket Kit	\$ 323	65%	\$ 113	New Effective 5/30/2017
3HE00271AG	CBL - AC PWR CBL 110V 13A USA	\$ 128	65%	\$ 45	
3HE09417AA	ACC - 7750 SR-a CPM/MDA Impedance Panel	\$ 1,360	65%	\$ 476	
3HE09418AA	ACC - 7750 SR-a IOM Impedance Panel	\$ 1,530	65%	\$ 536	
3HE09419AA	ACC - 7750 SR-a PSU Impedance Panel	\$ 1,360	65%	\$ 476	
3HE09420AA	ACC - 7750 SR-a4 AIR FILTER (5 pack)	\$ 4,590	65%	\$ 1,607	
3HE09978AA	ACC-Compact Flash cover for CPM-a 10pkg	\$ 1,615	65%	\$ 565	New Effective 5/30/2017
3HE09421AA	ACC - 7750 SR-a8 AIR FILTER (5 pack)	\$5,100	65%	\$ 1,785	Effective 5/30/2017
7950 XRS					
Chassis Bundles					
3HE11579AA	BNDL -7950 XRS-20 CHASSIS DC 16GB CPM	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE12041AA	BNDL-7950 XRS-20e CHASSIS DC 16G CPM	\$ 2,040,000	65%	\$ 714,000	New Effective 5/30/2017
3HE11580AA	BNDL -7950 XRS-20 SA CHASSIS DC 16GB CPM	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE12038AA	BNDL-7950 XRS-20e SA CHASSIS DC 16G CPM	\$ 1,360,000	65%	\$ 476,000	New Effective 5/30/2017
3HE11581AA	BNDL -7950 XRS-20 CHASSIS AC 16GB CPM	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE12040AA	BNDL-7950 XRS-20e CHASSIS AC 16G CPM	\$ 2,040,000	65%	\$ 714,000	New Effective 5/30/2017
3HE11582AA	BNDL -7950 XRS-20 SA CHASSIS AC 16GB CPM	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE12037AA	BNDL-7950 XRS-20e SA CHASSIS AC 16G CPM	\$ 1,360,000	65%	\$ 476,000	New Effective 5/30/2017
3HE11583AA	BNDL -7950 XRS-20 CHASSIS HVDC 16GB CPM	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE12042AA	BNDL-7950 XRS-20e CHASSIS HVDC 16G CPM	\$ 2,040,000	65%	\$ 714,000	New Effective 5/30/2017
3HE11584AA	BNDL -7950 XRS-20 SA CHASSIS HVDC 16GB CPM	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE12039AA	BNDL - 7950 XRS-20e SA CHASSIS HVDC 16G CPM	\$ 1,360,000	65%	\$ 476,000	New Effective 5/30/2017
3HE06935BA	BNDL - 7950 XRS-20 Chassis Bundle	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE08990AA	BNDL - 7950 XRS-20 SA Chassis Bundle	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE09177AA	BNDL - 7950 XRS-20 to XRS-40 UPGD KIT	\$ 2,210,000	65%	\$ 773,500	New Effective 5/30/2017
3HE09177AB	BNDL - 7950 XRS-20 to XRS-40 UPGD KIT 30m	\$ 3,060,000	65%	\$ 1,071,000	New Effective 5/30/2017
3HE10478AA	BNDL-7950 XRS-20 CHASSIS AC	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE10480AA	BNDL -7950 XRS-20 SA CHASSIS AC	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE10479AA	BNDL -7950 XRS-20 CHASSIS 60-80A DC	\$ 1,615,000	65%	\$ 565,250	New Effective 5/30/2017
3HE10481AA	BNDL -7950 XRS-20 SA CHASSIS 60-80A DC	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE09174AA	RTU - 7950 XRS-40 B2B Lic	\$ 1,700,000	65%	\$ 595,000	New Effective 5/30/2017
3HE08991AA	BNDL - 7950 XRS-20 SFM SA to MC upgrade	\$ 1,020,000	65%	\$ 357,000	New Effective 5/30/2017
3HE09272AA	BNDL - 7950 XRS-16c Entry Chassis Bundle	\$ 535,500	65%	\$ 187,425	New Effective 5/30/2017
3HE08170AA	BNDL - 7950 XRS-16c Chassis Bundle	\$ 748,000	65%	\$ 261,800	New Effective 5/30/2017
3HE10482AA	BNDL-7950 XRS-16c CHASSIS AC	\$ 748,000	65%	\$ 261,800	New Effective 5/30/2017
3HE10483AA	BNDL -7950 XRS-16c CHASSIS 60-80A DC	\$ 748,000	65%	\$ 261,800	New Effective 5/30/2017
3HE09273AA	BNDL - 7950 XRS-16c SFM ENTRY to STD upgd	\$ 272,000	65%	\$ 95,200	New Effective 5/30/2017
Software					
3HE06945RA	OS - 7950 XRS-16c/20/40 R14.0 LICENSE	\$ 29,750	65%	\$ 10,413	New Effective 5/30/2017

3HE06945TA	OS - 7950 XRS-16c/20/40 R15.0 LICENSE	\$ 29,750	65%	\$ 10,413	New Effective 5/30/2017
VPRN LICENSES					
3HE07462AA	RTU - 7950 XRS VPRN_IES64	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE07556AA	RTU - 7950 XRS VPRN_IES512	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE07590AA	RTU - 7950 XRS VPRN_IES2k	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE07591AA	RTU - 7950 XRS VPRN_IES8k	\$ 127,500	65%	\$ 44,625	New Effective 5/30/2017
3HE09021AA	RTU - 7950 XRS VPRN_IES16k	\$ 153,000	65%	\$ 53,550	New Effective 5/30/2017
VPLS LICENSES					
3HE07463AA	RTU - 7950 XRS VPLS64	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE07464AA	RTU - 7950 XRS VPLS512	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE07465AA	RTU - 7950 XRS VPLS2k	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE07645AA	RTU - 7950 XRS VPLS8k	\$ 127,500	65%	\$ 44,625	New Effective 5/30/2017
3HE09022AA	RTU - 7950 XRS VPLS40k	\$ 170,000	65%	\$ 59,500	New Effective 5/30/2017
VLL LICENSES					
3HE07466AA	RTU - 7950 XRS VLL256	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE07467AA	RTU - 7950 XRS VLL4k	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE07468AA	RTU - 7950 XRS VLL32k	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE07592AA	RTU - 7950 XRS VLL64k	\$ 127,500	65%	\$ 44,625	New Effective 5/30/2017
3HE09023AA	RTU - 7950 XRS VLL192k	\$ 170,000	65%	\$ 59,500	New Effective 5/30/2017
SAP LICENSES					
3HE07469AA	RTU - 7950 XRS SAP32k	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE07593AA	RTU - 7950 XRS SAP64k	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE09024AA	RTU - 7950 XRS SAP256k	\$ 119,000	65%	\$ 41,650	New Effective 5/30/2017
ADVANCED PEERING LICENSES					
3HE07470AA	RTU - 7950 XRS ADV Peering	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
ADVANCED BGP LICENSES					
3HE07471AA	RTU - 7950 XRS ADV BGP	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
LAWFUL INTERCEPT LICENSES					
3HE07472AA	RTU - 7950 XRS LI	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
CFLOWD LICENSES					
3HE07473AA	RTU - 7950 XRS cFlowd Basic	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE09025AA	RTU - 7950 XRS cFlowd Performance	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
FIB LICENSES					
3HE09026AA	RTU - 7950 XRS IP-FIB_MAX	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE09027AA	RTU - 7950 XRS MAC-FIB_MAX	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
1588 PTP License					
3HE10958AA	RTU - 7950 XRS IEEE1588 PTP	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
Switch Fabric Module (SFM)					
3HE08021AA	SFM - 7950 XRS-20 SFM-B	\$ 127,500	65%	\$ 44,625	New Effective 5/30/2017
3HE08505AA	SFM - 7950 XRS-20 SFM-X20S-B	\$ 110,500	65%	\$ 38,675	New Effective 5/30/2017
3HE08120AA	SFM - 7950 XRS-16c SFM	\$ 102,000	65%	\$ 35,700	New Effective 5/30/2017
Control Processor Module (CPM)					
3HE07116AA	CPM - 7950 XRS-20 CPM	\$ 238,000	65%	\$ 83,300	New Effective 5/30/2017
3HE07116AB	CPM - 7950 XRS-20 CPM 16GB	\$ 246,500	65%	\$ 86,275	New Effective 5/30/2017
3HE08121AA	CPM - 7950 XRS-16 CPM	\$ 238,000	65%	\$ 83,300	New Effective 5/30/2017
XCMS (XMA Control Module that accepts C-XMAs and XMAs)					
3HE06936AA	XCM - 7950 XRS-20 XCM	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE11087AA	XCM - 7950 XRS-20e XCM	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE08125AA	XCM - 7950 XRS-16c XCM	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE09280AA	XCM - 7950 XRS-16c XCM with XMA support	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
C-XMA/XMA QoS Licenses - Each License applied on a per C-XMA/XMA basis.					
3HE07475AA	RTU - 7950 XRS XMA QoS8k	\$ 255,000	65%	\$ 89,250	New Effective 5/30/2017
3HE07594AA	RTU - 7950 XRS XMA QoS32k	\$ 425,000	65%	\$ 148,750	New Effective 5/30/2017
3HE07595AA	RTU - 7950 XRS XMA QoS_Max	\$ 637,500	65%	\$ 223,125	New Effective 5/30/2017
C-XMA & XMA - IPCore Level					
3HE06937AA	C-XMA - 7950 XRS 20pt 10GE SFP+ - IPCore	\$ 765,000	65%	\$ 267,750	New Effective 5/30/2017
3HE06938AA	C-XMA - 7950 XRS 2pt 100GE CFP - IPCore	\$ 850,000	65%	\$ 297,500	New Effective 5/30/2017
3HE07297AA	XMA - 7950 XRS 40pt 10GE SFP+ - IPCore	\$ 1,360,000	65%	\$ 476,000	New Effective 5/30/2017
3HE07299AA	XMA - 7950 XRS 4pt 100GE CXP - IPCore	\$ 1,513,000	65%	\$ 529,550	New Effective 5/30/2017
3HE08214AA	C-XMA - 7950 XRS 6pt 40GE QSFP+ - IPCore	\$ 850,000	65%	\$ 297,500	New Effective 5/30/2017
3HE08632AA	XMA - 7950 XRS 4pt 100GE CFP2 - IPCore	\$ 1,513,000	65%	\$ 529,550	New Effective 5/30/2017
3HE08631AA	CXMA - 7950 XRS 72pt 1G CSFP/SFP - IPCore	\$ 595,000	65%	\$ 208,250	New Effective 5/30/2017
3HE10677AA	XMA - 7950 XRS 2pt 100GE INT DWDM - Ipcore	\$ 1,003,000	65%	\$ 351,050	New Effective 5/30/2017
C-XMA & XMA - LSR Level					
3HE06937BA	C-XMA - 7950 XRS 20pt 10GE SFP+ - LSR	\$ 340,000	65%	\$ 119,000	New Effective 5/30/2017
3HE06938BA	C-XMA - 7950 XRS 2pt 100GE CFP - LSR	\$ 382,500	65%	\$ 133,875	New Effective 5/30/2017
3HE07297BA	XMA - 7950 XRS 40pt 10GE SFP+ - LSR	\$ 595,000	65%	\$ 208,250	New Effective 5/30/2017
3HE07299BA	XMA - 7950 XRS 4pt 100GE CXP - LSR	\$ 680,000	65%	\$ 238,000	New Effective 5/30/2017
3HE08214BA	C-XMA - 7950 XRS 6pt 40GE QSFP+ - LSR	\$ 382,500	65%	\$ 133,875	New Effective 5/30/2017
3HE08632BA	XMA - 7950 XRS 4pt 100GE CFP2 - LSR	\$ 680,000	65%	\$ 238,000	New Effective 5/30/2017
3HE08631BA	CXMA - 7950 XRS 72pt 1G CSFP/SFP - LSR	\$ 255,000	65%	\$ 89,250	New Effective 5/30/2017
3HE10677BA	XMA - 7950 XRS 2pt 100GE TUNABLE - LSR	\$ 1,003,000	65%	\$ 351,050	New Effective 5/30/2017
C-XMA & XMA Upgrade licenses					
3HE07476AA	LIC UP - 7950 20x10G LSR to IPCore	\$ 510,000	65%	\$ 178,500	New Effective 5/30/2017

3HE07477AA	LIC UP - 7950 2x100G LSR to IPCore	\$ 552,500	65%	\$ 193,375	New Effective 5/30/2017
3HE07479AA	LIC UP - 7950 40x10G LSR to IPCore	\$ 935,000	65%	\$ 327,250	New Effective 5/30/2017
3HE07481AA	LIC UP - 7950 4x100G LSR to IPCore	\$ 1,020,000	65%	\$ 357,000	New Effective 5/30/2017
3HE08216AA	LIC UP - 7950 6x40G LSR to IPCore	\$ 510,000	65%	\$ 178,500	New Effective 5/30/2017
3HE09171AA	LIC UP - 7950 72x1G LSR to IPCore	\$ 425,000	65%	\$ 148,750	New Effective 5/30/2017
Spare Parts					
3HE11097AA	7950 XRS-20e Power Input Module	\$ 10,370	65%	\$ 3,630	New Effective 5/30/2017
3HE11093AA	7950 XRS-20e Dual Power Connect Module	\$ 5,270	65%	\$ 1,845	New Effective 5/30/2017
3HE10474AA	ACC 7950 XRS-20 80A BREAKERS (x24)	\$ 3,533	65%	\$ 1,236	New Effective 5/30/2017
3HE10486AA	ACC 7950 XRS-16 80A BREAKERS (x24)	\$ 2,295	65%	\$ 803	New Effective 5/30/2017
3HE10115AA	ACC 7950 XRS 16c AC bezel	\$ 2,975	65%	\$ 1,041	New Effective 5/30/2017
3HE07112AA	CH-BN - 7950 XR-20 Integrated Chassis	\$ 442,000	65%	\$ 154,700	New Effective 5/30/2017
3HE07113AA	CHAS - 7950 XRS-20 Spare Chassis	\$ 408,000	65%	\$ 142,800	New Effective 5/30/2017
3HE11085AA	CHAS-7950 XRS-20e Universal Spare Chassis	\$ 595,000	65%	\$ 208,250	New Effective 5/30/2017
3HE11086AA	CHAS-7950 XRS-20e AC/HVDC Spare Chassis	\$ 442,000	65%	\$ 154,700	New Effective 5/30/2017
3HE07117AA	CCM - 7950 XRS-20 CCM	\$ 25,500	65%	\$ 8,925	New Effective 5/30/2017
3HE08406AA	ACC- XRS-16c Install kit	\$ 502	65%	\$ 176	New Effective 5/30/2017
3HE08122AA	CH-BUN 7950 XRS-16c Intregated Chassis	\$ 374,000	65%	\$ 130,900	New Effective 5/30/2017
3HE08123AA	CHAS - 7950 XRS-16c Spare	\$ 340,000	65%	\$ 119,000	New Effective 5/30/2017
3HE07118AB	ACC - 7950 XRS-20 Air & APEQ Filter (x5)	\$ 10,710	65%	\$ 3,749	New Effective 5/30/2017
3HE11090AA	ACC-7950 XRS-20e Air filter Kit	\$ 3,740	65%	\$ 1,309	New Effective 5/30/2017
3HE07119AA	FAN - 7950 XRS-20 Fan Tray	\$ 20,230	65%	\$ 7,081	New Effective 5/30/2017
3HE11088AA	7950 XRS-20e Fan Tray	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE08124AA	FAN - 7950 XRS-16c Fan Tray	\$ 10,030	65%	\$ 3,511	New Effective 5/30/2017
3HE07388AA	ACC - XCM Impedance Panel	\$ 4,590	65%	\$ 1,607	New Effective 5/30/2017
3HE11089AA	ACC - 7950 XCM-20e Impedance Panel	\$ 6,613	65%	\$ 2,315	New Effective 5/30/2017
3HE07389AA	ACC - SFM/CPM Impedance Panel	\$ 3,400	65%	\$ 1,190	New Effective 5/30/2017
3HE08140AA	ACC - IMPEDANCE PANEL XCM - 16c	\$ 1,360	65%	\$ 476	New Effective 5/30/2017
3HE07390AA	ACC - XMA Impedance Panel	\$ 2,380	65%	\$ 833	New Effective 5/30/2017
3HE07391AA	ACC - C-XMA Mech Adapter	\$ 1,445	65%	\$ 506	New Effective 5/30/2017
3HE07392AA	ACC - C-XMA Impedance panel	\$ 2,210	65%	\$ 774	New Effective 5/30/2017
3HE10275AA	ACC - XRS-20 pwr stud repair kit	\$ 1,105	65%	\$ 387	New Effective 5/30/2017
3HE08961AA	ACC- 7950 XRS-20 FRONT PROTECTION PANEL	\$ 19,550	65%	\$ 6,843	New Effective 5/30/2017
3HE11091AA	ACC-7950 XRS-20e FRONT PROTECTION PANEL	\$ 8,670	65%	\$ 3,035	New Effective 5/30/2017
3HE08962AA	ACC- 7950 XRS-20 REAR PROTECTION PANEL	\$ 18,020	65%	\$ 6,307	New Effective 5/30/2017
3HE11092AA	ACC-7950 XRS-20e REAR PROTECTION PANEL	\$ 15,300	65%	\$ 5,355	New Effective 5/30/2017
3HE08963AA	ACC- 7950 XRS-16c FRONT PROTECTION PANEL	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE09879AA	ACC-7950 XRS-20 Air filter assembly	\$ 4,420	65%	\$ 1,547	New Effective 5/30/2017
3HE07373AA	ACC - 7950 XRS-20 TOP PLENUM ACCESSORY	\$ 7,650	65%	\$ 2,678	New Effective 5/30/2017
3HE08405AA	ACC- XRS-16c Air deflector	\$ 7,650	65%	\$ 2,678	New Effective 5/30/2017
3HE09173AA	ACC - 7950 XRS-40 REAR CABLE GUIDE KIT	\$ 5,092	65%	\$ 1,782	New Effective 5/30/2017
3HE07927AA	QSFP+ 40GE SR4 10M ROHS6/6 0/70C	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE07927AB	QSFP+ 40GE SR4 30M ROHS6/6 0/70C	\$ 3,060	65%	\$ 1,071	New Effective 5/30/2017
3HE07268AA	CBL - 7950 XRS-40 SPARE B2B OPTICAL CABLE, 10M	\$ 18,700	65%	\$ 6,545	New Effective 5/30/2017
3HE07268AB	CBL - 7950 XRS-40 SPARE B2B OPTICAL CABLE, 30M	\$ 23,800	65%	\$ 8,330	New Effective 5/30/2017
3HE07979AA	ACC - XCM Impedance Panel (5 pack)	\$ 15,300	65%	\$ 5,355	New Effective 5/30/2017
7750 Mobile Gateway					
Mobile Gateway ISM					
3HE10556AA	7750 SR Mobile Gateway ISM-MG-C	\$ 680,000	65%	\$ 238,000	New Effective 5/30/2017
3HE10557AA	7750 SR Mobile Gateway ISM-MG-C-E	\$ 680,000	65%	\$ 238,000	New Effective 5/30/2017
3HE09613AA	7750 SR Mobile Gateway ISM-MG-C	\$ 680,000	65%	\$ 238,000	
Software					
3HE04795TA	OS - 7750 SR R8.0 OS-MG LICENSE	\$ 17,000	65%	\$ 5,950	
3HE04795UA	OS - 7750 SR R09.0 OS-MG LICENSE	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE04798AA	SGW APPLICATION SOFTWARE LICENSE	\$ 68,000	65%	\$ 23,800	
3HE04799AA	PGW/GGSN APPLICATION SOFTWARE LICENSE	\$ 68,000	65%	\$ 23,800	
3HE04796AA	SGW RTU LIC FOR 10K BEARERS	\$ 34,000	65%	\$ 11,900	
3HE04797AA	PGW/GGSN RTU LIC FOR 10K BRS/PDP CTX	\$ 68,000	65%	\$ 23,800	
3HE07315AA	RTU PGW/GGSN AA License per 10K bearers	\$ 6,800	65%	\$ 2,380	
3HE07778AA	RTU PGW/GGSN Stateful Firewall 10K bear	\$ 3,400	65%	\$ 1,190	
3HE09970AA	RTU MGW AA URL Filter 10k Subs	\$ 1,700	65%	\$ 595	
3HE10024AA	RTU MGW AA IBN 10K Subs	\$ 1,700	65%	\$ 595	
3HE10025AA	RTU MGW AA ICAP control 10k Subscribers	\$ 34,000	65%	\$ 11,900	
3HE10026AA	RTU MGW AA RTP Perf 10k Subs	\$ 21,250	65%	\$ 7,438	
ePDG					
3HE09577AA	ePDG Application Software License	\$ 68,000	65%	\$ 23,800	
3HE09578AA	ePDG RTU LIC FOR 10K Bearers	\$ 34,000	65%	\$ 11,900	
TWAG					
3HE11352AA	TWAG Application Software License	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE11353AA	TWAG RTU LIC FOR 10K subscribers	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
SSG					
3HE11342AA	SSG Application Software License	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE11343AA	SSG RTU LIC FOR 10K subscribers	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE12080AA	7750 SR MG ISM-MG-C FOR SSG BASE	\$ 272,000	65%	\$ 95,200	New Effective 5/30/2017

3HE12081AA	RTU 7750 SR MG ISM-MG-C SSG FULL UPG	\$ 408,000	65%	\$ 142,800	New Effective 5/30/2017
3HE12082AA	7750 SR MG ISM-MG-C-E FOR SSG BASE	\$ 272,000	65%	\$ 95,200	New Effective 5/30/2017
3HE12083AA	RTU 7750 SR MG ISM-MG-C-E BASE FULL UPG	\$ 408,000	65%	\$ 142,800	New Effective 5/30/2017
Input/Output Module (IOMs)					
3HE03619AA	IOM - 7750 SR IOM3-XP	\$ 102,000	65%	\$ 35,700	
Integrated Media Modules GE (IMM's)					
3HE05895BA	IMM - 7x50 48-PT GE SFP - L3BQ	\$ 229,500	65%	\$ 80,325	
3HE06428AA	IMM - 7x50 48-PT GE SFP - L3HQ	\$ 484,500	65%	\$ 169,575	
9471 SGSN/MME					
3HZ20196AA	WMM dD	\$ 1,785,000	65%	\$ 624,750	Effective 5/30/2017
3HZ12009AA	WMM SW RTU: Base system software	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3HZ10713AA	STANDALONE CHASSIS SA1	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3HZ12012AA	WWW SW RTU: MME/SGSN Subscriber license -10K pack	\$ 85,000	65%	\$ 29,750	Effective 5/30/2017
3BK35561AA	Multimode SFP LC 50/62.5 duplex (1AB187280063)	\$ 136	65%	\$ 48	Effective 5/30/2017
3BK35506AA	ATCA Front Filler Pair	\$ 578	65%	\$ 202	Effective 5/30/2017
3HZ12008AA	WMM SW RTU: PCMD -10K pack	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
WMM - Expansion Kit & Interface					
3HZ00502AA	WMM 2nd aTCA Shelf for dD	\$ 1,785,000	65%	\$ 624,750	Effective 5/30/2017
3HZ10714AA	STANDALONE CHASSIS SA2-	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3HZ00330AB	SERVICE BOARD PAIR W IPPU FOR WMM dD	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3HZ00500AA	Interface Board second pair for dD2	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3BK35506AA	ATCA Front Filler Pair	\$ 85,000	65%	\$ 29,750	Effective 5/30/2017
3HZ00131AC	Multimode SFP LC 50/62.5 duplex (1AB187280063)	\$ 136	65%	\$ 48	Effective 5/30/2017
3HZ00503AA	WMM MME to SGSN/Combo EXTENSION KIT	\$ 578	65%	\$ 202	Effective 5/30/2017
3HZ00646AA	Cord Kit for WMM dD2 (combo & SGSN)	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
3HZ12004AA	WMM SW RTU: pooling,UE LB, SSM -10K pack	\$ 8,500	65%	\$ 2,975	Effective 5/30/2017
3HZ12005AA	WMM SW RTU: opex-saver -10K pack	\$ 5,100	65%	\$ 1,785	Effective 5/30/2017
3HZ12006AA	WMM SW RTU: extended core -10K pack	\$ 8,500	65%	\$ 2,975	Effective 5/30/2017
3HZ12007AA	WMM SW RTU: ARPU-booster -10K pack	\$ 17,000	65%	\$ 5,950	Effective 5/30/2017
WMM Spares					
3HZ80191AA	ATCAV2-Molene-2 32GB w/E1 Interface board	\$ 212,500	65%	\$ 74,375	Effective 5/30/2017
3HZ80192AA	ATCAV2-Molene-2 32GB IPPU service board	\$ 212,500	65%	\$ 74,375	Effective 5/30/2017
3HZ80155AA	SPARE Pilot-Blade for SGSN dC	\$ 170,000	65%	\$ 59,500	Effective 5/30/2017
3HZ80100AC	SPARE aTCAv2 SAV2AC chassis	\$ 85,000	65%	\$ 29,750	Effective 5/30/2017
3HZ80158AA	SPARE Ethernet Switch Blade for SGSN dC/dD	\$ 170,000	65%	\$ 59,500	Effective 5/30/2017
3HZ80159AA	SPARE Ethernet RTM for SGSN dC	\$ 42,500	65%	\$ 14,875	Effective 5/30/2017
3HZ80171AA	Spare ATCAV2 - Switch Ethernet Board	\$ 85,000	65%	\$ 29,750	Effective 5/30/2017
3HZ80066AA	ATCAV2 Shelf Manager Board	\$ 42,500	65%	\$ 14,875	Effective 5/30/2017
3HZ80064AA	ATCAV2 Front Air Filter	\$ 679	65%	\$ 238	Effective 5/30/2017
3HZ80065AA	ATCAV2 Rear Air Filter	\$ 1,067	65%	\$ 374	Effective 5/30/2017
3HZ80067AA	ATCAV2 Front Filler	\$ 656	65%	\$ 230	Effective 5/30/2017
3HZ80067AB	ATCAV2 Rear Filler	\$ 647	65%	\$ 227	Effective 5/30/2017
3HZ80160AA	SPARE Fan tray 300W bottom	\$ 6,024	65%	\$ 2,109	Effective 5/30/2017
3HZ80160AB	SPARE Fan tray 300W top	\$ 8,021	65%	\$ 2,807	Effective 5/30/2017
3HZ80068AB	ATCAV2 FEP 8GB SS7 NB & BB	\$ 34,425	65%	\$ 12,049	Effective 5/30/2017
3HZ80074AA	Spare ATCAV2 - E1/T1 RTM	\$ 3,213	65%	\$ 1,125	Effective 5/30/2017
3HZ80205AA	Spare Console Server MRV 16 port	\$ 13,770	65%	\$ 4,820	Effective 5/30/2017
3HZ80091AB	ATCAV2 Alarm for PDU AA	\$ 4,129	65%	\$ 1,445	Effective 5/30/2017
3HZ80109AA	XFP SR 10G MODULE	\$ 4,535	65%	\$ 1,587	Effective 5/30/2017
3HZ80161AA	SPARE SFP MINIGBIC RJ45 for ethernet RTM	\$ 230	65%	\$ 80	Effective 5/30/2017
7750 VSR					
Virtualized Service Router ASL					
3HE09180AA	SSF VSR-RR Route Reflector-Level 1	\$ 30,600	65%	\$ 10,710	New Effective 5/30/2017
3HE09181AA	SSF VSR-RR Route Reflector-Level 2	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE09019CA	ASL R14.0 VSR-RR RouteReflector-Level 1	\$ 102,000	65%	\$ 35,700	New Effective 5/30/2017
3HE09020CA	ASL R14.0 VSR-RR RouteReflector-Level 2	\$ 170,000	65%	\$ 59,500	New Effective 5/30/2017
3HE09407CA	ASL R14.0 VSIM Simulator	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE11380AA	ASL VSR BGP Route Reflector	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE09407DA	ASL R15.0 VSIM Simulator	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
VSR Commons for Distributed VNF					
3HE10934AA	ASL R14.0 VSR Distributed Base	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE10935AA	ASL R14.0 VSR Dist Redundant Ctl Plane	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE10936AA	ASL R14.0 VSR Distributed Base <60Gbps	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE11115AA	ASL R14.0 VSR Redund Ctl Plane <60Gbps	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE10934DA	ASL R15.0 VSR Distributed Base	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE10935DA	ASL R15.0 VSR Dist Redundant Ctl Plane	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE10936DA	ASL R15.0 VSR Distributed Base <60Gbps	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE11115DA	ASL R15.0 VSR Redund Ctl Plane <60Gbps	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
Virtualized Service Router ASL					
3HE11116AA	ASL R14.0 VSR Integrated System Base	\$ 25,500	65%	\$ 8,925	New Effective 5/30/2017
3HE11116DA	ASL R15.0 VSR Integrated System Base	\$ 25,500	65%	\$ 8,925	New Effective 5/30/2017
Virtualized Service Router ASL					
3HE11117AA	ASL 10Gbps BW w Standard QoS	\$ 53,550	65%	\$ 18,743	New Effective 5/30/2017

3HE11118AA	ASL VSR 10Gbps BW w Advanced QoS	\$ 80,750	65%	\$ 28,263	New Effective 5/30/2017
3HE11119AA	ASL VSR 1Gbps BW Standard QoS	\$ 7,650	65%	\$ 2,678	New Effective 5/30/2017
3HE11120AA	ASL VSR 1Gbps BW w Standard QoS	\$ 11,560	65%	\$ 4,046	New Effective 5/30/2017
3HE11121AA	ASL VSR VPN Service 500 instances	\$ 19,550	65%	\$ 6,843	New Effective 5/30/2017
3HE11122AA	ASL VSR VPN Service 100 instances	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE11123AA	ASL VSR VPN Service 25 instances	\$ 2,040	65%	\$ 714	New Effective 5/30/2017
3HE11124AA	ASL VSR IP-Tunnel 1k Tunnels	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE11125AA	ASL VSR IP-Tunnel 100 Tunnels	\$ 340	65%	\$ 119	New Effective 5/30/2017
3HE11126AA	ASL VSR Lawful Intercept (LI)	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE11127AA	ASL VSR ADV DC GW and Svc Chain	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE11128AA	ASL VSR Hybrid OpenFlow Switch	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
Virtualized Service Router ASL					
3HE11129AA	ASL VSR-BNG 10k Hosts	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE11130AA	ASL VSR-BNG 4k Hosts	\$ 25,500	65%	\$ 8,925	New Effective 5/30/2017
VSR-vRGW					
3HE11131AA	ASL VSR-vRGW 10k Hosts	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
VSR-LNS					
3HE11132AA	ASL VSR-LNS 1k L2TP Tunnels	\$ 3,400	65%	\$ 1,190	New Effective 5/30/2017
3HE11133AA	ASL VSR-LNS 10k Hosts	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE11134AA	ASL VSR-LNS 4k Hosts	\$ 25,500	65%	\$ 8,925	New Effective 5/30/2017
VSR-WLW					
3HE11135AA	ASL VSR-WLW 10k Hosts	\$ 12,750	65%	\$ 4,463	New Effective 5/30/2017
3HE11136AA	ASL VSR-WLW Multiple SSID	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE11137AA	ASL-VSR-WLW Mobility	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE11139AA	ASL VSR-WLW Geo Redundancy	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
Value Add Services AA for VSR-BNG, vRGW and for VSR-AA used as transit AA VNF					
3HE11140AA	ASL VSR-AA ID and CTL Res 10k Subs	\$ 68,000	65%	\$ 23,800	New Effective 5/30/2017
3HE11141AA	ASL VSR-AA IBN Res 10k Subs	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE11142AA	ASL VSR-AA ICAP ControlRes 10kSubs	\$ 170,000	65%	\$ 59,500	New Effective 5/30/2017
3HE11143AA	ASL VSR-AA URL Filter Res 10k Subs	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE11144AA	ASL VSR-AA RTP Perf Res 10k Subs	\$ 21,250	65%	\$ 7,438	New Effective 5/30/2017
AA for VSR-WLW					
3HE11145AA	ASL VSR-AA ID and CTL Wifi 10k Sub	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE11146AA	ASL VSR-AA IBN Wifi 10k Subs	\$ 4,250	65%	\$ 1,488	New Effective 5/30/2017
3HE11147AA	ASL VSR-AA ICAP Ctl Wifi 10k Subs	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
3HE11148AA	ASL VSR-AA URL Filter Wifi 10k Sub	\$ 4,250	65%	\$ 1,488	New Effective 5/30/2017
AA for VSR-PE and VSR-SeGW					
3HE11149AA	ASL VSR-AA ID and CTL VPN 1 Gbps	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE11150AA	ASL VSR-AA ID and CTL VPN 100 Mbps	\$ 1,700	65%	\$ 595	New Effective 5/30/2017
3HE11151AA	ASL VSR-AA Stateful FW VPN 1 Gbps	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE11152AA	ASL VSR-AA Stateful FW 100 Mbps	\$ 1,105	65%	\$ 387	New Effective 5/30/2017
3HE11153AA	ASL VSR-AA RTP Perf VPN 1 Gbps	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE11154AA	ASL VSR-AA RTP Perf 100 Mbps	\$ 1,105	65%	\$ 387	New Effective 5/30/2017
NAT for VSR-PE, VSR-BNG, VSR-LNS, VSR-NAT					
3HE11155AA	ASL VSR-NAT 10k Subs	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE11156AA	ASL VSR-NAT 1 Gbps	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE11157AA	ASL VSR-NAT Geo Redundancy	\$ 34,000	65%	\$ 11,900	New Effective 5/30/2017
3HE11158AA	ASL VSR-NAT UPnP	\$ 42,500	65%	\$ 14,875	New Effective 5/30/2017
3HE11159AA	ASL VSR L2Aware-NAT	\$ 59,500	65%	\$ 20,825	New Effective 5/30/2017
3HE11160AA	ASL VSR MAP-T 1 Gbps	\$ 1,700	65%	\$ 595	New Effective 5/30/2017
IPSec for VSR-PE and VSR-SeGW					
3HE11161AA	ASL VSR-IPsec 1k Tunnels	\$ 3,740	65%	\$ 1,309	New Effective 5/30/2017
3HE11162AA	ASL VSR-IPsec 100 Mbps	\$ 1,360	65%	\$ 476	New Effective 5/30/2017
3HE11163AA	ASL VSR-IPsec Geo Redundancy	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
VSR-a					
3HE11224AA	VSR-a R14.0 Route Reflector AC	\$ 125,800	65%	\$ 44,030	New Effective 5/30/2017
3HE11224BA	VSR-a R14.0 Route Reflector DC	\$ 129,200	65%	\$ 45,220	New Effective 5/30/2017
3HE12032AA	DC Power Supply Cable	\$ 213	65%	\$ 74	New Effective 5/30/2017
VMG ASL					
3HE10232BA	ASL R8.0 VMG Distributed VNF	\$ 600,000	65%	\$ 210,000	New Effective 5/30/2017
3HE10233BA	ASL R8.0 VMG-SGW 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE10234BA	ASL R8.0 VMG-EPDG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE10235BA	ASL R8.0 VMG-PGW 10k Subs	\$ 100,000	65%	\$ 35,000	New Effective 5/30/2017
3HE10236BA	ASL R8.0 VMG-SGW M2M 10k Subs	\$ 11,600	65%	\$ 4,060	New Effective 5/30/2017
3HE10237BA	ASL R8.0 VMG-EPDG M2M 10k Subs	\$ 11,600	65%	\$ 4,060	New Effective 5/30/2017
3HE10238BA	ASL R8.0 VMG-PGW M2M 10k Subs	\$ 22,400	65%	\$ 7,840	New Effective 5/30/2017
3HE11354AA	ASL R8.0 VMG-TWAG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE11106AA	ASL R8.0 VMG-SSG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE10232CA	ASL R9.0 VMG Distributed VNF	\$ 600,000	65%	\$ 210,000	New Effective 5/30/2017
3HE10233CA	ASL R9.0 VMG-SGW 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE10234CA	ASL R9.0 VMG-EPDG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE10235CA	ASL R9.0 VMG-PGW 10k Subs	\$ 100,000	65%	\$ 35,000	New Effective 5/30/2017
3HE10236CA	ASL R9.0 VMG-SGW M2M 10k Subs	\$ 11,600	65%	\$ 4,060	New Effective 5/30/2017
3HE10237CA	ASL R9.0 VMG-EPDG M2M 10k Subs	\$ 11,600	65%	\$ 4,060	New Effective 5/30/2017

3HE10238CA	ASL R9.0 VMG-PGW M2M 10k Subs	\$ 22,400	65%	\$ 7,840	New Effective 5/30/2017
3HE11354CA	ASL R9.0 VMG-TWAG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE11106CA	ASL R9.0 VMG-SSG 10k Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
VMG-AA ASL					
3HE10239BA	ASL R8.0 VMG-AA ID and Control 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE10240BA	ASL R8.0 VMG-AA ICAP Control 10k Subs	\$ 40,000	65%	\$ 14,000	New Effective 5/30/2017
3HE10241BA	ASL R8.0 VMG-AA IBN 10k Subs	\$ 2,000	65%	\$ 700	New Effective 5/30/2017
3HE10242BA	ASL R8.0 VMG-AA URL Filter 10k Subs	\$ 2,000	65%	\$ 700	New Effective 5/30/2017
3HE10243BA	ASL R8.0 VMG-AA Stateful FW 10k Subs	\$ 5,000	65%	\$ 1,750	New Effective 5/30/2017
3HE10244BA	ASL R8.0 VMG-AA RTP Perf 10k Subs	\$ 25,000	65%	\$ 8,750	New Effective 5/30/2017
3HE11107AA	RTU MGW AA ICAP blacklist 10K Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11109AA	ASL R8.0 VMG-AA ICAP blacklist 10K Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE10239CA	ASL R9.0 VMG-AA ID and Control 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE10240CA	ASL R9.0 VMG-AA ICAP Control 10k Subs	\$ 40,000	65%	\$ 14,000	New Effective 5/30/2017
3HE10241CA	ASL R9.0 VMG-AA IBN 10k Subs	\$ 2,000	65%	\$ 700	New Effective 5/30/2017
3HE10242CA	ASL R9.0 VMG-AA URL Filter 10k Subs	\$ 2,000	65%	\$ 700	New Effective 5/30/2017
3HE10243CA	ASL R9.0 VMG-AA Stateful FW 10k Subs	\$ 5,000	65%	\$ 1,750	New Effective 5/30/2017
3HE10244CA	ASL R9.0 VMG-AA RTP Perf 10k Subs	\$ 25,000	65%	\$ 8,750	New Effective 5/30/2017
VMG M2M					
3HE11554AA	SGW RTU License for M2M 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11555AA	ASL R8.0 VMG-PGW M2M 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11556AA	ASL R8.0 VMG-EPDG M2M 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11555DA	ASL R9.0 VMG-PGW M2M 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11556DA	ASL R9.0 VMG-EPDG M2M 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
CMG-AA					
3HE11791AA	ASL R9.0 CMG-AA TCP Optimization 10K Subs	\$ 4,000	65%	\$ 1,400	New Effective 5/30/2017
3HE11792AA	ASL R9.0 CMG-AA DEM Gateway 10K Subs	\$ 8,000	65%	\$ 2,800	New Effective 5/30/2017
7705 SAR					
7705 SAR-8 (-48 VDC) Cards/Modules					
3HE02776AB	8 PORT GE/FE ETHERNET CARD V2	\$ 8,840	65%	\$ 3,094	
3HE02776CB	8 PORT GE/FE ETHERNET CARD V2 / CONFORMAL COATED	\$ 9,945	65%	\$ 3,481	
3HE03125AA	4 PORT OC-3/STM-1 CLEAR CHANNEL CARD	\$ 30,600	65%	\$ 10,710	
3HE03125BA	4 PORT OC-3/STM-1 CLEAR CHANNEL CARD / CONFORMAL COATED	\$ 34,340	65%	\$ 12,019	
3HE03127AA	2P OC3/STM1 CHANNELIZED ADAPTER CARD	\$ 35,700	65%	\$ 12,495	
3HE03127BA	2P OC3/STM1 CHANNELIZED ADAPTER CARD/CONFORMAL COATED	\$ 40,035	65%	\$ 14,012	
3HE04962AA	4 PORT T3/E3 CARD	\$ 30,600	65%	\$ 10,710	
3HE03126AA	6 port E&M Interface Card	\$ 7,140	65%	\$ 2,499	
3HE03126BA	6 port E&M Interface Card / Conformal Coated	\$ 8,075	65%	\$ 2,826	
3HE07152AA	Power Injector Card	\$ 2,210	65%	\$ 774	
3HE07152BA	Power Injector Card / Conformal Coated	\$ 3,910	65%	\$ 1,369	
7705 SAR-8 (+24 VDC) Cards/Modules					
3HE02776BA	8 PORT GE/FE ETHERNET CARD V2 (+24VDC)	\$ 8,840	65%	\$ 3,094	
3HE02776DA	8 PORT GE/FE ETHERNET CARD V2 (+24VDC) / CONFORMAL COATED	\$ 9,945	65%	\$ 3,481	
3HE04962BA	4 PORT T3/E3 CARD (+24VDC)	\$ 30,600	65%	\$ 10,710	
7705 SAR-8 (Dual -48/+24 VDC Support) Cards/Modules					
3HE02774AB	CONTROL SWITCH MODULE V2 (CSMV2)	\$ 5,950	65%	\$ 2,083	
3HE02774CB	CONTROL SWITCH MODULE V2 (CSMV2) / CONFORMAL COATED	\$ 6,885	65%	\$ 2,410	
3HE06792EA	Fan Module (SAR-8 Shelf V2) Ext Temp	\$ 1,870	65%	\$ 655	
3HE06792FA	Fan Module (SAR-8 Shelf V2) Ext Temp / CONFORMAL COATED	\$ 3,060	65%	\$ 1,071	
3HE02772AA	Auxiliary Alarm Card (-48/+24 VDC)	\$ 10,200	65%	\$ 3,570	
3HE02772BA	Auxiliary Alarm Card (-48/+24 VDC) / CONFORMAL COATED	\$ 11,475	65%	\$ 4,016	
3HE02781AA	32 PORT T1/E1 ASAP CARD (-48/+24 VDC)	\$ 11,900	65%	\$ 4,165	
3HE02775AB	16 PORT T1/E1 ASAP CARD V2 (-48/+24 VDC)	\$ 7,140	65%	\$ 2,499	
3HE02775CB	16 PORT T1/E1 ASAP CARD V2 (-48/+24 VDC) / CONFORMAL COATED	\$ 8,075	65%	\$ 2,826	
3HE06151AA	8 PORT GE SFP CARD (-48/+24 VDC)	\$ 10,540	65%	\$ 3,689	
3HE06151BA	8 PORT GE SFP CARD (-48/+24 VDC) /CONFORMAL COATED	\$ 12,240	65%	\$ 4,284	
3HE06151AC	8 PORT GE SFP CARD V3 (-48/+24 VDC)	\$ 13,175	65%	\$ 4,611	
3HE06151BC	8 PORT GE SFP CARD V3 (-48/+24 VDC) /CONFORMAL COATED	\$ 14,960	65%	\$ 5,236	
3HE07938AA	4P OC3/STM1-1P OC12/STM4 (-48/+24 VDC) CHANNELIZED ADAPTER CARD	\$ 49,300	65%	\$ 17,255	
3HE02782AA	Packet Microwave Card (-48/+24 VDC)	\$ 10,540	65%	\$ 3,689	
3HE02782BA	Packet Microwave Card (-48/+24 VDC) / CONFORMAL COATED	\$ 11,900	65%	\$ 4,165	
3HE06006AA	8 Port Voice & Teleprotection Card (-48/+24 VDC)	\$ 9,350	65%	\$ 3,273	
3HE06006BA	8 Port Voice & Teleprotection Card (-48/+24 VDC) / CONFORMAL COATED	\$ 10,540	65%	\$ 3,689	
3HE07942AA	Integrated Services Card	\$ 6,800	65%	\$ 2,380	
3HE07942BA	INTEGRATED SERVICES CARD (ISC) cc	\$ 10,200	65%	\$ 3,570	New Effective 5/30/2017
3HE06794AA	8 port FXO line card (-48/+24 VDC)	\$ 8,500	65%	\$ 2,975	
3HE06794BA	8 port FXO line card (-48/+24 VDC) / CONFORMAL COATED	\$ 9,520	65%	\$ 3,332	
3HE06789AA	2 PORT 10GIGE (RING) XFP CARD (-48/+24 VDC)	\$ 17,340	65%	\$ 6,069	
3HE06789BA	2 PORT 10GIGE (RING) XFP CARD (-48/+24 VDC) / CONFORMAL COATED	\$ 19,465	65%	\$ 6,813	
3HE07943AA	2P 10GE+4P GE 10G ETH CARD (-48/+24VDC)	\$ 24,990	65%	\$ 8,747	
3HE07943BA	2P 10GE+4P GE 10G ETH CARD (-48/+24VDC)/CONFORMAL COATED	\$ 27,200	65%	\$ 9,520	
3HE03391AB	12P SERIAL DATA CARD V2 -48/+24VDC	\$ 12,920	65%	\$ 4,522	
3HE03391BB	12P SERIAL DATA CARD V2 -48/+24VDC/CONFORMAL COATED	\$ 14,280	65%	\$ 4,998	
3HE02780AA	6 port FXS line card (-48/+24 VDC)	\$ 8,500	65%	\$ 2,975	

3HE02780BA	6 port FXS line card (-48/+24 VDC) / CONFORMAL COATED	\$ 9,520	65%	\$ 3,332
3HE07954AA	SAR-8/18 MULTI-GNSS RECEIVER MDA	\$ 10,200	65%	\$ 3,570
3HE07954BA	SAR-8/18 MULTI-GNSS RECEIVER MDA cc	\$ 13,600	65%	\$ 4,760
7705 SAR-8 Chassis/Cables/Panels (For both -48/+24 VDC systems)				
3HE06791AA	SAR-8 SHELF V2	\$ 4,250	65%	\$ 1,488
3HE06791BA	SAR-8 SHELF V2/CONFORMAL COATED	\$ 5,100	65%	\$ 1,785
3HE03399AB	T1/E1 CABLE 26 AWG OPEN-ENDED 30M	\$ 2,550	65%	\$ 893
3HE03398AB	T1/E1 CABLE 26 AWG OPEN-ENDED 15M	\$ 1,275	65%	\$ 446
3HE03397AA	T1/E1 CABLE FOR DISTRIBUTION PANEL 1M	\$ 340	65%	\$ 119
3HE03397BB	T1/E1 Cable for Distribution Panel 1.6 m Cross-Over Configuration	\$ 340	65%	\$ 119
3HE03395AA	32 PORT E1 BNC PANEL	\$ 5,440	65%	\$ 1,904
3HE03394AA	32 PORT T1/E1 RJ45 PANEL	\$ 2,550	65%	\$ 893
3HE04430AA	32 PORT E1 1.0/2.3 PANEL	\$ 4,420	65%	\$ 1,547
3HE06420AA	Hardened distribution panel mounting bracket kit	\$ 298	65%	\$ 104
3HE03401AA	SYNCHRONIZATION Y- CABLE	\$ 255	65%	\$ 89
3HE04506AB	V.35 CABLE - 2M	\$ 1,445	65%	\$ 506
3HE04507AB	RS232 CABLE PAIR - 2M	\$ 1,445	65%	\$ 506
3HE04509AD	OPEN ENDED SDI CABLE PAIR - 10M	\$ 2,550	65%	\$ 893
3HE04508AB	X.21 CABLE - 2M	\$ 2,040	65%	\$ 714
3HE08608AA	X.21 TO RS530 DCE ADAPTOR CABLE – 1M	\$ 255	65%	\$ 89
3HE04510AA	6 PORT V.35 DISTRIBUTION PANEL	\$ 1,870	65%	\$ 655
3HE04511AA	6 PORT RS232 DISTRIBUTION PANEL	\$ 1,870	65%	\$ 655
3HE04512BA	6 PORT X.21 DISTRIBUTION PANEL V2	\$ 1,870	65%	\$ 655
3HE03054AA	SAR-8 Spare Blanking Plates (6 Pack)	\$ 680	65%	\$ 238
3HE05260AA	7705 SAR-M ETSI Adapters	\$ 425	65%	\$ 149
3HE04990AA	RJ45 TO BNC ADAPTER CABLES - 2 PACK	\$ 1,530	65%	\$ 536
3HE02783AA	Aux Alarm Cable with Amp 64 Connector - 3M	\$ 1,190	65%	\$ 417
3HE07771AA	7705 SAR-8 DC Port Surge Protector Kit	\$ 3,400	65%	\$ 1,190
3HE10338AA	External Surge Protection Kit	\$ 3,910	65%	\$ 1,369
3HE10339AA	CPX DC Defender Modules	\$ 1,105	65%	\$ 387
3HE03400AA	POWER CABLE (4M)	\$ 255.00	65%	\$ 89
3HE03400CA	POWER CABLE (12M)	\$ 595.00	65%	\$ 208
7705 SAR-18 Systems				
3HE04991AA	SAR-18 SHELF	\$ 17,000	65%	\$ 5,950
3HE04992AA	CONTROL SWITCH MODULE FOR SAR-18	\$ 12,750	65%	\$ 4,463
3HE04993AA	FAN MODULE FOR SAR-18	\$ 4,250	65%	\$ 1,488
3HE04994AA	ALARM MODULE FOR SAR-18	\$ 1,275	65%	\$ 446
3HE06153AC	1 PORT 10GE / 10 PORT 1GE 10G-CARD V2	\$ 63,750	65%	\$ 22,313
3HE04995AA	AIR FILTER FOR SAR-18 (4 pack)	\$ 1,020	65%	\$ 357
3HE06022AA	CSM Blanking Plate for SAR-18	\$ 765	65%	\$ 268
7705 SAR-A Systems				
3HE06797AA	SAR-A W/ 12 ENET 8 T1/E1 -48 VDC	\$ 22,440	65%	\$ 7,854
3HE06796AA	SAR-A W/ 12 ENET -48 VDC	\$ 16,150	65%	\$ 5,653
7705 SAR-Ax Systems				
3HE10329AA	SAR-Ax W/ 12p ENET and GNSS. -48/+24 VDC	\$ 21,250	65%	\$ 7,438
7705 SAR-H Systems, Modules, Power Supplies and Accessories				
3HE06969AA	SAR-H High Voltage Shelf	\$ 20,400	65%	\$ 7,140
3HE06969CA	SAR-H High Voltage Shelf /CONFORMAL COATED	\$ 22,950	65%	\$ 8,033
3HE06969BA	SAR-H Low Voltage Shelf	\$ 20,400	65%	\$ 7,140
3HE06969DA	SAR-H Low Voltage Shelf /CONFORMAL COATED	\$ 22,865	65%	\$ 8,003
3HE06973AA	SAR-H T1/E1/Serial Combo Module	\$ 4,250	65%	\$ 1,488
3HE06973BA	SAR-H T1/E1/Serial Combo Module / CONFORMAL COATED	\$ 5,185	65%	\$ 1,815
3HE09303AA	SAR-H 4 Port Fast Ethernet module	\$ 4,250	65%	\$ 1,488
3HE09303BA	SAR-H 4 Port Fast Ethernet module / CONFORMAL COATED	\$ 5,695	65%	\$ 1,993
3HE06970AA	100W 48V DC Power Supply - HV Input	\$ 6,290	65%	\$ 2,202
3HE06970CA	100W 48V DC Power Supply - HV Input /Conformal Coated	\$ 7,480	65%	\$ 2,618
3HE06970BA	100W 48V DC Power Supply - LV Input	\$ 9,010	65%	\$ 3,154
3HE06970DA	100W 48V DC Power Supply - LV Input /Conformal Coated	\$ 10,200	65%	\$ 3,570
3HE06971AA	SAR-H PoE Power Supply mounting tray	\$ 765	65%	\$ 268
3HE07769AA	7705 SAR-H Wall/reverse rack mounting kit	\$ 765	65%	\$ 268
3HE07770AA	7705 SAR-H PoE Wall Mount kit	\$ 765	65%	\$ 268
3HE07955AA	SAR-H GPS Receiver Module	\$ 8,500	65%	\$ 2,975
3HE07961AA	SAR-H/8/18 1M GPS CABLE (DIN/DIN)	\$ 425	65%	\$ 149
3HE07962AA	SAR-H/8/18 1M GPS Cable (DIN/N)	\$ 425	65%	\$ 149
7705 SAR-Hc Systems and Accessories				
3HE07353AA	SAR-HC	\$ 11,475	65%	\$ 4,016
3HE07353BA	SAR-HC W/ CONFORMAL COAT	\$ 12,920	65%	\$ 4,522
3HE07945AA	SAR-HC Panel Mounting H/W Kit - Rear Mount	\$ 425	65%	\$ 149
3HE07945AB	SAR-Hc Panel Mounting H/W Kit - Side Mount	\$ 425	65%	\$ 149
3HE07357AA	SAR-HC Din Mounting H/W KIT -Rear Mount	\$ 425	65%	\$ 149
3HE07357AB	SAR-HC Din Mounting H/W Kit -Side Mount	\$ 425	65%	\$ 149
7705 SAR-M Systems and Accessories				
3HE05051AB	SAR-M with 16 T1/E1, 7 GigE, -48/+24 VDC	\$ 22,440	65%	\$ 7,854
3HE05051BB	SAR-M W 16 T1/E1, 7 GIGE, -48/+24 VDC/CONFORMAL COAT	\$ 25,160	65%	\$ 8,806

New Effective 5/30/2017

Effective 5/30/2017

Effective 5/30/2017

New Effective 5/30/2017

3HE05653AA	SAR-M with 7 GigE, -48/+24 VDC	\$ 16,150	65%	\$ 5,653	
3HE05653BA	SAR-M with 7 GigE, -48/+24 VDC /CONFORMAL COAT	\$ 18,105	65%	\$ 6,337	
3HE09170AA	6 PORT ETHERNET MODULE FOR SAR-M	\$ 5,610	65%	\$ 1,964	
3HE09170BA	6 PORT ETHERNET MODULE FOR SAR-M / CONFORMAL COATED	\$ 7,183	65%	\$ 2,514	
3HE06788AA	2 Port 10GIGE (Ring) Module -SAR-M	\$ 8,840	65%	\$ 3,094	
3HE06788BA	2 Port 10GIGE (Ring) Module -SAR-M / CONFORMAL COATED	\$ 9,945	65%	\$ 3,481	
3HE09411AA	Ethernet Cable with RJ.5 and RJ45 connectors (6M)	\$ 255	65%	\$ 89	
3HE09411BA	Ethernet Cable with RJ.5 and RJ45 connectors (20M)	\$ 680	65%	\$ 238	
3HE09411CA	Ethernet Cable with RJ.5 and RJ45 connectors (50M)	\$ 1,530	65%	\$ 536	New Effective 5/30/2017
3HE05126AA	GPON Module for SAR-M	\$3,060.00	65%	\$ 1,071	Effective 5/30/2017
7705 SAR-W System and Accessories					
3HE07349AA	SAR-W with 5 Ethernet GigE ports, AC and DC Power	\$ 19,550	65%	\$ 6,843	
3HE07800AA	SAR-W Mounting Bracket Kit	\$ 850	65%	\$ 298	
3HE09389AA	SAR-W Strand Mounting Bracket	\$ 1,377	65%	\$ 482	
3HE09584AA	SAR-W Cosmetic Paintable Wrap Around	\$ 1,377	65%	\$ 482	
3HE09698AA	SAR-W and SAR-O Rack/Cabinet Mounting Bracket Kit	\$ 1,377	65%	\$ 482	
3HE07803BA	SAR-W DC Power Cable (12m)	\$ 850	65%	\$ 298	
7705 SAR-Wx Systems and Accessories					
3HE07614AA	SAR-Wx w 5 GigE & AC pwr	\$ 17,850	65%	\$ 6,248	
3HE07615AA	SAR-Wx w 5 GigE, GPS Rx & AC pwr	\$ 22,950	65%	\$ 8,033	
3HE07616AA	SAR-Wx w 5 GigE, PoE+, & AC pwr	\$ 19,550	65%	\$ 6,843	
3HE07617AA	SAR-Wx w 5 GigE,PoE+,GPS Rx & AC pwr	\$ 24,650	65%	\$ 8,628	
3HE07618AA	SAR-Wx w 4 GigE, 4p xDSL & AC pwr	\$ 19,550	65%	\$ 6,843	
3HE07619AA	SAR-Wx w 4 GigE,4p xDSL,GPS Rx & AC pwr	\$ 24,650	65%	\$ 8,628	
3HE07957AA	SAR-Wx Pole/Wall Mounting Bracket	\$ 1,275	65%	\$ 446	
3HE07958AA	SAR-Wx Strand Mounting Bracket	\$ 765	65%	\$ 268	
3HE07959AA	SAR-Wx GPS Antenna Mounting	\$ 850	65%	\$ 298	
3HE07960AA	SAR-Wx 0.35m GPS Cable	\$ 425	65%	\$ 149	
7705 SAR-W/Wx Common Accessories					
3HE07803AA	SAR-W/Wx AC Power Cable (12m)	\$ 680	65%	\$ 238	
3HE07801AA	Carrying Handle Kit for SAR-W or SAR-Wx	\$ 298	65%	\$ 104	
3HE07804AA	SAR-W/Wx Ethernet Cable Kit	\$ 595	65%	\$ 208	
3HE07804BA	SAR-W/Wx Ethernet Cable Kit (0.3m)	\$ 1,190	65%	\$ 417	
7705 SAR-X Systems and Accessories					
3HE08533AA	SAR-X (AC System)	\$ 41,735	65%	\$ 14,607	
3HE08534AA	SAR-X (DC System)	\$ 41,735	65%	\$ 14,607	
3HE08534BA	SAR-X (DC System) W/ CONFORMAL COAT	\$ 43,690	65%	\$ 15,292	
3HE09257AA	7705 SAR-X Air Filter Media replacement kit (10)	\$ 680	65%	\$ 238	
3HE08532BA	SAR-X (AC System) W/ CONFORMAL COAT	\$43,180.00	65%	\$ 15,113	Effective 5/30/2017
SAR Power Supply					
3HE05838AA	250W 120/240V AC power converter	\$ 2,635	65%	\$ 922	
3HE05837BA	7705 AC power converter pigtail - O-ring	\$ 442	65%	\$ 155	
3HE06972AA	100W High Voltage Power Supply for SAR-A/F/M	\$ 1,275	65%	\$ 446	
3HE06972AB	PSE Certified 100W High Voltage Power Supply	\$ 1,275	65%	\$ 446	New Effective 5/30/2017
3HE10447AA	AC POWER CABLE, LOCKING, 8FT, JAPAN	\$ 468	65%	\$ 164	
3HE10040AA	AC POWER CABLE, LOCKING, 6FT, NA	\$ 468	65%	\$ 164	
3HE10041AA	AC POWER CABLE, LOCKING, 8FT, EUR	\$ 468	65%	\$ 164	
GPS/GNSS Antennas					
3HE11035AA	GNSS ANTENNA 26 dB GAIN	\$ 2,720	65%	\$ 952	New Effective 5/30/2017
3HE11035AB	GNSS ANTENNA 40 dB GAIN	\$ 2,720	65%	\$ 952	New Effective 5/30/2017
3HE11036AA	GPS ANTENNA 26 dB GAIN	\$ 2,210	65%	\$ 774	New Effective 5/30/2017
3HE11036AB	GPS ANTENNA 40 dB GAIN	\$ 2,210	65%	\$ 774	New Effective 5/30/2017
7705 Software OS					
3HE02784HA	SAR RELEASE 6.2 BASIC OS LICENSE	\$ 1,445	65%	\$ 506	New Effective 5/30/2017
3HE05574EA	SAR-18 RELEASE 6.2 BASIC OS LICENSE	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE02784JA	SAR RELEASE 7.0 BASIC OS LICENSE	\$ 1,445	65%	\$ 506	
3HE02784KA	SAR RELEASE 8.0 BASIC OS LICENSE	\$ 1,445	65%	\$ 506	New Effective 5/30/2017
3HE05574FA	SAR-18 RELEASE 7.0 BASIC OS LICENSE	\$ 2,550	65%	\$ 893	
3HE05574GA	SAR-18 RELEASE 8.0 BASIC OS LICENSE	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
7705 Software OS Upgrades					
3HE02785HA	SAR RELEASE 6.2 BASIC OS UPGRADE	\$ 1,275	65%	\$ 446	New Effective 5/30/2017
3HE06681EA	SAR-18 RELEASE 6.2 BASIC OS UPGRADE	\$ 2,040	65%	\$ 714	New Effective 5/30/2017
3HE02785JA	SAR RELEASE 7.0 BASIC OS UPGRADE	\$ 1,275	65%	\$ 446	
3HE02785KA	SAR RELEASE 8.0 BASIC OS UPGRADE	\$ 1,275	65%	\$ 446	New Effective 5/30/2017
3HE06681FA	SAR-18 RELEASE 7.0 BASIC OS UPGRADE	\$ 2,040	65%	\$ 714	
3HE06681GA	SAR-18 RELEASE 8.0 BASIC OS UPGRADE	\$ 2,040	65%	\$ 714	New Effective 5/30/2017
7705 IPSEC (Basic, Upgrade, Full) RTUs					
3HE08607EA	RTU - 7705 SAR-8 Basic IPSEC LICENSE	\$ 3,910	65%	\$ 1,369	
3HE08607EB	RTU - 7705 SAR-8 UP-Basic to Full IPsec	\$ 5,831	65%	\$ 2,041	
3HE08607EC	RTU - 7705 SAR-8 Full IPsec LICENSE	\$ 7,650	65%	\$ 2,678	
3HE08607FA	RTU - 7705 SAR-18 Basic IPsec LICENSE	\$ 5,100	65%	\$ 1,785	
3HE08607FB	RTU - 7705 SAR-18 UP-Basic to Full IPsec	\$ 7,650	65%	\$ 2,678	
3HE08607FC	RTU - 7705 SAR-18 Full IPsec LICENSE	\$ 10,200	65%	\$ 3,570	
3HE08607HA	RTU - 7705 SAR-Ax Basic IPsec LICENSE	\$ 2,550	65%	\$ 893	New Effective 5/30/2017

3HE08607HB	RTU - 7705 SAR-Ax UP-Basic to Full IPsec	\$ 3,825	65%	\$ 1,339	New Effective 5/30/2017
3HE08607HC	RTU - 7705 SAR-Ax Full IPsec LICENSE	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE08607CA	RTU - 7705 SAR-W Basic IPsec LICENSE	\$ 2,550	65%	\$ 893	
3HE08607CB	RTU - 7705 SAR-W UP-Basic to Full IPsec	\$ 3,825	65%	\$ 1,339	
3HE08607CC	RTU - 7705 SAR-W Full IPsec LICENSE	\$ 5,100	65%	\$ 1,785	
3HE08607DA	RTU - 7705 SAR-Wx Basic IPsec LICENSE	\$ 2,550	65%	\$ 893	
3HE08607DB	RTU - 7705 SAR-Wx UP-Basic to Full IPsec	\$ 3,825	65%	\$ 1,339	
3HE08607DC	RTU - 7705 SAR-Wx Full IPsec LICENSE	\$ 5,100	65%	\$ 1,785	
3HE08607AA	RTU - 7705 SAR-H Basic IPsec LICENSE	\$ 2,550	65%	\$ 893	
3HE08607AB	RTU - 7705 SAR-H UP-Basic to Full IPsec	\$ 3,825	65%	\$ 1,339	
3HE08607AC	RTU - 7705 SAR-H Full IPsec LICENSE	\$ 5,100	65%	\$ 1,785	
3HE08607BA	RTU - 7705 SAR-Hc Basic IPsec LICENSE	\$ 2,550	65%	\$ 893	
3HE08607BB	RTU - 7705 SAR-Hc UP-Basic to Full IPsec	\$ 3,825	65%	\$ 1,339	
3HE08607BC	RTU - 7705 SAR-Hc Full IPsec LICENSE	\$ 5,100	65%	\$ 1,785	
3HE08607GA	RTU - 7705 SAR-X Basic IPsec LICENSE	\$ 3,910	65%	\$ 1,369	
3HE08607GB	RTU - 7705 SAR-X UP-Basic to Full IPsec	\$ 5,831	65%	\$ 2,041	
3HE08607GC	RTU - 7705 SAR-X Full IPsec LICENSE	\$ 7,650	65%	\$ 2,678	
7705 NGE RTUs					
3HE09259EA	RTU - 7705 SAR-8 NGE LICENSE	\$ 10,200	65%	\$ 3,570	
3HE09259FA	RTU - 7705 SAR-18 NGE LICENSE	\$ 13,600	65%	\$ 4,760	
3HE09259HA	7705 SAR-Ax NGE LICENSE	\$ 5,950	65%	\$ 2,083	New Effective 5/30/2017
3HE09259CA	RTU - 7705 SAR-W NGE LICENSE	\$ 5,950	65%	\$ 2,083	
3HE09259DA	RTU - 7705 SAR-Wx NGE LICENSE	\$ 5,950	65%	\$ 2,083	
3HE09259AA	RTU - 7705 SAR-H NGE LICENSE	\$ 5,950	65%	\$ 2,083	
3HE09259BA	RTU - 7705 SAR-Hc NGE LICENSE	\$ 5,950	65%	\$ 2,083	
3HE09259GA	RTU - 7705 SAR-X NGE LICENSE	\$ 13,600	65%	\$ 4,760	
7705 Encryption RTUs					
3HE09302CA	RTU -2P 10GE+4P GE 10G ETH ENCRYPTION	\$ 2,550	65%	\$ 893	
3HE09302AA	RTU-8 PORT GE SFP CARD V3 Encrypt	\$ 2,550	65%	\$ 893	
3HE09302BA	RTU -1P 10GE/10P 1GE 10G CARD V2 Encrypt	\$ 8,500	65%	\$ 2,975	
7705 Firewall RTUs					
3HE09747AA	RTU - 7705 SAR Basic SW FW LICENSE	\$ 3,400	65%	\$ 1,190	
3HE09747BA	RTU -8 PORT GE SFP CARD FW	\$ 3,400	65%	\$ 1,190	
3HE09747BB	RTU -2 PORT 10GIGE (RING) XFP CARD FW	\$ 3,400	65%	\$ 1,190	
3HE09747BC	RTU -Packet Microwave Card FW	\$ 3,400	65%	\$ 1,190	
3HE09747BD	RTU -1P 10GE/10P 1GE 10G CARD FW	\$ 10,200	65%	\$ 3,570	
3HE09747BE	RTU -6p Eth 10GE CARD FW	\$ 10,200	65%	\$ 3,570	
3HE09747CE	RTU HW SAR-Ax FW	\$ 3,400	65%	\$ 1,190	New Effective 5/30/2017
3HE09747CA	RTU HW SAR-H FW	\$ 3,400	65%	\$ 1,190	
3HE09747CB	RTU HW SAR-Hc FW	\$ 3,400	65%	\$ 1,190	
3HE09747CC	RTU HW SAR-Wx FW	\$ 3,400	65%	\$ 1,190	
3HE09747CD	RTU HW SAR-X FW	\$ 10,200	65%	\$ 3,570	
7705 SW Licenses					
3HE07354AA	RTU - 7705 SAR PoE LICENSE	\$ 1,360	65%	\$ 476	
3HE07354AB	RTU - 7705 IP Multicast LICENSE	\$ 2,890	65%	\$ 1,012	
3HE07354AC	RTU - 7705 IEEE1588 Time/Phase LICENSE	\$ 1,360	65%	\$ 476	
3HE11223AA	RTU - 7705 GNSS RTU	\$ 5,100	65%	\$ 1,785	New Effective 5/30/2017
3HE07354AF	MDDB RTU Software license	\$ 85,000	65%	\$ 29,750	
3HE07354AH	RTU - MDDB LICENSE (ADDITIONAL NODES)	\$ 3,400	65%	\$ 1,190	
3HE07354AJ	RTU - PCM MULTIDROP BRIDGING LICENSE	\$ 85,000	65%	\$ 29,750	New Effective 5/30/2017
3HE07354AK	RTU - PCM MULTIDROP BRIDGING (ADDITIONAL NODES)	\$ 3,400	65%	\$ 1,190	New Effective 5/30/2017
3HE07354AR	RTU - 7705 VPN Multicast LICENSE	\$ 2,890	65%	\$ 1,012	New Effective 5/30/2017
GigE Optics Modules					
3HE09500AA	SFP-100M FX SGMII 2KM ROHS6/6 -40/85C	\$ 680	65%	\$ 238	New Effective 5/30/2017
Passive Optical Cards/Modules					
3HE06582BA	SAR-M OADM Add/Drop CWDM 1471	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BB	SAR-M OADM Add/Drop CWDM 1491	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BC	SAR-M OADM Add/Drop CWDM 1511	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BD	SAR-M OADM Add/Drop CWDM 1531	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BE	SAR-M OADM Add/Drop CWDM 1551	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BF	SAR-M OADM Add/Drop CWDM 1571	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BG	SAR-M OADM Add/Drop CWDM 1591	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582BH	SAR-M OADM Add/Drop CWDM 1611	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AA	SAR-8/18 OADM Add/Drop CWDM 1471	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AB	SAR-8/18 OADM Add/Drop CWDM 1491	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AC	SAR-8/18 OADM Add/Drop CWDM 1511	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AD	SAR-8/18 OADM Add/Drop CWDM 1531	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AE	SAR-8/18 OADM Add/Drop CWDM 1551	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AF	SAR-8/18 OADM Add/Drop CWDM 1571	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AG	SAR-8/18 OADM Add/Drop CWDM 1591	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06582AH	SAR-8/18 OADM Add/Drop CWDM 1611	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE06583AA	SAR-8/18 OADM Add/Drop 1471/1491	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE06583AB	SAR-8/18 OADM Add/Drop 1511/1531	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE06583AC	SAR-8/18 OADM Add/Drop 1551/1571	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017

3HE06583AD	SAR-8/18 OADM Add/Drop 1591/1611	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE06584AA	SAR-8/18 OADM 4 color Add/Drop 1471/1491/1511/1531	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE06584AB	SAR-8/18 OADM 4 color Add/Drop 1551/1571/1591/1611	\$ 13,600	65%	\$ 4,760	New Effective 5/30/2017
3HE06585AA	SAR-8/18 8 Color Mux/Demux 1471-1611	\$ 17,000	65%	\$ 5,950	New Effective 5/30/2017
7705 SAR-O (Outdoor Passive Optical Chassis)					
3HE07939AA	SAR-O 2-Fiber CWDM 4color 1471-1531	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE07939BA	SAR-O 2-Fiber CWDM 4color 1551-1611	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE07939CA	SAR-O 2-Fiber CWDM 4 color 1271-1331	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE07939DA	SAR-O 2-Fiber CWDM 4 color 1351-1451	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09641AA	SAR-O 2-Fiber CWDM 2 color 1271/1291	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09642AA	SAR-O 2-Fiber CWDM 2 color 1311/1331	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09643AA	SAR-O 2-Fiber CWDM 2 color 1351/1371	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09644AA	SAR-O 2-Fiber CWDM 2 color 1431/1451	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09126AA	SAR-O 2-Fiber CWDM 2 color 1471/1491	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09127AA	SAR-O 2-Fiber CWDM 2 color 1511/1531	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09128AA	SAR-O 2-Fiber CWDM 2 color 1551/1571	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE09129AA	SAR-O 2-Fiber CWDM 2 color 1591/1611	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE07940AA	SAR-O 1-Fiber CWDM 8 color Mux (Up)	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
3HE07940BA	SAR-O 1-Fiber CWDM 8 color Mux (Dn)	\$ 16,150	65%	\$ 5,653	New Effective 5/30/2017
Outdoor Enclosures					
3HE07671AA	-48VDC PWR SURGE PROTECTOR	\$ 2,191	65%	\$ 767	
3HE08279BA	24VDC PWR SURGE PROTECTOR	\$ 2,647	65%	\$ 926	
3HE08279AA	AC PWR SURGE PROTECTOR	\$ 1,353	65%	\$ 474	
3HE07529AA	Ethernet Surge Protector with 4' CAT6 jumper	\$ 804	65%	\$ 281	
3HE07672AA	16-POS BRACKET ENET SURGE PROTECTORS	\$ 648	65%	\$ 227	
3HE07673AA	12-POS FIBER SPLICE & TERM TRAY	\$ 2,249	65%	\$ 787	
3HE07674AA	24-POS FIBER SPLICE & TERM TRAY	\$ 4,201	65%	\$ 1,470	
3HE07676AA	ALP-7705/7210 CABINET BATTERY CABLE KIT	\$ 886	65%	\$ 310	
3HE07678AA	ALP-7705/7210 CONCRETE ANCHOR PLATE	\$ 1,598	65%	\$ 559	
3HE07679AA	DC DISTRIBUTION / GMT FUSE PANEL	\$ 2,028	65%	\$ 710	
3HE07682AA	AC-DC RECTIFIER SHELF, PWR-ONE,W/O BATTERY BREAKER	\$ 6,895	65%	\$ 2,413	
3HE07683AA	AC-DC RECTIFIER SHELF, PWR-ONE,W/BATTERY BREAKER	\$ 9,019	65%	\$ 3,156	
7210 SAS					
7210 OS					
3HE11467AA	OS - 7210 SAS-K 2F6C4T Release 9.x	\$ 595	65%	\$ 208	New Effective 5/30/2017
3HE10218AA	OS - 7210-K Release 7.x ETR	\$ 442	65%	\$ 155	
3HE10757AA	OS - 7210 SAS-D Release 8.x (or upgrade to rel 8.x).	\$ 383	65%	\$ 134	New Effective 5/30/2017
3HE10758AA	OS - 7210 SAS-E Release 8.x (or upgrade to rel 8.x).	\$ 638	65%	\$ 223	New Effective 5/30/2017
3HE10759AA	OS - 7210 SAS-M Release 8.x (or upgrade to rel 8.x)	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE10760AA	OS - 7210 SAS-X Release 8.x (or upgrade to rel 8.x).	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE10218BA	OS - 7210 SAS-K 2F1C2T Release 8.x (or upgrade to release 8.x).	\$ 383	65%	\$ 134	New Effective 5/30/2017
3HE10218CA	OS-7210 SAS-K 2F1C2T Rel-9 SD	\$ 383	65%	\$ 134	New Effective 5/30/2017
3HE10757BA	OS -7210 SAS-D Rel 9.x or upg to rel 9.x	\$ 383	65%	\$ 134	New Effective 5/30/2017
3HE10758BA	OS -7210 SAS-E Rel 9.x or upg to rel 9.x	\$ 638	65%	\$ 223	New Effective 5/30/2017
3HE10759BA	OS -7210 SAS-M Rel 9.x or upg to rel 9.x	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE10760BA	OS -7210 SAS-X Rel 9.x or upg to rel 9.x	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE09507BA	OS - 7210 SAS-T Release 8.x (or upgrade to rel 8.x)	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE09507CA	OS -7210 SAS-T Rel 9.x or upg to rel 9.x	\$ 1,530	65%	\$ 536	New Effective 5/30/2017
3HE11468AA	RTU-7210 SAS-K 2F6C4T, IP svc License	\$ 340	65%	\$ 119	New Effective 5/30/2017
3HE09569AA	RTU - 7210 SAS-T IP Services License	\$ 680	65%	\$ 238	
3HE09570AA	RTU - 7210 SAS-T MPLS-TP Service License	\$ 680	65%	\$ 238	
3HE09571AA	RTU - 7210 SAS-T 1588v2 & Timing If Lic.	\$ 680	65%	\$ 238	
3HE06529AA	OS -7210 SAS-E Rls 2.x to Rls 3.0 Upgrade-	\$ 638	65%	\$ 223	Effective 5/30/2017
3HE06530AA	OS -7210 SAS-M Rls 2.x to Rls 3.0 Upgrade-	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE06531AA	OS -7210 SAS-X Rls 2.x to Rls 3.0 Upgrade-	\$ 2,550	65%	\$ 893	Effective 5/30/2017
3HE06912AA	OS -7210 SAS-D Rls 2.x to Rls 4.0 Upg	\$ 383	65%	\$ 134	Effective 5/30/2017
3HE06913AA	OS -7210 SAS-E Rls 2.x to Rls 4.0 Upg	\$ 638	65%	\$ 223	Effective 5/30/2017
3HE06914AA	OS -7210 SAS-M Rls 2.x to Rls 4.0 Upg	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE06911AA	OS -7210 SAS-X Rls 2.x to Rls 4.0 Upg	\$ 2,550	65%	\$ 893	Effective 5/30/2017
3HE07493AA	OS -7210 SAS-D Rls 4.x to Rls 5.0 Upg	\$ 383	65%	\$ 134	Effective 5/30/2017
3HE07494AA	OS -7210 SAS-E Rls 4.x to Rls 5.0 Upg	\$ 638	65%	\$ 223	Effective 5/30/2017
3HE07495AA	OS -7210 SAS-M Rls 4.x to Rls 5.0 Upg	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE07496AA	OS -7210 SAS-X Rls 4.x to Rls 5.0 Upg	\$ 2,550	65%	\$ 893	Effective 5/30/2017
3HE08215AA	OS -7210 SAS-D Release 5.x to Release 6.0 Upgrade	\$ 383	65%	\$ 134	Effective 5/30/2017
3HE08216AA	OS -7210 SAS-E Release 5.x to Release 6.0 Upgrade	\$ 638	65%	\$ 223	Effective 5/30/2017
3HE08217AA	OS -7210 SAS-M Release 5.x to Release 6.0 Upgrade	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE08218AA	OS -7210 SAS-X Release 5.x to Release 6.0 Upgrade	\$ 2,550	65%	\$ 893	Effective 5/30/2017
3HE09504AA	OS -7210 SAS-D Release 7.x	\$ 383	65%	\$ 134	Effective 5/30/2017
3HE09505AA	OS -7210 SAS-E Release 7.x	\$ 638	65%	\$ 223	Effective 5/30/2017
3HE09506AA	OS -7210 SAS-K Release 7.x	\$ 383	65%	\$ 134	Effective 5/30/2017
3HE09507AA	OS -7210 SAS-M Release 7.x	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE09508AA	OS -7210 SAS-T Release 7.x	\$ 1,190	65%	\$ 417	Effective 5/30/2017
3HE09509AA	OS -7210 SAS-X Release 7.x	\$ 2,550	65%	\$ 893	Effective 5/30/2017
7210 SAS-D Systems, Power Supplies and Accessories					

3HE05677AC	SYS - 7210 SAS-D 6F4T AC	\$ 2,431	65%	\$ 851	
3HE05676AC	SYS - 7210 SAS-D 6F4T ETR AC	\$ 3,485	65%	\$ 1,220	
3HE05676AD	SYS - 7210 SAS-D 6F4T ETR -48V DC	\$ 3,570	65%	\$ 1,250	
3HE06537AB	SYS - 7210 SAS-D 6F4T ETR +24V DC	\$ 3,655	65%	\$ 1,279	
3HE05677AD	SYS - 7210 SAS-D 6F4T -48V DC	\$ 2,508	65%	\$ 878	
3HE05681AD	SYS - 7210 SAS-D 6F4T AC w NAR Power Cord	\$ 2,431	65%	\$ 851	
3HE05681AE	SYS - 7210 SAS-D 6F4T AC w UK Power Cord	\$ 2,431	65%	\$ 851	
3HE05681AF	SYS - 7210 SAS-D 6F4T AC w EUR Power Cord	\$ 2,431	65%	\$ 851	
3HE05682AD	SYS - 7210 SAS-D 6F4T ETR AC w NAR Power Cord	\$ 3,485	65%	\$ 1,220	
3HE05682AE	SYS - 7210 SAS-D 6F4T ETR AC w UK Power Cord	\$ 3,485	65%	\$ 1,220	
3HE05682AF	SYS - 7210 SAS-D 6F4T ETR AC w EUR Power Cord	\$ 3,485	65%	\$ 1,220	
3HE06693AA	PS - 7210 SAS-D ETR External power supply AC	\$ 408	65%	\$ 143	
3HE06694AA	PS - 7210 SAS-D ETR External power supply DC -48V	\$ 442	65%	\$ 155	
3HE06695AA	PS - 7210 SAS-D ETR External power supply DC +24V	\$ 442	65%	\$ 155	
3HE06696AA	ACC - 7210 SAS-D rack mount kit	\$ 136	65%	\$ 48	
3HE06697AA	ACC - 7210 SAS-D ETR external PS tray	\$ 340	65%	\$ 119	
7210 SAS-E Systems					
3HE04698AA	SYS - 7210 SAS-E 12F12T	\$ 6,069	65%	\$ 2,124	
3HE04774AA	SYS - 7210 SAS-E 12F12T AC w NAR Power Cord	\$ 6,375	65%	\$ 2,231	
3HE04774AB	SYS - 7210 SAS-E 12F12T AC w UK Power Cord	\$ 6,375	65%	\$ 2,231	
3HE04774AC	SYS - 7210 SAS-E 12F12T AC w EUR Power Cord	\$ 6,375	65%	\$ 2,231	
3HE04410AC	SYS - 7210 SAS-E 12F12T AC	\$ 6,375	65%	\$ 2,231	
3HE04410AD	SYS - 7210 SAS-E 12F12T -48V DC	\$ 6,460	65%	\$ 2,261	
3HE06941AB	SYS - 7210 SAS-E 12F12T +24V DC	\$ 6,970	65%	\$ 2,440	
7210 SAS-K Systems & Accessories					
3HE09425AA	SYS - 7210 SAS-K 2F2T1C	\$ 2,380	65%	\$ 833	
3HE09426AA	SYS - 7210 SAS-K 2F2T1C ETR	\$ 3,230	65%	\$ 1,131	
3HE10959AA	SYS - 7210 SAS-K 2F4T6C	\$ 4,250	65%	\$ 1,488	New Effective 5/30/2017
3HE09749AA	ACC - SAS-K AC N-ETR PSCl NAR5	\$ 255	65%	\$ 89	
3HE09749AB	ACC - SAS-K AC N-ETR PSCB NAR1	\$ 204	65%	\$ 71	
3HE09750AA	ACC - SAS-K AC N-ETR PSCbl EUR	\$ 255	65%	\$ 89	
3HE09751AA	ACC - SAS-K AC N-ETR PS Cbl UK	\$ 340	65%	\$ 119	
3HE09752AA	PS - SAS-K AC Non-ETR PS 5 pck	\$ 638	65%	\$ 223	
3HE09752AB	PS - SAS-K AC Non-ETR PS (1)	\$ 306	65%	\$ 107	
3HE10962AA	PS - 7210 SAS-K 2F4T6C Non-ETR AC	\$ 442	65%	\$ 155	New Effective 5/30/2017
3HE10963AA	PS - 7210 SAS-K 2F4T6C Non-ETR -48V DC	\$ 825	65%	\$ 289	New Effective 5/30/2017
3HE09914AA	ACC - 7210 SAS-K non-ETR rack mount	\$ 510	65%	\$ 179	
3HE10027AA	ACC - 7210 SAS-K ETR rack mount	\$ 595	65%	\$ 208	
3HE10028AA	ACC - 7210 SAS-K ETR Wall mount	\$ 638	65%	\$ 223	
3HE10029AA	PS - 7210 SAS-K ETR AC power supply	\$ 595	65%	\$ 208	
3HE10030AA	PS - 7210 SAS-K ETR -48V DC power supply	\$ 612	65%	\$ 214	
3HE10219AA	PS - 7210 SAS-K ETR +24V DC power supply	\$ 680	65%	\$ 238	
7210 SAS-M Systems					
3HE04699AA	SYS - 7210 SAS-M 24F	\$ 11,645	65%	\$ 4,076	
3HE05828AA	SYS - 7210 SAS-M 24F2XFP	\$ 18,445	65%	\$ 6,456	
3HE06035AA	SYS - 7210 SAS-M 24F2XFP ETR	\$ 27,200	65%	\$ 9,520	
3HE05578AA	SYS - 7210 SAS-M24F AC w NAR Power Cord	\$ 11,900	65%	\$ 4,165	
3HE05578AB	SYS - 7210 SAS-M 24F AC w UK Power Cord	\$ 11,900	65%	\$ 4,165	
3HE05578AC	SYS - 7210 SAS-M 24F AC w EUR Power Cord	\$ 11,900	65%	\$ 4,165	
3HE05029AC	SYS - 7210 SAS M24F AC	\$ 11,900	65%	\$ 4,165	
3HE05029AD	SYS - 7210 SAS-M 24F -48V DC	\$ 12,070	65%	\$ 4,225	
3HE06534AB	SYS - 7210 SAS-M 24F + 24V DC	\$ 12,240	65%	\$ 4,284	
3HE05678AA	SYS - 7210 SAS-M 24F2XFP AC w NAR Power Cord	\$ 18,700	65%	\$ 6,545	
3HE05678AB	SYS - 7210 SAS-M 24F2XFP AC w UK Power Cord	\$ 18,700	65%	\$ 6,545	
3HE05678AC	SYS - 7210 SAS-M 24F2XFP AC w EUR Power Cord	\$ 18,700	65%	\$ 6,545	
3HE05679AD	SYS - 7210 SAS-M 24F2XFP ETR AC w NAR pc	\$ 27,795	65%	\$ 9,728	New Effective 5/30/2017
3HE05679AE	SYS - 7210 SAS-M 24F2XFP ETR AC W UK pc	\$ 27,795	65%	\$ 9,728	New Effective 5/30/2017
3HE05679AF	SYS - 7210 SAS-M 24F2XFP ETR AC W EUR pc	\$ 27,795	65%	\$ 9,728	New Effective 5/30/2017
3HE05168AB	SYS - 7210 SAS-M 24F2XFP AC	\$ 18,700	65%	\$ 6,545	
3HE05169AB	SYS - 7210 SAS-M 24F2XFP -48V DC	\$ 18,870	65%	\$ 6,605	
3HE06535AB	SYS - 7210 SAS-M 24F2XFP +24V DC	\$ 19,040	65%	\$ 6,664	
3HE05589AC	SYS - 7210 SAS-M 24F2XFP ETR AC	\$ 27,795	65%	\$ 9,728	New Effective 5/30/2017
3HE05590AC	SYS - 7210 SAS-M 24F2XFP ETR -48V DC	\$ 27,965	65%	\$ 9,788	New Effective 5/30/2017
3HE06536AB	SYS - 7210 SAS-M 24F2XFP ETR + 24V DC	\$ 29,835	65%	\$ 10,442	
3HE05679AA	SYS - 7210 SAS-M 24F2XFP ETR AC w NAR Power Cord	\$ 27,795	65%	\$ 9,728	Effective 5/30/2017
3HE05679AB	SYS - 7210 SAS-M 24F2XFP ETR AC w UK Power Cord	\$ 27,795	65%	\$ 9,728	Effective 5/30/2017
3HE05679AC	SYS - 7210 SAS-M 24F2XFP ETR AC w EUR Power Cord	\$ 27,795	65%	\$ 9,728	Effective 5/30/2017
3HE05589AB	SYS - 7210 SAS-M 24F2XFP ETR AC	\$ 27,795	65%	\$ 9,728	Effective 5/30/2017
3HE05590AB	SYS - 7210 SAS-M 24F2XFP ETR -48V DC	\$ 27,965	65%	\$ 9,788	Effective 5/30/2017
7210 SAS-Mxp Systems					
3HE10413AA	SYS - 7210 SAS-Mxp 22F 2C 45FP+ AC	\$ 19,805	65%	\$ 6,932	New Effective 5/30/2017
3HE10413AB	SYS - 7210 SAS-Mxp 22F 2C 45FP+ -48V DC	\$ 19,975	65%	\$ 6,991	New Effective 5/30/2017
3HE10413AC	SYS - 7210 SAS-Mxp 22F 2C 45FP+ +24V DC	\$ 20,145	65%	\$ 7,051	New Effective 5/30/2017
3HE10414AA	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR AC	\$ 29,410	65%	\$ 10,294	New Effective 5/30/2017

3HE10414AB	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR -48V DC	\$ 29,580	65%	\$ 10,353	New Effective 5/30/2017
3HE10414AC	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR +24V DC	\$ 30,260	65%	\$ 10,591	New Effective 5/30/2017
3HE10415AA	SYS - 7210 SAS-Mxp 22F 2C 45FP+ AC w NAR Power cord	\$ 19,890	65%	\$ 6,962	New Effective 5/30/2017
3HE10415AB	SYS - 7210 SAS-Mxp 22F 2C 45FP+ AC w UK Power Cord	\$ 19,890	65%	\$ 6,962	New Effective 5/30/2017
3HE10415AC	SYS - 7210 SAS-Mxp 22F 2C 45FP+ AC w EUR Power Cord	\$ 19,890	65%	\$ 6,962	New Effective 5/30/2017
3HE10416AA	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR AC w NAR Power cord	\$ 29,580	65%	\$ 10,353	New Effective 5/30/2017
3HE10416AB	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR AC w UK Power Cord	\$ 29,580	65%	\$ 10,353	New Effective 5/30/2017
3HE10416AC	SYS - 7210 SAS-Mxp 22F 2C 45FP+ ETR AC w EUR Power Cord	\$ 29,580	65%	\$ 10,353	New Effective 5/30/2017
3HE10417AA	OS - 7210 SAS-Mxp Release 8.x	\$ 1,530	65%	\$ 536	New Effective 5/30/2017
3HE10417BA	OS-7210 SAS-Mxp Rel-9 or upg to rel-9	\$ 1,530	65%	\$ 536	New Effective 5/30/2017
3HE10418AA	RTU - 7210 SAS-Mxp IP Services License	\$ 850	65%	\$ 298	New Effective 5/30/2017
3HE10420AA	RTU - 7210 SAS-Mxp 1588v2 & Timing If Lic.	\$ 850	65%	\$ 298	New Effective 5/30/2017
3HE10075AA	SYS - 7210 SAS-Mxp 22F2C45FP+	\$ 18,445	65%	\$ 6,456	New Effective 5/30/2017
3HE10076AA	SYS - 7210 SAS-Mxp 22F2C45FP+ ETR	\$ 27,200	65%	\$ 9,520	New Effective 5/30/2017
7210 SAS-T Systems					
3HE08116AA	SYS - 7210 SAS-T 12F 10T 4XFP	\$ 10,030	65%	\$ 3,511	
3HE08117AA	SYS -7210 SAS-T 12F 10T 4XFP ETR	\$ 13,090	65%	\$ 4,582	
3HE08362AA	SYS - 7210 SAS-T 12F 10T 4XFP AC	\$ 10,455	65%	\$ 3,659	
3HE08362AB	SYS - 7210 SAS-T 12F 10T 4XFP -48V DC	\$ 10,625	65%	\$ 3,719	
3HE08362AC	SYS - 7210 SAS-T 12F 10T 4XFP +24V DC	\$ 11,305	65%	\$ 3,957	
3HE08363AA	SYS - 7210 SAS-T 12F 10T 4XFP ETR AC	\$ 14,110	65%	\$ 4,939	
3HE08363AB	SYS - 7210 SAS-T 12F 10T 4XFP ETR -48V DC	\$ 14,450	65%	\$ 5,058	
3HE08363AC	SYS - 7210 SAS-T 12F 10T 4XFP ETR +24V DC	\$ 14,365	65%	\$ 5,028	
3HE08364AA	SYS - 7210 SAS-T 12F 10T 4XFP AC w NAR Power cord	\$ 10,625	65%	\$ 3,719	
3HE08364AB	SYS - 7210 SAS-T 12F 10T 4XFP AC w UK Power Cord	\$ 10,625	65%	\$ 3,719	
3HE08364AC	SYS - 7210 SAS-T 12F 10T 4XFP AC w EUR Power Cord	\$ 10,625	65%	\$ 3,719	
3HE08365AA	SYS - 7210 SAS-T 12F 10T 4XFP ETR AC w NAR Power cord	\$ 14,195	65%	\$ 4,968	
3HE08365AB	SYS - 7210 SAS-T 12F 10T 4XFP ETR AC w UK Power Cord	\$ 14,195	65%	\$ 4,968	
3HE08365AC	SYS - 7210 SAS-T 12F 10T 4XFP ETR AC w EUR Power Cord	\$ 14,195	65%	\$ 4,968	
7210 SAS-S Satellite Systems					
3HE10492AA	SYS - 7210 SAS-Sx 46F2C45FP+	\$ 14,450	65%	\$ 5,058	New Effective 5/30/2017
3HE10493AA	SYS - 7210 SAS-Sx 22F2C45FP+	\$ 12,495	65%	\$ 4,373	New Effective 5/30/2017
3HE10494AA	SYS - 7210 SAS-Sx 48T45FP+	\$ 13,898	65%	\$ 4,864	New Effective 5/30/2017
3HE10495AA	SYS - 7210 SAS-Sx 24T45FP+	\$ 12,512	65%	\$ 4,379	New Effective 5/30/2017
3HE10496AA	SYS - 7210 SAS-Sx 48Tp45FP+ (PoE)	\$ 15,768	65%	\$ 5,519	New Effective 5/30/2017
3HE10497AA	SYS - 7210 SAS-Sx 24Tp45FP+ (PoE)	\$ 13,133	65%	\$ 4,596	New Effective 5/30/2017
3HE11597AA	SYS - 7210 SAS-Sx 645FP+ 4Q5FP28	\$ 52,700	65%	\$ 18,445	New Effective 5/30/2017
3HE10835AA	SYS - 7210 SAS-Sx 645FP+ 4CFP4	\$ 52,700	65%	\$ 18,445	New Effective 5/30/2017
3HE10530AA	SYS - 7210 SAS-S 48F45FP+ (AC)	\$ 10,200	65%	\$ 3,570	New Effective 5/30/2017
3HE10531AA	SYS - 7210 SAS-S 48F45FP+ (DC -48)	\$ 10,498	65%	\$ 3,674	New Effective 5/30/2017
3HE10532AA	SYS - 7210 SAS-S 24F45FP+ (AC)	\$ 8,075	65%	\$ 2,826	New Effective 5/30/2017
3HE10533AA	SYS - 7210 SAS-S 24F45FP+ (DC -48)	\$ 8,670	65%	\$ 3,035	New Effective 5/30/2017
3HE10328AA	SYS - 7210 SAS-Sx SONET/SDH ETR DC	\$ 51,000	65%	\$ 17,850	New Effective 5/30/2017
3HE10866AA	OS-7210SAS-Sx R8.0 Base OS 1G standalone	\$ 1,700	65%	\$ 595	New Effective 5/30/2017
3HE10866BA	OS-7210 SAS-S/Sx 1/10 Rel-9 Base Lic S-A	\$ 1,700	65%	\$ 595	New Effective 5/30/2017
3HE11469AA	OS-7210 SAS-Sx 10/100 Rel-9 Base Lic S-A	\$ 8,500	65%	\$ 2,975	New Effective 5/30/2017
3HE11470AA	RTU-7210 SAS-Sx 10/100 IP svc Lic S-A	\$ 4,250	65%	\$ 1,488	New Effective 5/30/2017
3HE11471AA	OS-7210 SAS-Sx 10/100 Rel-9 Base Lic Sat	\$ 3,400	65%	\$ 1,190	New Effective 5/30/2017
3HE10867AA	RTU-7210SAS-Sx IP Srv-Lic 1G stand alone	\$ 1,020	65%	\$ 357	New Effective 5/30/2017
3HE10869AA	OS-7210SAS-Sx R8.0 Base OS 1G satellite	\$ 850	65%	\$ 298	New Effective 5/30/2017
3HE10869BA	OS-7210SAS-S/Sx 1/10 Rel-9 Base Lic Sat	\$ 850	65%	\$ 298	New Effective 5/30/2017
7210 SAS-S Power supplies and Accessories					
3HE10498AA	PS - 7210 SAS-Sx Power Supply AC (F)	\$ 1,275	65%	\$ 446	New Effective 5/30/2017
3HE10499AA	PS - 7210 SAS-Sx Power Supply DC -48V (F)	\$ 2,431	65%	\$ 851	New Effective 5/30/2017
3HE10500AA	PS - 7210 SAS-Sx Power Supply AC	\$ 1,088	65%	\$ 381	New Effective 5/30/2017
3HE10501AA	PS - 7210 SAS-Sx Power Supply DC -48V (T)	\$ 1,190	65%	\$ 417	New Effective 5/30/2017
3HE10502AA	PS - 7210 SAS-Sx Power Supply PoE AC	\$ 2,040	65%	\$ 714	New Effective 5/30/2017
3HE10503AA	ACC - 7210 SAS-Sx Fan Tray Filter (10)	\$ 2,550	65%	\$ 893	New Effective 5/30/2017
3HE10836AA	PS - 7210 SAS-Sx 645FP+4CFP4 NETR AC	\$ 1,360	65%	\$ 476	New Effective 5/30/2017
3HE10837AA	PS - 7210 SAS-Sx 645FP+4CFP4 NETR DC	\$ 3,060	65%	\$ 1,071	New Effective 5/30/2017
3HE10542AA	PS - 7210 SAS-S Power Supply AC	\$ 774	65%	\$ 271	New Effective 5/30/2017
3HE10543AA	PS - 7210 SAS-S Power Supply DC -48V	\$ 1,870	65%	\$ 655	New Effective 5/30/2017
7210 SAS-E/M/T/Mxp Power supplies and Accessories					
3HE06339AA	ACC-7210 SAS-E/M/T Fan tray filter (10)	\$ 425	65%	\$ 149	
3HE06338AA	ACC-7210 SAS-E/M/T 23" rack mount (5)	\$ 204	65%	\$ 71	
3HE09915AA	ACC-7210 SAS-E/M/T 19" rack mount (5)	\$ 298	65%	\$ 104	
3HE05581AA	PS - 7210 SAS-M ETR -48V DC Power Supply	\$ 1,360	65%	\$ 476	
3HE06336AA	PS - 7210 SAS-E/M ETR +24V DC Power supply	\$ 1,445	65%	\$ 506	
3HE04414AA	PS - 7210 SAS E/M/T AC PS (Non ETR)	\$ 442	65%	\$ 155	
3HE04414AB	PS-7210 SAS E/M AC PS (NON-ETR) 200 Watt	\$ 678	65%	\$ 237	New Effective 5/30/2017
3HE04415AA	PS - 7210 SAS E/M/T -48V DC PS (Non ETR)	\$ 621	65%	\$ 217	
3HE04415AB	PS-7210 SAS E/M DC PS (NON-ETR) 200 Watt	\$ 816	65%	\$ 286	New Effective 5/30/2017
3HE05580AB	PS - 7210 SAS-M/T/Mxp ETR (200W) AC Power Supply	\$ 1,054	65%	\$ 369	
3HE05581AB	PS - 7210 SAS-M/T/Mxp ETR -48V (200W) DC Power Supply	\$ 1,318	65%	\$ 461	

3HE06336AB	PS - 7210 SAS-M/T/Mxp ETR +24V (200W) DC Power Supply	\$ 1,318	65%	\$ 461	
3HE04416AA	FAN - 7210 SAS E/M/T Fan Tray (Spare)	\$ 238	65%	\$ 83	
3HE08605AA	ACC - 7210 SAS E/M/T/Mxp DC-Power input connector 10 Pack	\$ 204	65%	\$ 71	New Effective 5/30/2017
3HE09157AA	ACC - 7210 SAS-R6 DC-Power input connector 10 Pack	\$ 425	65%	\$ 149	
3HE05561AA	7210 SAS 4xT1/E1 CES Module	\$ 5,950	65%	\$ 2,083	Effective 5/30/2017
3HE06237AA	7210 SAS M-2XFP Module	\$ 6,460	65%	\$ 2,261	Effective 5/30/2017
3HE05580AA	PS - 7210 SAS M-ETR AC Power Supply	\$ 1,020	65%	\$ 357	Effective 5/30/2017
7210 SAS-X Systems and Accessories					
3HE05827AA	SYS - 7210 SAS-X 24F2XFP	\$ 38,250	65%	\$ 13,388	
3HE05170AB	SYS - 7210 SAS-X 24F2XFP AC	\$ 38,760	65%	\$ 13,566	
3HE05171AB	SYS - 7210 SAS-X 24F2XFP -48V DC	\$ 38,760	65%	\$ 13,566	
3HE05680AA	SYS - 7210 SAS-X 24F2XFP AC w NAR Power Cord	\$ 38,760	65%	\$ 13,566	
3HE05680AB	SYS - 7210 SAS-X 24F2XFP AC w UK Power Cord	\$ 38,760	65%	\$ 13,566	
3HE05680AC	SYS - 7210 SAS-X 24F2XFP AC w EUR Power Cord	\$ 38,760	65%	\$ 13,566	
3HE05172AA	PS - 7210 SAS-X AC Power Supply	\$ 1,224	65%	\$ 428	
3HE05173AA	PS - 7210 SAS-X -48V DC Power Supply	\$ 1,224	65%	\$ 428	
3HE06340AA	ACC- 7210 SAS-X Fan tray filter (5 pack)	\$ 935	65%	\$ 327	
3HE05174AA	FAN - 7210 SAS-X Fan Tray (Spare)	\$ 680	65%	\$ 238	
7210 SAS-R Chassis and appliances					
3HE08898AA	BNDL - 7210 SAS-R6	\$ 28,050	65%	\$ 9,818	
3HE10515AA	BNDL - 7210 SAS-R12	\$ 65,620	65%	\$ 22,967	
3HE08151AA	CHAS - 7210 SAS-R6 CHASSIS SPARE	\$ 8,500	65%	\$ 2,975	
3HE09427AA	CHAS - 7210 SAS-R12 CHASSIS SPARE	\$ 27,795	65%	\$ 9,728	New Effective 5/30/2017
3HE08152AA	FAN - 7210 SAS-R6 Fan Tray	\$ 1,275	65%	\$ 446	
3HE09428AA	FAN - 7210 SAS-R12 Fan Tray	\$ 6,205	65%	\$ 2,172	New Effective 5/30/2017
3HE08153AA	PEM - 7210 SAS-R6 -48V	\$ 1,148	65%	\$ 402	
3HE09429AA	PEM - 7210 SAS-R12 -48V	\$ 2,678	65%	\$ 937	New Effective 5/30/2017
3HE08154AB	SF/CPM - 7210 SAS-R6	\$ 15,938	65%	\$ 5,578	
3HE09430AA	SF/CPM - 7210 SAS-R12	\$ 24,735	65%	\$ 8,657	New Effective 5/30/2017
3HE08155AA	IMM - 7210 SAS-R 10SFP - 1XFP	\$ 7,225	65%	\$ 2,529	
3HE08156AA	IMM - 7210 SAS-R 10SFP	\$ 4,760	65%	\$ 1,666	
3HE08158AA	IMM - 7210 SAS-R 2XFP	\$ 6,120	65%	\$ 2,142	
3HE09152AA	IMM - 7210 SAS-R-b 10SFP - 1SFP+	\$ 8,075	65%	\$ 2,826	
3HE09153AA	IMM - 7210 SAS-R-b 2SFP+	\$ 7,225	65%	\$ 2,529	
3HE09154AA	IMM - 7210 SAS-R-b 4SFP+	\$ 8,415	65%	\$ 2,945	
3HE09155AA	IMM - 7210 SAS-R-b 11SFP/22cSFP	\$ 7,225	65%	\$ 2,529	
3HE09156AA	IMM - 7210 SAS-R-b 16TX	\$ 7,055	65%	\$ 2,469	
3HE08159AA	ACC - 7210 SAS-R IMM Impedance Panel	\$ 153	65%	\$ 54	
3HE08166AA	ACC - 7210 SAS-R6 SF/CPM Impedance Panel	\$ 204	65%	\$ 71	
3HE10441AA	ACC - 7210 SAS-R12 SF/CPM Impedance Panel	\$ 315	65%	\$ 110	New Effective 5/30/2017
3HE08167AA	ACC - 7210 SAS-R6 PEM Impedance Panel	\$ 153	65%	\$ 54	
3HE10439AA	ACC - 7210 SAS-R12 PEM Impedance Panel	\$ 315	65%	\$ 110	New Effective 5/30/2017
3HE08168AA	ACC - 7210 SAS-R6 Air Filter 5 pack	\$ 2,550	65%	\$ 893	
3HE09116AA	ACC - 7210 R6 ETSI Cabinet & Cable Management bracket	\$ 612	65%	\$ 214	
3HE09704AA	PS 7210 SAS-R AC Power shelve impedance panel	\$ 60	65%	\$ 21	New Effective 5/30/2017
3HE09431AA	PS 7210 SAS-R AC Power shelve	\$ 2,125	65%	\$ 744	
3HE09432AA	PS 7210 SAS-R AC Power modules	\$ 3,060	65%	\$ 1,071	
7210 SAS-R Software and software licenses					
3HE08996CA	OS - 7210 SAS-R Base OS License Release 8.x, (or upgrade to 8.x)	\$ 5,950	65%	\$ 2,083	New Effective 5/30/2017
3HE08996DA	OS-7210 SAS-R Lic Rel-9 or upg to Rel-9	\$ 5,950	65%	\$ 2,083	New Effective 5/30/2017
3HE08997AA	RTU - 7210 SAS-R IP Services License.	\$ 3,400	65%	\$ 1,190	
3HE08998AA	RTU - 7210 SAS-R MPLS-TP Services License.	\$ 2,550	65%	\$ 893	
3HE08999AA	RTU - 7210 SAS-R PTP/1588 & Timing Interfaces License.	\$ 2,550	65%	\$ 893	
3HE08996AA	OS - 7210 SAS R6 Base OS License, Rls 6.x	\$ 5,950	65%	\$ 2,083	Effective 5/30/2017
3HE08996BA	OS - 7210 SAS R6 Base OS License, Rls 7.x	\$ 5,950	65%	\$ 2,083	Effective 5/30/2017
Outdoor Enclosures					
3HE07278AA	7210 SAS-D Enclosure	\$ 5,789	65%	\$ 2,026	
3HE07527AA	ACC - -48VDC Power Surge Protector	\$ 2,885	65%	\$ 1,010	
3HE07528AA	ACC - +24VDC Power Surge Protection	\$ 3,199	65%	\$ 1,120	
3HE07530AA	ACC - Bracket, Ethernet Surge Protectors	\$ 447	65%	\$ 156	
3HE07531AA	ACC - Fiber Splice Tray, 12-pos	\$ 1,362	65%	\$ 477	
3HE07532AA	ACC - Fiber Slack Storage	\$ 354	65%	\$ 124	
3HE07533AA	ACC - Bracket, Redundant Power Supply	\$ 581	65%	\$ 203	
3HE07656AA	Rear Mounting Bracket, SAS-D Enclosure	\$ 848	65%	\$ 297	
3HE07670AA	ALP-7705/7210 5RU -48VDC UNVRSL CABINET	\$ 16,085	65%	\$ 5,630	Effective 5/30/2017
3HE07677AA	ALP-7705/7210 CABINET POLE MOUNT KIT	\$ 4,106	65%	\$ 1,437	Effective 5/30/2017
3HE08132AA	ACC +24VDC Cabinet Fan Kit	\$ 794	65%	\$ 278	Effective 5/30/2017
Outdoor Enclosures					
3HE08280AB	ALP-7705/7210 UNIVERSAL HEX CABINET	\$ 28,524	65%	\$ 9,984	New Effective 5/30/2017
3HE07675AB	ALP-7705/7210 CABINET BATT COMPARTMENT	\$ 4,495	65%	\$ 1,573	New Effective 5/30/2017
3HE07677AB	ALP-7705/7210 CABINET ONLY POLE MOUNT KIT	\$ 981	65%	\$ 343	New Effective 5/30/2017
3HE08278AA	24V TO (-48V) DC-DC 300W CONVERTER	\$ 1,219	65%	\$ 427	New Effective 5/30/2017
CMG					
CMG Instance and Capacity ASLs					

3HE11386AA	ASL CMG R9.0 SW Perpetual CMG Instance	\$ 643,000	65%	\$ 225,050	New Effective 5/30/2017
3HExxxxAA	ASL CMG R9.0 SW Perp CMG-a Instance	\$ 643,000	65%	\$ 225,050	New Effective 5/30/2017
3HE11387AA	ASL CMG Throughput 1 Gbps	\$ 86,000	65%	\$ 30,100	New Effective 5/30/2017
3HE11388AA	ASL CMG-SGW 10k MBB Subs	\$ 43,000	65%	\$ 15,050	New Effective 5/30/2017
3HE11389AA	ASL CMG-ePDG 10k MBB Subs	\$ 43,000	65%	\$ 15,050	New Effective 5/30/2017
3HE11390AA	ASL CMG-PGW 10k MBB Subs	\$ 86,000	65%	\$ 30,100	New Effective 5/30/2017
3HE11391AA	ASL CMG-SGW 10k IoT Devices	\$ 9,500	65%	\$ 3,325	New Effective 5/30/2017
3HE11392AA	ASL CMG-ePDG 10k IoT Devices	\$ 9,500	65%	\$ 3,325	New Effective 5/30/2017
3HE11393AA	ASL CMG-PGW 10k IoT Devices	\$ 19,000	65%	\$ 6,650	New Effective 5/30/2017
General CMG ASLs					
3HE11400AA	ASL CMG Real-time QoS 10k Subs	\$ 3,000	65%	\$ 1,050	New Effective 5/30/2017
3HE11401AA	ASL CMG Geo-Redundancy 10k Subs	\$ 5,000	65%	\$ 1,750	New Effective 5/30/2017
3HE11402AA	ASL CMG PCMD 10k Subs	\$ 3,000	65%	\$ 1,050	New Effective 5/30/2017
3HE11403AA	ASL CMG Optimized CloT 10k Devices	\$ 3,000	65%	\$ 1,050	New Effective 5/30/2017
CMG-PGW SGI ASLs					
3HE11404AA	ASL CMG Corporate VPN 25 Instances	\$ 5,000	65%	\$ 1,750	New Effective 5/30/2017
3HE11405AA	ASL CMG IPsec Tunneling 25 Tunnels	\$ 5,000	65%	\$ 1,750	New Effective 5/30/2017
3HE11406AA	ASL CMG NAT 10k Subs	\$ 3,930	65%	\$ 1,376	New Effective 5/30/2017
CMG-PGW AA ASLs					
3HE11394AA	ASL CMG-AA ID and Control 10k Subs	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11395AA	ASL CMG-AA ICAP Control 10k Subs	\$ 40,000	65%	\$ 14,000	New Effective 5/30/2017
3HE11396AA	ASL CMG-AA IBN 10k Subs	\$ 3,980	65%	\$ 1,393	New Effective 5/30/2017
3HE11397AA	ASL CMG-AA URL Filter 10k Subs	\$ 3,980	65%	\$ 1,393	New Effective 5/30/2017
3HE11398AA	ASL CMG-AA Stateful FW 10k Subs	\$ 15,590	65%	\$ 5,457	New Effective 5/30/2017
3HE11399AA	ASL CMG-AA RTP Perf 10k Subs	\$ 25,000	65%	\$ 8,750	New Effective 5/30/2017
CMG Instance and Capacity ASLs					
3HE11407AA	ASL CMG R9.0 SW - 12mo CMG Instance	\$ 215,000	65%	\$ 75,250	New Effective 5/30/2017
3HE11408AA	ASL CMG Throughput 1 Gbps - 12mo	\$ 29,000	65%	\$ 10,150	New Effective 5/30/2017
3HE11409AA	ASL CMG-SGW 10k MBB Subs - 12mo	\$ 14,000	65%	\$ 4,900	New Effective 5/30/2017
3HE11410AA	ASL CMG-ePDG 10k MBB Subs - 12mo	\$ 14,000	65%	\$ 4,900	New Effective 5/30/2017
3HE11411AA	ASL CMG-PGW 10k MBB Subs - 12mo	\$ 29,000	65%	\$ 10,150	New Effective 5/30/2017
3HE11412AA	ASL CMG-SGW 10k IoT Devices - 12mo	\$ 3,000	65%	\$ 1,050	New Effective 5/30/2017
3HE11413AA	ASL CMG-ePDG 10k IoT Devices - 12mo	\$ 3,000	65%	\$ 1,050	New Effective 5/30/2017
3HE11414AA	ASL CMG-PGW 10k IoT Devices - 12mo	\$ 6,000	65%	\$ 2,100	New Effective 5/30/2017
General CMG ASLs					
3HE11421AA	ASL CMG Real-time QoS 10k Subs - 12mo	\$ 1,000	65%	\$ 350	New Effective 5/30/2017
3HE11422AA	ASL CMG Sess Continuity 10k Subs - 12mo	\$ 1,666	65%	\$ 583	New Effective 5/30/2017
3HE11423AA	ASL CMG PCMD 10k Subs - 12mo	\$ 1,000	65%	\$ 350	New Effective 5/30/2017
3HE11424AA	ASL CMG Optimized CloT 10k Devices - 12mo	\$ 1,000	65%	\$ 350	New Effective 5/30/2017
CMG-PGW SGI ASLs					
3HE11425AA	ASL CMG Corporate VPN 25 Instances - 12mo	\$ 1,666	65%	\$ 583	New Effective 5/30/2017
3HE11426AA	ASL CMG IPsec Tunneling 25 Tunnels - 12mo	\$ 1,666	65%	\$ 583	New Effective 5/30/2017
3HE11427AA	ASL CMG NAT 10k Subs - 12mo	\$ 1,310	65%	\$ 459	New Effective 5/30/2017
CMG-PGW AA ASLs					
3HE11415AA	ASL CMG-AA ID and Control 10k Subs - 12mo	\$ 3,334	65%	\$ 1,167	New Effective 5/30/2017
3HE11416AA	ASL CMG-AA ICAP Control 10k Subs - 12mo	\$ 13,334	65%	\$ 4,667	New Effective 5/30/2017
3HE11417AA	ASL CMG-AA IBN 10k Subs - 12mo	\$ 1,326	65%	\$ 464	New Effective 5/30/2017
3HE11418AA	ASL CMG-AA URL Filter 10k Subs - 12mo	\$ 1,326	65%	\$ 464	New Effective 5/30/2017
3HE11419AA	ASL CMG-AA Stateful FW 10k Subs - 12mo	\$ 5,196	65%	\$ 1,819	New Effective 5/30/2017
3HE11420AA	ASL CMG-AA RTP Perf 10k Subs - 12mo	\$ 8,334	65%	\$ 2,917	New Effective 5/30/2017
CMU					
NDCHW0100			65%		New Effective 5/30/2017
3HE11575AA	OS - Compact Mobility Unit R1.0 Bundle	\$ 100,000	65%	\$ 35,000	New Effective 5/30/2017
3HE11348AA	ASL CMU 1k Subscribers	\$ 20,000	65%	\$ 7,000	New Effective 5/30/2017
3HE11349AA	ASL CMU 5k Subscribers	\$ 56,000	65%	\$ 19,600	New Effective 5/30/2017
3HE11350AA	ASL CMU 10k Subscribers	\$ 110,000	65%	\$ 38,500	New Effective 5/30/2017
CMM					
CMM Instance and Capacity ASLs					
3HE11604AA	ASL CMM 17 Perpetual CMM Instance	\$ 600,000	65%	\$ 210,000	New Effective 5/30/2017
3HE11605AA	ASL CMM-MME 10k MBB Subs	\$ 50,000	65%	\$ 17,500	New Effective 5/30/2017
3HE11606AA	ASL CMM-SGSN 10k MBB Subs	\$ 23,000	65%	\$ 8,050	New Effective 5/30/2017
3HE11607AA	ASL CMM-MME 10k IoT Devices	\$ 10,000	65%	\$ 3,500	New Effective 5/30/2017
3HE11608AA	ASL CMM-SGSN 10k IoT Devices	\$ 4,400	65%	\$ 1,540	New Effective 5/30/2017
3HE11609AA	ASL CMM 2G-3G Throughput 10 Mbps	\$ 1,980	65%	\$ 693	New Effective 5/30/2017
3HE11610AA	ASL CMM RoSA 1M BH Messages	\$ 4,000	65%	\$ 1,400	New Effective 5/30/2017
General CMM ASLs					
3HE11618AA	ASL CMM Session Restore 10k Subs	\$ 9,180	65%	\$ 3,213	New Effective 5/30/2017
3HE11611AA	ASL CMM PCMD-Traffic 10k Subs	\$ 8,880	65%	\$ 3,108	New Effective 5/30/2017
3HE11621AA	ASL CMM Control Roaming 10k Subs	\$ 1,980	65%	\$ 693	New Effective 5/30/2017
Internet of Things CMM ASLs					
3HE11614AA	ASL CMM Optimized CloT 10k Devices	\$ 1,980	65%	\$ 693	New Effective 5/30/2017
Service Enabling CMM ASLs					
3HE11613AA	ASL CMM VoLTE 10k Subs	\$ 2,280	65%	\$ 798	New Effective 5/30/2017
3HE11615AA	ASL CMM eMBMS 10k Subs	\$ 5,640	65%	\$ 1,974	New Effective 5/30/2017

3HE11619AA	ASL CMM Location Svcs 10k Subs	\$ 7,920	65%	\$ 2,772	New Effective 5/30/2017
3HE11616AA	ASL CMM Network Share 10k Subs	\$ 1,920	65%	\$ 672	New Effective 5/30/2017
3HE11620AA	ASL CMM Pub Safety Svcs 10k Subs	\$ 2,100	65%	\$ 735	New Effective 5/30/2017
Service Control CMM ASLs					
3HE11612AA	ASL CMM Smart Paging 10k Subs	\$ 1,740	65%	\$ 609	New Effective 5/30/2017
3HE11617AA	ASL CMM UE Load Balance 10k Subs	\$ 2,220	65%	\$ 777	New Effective 5/30/2017
CMM Instance and Capacity ASLs					
3HE11622AA	ASL CMM NS17 - 1 Year CMM Instance	\$ 200,000	65%	\$ 70,000	New Effective 5/30/2017
3HE11623AA	ASL CMM-MME 10k MBB Subs -12 mo	\$ 16,666	65%	\$ 5,833	New Effective 5/30/2017
3HE11624AA	ASL CMM-SGSN 10k MBB Subs -12 mo	\$ 7,666	65%	\$ 2,683	New Effective 5/30/2017
3HE11625AA	ASL CMM-MME 10k IoT Devices -12 mo	\$ 3,334	65%	\$ 1,167	New Effective 5/30/2017
3HE11626AA	ASL CMM-SGSN 10k IoT Devices -12 mo	\$ 1,466	65%	\$ 513	New Effective 5/30/2017
3HE11627AA	ASL CMM 2G/3G Throughput 10 Mbps -12 mo	\$ 660	65%	\$ 231	New Effective 5/30/2017
3HE11628AA	ASL CMM RoSA 1M BH Transactions -12 mo	\$ 1,334	65%	\$ 467	New Effective 5/30/2017
General CMM ASLs					
3HE11636AA	ASL CMM Session Restore 10k Subs -12 mo	\$ 3,060	65%	\$ 1,071	New Effective 5/30/2017
3HE11629AA	ASL CMM PCMD/Traffic 10k Subs -12 mo	\$ 2,960	65%	\$ 1,036	New Effective 5/30/2017
3HE11639AA	ASL CMM Control Roaming 10k Subs -12 mo	\$ 660	65%	\$ 231	New Effective 5/30/2017
Internet of Things CMM ASLs					
3HE11632AA	ASL CMM Optimized CloT 10k Devices -12 mo	\$ 660	65%	\$ 231	New Effective 5/30/2017
Service Enabling CMM ASLs					
3HE11631AA	ASL CMM VoLTE 10k Subs -12 mo	\$ 760	65%	\$ 266	New Effective 5/30/2017
3HE11633AA	ASL CMM eMBMS 10k Subs -12 mo	\$ 1,880	65%	\$ 658	New Effective 5/30/2017
3HE11637AA	ASL CMM Location Svcs 10k Subs -12 mo	\$ 2,640	65%	\$ 924	New Effective 5/30/2017
3HE11634AA	ASL CMM Network Share 10k Subs -12 mo	\$ 640	65%	\$ 224	New Effective 5/30/2017
3HE11638AA	ASL CMM Pub Safety Services 10k Subs -12 mo	\$ 700	65%	\$ 245	New Effective 5/30/2017
Service Control CMM ASLs					
3HE11630AA	ASL CMM Smart Paging 10k Subs -12 mo	\$ 1,740	65%	\$ 609	New Effective 5/30/2017
3HE116345AA	ASL CMM UE Load Balance 10k Subs -12 mo	\$ 2,220	65%	\$ 777	New Effective 5/30/2017
Nuage					
Management Applications Licenses					
3HE08287DA	VSD RTU	\$ 102,846	65%	\$ 35,996	New Effective 5/30/2017
3HE09434DA	VSD Cluster RTU	\$ 155,417	65%	\$ 54,396	New Effective 5/30/2017
3HE08289DA	VSC 1+1 RTU	\$ 45,703	65%	\$ 15,996	New Effective 5/30/2017
3HE08287CC	VSD R3.2 RTU	\$ 102,846	65%	\$ 35,996	New Effective 5/30/2017
3HE09434CC	VSD R3.2 Cluster RTU	\$ 155,417	65%	\$ 54,396	New Effective 5/30/2017
3HE08289CC	VSC R3.2 1+1 RTU	\$ 45,703	65%	\$ 15,996	New Effective 5/30/2017
Compute Management Integration Licenses					
3HE08290DA	VMware Integration RTU	\$ 45,703	65%	\$ 15,996	New Effective 5/30/2017
Virtual Routing and Switching Gateway (VRS-G) Licenses					
3HE09546DA	VRS-G-10G RTU	\$ 11,189	65%	\$ 3,916	New Effective 5/30/2017
3HE09495DA	VRS-G-40G RTU	\$ 38,846	65%	\$ 13,596	New Effective 5/30/2017
Virtual Routing and Switching ESXi (VRS-E) Licenses					
3HE09540DA	VRS-E-10G RTU	\$ 11,189	65%	\$ 3,916	New Effective 5/30/2017
3HE09469DA	VRS-E-40G RTU	\$ 38,846	65%	\$ 13,596	New Effective 5/30/2017
Virtual Routing and Switching KVM (VRS-K) Licenses					
3HE09542DA	VRS-K-10G RTU	\$ 11,189	65%	\$ 3,916	New Effective 5/30/2017
3HE09479DA	VRS-K-40G RTU	\$ 38,846	65%	\$ 13,596	New Effective 5/30/2017
Virtual Routing and Switching Hyper-V (VRS-H) Licenses					
3HE10778DA	VRS-H-10G RTU	\$ 11,189	65%	\$ 3,916	New Effective 5/30/2017
3HE10783DA	VRS-H-40G RTU	\$ 38,846	65%	\$ 13,596	New Effective 5/30/2017
Virtual Routing and Switching KVM Container (VRS-K-C) Licenses					
3HE10775DA	VRS-K-C-10G RTU	\$ 15,074	65%	\$ 5,276	New Effective 5/30/2017
3HE10776DA	VRS-K-C-40G RTU	\$ 52,560	65%	\$ 18,396	New Effective 5/30/2017
Virtual Routing and Switching Bare Metal (VRS-B) Licenses					
3HE11355DA	VRS-B-Linux-10G RTU	\$ 11,189	65%	\$ 3,916	New Effective 5/30/2017
3HE11356DA	VRS-B-Linux-40G RTU	\$ 38,846	65%	\$ 13,596	New Effective 5/30/2017
Virtualized Services Directory (VSD) and Virtualized Services Controller (VSC) Subscriptions					
3HE08281AA	VSD RTU Subscription	\$ 41,131	65%	\$ 14,396	New Effective 5/30/2017
3HE09435AA	VSD Cluster RTU Subscription	\$ 61,703	65%	\$ 21,596	New Effective 5/30/2017
3HE08283AA	VSC 1+1 RTU Subscription	\$ 18,274	65%	\$ 6,396	New Effective 5/30/2017
Compute Management Integration Subscriptions					
3HE08284AA	VMware Integration RTU Subscription	\$ 13,703	65%	\$ 4,796	New Effective 5/30/2017
Virtual Routing and Switching Gateway (VRS-G) Subscriptions					
3HE09547AA	S-VRS-G-10G RTU Subscription	\$ 4,560	65%	\$ 1,596	New Effective 5/30/2017
3HE09496AA	S-VRS-G-40G RTU Subscription	\$ 15,760	65%	\$ 5,516	New Effective 5/30/2017
Virtual Routing and Switching ESXi (VRS-E) Subscriptions					
3HE09541AA	S-VRS-E-10G RTU Subscription	\$ 4,560	65%	\$ 1,596	New Effective 5/30/2017
3HE09474AA	S-VRS-E-40G RTU Subscription	\$ 15,760	65%	\$ 5,516	New Effective 5/30/2017
Virtual Routing and Switching KVM (VRS-K) Subscriptions					
3HE09543AA	S-VRS-K-10G RTU Subscription	\$ 4,560	65%	\$ 1,596	New Effective 5/30/2017
3HE09484AA	S-VRS-K-40G RTU Subscription	\$ 15,760	65%	\$ 5,516	New Effective 5/30/2017
3HE10874CC	S-VRS-K-C-10G RTU Subscription	\$ 6,160	65%	\$ 2,156	New Effective 5/30/2017
3HE10875CC	S-VRS-K-C-40G RTU Subscription	\$ 21,474	65%	\$ 7,516	New Effective 5/30/2017

Virtual Routing and Switching Hyper-V (VRS-H) Subscriptions							
3HE10860DA	S-VRS-H-10G RTU Subscription	\$	4,560	65%	\$	1,596	New Effective 5/30/2017
3HE10865DA	S-VRS-H-40G RTU Subscription	\$	15,760	65%	\$	5,516	New Effective 5/30/2017
Virtual Routing and Switching KVM (VRS-B) Subscriptions							
3HE11357DA	S-VRS-B-Linux-10G RTU Subscription	\$	4,560	65%	\$	1,596	New Effective 5/30/2017
3HE11358DA	S-VRS-B-Linux-40G RTU Subscription	\$	15,531	65%	\$	5,436	New Effective 5/30/2017
Nuage 7850 Datacenter Switch/Router Bundles							
3HE08595AA	BNDL-7850 VSG AC-AC - F-R	\$	164,560	65%	\$	57,596	New Effective 5/30/2017
3HE08595BA	BNDL-7850 VSG AC-AC - R-F	\$	164,560	65%	\$	57,596	New Effective 5/30/2017
3HE08596AA	BNDL-7850 VSG DC-DC - F-R	\$	166,846	65%	\$	58,396	New Effective 5/30/2017
3HE08596BA	BNDL-7850 VSG DC-DC - R-F	\$	166,846	65%	\$	58,396	New Effective 5/30/2017
3HE08597AA	BNDL-7850 VSA AC-AC - F-R	\$	205,703	65%	\$	71,996	New Effective 5/30/2017
3HE08597BA	BNDL-7850 VSA AC-AC - R-F	\$	205,703	65%	\$	71,996	New Effective 5/30/2017
3HE08598AA	BNDL-7850 VSA DC-DC - F-R	\$	207,989	65%	\$	72,796	New Effective 5/30/2017
3HE08598BA	BNDL-7850 VSA DC-DC - R-F	\$	207,989	65%	\$	72,796	New Effective 5/30/2017
Nuage 7850 VSG/VSA Software Licenses							
3HE08695DA	OS - 7850 VSG/VSA R4.0 OS LICENSE	\$	11,417	65%	\$	3,996	New Effective 5/30/2017
3HE08695CC	OS - 7850 VSG/VSA R3.2 OS LICENSE	\$	11,417	65%	\$	3,996	New Effective 5/30/2017
3HE08696CC	fdVS-B-10G R3.2 RTU	\$	3,646	65%	\$	1,276	New Effective 5/30/2017
3HE09461CC	fdVRS-B-10G R3.2 RTU	\$	1,360	65%	\$	476	New Effective 5/30/2017
3HE08697CC	fdVS-B-40G R3.2 RTU	\$	14,617	65%	\$	5,116	New Effective 5/30/2017
3HE09462CC	fdVRS-B-40G R3.2 RTU	\$	5,474	65%	\$	1,916	New Effective 5/30/2017
3HE08698AA	OS - 7850 VSG Linux RTU	\$	6,846	65%	\$	2,396	New Effective 5/30/2017
Nuage VSP 3rd Party Gateway Software Licenses							
3HE11370DA	VTEP-10G RTU	\$	20,560	65%	\$	7,196	New Effective 5/30/2017
3HE11371DA	VTEP-40G RTU	\$	51,394	65%	\$	17,988	New Effective 5/30/2017
3HE11372DA	S-VTEP-10G RTU Subscription	\$	8,217	65%	\$	2,876	New Effective 5/30/2017
3HE11373DA	S-VTEP-40G RTU Subscription	\$	20,560	65%	\$	7,196	New Effective 5/30/2017
SFP+ Cables (Direct Attach)							
3HE08587AA	CBL - SFP+-SFP+ DAC 1m - 4PACK	\$	1,371	65%	\$	480	New Effective 5/30/2017
3HE08588AA	CBL - SFP+-SFP+ DAC 3m - 4PACK	\$	1,920	65%	\$	672	New Effective 5/30/2017
3HE08589AA	CBL - SFP+-SFP+ DAC 7m - 4PACK	\$	2,743	65%	\$	960	New Effective 5/30/2017
QSFP+ Cables (Direct Attach)							
3HE08590AA	CBL - QSFP+-QSFP+ DAC 1m - 4PACK	\$	4,114	65%	\$	1,440	New Effective 5/30/2017
3HE08591AA	CBL - QSFP+-QSFP+ DAC 3m - 4PACK	\$	5,029	65%	\$	1,760	New Effective 5/30/2017
3HE08592AA	CBL - QSFP+-QSFP+ DAC 7m - 4PACK	\$	5,943	65%	\$	2,080	New Effective 5/30/2017
QSFP+ to SFP+ Splitter Cables (Direct Attach)							
3HE08593AA	CBL - QSFP+-4xSFP+ Splitter 1m - 4PACK	\$	3,657	65%	\$	1,280	New Effective 5/30/2017
3HE08594AA	CBL - QSFP+-4xSFP+ Splitter 3m - 4PACK	\$	5,486	65%	\$	1,920	New Effective 5/30/2017
Nuage 7850 VSG/VSA Spares							
3HE08489AA	CHAS - 7850 VSG Chassis	\$	159,989	65%	\$	55,996	New Effective 5/30/2017
3HE08490AA	CHAS - 7850 VSA Chassis	\$	198,846	65%	\$	69,596	New Effective 5/30/2017
3HE08491AA	PS - 7850 VSG VSA AC 850W - F-R	\$	1,943	65%	\$	680	New Effective 5/30/2017
3HE08492AA	PS - 7850 VSG VSA DC 850W - F-R	\$	3,086	65%	\$	1,080	New Effective 5/30/2017
3HE08493AA	PS - 7850 VSG VSA AC 850W - R-F	\$	1,943	65%	\$	680	New Effective 5/30/2017
3HE08494AA	PS - 7850 VSG VSA DC 850W - R-F	\$	3,086	65%	\$	1,080	New Effective 5/30/2017
3HE08495AA	FAN - 7850 VSG VSA Fan Tray - F-R	\$	686	65%	\$	240	New Effective 5/30/2017
3HE08496AA	FAN - 7850 VSG VSA Fan Tray - R-F	\$	686	65%	\$	240	New Effective 5/30/2017
NSG-C Appliance							
3HE11203AA	SYS-7850 NSG-C 3T AC	\$	1,817	65%	\$	636	New Effective 5/30/2017
3HE11204AA	CBL - AC PWR CBL NSG-C 110V USA	\$	69	65%	\$	24	New Effective 5/30/2017
3HE11204AC	CBL - AC PWR CBL NSG-C EUR	\$	69	65%	\$	24	New Effective 5/30/2017
3HE11204AD	CBL - AC PWR CBL NSG-C GBR	\$	69	65%	\$	24	New Effective 5/30/2017
3HE11206AA	PS - 7850 NSG-C AC power supply	\$	194	65%	\$	68	New Effective 5/30/2017
NSG-C SW Licenses							
3HE11381DA	NSG-C Base Router RTU	\$	1,291	65%	\$	452	New Effective 5/30/2017
3HE11382DA	NSG-C VPN Router RTU	\$	480	65%	\$	168	New Effective 5/30/2017
3HE11383DA	NSG-C IPsec License	\$	446	65%	\$	156	New Effective 5/30/2017
3HE11384DA	NSG-C Bus Intel RTU	\$	217	65%	\$	76	New Effective 5/30/2017
3HE11385DA	NSG-C Service Chaining RTU	\$	217	65%	\$	76	New Effective 5/30/2017
NSG-E Appliance							
3HE09966AA	SYS - 7850 NSG-E 6T AC	\$	2,914	65%	\$	1,020	New Effective 5/30/2017
3HE09966AB	SYS - 7850 NSG-E 6T AC	\$	2,914	65%	\$	1,020	New Effective 5/30/2017
3HE10230AA	CBL - AC PWR CBL NSG-E 110V USA	\$	69	65%	\$	24	New Effective 5/30/2017
3HE10230AC	CBL - AC PWR CBL NSG-E EUR	\$	69	65%	\$	24	New Effective 5/30/2017
3HE10230AD	CBL - AC PWR CBL NSG-E GBR	\$	69	65%	\$	24	New Effective 5/30/2017
3HE11205AA	PS - 7850 NSG-E AC power supply	\$	194	65%	\$	68	New Effective 5/30/2017
NSG-X Appliance							
3HE10833AA	SYS - 7850 NSG-X 2SFP+ 4F 4T AC	\$	27,417	65%	\$	9,596	New Effective 5/30/2017
3HE10834AA	PS - 7850 NSG-X AC 300W	\$	971	65%	\$	340	New Effective 5/30/2017
NSG Base Router Licenses							
3HE09711DA	NSG-V Base Router RTU 100Mbps	\$	1,509	65%	\$	528	New Effective 5/30/2017
3HE09712DA	NSG-V Base Router RTU 200Mbps	\$	2,263	65%	\$	792	New Effective 5/30/2017
3HE09713DA	NSG-V Base Router RTU 500Mbps	\$	3,771	65%	\$	1,320	New Effective 5/30/2017

3HE09714DA	NSG-V Base Router RTU 1000Mbps	\$	7,543	65%	\$	2,640	New Effective 5/30/2017
3HE09715DA	NSG-V Base Router RTU 2000Mbps	\$	22,629	65%	\$	7,920	New Effective 5/30/2017
3HE09716DA	NSG-V Base Router RTU 10000Mbps	\$	27,154	65%	\$	9,504	New Effective 5/30/2017
NSG VPN Router Licenses							
3HE09717DA	NSG R4.0 VPN Router RTU 100Mbps	\$	686	65%	\$	240	New Effective 5/30/2017
3HE09718DA	NSG R4.0 VPN Router RTU 200Mbps	\$	1,029	65%	\$	360	New Effective 5/30/2017
3HE09719DA	NSG R4.0 VPN Router RTU 500Mbps	\$	1,714	65%	\$	600	New Effective 5/30/2017
3HE09720DA	NSG R4.0 VPN Router RTU 1000Mbps	\$	3,429	65%	\$	1,200	New Effective 5/30/2017
3HE09721DA	NSG R4.0 VPN Router RTU 2000Mbps	\$	10,286	65%	\$	3,600	New Effective 5/30/2017
3HE09722DA	NSG R4.0 VPN Router RTU 10000Mbps	\$	12,343	65%	\$	4,320	New Effective 5/30/2017
NSG ACL Licenses							
3HE09723DA	NSG ACL RTU 100Mbps	\$	126	65%	\$	44	New Effective 5/30/2017
3HE09724DA	NSG ACL RTU 200Mbps	\$	194	65%	\$	68	New Effective 5/30/2017
3HE09725DA	NSG ACL RTU 500Mbps	\$	320	65%	\$	112	New Effective 5/30/2017
3HE09726DA	NSG ACL RTU 1000Mbps	\$	629	65%	\$	220	New Effective 5/30/2017
3HE09727DA	NSG ACL RTU 2000Mbps	\$	1,886	65%	\$	660	New Effective 5/30/2017
3HE09728DA	NSG ACL RTU 10000Mbps	\$	2,263	65%	\$	792	New Effective 5/30/2017
NSG NAT/PAT Licenses							
3HE09729DA	NSG NAT/PAT RTU 100Mbps	\$	194	65%	\$	68	New Effective 5/30/2017
3HE09730DA	NSG NAT/PAT RTU 200Mbps	\$	286	65%	\$	100	New Effective 5/30/2017
3HE09731DA	NSG NAT/PAT RTU 500Mbps	\$	480	65%	\$	168	New Effective 5/30/2017
3HE09732DA	NSG NAT/PAT RTU 1000Mbps	\$	949	65%	\$	332	New Effective 5/30/2017
3HE09733DA	NSG NAT/PAT RTU 2000Mbps	\$	2,834	65%	\$	992	New Effective 5/30/2017
3HE09734DA	NSG NAT/PAT RTU 10000Mbps	\$	3,394	65%	\$	1,188	New Effective 5/30/2017
3HE09729CC	NSG R3.2 NAT/PAT RTU 100Mbps	\$	194	65%	\$	68	New Effective 5/30/2017
3HE09730CC	NSG R3.2 NAT/PAT RTU 200Mbps	\$	286	65%	\$	100	New Effective 5/30/2017
3HE09731CC	NSG R3.2 NAT/PAT RTU 500Mbps	\$	480	65%	\$	168	New Effective 5/30/2017
3HE09732CC	NSG R3.2 NAT/PAT RTU 1000Mbps	\$	949	65%	\$	332	New Effective 5/30/2017
3HE09733CC	NSG R3.2 NAT/PAT RTU 2000Mbps	\$	2,834	65%	\$	992	New Effective 5/30/2017
3HE09734CC	NSG R3.2 NAT/PAT RTU 10000Mbps	\$	3,394	65%	\$	1,188	New Effective 5/30/2017
NSG IPsec Licenses							
3HE10871DA	NSG IPsec RTU 100Mbps	\$	629	65%	\$	220	New Effective 5/30/2017
3HE10872DA	NSG IPsec RTU 200Mbps	\$	949	65%	\$	332	New Effective 5/30/2017
3HE10873DA	NSG IPsec RTU 500Mbps	\$	1,577	65%	\$	552	New Effective 5/30/2017
3HE10875DA	NSG IPsec RTU 1000Mbps	\$	3,143	65%	\$	1,100	New Effective 5/30/2017
3HE10876DA	NSG IPsec RTU 2000Mbps	\$	9,429	65%	\$	3,300	New Effective 5/30/2017
3HE10874DA	NSG IPsec RTU 10000Mbps	\$	11,314	65%	\$	3,960	New Effective 5/30/2017
NSG Border Router Licenses							
3HE11367AA	NSG R4.0 Border Router RTU 1Gbps	\$	33,131	65%	\$	11,596	New Effective 5/30/2017
3HE11368AA	NSG R4.0 Border Router RTU 2Gbps	\$	39,531	65%	\$	13,836	New Effective 5/30/2017
3HE11369AA	NSG R4.0 Border Router RTU 10Gbps	\$	118,846	65%	\$	41,596	New Effective 5/30/2017
NSG Business Intelligence Licenses							
3HE09735DA	NSG Bus Intel RTU 100Mbps	\$	320	65%	\$	112	New Effective 5/30/2017
3HE09736DA	NSG Bus Intel RTU 200Mbps	\$	480	65%	\$	168	New Effective 5/30/2017
3HE09737DA	NSG Bus Intel RTU 500Mbps	\$	789	65%	\$	276	New Effective 5/30/2017
3HE09738DA	NSG Bus Intel RTU 1000Mbps	\$	1,577	65%	\$	552	New Effective 5/30/2017
3HE09739DA	NSG Bus Intel RTU 2000Mbps	\$	4,720	65%	\$	1,652	New Effective 5/30/2017
3HE09740DA	NSG Bus Intel RTU 10000Mbps	\$	5,657	65%	\$	1,980	New Effective 5/30/2017
3HE09735CC	NSG R3.2 Bus Intel RTU 100Mbps	\$	320	65%	\$	112	New Effective 5/30/2017
3HE09736CC	NSG R3.2 Bus Intel RTU 200Mbps	\$	480	65%	\$	168	New Effective 5/30/2017
3HE09737CC	NSG R3.2 Bus Intel RTU 500Mbps	\$	789	65%	\$	276	New Effective 5/30/2017
3HE09738CC	NSG R3.2 Bus Intel RTU 1000Mbps	\$	1,577	65%	\$	552	New Effective 5/30/2017
3HE09739CC	NSG R3.2 Bus Intel RTU 2000Mbps	\$	4,720	65%	\$	1,652	New Effective 5/30/2017
3HE09740CC	NSG R3.2 Bus Intel RTU 10000Mbps	\$	5,657	65%	\$	1,980	New Effective 5/30/2017
NSG Service Chaining Licenses							
3HE09741DA	NSG Service Chaining RTU 100Mbps	\$	320	65%	\$	112	New Effective 5/30/2017
3HE09742DA	NSG Service Chaining RTU 200Mbps	\$	480	65%	\$	168	New Effective 5/30/2017
3HE09743DA	NSG Service Chaining RTU 500Mbps	\$	789	65%	\$	276	New Effective 5/30/2017
3HE09744DA	NSG Service Chaining RTU 1000Mbps	\$	1,577	65%	\$	552	New Effective 5/30/2017
3HE09745DA	NSG Service Chaining RTU 2000Mbps	\$	4,720	65%	\$	1,652	New Effective 5/30/2017
3HE09746DA	NSG Service Chaining RTU 10000Mbps	\$	5,657	65%	\$	1,980	New Effective 5/30/2017
NSG-C SW Subscription Licenses							
3HE11687DA	NSG-C Base Router RTU Subscription	\$	529	65%	\$	185	New Effective 5/30/2017
3HE11688DA	NSG-C VPN Router RTU Subscription	\$	197	65%	\$	69	New Effective 5/30/2017
3HE11689DA	NSG-C IPsec License Subscription	\$	183	65%	\$	64	New Effective 5/30/2017
3HE11690DA	NSG-C Bus Intel RTU Subscription	\$	89	65%	\$	31	New Effective 5/30/2017
3HE11691DA	NSG-C Service Chaining RTU Subscription	\$	89	65%	\$	31	New Effective 5/30/2017
NSG Base Router Subscription Licenses							
3HE11648DA	NSG-V Base Router RTU Subscription 100Mbps	\$	619	65%	\$	216	New Effective 5/30/2017
3HE11649DA	NSG-V Base Router RTU Subscription 200Mbps	\$	928	65%	\$	325	New Effective 5/30/2017
3HE11650DA	NSG-V Base Router RTU Subscription 500Mbps	\$	1,546	65%	\$	541	New Effective 5/30/2017
3HE11651DA	NSG-V Base Router RTU Subscription 1000Mbps	\$	3,093	65%	\$	1,082	New Effective 5/30/2017
3HE11652DA	NSG-V Base Router RTU Subscription 2000Mbps	\$	9,278	65%	\$	3,247	New Effective 5/30/2017
3HE11653DA	NSG-V Base Router RTU Subscription 10000Mbps	\$	11,133	65%	\$	3,897	New Effective 5/30/2017

NSG VPN Router Subscription Licenses							
3HE11654DA	NSG VPN Router RTU Subscription 100Mbps	\$	281	65%	\$	98	New Effective 5/30/2017
3HE11655DA	NSG VPN Router RTU Subscription 200Mbps	\$	422	65%	\$	148	New Effective 5/30/2017
3HE11656DA	NSG VPN Router RTU Subscription 500Mbps	\$	703	65%	\$	246	New Effective 5/30/2017
3HE11657DA	NSG VPN Router RTU Subscription 1000Mbps	\$	1,406	65%	\$	492	New Effective 5/30/2017
3HE11658DA	NSG VPN Router RTU Subscription 2000Mbps	\$	4,217	65%	\$	1,476	New Effective 5/30/2017
3HE11659DA	NSG VPN Router RTU Subscription 10000Mbps	\$	5,061	65%	\$	1,771	New Effective 5/30/2017
NSG ACL Subscription Licenses							
3HE11692DA	NSG ACL RTU Subscription 100Mbps	\$	52	65%	\$	18	New Effective 5/30/2017
3HE11693DA	NSG ACL RTU Subscription 200Mbps	\$	80	65%	\$	28	New Effective 5/30/2017
3HE11694DA	NSG ACL RTU Subscription 500Mbps	\$	131	65%	\$	46	New Effective 5/30/2017
3HE11695DA	NSG ACL RTU Subscription 1000Mbps	\$	258	65%	\$	90	New Effective 5/30/2017
3HE11696DA	NSG ACL RTU Subscription 2000Mbps	\$	773	65%	\$	271	New Effective 5/30/2017
3HE11697DA	NSG ACL RTU 10000Mbps Subscription	\$	928	65%	\$	325	New Effective 5/30/2017
NSG NAT/PAT Subscription Licenses							
3HE11660DA	NSG NAT/PAT RTU Subscription 100Mbps	\$	80	65%	\$	28	New Effective 5/30/2017
3HE11661DA	NSG NAT/PAT RTU Subscription 200Mbps	\$	117	65%	\$	41	New Effective 5/30/2017
3HE11662DA	NSG NAT/PAT RTU Subscription 500Mbps	\$	197	65%	\$	69	New Effective 5/30/2017
3HE11663DA	NSG NAT/PAT RTU Subscription 1000Mbps	\$	389	65%	\$	136	New Effective 5/30/2017
3HE11664DA	NSG NAT/PAT RTU Subscription 2000Mbps	\$	1,162	65%	\$	407	New Effective 5/30/2017
3HE11665DA	NSG NAT/PAT RTU Subscription 10000Mbps	\$	1,392	65%	\$	487	New Effective 5/30/2017
NSG Ipv6 Subscription Licenses							
3HE11666DA	NSG Ipv6 RTU Subscription 100Mbps	\$	258	65%	\$	90	New Effective 5/30/2017
3HE11667DA	NSG Ipv6 RTU Subscription 200Mbps	\$	389	65%	\$	136	New Effective 5/30/2017
3HE11668DA	NSG Ipv6 RTU Subscription 500Mbps	\$	647	65%	\$	226	New Effective 5/30/2017
3HE11669DA	NSG Ipv6 RTU Subscription 1000Mbps	\$	1,289	65%	\$	451	New Effective 5/30/2017
3HE11670DA	NSG Ipv6 RTU Subscription 2000Mbps	\$	3,866	65%	\$	1,353	New Effective 5/30/2017
3HE11671DA	NSG Ipv6 RTU Subscription 10000Mbps	\$	4,639	65%	\$	1,624	New Effective 5/30/2017
NSG Border Router Subscription Licenses							
3HE11672DA	NSG Border Router RTU Subscription 1Gbps	\$	13,584	65%	\$	4,754	New Effective 5/30/2017
3HE11673DA	NSG Border Router RTU Subscription 2Gbps	\$	16,208	65%	\$	5,673	New Effective 5/30/2017
3HE11674DA	NSG Border Router RTU Subscription 10Gbps	\$	48,727	65%	\$	17,054	New Effective 5/30/2017
NSG Business Intelligence Subscription Licenses							
3HE11675DA	NSG Bus Intel RTU Subscription 100Mbps	\$	131	65%	\$	46	New Effective 5/30/2017
3HE11676DA	NSG Bus Intel RTU Subscription 200Mbps	\$	197	65%	\$	69	New Effective 5/30/2017
3HE11677DA	NSG Bus Intel RTU Subscription 500Mbps	\$	323	65%	\$	113	New Effective 5/30/2017
3HE11678DA	NSG Bus Intel RTU Subscription 1000Mbps	\$	647	65%	\$	226	New Effective 5/30/2017
3HE11679DA	NSG Bus Intel RTU Subscription 2000Mbps	\$	1,935	65%	\$	677	New Effective 5/30/2017
3HE11680DA	NSG Bus Intel RTU Subscription 10000Mbps	\$	2,319	65%	\$	812	New Effective 5/30/2017
NSG Service Chaining Subscription Licenses							
3HE11681DA	NSG Service Chaining RTU Subscription 100Mbps	\$	131	65%	\$	46	New Effective 5/30/2017
3HE11682DA	NSG Service Chaining RTU Subscription 200Mbps	\$	197	65%	\$	69	New Effective 5/30/2017
3HE11683DA	NSG Service Chaining RTU Subscription 500Mbps	\$	323	65%	\$	113	New Effective 5/30/2017
3HE11684DA	NSG Service Chaining RTU Subscription 1000Mbps	\$	647	65%	\$	226	New Effective 5/30/2017
3HE11685DA	NSG Service Chaining RTU Subscription 2000Mbps	\$	1,935	65%	\$	677	New Effective 5/30/2017
3HE11686DA	NSG Service Chaining RTU Subscription 10000Mbps	\$	2,319	65%	\$	812	New Effective 5/30/2017
Virtualized Security Services (VSS) Licenses							
3HE11557AA	VSS-L4-DataSource-VRS-10G	\$	2,800	65%	\$	980	New Effective 5/30/2017
3HE11558AA	VSS-L4-DataSource-VRS-40G	\$	9,714	65%	\$	3,400	New Effective 5/30/2017
3HE11561AA	VSS-L4-Security-Insights-Alerts-Act-VSD	\$	22,834	65%	\$	7,992	New Effective 5/30/2017
3HE11565DA	VSS-L4-DataSource-NSG-100M	\$	377	65%	\$	132	New Effective 5/30/2017
3HE11566DA	VSS-L4-DataSource-NSG-200M	\$	571	65%	\$	200	New Effective 5/30/2017
3HE11567DA	VSS-L4-DataSource-NSG-500M	\$	949	65%	\$	332	New Effective 5/30/2017
3HE11568DA	VSS-L4-DataSource-NSG-1G	\$	1,886	65%	\$	660	New Effective 5/30/2017
3HE11569DA	VSS-L4-DataSource-NSG-2G	\$	5,657	65%	\$	1,980	New Effective 5/30/2017
3HE11570DA	VSS-L4-DataSource-NSG-10G	\$	6,743	65%	\$	2,360	New Effective 5/30/2017
Virtualized Security Services (VSS) Subscriptions							
3HE11559AA	S-VSS-L4-DataSource-VRS-10G Subscription	\$	1,120	65%	\$	392	New Effective 5/30/2017
3HE11560AA	S-VSS-L4-DataSource-VRS-40G Subscription	\$	3,886	65%	\$	1,360	New Effective 5/30/2017
3HE11562AA	S-VSS-L4-Security-Insights-Alerts-Action-VSD Subscription	\$	13,703	65%	\$	4,796	New Effective 5/30/2017
3HE11642DA	VSS-L4-DataSource-NSG-100M Subscription	\$	155	65%	\$	54	New Effective 5/30/2017
3HE11643DA	VSS-L4-DataSource-NSG-200M Subscription	\$	234	65%	\$	82	New Effective 5/30/2017
3HE11644DA	VSS-L4-DataSource-NSG-500M Subscription	\$	389	65%	\$	136	New Effective 5/30/2017
3HE11645DA	VSS-L4-DataSource-NSG-1G Subscription	\$	773	65%	\$	271	New Effective 5/30/2017
3HE11646DA	VSS-L4-DataSource-NSG-2G Subscription	\$	2,319	65%	\$	812	New Effective 5/30/2017
3HE11647DA	VSS-L4-DataSource-NSG-10G Subscription	\$	2,765	65%	\$	968	New Effective 5/30/2017



NETWORK MANAGEMENT

Part No	Description	NASPO MSRP	Discount %	Unit Price	
5620 Service Aware Manager (SAM)					
3HE00210NA	5620 SAM R12 OPERATOR POSITION	\$8,500	65%	\$ 2,975.00	New Effective 5/30/2017
3HE00210PA	5620 SAM R13 OPERATOR POSITION	\$8,500	65%	\$ 2,975.00	
3HE00210QA	5620 SAM R14 OPERATOR POSITION	\$8,110	65%	\$ 2,838.42	
3HE00220NA	5620 SAM-E R12 LICENSE - 7750/7710 MDA	\$3,230	65%	\$ 1,130.50	New Effective 5/30/2017
3HE00220NB	5620 SAM-E LIC UPG- R12 - 7750/7710 MDA	\$1,615	65%	\$ 565.25	New Effective 5/30/2017
3HE00220PA	5620 SAM-E R13 LICENSE - 7750/7710 MDA	\$3,230	65%	\$ 1,130.50	
3HE00220PB	5620 SAM-E LIC UPG- R13 - 7750/7710 MDA	\$1,615	65%	\$ 565.25	New Effective 5/30/2017
3HE00323NA	5620 SAM-E R12 LICENSE -7450 Series MDA	\$1,870	65%	\$ 654.50	New Effective 5/30/2017
3HE00323NB	5620 SAM-E LIC. UPG. TO R12 - 7450 MDA	\$935	65%	\$ 327.25	New Effective 5/30/2017
3HE00323PA	5620 SAM-E R13 LICENSE -7450 Series MDA	\$1,870	65%	\$ 654.50	
3HE00323PB	5620 SAM-E LIC. UPG. TO R13 - 7450 MDA	\$935	65%	\$ 327.25	New Effective 5/30/2017
3HE00407LA	5620 SAM SMALL LAB SSP WITH 3 YEAR UPG's	\$85,000	65%	\$ 29,750.00	New Effective 5/30/2017
3HE00407LB	5620 SAM MED. LAB SSP WITH 3 YEAR UPG's	\$163,495	65%	\$ 57,223.35	New Effective 5/30/2017
3HE00407LC	5620 SAM LARGE. LAB SSP WITH 3 YEAR UPG's	\$322,049	65%	\$ 112,717.18	New Effective 5/30/2017
3HE00407LD	5620 SAM SMALL LAB SSP EXT. 3 YEAR UPG's	\$21,760	65%	\$ 7,616.00	New Effective 5/30/2017
3HE00407LE	5620 SAM MED. LAB SSP EXT. 3 YEAR UPG's	\$43,520	65%	\$ 15,232.00	New Effective 5/30/2017
3HE00407LF	5620 SAM LARGE LAB SSP EXT. 3 YEAR UPG's	\$87,040	65%	\$ 30,464.00	New Effective 5/30/2017
3HE00660NA	5620 SAM-O R12 LICENSE	\$51,000	65%	\$ 17,850.00	New Effective 5/30/2017
3HE00660NB	5620 SAM-O LIC. UPG. TO R12	\$25,500	65%	\$ 8,925.00	New Effective 5/30/2017
3HE00660PA	5620 SAM-O R13 LICENSE	\$51,000	65%	\$ 17,850.00	
3HE00660PB	5620 SAM-O LIC. UPG. TO R13	\$25,500	65%	\$ 8,925.00	New Effective 5/30/2017
3HE00756NA	5620 SAM-E/A/P R12 Lic. - 7750/7710 MDA	\$10,540	65%	\$ 3,689.00	New Effective 5/30/2017
3HE00756NB	5620 SAM-E/A/P Lic Upg- R12-7750/10 MDA	\$5,270	65%	\$ 1,844.50	New Effective 5/30/2017
3HE00756PA	5620 SAM-E/A/P R13 Lic. - 7750/7710 MDA	\$10,540	65%	\$ 3,689.00	
3HE00756PB	5620 SAM-E/A/P Lic Upg- R13-7750/10 MDA	\$5,270	65%	\$ 1,844.50	New Effective 5/30/2017
3HE00757NA	5620 SAM-E/A/P R12 Lic-7450 Series MDA	\$6,120	65%	\$ 2,142.00	New Effective 5/30/2017
3HE00757NB	5620 SAM-E/A/P Lic Upg to R12-7450 MDA	\$3,060	65%	\$ 1,071.00	New Effective 5/30/2017
3HE00757PA	5620 SAM-E/A/P R13 Lic-7450 Series MDA	\$6,120	65%	\$ 2,142.00	
3HE00757PB	5620 SAM-E/A/P Lic Upg to R13-7450 MDA	\$3,060	65%	\$ 1,071.00	New Effective 5/30/2017
3HE00981NA	5620 SAM R12 BASE PRODUCT	\$42,500	65%	\$ 14,875.00	New Effective 5/30/2017
3HE00981NB	5620 SAM BASE PRODUCT UPGRADE - R12	\$21,250	65%	\$ 7,437.50	New Effective 5/30/2017
3HE00981NC	5620 SAM WINDOWS -SOLARIS/LINUX UPG R12	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE00981PA	5620 SAM R13 BASE PRODUCT	\$42,500	65%	\$ 14,875.00	
3HE00981PB	5620 SAM BASE PRODUCT UPGRADE - R13	\$21,250	65%	\$ 7,437.50	New Effective 5/30/2017
3HE00981PC	5620 SAM WINDOWS to LINUX UPG R13	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE00986NA	5620 SAM R12 REDUNDANCY LICENSE	\$136,000	65%	\$ 47,600.00	New Effective 5/30/2017
3HE00986NB	5620 SAM REDUNDANCY LIC. UPG. TO R12	\$68,000	65%	\$ 23,800.00	New Effective 5/30/2017
3HE00986PA	5620 SAM R13 REDUNDANCY LICENSE	\$136,000	65%	\$ 47,600.00	
3HE00986PB	5620 SAM REDUNDANCY LIC. UPG. TO R13	\$68,000	65%	\$ 23,800.00	New Effective 5/30/2017
3HE00986QA	5620 SAM R14 REDUNDANCY LICENSE	\$135,163	65%	\$ 47,306.96	
3HE00986QB	5620 SAM R14 REDUNDANCY UPG. - R14	\$67,581	65%	\$ 23,653.48	New Effective 5/30/2017
3HE01550NA	5620 SAM-E/A/P R12 -7710/7750SRc4/12 CMA	\$2,975	65%	\$ 1,041.25	New Effective 5/30/2017
3HE01550NB	5620 SAM-EAP Upg R12-7710/7750SRc4/12CMA	\$1,488	65%	\$ 520.63	New Effective 5/30/2017
3HE01550PA	5620 SAM-E/A/P R13 -7710/7750SRc4/12 CMA	\$2,975	65%	\$ 1,041.25	
3HE01550PB	5620 SAM-EAP Upg R13-7710/7750SRc4/12CMA	\$1,488	65%	\$ 520.63	New Effective 5/30/2017
3HE01552NA	5620 SAM-E R12 LIC-7710 CMA/7750 SRc4/12	\$911	65%	\$ 318.92	New Effective 5/30/2017
3HE01552NB	5620 SAM-E UPG R12-7710/7750 SRc4/12 CMA	\$456	65%	\$ 159.46	New Effective 5/30/2017
3HE01552PA	5620 SAM-E R13 LIC-7710 CMA/7750 SRc4/12	\$911	65%	\$ 318.92	
3HE01552PB	5620 SAM-E UPG R13-7710/7750 SRc4/12 CMA	\$456	65%	\$ 159.46	New Effective 5/30/2017
3HE02023NA	5620 SAM-E/A/P R12 License -GNE	\$170	65%	\$ 59.50	New Effective 5/30/2017
3HE02023NB	5620 SAM-E/A/P R12 License Upg -GNE	\$85	65%	\$ 29.75	New Effective 5/30/2017
3HE02023PA	5620 SAM-E/A/P R13 License -GNE	\$170	65%	\$ 59.50	
3HE02023PB	5620 SAM-E/A/P R13 License Upg -GNE	\$85	65%	\$ 29.75	New Effective 5/30/2017
3HE03603NA	5620 SAM-E/A/P R12 LICENSE - 7705 SAR-8	\$4,208	65%	\$ 1,472.63	New Effective 5/30/2017
3HE03603NB	5620 SAM-E/A/P LIC UPG - R12-7705 SAR-8	\$2,104	65%	\$ 736.31	New Effective 5/30/2017
3HE03603PA	5620 SAM-E/A/P R13 LICENSE - 7705 SAR-8	\$4,208	65%	\$ 1,472.63	
3HE03603PB	5620 SAM-E/A/P LIC UPG - R13-7705 SAR-8	\$2,104	65%	\$ 736.31	New Effective 5/30/2017
3HE03604NA	5620 SAM-E R12 LICENSE - 7705 SAR-8	\$1,406	65%	\$ 492.07	New Effective 5/30/2017
3HE03604NB	5620 SAM-E LIC UPG - R12-7705 SAR-8	\$703	65%	\$ 246.03	New Effective 5/30/2017
3HE03604PA	5620 SAM-E R13 LICENSE - 7705 SAR-8	\$1,406	65%	\$ 492.07	New Effective 5/30/2017
3HE03604PB	5620 SAM-E LIC UPG - R13-7705 SAR-8	\$703	65%	\$ 246.03	New Effective 5/30/2017
3HE03605NA	5620 SAM-EAP R12 ADDL- 7705 SAR-8/18 MDA	\$723	65%	\$ 252.88	New Effective 5/30/2017
3HE03605NB	5620 SAMEAP LIC UPG-R12 ADD-SAR-8/18 MDA	\$361	65%	\$ 126.44	New Effective 5/30/2017
3HE03605PA	5620 SAM-EAP R13 ADDL- 7705 SAR-8/18 MDA	\$723	65%	\$ 252.88	
3HE03605PB	5620 SAMEAP LIC UPG-R13 ADD-SAR-8/18 MDA	\$361	65%	\$ 126.44	New Effective 5/30/2017
3HE03606NA	5620 SAM-E R12 ADDL- 7705 SAR-8/18 MDA	\$245	65%	\$ 85.68	New Effective 5/30/2017

3HE03606NB	5620 SAME LIC UPG-R12 ADD'L-SAR-8/18 MDA	\$122	65%	\$	42.84	New Effective 5/30/2017
3HE03606PA	5620 SAM-E R13 ADD'L- 7705 SAR-8/18 MDA	\$245	65%	\$	85.68	New Effective 5/30/2017
3HE03606PB	5620 SAME LIC UPG-R13 ADD'L-SAR-8/18 MDA	\$122	65%	\$	42.84	New Effective 5/30/2017
3HE04058NA	5620 SAM-EAP R12 LIC. OS6850/E CHASSIS	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE04058NB	5620 SAM-EAP R12 UPG -OS6850/E CHASSIS	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE04058PA	5620 SAM-EAP R13 LIC. OS6850/E CHASSIS	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE04058PB	5620 SAM-EAP R13 UPG -OS6850/E CHASSIS	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE04059NA	5620 SAM-E R12 LIC. OS6850/E CHASSIS	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE04059NB	5620 SAM-E R12 UPG LIC- OS6850/E CHASSIS	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04059PA	5620 SAM-E R13 LIC. OS6850/E CHASSIS	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE04059PB	5620 SAM-E R13 UPG LIC- OS6850/E CHASSIS	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04331NA	5620 SAM-E/A/P R12 7750/7710 SR PREM MDA	\$21,080	65%	\$	7,378.00	New Effective 5/30/2017
3HE04331NB	5620 SAM-EAP UPG R12 7750/7710 PREM. MDA	\$10,540	65%	\$	3,689.00	New Effective 5/30/2017
3HE04331PA	5620 SAM-E/A/P R13 7750/7710 SR PREM MDA	\$21,080	65%	\$	7,378.00	New Effective 5/30/2017
3HE04331PB	5620 SAM-EAP UPG R13 7750/7710 PREM. MDA	\$10,540	65%	\$	3,689.00	New Effective 5/30/2017
3HE04332NA	5620 SAM-E/A/P R12 7450 PREMIUM MDA	\$12,240	65%	\$	4,284.00	New Effective 5/30/2017
3HE04332NB	5620 SAM-EAP UPG LIC R12 7450 PREM. MDA	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE04332PA	5620 SAM-E/A/P R13 7450 PREMIUM MDA	\$12,240	65%	\$	4,284.00	New Effective 5/30/2017
3HE04332PB	5620 SAM-EAP UPG LIC R13 7450 PREM. MDA	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE04333NA	5620 SAM-E R12 7750/7710 SR PREMIUM MDA	\$6,460	65%	\$	2,261.00	New Effective 5/30/2017
3HE04333NB	5620 SAM-E UPG LIC R12 7750/7710 PRE MDA	\$3,230	65%	\$	1,130.50	New Effective 5/30/2017
3HE04333PA	5620 SAM-E R13 7750/7710 SR PREMIUM MDA	\$6,460	65%	\$	2,261.00	New Effective 5/30/2017
3HE04333PB	5620 SAM-E UPG LIC R13 7750/7710 PRE MDA	\$3,230	65%	\$	1,130.50	New Effective 5/30/2017
3HE04334NA	5620 SAM-E R12 7450 PREMIUM MDA	\$3,740	65%	\$	1,309.00	New Effective 5/30/2017
3HE04334NB	5620 SAM-E UPG LIC. R12 7450 PREMIUM MDA	\$1,870	65%	\$	654.50	New Effective 5/30/2017
3HE04334PA	5620 SAM-E R13 7450 PREMIUM MDA	\$3,740	65%	\$	1,309.00	New Effective 5/30/2017
3HE04334PB	5620 SAM-E UPG LIC. R13 7450 PREMIUM MDA	\$1,870	65%	\$	654.50	New Effective 5/30/2017
3HE04352NA	5620 SAM-E/A/P R12 LIC. OS6400 CHASSIS	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE04352NB	5620 SAM-EAP R12 UPG LIC. OS6400 CHASSIS	\$213	65%	\$	74.38	New Effective 5/30/2017
3HE04352PA	5620 SAM-E/A/P R13 LIC. OS6400 CHASSIS	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE04352PB	5620 SAM-EAP R13 UPG LIC. OS6400 CHASSIS	\$213	65%	\$	74.38	New Effective 5/30/2017
3HE04353NA	5620 SAM-E/A/P R12 LIC. OS6855 CHASSIS	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE04353NB	5620 SAM-E/AP R12 UPG LIC OS6855 CHASSIS	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE04353PA	5620 SAM-E/A/P R13 LIC. OS6855 CHASSIS	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE04353PB	5620 SAM-E/AP R13 UPG LIC OS6855 CHASSIS	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE04354NA	5620 SAM-E LIC - R12 - OS6400 CHASSIS	\$306	65%	\$	107.10	New Effective 5/30/2017
3HE04354NB	5620 SAM-E UPG. LIC. R12 -OS6400 CHASSIS	\$153	65%	\$	53.55	New Effective 5/30/2017
3HE04354PA	5620 SAM-E LIC - R13 - OS6400 CHASSIS	\$306	65%	\$	107.10	New Effective 5/30/2017
3HE04354PB	5620 SAM-E UPG. LIC. R13 -OS6400 CHASSIS	\$153	65%	\$	53.55	New Effective 5/30/2017
3HE04355NA	5620 SAM-E R12 LIC. OS6855 CHASSIS	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE04355NB	5620 SAM-E R12 UPG. LIC. -OS6855 CHASSIS	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04355PA	5620 SAM-E R13 LIC. OS6855 CHASSIS	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE04355PB	5620 SAM-E R13 UPG. LIC. -OS6855 CHASSIS	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04370NA	5620 SAM-E/A/P R12 LICENSE-7705 SAR-F	\$3,230	65%	\$	1,130.50	New Effective 5/30/2017
3HE04370NB	5620 SAM-EAP UPG LIC R12 LIC -7705 SAR-F	\$1,615	65%	\$	565.25	New Effective 5/30/2017
3HE04370PA	5620 SAM-E/A/P R13 LICENSE-7705 SAR-F	\$3,230	65%	\$	1,130.50	New Effective 5/30/2017
3HE04370PB	5620 SAM-EAP UPG LIC R13 LIC -7705 SAR-F	\$1,615	65%	\$	565.25	New Effective 5/30/2017
3HE04371NA	5620 SAM-E R12 LICENSE-7705 SAR-F	\$1,078	65%	\$	377.23	New Effective 5/30/2017
3HE04371NB	5620 SAM-E UPG LIC R12 LIC. - 7705 SAR-F	\$539	65%	\$	188.62	New Effective 5/30/2017
3HE04371PA	5620 SAM-E R13 LICENSE-7705 SAR-F	\$1,078	65%	\$	377.23	New Effective 5/30/2017
3HE04371PB	5620 SAM-E UPG LIC R13 LIC. - 7705 SAR-F	\$539	65%	\$	188.62	New Effective 5/30/2017
3HE04836NA	5620 SAM-E R12 LICENSE- 7210 SAS-E	\$323	65%	\$	113.05	New Effective 5/30/2017
3HE04836NB	5620 SAM-E R12 UPG LICENSE- 7210 SAS-E	\$162	65%	\$	56.53	New Effective 5/30/2017
3HE04836PA	5620 SAM-E R13 LICENSE- 7210 SAS-E	\$323	65%	\$	113.05	New Effective 5/30/2017
3HE04836PB	5620 SAM-E R13 UPG LICENSE- 7210 SAS-E	\$162	65%	\$	56.53	New Effective 5/30/2017
3HE04837NA	5620 SAM-E/A/P R12 LICENSE- 7210 SAS-E	\$646	65%	\$	226.10	New Effective 5/30/2017
3HE04837NB	5620 SAM-E/A/P R12 UPG LIC. - 7210 SAS-E	\$323	65%	\$	113.05	New Effective 5/30/2017
3HE04837PA	5620 SAM-E/A/P R13 LICENSE- 7210 SAS-E	\$646	65%	\$	226.10	New Effective 5/30/2017
3HE04837PB	5620 SAM-E/A/P R13 UPG LIC. - 7210 SAS-E	\$323	65%	\$	113.05	New Effective 5/30/2017
3HE04838NA	5620 SAM-E R12 LICENSE- 7210 SAS-M	\$527	65%	\$	184.45	New Effective 5/30/2017
3HE04838NB	5620 SAM-E R12 UPG LICENSE- 7210 SAS-M	\$264	65%	\$	92.23	New Effective 5/30/2017
3HE04838PA	5620 SAM-E R13 LICENSE- 7210 SAS-M	\$527	65%	\$	184.45	New Effective 5/30/2017
3HE04838PB	5620 SAM-E R13 UPG LICENSE- 7210 SAS-M	\$264	65%	\$	92.23	New Effective 5/30/2017
3HE04839NA	5620 SAM-E/A/P R12 LICENSE- 7210 SAS-M	\$1,054	65%	\$	368.90	New Effective 5/30/2017
3HE04839NB	5620 SAM-E/A/P R12 UPG LIC - 7210 SAS-M	\$527	65%	\$	184.45	New Effective 5/30/2017
3HE04839PA	5620 SAM-E/A/P R13 LICENSE- 7210 SAS-M	\$1,054	65%	\$	368.90	New Effective 5/30/2017
3HE04839PB	5620 SAM-E/A/P R13 UPG LIC - 7210 SAS-M	\$527	65%	\$	184.45	New Effective 5/30/2017
3HE04840NA	5620 SAM-E/A/P R12 LIC. - OS9-GNI CARD	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE04840NB	5620 SAM-E/A/P R12 UPG LIC- OS9-GNI CARD	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE04840PA	5620 SAM-E/A/P R13 LIC. - OS9-GNI CARD	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE04840PB	5620 SAM-E/A/P R13 UPG LIC- OS9-GNI CARD	\$425	65%	\$	148.75	New Effective 5/30/2017

3HE04841NA	5620 SAM-E/A/P R12 LIC. - OS9-XNI CARD	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE04841NB	5620 SAM-E/A/P R12 UPG LIC- OS9-XNI CARD	\$765	65%	\$	267.75	New Effective 5/30/2017
3HE04841PA	5620 SAM-E/A/P R13 LIC. - OS9-XNI CARD	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE04841PB	5620 SAM-E/A/P R13 UPG LIC- OS9-XNI CARD	\$765	65%	\$	267.75	New Effective 5/30/2017
3HE04842NA	5620 SAM-E R12 LIC. - OS9-GNI CARD	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04842NB	5620 SAM-E R12 UPG. LIC. - OS9-GNI CARD	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE04842PA	5620 SAM-E R13 LIC. - OS9-GNI CARD	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE04842PB	5620 SAM-E R13 UPG. LIC. - OS9-GNI CARD	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE04843NA	5620 SAM-E R12 LIC. - OS9-XNI CARD	\$459	65%	\$	160.65	New Effective 5/30/2017
3HE04843NB	5620 SAM-E R12 UPG. LIC. - OS9-XNI CARD	\$230	65%	\$	80.33	New Effective 5/30/2017
3HE04843PA	5620 SAM-E R13 LIC. - OS9-XNI CARD	\$459	65%	\$	160.65	New Effective 5/30/2017
3HE04843PB	5620 SAM-E R13 UPG. LIC. - OS9-XNI CARD	\$230	65%	\$	80.33	New Effective 5/30/2017
3HE04844NA	5620 SAM-E/A/P R12 LIC- 9500 MPR MSS-8	\$3,057	65%	\$	1,069.81	New Effective 5/30/2017
3HE04844NB	5620 SAM-E/A/P R12 UPG LIC 9500 MPR MSS8	\$1,528	65%	\$	534.91	New Effective 5/30/2017
3HE04844PA	5620 SAM-E/A/P R13 LIC- 9500 MPR MSS-8	\$3,057	65%	\$	1,069.81	New Effective 5/30/2017
3HE04844PB	5620 SAM-E/A/P R13 UPG LIC 9500 MPR MSS8	\$1,528	65%	\$	534.91	New Effective 5/30/2017
3HE04845NA	5620 SAM-E/A/P R12 LIC- 9500 MPR MSS-4	\$2,599	65%	\$	909.76	New Effective 5/30/2017
3HE04845NB	5620 SAM-E/A/P R12 UPG LIC 9500 MPR MSS4	\$1,300	65%	\$	454.88	New Effective 5/30/2017
3HE04845PA	5620 SAM-E/A/P R13 LIC- 9500 MPR MSS-4	\$2,599	65%	\$	909.76	New Effective 5/30/2017
3HE04845PB	5620 SAM-E/A/P R13 UPG LIC 9500 MPR MSS4	\$1,300	65%	\$	454.88	New Effective 5/30/2017
3HE05665NA	5620 SAM-EAP R12 Lic -7750 SR MG-ISM MOD	\$42,160	65%	\$	14,756.00	New Effective 5/30/2017
3HE05665NB	5620 SAM-E/A/P R12 UPG - 7750 SR MG-ISM	\$21,080	65%	\$	7,378.00	New Effective 5/30/2017
3HE05665PA	5620 SAM-EAP R13 Lic -7750 SR MG-ISM MOD	\$42,160	65%	\$	14,756.00	New Effective 5/30/2017
3HE05665PB	5620 SAM-E/A/P R13 UPG - 7750 SR MG-ISM	\$21,080	65%	\$	7,378.00	New Effective 5/30/2017
3HE05666NA	5620 SAM-E/A/P R12 Lic-9471 WMM/SRS CARD	\$31,620	65%	\$	11,067.00	New Effective 5/30/2017
3HE05666NB	5620 SAM-E/A/P R12 UPG LIC 9471 WMM CARD	\$15,810	65%	\$	5,533.50	New Effective 5/30/2017
3HE05666PA	5620 SAM-E/A/P R13 Lic-9471 WMM/SRS CARD	\$31,620	65%	\$	11,067.00	New Effective 5/30/2017
3HE05666PB	5620 SAM-E/A/P R13 UPG LIC 9471 WMM CARD	\$15,810	65%	\$	5,533.50	New Effective 5/30/2017
3HE05667NA	5620 SAM-E/A/P R12 LIC. - 5780 DSC MOD	\$13,702	65%	\$	4,795.70	New Effective 5/30/2017
3HE05667NB	5620 SAM-E/A/P R12 UPG LIC 5780 DSC MOD	\$6,834	65%	\$	2,391.90	New Effective 5/30/2017
3HE05667PA	5620 SAM-E/A/P R13 LIC. - 5780 DSC MOD	\$13,702	65%	\$	4,795.70	New Effective 5/30/2017
3HE05667PB	5620 SAM-E/A/P R13 UPG LIC 5780 DSC MOD	\$6,834	65%	\$	2,391.90	New Effective 5/30/2017
3HE05787NA	5620 SAM-E/A/P R12 LIC. OS6250 CHASSIS	\$153	65%	\$	53.55	New Effective 5/30/2017
3HE05787NB	5620 SAM-EAP R12 UPG. LIC OS6250 CHASSIS	\$77	65%	\$	26.78	New Effective 5/30/2017
3HE05787PA	5620 SAM-E/A/P R13 LIC. OS6250 CHASSIS	\$153	65%	\$	53.55	New Effective 5/30/2017
3HE05787PB	5620 SAM-EAP R13 UPG. LIC OS6250 CHASSIS	\$77	65%	\$	26.78	New Effective 5/30/2017
3HE05788NA	5620 SAM-E R12 LIC. OS6250 CHASSIS	\$77	65%	\$	26.78	New Effective 5/30/2017
3HE05788NB	5620 SAM-E R12 UPG. LIC. -OS6250 CHASSIS	\$38	65%	\$	13.39	New Effective 5/30/2017
3HE05788PA	5620 SAM-E R13 LIC. OS6250 CHASSIS	\$77	65%	\$	26.78	New Effective 5/30/2017
3HE05788PB	5620 SAM-E R13 UPG. LIC. -OS6250 CHASSIS	\$38	65%	\$	13.39	New Effective 5/30/2017
3HE05789NA	5620 SAM-E/A/P R12 - 7210 SAS-M 24F2XFP	\$2,210	65%	\$	773.50	New Effective 5/30/2017
3HE05789NB	5620 SAM-E/A/P R12 UP 7210 SAS-M 24F2XFP	\$1,105	65%	\$	386.75	New Effective 5/30/2017
3HE05789PA	5620 SAM-E/A/P R13 - 7210 SAS-M 24F2XFP	\$2,210	65%	\$	773.50	New Effective 5/30/2017
3HE05789PB	5620 SAM-E/A/P R13 UP 7210 SAS-M 24F2XFP	\$1,105	65%	\$	386.75	New Effective 5/30/2017
3HE05790NA	5620 SAM-E/A/P R12 - 7210 SAS-X 24F2XFP	\$3,876	65%	\$	1,356.60	New Effective 5/30/2017
3HE05790NB	5620 SAM-E/A/P R12 UP 7210 SAS-X 24F2XFP	\$1,938	65%	\$	678.30	New Effective 5/30/2017
3HE05790PA	5620 SAM-E/A/P R13 - 7210 SAS-X 24F2XFP	\$3,876	65%	\$	1,356.60	New Effective 5/30/2017
3HE05790PB	5620 SAM-E/A/P R13 UP 7210 SAS-X 24F2XFP	\$1,938	65%	\$	678.30	New Effective 5/30/2017
3HE05791NA	5620 SAM-E/A/P R12 7210 SAS MDA Module	\$595	65%	\$	208.25	New Effective 5/30/2017
3HE05791NB	5620 SAM-E/A/P R12 UPG 7210 SAS MDA MOD	\$298	65%	\$	104.13	New Effective 5/30/2017
3HE05791PA	5620 SAM-E/A/P R13 7210 SAS MDA MODULE	\$595	65%	\$	208.25	New Effective 5/30/2017
3HE05791PB	5620 SAM-E/A/P R13 UPG 7210 SAS MDA MOD	\$298	65%	\$	104.13	New Effective 5/30/2017
3HE05792NA	5620 SAM-E R12 LIC - 7210 SAS-M 24F2XFP	\$1,105	65%	\$	386.75	New Effective 5/30/2017
3HE05792NB	5620 SAM-E R12 UP LIC 7210 SAS-M 24F2XFP	\$553	65%	\$	193.38	New Effective 5/30/2017
3HE05792PA	5620 SAM-E R13 LIC - 7210 SAS-M 24F2XFP	\$1,105	65%	\$	386.75	New Effective 5/30/2017
3HE05792PB	5620 SAM-E R13 UP LIC 7210 SAS-M 24F2XFP	\$553	65%	\$	193.38	New Effective 5/30/2017
3HE05793NA	5620 SAM-E R12 LIC - 7210 SAS-X 24F2XFP	\$1,938	65%	\$	678.30	New Effective 5/30/2017
3HE05793NB	5620 SAM-E R12 UPG - 7210 SAS-X 24F2XFP	\$969	65%	\$	339.15	New Effective 5/30/2017
3HE05793PA	5620 SAM-E R13 LIC - 7210 SAS-X 24F2XFP	\$1,938	65%	\$	678.30	New Effective 5/30/2017
3HE05793PB	5620 SAM-E R13 UPG - 7210 SAS-X 24F2XFP	\$969	65%	\$	339.15	New Effective 5/30/2017
3HE05794NA	5620 SAM-E R12 7210 SAS MDA MODULE	\$298	65%	\$	104.13	New Effective 5/30/2017
3HE05794NB	5620 SAM-E R12 UPG LIC 7210 SAS MDA MOD	\$149	65%	\$	52.06	New Effective 5/30/2017
3HE05794PA	5620 SAM-E R13 7210 SAS MDA MODULE	\$298	65%	\$	104.13	New Effective 5/30/2017
3HE05794PB	5620 SAM-E R13 UPG LIC 7210 SAS MDA MOD	\$149	65%	\$	52.06	New Effective 5/30/2017
3HE06184NA	5620 SAM-E/A/P R12 LIC WLS MACRO CELL	\$1,097	65%	\$	383.78	New Effective 5/30/2017
3HE06184NB	5620 SAM-EAP R12 UPG. LIC WLS MACRO CELL	\$548	65%	\$	191.89	New Effective 5/30/2017
3HE06184PA	5620 SAM-E/A/P R13 LIC WLS MACRO CELL	\$434	65%	\$	152.01	New Effective 5/30/2017
3HE06184PB	5620 SAM-EAP R13 UPG. LIC WLS MACRO CELL	\$217	65%	\$	76.01	New Effective 5/30/2017
3HE06452NA	5620 SAM-E/A/P R12 LIC 1830 OT =<10Gbps	\$2,754	65%	\$	963.90	New Effective 5/30/2017
3HE06452NB	5620 SAM-E/A/P R12 UPG 1830 OT =<10Gbps	\$1,377	65%	\$	481.95	New Effective 5/30/2017
3HE06452PA	5620 SAM-E/A/P R13 LIC 1830 OT =<10Gbps	\$2,754	65%	\$	963.90	New Effective 5/30/2017

3HE06452PB	5620 SAM-E/A/P R13 UPG 1830 OT <=10Gbps	\$1,377	65%	\$ 481.95	New Effective 5/30/2017
3HE06453NA	5620 SAM-E/A/P R12 LIC 1830 OT 40 Gbps	\$11,016	65%	\$ 3,855.60	New Effective 5/30/2017
3HE06453NB	5620 SAM-E/A/P R12 UPG 1830 OT 40 Gbps	\$5,508	65%	\$ 1,927.80	New Effective 5/30/2017
3HE06453PA	5620 SAM-E/A/P R13 LIC 1830 OT 40 Gbps	\$11,016	65%	\$ 3,855.60	New Effective 5/30/2017
3HE06453PB	5620 SAM-E/A/P R13 UPG 1830 OT 40 Gbps	\$5,508	65%	\$ 1,927.80	New Effective 5/30/2017
3HE06454NA	5620 SAM-E/A/P R12 LIC 1830 OT 100Gbps	\$27,540	65%	\$ 9,639.00	New Effective 5/30/2017
3HE06454NB	5620 SAM-E/A/P R12 UPG 1830 OT 100Gbps	\$13,770	65%	\$ 4,819.50	New Effective 5/30/2017
3HE06454PA	5620 SAM-E/A/P R13 LIC 1830 OT 100Gbps	\$27,540	65%	\$ 9,639.00	New Effective 5/30/2017
3HE06454PB	5620 SAM-E/A/P R13 UPG 1830 OT 100Gbps	\$13,770	65%	\$ 4,819.50	New Effective 5/30/2017
3HE06455NA	5620 SAM-E/A/P R12 1830 WSS 44 CHANNELS	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06455NB	5620 SAM-E/A/P R12 UPG 1830 WSS 44 CHAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06455PA	5620 SAM-E/A/P R13 1830 WSS 44 CHANNELS	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06455PB	5620 SAM-E/A/P R13 UPG 1830 WSS 44 CHAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06456NA	5620 SAM-E/A/P R12 1830 WSS 88 CHANNELS	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06456NB	5620 SAM-E/A/P R12 UPG 1830 WSS 88 CHAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06456PA	5620 SAM-E/A/P R13 1830 WSS 88 CHANNELS	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06456PB	5620 SAM-E/A/P R13 UPG 1830 WSS 88 CHAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06457NA	5620 SAM-E/A/P R12 1830 LIC OPTICAL AMP	\$1,377	65%	\$ 481.95	New Effective 5/30/2017
3HE06457NB	5620 SAM-E/A/P R12 UPG 1830 LIC OPT AMP	\$689	65%	\$ 240.98	New Effective 5/30/2017
3HE06457PA	5620 SAM-E/A/P R13 1830 LIC OPTICAL AMP	\$1,377	65%	\$ 481.95	New Effective 5/30/2017
3HE06457PB	5620 SAM-E/A/P R13 UPG 1830 LIC OPT AMP	\$689	65%	\$ 240.98	New Effective 5/30/2017
3HE06458NA	5620 SAM-E/A/P R12 LIC 1830 OTHER CARD	\$765	65%	\$ 267.75	New Effective 5/30/2017
3HE06458NB	5620 SAM-E/A/P R12 UPG 1830 OTHER CARD	\$383	65%	\$ 133.88	New Effective 5/30/2017
3HE06458PA	5620 SAM-E/A/P R13 LIC 1830 OTHER CARD	\$765	65%	\$ 267.75	New Effective 5/30/2017
3HE06458PB	5620 SAM-E/A/P R13 UPG 1830 OTHER CARD	\$383	65%	\$ 133.88	New Effective 5/30/2017
3HE06538NA	5620 SAM-E/A/P R12 LIC. -1830 PSS-1	\$2,040	65%	\$ 714.00	New Effective 5/30/2017
3HE06538NB	5620 SAM-E/A/P R12 UPG LIC 1830 PSS-1	\$1,020	65%	\$ 357.00	New Effective 5/30/2017
3HE06538PA	5620 SAM-E/A/P R13 LIC. -1830 PSS-1	\$2,040	65%	\$ 714.00	New Effective 5/30/2017
3HE06538PB	5620 SAM-E/A/P R13 UPG LIC 1830 PSS-1	\$1,020	65%	\$ 357.00	New Effective 5/30/2017
3HE06548NA	5620 SAM-E/A/P R12 7210 SAS -D	\$298	65%	\$ 104.13	New Effective 5/30/2017
3HE06548NB	5620 SAM-E/A/P R12 UPG 7210 SAS -D	\$149	65%	\$ 52.06	New Effective 5/30/2017
3HE06548PA	5620 SAM-E/A/P R13 7210 SAS -D	\$298	65%	\$ 104.13	New Effective 5/30/2017
3HE06548PB	5620 SAM-E/A/P R13 UPG 7210 SAS -D	\$149	65%	\$ 52.06	New Effective 5/30/2017
3HE06549NA	5620 SAM-E R12 7210 SAS-D	\$149	65%	\$ 52.06	New Effective 5/30/2017
3HE06549NB	5620 SAM-E R12 UPG 7210 SAS -D	\$74	65%	\$ 26.03	New Effective 5/30/2017
3HE06549PA	5620 SAM-E R13 7210 SAS-D	\$149	65%	\$ 52.06	New Effective 5/30/2017
3HE06549PB	5620 SAM-E R13 UPG 7210 SAS -D	\$74	65%	\$ 26.03	New Effective 5/30/2017
3HE06550NA	5620 SAM-E/A/P R12 LICENSE -7705 SAR-18	\$6,120	65%	\$ 2,142.00	New Effective 5/30/2017
3HE06550NB	5620 SAM-E/A/P R12 UPG. LIC 7705 SAR-18	\$3,060	65%	\$ 1,071.00	New Effective 5/30/2017
3HE06550PA	5620 SAM-E/A/P R13 LICENSE -7705 SAR-18	\$6,120	65%	\$ 2,142.00	New Effective 5/30/2017
3HE06550PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-18	\$3,060	65%	\$ 1,071.00	New Effective 5/30/2017
3HE06551NA	5620 SAM-EAP R12 ADDL 7705 SAR-8/18 XMDA	\$3,825	65%	\$ 1,338.75	New Effective 5/30/2017
3HE06551NB	5620 SAM-EAP R12 UPG 7705 SAR8/18 XMDA	\$1,913	65%	\$ 669.38	New Effective 5/30/2017
3HE06551PA	5620 SAM-EAP R13 ADDL 7705 SAR-8/18 XMDA	\$3,825	65%	\$ 1,338.75	New Effective 5/30/2017
3HE06551PB	5620 SAM-EAP R13 UPG 7705 SAR8/18 XMDA	\$1,913	65%	\$ 669.38	New Effective 5/30/2017
3HE06552NA	5620 SAM-E R12 LICENSE -7705 SAR-18	\$2,040	65%	\$ 714.00	New Effective 5/30/2017
3HE06552NB	5620 SAM-E R12 UPG. LIC 7705 SAR-18	\$1,020	65%	\$ 357.00	New Effective 5/30/2017
3HE06552PA	5620 SAM-E R13 LICENSE -7705 SAR-18	\$2,040	65%	\$ 714.00	New Effective 5/30/2017
3HE06552PB	5620 SAM-E R13 UPG. LIC 7705 SAR-18	\$1,020	65%	\$ 357.00	New Effective 5/30/2017
3HE06553NA	5620 SAM-E R12 ADD'L 7705 SAR-8/18 XMDA	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE06553NB	5620 SAM-E R12 UPG 7705 SAR8/18 XMDA	\$638	65%	\$ 223.13	New Effective 5/30/2017
3HE06553PA	5620 SAM-E R13 ADD'L 7705 SAR-8/18 XMDA	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE06553PB	5620 SAM-E R13 UPG 7705 SAR8/18 XMDA	\$638	65%	\$ 223.13	New Effective 5/30/2017
3HE06809NA	5620 SAM-E/A/P R12 EAST/WEST NE	\$680	65%	\$ 238.00	New Effective 5/30/2017
3HE06809NB	5620 SAM-E/A/P R12 UPG EAST/WEST NE	\$340	65%	\$ 119.00	New Effective 5/30/2017
3HE06809PA	5620 SAM-E/A/P R13 EAST/WEST NE	\$680	65%	\$ 238.00	New Effective 5/30/2017
3HE06809PB	5620 SAM-E/A/P R13 UPG EAST/WEST NE	\$340	65%	\$ 119.00	New Effective 5/30/2017
3HE06810NA	5620 SAM-EAP R12 EAST/WEST NE BUNDLE 100	\$34,000	65%	\$ 11,900.00	New Effective 5/30/2017
3HE06810NB	5620 SAM-EAP R12 UPG EAST/WEST NE Bundle	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE06810PA	5620 SAM-EAP R13 EAST/WEST NE BUNDLE 100	\$34,000	65%	\$ 11,900.00	New Effective 5/30/2017
3HE06810PB	5620 SAM-EAP R13 UPG EAST/WEST NE BUNDLE	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE06811NA	5620 SAM-E/A/P R12 LIC. 1830 RAMAN PUMP	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06811NB	5620 SAM-E/A/P R12 UPG LIC. 1830 RAMAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06811PA	5620 SAM-E/A/P R13 LIC. 1830 RAMAN PUMP	\$4,590	65%	\$ 1,606.50	New Effective 5/30/2017
3HE06811PB	5620 SAM-E/A/P R13 UPG LIC. 1830 RAMAN	\$2,295	65%	\$ 803.25	New Effective 5/30/2017
3HE06889NA	5620 SAM-E/A/P R12 LIC 7705 SAR-M ASAP	\$2,550	65%	\$ 892.50	New Effective 5/30/2017
3HE06889NB	5620 SAM-EAP R12 UPG LIC 7705 SAR-M ASAP	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE06889PA	5620 SAM-E/A/P R13 LIC 7705 SAR-M ASAP	\$2,550	65%	\$ 892.50	New Effective 5/30/2017
3HE06889PB	5620 SAM-EAP R13 UPG LIC 7705 SAR-M ASAP	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE06890NA	5620 SAM-E R12 LIC 7705 SAR-M ASAP	\$850	65%	\$ 297.50	New Effective 5/30/2017
3HE06890NB	5620 SAM-E R12 UPG LIC 7705 SAR-M ASAP	\$425	65%	\$ 148.75	New Effective 5/30/2017

3HE06890PA	5620 SAM-E R13 LIC 7705 SAR-M ASAP	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE06890PB	5620 SAM-E R13 UPG LIC 7705 SAR-M ASAP	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE06891NA	5620 SAM-E/A/P R12 LIC 7705 SAR-M	\$1,955	65%	\$	684.25	New Effective 5/30/2017
3HE06891NB	5620 SAM-E/A/P R12 UPG LIC 7705 SAR-M	\$978	65%	\$	342.13	New Effective 5/30/2017
3HE06891PA	5620 SAM-E/A/P R13 LIC 7705 SAR-M	\$1,955	65%	\$	684.25	New Effective 5/30/2017
3HE06891PB	5620 SAM-E/A/P R13 UPG LIC 7705 SAR-M	\$978	65%	\$	342.13	New Effective 5/30/2017
3HE06892NA	5620 SAM-E R12 LICENSE 7705 SAR-M	\$651	65%	\$	227.89	New Effective 5/30/2017
3HE06892NB	5620 SAM-E R12 UPG LICENSE 7705 SAR-M	\$326	65%	\$	113.94	New Effective 5/30/2017
3HE06892PA	5620 SAM-E R13 LICENSE 7705 SAR-M	\$651	65%	\$	227.89	New Effective 5/30/2017
3HE06892PB	5620 SAM-E R13 UPG LICENSE 7705 SAR-M	\$326	65%	\$	113.94	New Effective 5/30/2017
3HE06904NA	5620 SAM-EAP R12 LIC. OS6900-40 CHASSIS	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE06904NB	5620 SAM-EAP R12 UPG. - OS6900-40 CHASSIS	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE06904PA	5620 SAM-EAP R13 LIC. OS6900-40 CHASSIS	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE06904PB	5620 SAM-EAP R13 UPG. - OS6900-40 CHASSIS	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE06905NA	5620 SAM-E/A/P R12 LIC. - OS10K-GNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE06905NB	5620 SAM-EAP R12 UPG LIC. OS10K-GNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06905PA	5620 SAM-E/A/P R13 LIC. - OS10K-GNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE06905PB	5620 SAM-EAP R13 UPG LIC. OS10K-GNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06906NA	5620 SAM-E/A/P R12 LIC. - OS10K-XNI CARD	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE06906NB	5620 SAM-EAP R12 UPG LIC. OS10K-XNI CARD	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE06906PA	5620 SAM-E/A/P R13 LIC. - OS10K-XNI CARD	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE06906PB	5620 SAM-EAP R13 UPG LIC. OS10K-XNI CARD	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE06907NA	5620 SAM-E R12 LIC. OS6900-20 CHASSIS	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE06907NB	5620 SAM-E R12 UPG LIC-OS6900-20 CHASSIS	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE06907PA	5620 SAM-E R13 LIC. OS6900-20 CHASSIS	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE06907PB	5620 SAM-E R13 UPG LIC-OS6900-20 CHASSIS	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE06908NA	5620 SAM-E R12 LIC. OS6900-40 CHASSIS	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE06908NB	5620 SAM-E R12 UPG LIC-OS6900-40 CHASSIS	\$765	65%	\$	267.75	New Effective 5/30/2017
3HE06908PA	5620 SAM-E R13 LIC. OS6900-40 CHASSIS	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE06908PB	5620 SAM-E R13 UPG LIC-OS6900-40 CHASSIS	\$765	65%	\$	267.75	New Effective 5/30/2017
3HE06909NA	5620 SAM-E R12 LIC. - OS10K-GNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06909NB	5620 SAM-E R12 UPG. LIC. - OS10K-GNI CARD	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE06909PA	5620 SAM-E R13 LIC. - OS10K-GNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06909PB	5620 SAM-E R13 UPG. LIC. - OS10K-GNI CARD	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE06910NA	5620 SAM-E R12 LIC. - OS10K XNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE06910NB	5620 SAM-E R12 UPG. LIC.- OS10K XNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06910PA	5620 SAM-E R13 LIC. - OS10K XNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE06910PB	5620 SAM-E R13 UPG. LIC.- OS10K XNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE06918NA	5620 SAM-EAP R12 LIC. OS6900-20 CHASSIS	\$1,700	65%	\$	595.00	New Effective 5/30/2017
3HE06918NB	5620 SAM-EAP R12 UPG. -OS6900-20 CHASSIS	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE06918PA	5620 SAM-EAP R13 LIC. OS6900-20 CHASSIS	\$1,700	65%	\$	595.00	New Effective 5/30/2017
3HE06918PB	5620 SAM-EAP R13 UPG. -OS6900-20 CHASSIS	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE06922GA	5670 RAM 7.0 10K RES SUB ADV REP	\$34,000	65%	\$	11,900.00	
3HE06922GB	5670 RAM 7.0 10K UPG RES SUB ADV REP	\$17,000	65%	\$	5,950.00	
3HE06922HA	5670 RAM R8.0 10K RES SUB ADV REP	\$34,000	65%	\$	11,900.00	
3HE06922HB	5670 RAM R8.0 10K UPG RES SUB ADV REP	\$17,000	65%	\$	5,950.00	
3HE06922JA	5670 RAM R9.0 10K RES SUB ADV REP	\$34,000	65%	\$	11,900.00	New Effective 5/30/2017
3HE06922JB	5670 RAM R9.0 10K UPG RES SUB ADV REP	\$17,000	65%	\$	5,950.00	New Effective 5/30/2017
3HE07311NA	5620 SAM-EAP R12 1830 WSS CLR 44/88 CHAN	\$4,590	65%	\$	1,606.50	New Effective 5/30/2017
3HE07311NB	5620 SAM-EAP R12 UPG 1830 WSS 44/88 CHAN	\$2,295	65%	\$	803.25	New Effective 5/30/2017
3HE07311PA	5620 SAM-EAP R13 1830 WSS CLR 44/88 CHAN	\$4,590	65%	\$	1,606.50	New Effective 5/30/2017
3HE07311PB	5620 SAM-EAP R13 UPG 1830 WSS 44/88 CHAN	\$2,295	65%	\$	803.25	New Effective 5/30/2017
3HE07399NA	5620 SAM-E/A/P R12 LIC- 9500 MPRe	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE07399NB	5620 SAM-E/A/P R12 UPG LIC- 9500 MPRe	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE07399PA	5620 SAM-E/A/P R13 LIC- 9500 MPRe	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE07399PB	5620 SAM-E/A/P R13 UPG LIC- 9500 MPRe	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE07400NA	5620 SAM-E R12 LIC- 9500 MPR MSS-8	\$808	65%	\$	282.63	New Effective 5/30/2017
3HE07400NB	5620 SAM-E R12 UPG LIC- 9500 MPR MSS-8	\$404	65%	\$	141.31	New Effective 5/30/2017
3HE07400PA	5620 SAM-E R13 LIC- 9500 MPR MSS-8	\$808	65%	\$	282.63	New Effective 5/30/2017
3HE07400PB	5620 SAM-E R13 UPG LIC- 9500 MPR MSS-8	\$404	65%	\$	141.31	New Effective 5/30/2017
3HE07401NA	5620 SAM-E R12 LIC- 9500 MPR MSS-4	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE07401NB	5620 SAM-E R12 UPG LIC- 9500 MPR MSS-4	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE07401PA	5620 SAM-E R13 LIC- 9500 MPR MSS-4	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE07401PB	5620 SAM-E R13 UPG LIC- 9500 MPR MSS-4	\$340	65%	\$	119.00	New Effective 5/30/2017
3HE07402NA	5620 SAM-E R12 LIC- 9500 MPRe	\$64	65%	\$	22.31	New Effective 5/30/2017
3HE07402NB	5620 SAM-E R12 UPG LIC- 9500 MPRe	\$32	65%	\$	11.16	New Effective 5/30/2017
3HE07402PA	5620 SAM-E R13 LIC- 9500 MPRe	\$64	65%	\$	22.31	New Effective 5/30/2017
3HE07402PB	5620 SAM-E R13 UPG LIC- 9500 MPRe	\$32	65%	\$	11.16	New Effective 5/30/2017
3HE07421NA	5620 SAM-EAP R12 ADDL 7705 PASSIVE MDA	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE07421NB	5620 SAM-EAP R12 UPG ADDL 7705 PASS MDA	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE07421PA	5620 SAM-EAP R13 ADDL 7705 PASSIVE MDA	\$255	65%	\$	89.25	

3HE07421PB	5620 SAM-EAP R13 UPG ADDL 7705 PASS MDA	\$128	65%	\$ 44.63	New Effective 5/30/2017
3HE07422NA	5620 SAM-E R12 ADDL 7705 SAR PASSIVE MDA	\$85	65%	\$ 29.75	New Effective 5/30/2017
3HE07422NB	5620 SAM-E R12 UPG ADD 7705 SAR PASS MDA	\$43	65%	\$ 14.88	New Effective 5/30/2017
3HE07422PA	5620 SAM-E R13 ADDL 7705 SAR PASSIVE MDA	\$85	65%	\$ 29.75	New Effective 5/30/2017
3HE07422PB	5620 SAM-E R13 UPG ADD 7705 SAR PASS MDA	\$43	65%	\$ 14.88	New Effective 5/30/2017
3HE07423NA	5620 SAM-E/A/P R12 LICENSE - XMA	\$11,475	65%	\$ 4,016.25	New Effective 5/30/2017
3HE07423NB	5620 SAM-E/A/P R12 UPG. LICENSE - XMA	\$5,738	65%	\$ 2,008.13	New Effective 5/30/2017
3HE07423PA	5620 SAM-E/A/P R13 LICENSE - XMA	\$11,475	65%	\$ 4,016.25	
3HE07423PB	5620 SAM-E/A/P R13 UPG. LICENSE - XMA	\$5,738	65%	\$ 2,008.13	New Effective 5/30/2017
3HE07439NA	5620 SAM-E R12 LICENSE - XMA	\$3,825	65%	\$ 1,338.75	New Effective 5/30/2017
3HE07439NB	5620 SAM-E R12 UPG. LICENSE - XMA	\$1,913	65%	\$ 669.38	New Effective 5/30/2017
3HE07439PA	5620 SAM-E R13 LICENSE - XMA	\$3,825	65%	\$ 1,338.75	
3HE07439PB	5620 SAM-E R13 UPG. LICENSE - XMA	\$1,913	65%	\$ 669.38	New Effective 5/30/2017
3HE07523NA	5620 SAM-EAP R12 LIC. OS6450-10 CHASSIS	\$153	65%	\$ 53.55	New Effective 5/30/2017
3HE07523NB	5620 SAM-EAP R12 UPG LIC OS6450-10 CHAS.	\$77	65%	\$ 26.78	New Effective 5/30/2017
3HE07523PA	5620 SAM-EAP R13 LIC. OS6450-10 CHASSIS	\$153	65%	\$ 53.55	New Effective 5/30/2017
3HE07523PB	5620 SAM-EAP R13 UPG LIC OS6450-10 CHAS.	\$77	65%	\$ 26.78	New Effective 5/30/2017
3HE07524NA	5620 SAM-E R12 LIC. - OS6450-10 CHASSIS	\$111	65%	\$ 38.68	New Effective 5/30/2017
3HE07524NB	5620 SAM-E R12 UPG LIC-OS6450-10 CHASSIS	\$55	65%	\$ 19.34	New Effective 5/30/2017
3HE07524PA	5620 SAM-E R13 LIC. - OS6450-10 CHASSIS	\$111	65%	\$ 38.68	New Effective 5/30/2017
3HE07524PB	5620 SAM-E R13 UPG LIC-OS6450-10 CHASSIS	\$55	65%	\$ 19.34	New Effective 5/30/2017
3HE07525NA	5620 SAM-EAP R12 LI OS6450-24/48 CHASSIS	\$374	65%	\$ 130.90	New Effective 5/30/2017
3HE07525NB	5620 SAM-EAP R12 UPG OS6450-24/48 CHASSI	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE07525PA	5620 SAM-EAP R13 LI OS6450-24/48 CHASSIS	\$374	65%	\$ 130.90	New Effective 5/30/2017
3HE07525PB	5620 SAM-EAP R13 UPG OS6450-24/48 CHASSI	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE07526NA	5620 SAM-E R12 LIC- OS6450-24/48 CHASSIS	\$281	65%	\$ 98.18	New Effective 5/30/2017
3HE07526NB	5620 SAM-E R12 UPG -OS6450-24/48 CHASSIS	\$140	65%	\$ 49.09	New Effective 5/30/2017
3HE07526PA	5620 SAM-E R13 LIC- OS6450-24/48 CHASSIS	\$281	65%	\$ 98.18	New Effective 5/30/2017
3HE07526PB	5620 SAM-E R13 UPG -OS6450-24/48 CHASSIS	\$140	65%	\$ 49.09	New Effective 5/30/2017
3HE07790NA	5620 SAM-E/A/P R12 LIC- 9500 MPR MSS-1	\$765	65%	\$ 267.75	New Effective 5/30/2017
3HE07790NB	5620 SAM-E/A/P R12UPG LIC 9500 MPR MSS-1	\$383	65%	\$ 133.88	New Effective 5/30/2017
3HE07790PA	5620 SAM-E/A/P R13 LIC- 9500 MPR MSS-1	\$765	65%	\$ 267.75	New Effective 5/30/2017
3HE07790PB	5620 SAM-E/A/P R13UPG LIC 9500 MPR MSS-1	\$383	65%	\$ 133.88	New Effective 5/30/2017
3HE07791NA	5620 SAM-E R12 LIC- 9500 MPR MSS-1	\$191	65%	\$ 66.94	New Effective 5/30/2017
3HE07791NB	5620 SAM-E R12 UPG LIC- 9500 MPR MSS-1	\$96	65%	\$ 33.47	New Effective 5/30/2017
3HE07791PA	5620 SAM-E R13 LIC- 9500 MPR MSS-1	\$191	65%	\$ 66.94	New Effective 5/30/2017
3HE07791PB	5620 SAM-E R13 UPG LIC- 9500 MPR MSS-1	\$96	65%	\$ 33.47	New Effective 5/30/2017
3HE08128NA	5620 SAM R12 - ADD'L ONE CPU CORE LIC.	\$12,750	65%	\$ 4,462.50	New Effective 5/30/2017
3HE08128NB	5620 SAM R12- ADD'L ONE CPU CORE LIC UPG	\$6,375	65%	\$ 2,231.25	New Effective 5/30/2017
3HE08128PA	5620 SAM - ADD'L DB CPU/vCPU LIC.	\$12,750	65%	\$ 4,462.50	
3HE08128PB	5620 SAM R13- ADD'L DB CPU/vCPU UPG LIC	\$6,375	65%	\$ 2,231.25	New Effective 5/30/2017
3HE08202NA	5620 SAM-E/A/P R12 LIC 7705 SAR-A	\$1,955	65%	\$ 684.25	New Effective 5/30/2017
3HE08202NB	5620 SAM-E/A/P R12 UPG. LIC 7705 SAR-A	\$978	65%	\$ 342.13	New Effective 5/30/2017
3HE08202PA	5620 SAM-E/A/P R13 LIC 7705 SAR-A	\$1,955	65%	\$ 684.25	New Effective 5/30/2017
3HE08202PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-A	\$978	65%	\$ 342.13	New Effective 5/30/2017
3HE08203NA	5620 SAM-E/A/P R12 LIC 7705 SAR-A wT1/E1	\$2,550	65%	\$ 892.50	New Effective 5/30/2017
3HE08203NB	5620 SAM-E/A/P R12 UPG 7705 SAR-A wT1/E1	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE08203PA	5620 SAM-E/A/P R13 LIC 7705 SAR-A wT1/E1	\$2,550	65%	\$ 892.50	New Effective 5/30/2017
3HE08203PB	5620 SAM-E/A/P R13 UPG 7705 SAR-A wT1/E1	\$1,275	65%	\$ 446.25	New Effective 5/30/2017
3HE08204NA	5620 SAM-E/A/P R12 LIC 7705 SAR-H	\$2,805	65%	\$ 981.75	New Effective 5/30/2017
3HE08204NB	5620 SAM-E/A/P R12 UPG. LIC 7705 SAR-H	\$1,403	65%	\$ 490.88	New Effective 5/30/2017
3HE08204PA	5620 SAM-E/A/P R13 LIC 7705 SAR-H	\$2,805	65%	\$ 981.75	New Effective 5/30/2017
3HE08204PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-H	\$1,403	65%	\$ 490.88	New Effective 5/30/2017
3HE08205NA	5620 SAM-E/A/P R12 LIC 7705 SAR-W	\$2,210	65%	\$ 773.50	New Effective 5/30/2017
3HE08205NB	5620 SAM-E/A/P R12 UPG. LIC 7705 SAR-W	\$1,105	65%	\$ 386.75	New Effective 5/30/2017
3HE08205PA	5620 SAM-E/A/P R13 LIC 7705 SAR-W	\$2,210	65%	\$ 773.50	New Effective 5/30/2017
3HE08205PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-W	\$1,105	65%	\$ 386.75	New Effective 5/30/2017
3HE08206NA	5620 SAM-E R12 LIC 7705 SAR-A	\$651	65%	\$ 227.89	New Effective 5/30/2017
3HE08206NB	5620 SAM-E R12 UPG. LIC 7705 SAR-A	\$326	65%	\$ 113.94	New Effective 5/30/2017
3HE08206PA	5620 SAM-E R13 LIC 7705 SAR-A	\$651	65%	\$ 227.89	New Effective 5/30/2017
3HE08206PB	5620 SAM-E R13 UPG. LIC 7705 SAR-A	\$326	65%	\$ 113.94	New Effective 5/30/2017
3HE08207NA	5620 SAM-E R12 LIC 7705 SAR-A w T1/E1	\$850	65%	\$ 297.50	New Effective 5/30/2017
3HE08207NB	5620 SAM-E R12 UPG LIC 7705 SAR-A T1/E1	\$425	65%	\$ 148.75	New Effective 5/30/2017
3HE08207PA	5620 SAM-E R13 LIC 7705 SAR-A w T1/E1	\$850	65%	\$ 297.50	New Effective 5/30/2017
3HE08207PB	5620 SAM-E R13 UPG LIC 7705 SAR-A T1/E1	\$425	65%	\$ 148.75	New Effective 5/30/2017
3HE08208NA	5620 SAM-E R12 LIC 7705 SAR-H	\$850	65%	\$ 297.50	New Effective 5/30/2017
3HE08208NB	5620 SAM-E R12 UPG. LIC 7705 SAR-H	\$425	65%	\$ 148.75	New Effective 5/30/2017
3HE08208PA	5620 SAM-E R13 LIC 7705 SAR-H	\$850	65%	\$ 297.50	New Effective 5/30/2017
3HE08208PB	5620 SAM-E R13 UPG. LIC 7705 SAR-H	\$425	65%	\$ 148.75	New Effective 5/30/2017
3HE08209NA	5620 SAM-E R12 LIC 7705 SAR-W	\$765	65%	\$ 267.75	New Effective 5/30/2017
3HE08209NB	5620 SAM-E R12 UPG. LIC 7705 SAR-W	\$383	65%	\$ 133.88	New Effective 5/30/2017

3HE08209PA	5620 SAM-E R13 LIC 7705 SAR-W	\$765	65%	\$	267.75	New Effective 5/30/2017
3HE08209PB	5620 SAM-E R13 UPG. LIC 7705 SAR-W	\$383	65%	\$	133.88	New Effective 5/30/2017
3HE08210NA	5620 SAM-E/A/P R12 LIC. - OS10K-QNI CARD	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE08210NB	5620 SAM-EAP R12 UPG LIC. OS10K-QNI CARD	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE08210PA	5620 SAM-E/A/P R13 LIC. - OS10K-QNI CARD	\$6,120	65%	\$	2,142.00	New Effective 5/30/2017
3HE08210PB	5620 SAM-EAP R13 UPG LIC. OS10K-QNI CARD	\$3,060	65%	\$	1,071.00	New Effective 5/30/2017
3HE08211NA	5620 SAM-E R12 LIC. - OS10K-QNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE08211NB	5620 SAM-E R12 UPG. LIC. -OS10K-QNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE08211PA	5620 SAM-E R13 LIC. - OS10K-QNI CARD	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE08211PB	5620 SAM-E R13 UPG. LIC. -OS10K-QNI CARD	\$1,360	65%	\$	476.00	New Effective 5/30/2017
3HE08212NA	5620 SAM-E/A/P R12 LIC. 1830 OT STM1	\$459	65%	\$	160.65	New Effective 5/30/2017
3HE08212NB	5620 SAM-E/A/P R12 UPG. LIC 1830 OT STM1	\$230	65%	\$	80.33	New Effective 5/30/2017
3HE08212PA	5620 SAM-E/A/P R13 LIC. 1830 OT STM1	\$459	65%	\$	160.65	New Effective 5/30/2017
3HE08212PB	5620 SAM-E/A/P R13 UPG. LIC 1830 OT STM1	\$230	65%	\$	80.33	New Effective 5/30/2017
3HE08370NA	5620 SAM-E/A/P R12 7210 SAS CWDM SHELF	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE08370NB	5620 SAM-EAP R12 UPG 7210 SAS CWDM SHELF	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE08370PA	5620 SAM-EAP R13 7210SAS CWDM/DWDM SHELF	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE08370PB	5620 SAM-EAP R13 UPG 7210 SAS CWDM/DWDM	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE08371NA	5620 SAM-E R12 7210 SAS CWDM SHELF	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE08371NB	5620 SAM-E R12 UPG. 7210 SAS CWDM SHELF	\$64	65%	\$	22.31	New Effective 5/30/2017
3HE08371PA	5620 SAM-E R13 7210 SAS CWDM/DWDM SHELF	\$128	65%	\$	44.63	New Effective 5/30/2017
3HE08371PB	5620 SAM-E R13 UPG. 7210 SAS CWDM/DWDM	\$64	65%	\$	22.31	New Effective 5/30/2017
3HE08372NA	5620 SAM-E/A/P R12 7210 SAS-T 12F10T4XFP	\$1,020	65%	\$	357.00	New Effective 5/30/2017
3HE08372NB	5620 SAM-EAP R12 UPG 7210SAS-T 12F10T4XFP	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE08372PA	5620 SAM-E/A/P R13 7210 SAS-T 12F10T4XFP	\$1,020	65%	\$	357.00	New Effective 5/30/2017
3HE08372PB	5620 SAM-EAP R13 UPG 7210SAS-T 12F10T4XFP	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE08373NA	5620 SAM-E R12 7210 SAS-T 12F10T4XFP	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE08373NB	5620 SAM-E R12 UPG 7210 SAS-T 12F10T4XFP	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE08373PA	5620 SAM-E R13 7210 SAS-T 12F10T4XFP	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE08373PB	5620 SAM-E R13 UPG 7210 SAS-T 12F10T4XFP	\$255	65%	\$	89.25	New Effective 5/30/2017
3HE08398NA	5620 SAM-E/A/P R12 LIC 1830 CLIENT/LINE	\$1,836	65%	\$	642.60	New Effective 5/30/2017
3HE08398NB	5620 SAM-EAP R12 UPG LI 1830 CLIENT/LINE	\$918	65%	\$	321.30	New Effective 5/30/2017
3HE08398PA	5620 SAM-E/A/P R13 LIC 1830 CLIENT/LINE	\$1,836	65%	\$	642.60	New Effective 5/30/2017
3HE08398PB	5620 SAM-EAP R13 UPG LI 1830 CLIENT/LINE	\$918	65%	\$	321.30	New Effective 5/30/2017
3HE08449NA	5620 SAM-E/A/P R12 LIC 7705 SAR-Hc	\$1,403	65%	\$	490.88	New Effective 5/30/2017
3HE08449PA	5620 SAM-E/A/P R13 LIC 7705 SAR-Hc	\$1,403	65%	\$	490.88	New Effective 5/30/2017
3HE08449PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-Hc	\$701	65%	\$	245.44	New Effective 5/30/2017
3HE08450NA	5620 SAM-E R12 LIC 7705 SAR-Hc	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE08450PA	5620 SAM-E R13 LIC 7705 SAR-Hc	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE08450PB	5620 SAM-E R13 UPG. LIC 7705 SAR-Hc	\$213	65%	\$	74.38	New Effective 5/30/2017
3HE08619PA	VSAP R13 (SAM+CPAM NON RED) BASE	\$42,500	65%	\$	14,875.00	New Effective 5/30/2017
3HE08620PA	VSAP R13 SAM+CPAM REDUNDANT BASE	\$68,000	65%	\$	23,800.00	New Effective 5/30/2017
3HE08621PA	VSAP R13 & 5650 CPAM R8 NV OSS LIC	\$25,500	65%	\$	8,925.00	New Effective 5/30/2017
3HE08835PA	VSAP R13 TOPOLOGY - ALU EQUIV NE	\$2,550	65%	\$	892.50	New Effective 5/30/2017
3HE08836PA	VSAP R13 TOPOLOGY MGMT - GNE LIC	\$1,275	65%	\$	446.25	New Effective 5/30/2017
3HE08971NA	5620 SAM-E/A/P R12 LIC 7705 SAR-Wx	\$2,550	65%	\$	892.50	New Effective 5/30/2017
3HE08971PA	5620 SAM-E/A/P R13 LIC 7705 SAR-Wx	\$2,550	65%	\$	892.50	New Effective 5/30/2017
3HE08971PB	5620 SAM-E/A/P R13 UPG. LIC 7705 SAR-Wx	\$1,275	65%	\$	446.25	New Effective 5/30/2017
3HE08972NA	5620 SAM-E R12 LIC 7705 SAR-Wx	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE08972PA	5620 SAM-E R13 LIC 7705 SAR-Wx	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE08972PB	5620 SAM-E R13 UPG. LIC 7705 SAR-Wx	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE08973NA	5620 SAM-E/A/P R12 7210 SAS-R6	\$3,403	65%	\$	1,191.19	New Effective 5/30/2017
3HE08973PA	5620 SAM-E/A/P R13 7210 SAS-R6 / R12	\$3,403	65%	\$	1,191.19	New Effective 5/30/2017
3HE08973PB	5620 SAM-EAP R13 UPG LIC 7210 SAS-R6 /12	\$1,702	65%	\$	595.60	New Effective 5/30/2017
3HE08974NA	5620 SAM-E R12 7210 SAS-R6	\$1,134	65%	\$	397.06	New Effective 5/30/2017
3HE08974PA	5620 SAM-E R13 LIC. 7210 SAS-R6 / R12	\$1,134	65%	\$	397.06	New Effective 5/30/2017
3HE08974PB	5620 SAM-E R13 UPG LIC 7210 SAS-R6 / R12	\$567	65%	\$	198.53	New Effective 5/30/2017
3HE09159PA	VSAP R13 VRS 10G HYPERVISOR PORT	\$132	65%	\$	46.05	New Effective 5/30/2017
3HE09160PA	VSAP R13 VRS 40G HYPERVISOR PORT	\$261	65%	\$	91.46	New Effective 5/30/2017
3HE09162PA	VSAP R13 dVS 10G L2 PORT	\$196	65%	\$	68.75	New Effective 5/30/2017
3HE09163PA	VSAP R13 dVRS 10G L3 PORT	\$261	65%	\$	91.46	New Effective 5/30/2017
3HE09283PA	VSAP R13 dVS 40G L2 PORT	\$786	65%	\$	275.01	New Effective 5/30/2017
3HE09284PA	VSAP R13 dVRS 40G L3 PORT	\$1,049	65%	\$	367.10	New Effective 5/30/2017
3HE09332NA	5620 SAM-EAP R12 LIC WLS METRO/ENT CELL	\$138	65%	\$	48.20	New Effective 5/30/2017
3HE09332PA	5620 SAM-EAP R13 LIC WLS METRO/ENT CELL	\$108	65%	\$	37.85	New Effective 5/30/2017
3HE09332PB	5620 SAM-EAP R13 UPG WLS METRO/ENT CELL	\$54	65%	\$	18.92	New Effective 5/30/2017
3HE09333NA	5620 SAM-E/A/P R12 LIC WLS HOME CELL	\$34	65%	\$	11.90	New Effective 5/30/2017
3HE09333PA	5620 SAM-E/A/P R13 LIC WLS HOME CELL	\$29	65%	\$	10.09	New Effective 5/30/2017
3HE09333PB	5620 SAM-E/A/P R13 UPG LIC WLS HOME CELL	\$14	65%	\$	5.05	New Effective 5/30/2017
3HE09334NA	5620 SAM-E/A/P R12 LIC WLS SC GW	\$31,620	65%	\$	11,067.00	New Effective 5/30/2017
3HE09334PA	5620 SAM-E/A/P R13 LIC WLS SC GW	\$24,830	65%	\$	8,690.60	New Effective 5/30/2017

3HE09334PB	5620 SAM-E/A/P R13 UPG. LIC WLS SC GW	\$12,415	65%	\$	4,345.30	New Effective 5/30/2017
3HE09593NA	5620 SAM-E/A/P R12 7750 SR-a MDA	\$5,440	65%	\$	1,904.00	New Effective 5/30/2017
3HE09593PA	5620 SAM-E/A/P R13 7750 SR-a MDA	\$5,440	65%	\$	1,904.00	
3HE09593PB	5620 SAM-E/A/P R13 UPG LIC 7750 SR-a MDA	\$2,720	65%	\$	952.00	New Effective 5/30/2017
3HE09594NA	5620 SAM-E R12 7750 SR-a MDA	\$1,812	65%	\$	634.27	New Effective 5/30/2017
3HE09594PA	5620 SAM-E R13 7750 SR-a MDA	\$1,812	65%	\$	634.27	
3HE09594PB	5620 SAM-E R13 UPG. LIC. 7750 SR-a MDA	\$906	65%	\$	317.14	New Effective 5/30/2017
3HE09692NA	5620 SAM-E/A/P R12 7210 SAS-K	\$153	65%	\$	53.55	New Effective 5/30/2017
3HE09692PA	5620 SAM-E/A/P R13 7210 SAS-K	\$153	65%	\$	53.55	
3HE09692PB	5620 SAM-E/A/P R13 UPG. LIC. 7210 SAS-K	\$77	65%	\$	26.78	New Effective 5/30/2017
3HE09693NA	5620 SAM-E R12 7210 SAS-K	\$51	65%	\$	17.85	New Effective 5/30/2017
3HE09693PA	5620 SAM-E R13 LIC. 7210 SAS-K	\$51	65%	\$	17.85	
3HE09693PB	5620 SAM-E R13 UPG. LIC 7210 SAS-K	\$26	65%	\$	8.93	New Effective 5/30/2017
3HE09955PA	5620 SAM R13 IPDR NBI	\$425,000	65%	\$	148,750.00	New Effective 5/30/2017
3HE09955PB	5620 SAM R13 IPDR NBI UPG	\$212,500	65%	\$	74,375.00	New Effective 5/30/2017
3HE09955QA	5620 SAM R14 AA ANALYTICS BASE	\$245,095	65%	\$	85,783.29	
3HE09955QB	5620 SAM AA ANALYTICS BASE UPG R14	\$122,548	65%	\$	42,891.65	New Effective 5/30/2017
3HE09956PA	5620 SAM R13 REDUNDANT IPDR NBI	\$212,500	65%	\$	74,375.00	New Effective 5/30/2017
3HE09956PB	5620 SAM R13 REDUNDANT IPDR NBI UPG	\$106,250	65%	\$	37,187.50	New Effective 5/30/2017
3HE09957PA	5620 SAM R13 10K AA RESIDENTIAL SUB	\$18,700	65%	\$	6,545.00	New Effective 5/30/2017
3HE09957PB	5620 SAM R13 10K AA UPG RESIDENTIAL SUB	\$9,350	65%	\$	3,272.50	New Effective 5/30/2017
3HE09957QA	5620 SAM R14 10K AA RESIDENTIAL SUBS	\$16,220	65%	\$	5,676.84	
3HE09957QB	5620 SAM 10K AA RESIDENTIAL SUBS UPG R14	\$8,110	65%	\$	2,838.42	New Effective 5/30/2017
3HE09958PA	5670 SAM R13 10K AA MOBILE SUB	\$8,500	65%	\$	2,975.00	New Effective 5/30/2017
3HE09958PB	5670 SAM R13 10K AA UPG MOBILE SUB	\$4,250	65%	\$	1,487.50	New Effective 5/30/2017
3HE09958QA	5620 SAM R14 10K AA MOBILE SUBS	\$16,220	65%	\$	5,676.84	
3HE09958QB	5620 SAM 10K AA MOBILE SUBS UPG.TO R14	\$8,110	65%	\$	2,838.42	New Effective 5/30/2017
3HE09959PA	5620 SAM R13 500 AA BUSINESS SUB	\$34,000	65%	\$	11,900.00	New Effective 5/30/2017
3HE09959PB	5620 SAM R13 500 AA UPG BUSINESS SUB	\$17,000	65%	\$	5,950.00	New Effective 5/30/2017
3HE09959QA	5620 SAM R14 500 AA BUSINESS SUBS	\$32,439	65%	\$	11,353.67	
3HE09959QB	5620 SAM 500 AA BUSINESS SUBS UPG. R14	\$16,220	65%	\$	5,676.84	New Effective 5/30/2017
3HE09960PA	5620 SAM R13 PER AA-ISA REP	\$3,400	65%	\$	1,190.00	New Effective 5/30/2017
3HE09960PB	5620 SAM R13 PER AA-ISA REP UPG	\$1,700	65%	\$	595.00	New Effective 5/30/2017
3HE09961PA	5620 SAM R13 CFLOWD AUXILIARY SERVER	\$68,000	65%	\$	23,800.00	New Effective 5/30/2017
3HE09961PB	5620 SAM R13 CFLOWD AUXILIARY SERVER UPG	\$34,000	65%	\$	11,900.00	New Effective 5/30/2017
3HE10033PA	5620 SAM-E/A/P R13 LIC. NGE	\$680	65%	\$	238.00	New Effective 5/30/2017
3HE10034PA	5620 SAM-E/A/P R13 LIC 7705 SAR-X	\$4,590	65%	\$	1,606.50	New Effective 5/30/2017
3HE10035PA	5620 SAM-E R13 LIC 7705 SAR-X	\$1,530	65%	\$	535.50	New Effective 5/30/2017
3HE10036PA	5620 SAM-EAP R13 -9500 MPR MSS-O CHASSIS	\$425	65%	\$	148.75	New Effective 5/30/2017
3HE10037PA	5620 SAM-E R13 - 9500 MPR MSS-O CHASSIS	\$106	65%	\$	37.19	New Effective 5/30/2017
3HE10038PA	5620 SAM-E/A/P R13 1830 GMPLS NODE	\$56,100	65%	\$	19,635.00	New Effective 5/30/2017
3HE10072PA	VSAP R13 VNS CORE STANDARD / NSG	\$238	65%	\$	83.30	New Effective 5/30/2017
3HE10100NA	5620 SAM-EAP R12 EAST/WEST EMS BUNDLE 25	\$1,700	65%	\$	595.00	New Effective 5/30/2017
3HE10100PA	5620 SAM-EAP R13 EAST/WEST EMS BUNDLE 25	\$1,700	65%	\$	595.00	
3HE10100PB	5620 SAM-EAP R13 UPG EAST/WEST BUNDLE 25	\$850	65%	\$	297.50	New Effective 5/30/2017
3HE10245NA	5620 SAM-E/A/P R12 LIC WLS LMG NODE	\$178,415	65%	\$	62,445.19	New Effective 5/30/2017
3HE10245PA	5620 SAM-E/A/P R13 LIC WLS LMG NODE	\$177,533	65%	\$	62,136.65	New Effective 5/30/2017
3HE10245PB	5620 SAM-E/A/P R13 UPG. LIC WLS LMG NODE	\$82,343	65%	\$	28,820.03	New Effective 5/30/2017
3HE10250AA	5620 SAM-E/A/P R13 VMG DISTRIBUTED VNF	\$61,200	65%	\$	21,420.00	New Effective 5/30/2017
3HE10251AA	5620 SAM-E/A/P R13 VMG-SGW 10K SUBS	\$5,100	65%	\$	1,785.00	New Effective 5/30/2017
3HE10252AA	5620 SAM-E/A/P R13 VMG-PGW 10K SUBS	\$10,200	65%	\$	3,570.00	New Effective 5/30/2017
3HE10253AA	5620 SAM-E/A/P R13 VMG-SGW M2M 10K SUBS	\$1,190	65%	\$	416.50	New Effective 5/30/2017
3HE10254AA	5620 SAM-E/A/P R13 VMG-PGW M2M 10K SUBS	\$2,295	65%	\$	803.25	New Effective 5/30/2017
3HE10255AA	5620 SAM-E/A/P R13 VMG-AA ID 10K SUBS	\$1,020	65%	\$	357.00	New Effective 5/30/2017
3HE10256AA	5620 SAM-E/A/P R13 VMG-AA ICAP 10K SUBS	\$20,400	65%	\$	7,140.00	New Effective 5/30/2017
3HE10257AA	5620 SAM-E/A/P R13 VMG-AA IBN 10K SUBS	\$2,040	65%	\$	714.00	New Effective 5/30/2017
3HE10258AA	5620 SAM-E/A/P R13 VMG-AA URL 10K SUBS	\$2,040	65%	\$	714.00	New Effective 5/30/2017
3HE10259AA	5620 SAM-E/A/P R13 VMG-AA FW 10K SUBS	\$510	65%	\$	178.50	New Effective 5/30/2017
3HE10260AA	5620 SAM-E/A/P R13 VMG-AA RTP 10K SUBS	\$2,040	65%	\$	714.00	New Effective 5/30/2017
3HE10261AA	5620 SAM-E/A/P R13 VMG-EPDG 10K SUBS	\$4,080	65%	\$	1,428.00	New Effective 5/30/2017
3HE10262AA	5620 SAM-E/A/P R13 VMM DISTRIBUTED VNF	\$61,200	65%	\$	21,420.00	New Effective 5/30/2017
3HE10263AA	5620 SAM-E/A/P R13 VMM-MME 10K SUBS	\$7,990	65%	\$	2,796.50	New Effective 5/30/2017
3HE10264AA	5620 SAM-E/A/P R13 VMM-SGSN 10K SUBS	\$3,655	65%	\$	1,279.25	New Effective 5/30/2017
3HE10265AA	5620 SAM-E/A/P R13 VMM-MME M2M 10K SUBS	\$1,598	65%	\$	559.30	New Effective 5/30/2017
3HE10266AA	5620 SAM-E/A/P R13 VMM-SGSN M2M 10K SUBS	\$731	65%	\$	255.85	New Effective 5/30/2017
3HE10330PA	5620 SAM-E/A/P R13 7210 SAS-MXP	\$2,210	65%	\$	773.50	
3HE10331PA	5620 SAM-E R13 7210 SAS-MXP	\$1,105	65%	\$	386.75	
3HE10463PA	5620 SAM R13 AUXILIARY DATABASE 1 TB	\$22,100	65%	\$	7,735.00	
3HE10463QA	5620 SAM R14 AUXILIARY DATABASE 1 TB	\$21,626	65%	\$	7,569.11	
3HE10463QB	5620 SAM AUXILIARY DATABASE 1 TB UPG R14	\$10,813	65%	\$	3,784.56	New Effective 5/30/2017
3HE10464PA	5620 SAM-E/A/P R13 - 9500 MPR MSS-1c	\$255	65%	\$	89.25	New Effective 5/30/2017

3HE10465PA	5620 SAM-E R13 LIC- 9500 MPR MSS-1c	\$64	65%	\$	22.31	New Effective 5/30/2017
3HE10746PA	VSAP R13 40G L3 dVRS-B 3rd PARTY-VTEP PT	\$391	65%	\$	136.87	New Effective 5/30/2017
3HE10747PA	VSAP R13 40G L2 dVS-B 3rd PARTY-VTEP PT	\$1,047	65%	\$	366.47	New Effective 5/30/2017
3HE10748PA	VSAP R13 10G L3 dVRS-B 3rd PARTY-VTEP PT	\$97	65%	\$	34.06	New Effective 5/30/2017
3HE10749PA	VSAP R13 10G L2 dVS-B 3rd PARTY-VTEP PT	\$261	65%	\$	91.46	New Effective 5/30/2017
3HE10820QA	5620 SAM R14 BASE PRODUCT - CLASSIC	\$126,152	65%	\$	44,153.17	
3HE10820QB	5620 SAM BASE PRODUCT - CLASSIC UPG- R14	\$63,076	65%	\$	22,076.58	New Effective 5/30/2017
3HE10821QA	5620 SAM R14 BASE PRODUCT - PREMIUM	\$252,304	65%	\$	88,306.33	
3HE10821QB	5620 SAM BASE PROD. PREMIUM UPG -R14	\$126,152	65%	\$	44,153.17	New Effective 5/30/2017
3HE10821QC	5620 SAM R14 BASE CONV CLASSIC TO PREM.	\$126,152	65%	\$	44,153.17	
3HE10822QA	5620 SAM R14 EXTENDED NE S/W SUPPORT	\$18,022	65%	\$	6,307.60	
3HE10823QA	5620 SAM R14 CLASSIC SUITE LICENSE POINT	\$180	65%	\$	63.08	
3HE10823QB	5620 SAM CLASSIC SUITE LIC POINT UPG R14	\$90	65%	\$	31.54	New Effective 5/30/2017
3HE10824QA	5620 SAM R14 PREMIUM SUITE LICENSE POINT	\$270	65%	\$	94.61	
3HE10824QB	5620 SAM PREMIUM SUITE LIC POINT UPG R14	\$135	65%	\$	47.31	New Effective 5/30/2017
3HE10824QC	5620 SAM R14 CLASSIC TO PREMIUM LP CONV.	\$90	65%	\$	31.54	
3HE10838AA	5620 SAM MULTI-VENDOR DRIVER DEVELOPMENT	\$45,054	65%	\$	15,768.99	New Effective 5/30/2017
3HE10838AB	5620 SAM MULTI-VENDOR DRIVER S/W UPGRADE	\$22,527	65%	\$	7,884.49	New Effective 5/30/2017
3HE10839AA	5620 SAM MULTI-VENDOR DRIVER 3 YEAR SSP	\$60,823	65%	\$	21,288.13	New Effective 5/30/2017
3HE10846QA	5620 SAM R14 OPTICS INTEGRATION MODULE	\$270,326	65%	\$	94,613.93	
3HE11048QA	5620 SAM R14 CLASSIC WLS LTE LIC POINT	\$180	65%	\$	63.08	New Effective 5/30/2017
3HE11048QB	5620 SAM CLASSIC WLS LTE LP UPG R14	\$90	65%	\$	31.54	New Effective 5/30/2017
3HE11049QA	5620 SAM R14 CLASSIC WLS SC LIC POINT	\$180	65%	\$	63.08	New Effective 5/30/2017
3HE11049QB	5620 SAM CLASSIC WLS SC LP UPG R14	\$90	65%	\$	31.54	New Effective 5/30/2017
3HE11050QA	5620 SAM R14 PREMIUM WLS LTE LIC POINT	\$270	65%	\$	94.61	New Effective 5/30/2017
3HE11050QB	5620 SAM PREMIUM WLS LTE LP UPG R14	\$135	65%	\$	47.31	New Effective 5/30/2017
3HE11050QC	5620 SAM R14 CLASSIC-PREM WLS LTE LP CON	\$90	65%	\$	31.54	New Effective 5/30/2017
3HE11051QA	5620 SAM R14 PREMIUM WLS SC LIC POINT	\$270	65%	\$	94.61	New Effective 5/30/2017
3HE11051QB	5620 SAM PREMIUM WLS SC LP UPG R14	\$135	65%	\$	47.31	New Effective 5/30/2017
3HE11051QC	5620 SAM R14 CLASSIC-PREM WLS SC LP CONV	\$90	65%	\$	31.54	New Effective 5/30/2017
5650 Control Plane Assurance Management & 7701 CCAA (CPAM)						
3HE02977HA	5650 CPAM R8.0 BASE PRODUCT	\$42,500	65%	\$	14,875.00	New Effective 5/30/2017
3HE02977HB	5650 CPAM R8.0 BASE PRODUCT UPGRADE	\$21,250	65%	\$	7,437.50	
3HE02977JA	5650 CPAM R9.0 BASE PRODUCT	\$42,500	65%	\$	14,875.00	
3HE02977JB	5650 CPAM R9.0 BASE PRODUCT UPGRADE	\$21,250	65%	\$	7,437.50	
3HE02980HA	5650 CPAM-O R8.0 LICENSE - CPAM INSTALL	\$34,000	65%	\$	11,900.00	
3HE02980HB	5650 CPAM-O R8.0 LICENSE UPGRADE	\$17,000	65%	\$	5,950.00	
3HE02980JA	5650 CPAM-O R9.0 LICENSE - CPAM INSTALL	\$34,000	65%	\$	11,900.00	
3HE02980JB	5650 CPAM-O R9.0 LICENSE UPGRADE	\$17,000	65%	\$	5,950.00	
3HE02982HA	5650 CPAM R8.0 3P P/PE RT LIC (1-100)	\$5,100	65%	\$	1,785.00	
3HE02982HB	5650 CPAM R8.0 3P P/PE RT LIC (101-300)	\$1,275	65%	\$	446.25	
3HE02982HC	5650 CPAM R8.0 3P P/PE RT LIC (301->)	\$510	65%	\$	178.50	
3HE02982HD	5650 CPAM R8.0 3P P/PE RT UPG LIC(1-100)	\$2,550	65%	\$	892.50	
3HE02982HE	5650 CPAM R8 3P P/PE RT UPG LIC(101-300)	\$638	65%	\$	223.13	
3HE02982HF	5650 CPAM R8.0 3P P/PE RT UPG LIC (301->)	\$255	65%	\$	89.25	
3HE02982JA	5650 CPAM R9.0 3P P/PE RT LIC (1-100)	\$5,100	65%	\$	1,785.00	
3HE02982JB	5650 CPAM R9.0 3P P/PE RT LIC (101-300)	\$1,275	65%	\$	446.25	
3HE02982JC	5650 CPAM R9.0 3P P/PE RT LIC (301->)	\$510	65%	\$	178.50	
3HE02982JD	5650 CPAM R9.0 3P P/PE RT UPG LIC(1-100)	\$2,550	65%	\$	892.50	
3HE02982JE	5650 CPAM R9 3P P/PE RT UPG LIC(101-300)	\$638	65%	\$	223.13	
3HE02982JF	5650 CPAM R9.0 3P P/PE RT UPG LIC (301->)	\$255	65%	\$	89.25	
3HE02983HA	5650 CPAM R8.0 ALU P/PE RT LIC. (1-100)	\$7,225	65%	\$	2,528.75	
3HE02983HB	5650 CPAM R8.0 ALU P/PE RT LIC (101-300)	\$1,828	65%	\$	639.63	
3HE02983HC	5650 CPAM R8.0 ALU P/PE RT LIC. (301 >)	\$723	65%	\$	252.88	
3HE02983HD	5650 CPAM ALU P/PE RT UPG. LIC R8(1-100)	\$3,613	65%	\$	1,264.38	
3HE02983HE	5650 ALU P/PE RT UPG LIC R8.0 (101-300)	\$914	65%	\$	319.81	
3HE02983HF	5650 CPAM ALU P/PE RT UPG LIC R8 (301 >)	\$361	65%	\$	126.44	
3HE02983JA	5650 CPAM R9.0 ALU P/PE RT LIC. (1-100)	\$7,225	65%	\$	2,528.75	
3HE02983JB	5650 CPAM R9.0 ALU P/PE RT LIC (101-300)	\$1,828	65%	\$	639.63	
3HE02983JC	5650 CPAM R9.0 ALU P/PE RT LIC. (301 >)	\$723	65%	\$	252.88	
3HE02983JD	5650 CPAM ALU P/PE RT UPG. LIC R9(1-100)	\$3,613	65%	\$	1,264.38	
3HE02983JE	5650 ALU P/PE RT UPG LIC R9.0 (101-300)	\$914	65%	\$	319.81	
3HE02983JF	5650 CPAM ALU P/PE RT UPG LIC R9 (301 >)	\$361	65%	\$	126.44	
3HE04125HA	5650 CPAM R8.0 ALU P/PE SM RT LIC(1-100)	\$893	65%	\$	312.38	
3HE04125HB	5650 CPAM R8 ALU P/PE SM RT LIC(101-300)	\$340	65%	\$	119.00	
3HE04125HC	5650 CPAM R8.0 ALU P/PE SM RT LIC(301 >)	\$213	65%	\$	74.38	
3HE04125HD	5650 CPAM R8.0 ALU P/PE SM RT UPG(1-100)	\$446	65%	\$	156.19	
3HE04125HE	5650 CPAM R8 ALU P/PE SM RT UPG(101-300)	\$170	65%	\$	59.50	
3HE04125HF	5650 CPAM R8.0 ALU P/PE SM RT UPG(301 >)	\$106	65%	\$	37.19	
3HE04125JA	5650 CPAM R9.0 ALU P/PE SM RT LIC(1-100)	\$893	65%	\$	312.38	
3HE04125JB	5650 CPAM R9 ALU P/PE SM RT LIC(101-300)	\$340	65%	\$	119.00	

3HE04125JC	5650 CPAM R9.0 ALU P/PE SM RT LIC(301 >)	\$213	65%	\$ 74.38	
3HE04125JD	5650 CPAM R9.0 ALU P/PE SM RT UPG(1-100)	\$446	65%	\$ 156.19	
3HE04125JE	5650 CPAM R9 ALU P/PE SM RT UPG(101-300)	\$170	65%	\$ 59.50	
3HE04125JF	5650 CPAM R9.0 ALU P/PE SM RT UPG(301 >)	\$106	65%	\$ 37.19	
3HE04126HA	5650 CPAM R8.0 MULTICAST RT LIC. (1-100)	\$1,615	65%	\$ 565.25	
3HE04126HB	5650 CPAM R8.0 MULTICAST RT LIC(101-300)	\$510	65%	\$ 178.50	
3HE04126HC	5650 CPAM R8.0 MULTICAST RT LIC. (301 >)	\$255	65%	\$ 89.25	
3HE04126HD	5650 CPAM R8.0 MULTICAST RT UPG (1-100)	\$808	65%	\$ 282.63	
3HE04126HE	5650 CPAM R8.0 MULTICAST RT UPG(101-300)	\$255	65%	\$ 89.25	
3HE04126HF	5650 CPAM R8.0 MULTICAST RT UPG (301 >)	\$128	65%	\$ 44.63	
3HE04126JA	5650 CPAM R9.0 MULTICAST RT LIC. (1-100)	\$1,615	65%	\$ 565.25	
3HE04126JB	5650 CPAM R9.0 MULTICAST RT LIC(101-300)	\$510	65%	\$ 178.50	
3HE04126JC	5650 CPAM R9.0 MULTICAST RT LIC. (301 >)	\$255	65%	\$ 89.25	
3HE04126JD	5650 CPAM R9.0 MULTICAST RT UPG (1-100)	\$808	65%	\$ 282.63	
3HE04126JE	5650 CPAM R9.0 MULTICAST RT UPG(101-300)	\$255	65%	\$ 89.25	
3HE04126JF	5650 CPAM R9.0 MULTICAST RT UPG (301 >)	\$128	65%	\$ 44.63	
3HE04128HA	5650 CPAM R8.0 RCIA ROUTER LIC. (1-100)	\$1,615	65%	\$ 565.25	
3HE04128HB	5650 CPAM R8.0 RCIA ROUTER LIC (101-300)	\$510	65%	\$ 178.50	
3HE04128HC	5650 CPAM R8.0 RCIA ROUTER LIC. (301 >)	\$255	65%	\$ 89.25	
3HE04128HD	5650 CPAM R8.0 RCIA ROUTERUPG LI (1-100)	\$808	65%	\$ 282.63	
3HE04128HE	5650 CPAM R8.0 RCIA ROUTER UPG (101-300)	\$255	65%	\$ 89.25	
3HE04128HF	5650 CPAM R8.0 RCIA ROUTER UPG (301 >)	\$128	65%	\$ 44.63	
3HE04128JA	5650 CPAM R9.0 RCIA ROUTER LIC. (1-100)	\$1,615	65%	\$ 565.25	
3HE04128JB	5650 CPAM R9.0 RCIA ROUTER LIC (101-300)	\$510	65%	\$ 178.50	
3HE04128JC	5650 CPAM R9.0 RCIA ROUTER LIC. (301 >)	\$255	65%	\$ 89.25	
3HE04128JD	5650 CPAM R9.0 RCIA ROUTERUPG LI (1-100)	\$808	65%	\$ 282.63	
3HE04128JE	5650 CPAM R9.0 RCIA ROUTER UPG (101-300)	\$255	65%	\$ 89.25	
3HE04128JF	5650 CPAM R9.0 RCIA ROUTER UPG (301 >)	\$128	65%	\$ 44.63	
3HE08510HA	5650 CPAM R8.0 500 BGP ROUTE PROFILE	\$4,250	65%	\$ 1,487.50	
3HE08510HB	5650 CPAM R8 500 BGP ROUTE PROFILE UPG.	\$2,125	65%	\$ 743.75	
3HE08510JA	5650 CPAM R9.0 500 BGP ROUTE PROFILE	\$4,250	65%	\$ 1,487.50	
3HE08510JB	5650 CPAM R9 500 BGP ROUTE PROFILE UPG.	\$2,125	65%	\$ 743.75	
3HE02948HA	7701 CPAA S/W UPGRADE LICENSE TO R8.0	\$6,800	65%	\$ 2,380.00	
3HE02948HC	7701 CPAA S/W LICENSE R8.0	\$13,600	65%	\$ 4,760.00	
3HE02948JA	7701 CPAA S/W UPGRADE LICENSE TO R9.0	\$6,800	65%	\$ 2,380.00	
3HE02948JC	7701 CPAA S/W LICENSE R9.0	\$13,600	65%	\$ 4,760.00	
3HE0666AA	7701 CPAA REV 2 MEMORY EXPANSION 2G PKG	\$2,040	65%	\$ 714.00	New Effective 5/30/2017
3HE02948GA	7701 CPAA S/W UPGRADE LICENSE TO R7.0	\$6,800	65%	\$ 2,380.00	Effective 5/30/2017
3HE02977GA	5650 CPAM R7.0 BASE PRODUCT	\$42,500	65%	\$ 14,875.00	Effective 5/30/2017
3HE02980GA	5650 CPAM O R7.0 LICENSE - CPAM INSTALL	\$34,000	65%	\$ 11,900.00	Effective 5/30/2017
3HE02977GB	5650 CPAM R7.0 BASE PRODUCT UPG - SOLARIS	\$21,250	65%	\$ 7,437.50	Effective 5/30/2017
3HE02980GB	5650 CPAM O R7.0 LICENSE UPGRADE	\$17,000	65%	\$ 5,950.00	Effective 5/30/2017
3HE02982GA	5650 CPAM R7.0 3P P/PE RT LIC (1-100)	\$5,100	65%	\$ 1,785.00	Effective 5/30/2017
3HE02982GB	5650 CPAM R7.0 3P P/PE RT LIC (101-300)	\$1,275	65%	\$ 446.25	Effective 5/30/2017
3HE02982GC	5650 CPAM R7.0 3P P/PE RT LIC (301 >)	\$510	65%	\$ 178.50	Effective 5/30/2017
3HE02982GD	5650 CPAM R7.0 3P P/PE RT UPG LIC(1-100)	\$2,550	65%	\$ 892.50	Effective 5/30/2017
3HE02982GE	5650 CPAM R7 3P P/PE RT UPG LIC(101-300)	\$638	65%	\$ 223.13	Effective 5/30/2017
3HE02982GF	5650 CPAM R7.0 3P P/PE RT UPG LIC (301 >)	\$255	65%	\$ 89.25	Effective 5/30/2017
3HE02983GA	5650 CPAM R7.0 ALU P/PE RT LIC. (1-100)	\$7,225	65%	\$ 2,528.75	Effective 5/30/2017
3HE02983GB	5650 CPAM R7.0 ALU P/PE RT LIC (101-300)	\$1,828	65%	\$ 639.63	Effective 5/30/2017
3HE02983GC	5650 CPAM R7.0 ALU P/PE RT LIC. (301 >)	\$723	65%	\$ 252.88	Effective 5/30/2017
3HE02983GD	5650 CPAM ALU P/PE RT UPG. LIC R7(1-100)	\$3,613	65%	\$ 1,264.38	Effective 5/30/2017
3HE02983GE	5650 ALU P/PE RT UPG LIC R7.0 (101-300)	\$914	65%	\$ 319.81	Effective 5/30/2017
3HE02983GF	5650 CPAM ALU P/PE RT UPG LIC R7 (301 >)	\$361	65%	\$ 126.44	Effective 5/30/2017
3HE04125GA	5650 CPAM R7.0 ALU P/PE SM RT LIC(1-100)	\$893	65%	\$ 312.38	Effective 5/30/2017
3HE04125GB	5650 CPAM R7 ALU P/PE SM RT LIC(101-300)	\$340	65%	\$ 119.00	Effective 5/30/2017
3HE04125GC	5650 CPAM R7.0 ALU P/PE SM RT LIC(301 >)	\$213	65%	\$ 74.38	Effective 5/30/2017
3HE04125GD	5650 CPAM R7.0 ALU P/PE SM RT UPG(1-100)	\$446	65%	\$ 156.19	Effective 5/30/2017
3HE04125GE	5650 CPAM R7 ALU P/PE SM RT UPG(101-300)	\$170	65%	\$ 59.50	Effective 5/30/2017
3HE04125GF	5650 CPAM R7.0 ALU P/PE SM RT UPG(301 >)	\$106	65%	\$ 37.19	Effective 5/30/2017
3HE04126GA	5650 CPAM R7.0 MULTICAST RT LIC. (1-100)	\$1,615	65%	\$ 565.25	Effective 5/30/2017
3HE04126GB	5650 CPAM R7.0 MULTICAST RT LIC(101-300)	\$510	65%	\$ 178.50	Effective 5/30/2017
3HE04126GC	5650 CPAM R7.0 MULTICAST RT LIC. (301 >)	\$255	65%	\$ 89.25	Effective 5/30/2017
3HE04126GD	5650 CPAM R7.0 MULTICAST RT UPG (1-100)	\$808	65%	\$ 282.63	Effective 5/30/2017
3HE04126GE	5650 CPAM R7.0 MULTICAST RT UPG(101-300)	\$255	65%	\$ 89.25	Effective 5/30/2017
3HE04126GF	5650 CPAM R7.0 MULTICAST RT UPG (301 >)	\$128	65%	\$ 44.63	Effective 5/30/2017
3HE04128GA	5650 CPAM R7.0 RCIA ROUTER LIC. (1-100)	\$1,615	65%	\$ 565.25	Effective 5/30/2017
3HE04128GB	5650 CPAM R7.0 RCIA ROUTER LIC (101-300)	\$510	65%	\$ 178.50	Effective 5/30/2017
3HE04128GC	5650 CPAM R7.0 RCIA ROUTER LIC. (301 >)	\$255	65%	\$ 89.25	Effective 5/30/2017
3HE04128GD	5650 CPAM R7.0 RCIA ROUTERUPG LI (1-100)	\$808	65%	\$ 282.63	Effective 5/30/2017
3HE04128GE	5650 CPAM R7.0 RCIA ROUTER UPG (101-300)	\$255	65%	\$ 89.25	Effective 5/30/2017

3HE04128GF	5650-CPAM R7.0-RCIA -ROUTER-UPG (301 →)	\$128	65%	\$ 44.63	Effective 5/30/2017
3HE08510GA	5650-CPAM R7.0-500-BGP-ROUTE-PROFILE	\$4,250	65%	\$ 1,487.59	Effective 5/30/2017
5670 Reporting and Analysis Manager (RAM)					New Effective 5/30/2017
3HE04265GA	5670 RAM R7.0 BASE - RESIDENTAL / MOBILE	\$424,968	65%	\$ 148,738.70	
3HE04265GB	5670 RAM R7.0 BASE UPG RESIDENTAL/MOBILE	\$212,483	65%	\$ 74,369.05	
3HE04265HA	5670 RAM R8.0 BASE - RESIDENTAL / MOBILE	\$424,968	65%	\$ 148,738.70	
3HE04265HB	5670 RAM R8.0 BASE UPG RESIDENTAL/MOBILE	\$212,483	65%	\$ 74,369.05	
3HE04265JA	5670 RAM R9.0 BASE - RESIDENTAL / MOBILE	\$424,968	65%	\$ 148,738.70	New Effective 5/30/2017
3HE04265JB	5670 RAM R9.0 BASE UPG RESIDENTAL/MOBILE	\$212,483	65%	\$ 74,369.05	New Effective 5/30/2017
3HE04267GA	5670 RAM R7.0 10K RESIDENTIAL SUB	\$18,700	65%	\$ 6,545.00	
3HE04267GB	5670 RAM R7.0 10K UPG. RESIDENTIAL SUBS	\$9,350	65%	\$ 3,272.50	
3HE04267HA	5670 RAM R8.0 10K RESIDENTIAL SUB	\$18,700	65%	\$ 6,545.00	
3HE04267HB	5670 RAM R8.0 10K UPG. RESIDENTIAL SUBS	\$9,350	65%	\$ 3,272.50	
3HE04267JA	5670 RAM R9.0 10K RESIDENTIAL SUB	\$18,700	65%	\$ 6,545.00	New Effective 5/30/2017
3HE04267JB	5670 RAM R9.0 10K UPG. RESIDENTIAL SUBS	\$9,350	65%	\$ 3,272.50	New Effective 5/30/2017
3HE04269GA	5670 RAM 7.0 ADD'L 5 RECIPIENT USERS	\$6,120	65%	\$ 2,142.00	
3HE04269GB	5670 RAM 7.0 ADD'L 5 RECIPIENT USERS UPG	\$3,060	65%	\$ 1,071.00	
3HE04269HA	5670 RAM R8.0 ADD'L 5 RECIPIENT USERS	\$6,120	65%	\$ 2,142.00	
3HE04269HB	5670 RAM R8.0 ADD'L 5 RECIPIENT USERS UPG	\$3,060	65%	\$ 1,071.00	
3HE04269JA	5670 RAM R9.0 ADD'L 5 RECIPIENT USERS	\$6,120	65%	\$ 2,142.00	New Effective 5/30/2017
3HE04269JB	5670 RAM R9.0 ADD'L 5 RECIPIENT USERS UPG	\$3,060	65%	\$ 1,071.00	New Effective 5/30/2017
3HE04270GA	5670 RAM 7.0 ADD'L WEB ADMINISTRATOR	\$17,000	65%	\$ 5,950.00	
3HE04270GB	5670 RAM 7.0 ADD'L WEB ADMIN. - UPGRADE	\$8,500	65%	\$ 2,975.00	
3HE04270HA	5670 RAM R8.0 ADD'L WEB ADMINISTRATOR	\$17,000	65%	\$ 5,950.00	
3HE04270HB	5670 RAM R8.0 ADD'L WEB ADMIN. - UPGRADE	\$8,500	65%	\$ 2,975.00	
3HE04270JA	5670 RAM R9.0 ADD'L WEB ADMINISTRATOR	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE04270JB	5670 RAM R9.0 ADD'L WEB ADMIN. - UPGRADE	\$8,500	65%	\$ 2,975.00	New Effective 5/30/2017
3HE04271GA	5670 RAM 7.0 ADD'L PROFESSIONAL AUTHOR	\$7,650	65%	\$ 2,677.50	
3HE04271GB	5670 RAM 7.0 ADD'L PROF. AUTHOR -UPGRADE	\$3,825	65%	\$ 1,338.75	
3HE04271HA	5670 RAM R8.0 ADD'L PROFESSIONAL AUTHOR	\$7,650	65%	\$ 2,677.50	
3HE04271HB	5670 RAM R8.0 ADD'L PROF AUTHOR -UPGRADE	\$3,825	65%	\$ 1,338.75	
3HE04271JA	5670 RAM R9.0 ADD'L PROFESSIONAL AUTHOR	\$7,650	65%	\$ 2,677.50	New Effective 5/30/2017
3HE04271JB	5670 RAM R9.0 ADD'L PROF AUTHOR -UPGRADE	\$3,825	65%	\$ 1,338.75	New Effective 5/30/2017
3HE04910GA	5670 RAM R7.0 REDUNDANT AGGREGATOR	\$169,968	65%	\$ 59,488.70	
3HE04910GB	5670 RAM R7.0 REDUNDANT AGGREGATOR - UPG	\$84,983	65%	\$ 29,744.05	
3HE04910HA	5670 RAM R8.0 REDUNDANT AGGREGATOR	\$169,968	65%	\$ 59,488.70	
3HE04910HB	5670 RAM R8.0 REDUNDANT AGGREGATOR - UPG	\$84,983	65%	\$ 29,744.05	
3HE04910JA	5670 RAM R9.0 REDUNDANT AGGREGATOR	\$169,968	65%	\$ 59,488.70	New Effective 5/30/2017
3HE04910JB	5670 RAM R9.0 REDUNDANT AGGREGATOR - UPG	\$84,983	65%	\$ 29,744.05	New Effective 5/30/2017
3HE04911GA	5670 RAM R7.0 2K BUSINESS SUB RPT'ING	\$127,468	65%	\$ 44,613.70	
3HE04911GB	5670 RAM R7.0 2K UPG BUSINESS SUBS RPT'G	\$63,733	65%	\$ 22,306.55	
3HE04911HA	5670 RAM R8.0 2K BUSINESS SUB RPT'ING	\$127,468	65%	\$ 44,613.70	
3HE04911HB	5670 RAM R8.0 2K UPG BUSINESS SUBS RPT'G	\$63,733	65%	\$ 22,306.55	
3HE04911JA	5670 RAM R9.0 2K BUSINESS SUB RPT'ING	\$127,468	65%	\$ 44,613.70	New Effective 5/30/2017
3HE04911JB	5670 RAM R9.0 2K UPG BUSINESS SUBS RPT'G	\$63,733	65%	\$ 22,306.55	New Effective 5/30/2017
3HE05558GA	5670 RAM R7.0 DCP S/W LICENSE	\$69,700	65%	\$ 24,395.00	
3HE05558HA	5670 RAM R8.0 DCP S/W LICENSE	\$69,700	65%	\$ 24,395.00	
3HE05558JA	5670 RAM R9.0 DCP S/W LICENSE	\$69,700	65%	\$ 24,395.00	New Effective 5/30/2017
3HE05559GA	5670 RAM 7.0 ADDITIONAL DCP ISA LIC.	\$3,400	65%	\$ 1,190.00	
3HE05559GB	5670 RAM 7.0 ADD'L DCP ISA UPG LICENSE	\$1,700	65%	\$ 595.00	
3HE05559HA	5670 RAM R8.0 ADDITIONAL DCP ISA LIC.	\$3,400	65%	\$ 1,190.00	
3HE05559HB	5670 RAM R8.0 ADD'L DCP ISA UPG LICENSE	\$1,700	65%	\$ 595.00	
3HE05559JA	5670 RAM R9.0 ADDITIONAL DCP ISA LIC.	\$3,400	65%	\$ 1,190.00	New Effective 5/30/2017
3HE05559JB	5670 RAM R9.0 ADD'L DCP ISA UPG LICENSE	\$1,700	65%	\$ 595.00	New Effective 5/30/2017
3HE06515GA	5670 RAM R7.0 PER AA-ISA LICENSE	\$17,000	65%	\$ 5,950.00	
3HE06515GB	5670 RAM R7.0 PER AA-ISA UPG LICENSE	\$8,500	65%	\$ 2,975.00	
3HE06515HA	5670 RAM R8.0 PER AA-ISA LICENSE	\$17,000	65%	\$ 5,950.00	
3HE06515HB	5670 RAM R8.0 PER AA-ISA UPG LICENSE	\$8,500	65%	\$ 2,975.00	
3HE06515JA	5670 RAM R9.0 PER AA-ISA LICENSE	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE06515JB	5670 RAM R9.0 PER AA-ISA UPG LICENSE	\$8,500	65%	\$ 2,975.00	New Effective 5/30/2017
3HE06843GA	5670 RAM R7.0 2K BUSINESS SUB (OSS)	\$127,468	65%	\$ 44,613.70	
3HE06843GB	5670 RAM R7.0 2K UPG BUSINESS SUB (OSS)	\$63,733	65%	\$ 22,306.55	
3HE06843HA	5670 RAM R8.0 2K BUSINESS SUB (OSS)	\$127,468	65%	\$ 44,613.70	
3HE06843HB	5670 RAM R8.0 2K UPG BUSINESS SUB (OSS)	\$63,733	65%	\$ 22,306.55	
3HE06843JA	5670 RAM R9.0 2K BUSINESS SUB (OSS)	\$127,468	65%	\$ 44,613.70	New Effective 5/30/2017
3HE06843JB	5670 RAM R9.0 2K UPG BUSINESS SUB (OSS)	\$63,733	65%	\$ 22,306.55	New Effective 5/30/2017
3HE06844GA	5670 RAM R7.0 BASE- AA-VPN / REPORTING	\$689,049	65%	\$ 241,167.19	
3HE06844GB	5670 RAM R7.0 BASE UPG- AA-VPN / RPT'ING	\$344,507	65%	\$ 120,577.35	
3HE06844HA	5670 RAM R8.0 BASE- AA-VPN / REPORTING	\$689,049	65%	\$ 241,167.19	
3HE06844HB	5670 RAM R8.0 BASE UPG- AA-VPN / RPT'ING	\$344,507	65%	\$ 120,577.35	
3HE06844JA	5670 RAM R9.0 BASE- AA-VPN / REPORTING	\$689,049	65%	\$ 241,167.19	New Effective 5/30/2017

3HE06844JB	5670 RAM R9.0 BASE UPG- AA-VPN / RPT'G	\$344,507	65%	\$ 120,577.35	New Effective 5/30/2017
3HE06845GA	5670 RAM R7.0 BASE PROD- AA - VPN / OSSI	\$689,049	65%	\$ 241,167.19	
3HE06845GB	5670 RAM R7.0 BASE UPG - AA - VPN / OSSI	\$344,507	65%	\$ 120,577.35	
3HE06845HA	5670 RAM R8.0 BASE PROD- AA - VPN / OSSI	\$689,049	65%	\$ 241,167.19	
3HE06845HB	5670 RAM R8.0 BASE UPG - AA - VPN / OSSI	\$344,507	65%	\$ 120,577.35	
3HE06845JA	5670 RAM R9.0 BASE PROD- AA - VPN / OSSI	\$689,049	65%	\$ 241,167.19	New Effective 5/30/2017
3HE06845JB	5670 RAM R9.0 BASE UPG - AA - VPN / OSSI	\$344,507	65%	\$ 120,577.35	New Effective 5/30/2017
3HE07374GA	5670 RAM R7.0 BASE PEERING /REPORTING	\$186,967.70	65%	\$ 65,438.70	
3HE07374GB	5670 RAM R7.0 BASE UPG PEERING/REPORTING	\$93,483	65%	\$ 32,719.05	
3HE07374HA	5670 RAM R8.0 BASE PEERING /REPORTING	\$186,968	65%	\$ 65,438.70	
3HE07374HB	5670 RAM R8.0 BASE UPG PEERING/REPORTING	\$93,483	65%	\$ 32,719.05	
3HE07374JA	5670 RAM R9.0 BASE PEERING /REPORTING	\$186,968	65%	\$ 65,438.70	New Effective 5/30/2017
3HE07374JB	5670 RAM R9.0 BASE UPG PEERING/REPORTING	\$93,483	65%	\$ 32,719.05	New Effective 5/30/2017
3HE07375GA	5670 RAM R7.0 10K BLOCK MOBILE SUB	\$8,500	65%	\$ 2,975.00	
3HE07375GB	5670 RAM R7.0 10K UPG BLOCK MOBILE SUB	\$4,250	65%	\$ 1,487.50	
3HE07375HA	5670 RAM R8.0 10K BLOCK MOBILE SUB	\$8,500	65%	\$ 2,975.00	
3HE07375HB	5670 RAM R8.0 10K UPG BLOCK MOBILE SUB	\$4,250	65%	\$ 1,487.50	
3HE07375JA	5670 RAM R9.0 10K BLOCK MOBILE SUB	\$8,500	65%	\$ 2,975.00	New Effective 5/30/2017
3HE07375JB	5670 RAM R9.0 10K UPG BLOCK MOBILE SUB	\$4,250	65%	\$ 1,487.50	New Effective 5/30/2017
3HE07376GA	5670 RAM R7.0 20 BUS SUB (PEERING PT)	\$111,857	65%	\$ 39,149.81	
3HE07376GB	5670 RAM R7.0 20 UPG BUS SUB (PEER PT)	\$55,928	65%	\$ 19,574.91	
3HE07376HA	5670 RAM R8.0 20 BUS SUB (PEERING PT)	\$111,857	65%	\$ 39,149.81	
3HE07376HB	5670 RAM R8.0 20 UPG BUS SUB (PEER PT)	\$55,928	65%	\$ 19,574.91	
3HE07376JA	5670 RAM R9.0 20 BUS SUB (PEERING PT)	\$111,857	65%	\$ 39,149.81	New Effective 5/30/2017
3HE07376JB	5670 RAM R9.0 20 UPG BUS SUB (PEER PT)	\$55,928	65%	\$ 19,574.91	New Effective 5/30/2017
3HE08525GA	5670 RAM R7.0 - ADD'L ONE CPU CORE LIC.	\$12,750	65%	\$ 4,462.50	
3HE08525GB	5670 RAM R7.0- ADDL ONE CPU CORE LIC UPG	\$6,375	65%	\$ 2,231.25	
3HE08525HA	5670 RAM R8.0 - ADD'L ONE CPU CORE LIC.	\$12,750	65%	\$ 4,462.50	
3HE08525HB	5670 RAM R8.0- ADDL ONE CPU CORE LIC UPG	\$6,375	65%	\$ 2,231.25	
3HE08525JA	5670 RAM R9.0 - ADD'L ONE CPU CORE LIC.	\$12,750	65%	\$ 4,462.50	New Effective 5/30/2017
3HE08525JB	5670 RAM R9.0- ADDL ONE CPU CORE LIC UPG	\$6,375	65%	\$ 2,231.25	New Effective 5/30/2017
3HE08694AA	5670 RAM CUSTOM REPORT DEVELOPMENT-1 DAY	\$1,783	65%	\$ 624.16	
3HE04265FA	5670 RAM R6.0 BASE - RESIDENTIAL / MOBILE	\$424,968	65%	\$ 148,738.70	Effective 5/30/2017
3HE06844FA	5670 RAM R6.0 BASE - AA -VPN / REPORTING	\$689,049	65%	\$ 241,167.19	Effective 5/30/2017
3HE06845FA	5670 RAM R6.0 BASE PROD - AA -VPN / OSSI	\$689,049	65%	\$ 241,167.19	Effective 5/30/2017
3HE07374FA	5670 RAM R6.0 BASE PEERING /REPORTING	\$186,968	65%	\$ 65,438.70	Effective 5/30/2017
3HE04910FA	5670 RAM R6.0 REDUNDANT AGGREGATOR	\$169,968	65%	\$ 59,488.70	Effective 5/30/2017
3HE08525FA	5670 RAM R6.0 - ADD'L ONE CPU CORE LIC.	\$12,750	65%	\$ 4,462.50	Effective 5/30/2017
3HE04265FB	5670 RAM R6.0 BASE UPG RESIDENTIAL/MOBILE	\$212,483	65%	\$ 74,369.05	Effective 5/30/2017
3HE06844FB	5670 RAM R6.0 BASE UPG - AA -VPN / RPT'G	\$344,507	65%	\$ 120,577.35	Effective 5/30/2017
3HE06845FB	5670 RAM R6.0 BASE UPG - AA - VPN / OSSI	\$344,507	65%	\$ 120,577.35	Effective 5/30/2017
3HE07374FB	5670 RAM R6.0 BASE UPG PEERING/REPORTING	\$93,483	65%	\$ 32,719.05	Effective 5/30/2017
3HE04910FB	5670 RAM R6.0 REDUNDANT AGGREGATOR - UPG	\$84,983	65%	\$ 29,744.05	Effective 5/30/2017
3HE08525FB	5670 RAM R6.0 - ADDL ONE CPU CORE LIC UPG	\$6,375	65%	\$ 2,231.25	Effective 5/30/2017
3HE04267FA	5670 RAM R6.0 10K RESIDENTIAL SUB	\$18,700	65%	\$ 6,545.00	Effective 5/30/2017
3HE06922FA	5670 RAM 6.0 10K RES SUB ADV REP	\$34,000	65%	\$ 11,900.00	Effective 5/30/2017
3HE07375FA	5670 RAM R6.0 10K BLOCK MOBILE SUB	\$8,500	65%	\$ 2,975.00	Effective 5/30/2017
3HE04267FB	5670 RAM R6.0 10K UPG- RESIDENTIAL SUBS	\$9,350	65%	\$ 3,272.50	Effective 5/30/2017
3HE06922FB	5670 RAM 6.0 10K UPG RES SUB ADV REP	\$17,000	65%	\$ 5,950.00	Effective 5/30/2017
3HE07375FB	5670 RAM R6.0 10K UPG BLOCK MOBILE SUB	\$4,250	65%	\$ 1,487.50	Effective 5/30/2017
3HE04911FA	5670 RAM R6.0 2K BUSINESS SUB RPT'G	\$127,468	65%	\$ 44,613.70	Effective 5/30/2017
3HE07376FA	5670 RAM R6.0 20 BUS SUB (PEERING PT)	\$111,857	65%	\$ 39,149.81	Effective 5/30/2017
3HE06843FA	5670 RAM R6.0 2K BUSINESS SUB (OSSI)	\$127,468	65%	\$ 44,613.70	Effective 5/30/2017
3HE04911FB	5670 RAM R6.0 2K UPG BUSINESS SUBS RPT'G	\$63,733	65%	\$ 22,306.55	Effective 5/30/2017
3HE06843FB	5670 RAM R6.0 2K UPG BUSINESS SUB (OSSI)	\$63,733	65%	\$ 22,306.55	Effective 5/30/2017
3HE07376FB	5670 RAM R6.0 20 UPG BUS SUB (PEER PT)	\$55,928	65%	\$ 19,574.91	Effective 5/30/2017
3HE04269FA	5670 RAM 6.0 ADD'L 5 - RECIPIENT USERS	\$6,120	65%	\$ 2,142.00	Effective 5/30/2017
3HE04270FA	5670 RAM 6.0 ADD'L WEB ADMINISTRATOR	\$17,000	65%	\$ 5,950.00	Effective 5/30/2017
3HE04271FA	5670 RAM 6.0 ADD'L PROFESSIONAL AUTHOR	\$7,650	65%	\$ 2,677.50	Effective 5/30/2017
3HE04269FB	5670 RAM 6.0 ADD'L 5 RECIPIENT USERS UPG	\$3,060	65%	\$ 1,071.00	Effective 5/30/2017
3HE04270FB	5670 RAM 6.0 ADD'L WEB ADMIN. UPGRADE	\$8,500	65%	\$ 2,975.00	Effective 5/30/2017
3HE04271FB	5670 RAM 6.0 ADD'L PROF. AUTHOR UPGRADE	\$3,825	65%	\$ 1,338.75	Effective 5/30/2017
3HE06515FA	5670 RAM R6.0 PER AA ISA LICENSE	\$17,000	65%	\$ 5,950.00	Effective 5/30/2017
3HE06515FB	5670 RAM R6.0 PER AA ISA UPG LICENSE	\$8,500	65%	\$ 2,975.00	Effective 5/30/2017
3HE05559FA	5670 RAM 6.0 ADDITIONAL DCP ISA LIC.	\$3,400	65%	\$ 1,190.00	Effective 5/30/2017

3HE0559FB	5670 RAM 6.0 ADD'L DCP ISA UPG LICENSE	\$1,700	65%	\$ 595.00	Effective 5/30/2017
Network Services Platform (NSP)					
3HE11799CA	NSP 17: NFM-P STANDARD BASE	\$136,000	65%	\$ 47,600.00	New Effective 5/30/2017
3HE11800CA	NSP 17: NFM-P PREMIUM BASE	\$272,000	65%	\$ 95,200.00	New Effective 5/30/2017
3HE11800CC	NSP 17: NFM-P CONVERSION STD TO PREM BASE	\$136,000	65%	\$ 47,600.00	New Effective 5/30/2017
3HE11801CA	NSP 17: NFM-P STANDARD LP	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE11802CA	NSP 17: NFM-P PREMIUM LP	\$281	65%	\$ 98.18	New Effective 5/30/2017
3HE11802CC	NSP 17: NFM-P LP CONV. STD. TO PREMIUM	\$94	65%	\$ 32.73	New Effective 5/30/2017
3HE11803CA	NSP 17: NFM-P HIGH AVAILABILITY LP	\$34	65%	\$ 11.90	New Effective 5/30/2017
3HE11808CA	NSP: NFM-P MULTI-VENDOR DRIVER DEV.	\$42,500	65%	\$ 14,875.00	New Effective 5/30/2017
3HE11808CB	NSP: NFM-P MULTI-VENDOR DRIVER S/W UPG.	\$21,250	65%	\$ 7,437.50	New Effective 5/30/2017
3HE11809CA	NSP: NFM-P MULTI-VENDOR DRIVER 3 YR SRS	\$59,500	65%	\$ 20,825.00	New Effective 5/30/2017
3HE11810CA	NSP 17: NFM-P AA ANALYTICS BASE	\$246,500	65%	\$ 86,275.00	New Effective 5/30/2017
3HE11811CA	NSP 17: NFM-P AUXILIARY DATABASE 1 TB	\$22,100	65%	\$ 7,735.00	New Effective 5/30/2017
3HE11812CA	NSP 17: NFM-P 10K AA RESIDENTIAL SUBS	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE11813CA	NSP 17: NFM-P 10K AA MOBILE SUBS	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
3HE11814CA	NSP 17: NFM-P 500 AA BUSINESS SUBS	\$34,000	65%	\$ 11,900.00	New Effective 5/30/2017
3HE11815CA	NSP 17: NFM-P EXTENDED NE S/W SUPPORT	\$17,000	65%	\$ 5,950.00	New Effective 5/30/2017
1AK04717AAAB	DL380 GEN9 1 CPU 8 CORE	\$16,549	65%	\$ 5,792.26	New Effective 5/30/2017
1AK14288AAAB	DL380 GEN9 2 CPU 16 CORE	\$38,145	65%	\$ 13,350.66	New Effective 5/30/2017
3KC73608AAAA	NSP 17: NFM-T STANDARD LP	\$180	65%	\$ 63.08	New Effective 5/30/2017
3KC73609AAAA	NSP 17: NFM-T HIGH AVAILABILITY LP	\$36	65%	\$ 12.62	New Effective 5/30/2017
3KC73610AAAA	NSP 17: NFM-T STANDARD BASE	\$126,152	65%	\$ 44,153.17	New Effective 5/30/2017
3KC73611AAAA	NSP NFM-T ENHANCED DB 4VCPU	\$18,022	65%	\$ 6,307.60	New Effective 5/30/2017
3KC73612AAAA	NSP NFM-T 2 CPU EMBEDDED OS ENHANCEMENT	\$1,009	65%	\$ 353.23	New Effective 5/30/2017
3HE11269CA	NSP 17: NRC-F STANDARD BASE	\$680,000	65%	\$ 238,000.00	New Effective 5/30/2017
3HE09989CA	NSP 17: NRC-P STANDARD BASE	\$680,000	65%	\$ 238,000.00	New Effective 5/30/2017
3KC73612AAAA	NSP 17: NRC-T STANDARD LP	\$180	65%	\$ 63.08	New Effective 5/30/2017
3KC73613AAAA	NSP 17: NRC-T HIGH AVAILABILITY LP	\$36	65%	\$ 12.62	New Effective 5/30/2017
3KC76608AAAA	NSP 17: NRC-T STANDARD BASE	\$630,760	65%	\$ 220,765.83	New Effective 5/30/2017
3HE09985CA	NSP 17: NSD STANDARD BASE	\$1,020,000	65%	\$ 357,000.00	New Effective 5/30/2017
3HE12275CA	NSP 17: NSD-NRC STANDARD LP	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE12276CA	NSP 17: NSD-NRC HIGH AVAILABILITY LP	\$34	65%	\$ 11.90	New Effective 5/30/2017
3HE11804CA	NSP 17 WIRELESS STANDARD LTE LP	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE11805CA	NSP 17 WIRELESS PREMIUM LTE LP	\$281	65%	\$ 98.18	New Effective 5/30/2017
3HE11805CC	NSP 17 WIRELESS STD TO PREM LTE LP CONV	\$94	65%	\$ 32.73	New Effective 5/30/2017
3HE11806CA	NSP 17 WIRELESS STANDARD SC LP	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE11807CA	NSP 17 WIRELESS PREMIUM SC LP	\$281	65%	\$ 98.18	New Effective 5/30/2017
3HE11807CC	NSP 17 WIRELESS STD. TO PREM SC LP CONV	\$94	65%	\$ 32.73	New Effective 5/30/2017
3HE12097AA	NSP VIRTUAL INSTANCE	\$1,700	65%	\$ 595.00	New Effective 5/30/2017
Virtualized Services Assurance Platform (VSAP)					
3HE08619QA	VSAP R14 BASE PRODUCT LICENSE	\$48,929	65%	\$ 17,125.12	New Effective 5/30/2017
3HE08619QB	VSAP BASE PRODUCT LICENSE UPG LIC. - R14	\$24,464	65%	\$ 8,562.56	New Effective 5/30/2017
3HE08619QC	VSAP R14 BASE CONVERSION LICENSE	\$16,400	65%	\$ 5,739.91	New Effective 5/30/2017
3HE08619RA	VSAP 17 BASE PRODUCT LICENSE	\$49,300	65%	\$ 17,255.00	New Effective 5/30/2017
3HE08619RC	VSAP 17 BASE CONVERSION LICENSE	\$16,830	65%	\$ 5,890.50	New Effective 5/30/2017
3HE08620QA	VSAP R14 REDUNDANT PRODUCT LICENSE	\$79,656	65%	\$ 27,879.57	New Effective 5/30/2017
3HE08620QB	VSAP REDUNDANT PRODUCT LICENSE UPG - R14	\$39,828	65%	\$ 13,939.78	New Effective 5/30/2017
3HE08620QC	VSAP R14 REDUNDANT CONVERSION LICENSE	\$26,492	65%	\$ 9,272.16	New Effective 5/30/2017
3HE11724QA	VSAP R14 NETWORK ELEMENT MGNT LICENSE	\$1,622	65%	\$ 567.68	New Effective 5/30/2017
3HE11724QB	VSAP NETWORK ELEMENT MGNT UPG. - R14	\$811	65%	\$ 283.84	New Effective 5/30/2017
3HE11724RA	VSAP 17 NETWORK ELEMENT MGNT LICENSE	\$1,748	65%	\$ 611.66	New Effective 5/30/2017
3HE11725QA	VSAP VIRTUAL ROUTING & SWITCH LIC (10GE)	\$541	65%	\$ 189.23	New Effective 5/30/2017
3HE11725QB	VSAP VIRTUAL ROUTING & SWITCH LIC (40GE)	\$1,874	65%	\$ 655.99	New Effective 5/30/2017
3HE11725RA	VSAP 17 VIRTUAL RT & SWITCHING LIC(10GE)	\$578	65%	\$ 202.30	New Effective 5/30/2017
3HE11725RB	VSAP 17 VIRTUAL RT & SWITCHING LIC(40GE)	\$1,870	65%	\$ 654.50	New Effective 5/30/2017
3HE12101RA	VSAP 17 VIRTUAL RT & SWITCHING NSG LIC.	\$187	65%	\$ 65.45	New Effective 5/30/2017
3HE12102RA	VSAP 17 HIGH AVAILABILITY NE MGNT LIC.	\$323	65%	\$ 113.05	New Effective 5/30/2017
HP HARDWARE BUNDLES - DL380 Gen 9					
1AK09384AAAK	DL380 Gen9 2xE52620v3 64GB 8x300GB	\$67,074	65%	\$ 23,475.79	New Effective 5/30/2017
1AK09377AAAL	DL380 Gen9 1xE5-2640v3 64GB 4x300GB	\$48,901	65%	\$ 17,115.20	New Effective 5/30/2017
1AK09377AAAM	DL380 Gen9 1xE5-2640v3 64GB 8x300GB	\$54,981	65%	\$ 19,243.20	New Effective 5/30/2017
1AK09384AAAL	DL380 Gen9 2xE5-2640v3 64GB 16x300GB	\$87,357	65%	\$ 30,574.80	New Effective 5/30/2017
1AK09385AAAM	DL380 Gen9 2xE5-2640v3 64GB 16x300GB	\$91,944	65%	\$ 32,180.49	New Effective 5/30/2017
1AK09384AAAM	DL380 Gen9 2xE5-2620v3 64GB 16x300GB	\$78,582	65%	\$ 27,503.79	New Effective 5/30/2017
1AK09385AAAN	DL380 Gen9 2xE5-2620v3 64GB 16x300GB	\$82,118	65%	\$ 28,741.26	New Effective 5/30/2017
1AK09377AAAR	DL380 Gen9 1xE5-2623v3 32GB 4x300GB	\$38,771	65%	\$ 13,569.80	New Effective 5/30/2017
1AK09377AAAH	DL380 Gen9 1xE5-2623v3 64GB 4x300GB	\$43,852	65%	\$ 15,348.20	New Effective 5/30/2017
1AK09377AAAZ	DL380 Gen9 1xE5-2623v3 64GB 8x300GB	\$49,932	65%	\$ 17,476.20	New Effective 5/30/2017
1AK09377AAAY	DL380 Gen9 1xE5-2620v3 64GB 16x300GB	\$67,803	65%	\$ 23,731.00	New Effective 5/30/2017

1AK09384AAAJ	DL380 Gen9 2xE5-2640v3 128GB 12x600GB	\$107,626	65%	\$ 37,669.10	New Effective 5/30/2017
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Services

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Part No	Description	Metric	NASPO MSRP	Discount %	Unit Price
REMOTE TECHNICAL SUPPORT					
Price per Year					
301013231	7750 SR SPGWwAggRtr - Remote Technical Support Gold	per unit	\$ 153,000	65%	\$ 53,550
301013231	7750 SR - Remote Technical Support Gold	per unit	\$ 22,100	65%	\$ 7,735
301013231	7705 SAR - Remote Technical Support Gold	per unit	\$ 14,166	65%	\$ 4,958
301013231	9471 MME - Remote Technical Support Gold	per unit	\$ 102,000	65%	\$ 35,700
301013231	7210 SAS Remote Technical Support Gold	per unit	\$ 8,500	65%	\$ 2,975
301013231	7750 SR SPGWwAggRtr - Remote Technical Support Silver	per unit	\$ 153,000	65%	\$ 53,550
301013231	7750 SR - Remote Technical Support Silver	per unit	\$ 22,100	65%	\$ 7,735
301013231	7705 SAR - Remote Technical Support Silver	per unit	\$ 14,166	65%	\$ 4,958
301013231	9471 MME - Remote Technical Support Silver	per unit	\$ 102,000	65%	\$ 35,700
301013231	7210 SAS - Remote Technical Support Silver	per unit	\$ 8,500	65%	\$ 2,975
301013231	7750 SR SPGWwAggRtr - Remote Technical Support Bronze	per unit	\$ 153,000	65%	\$ 53,550
301013231	7750 SR - Remote Technical Support Silver	per unit	\$ 22,100	65%	\$ 7,735
301013231	7705 SAR - Remote Technical Support Bronze	per unit	\$ 14,166	65%	\$ 4,958
301013231	9471 MME - Remote Technical Support Bronze	per unit	\$ 102,000	65%	\$ 35,700
301013231	7210 SAS - Remote Technical Support Bronze	per unit	\$ 8,500	65%	\$ 2,975
301013231	5620 SAM - Remote Technical Support Gold	per unit	\$ 19,833	65%	\$ 6,942
301013231	5620 SAM - Remote Technical Support Silver	per unit	\$ 17,000	65%	\$ 5,950
301013231	5620 SAM - Remote Technical Support Bronze	per unit	\$ 15,583	65%	\$ 5,454
301013231	7750 SR - Remote Technical Support Bronze	per unit	\$ 22,100	65%	\$ 7,735
HARDWARE REPAIR & REPLACEMENT (RES-RFR)					
Price per Year					
301048468	7750 SR SPGWwAggRtr - (RES-RFR)	per unit	\$ 42,500	65%	\$ 14,875
301048468	7750 SR	per unit			See Note 12 below
301048468	7705 SAR - (RES-RFR)	per unit	\$ 8,500	65%	\$ 2,975
301048468	9471 MME - (RES-RFR)	per unit	\$ 46,750	65%	\$ 16,363
301048468	7210 SAS - (RES-AE)	per unit	\$ 8,500	65%	\$ 2,975
HARDWARE REPAIR & REPLACEMENT - ADVANCED EXCHANGE (RES-AE)					
Price per Year					
301048450	7750 SR SPGWwAggRtr - (RES-AE)	per unit	\$ 46,750	65%	\$ 16,363
301048468	7750 SR	per unit			See Note 12 below
301048450	7705 SAR - (RES-AE)	per unit	\$ 14,166	65%	\$ 4,958
301048450	9471 MME - (RES-AE)	per unit	\$ 51,000	65%	\$ 17,850
301048450	7210 SAS - (RES-AE)	per unit	\$ 14,167	65%	\$ 4,958
SOFTWARE SUBSCRIPTION PLANS					
Price per Year					
3HE01807AB	7750 SR SPGWwAggRtr - Software Subscription Plan	per unit	\$ 70,474	65%	\$ 24,666
301048468	7750 SR	per unit	\$ 8,000	65%	\$ 2,800
3HE05610AB	7705 SAR - Software Subscription Plan	per unit	\$ 1,438	65%	\$ 503
3HE06522AB	9471 MME - Software Subscription Plan	per unit	\$ 69,036	65%	\$ 24,162
3HE00407XZ	5620 SAM - Software Subscription (Annual price beginning in Year 1)	per Unit	\$ 23,106	65%	\$ 8,087
3HE00407XZ	5620 SAM - Software Subscription - Additional Node license	See Note 3 below			See Note 3 below
INSTALLATION AND IMPLEMENTATION					
3HE01605AA	Program Management - Remote	per hour	\$ 560	65%	\$ 196
301036679	Site Survey - OnSite	per site	\$ 6,000	65%	\$ 2,100
301036679	Engineering - Remote	per hour	\$ 500	65%	\$ 175
301036786	Installation - OnSite	per hour	\$ 522	65%	\$ 183
3HE07794AA	Integration - OnSite	per hour	\$ 870	65%	\$ 305
301071387	Site Materials	priced per specific site conditions			
RESIDENT ENGINEER					
3HE06254AA	ONSITE SUPPORT ENGINEER NOC	per month	\$ 148,865	65%	\$ 52,103
3HE09107AA	ONSITE SUPPORT ENGINEER NOC	per year	\$ 1,015,651	65%	\$ 355,478
3HE06627AA	ONSITE ARCHITECTURE ENGINEER	per month	\$ 148,865	65%	\$ 52,103
3HE09108AA	ONSITE ARCHITECTURE ENGINEER	per year	\$ 1,015,651	65%	\$ 355,478
3HE06628AA	5620 SAM SUPPORT ENGINEER	per month	\$ 148,865	65%	\$ 52,103
3HE09109AA	5620 SAM SUPPORT ENGINEER	per year	\$ 1,015,651	65%	\$ 355,478
INTEGRATION					
3HE06631AA	NETWORK INTEGRATION 7x50 SR/ESS	per unit	\$ 16,541	65%	\$ 5,789
3HE06632AA	NETWORK INTEGRATION 7705 SAR	per unit	\$ 5,514	65%	\$ 1,930
3HE07153AA	ON-SITE NETWORK INTEGRATION 7950 XRS, 7750 SR, 7705 SAR 7210 SAS - 1 WEEK	per week	\$ 47,881	65%	\$ 16,758
3HE01601AA	Professional Svcs - Remote (Includes Design, Integration, Consultation & IOT)	per hour	\$ 729	65%	\$ 255
3HE07794AA	Professional Svcs - Onsite (Includes Design, Integration, Consultation & IOT)	per hour	\$ 1,029	65%	\$ 360
OSS (SAM CPAM)					
3HE06639AA	5620 SAM UPGRADE (STAGING & REMOTE)	per network	\$ 82,703	65%	\$ 28,946
3HE04124AA	5620 SAM UPGRADE (STAGING & ON SITE)	per network	\$ 101,565	65%	\$ 35,548
3HE02934AA	5620 SAM INSTALLATION - 5 DAYS (REMOTE)	per network	\$ 43,528	65%	\$ 15,235

3HE09347AA	5620 SAM INSTALLATION - 5 DAYS (ONSITE)	per network	\$ 55,135	65%	\$ 19,297
3HE04256AA	5620 SAM OPERATIONS CONSULTING	per network	\$ 79,801	65%	\$ 27,930
3HE09112AA	5620 SAM INSTALLATION & OPERATION FOR STRATEGICS	per network	\$ 92,860	65%	\$ 32,501

* Notes:

1. RTS, RESRFR, RES-AE and SSP pricing shown above assumes minimum configurations
2. RTS, RES-RFR and RES-AE values are calculated per project based on type, configuration, quantity of nodes and term of agreement. The values shown above are minimum per network fees.
3. 5620 SAM SSP annual rates = $\$ \sum (\text{base SW} + \text{RTUs/License Points}) \times 40\%$ of purchase price
4. Site Survey is limited to the United States, excluding Hawaii and Canada
5. Site Survey Assumptions: Pricing includes performing a basic site survey, which c/o verification of equipment bay location, peripheral equipment termination assignments, power type and termination a
6. Ordering codes are subject to change and will be determined when an official quote is provided by Nokia
7. Installation and Implementation Services pricing does not apply to states with prevailing wages statutes. Pricing will be quoted based on individual State adherence to prevailing wage requirements
8. Program Management performed remotely. Any customer-required travel will be billed as incurred.
9. All services are subject to specific definitions, inclusions, exclusions, terms, etc. as defined in a Statement of Work that will accompany each price quote from Nokia to the WSCA Customer.
10. All hourly rates are based on a 40-hour work week and normal business hours.
11. Onsite rates do not include travel and living expenses
12. 7750 SR repair services are configuration dependent.

Nokia Microwave Services

Part No	Group Item	Description	NASPO ValuePoint MSRP	Discount %	Unit Price	
Line of Sight - Path Survey (15- 38 GHz)						
SVC-KWIE-ENG-TSE1		LOS Path Survey (single hop system)	\$7,865.71	65%	\$ 2,753.00	
SVC-KWIE-ENG-TSE2		LOS Path Survey (1st hop for a connected multi-hop system)	\$7,865.71	65%	\$ 2,753.00	
SVC-KWIE-ENG-TSE3		LOS Path Survey (2nd hop+ for a connected multi-hop system)	\$6,293.71	65%	\$ 2,202.80	
SVC-KWIE-ENG-TSE4		LOS Path Survey (Each single path in a multi-hop system, not connected)	\$7,865.71	65%	\$ 2,753.00	
SVC-KWIE-ENG-TSE5		Path Survey Air Fare (per survey)(1 Surveyor with equipment shipment)	\$11,428.57	65%	\$ 4,000.00	
SVC-KWIE-ENG-TSE6		Additional Survey Reports (on CD ROM)	\$142.86	65%	\$ 50.00	
SVC-KWIE-ENG-TSE7		Additional Survey Reports (printed copies)	\$285.71	65%	\$ 100.00	
SVC-KWIE-ENG-TSE8		Path Survey (Per Man Day)	\$4,085.71	65%	\$ 1,430.00	
Path Survey (< 11 GHz)						
SVC-KWIE-ENG-TSE9		Path Survey (single hop system)	\$11,237.14	65%	\$ 3,933.00	
SVC-KWIE-ENG-TSE10		Path Survey (1st hop for a connected multi-hop system)	\$11,237.14	65%	\$ 3,933.00	
SVC-KWIE-ENG-TSE11		Path Survey (2nd hop+ for a connected multi-hop system)	\$8,988.57	65%	\$ 3,146.00	
SVC-KWIE-ENG-TSE12		Path Survey (Each single path in a multi-hop system, not connected)	\$11,237.14	65%	\$ 3,933.00	
SVC-KWIE-ENG-TSE13		Path Survey Air Fare (per survey)(1 Surveyor with equipment shipment)	\$11,428.57	65%	\$ 4,000.00	
SVC-KWIE-ENG-TSE14		Additional Survey Reports (on CD ROM)	\$142.86	65%	\$ 50.00	
SVC-KWIE-ENG-TSE15		Additional Survey Reports (printed copies)	\$285.71	65%	\$ 100.00	
Path Design						
SVC-KWIE-ENG-TSE16		System Map (1-10 paths)	\$285.71	65%	\$ 100.00	
SVC-KWIE-ENG-TSE17		System Map (10+ paths)	\$571.43	65%	\$ 200.00	
SVC-KWIE-ENG-TSE18		Path Design (per path)	\$428.57	65%	\$ 150.00	
SVC-KWIE-ENG-TSE19		Path Performance Calculations (per path)	\$428.57	65%	\$ 150.00	
Frequency Selection/Coordination						
SVC-KWIE-ENG-TSE20		Frequency Selection (2, 6, 6.7, 11 GHz bands / per path)	\$2,428.57	65%	\$ 850.00	
SVC-KWIE-ENG-TSE21		Frequency Selection (7,10, 18, 23 GHz bands / per path)	\$2,122.86	65%	\$ 743.00	
SVC-KWIE-ENG-TSE22		Normal 30-day Prior Coordination (per system)	\$885.71	65%	\$ 310.00	
SVC-KWIE-ENG-TSE23		Expedited Prior Coordination (1st path)	\$2,620.00	65%	\$ 917.00	
SVC-KWIE-ENG-TSE24		Expedited Prior Coordination (2nd path)	\$542.86	65%	\$ 190.00	
SVC-KWIE-ENG-TSE25		Major Change Analysis (per path)	\$1,551.43	65%	\$ 543.00	
SVC-KWIE-ENG-TSE26		Minor Change Analysis (per path)	\$914.29	65%	\$ 320.00	
SVC-KWIE-ENG-TSE27		Prior Coordination Renewal within 6 months of PCN date (1st path)	\$771.43	65%	\$ 270.00	
SVC-KWIE-ENG-TSE28		Prior Coordination Renewal 2nd path+ (per path)	\$171.43	65%	\$ 60.00	
FCC License Application						
SVC-KWIE-ENG-TSE29		FCC License Application Prep (New/Mod) (per site / Form 601) (2)	\$1,328.57	65%	\$ 465.00	
SVC-KWIE-ENG-TSE30		STA Form Preparation (Note 1)	\$814.29	65%	\$ 285.00	
SVC-KWIE-ENG-TSE31		Waiver Preparation (Note 1)	\$614.29	65%	\$ 215.00	
SVC-KWIE-ENG-TSE32		Senior Transmission Systems Engineer (per Hour)	\$714.29	65%	\$ 250.00	New Effective 5/30/2017
SVC-KWIE-ENG-TSE33		Transmission Systems Engineer (per Hour)	\$500.00	65%	\$ 175.00	New Effective 5/30/2017
Network Engineering						
SVC-KWIE-ENG-TSE34		Senior Network Engineer (per Hour)	\$714.29	65%	\$ 250.00	New Effective 5/30/2017
SVC-KWIE-ENG-TSE35		Network Engineer (per Hour)	\$500.00	65%	\$ 175.00	New Effective 5/30/2017
SVC-KWIE-ENG-TSE36		Network Engineering Drawings (per Hour)	\$285.71	65%	\$ 100.00	New Effective 5/30/2017
Field Engineering						
SVC-QHIE-ENG-FE1		Field Service Engineer (Per Man Hour)	\$514.29	65%	\$ 180.00	
SVC-QHIE-ENG-FE2		Field Living Expenses (per man per calendar day)	\$971.43	65%	\$ 340.00	
SVC-QHIE-ENG-FE3		Air Fare (per man) (1 Engineer with equipment shipment)	\$11,428.57	65%	\$ 4,000.00	
Field Engineering - Outside Plant						
300054129-FEOSP1		Outside Plant Engineering e.g. Tower Structural Analysis, Grounding, etc. (Per Man Hour)	\$514.29	65%	\$ 180.00	
300054129-FEOSP2		Field Living Expenses (per man per calendar day)	\$971.43	65%	\$ 340.00	
300054129-FEOSP3		Air Fare (per man)(1 Engineer with equipment shipment)	\$11,428.57	65%	\$ 4,000.00	
Installation & Commission (Microwave)						
SVC-QHIE-INST-INCOM1		Microwave Antenna / Tower Installation Services (Per Man Hour)	\$1,074.29	65%	\$ 376.00	
SVC-QHIE-INST-INCOM2		Radio Installation Services (Per Man Hour)	\$902.86	65%	\$ 316.00	
SVC-QHIE-INST-INCOM3		Radio Commissioning and Test Services (Per Man Hour)	\$902.86	65%	\$ 316.00	
SVC-QHIE-INST-INCOM4		Ancillary Equipment Installation and Test Services (Per Man Hour)	\$902.86	65%	\$ 316.00	
SVC-QHIE-INST-INCOM5		Deployment Project Management (Per Man Hour)	\$514.29	65%	\$ 180.00	
SVC-QHIE-INST-INCOM6		Field Supervisor (Per Man Hour)	\$325.71	65%	\$ 184.00	
SVC-QHIE-INST-INCOM7		Network Management Engineering (Per Man Hour)	\$325.71	65%	\$ 184.00	
SVC-QHIE-INST-INCOM8		Field Living Expenses (Per calendar day) (1 Field Engineer)	\$971.43	65%	\$ 340.00	
SVC-QHIE-INST-INCOM9		Air Fare (per man)(1 Engineer with equipment shipment)	\$11,428.57	65%	\$ 4,000.00	
Program Management Office (PMO)						
300702487		PMI certified project manager skilled in all aspects of managing network deployment projects. (Per Hour)	\$491.43	65%	\$172.00	
Product Maintenance (9500 MPR)						
301090767-9500		Technical Support Gold (7x24x365 annual rate per hop)	\$628.57	65%	\$220.00	Part No Modified
301090775-9500		Standard Repair 45 days (annual rate after warranty per hop)	\$2,871.43	65%	\$1,005.00	Part No Modified
301090791-9500		Advanced Exchange Next Day (annual rate per hop)	\$3,085.71	65%	\$1,080.00	Part No Modified
3EM24592AAAB		9500 MPR Software Subscription (Per Node)	\$500.00	65%	\$175.00	New Effective 5/30/2017
Product Maintenance (TSM-8000)						
301090767-TSM		Technical Support Gold (7x24x365 annual rate per Network Element)			Pricing provided upon request	Part No Modified
301090775-TSM		Standard Repair 45 days (annual rate after warranty per server)	\$8,280.00	65%	\$2,898.00	Part No Modified
3EM16790HN		TSM-8000 Software Subscription	\$51,428.57	65%	\$18,000.00	New Effective 5/30/2017
MW Product Freight						
SVC-YGRL-RF1		MW Product Freight per radio rack	\$1,142.86	65%	\$400.00	
SVC-YGRL-AS1		MW Product Freight per small antenna	\$857.14	65%	\$300.00	
SVC-YGRL-AS2		MW Product Freight per medium antenna	\$1,428.57	65%	\$500.00	
SVC-YGRL-AS3		MW Product Freight per large antenna (or HI and AK)	\$2,285.71	65%	\$800.00	
Product Training (9500 MPR) at Nokia Facility						
3HE09335AA-TWT42035		TWT42035 9500 MPR (Microwave Packet Radio) Global Market Node (MSS-1/MSS-4/MSS-8) Functional and Hardware Description Per Student @ Nokia facility. Class is 1 day.	\$2,077.14	65%	\$727.00	Part No Modified
3HE09335AA-TWT42036		TWT42036 9500 MPR (Microwave Packet Radio) Global Market Node (MSS-1/MSS-4/MSS-8) Common functionality Operation and Maintenance Per Student @ Nokia facility. Class is 1 day.	\$2,077.14	65%	\$727.00	Part No Modified
3HE09335AA-TWT42037		TWT42037 9500 MPR Global Market Ethernet Traffic Operations & Maintenance Per Student @ Nokia facility Class is 2 days.	\$4,154.29	65%	\$1,454.00	Part No Modified
3HE09335AA-TWT42038		TWT42038 9500 MPR R5 Global market Terminal (MPR-e/MSS-1c) Functional and Hardware Description Per Student @ Nokia facility. Class is 1 day.	\$2,077.14	65%	\$727.00	Part No Modified
3HE09335AA-TWT42039		TWT42039 9500 MPR R5 global market Terminal (MPR-e/MSS-1c) Operations & Maintenance Per Student @ Nokia facility. Class is 3 days.	\$6,231.43	65%	\$2,181.00	Part No Modified

Product Training (TSM-8000) at Nokia Facility						
3HE09335AA-3FL30698		3FL30698 TSM-8000 Operations Per Student @ Nokia facility. Class is 2 days.	\$4,154.29	65%	\$1,454.00	Part No Modified New Effective 5/30/2017
3HE09335AA-3FL30699		3FL30699 TSM-8000 Administration Per Student @ Nokia facility. Class is 3 days.	\$6,231.43	65%	\$2,181.00	Part No Modified New Effective 5/30/2017
Product Training (9500 MPR) at Customer Facility						
3HE09335AA-TWT42035-CF		TWT42035 9500 MPR (Microwave Packet Radio) Global Market Node (MSS-1/MSS-4/MSS-8) Functional and Hardware Description Per Min 6 Students @ Customer facility. Each additional Student is \$727 up to Max of 8. Class is 1 day.	\$12,460.00	65%	\$4,361.00	Part No Modified New Effective 5/30/2017
3HE09335AA-TWT42036-CF		TWT42036 9500 MPR (Microwave Packet Radio) Global Market Node (MSS-1/MSS-4/MSS-8) Common functionality Operation and Maintenance Per Min 6 Students @ Customer facility. Each additional Student is \$727 up to Max of 8. Class is 1 day.	\$12,460.00	65%	\$4,361.00	Part No Modified New Effective 5/30/2017
3HE09335AA-TWT42037 -CF		TWT42037 9500 MPR Global Market Ethernet Traffic Operations & Maintenance Per Min 6 Students @ Customer facility. Each additional Student is \$1454 up to Max of 8. Class is 2 days.	\$24,920.00	65%	\$8,722.00	Part No Modified New Effective 5/30/2017
3HE09335AA-TWT42038-CF		TWT42038 9500 MPR R5 Global market Terminal (MPR-e/MSS-1c) Functional and Hardware Description Per Min 6 Students @ Customer facility. Each additional Student is \$727 up to Max of 8. Class is 1 day.	\$12,460.00	65%	\$4,361.00	Part No Modified New Effective 5/30/2017
3HE09335AA-TWT42039 -CF		TWT42039 9500 MPR R5 global market Terminal (MPR-e/MSS-1c) Operations & Maintenance Per Min 6 Students @ Customer facility. Each additional Student is \$2181 up to Max of 8. Class is 3 days.	\$37,388.57	65%	\$13,086.00	Part No Modified New Effective 5/30/2017
Product Training (TSM-8000) at Customer Facility						
3HE09335AA-3FL30698-CF		3FL30698 TSM-8000 Operations Per Min 6 Students @ Customer facility. Each additional Student is \$1454 up to Max of 8. Class is 2 days.	\$24,920.00	65%	\$8,722.00	Part No Modified New Effective 5/30/2017
3HE09335AA-3FL30699-CF		3FL30699 TSM-8000 Administration Per Min 6 Students @ Customer facility. Each additional Student is \$2181 up to Max of 8. Class is 3 days.	\$37,380.00	65%	\$13,083.00	Part No Modified New Effective 5/30/2017
Onsite Fees for Training (9500 MPR/TSM-8000) at Customer Facility						
3HE09335AA-OSF-CF-5		Instructor T&L On-Site Fee - \$3,190 for each 5 days of training.	\$9,114.29	65%	\$3,190.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-CF-4		Instructor T&L On-Site Fee - \$2,890 for each 4 days of training.	\$8,257.14	65%	\$2,890.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-CF-3		Instructor T&L On-Site Fee - \$2,600 for each 3 days of training.	\$7,428.57	65%	\$2,600.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-CF-2		Instructor T&L On-Site Fee - \$2,180 for each 2 days of training.	\$6,228.57	65%	\$2,180.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-CF-1		Instructor T&L On-Site Fee - \$1,760 for each 1 days of training.	\$5,028.57	65%	\$1,760.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-EF		On-site Equipment Fee - \$800 per class, if remotely access Nokia equipment	\$2,285.71	65%	\$800.00	Part No Modified New Effective 5/30/2017
3HE09335AA-OSF-EF-S		On-site Equipment Fee, if shipped from Nokia (9500 MPR or TSM-8000) to customer site for use during training. \$3,500 for each class requiring shipped equipment (Per Round Trip)	\$10,000.00	65%	\$3,500.00	Part No Modified New Effective 5/30/2017

Notes:

- Does not include FCC fees, if any
- Pricing does not apply to states with prevailing wages statutes and can be quoted upon request
- SVC-KWIE-ENG, SVC-QHIE-ENG, SVC-QHIE-INST requires the description to be included with all orders
- A Man Day is considered to be 8 hours.
- For Training Two Options are provided: 1 - is per-student at Nokia facility; 2 - is per-session at customer location.
- The maximum number of students allowable for instructor-led classes is 8 students. Minimum class size for onsite training is 6 students.
- Customer is responsible for all travel arrangements and expenses for their students when traveling to an Alcatel-Lucent site for training
- Training prices do not include duties or taxes, which shall be Customer's responsibility.
- For Training classes - Customer cancellation within business fifteen (15) days of the scheduled training will result in the full amount of the course being billed.
- Onsite Training - A suitable classroom and classroom equipment to meet the student's needs, including the use of an overhead projector, whiteboard/chalkboard & markers, along with customer technical documentation should be provided by the customer.
- If the Customer is providing the training equipment for a practical (hands-on) course, it must be free of live traffic, dedicated and available for training purposes only.
- An adequate supply of terminals (PC/laptop) connected to the training platform with access to internet is required. The standard is one terminal for two trainees.

End of Nokia Microwave Services



Nokia
WTD Products Portfolio
Price Catalog - March 2016 Updated June 2017

Customer: The State of Washington Department of
Enterprise Services on behalf of NASPO ValuePoint
Cooperative Purchasing Program



Electronic Approval History

	User ID	Approver Name	Datetime	Description
1	M292915	Kent,Matthew	01/17/2018 2:59:02PM	Agency Fiscal Approval
2	S003602	Jones,Sandy	01/18/2018 7:45:03AM	IOT Approval
3	S261646	Edwards,Steven	01/18/2018 7:52:56AM	IOT Approval
4	M338303	Wolf,Matthew	01/19/2018 2:16:12PM	SBA Approval
5	D204406	Oware,Deanna Jeffrion	02/02/2018 9:09:16AM	SBA Approval
6	M338811	Skarbeck,Molly H	02/02/2018 9:10:44AM	Attorney General Approval
7	S210690	Gard,Susan W	02/02/2018 10:12:10AM	Attorney General Approval