



The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at ***WVPurchasing.gov*** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

## Header @ 3

[List View](#)

## General Information

[Contact](#)[Default Values](#)[Discount](#)[Document Information](#)

Procurement Folder: 390446

SO Doc Code: CRFQ

Procurement Type: Central Master Agreement

SO Dept: 0608

Vendor ID: 

SO Doc ID: COR1800000010

Legal Name: POMEROY IT SOLUTIONS SALES CO

Published Date: 11/2/17

Alias/DBA:

Close Date: 11/28/17

Total Bid: \$0.00

Close Time: 13:30

Response Date: 

Status: Closed

Response Time: Solicitation Description: 

Total of Header Attachments: 3

Total of All Attachments: 3



Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

State of West Virginia  
 Solicitation Response

Proc Folder : 390446  
 Solicitation Description : RADIO TESTER  
 Proc Type : Central Master Agreement

Date issued	Solicitation Closes	Solicitation Response	Version
	2017-11-28 13:30:00	SR 0608 ESR11281700000002303	1

VENDOR
000000219123 POMEROY IT SOLUTIONS SALES CO

Solicitation Number: CRFQ 0608 COR1800000010

Total Bid : \$0.00      Response Date: 2017-11-28      Response Time: 11:27:23

Comments:

**FOR INFORMATION CONTACT THE BUYER**  
 Crystal Rink  
 (304) 558-2402  
 crystal.g.rink@wv.gov

Signature on File      FEIN #      DATE

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	AEROFLEX 8800SX DIGITAL RADIO TEST SET OR EQUAL	0.00000	EA	\$0.000000	\$0.00

Comm Code	Manufacturer	Specification	Model #
52161511			

**Extended Description :** VENDOR MUST COMPLETE THE ATTACHED PRICING PAGE, EXHIBIT A. IF BIDDING ELECTRONICALLY, VENDOR IS TO PUT \$0.00 ON THE COMMODITY LINE IN WVOASIS, COMPLETE THE EXCEL PRICING PAGE, AND UPLOAD INTO WVOASIS AS AN ATTACHMENT. ONLY PRICING SUBMITTED VIA EXHIBIT A PRICING PAGE WILL BE EVALUATED FOR AWARD.

**Comments:** Exhibit A for Pricing



Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
 Charleston, WV 25305-0130

State of West Virginia  
 Request for Quotation  
 04 — Audio/Video

Proc Folder: 390446

Doc Description: RADIO TESTER

Proc Type: Central Master Agreement

Date Issued	Solicitation Closes	Solicitation No	Version
2017-11-02	2017-11-28 13:30:00	CRFQ 0608 COR1800000010	1

**BID RECEIVING LOCATION**

BID CLERK  
 DEPARTMENT OF ADMINISTRATION  
 PURCHASING DIVISION  
 2019 WASHINGTON ST E  
 CHARLESTON WV 25305  
 US

**VENDOR**

Vendor Name, Address and Telephone Number:

Pomeroy  
 Attn: Summer Bailey  
 500 Westmoreland Office Park  
 Dunbar, WV 25064

**FOR INFORMATION CONTACT THE BUYER**

Crystal Rink  
 (304) 558-2402  
 crystal.g.rink@wv.gov

Signature X

*Summer Bailey*

FEIN # 61-1352158

DATE 11-28-2017

All offers subject to all terms and conditions contained in this solicitation

**ADDITIONAL INFORMATION:**

THE STATE OF WEST VIRGINIA PURCHASING DIVISION IS SOLICITING BIDS ON BEHALF OF WEST VIRGINIA DIVISION OF CORRECTIONS AND AGENCIES WITHIN THE DEPARTMENT OF MILITARY AFFAIRS AND PUBLIC SAFETY, WEST VIRGINIA DEPARTMENT OF TRANSPORTATION, AND WEST VIRGINIA DIVISION OF NATURAL RESOURCES, TO ESTABLISH AN OPEN-END CONTRACT FOR AEROFLEX 8800SX DIGITAL RADIO TEST SET (SERVICE MONITOR) OR EQUAL PER THE ATTACHED DOCUMENTS.

INVOICE TO		SHIP TO	
FISCAL DEPARTMENT DIVISION OF CORRECTIONS - CENTRAL OFFICE 1409 GREENBRIER ST STE 300		WV DIVISION OF CORRECTIONS 901 8TH ST	
CHARLESTON	WV25311	MOUNDSVILLE	WV 26041
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	AEROFLEX 8800SX DIGITAL RADIO TEST SET OR EQUAL	0.00000	EA	0.00	0.00

Comm Code	Manufacturer	Specification	Model #
52161511			

**Extended Description :**

VENDOR MUST COMPLETE THE ATTACHED PRICING PAGE, EXHIBIT A. IF BIDDING ELECTRONICALLY, VENDOR IS TO PUT \$0.00 ON THE COMMODITY LINE IN WVOASIS, COMPLETE THE EXCEL PRICING PAGE, AND UPLOAD INTO WVOASIS AS AN ATTACHMENT. ONLY PRICING SUBMITTED VIA EXHIBIT A PRICING PAGE WILL BE EVALUATED FOR AWARD.

**SCHEDULE OF EVENTS**

Line	Event	Event Date
1	VENDOR QUESTION DEADLINE	2017-11-14

Exhibit A Attached to bid response.

COR1800000010	<b>Document Phase</b> Final	<b>Document Description</b> RADIO TESTER	<b>Page 3</b> of 3
---------------	--------------------------------	---	-----------------------

**ADDITIONAL TERMS AND CONDITIONS**

See attached document(s) for additional Terms and Conditions

## **INSTRUCTIONS TO VENDORS SUBMITTING BIDS**

**1. REVIEW DOCUMENTS THOROUGHLY:** The attached documents contain a solicitation for bids. Please read these instructions and all documents attached in their entirety. These instructions provide critical information about requirements that if overlooked could lead to disqualification of a Vendor's bid. All bids must be submitted in accordance with the provisions contained in these instructions and the Solicitation. Failure to do so may result in disqualification of Vendor's bid.

**2. MANDATORY TERMS:** The Solicitation may contain mandatory provisions identified by the use of the words "must," "will," and "shall." Failure to comply with a mandatory term in the Solicitation will result in bid disqualification.

**3. PREBID MEETING:** The item identified below shall apply to this Solicitation.

A pre-bid meeting will not be held prior to bid opening

A **NON-MANDATORY PRE-BID** meeting will be held at the following place and time:

A **MANDATORY PRE-BID** meeting will be held at the following place and time:

All Vendors submitting a bid must attend the mandatory pre-bid meeting. Failure to attend the mandatory pre-bid meeting shall result in disqualification of the Vendor's bid. No one person attending the pre-bid meeting may represent more than one Vendor.

An attendance sheet provided at the pre-bid meeting shall serve as the official document verifying attendance. The State will not accept any other form of proof or documentation to verify attendance. Any person attending the pre-bid meeting on behalf of a Vendor must list on the attendance sheet his or her name and the name of the Vendor he or she is representing.



Additionally, the person attending the pre-bid meeting should include the Vendor's E-Mail address, phone number, and Fax number on the attendance sheet. It is the Vendor's responsibility to locate the attendance sheet and provide the required information. Failure to complete the attendance sheet as required may result in disqualification of Vendor's bid.

All Vendors should arrive prior to the starting time for the pre-bid. Vendors who arrive after the starting time but prior to the end of the pre-bid will be permitted to sign in, but are charged with knowing all matters discussed at the pre-bid.

Questions submitted at least five business days prior to a scheduled pre-bid will be discussed at the pre-bid meeting if possible. Any discussions or answers to questions at the pre-bid meeting are preliminary in nature and are non-binding. Official and binding answers to questions will be published in a written addendum to the Solicitation prior to bid opening.

**4. VENDOR QUESTION DEADLINE:** Vendors may submit questions relating to this Solicitation to the Purchasing Division. Questions must be submitted in writing. All questions must be submitted on or before the date listed below and to the address listed below in order to be considered. A written response will be published in a Solicitation addendum if a response is possible and appropriate. Non-written discussions, conversations, or questions and answers regarding this Solicitation are preliminary in nature and are nonbinding.

Submitted e-mails should have solicitation number in the subject line.

Question Submission Deadline: November 14, 2017 at 10:00 AM EST

Submit Questions to: Crystal Rink  
2019 Washington Street, East  
Charleston, WV 25305  
Fax: (304) 558-4115 (Vendors should not use this fax number for bid submission)  
Email: [Crystal.G.Rink@wv.gov](mailto:Crystal.G.Rink@wv.gov)

**5. VERBAL COMMUNICATION:** Any verbal communication between the Vendor and any State personnel is not binding, including verbal communication at the mandatory pre-bid conference. Only information issued in writing and added to the Solicitation by an official written addendum by the Purchasing Division is binding.

**6. BID SUBMISSION:** All bids must be submitted electronically through wvOASIS or signed and delivered by the Vendor to the Purchasing Division at the address listed below on or before the date and time of the bid opening. Any bid received by the Purchasing Division staff is considered to be in the possession of the Purchasing Division and will not be returned for any reason. The Purchasing Division will not accept bids, modification of bids, or addendum acknowledgment forms via e-mail. Acceptable delivery methods include electronic submission via wvOASIS, hand delivery, delivery by courier, or facsimile.

The bid delivery address is:  
Department of Administration, Purchasing Division  
2019 Washington Street East  
Charleston, WV 25305-0130

A bid that is not submitted electronically through wvOASIS should contain the information listed below on the face of the envelope or the bid may be rejected by the Purchasing Division.:

SEALED BID:  
BUYER: Crystal Rink  
SOLICITATION NO.: CRFQ COR1800000010  
BID OPENING DATE: 11/28/2017  
BID OPENING TIME: 1:30 PM EST  
FAX NUMBER: 304-558-3970

The Purchasing Division may prohibit the submission of bids electronically through wvOASIS at its sole discretion. Such a prohibition will be contained and communicated in the wvOASIS system resulting in the Vendor's inability to submit bids through wvOASIS. Submission of a response to an Expression or Interest or Request for Proposal is not permitted in wvOASIS.

**For Request For Proposal ("RFP") Responses Only:** In the event that Vendor is responding to a request for proposal, the Vendor shall submit one original technical and one original cost proposal plus n/a convenience copies of each to the Purchasing Division at the address shown above. Additionally, the Vendor should identify the bid type as either a technical or cost proposal on the face of each bid envelope submitted in response to a request for proposal as follows:

BID TYPE: (This only applies to CRFP)

- Technical  
 Cost

**7. BID OPENING:** Bids submitted in response to this Solicitation will be opened at the location identified below on the date and time listed below. Delivery of a bid after the bid opening date and time will result in bid disqualification. For purposes of this Solicitation, a bid is considered delivered when confirmation of delivery is provided by wvOASIS (in the case of electronic submission) or when the bid is time stamped by the official Purchasing Division time clock (in the case of hand delivery).

Bid Opening Date and Time: November 28, 2017 at 1:30 PM EST

Bid Opening Location: Department of Administration, Purchasing Division  
2019 Washington Street East  
Charleston, WV 25305-0130

**8. ADDENDUM ACKNOWLEDGEMENT:** Changes or revisions to this Solicitation will be made by an official written addendum issued by the Purchasing Division. Vendor should acknowledge receipt of all addenda issued with this Solicitation by completing an Addendum Acknowledgment Form, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

**9. BID FORMATTING:** Vendor should type or electronically enter the information onto its bid to prevent errors in the evaluation. Failure to type or electronically enter the information may result in bid disqualification.

**10. ALTERNATES:** Any model, brand, or specification listed in this Solicitation establishes the acceptable level of quality only and is not intended to reflect a preference for, or in any way favor, a particular brand or vendor. Vendors may bid alternates to a listed model or brand provided that the alternate is at least equal to the model or brand and complies with the required specifications. The equality of any alternate being bid shall be determined by the State at its sole discretion. Any Vendor bidding an alternate model or brand should clearly identify the alternate items in its bid and should include manufacturer's specifications, industry literature, and/or any other relevant documentation demonstrating the equality of the alternate items. Failure to provide information for alternate items may be grounds for rejection of a Vendor's bid.

**11. EXCEPTIONS AND CLARIFICATIONS:** The Solicitation contains the specifications that shall form the basis of a contractual agreement. Vendor shall clearly mark any exceptions, clarifications, or other proposed modifications in its bid. Exceptions to, clarifications of, or modifications of a requirement or term and condition of the Solicitation may result in bid disqualification.

**12. COMMUNICATION LIMITATIONS:** In accordance with West Virginia Code of State Rules §148-1-6.6, communication with the State of West Virginia or any of its employees regarding this Solicitation during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited without prior Purchasing Division approval. Purchasing Division approval for such communication is implied for all agency delegated and exempt purchases.

**13. REGISTRATION:** Prior to Contract award, the apparent successful Vendor must be properly registered with the West Virginia Purchasing Division and must have paid the \$125 fee, if applicable.

**14. UNIT PRICE:** Unit prices shall prevail in cases of a discrepancy in the Vendor's bid.

**15. PREFERENCE:** Vendor Preference may only be granted upon written request and only in accordance with the West Virginia Code § 5A-3-37 and the West Virginia Code of State Rules. A Vendor Preference Certificate form has been attached hereto to allow Vendor to apply for the preference. Vendor's failure to submit the Vendor Preference Certificate form with its bid will result in denial of Vendor Preference. Vendor Preference does not apply to construction projects.

**16. SMALL, WOMEN-OWNED, OR MINORITY-OWNED BUSINESSES:** For any solicitations publicly advertised for bid, in accordance with West Virginia Code §5A-3-37(a)(7) and W. Va. CSR § 148-22-9, any non-resident vendor certified as a small, women-owned, or minority-owned business under W. Va. CSR § 148-22-9 shall be provided the same preference made available to any resident vendor. Any non-resident small, women-owned, or minority-owned business must identify itself as such in writing, must submit that writing to the Purchasing Division with its bid, and must be properly certified under W. Va. CSR § 148-22-9 prior to contract award to receive the preferences made available to resident vendors. Preference for a non-resident small, women-owned, or minority owned business shall be applied in accordance with W. Va. CSR § 148-22-9.

**17. WAIVER OF MINOR IRREGULARITIES:** The Director reserves the right to waive minor irregularities in bids or specifications in accordance with West Virginia Code of State Rules § 148-1-4.6.

**18. ELECTRONIC FILE ACCESS RESTRICTIONS:** Vendor must ensure that its submission in wvOASIS can be accessed and viewed by the Purchasing Division staff immediately upon bid opening. The Purchasing Division will consider any file that cannot be immediately accessed and viewed at the time of the bid opening (such as, encrypted files, password protected files, or incompatible files) to be blank or incomplete as context requires, and are therefore unacceptable. A vendor will not be permitted to unencrypt files, remove password protections, or resubmit documents after bid opening to make a file viewable if those documents are required with the bid. A Vendor may be required to provide document passwords or remove access restrictions to allow the Purchasing Division to print or electronically save documents provided that those documents are viewable by the Purchasing Division prior to obtaining the password or removing the access restriction.

**19. NON-RESPONSIBLE:** The Purchasing Division Director reserves the right to reject the bid of any vendor as Non-Responsible in accordance with W. Va. Code of State Rules § 148-1-5.3, when the Director determines that the vendor submitting the bid does not have the capability to fully perform, or lacks the integrity and reliability to assure good-faith performance.”

**20. ACCEPTANCE/REJECTION:** The State may accept or reject any bid in whole, or in part in accordance with W. Va. Code of State Rules § 148-1-4.5. and § 148-1-6.4.b.”

**21. YOUR SUBMISSION IS A PUBLIC DOCUMENT:** Vendor’s entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

**DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.**

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

**22. INTERESTED PARTY DISCLOSURE:** W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$100,000, the vendor must submit to the Purchasing Division a disclosure of interested parties to the contract, prior to contract award. That disclosure must occur on the form prescribed and approved by the WV Ethics Commission. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. "Interested parties" means: (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors; (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract; and (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency: Provided, That subdivision (2) shall be inapplicable if a business entity is a publicly traded company: Provided, however, That subdivision (3) shall not include persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.

## GENERAL TERMS AND CONDITIONS:

1. **CONTRACTUAL AGREEMENT:** Issuance of a Award Document signed by the Purchasing Division Director, or his designee, and approved as to form by the Attorney General's office constitutes acceptance of this Contract made by and between the State of West Virginia and the Vendor. Vendor's signature on its bid signifies Vendor's agreement to be bound by and accept the terms and conditions contained in this Contract.
2. **DEFINITIONS:** As used in this Solicitation/Contract, the following terms shall have the meanings attributed to them below. Additional definitions may be found in the specifications included with this Solicitation/Contract.
  - 2.1. **"Agency" or "Agencies"** means the agency, board, commission, or other entity of the State of West Virginia that is identified on the first page of the Solicitation or any other public entity seeking to procure goods or services under this Contract.
  - 2.2. **"Bid" or "Proposal"** means the vendors submitted response to this solicitation.
  - 2.3. **"Contract"** means the binding agreement that is entered into between the State and the Vendor to provide the goods or services requested in the Solicitation.
  - 2.4. **"Director"** means the Director of the West Virginia Department of Administration, Purchasing Division.
  - 2.5. **"Purchasing Division"** means the West Virginia Department of Administration, Purchasing Division.
  - 2.6. **"Award Document"** means the document signed by the Agency and the Purchasing Division, and approved as to form by the Attorney General, that identifies the Vendor as the contract holder.
  - 2.7. **"Solicitation"** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.
  - 2.8. **"State"** means the State of West Virginia and/or any of its agencies, commissions, boards, etc. as context requires.
  - 2.9. **"Vendor" or "Vendors"** means any entity submitting a bid in response to the Solicitation, the entity that has been selected as the lowest responsible bidder, or the entity that has been awarded the Contract as context requires.

**3. CONTRACT TERM; RENEWAL; EXTENSION:** The term of this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below:

**Term Contract**

**Initial Contract Term:** This Contract becomes effective on award and extends for a period of one (1) year(s).

**Renewal Term:** This Contract may be renewed upon the mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any request for renewal should be submitted to the Purchasing Division thirty (30) days prior to the expiration date of the initial contract term or appropriate renewal term. A Contract renewal shall be in accordance with the terms and conditions of the original contract. Renewal of this Contract is limited to three (3) successive one (1) year periods or multiple renewal periods of less than one year, provided that the multiple renewal periods do not exceed thirty-six (36) months in total. Automatic renewal of this Contract is prohibited. Notwithstanding the foregoing, Purchasing Division approval is not required on agency delegated or exempt purchases. Attorney General approval may be required for vendor terms and conditions.

**Delivery Order Limitations:** In the event that this contract permits delivery orders, a delivery order may only be issued during the time this Contract is in effect. Any delivery order issued within one year of the expiration of this Contract shall be effective for one year from the date the delivery order is issued. No delivery order may be extended beyond one year after this Contract has expired.

**Fixed Period Contract:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and must be completed within \_\_\_\_\_ days.

**Fixed Period Contract with Renewals:** This Contract becomes effective upon Vendor's receipt of the notice to proceed and part of the Contract more fully described in the attached specifications must be completed within \_\_\_\_\_ days.

Upon completion, the vendor agrees that maintenance, monitoring, or warranty services will be provided for one year thereafter with an additional \_\_\_\_\_ successive one year renewal periods or multiple renewal periods of less than one year provided that the multiple renewal periods do not exceed \_\_\_\_\_ months in total. Automatic renewal of this Contract is prohibited.

**One Time Purchase:** The term of this Contract shall run from the issuance of the Award Document until all of the goods contracted for have been delivered, but in no event will this Contract extend for more than one fiscal year.

**Other:** See attached.

**4. NOTICE TO PROCEED:** Vendor shall begin performance of this Contract immediately upon receiving notice to proceed unless otherwise instructed by the Agency. Unless otherwise specified, the fully executed Award Document will be considered notice to proceed.

**5. QUANTITIES:** The quantities required under this Contract shall be determined in accordance with the category that has been identified as applicable to this Contract below.

**Open End Contract:** Quantities listed in this Solicitation are approximations only, based on estimates supplied by the Agency. It is understood and agreed that the Contract shall cover the quantities actually ordered for delivery during the term of the Contract, whether more or less than the quantities shown.

**Service:** The scope of the service to be provided will be more clearly defined in the specifications included herewith.

**Combined Service and Goods:** The scope of the service and deliverable goods to be provided will be more clearly defined in the specifications included herewith.

**One Time Purchase:** This Contract is for the purchase of a set quantity of goods that are identified in the specifications included herewith. Once those items have been delivered, no additional goods may be procured under this Contract without an appropriate change order approved by the Vendor, Agency, Purchasing Division, and Attorney General's office.

**6. EMERGENCY PURCHASES:** The Purchasing Division Director may authorize the Agency to purchase goods or services in the open market that Vendor would otherwise provide under this Contract if those goods or services are for immediate or expedited delivery in an emergency. Emergencies shall include, but are not limited to, delays in transportation or an unanticipated increase in the volume of work. An emergency purchase in the open market, approved by the Purchasing Division Director, shall not constitute a breach of this Contract and shall not entitle the Vendor to any form of compensation or damages. This provision does not excuse the State from fulfilling its obligations under a One Time Purchase contract.

**7. REQUIRED DOCUMENTS:** All of the items checked below must be provided to the Purchasing Division by the Vendor as specified below.

**BID BOND (Construction Only):** Pursuant to the requirements contained in W. Va. Code § 5-22-1(c), All Vendors submitting a bid on a construction project shall furnish a valid bid bond in the amount of five percent (5%) of the total amount of the bid protecting the State of West Virginia. The bid bond must be submitted with the bid.

**PERFORMANCE BOND:** The apparent successful Vendor shall provide a performance bond in the amount of \_\_\_\_\_. The performance bond must be received by the Purchasing Division prior to Contract award. On construction contracts, the performance bond must be 100% of the Contract value.



**LABOR/MATERIAL PAYMENT BOND:** The apparent successful Vendor shall provide a labor/material payment bond in the amount of 100% of the Contract value. The labor/material payment bond must be delivered to the Purchasing Division prior to Contract award.

In lieu of the Bid Bond, Performance Bond, and Labor/Material Payment Bond, the Vendor may provide certified checks, cashier's checks, or irrevocable letters of credit. Any certified check, cashier's check, or irrevocable letter of credit provided in lieu of a bond must be of the same amount and delivered on the same schedule as the bond it replaces. A letter of credit submitted in lieu of a performance and labor/material payment bond will only be allowed for projects under \$100,000. Personal or business checks are not acceptable. Notwithstanding the foregoing, West Virginia Code § 5-22-1 (d) mandates that a vendor provide a performance and labor/material payment bond for construction projects. Accordingly, substitutions for the performance and labor/material payment bonds for construction projects is not permitted.

**MAINTENANCE BOND:** The apparent successful Vendor shall provide a two (2) year maintenance bond covering the roofing system. The maintenance bond must be issued and delivered to the Purchasing Division prior to Contract award.

**LICENSE(S) / CERTIFICATIONS / PERMITS:** In addition to anything required under the Section entitled Licensing, of the General Terms and Conditions, the apparent successful Vendor shall furnish proof of the following licenses, certifications, and/or permits prior to Contract award, in a form acceptable to the Purchasing Division.

The apparent successful Vendor shall also furnish proof of any additional licenses or certifications contained in the specifications prior to Contract award regardless of whether or not that requirement is listed above.

**8. INSURANCE:** The apparent successful Vendor shall furnish proof of the insurance identified by a checkmark below prior to Contract award. Subsequent to contract award, and prior to the insurance expiration date, Vendor shall provide the Agency with proof that the insurance mandated herein has been continued. Vendor must also provide Agency with immediate notice of any changes in its insurance policies mandated herein, including but not limited to, policy cancelation, policy reduction, or change in insurers. The insurance coverages identified below must be maintained throughout the life of this contract. The apparent successful Vendor shall also furnish proof of any additional insurance requirements contained in the specifications prior to Contract award regardless of whether or not that insurance requirement is listed in this section.

Vendor must maintain:

**Commercial General Liability Insurance** in at least an amount of:

\_\_\_\_\_

**Automobile Liability Insurance** in at least an amount of: \_\_\_\_\_

**Professional/Malpractice/Errors and Omission Insurance** in at least an amount of:

\_\_\_\_\_

**Commercial Crime and Third Party Fidelity Insurance** in an amount of:

\_\_\_\_\_

**Cyber Liability Insurance** in an amount of: \_\_\_\_\_

**Builders Risk Insurance** in an amount equal to 100% of the amount of the Contract.

**9. WORKERS' COMPENSATION INSURANCE:** The apparent successful Vendor shall comply with laws relating to workers compensation, shall maintain workers' compensation insurance when required, and shall furnish proof of workers' compensation insurance upon request.

**10. LITIGATION BOND:** The Director reserves the right to require any Vendor that files a protest of an award to submit a litigation bond in the amount equal to one percent of the lowest bid submitted or \$5,000, whichever is greater. The entire amount of the bond shall be forfeited if the hearing officer determines that the protest was filed for frivolous or improper purpose, including but not limited to, the purpose of harassing, causing unnecessary delay, or needless expense for the Agency. All litigation bonds shall be made payable to the Purchasing Division. In lieu of a bond, the protester may submit a cashier's check or certified check payable to the Purchasing Division. Cashier's or certified checks will be deposited with and held by the State Treasurer's office. If it is determined that the protest has not been filed for frivolous or improper purpose, the bond or deposit shall be returned in its entirety.

**11. LIQUIDATED DAMAGES:** Vendor shall pay liquidated damages in the amount of

\_\_\_\_\_ for \_\_\_\_\_  
This clause shall in no way be considered exclusive and shall not limit the State or Agency's right to pursue any other available remedy.

**12. ACCEPTANCE:** Vendor's signature on its bid, or on the certification and signature page, constitutes an offer to the State that cannot be unilaterally withdrawn, signifies that the product or service proposed by vendor meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise indicated, and signifies acceptance of the terms and conditions contained in the Solicitation unless otherwise indicated.

**13. PRICING:** The pricing set forth herein is firm for the life of the Contract, unless specified elsewhere within this Solicitation/Contract by the State. A Vendor's inclusion of price adjustment provisions in its bid, without an express authorization from the State in the Solicitation to do so, may result in bid disqualification.

**14. PAYMENT:** Payment in advance is prohibited under this Contract. Payment may only be made after the delivery and acceptance of goods or services. The Vendor shall submit invoices, in arrears.

**15. PURCHASING CARD ACCEPTANCE:** The State of West Virginia currently utilizes a Purchasing Card program, administered under contract by a banking institution, to process payment for goods and services. The Vendor must accept the State of West Virginia's Purchasing Card for payment of all orders under this Contract unless the box below is checked.

Vendor is not required to accept the State of West Virginia's Purchasing Card as payment for all goods and services.

**16. TAXES:** The Vendor shall pay any applicable sales, use, personal property or any other taxes arising out of this Contract and the transactions contemplated thereby. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.

**17. ADDITIONAL FEES:** Vendor is not permitted to charge additional fees or assess additional charges that were not either expressly provided for in the solicitation published by the State of West Virginia or included in the unit price or lump sum bid amount that Vendor is required by the solicitation to provide. Including such fees or charges as notes to the solicitation may result in rejection of vendor's bid. Requesting such fees or charges be paid after the contract has been awarded may result in cancellation of the contract.

**18. FUNDING:** This Contract shall continue for the term stated herein, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise made available, this Contract becomes void and of no effect beginning on July 1 of the fiscal year for which funding has not been appropriated or otherwise made available.

**19. CANCELLATION:** The Purchasing Division Director reserves the right to cancel this Contract immediately upon written notice to the vendor if the materials or workmanship supplied do not conform to the specifications contained in the Contract. The Purchasing Division Director may also cancel any purchase or Contract upon 30 days written notice to the Vendor in accordance with West Virginia Code of State Rules § 148-1-6.1.e.

**20. TIME:** Time is of the essence with regard to all matters of time and performance in this Contract.

**21. APPLICABLE LAW:** This Contract is governed by and interpreted under West Virginia law without giving effect to its choice of law principles. Any information provided in specification manuals, or any other source, verbal or written, which contradicts or violates the West Virginia Constitution, West Virginia Code or West Virginia Code of State Rules is void and of no effect.

**22. COMPLIANCE WITH LAWS:** Vendor shall comply with all applicable federal, state, and local laws, regulations and ordinances. By submitting a bid, Vendor acknowledges that it has reviewed, understands, and will comply with all applicable laws, regulations, and ordinances.

**23. ARBITRATION:** Any references made to arbitration contained in this Contract, Vendor's bid, or in any American Institute of Architects documents pertaining to this Contract are hereby deleted, void, and of no effect.

**24. MODIFICATIONS:** This writing is the parties' final expression of intent. Notwithstanding anything contained in this Contract to the contrary no modification of this Contract shall be binding without mutual written consent of the Agency, and the Vendor, with approval of the Purchasing Division and the Attorney General's office (Attorney General approval is as to form only). Any change to existing contracts that adds work or changes contract cost, and were not included in the original contract, must be approved by the Purchasing Division and the Attorney General's Office (as to form) prior to the implementation of the change or commencement of work affected by the change.

**25. WAIVER:** The failure of either party to insist upon a strict performance of any of the terms or provision of this Contract, or to exercise any option, right, or remedy herein contained, shall not be construed as a waiver or a relinquishment for the future of such term, provision, option, right, or remedy, but the same shall continue in full force and effect. Any waiver must be expressly stated in writing and signed by the waiving party.

**26. SUBSEQUENT FORMS:** The terms and conditions contained in this Contract shall supersede any and all subsequent terms and conditions which may appear on any form documents submitted by Vendor to the Agency or Purchasing Division such as price lists, order forms, invoices, sales agreements, or maintenance agreements, and includes internet websites or other electronic documents. Acceptance or use of Vendor's forms does not constitute acceptance of the terms and conditions contained thereon.

**27. ASSIGNMENT:** Neither this Contract nor any monies due, or to become due hereunder, may be assigned by the Vendor without the express written consent of the Agency, the Purchasing Division, the Attorney General's office (as to form only), and any other government agency or office that may be required to approve such assignments. Notwithstanding the foregoing, Purchasing Division approval may or may not be required on certain agency delegated or exempt purchases.

**28. WARRANTY:** The Vendor expressly warrants that the goods and/or services covered by this Contract will: (a) conform to the specifications, drawings, samples, or other description furnished or specified by the Agency; (b) be merchantable and fit for the purpose intended; and (c) be free from defect in material and workmanship.

**29. STATE EMPLOYEES:** State employees are not permitted to utilize this Contract for personal use and the Vendor is prohibited from permitting or facilitating the same.

**30. BANKRUPTCY:** In the event the Vendor files for bankruptcy protection, the State of West Virginia may deem this Contract null and void, and terminate this Contract without notice.

**31. PRIVACY, SECURITY, AND CONFIDENTIALITY:** The Vendor agrees that it will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the Agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the Agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/default.html>.

**32. YOUR SUBMISSION IS A PUBLIC DOCUMENT:** Vendor's entire response to the Solicitation and the resulting Contract are public documents. As public documents, they will be disclosed to the public following the bid/proposal opening or award of the contract, as required by the competitive bidding laws of West Virginia Code §§ 5A-3-1 et seq., 5-22-1 et seq., and 5G-1-1 et seq. and the Freedom of Information Act West Virginia Code §§ 29B-1-1 et seq.

DO NOT SUBMIT MATERIAL YOU CONSIDER TO BE CONFIDENTIAL, A TRADE SECRET, OR OTHERWISE NOT SUBJECT TO PUBLIC DISCLOSURE.

Submission of any bid, proposal, or other document to the Purchasing Division constitutes your explicit consent to the subsequent public disclosure of the bid, proposal, or document. The Purchasing Division will disclose any document labeled "confidential," "proprietary," "trade secret," "private," or labeled with any other claim against public disclosure of the documents, to include any "trade secrets" as defined by West Virginia Code § 47-22-1 et seq. All submissions are subject to public disclosure without notice.

**33. LICENSING:** In accordance with West Virginia Code of State Rules § 148-1-6.1.e, Vendor must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agency or political subdivision. Upon request, the Vendor must provide all necessary releases to obtain information to enable the Purchasing Division Director or the Agency to verify that the Vendor is licensed and in good standing with the above entities.

**34. ANTITRUST:** In submitting a bid to, signing a contract with, or accepting a Award Document from any agency of the State of West Virginia, the Vendor agrees to convey, sell, assign, or transfer to the State of West Virginia all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to Vendor.

**35. VENDOR CERTIFICATIONS:** By signing its bid or entering into this Contract, Vendor certifies (1) that its bid or offer was made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, person or entity submitting a bid or offer for the same material, supplies, equipment or services; (2) that its bid or offer is in all respects fair and without collusion or fraud; (3) that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; and (4) that it has reviewed this Solicitation in its entirety; understands the requirements, terms and conditions, and other information contained herein.

Vendor's signature on its bid or offer also affirms that neither it nor its representatives have any interest, nor shall acquire any interest, direct or indirect, which would compromise the performance of its services hereunder. Any such interests shall be promptly presented in detail to the Agency. The individual signing this bid or offer on behalf of Vendor certifies that he or she is authorized by the Vendor to execute this bid or offer or any documents related thereto on Vendor's behalf; that he or she is authorized to bind the Vendor in a contractual relationship; and that, to the best of his or her knowledge, the Vendor has properly registered with any State agency that may require registration.

**36. VENDOR RELATIONSHIP:** The relationship of the Vendor to the State shall be that of an independent contractor and no principal-agent relationship or employer-employee relationship is contemplated or created by this Contract. The Vendor as an independent contractor is solely liable for the acts and omissions of its employees and agents. Vendor shall be responsible for selecting, supervising, and compensating any and all individuals employed pursuant to the terms of this Solicitation and resulting contract. Neither the Vendor, nor any employees or subcontractors of the Vendor, shall be deemed to be employees of the State for any purpose whatsoever. Vendor shall be exclusively responsible for payment of employees and contractors for all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, professional liability insurance premiums, contributions to insurance and pension, or other deferred compensation plans, including but not limited to, Workers' Compensation and Social Security obligations, licensing fees, etc. and the filing of all necessary documents, forms, and returns pertinent to all of the foregoing.

Vendor shall hold harmless the State, and shall provide the State and Agency with a defense against any and all claims including, but not limited to, the foregoing payments, withholdings, contributions, taxes, Social Security taxes, and employer income tax returns.

**37. INDEMNIFICATION:** The Vendor agrees to indemnify, defend, and hold harmless the State and the Agency, their officers, and employees from and against: (1) Any claims or losses for services rendered by any subcontractor, person, or firm performing or supplying services, materials, or supplies in connection with the performance of the Contract; (2) Any claims or losses resulting to any person or entity injured or damaged by the Vendor, its officers, employees, or subcontractors by the publication, translation, reproduction, delivery, performance, use, or disposition of any data used under the Contract in a manner not authorized by the Contract, or by Federal or State statutes or regulations; and (3) Any failure of the Vendor, its officers, employees, or subcontractors to observe State and Federal laws including, but not limited to, labor and wage and hour laws.

**38. PURCHASING AFFIDAVIT:** In accordance with West Virginia Code § 5-22-1(i), the contracting public entity shall not award a contract for a construction project to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees. Accordingly, prior to contract award, Vendors are required to sign, notarize, and submit the Purchasing Affidavit to the Purchasing Division affirming under oath that it is not in default on any monetary obligation owed to the state or a political subdivision of the state.

**39. ADDITIONAL AGENCY AND LOCAL GOVERNMENT USE:** This Contract may be utilized by other agencies, spending units, and political subdivisions of the State of West Virginia; county, municipal, and other local government bodies; and school districts ("Other Government Entities"). Any extension of this Contract to the aforementioned Other Government Entities must be on the same prices, terms, and conditions as those offered and agreed to in this Contract, provided that such extension is in compliance with the applicable laws, rules, and ordinances of the Other Government Entity. If the Vendor does not wish to extend the prices, terms, and conditions of its bid and subsequent contract to the Other Government Entities, the Vendor must clearly indicate such refusal in its bid. A refusal to extend this Contract to the Other Government Entities shall not impact or influence the award of this Contract in any manner.

**40. CONFLICT OF INTEREST:** Vendor, its officers or members or employees, shall not presently have or acquire an interest, direct or indirect, which would conflict with or compromise the performance of its obligations hereunder. Vendor shall periodically inquire of its officers, members and employees to ensure that a conflict of interest does not arise. Any conflict of interest discovered shall be promptly presented in detail to the Agency.

**41. REPORTS:** Vendor shall provide the Agency and/or the Purchasing Division with the following reports identified by a checked box below:

Such reports as the Agency and/or the Purchasing Division may request. Requested reports may include, but are not limited to, quantities purchased, agencies utilizing the contract, total contract expenditures by agency, etc.

Quarterly reports detailing the total quantity of purchases in units and dollars, along with a listing of purchases by agency. Quarterly reports should be delivered to the Purchasing Division via email at [purchasing.requisitions@wv.gov](mailto:purchasing.requisitions@wv.gov).

**42. BACKGROUND CHECK:** In accordance with W. Va. Code § 15-2D-3, the Director of the Division of Protective Services shall require any service provider whose employees are regularly employed on the grounds or in the buildings of the Capitol complex or who have access to sensitive or critical information to submit to a fingerprint-based state and federal background inquiry through the state repository. The service provider is responsible for any costs associated with the fingerprint-based state and federal background inquiry.

After the contract for such services has been approved, but before any such employees are permitted to be on the grounds or in the buildings of the Capitol complex or have access to sensitive or critical information, the service provider shall submit a list of all persons who will be physically present and working at the Capitol complex to the Director of the Division of Protective Services for purposes of verifying compliance with this provision. The State reserves the right to prohibit a service provider's employees from accessing sensitive or critical information or to be present at the Capitol complex based upon results addressed from a criminal background check.

Service providers should contact the West Virginia Division of Protective Services by phone at (304) 558-9911 for more information.



**43. PREFERENCE FOR USE OF DOMESTIC STEEL PRODUCTS:** Except when authorized by the Director of the Purchasing Division pursuant to W. Va. Code § 5A-3-56, no contractor may use or supply steel products for a State Contract Project other than those steel products made in the United States. A contractor who uses steel products in violation of this section may be subject to civil penalties pursuant to W. Va. Code § 5A-3-56. As used in this section:

- a. "State Contract Project" means any erection or construction of, or any addition to, alteration of or other improvement to any building or structure, including, but not limited to, roads or highways, or the installation of any heating or cooling or ventilating plants or other equipment, or the supply of and materials for such projects, pursuant to a contract with the State of West Virginia for which bids were solicited on or after June 6, 2001.
- b. "Steel Products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two or more or such operations, from steel made by the open heath, basic oxygen, electric furnace, Bessemer or other steel making process. The Purchasing Division Director may, in writing, authorize the use of foreign steel products if:
- c. The cost for each contract item used does not exceed one tenth of one percent (.1%) of the total contract cost or two thousand five hundred dollars (\$2,500.00), whichever is greater. For the purposes of this section, the cost is the value of the steel product as delivered to the project; or
- d. The Director of the Purchasing Division determines that specified steel materials are not produced in the United States in sufficient quantity or otherwise are not reasonably available to meet contract requirements.

**44. PREFERENCE FOR USE OF DOMESTIC ALUMINUM, GLASS, AND STEEL:** In Accordance with W. Va. Code § 5-19-1 et seq., and W. Va. CSR § 148-10-1 et seq., for every contract or subcontract, subject to the limitations contained herein, for the construction, reconstruction, alteration, repair, improvement or maintenance of public works or for the purchase of any item of machinery or equipment to be used at sites of public works, only domestic aluminum, glass or steel products shall be supplied unless the spending officer determines, in writing, after the receipt of offers or bids, (1) that the cost of domestic aluminum, glass or steel products is unreasonable or inconsistent with the public interest of the State of West Virginia, (2) that domestic aluminum, glass or steel products are not produced in sufficient quantities to meet the contract requirements, or (3) the available domestic aluminum, glass, or steel do not meet the contract specifications. This provision only applies to public works contracts awarded in an amount more than fifty thousand dollars (\$50,000) or public works contracts that require more than ten thousand pounds of steel products.

The cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than twenty percent (20%) of the bid or offered price for foreign made aluminum, glass, or steel products. If the domestic aluminum, glass or steel products to be supplied or produced in a "substantial labor surplus area", as defined by the United States Department of Labor, the cost of domestic aluminum, glass, or steel products may be unreasonable if the cost is more than thirty percent (30%) of the bid or offered price for foreign made aluminum, glass, or steel products. This preference shall be applied to an item of machinery or equipment, as indicated above, when

the item is a single unit of equipment or machinery manufactured primarily of aluminum, glass or steel, is part of a public works contract and has the sole purpose or of being a permanent part of a single public works project. This provision does not apply to equipment or machinery purchased by a spending unit for use by that spending unit and not as part of a single public works project.

All bids and offers including domestic aluminum, glass or steel products that exceed bid or offer prices including foreign aluminum, glass or steel products after application of the preferences provided in this provision may be reduced to a price equal to or lower than the lowest bid or offer price for foreign aluminum, glass or steel products plus the applicable preference. If the reduced bid or offer prices are made in writing and supersede the prior bid or offer prices, all bids or offers, including the reduced bid or offer prices, will be reevaluated in accordance with this rule.

**45. INTERESTED PARTY SUPPLEMENTAL DISCLOSURE:** W. Va. Code § 6D-1-2 requires that for contracts with an actual or estimated value of at least \$100,000, the vendor must submit to the Agency a supplemental disclosure of interested parties reflecting any new or differing interested parties to the contract, which were not included in the original pre-award interested party disclosure, within 30 days following the completion or termination of the contract. A copy of that form is included with this solicitation or can be obtained from the WV Ethics Commission. "Interested parties" means: (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors; (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract; and (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency: Provided, That subdivision (2) shall be inapplicable if a business entity is a publicly traded company: Provided, however, That subdivision (3) shall not include persons or business entities performing legal services related to the negotiation or drafting of the applicable contract. The Agency shall submit a copy of the disclosure to the Ethics Commission within 15 days after receiving the supplemental disclosure of interested parties.

**DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

Summer Bailey, Technology Solutions Executive  
\_\_\_\_\_  
(Name, Title)  
Summer Bailey, Technology Solutions Executive  
\_\_\_\_\_  
(Printed Name and Title)  
Pomeroy - 500 Westmoreland Office Park - Dunbar, WV 25064  
\_\_\_\_\_  
(Address)  
304-553-7526 / 1-866-301-1761  
\_\_\_\_\_  
(Phone Number) / (Fax Number)  
summer.bailey@pomeroy.com  
\_\_\_\_\_  
(email address)

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through wvOASIS, I certify that I have reviewed this Solicitation in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that I am authorized by the vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

Pomeroy  
\_\_\_\_\_  
(Company)  
*Summer Bailey, TSE*  
\_\_\_\_\_  
(Authorized Signature) (Representative Name, Title)

Summer Bailey, Technology Solutions Executive  
\_\_\_\_\_  
(Printed Name and Title of Authorized Representative)

11/28/2017  
\_\_\_\_\_  
(Date)

304-553-7526 / 1-866-301-1761  
\_\_\_\_\_  
(Phone Number) (Fax Number)

ADDENDUM ACKNOWLEDGEMENT FORM  
SOLICITATION NO.: CRFQ COR1800000010

Instructions: Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

Acknowledgment: I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

Addendum Numbers Received:

*(Check the box next to each addendum received)*

- |   |  |
|---|--|
| <input type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7  |
| <input type="checkbox"/> Addendum No. 3 | <input type="checkbox"/> Addendum No. 8  |
| <input type="checkbox"/> Addendum No. 4 | <input type="checkbox"/> Addendum No. 9  |
| <input type="checkbox"/> Addendum No. 5 | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

Pomeroy IT Solutions Sales Co Inc

Company

*Summer Bailey*

Authorized Signature

11/28/2017

Date

NOTE: This addendum acknowledgment should be submitted with the bid to expedite document processing.

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**SPECIFICATIONS**

1. **PURPOSE AND SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of West Virginia Division of Corrections and agencies within the Department of Military Affairs and Public Safety, West Virginia Department of Transportation, West Virginia Division of Natural Resources to establish an open-end contract for AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or equal.
  
2. **DEFINITIONS:** The terms listed below shall have the meanings assigned to them below. Additional definitions can be found in section 2 of the General Terms and Conditions.
  - 2.1 **“Contract Item” or “Contract Items”** means the list of items identified in Section 3.1 below and on the Pricing Pages.
  
  - 2.2 **“Pricing Pages”** means the schedule of prices, estimated order quantity, and totals contained in wvOASIS or attached hereto as Exhibit A, and used to evaluate the Solicitation responses.
  
  - 2.3 **“Solicitation”** means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.
  
  - 2.4 **“dBm”** means an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used in radio, microwave and fiber-optical networks as a convenient measure of absolute power because of its capability to express both very large and very small values in a short form. Compare dBW, which is referenced to one watt (1000 mW). Since it is referenced to the watt, it is an absolute unit, used when measuring absolute power. By comparison, the decibel (dB) is a dimensionless unit, used for quantifying the ratio between two values, such as signal-to-noise ratio. In audio and telephony, dBm is typically referenced relative to a 600-ohm impedance, while in radio-frequency work dBm is typically referenced relative to a 50-ohm impedance.
  
  - 2.5 **“AC/DC” (AC)** is an electric current which periodically reverses direction, in contrast to direct current (DC) which flows only in one direction.
  
  - 2.6 **“RF”** means Radio Frequency
  
  - 2.7 **“T/R”** means Transmit and Receive
  
  - 2.8 **“AM”** is a modulation technique used in electronic communication, most commonly for transmitting information via a radio carrier wave. In amplitude modulation, the

## REQUEST FOR QUOTATION

CRFQ COR1800000010

### AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal

---

amplitude (signal strength) of the carrier wave is varied in proportion to the waveform being transmitted. That waveform may, for instance, correspond to the sounds to be reproduced by a loudspeaker, or the light intensity of television pixels. This technique contrasts with frequency modulation, in which the frequency of the carrier signal is varied, and phase modulation, in which its phase is varied. AM was the earliest modulation method used to transmit voice by radio. It was developed during the first two decades of the 20th century beginning with Landell de Moura and Reginald Fessenden's radiotelephone experiments in 1900. It remains in use today in many forms of communication; for example it is used in portable two-way radios, VHF aircraft radio, Citizen's Band Radio, and in computer modems (in the form of QAM). "AM" is often used to refer to mediumwave AM radio broadcasting.

**2.9 "FM"** Is the encoding of information in a carrier wave by varying the instantaneous frequency of the wave. This contrasts with amplitude modulation, in which the amplitude of the carrier wave varies, while the frequency remains constant. In analog frequency modulation, such as FM radio broadcasting of an audio signal representing voice or music, the instantaneous frequency deviation, the difference between the frequency of the carrier and its center frequency, is proportional to the modulating signal.

**2.10 "Hz"** The hertz (symbol: Hz) is the derived unit of frequency in the International System of Units (SI) and is defined as one cycle per second. It is named for Heinrich Rudolf Hertz, the first person to provide conclusive proof of the existence of electromagnetic waves. Hertz are commonly expressed in multiples: kilohertz (10<sup>3</sup> Hz, kHz), megahertz (10<sup>6</sup> Hz, MHz), gigahertz (10<sup>9</sup> Hz, GHz), and terahertz (10<sup>12</sup> Hz, THz). Some of the unit's most common uses are in the description of sine waves and musical tones, particularly those used in radio- and audio-related applications. It is also used to describe the speeds at which computers and other electronics are driven.

**2.11 "VSWR"** (Voltage Standing Wave Ratio), is a measure of how efficiently radio-frequency power is transmitted from a power source, through a transmission line, into a load (for example, from a power amplifier through a transmission line, to an antenna).

**2.12 "(~)"** The symbol for approximate indicates an imprecise or nominal value where variations will be acceptable.

**2.13 "dBm"** is an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used in radio, microwave and fiber-optical networks as a convenient measure of absolute power because of its capability to express both very large and very small values in a short form. Compare

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

dBW, which is referenced to one watt (1000 mW). Since it is referenced to the watt, it is an absolute unit, used when measuring absolute power. By comparison, the decibel (dB) is a dimensionless unit, used for quantifying the ratio between two values, such as signal-to-noise ratio.

- 2.14 “dBc”** (decibels relative to the carrier) is the power ratio of a signal to a carrier signal, expressed in decibels. For example, phase noise is expressed in dBc/Hz at a given frequency offset from the carrier. dBc can also be used as a measurement of Spurious-Free Dynamic Range (SFDR) between the desired signal and unwanted spurious outputs resulting from the use of signal converters such as a digital-to-analog converter or a frequency mixer. If the dBc figure is positive, then the relative signal strength is greater than the carrier signal strength. If the dBc figure is negative, then the relative signal strength is less than carrier signal strength.
- 2.15 “CW”** A continuous wave or continuous waveform (CW) is an electromagnetic wave of constant amplitude and frequency; almost always a sine wave, that for mathematical analysis is considered to be of infinite duration. Continuous wave is also the name given to an early method of radio transmission, in which a sinusoidal carrier wave is switched on and off. Information is carried in the varying duration of the on and off periods of the signal, for example by Morse code in early radio. In early wireless telegraphy radio transmission, CW waves were also known as "undamped waves", to distinguish this method from damped wave signals produced by earlier spark gap type transmitters.
- 2.16 “SINAD”** Signal-to-noise and distortion ratio (SINAD) is a measure of the quality of a signal from a communications device, SINAD is usually expressed in dB and is quoted alongside the receiver RF sensitivity, to give a quantitative evaluation of the receiver sensitivity. Note that with this definition a SINAD reading can never be less than 1 (i.e. it is always positive when quoted in dB).
- 2.17 “NXDN”** is an open standard Common Air Interface (CAI) technical protocol for mobile communications. It was developed jointly by Icom Incorporated and Kenwood Corporation. NXDN is implemented by Icom in their IDAS system and by Kenwood as NEXEDGE.
- 2.18 “P25”** is a suite of standards for digital radio communications for use by federal, state/province and local Public safety organizations in North America to enable them to communicate with other agencies and mutual aid response teams in emergencies.
- 2.19 “DMR”** is an open digital mobile radio standard defined in the European Telecommunications Standards Institute (ETSI) Standard TS

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- 2.20** “**dPMR**” digital private mobile radio, is a Common Air Interface (CAI) for digital mobile communications. dPMR is an open, non-proprietary standard that was developed by the European Telecommunications Standards Institute
- 2.21** “**ARIB T98**” is Association of Radio Industries and Business standard for Digital Convenience Radio Equipment for Simplified Service
- 2.22** “**PTC**” is Positive Train Control System
- 2.23** “**rms**” in a cyclically alternating electric current, root mean square (RMS) is equal to the value of the direct current that would produce the same average power dissipation in a resistive load
- 2.24** “**ppm**” Is a temperature coefficient that describes the relative change of a physical property that is associated with a given change in temperature
- 2.25** “**DTMF**” Dual-tone multi-frequency signaling (DTMF) is an in-band telecommunication signaling system using the voice-frequency band over telephone lines between telephone equipment and other communications devices and switching centers. DTMF was first developed in the Bell System in the United States, and became known under the trademark Touch-Tone for use in push-button telephones supplied to telephone customers, starting in 1963. DTMF is standardized as ITU-T Recommendation Q.23
- 2.26** “**DCS**” DCS (Digital Coded Squelch) is digital data or code word that is transmitted with the voice audio. This data is sub-audible with most of its energy below 300Hz. However, it does have a wide bandwidth from 2 to 300 Hz. Unlike CTCSS (Continuous Tone Coded Squelch System) which uses continuous tones below 300 Hz., DCS uses digital data or code words. Each code word is unique and all code words may be used on the same channel without interference. At the end of the radio transmission and about 1/2 second before the transmitter un-keys, the radio will encode a 134 Hz tone that serves as a turn off code. The FM deviation level of DCS data should be in the range of 500 to 800 Hz.
- 2.27** “**ohm**” The ohm is defined as an electrical resistance between two points of a conductor when a constant potential difference of one volt, applied to these points, produces in the conductor a current of one ampere, the conductor not being the seat of any electromotive force in many cases the resistance of a conductor in ohms is approximately constant within a certain range of voltages, temperatures, and other parameters. These are called linear resistors. In other cases, resistance varies (e.g., thermistors). In alternating current circuits, electrical impedance is also measured in ohms.



**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- 2.28 “Z”** Electrical impedance is the measure of the opposition that a circuit presents to a current when a voltage is applied. The term complex impedance may be used interchangeably. Quantitatively, the impedance of a two-terminal circuit element is the ratio of the complex representation of a sinusoidal voltage between its terminals to the complex representation of the current flowing through it. In general, it depends upon the frequency of the sinusoidal voltage. Impedance extends the concept of resistance to AC circuits, and possesses both magnitude and phase, unlike resistance, which has only magnitude. When a circuit is driven with direct current (DC), there is no distinction between impedance and resistance; the latter can be thought of as impedance with zero phase angle. The notion of impedance is useful for performing AC analysis of electrical networks, because it allows relating sinusoidal voltages and currents by a simple linear law. In multiple port networks, the two-terminal definition of impedance is inadequate, but the complex voltages at the ports and the currents flowing through them are still linearly related by the impedance matrix. Impedance is a complex number, with the same units as resistance, for which the SI unit is the ohm ( $\Omega$ ). Its symbol is usually  $Z$ , and it may be represented by writing its magnitude and phase in the form  $|Z| \angle \theta$ . However, cartesian complex number representation is often more powerful for circuit analysis purposes.
- 2.29 “C-WT”** Continuous wavelet transforms (continuous shift and scale parameters) In continuous wavelet transforms, a given signal of finite energy is projected on a continuous family of frequency bands. For instance, the signal may be represented on every frequency band of the form then, the original signal can be reconstructed by a suitable integration over all the resulting frequency components.
- 2.30 “CCITT”** defined public standards for compressing voice data in CCITT G.721 (ADPCM at 32 k bits/sec) and G.723 (ADPCM at 24 and 40 k bits/sec). ADPCM stands for Adaptive Differential Pulse Code Modulation and is a common method for compressing audio data. It takes advantage of the fact that you can generally predict the value of the next sound sample based on the previous sound sample. Most ADPCM implementations are a good compromise between fast processing, good compression rates, and good quality decoding.
- 2.31 “ $\mu$ S”** Symbol for the micro siemens, an SI unit of electrical conductance equal to  $10^{-6}$  siemens.

### **3. GENERAL REQUIREMENTS:**

## REQUEST FOR QUOTATION

CRFQ COR1800000010

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1 Contract Items and Mandatory Requirements:** Vendor shall provide Agency with the Contract Items listed below on an open-end and continuing basis. Contract Items must meet or exceed the mandatory requirements as shown below. Descriptive product literature shall be provided by the Vender and may be attached to the Request for Quotation. *Attached.*

**3.1.1 AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or equal**

**3.1.1.1** Test Set shall have an AM/FM/P25 Monitor

**3.1.1.2** Must have a AM/FM/P25 Generator

**3.1.1.3** Shall have a Duplex Generator

**3.1.1.4** Shall have a Signal Strength Mete

**3.1.1.5** Test Set Shall have an RF Power Meter

**3.1.1.6** Must have a minimum two spectrum analyzers available

**3.1.1.7** Shall have a Tracking Generator

**3.1.1.8** Test Set shall be capable of preforming RF cable fault location

**3.1.1.9** Test Set shall have a Frequency Counter

**3.1.1.10** Test set shall have a Frequency Error Meter

**3.1.1.11** Must have an AM modulation Meter

**3.1.1.12** Must have an FM modulation Meter

**3.1.1.13** Shall have an SINAD Meter

**3.1.1.14** Test set shall have a Distortion meter

**3.1.1.15** Must have an Audio Synthesizer

**3.1.1.16** Test set shall have an Oscilloscope

**REQUEST FOR QUOTATION**  
**CRFQ COR180000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.1.17** Test set shall have a Digital voltmeter which includes an AC/DC Ammeter

**3.1.1.18** Test set must be capable of performing Auto Test and Auto tune on each of the following radio models:  
A. Kenwood NXDN  
B. Kenwood 5X20 P25  
C. Motorola APX

**3.1.2 Time Base**

**3.1.2.1** Must have at a minimum temperature stability of  $\pm 0.15$  ppm of  $-20^{\circ}\text{C}$  to  $70^{\circ}\text{C}$

**3.1.2.2** Aging must be a minimum of 0.5 ppm for First Year and a minimum of 0.3 ppm after

**3.1.3 External 10 MHz Reference Input**

**3.1.3.1** Must have a minimum External Input Frequency Range of 10 MHz  $\pm 150\text{Hz}$

**3.1.3.2** External Input Level must be a minimum -10 dBm to +10 dBm

**3.1.3.3** Must of a Max Input: +15 dBm

**3.1.4 Frequency Flex (Externally Referenced Time base Calibration)**

**3.1.4.1** Input Frequency Range must be a minimum of 2MHz to 1000 MHz

**3.1.4.2** Reference Input Port must have a minimum T / R of -20 dBm and the Antenna must be a minimum of -40 dBm

**3.1.4.3** Frequency Flex Accuracy must be a minimum of 0.5 Hz from external source applied + Stability + Aging.  
For Example: 10 MHz External Input, after Frequency Flex =  $\pm 0.05$  Hz to external input.

**3.1.4.4** Must have a minimum 10 MHz  $\pm 0.5\text{Hz} = 0.05$  ppm + Stability + Aging

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.5 RF Generator**

**3.1.5.1** Port Input Protection must have at a minimum: Gen Port: +20 dBm (Input Port Alarm Typical), T/R Port: +52 dBm CW (Input Power Alarm Typical), T/R Port: >+90°C (Temperature Alarm Typical)

**3.1.6 Frequency**

**3.1.6.1** Must have a minimum usable range of 2 MHz to 1000MHz

**3.1.6.2** Accuracy must be the same as Time Base

**3.1.6.3** Resolution must be a minimum of 1Hz

**3.1.7 Output Level**

**3.1.7.1** Must have a minimum T/R Port: -50 to -125 dBm

**3.1.7.2** Ant Port shall be a minimum of -30 to -90 dBm

**3.1.7.3** Gen Port shall be a minimum of -5 to -65 dBm

**3.1.8 Accuracy**

**3.1.8.1** Accuracy must have at a minimum:  $\pm 2$  dB;  $\pm 1.5$  dB (typical),  $\pm 3$  dB (-100 dBm),  $\pm 3$  dB (-110 dBm Hold ATTN: mode) with the minimum Resolution of 0.1 dB, 0.1 dB (0 to -6 dBm); HOLD ATTN: ON

**3.1.9 Port VSWR**

**3.1.9.1** Must have an ANT Port with minimum 1.5:1 Typical

**3.1.9.2** Gen Port must be a minimum of 1.5:1 Typical

**3.1.9.3** T/R Port must be a minimum of 1.2:1

**3.1.10 SSB Phase Noise**

**3.1.10.1** SSB Phase Noise shall be a minimum of -90dBc / Hz at 20 kHz at 20 kHz offset with a

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

minimum of -95 dBc / Hz at 1 GHz at 20 kHz  
Offset, Typical

**3.1.11 Spurious**

**3.1.11.1** Must have minimum Harmonics of -30 dBc, -42dBc  
Typical

**3.1.11.2** Non-Harmonics must be a minimum -40 dBc, -50  
dBc Typical ( $\pm 20$  kHz offset from carrier; 0 to 1  
GHz)

**3.1.12 Residual FM**

**3.1.12.1** Must have a minimum 20 Hz rms in 300 Hz to 3  
kHz Band Width

**3.1.12.2** Must have a minimum 4 Hz rms, Typical and  
maximum 100 MHz

**3.1.12.3** Must have a minimum 6 Hz rms, Typical and  
maximum 800 MHz

**3.1.12.4** Must have a minimum 11 Hz rms, Typical and  
maximum 800 MHz

**3.1.13 Residual AM**

**3.1.13.1** Must have a minimum 0.5% rms in 300 Hz to 3 kHz  
Band Width

**3.1.14 RF Generator Modulation**

**3.1.14.1** RF Generator Modulation must have the following:

- A. Analog Modulation: None, FM, and AM
- B. Digital Modulation: P25, (C4FM, H-CPM, H-DQPSK), DMR, dPMR, ARIB, T98, NXDN, PTC
- C. DTMF Modulation: None, FM, AM
- D. DCS Modulation: None, FM, AM
- E. Two-Tone Sequential Modulation: None, FM, AM
- F. Tone Remote Modulation: None, FM, AM
- G. Tone Sequential: None, FM, AM

## REQUEST FOR QUOTATION

CRFQ COR180000010

AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal

---

### 3.1.15 FM Modulation – Internal (Gen 1, Gen 2) Modulation Frequency Range

#### 3.1.15.1 FM Modulation must have the following at a minimum:

- A. Range: 0 Hz to 20 kHz
- B. Resolution: 0.1 Hz
- C. Accuracy: Time Base  $\pm 2$  Hz
- D. FM Deviation Range: OFF, 0 Hz to 100 kHz (Gen 1 and Gen 2 Selectable)
- E. Total Harmonic Distortion: 3% (1000 Hz rate, minimum 2 Hz Deviation, 300 Hz – 3 kHz Band Pass filter)
- F. Accuracy:  $\pm 5\%$  at 1 kHz rate; 2 kHz to 50 kHz deviation ( $\pm 1\%$  Typical),  $\pm 10\%$  at 150 Hz to 3 kHz rate; 2 kHz to 50 kHz deviation

### 3.1.16 FM Modulation – External (Mic, Audio In)

#### 3.1.16.1 Microphone In

##### 3.1.16.1.1 Must have Alternate Mic Configurations Mic Connector Pins with the following at a minimum:

- A. Range 1: 2-15 mV<sub>rmw</sub> (8 mV<sub>rmw</sub> Typical)  
Pin 2 – OPEN, Pin 6-GND
- B. Range 2: 35-350 mV<sub>rms</sub> (20 mV<sub>rms</sub> Typical) Pin 2- GND, Pin 6-Open (Range 2 enables a nominal 3 Vdc Bias Voltage)
- C. Range 3: 2-32 mV<sub>rms</sub> (20 mV<sub>rms</sub> Typical)  
Pin 2 OPEN, Pin 6-Open
- D. Mic Frequency Range: 300 Hz to 3kHz
- E. Mic Level: OFF, 0 Hz to 80 kHz
- F. Mic Modulation Accuracy:  $\pm 20\%$  (300 Hz to 1.2 kHz),  $\pm 30\%$  (minimum 1.2 kHz)
- G. Mic Slope: Positive voltage yields Positive Deviation

### 3.1.17 Audio In

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.17.1 Audio In must have the following minimum functionality:**

- A. Audio In, Input Range: 30 V, 3 V
- B. Audio In, Switchable Loads: 3 V Range; 150 ohms, 600 ohms, 1K ohms, High Z, 30 V Range; High Z
- C. Audio In, Input Levels: 3V Range; 0.05 to 3.2 Vrms, 30V Range; 3 Vrms - 30 Vrms
- D. Audio In, FM Frequency Range; 300 Hz to 5 kHz
- E. Audio In, FM Input Level Sensitivity: 3V Range; 1 kHz / 35 mVrms Typical, 30 V Range; 1 kHz / 350 mVrms Typical
- F. Audio In, FM Input Level Slope; Positive voltage yields Positive Deviation

**3.1.18 AM Modulation – Internal (Gen 1, Gen 2) Modulation Frequency Range**

**3.1.18.1 Am Modulation Internal (Gen 1, Gen 2) Modulation Frequency Range must have the following minimum functionality:**

- A. Minimum Range of 0 Hz to 20 kHz
- B. Minimum Resolution 0.1 Hz
- C. Minimum Accuracy; Time base  $\pm 2$ Hz
- D. Range; OFF, 0 to 100% (GEN 1 and GEN 2 Selectable)
- E. Minimum Resolution of 0.1%
- F. Minimum Total Harmonics Distortion; 3% (20% to 90% mod, 1000 Hz rate, 300 Hz to 3kHz Band Pass Filter)
- G. Minimum Modulation Accuracy; 10% setting, 150 Hz to 5kHz rate 10% to 90% modulation

**3.1.19 AM Modulation – External (MIC, AUDIO IN)**

**3.1.19.1 Microphone In must have the following minimum functionality:**

- A. Alternate MIC Configurations, MIC Connector Pins

## REQUEST FOR QUOTATION

CRFQ COR1800000010

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- B. Minimum Range 1; 2 – 15 mVrms (8 mVrms Typical), Pin 2 – OPEN, Pin 6 – GND
- C. Minimum Range 2; 35 – 350 mVrms (100 mVrms Typical), Pin – GND, Pin 6 – OPEN (Range 2 enables a nominal 3 Vdc Bias Voltage)
- D. Minimum Range 3; 2 – 32 mVrms (20 mVrms Typical), Pin 2 – OPEN, Pin 6 – GND
- E. Minimum Mic Frequency Range; 300 Hz to 3kHz
- F. Minimum MIC Modulation; 0% to 80%
- G. Minimum MIC Modulation Accuracy;  $\pm 20\%$  (300 Hz to 1.2 kHz),  $\pm 30\%$  (minimum of 1.2 kHz)

### 3.1.19.2 Audio In must have the following minimum functionality

- A. Audio In, minimum Input; Range 30 V, 3 V
- B. Audio In, Switchable Loads minimum 3 V Range; 150 ohms, 600 ohms, 1 K ohms, High Z, 30 V Range; High Z
- C. Audio In, minimum Input Levels: 3 V Range 0.05 to 3.2 Vrms, 30 V Range 3 Vrms – 30 Vrms
- D. Audio IN, AM Frequency Range minimum 300 Hz to 5 kHz
- E. Audio In, minimum Level Sensitivity: 3 V Range: 1% / 35 mVrms Typical (High Z Load) 30 V Range: 1% / 350 Vrms Typical (High Z Load)

### 3.1.20 Audio Frequency Gen 1 and Audio Gen 2

- 3.1.20.1 Frequency must have the following a minimum range of 0.0 Hz to 20.0 kHz
- 3.1.20.2 Must have a resolution of a minimum 0.1 kHz
- 3.1.20.3 Must have a minimum Accuracy: Time base  $\pm 2$  Hz



**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.21 Output Level**

- 3.1.21.1** Must have Audio Out Port Impedance with a minimum of 1 ohm
- 3.1.21.2** Must have an Audio Level Out with a minimum of 0 Vrms to 1.57 Vrms
- 3.1.21.3** Shall have a minimum resolution of 0.001 Vrms
- 3.1.21.4** Must have a minimum Accuracy  $\pm 10\%$ ; 100 mVrms, 30 Hz to 3 kHz
- 3.1.21.5** Must have a minimum Distortion of 3% (1 kHz rate, sine 300 Hz to 3kHz)

**3.1.22 RF Receiver**

- 3.1.22.1** RF Receiver must have port input protection with the following minimum functionality:
  - A.** Minimum Ant Port of +20 dBm (Input Power Alarm Typical)
  - B.** Minimum T/R Port of + 52 dBm CW
  - C.** Minimum T/R Port of +90°C (Temperature Alarm Typical)
- 3.1.22.2** RF Receiver Range must be a minimum of 2 MHz to 1000 MHz and a minimum of 2 MHz to 100 kHz Useable Range
- 3.1.22.3** Accuracy shall be same as time base
- 3.1.22.4** Resolution shall be a minimum of 1Hz

**3.1.23 Input Amplitude**

- 3.1.23.1** Sensitivity must have the following minimum functionality:
  - A.** ANT: -80 dBm, typical 10 dB SINAD (-110 dBm with preamp)
  - B.** T/R -40 dBm, typical, 10 dB SINAD

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.23.2** Minimum Level Receiver Measurements must have the following minimum functionality:

- A. ANT: -80 dBm Preamp off, -80 dBm Preamp on RF Error Meter
- B. T/R -20 dBm Preamp off, -40 dBm Preamp ON RF Error Meter

**3.1.24 DEMOD Meters**

**3.1.24.1** Must have ANT Distortion, SINAD, Modulation, AF Counter

**3.1.24.2** Shall have T/R: Modulation, Distortion, SINAD, AF Counter

**3.1.24.3** Must have Maximum Input Level Receiver Measurements ANT: +10 dBm (Auto, Preamp off) T/R: +47 dBm CW, FM +41 dBm AM

**3.1.25 Receiver Demodulation Types**

**3.1.25.1** Must have the following demodulation types:  
AM, FM, DMR, dPMR, ARIB, T98, NXDN, P25 (C4FM, H-CPM, H-DQPSK), PTC

**3.1.26 AM Modulation – External (MIC, Audio IN)**

**3.1.26.1** Must have the following IF Bandwidth for FM: 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300 kHz

**3.1.26.2** Must have the following AM functionality 5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz

**3.1.26.3** Audio Filters Band width must have the following:

- A. FM: C-WT Band Pass, CCITT BP, None, 15 kHz LP, 300 Hz LP, 300 Hz HP, 5 kHz LP, 300 Hz to 5kHz BP, 300 Hz to 3 kHz BP, 300 Hz to 20 kHz BP, 3kHz LP

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**B. AM: C-WT BP, CCITT BP, None, 15 kHz LP, 300 Hz LP, 300 Hz HP, 5 kHz LP, 300 Hz to 5kHz BP, 300 Hz to 3 kHz BP, 300 Hz to 20 kHz BP, 3kHz LP**

**3.1.26.4 Audio Output, Level Sensitivity must have the following at a minimum:**

- A. FM: 3Vrms / kHz Dev / IF Band Width (kHz,  $\pm 15\%$ )**
- B. AM: 7mVrms / % AM,  $\pm 15\%$**
- C. LO Emissions must be a minimum - 50dBc**

**3.1.27 RF Frequency Error Meter**

**3.1.27.1 Units must be Hz, PPM**

**3.1.27.2 Range must be a minimum of  $\pm 200$  kHz,  $\pm 1000$  PPM**

**3.1.27.3 Resolution must be a minimum of 1Hz**

**3.1.27.4 Accuracy Time Base must be a minimum of  $\pm 1$  Hz**

**3.1.28 RSSI (Receive Signal Strength Indicator) RF Power Within Receiver IF Bandwidth**

**3.1.28.1 Units must be dBm, Watts, Microwatts**

**3.1.28.2 Range must be a minimum -120 dBm to +60 dBm**

**3.1.28.3 RF Level Range must have the following at a minimum:**

**A. T/R Port; (preamp OFF) with minimum - 50 dBm to +47 dBm**

**B. ANT Port; (preamp OFF) with minimum -90 dBm to +10 dBm**

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

C. ANT Port (preamp ON) with minimum -  
110 dBm to -10 dBm

**3.1.28.4** Resolution must be a minimum 0.01 dBm

**3.1.28.5** Accuracy must be a minimum  $\pm 3$  dB; (1.5 Typical)  
Normalized

**3.1.28.6** Ext Attenuation must be a minimum -50 to +50 dB,  
0.01 dB resolution

**3.1.29 RF Power Meter (Broadband RF Power Into T/R Port)**

**3.1.29.1** Maximum Input Level must be a minimum of 50  
Watts continuous, +25°C,  $\pm 10^\circ\text{C}$  and 125 Watts  
Cyclical (Max "ON" of 30 sec and Min "OFF" for  
90 sec) for power levels less than 50 Watts

**3.1.29.2** Alarms must be a minimum of +49 dBm (Input RF  
Power Alarm) in greater than +90°C (Temperature  
Alarm)

**3.1.29.3** Meter Range must be a minimum of +20 to +53  
dBm

**3.1.29.4** Meter Floor must be a minimum 0.10 W / +20 dBm

**3.1.29.5** Averaging Range must be 1 to 99

**3.1.29.6** Display Units must have Watts, dBm

**3.1.29.7** Must have a minimum accuracy of 10% of reading,  
(6% Typical)

**3.1.29.8** Ext Attenuation must be a minimum -50 to +50 dB,  
0.01 dB resolution

**3.1.30 FM Deviation Meter**

**3.1.30.1** Must have a minimum range of 00 Hz to  $\pm 100$  kHz

**3.1.30.2** Meter Type must be Peak+, Peak-, (Peak to Peak)/2,  
RMS

**3.1.30.3** Resolution must be a minimum of 0.1 Hz

## REQUEST FOR QUOTATION

CRFQ COR1800000010

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.30.4** Must have accuracy of a minimum of  $\pm 10\%$  of reading, 500 Hz to 100 kHz Deviation  $\pm 5\%$  of reading, 1kHz to 10 kHz Deviation (150 Hz to 1kHz rate)  $\pm 3\%$  of reading, 1 kHz to 10kHz Deviation (1 kHz to 1.5 kHz rate)

### **3.1.31 AM Percent Meter**

**3.1.31.1** Must have a minimum range of 5% to 100%

**3.1.31.2** Must have the following modes at a minimum:  
Peak+, Peak-, (Peak to peak)/2, RMS

**3.1.31.3** Resolution must be a minimum 0.001%

**3.1.31.4** Must have a minimum accuracy of  $\pm 5\%$  of reading, 1kHz rate 30% to 90% Modulation, 3kHz LPF

### **3.1.32 SINAD Meter**

**3.1.32.1** Measurement Sources must contain Audio In, Demodulation with the following functionality at a minimum:

A. FM must be a minimum 2kHz Deviation (IF BW set Appropriately for received Modulation BW)

B. AM must be a minimum 25% Modulation (IF BW Set Appropriately for received Modulation BW)

**3.1.32.2** Audio In, Port must have a minimum frequency range of 300 Hz to 10 kHz

**3.1.32.3** Input Level must have the following functionality at a minimum:

A. 3 V (Audio Config setup): 0.9 Vp-p to 9 Vp-p

B. 30V (Audio Config Setup); 9Vp-p to 90Vp-p

**REQUEST FOR QUOTATION  
CRFQ COR1800000010**

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- C. Audio Frequency Notch with a minimum of 1kHz
- D. Minimum reading range of 0dB to 60Db
- E. Minimum resolution of 0.001
- F. Accuracy of  $\pm 1.5$  dB reading must be a minimum of 8db with a maximum of 40 dB

**3.1.33 Distortion Meter**

**3.1.33.1** Measurement sources must contain Audio Demodulation DEMOD with the following functionality at a minimum:

- A. FM with a minimum 2kHz Deviation (IF BW Set Appropriately for received Modulation BW)
- B. AM must have a minimum 25% Modulation (IF BW set appropriately for received Modulation BW)

**3.1.33.2** Must have an Audio Port In with a minimum frequency range 300 Hz to 10 kHz

**3.1.33.3** Must have a minimum Input Level of 3V (Audio Config setup) and 0.9 Vp-p to 9 Vp-p with 30V (Audio Config Setup) 9 Vp-p to 90 Vp-p

**3.1.33.4** Must have a minimum audio frequency notch of 1 kHz with a minimum reading range of 0% to 100%

**3.1.33.5** Must have a minimum resolution of 0.001% and minimum accuracy of  $\pm 10\%$  of reading  $+0.1\%$  Distortion, and greater than 1% to less than 20%

**3.1.34 Audio Frequency Counter**

**3.1.34.1** Measurement Sources must have the following:

- A. Audio In, Demodulation

**REQUEST FOR QUOTATION  
CRFQ COR1800000010**

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- B. DEMOD with a minimum FM: 15 Hz to 20 kHz rate (IF BW set appropriately for received modulation BW) and minimum AM: 100 Hz to 10kHz rate (IF BW set appropriately for received modulation BW)**

**3.1.34.2 Audio In, Port must have the following at a minimum:**

- A. Frequency Range with a minimum 300 Hz to 20 kHz**
- B. Input Level with a minimum 3 V (Audio Config Setup): 28 mVp-p to 9 Vp-p and minimum of 30 V (Audio Config Setup): 280 mVp-p to 90 Vp-p**
- C. Must have a minimum Frequency Range of 15 Hz to 20 kHz**
- D. Must have a minimum Resolution of 0.1 Hz**
- E. Must have a minimum Accuracy of  $\pm 1$  Hz**

**3.1.35 Audio Frequency Level Meter**

**3.1.35.1 Measurement Sources Audio In, Scope must have the following minimum functionality:**

- A. Input Range with Audio In, Range of a minimum of 3V, 30 V with a minimum Scope Range of 2VDC, 40 VDC**
- B. Must have a minimum Frequency Range of 200 Hz to and must be less than 5 kHz**
- C. Must have load selection**
- D. Must have scope with High Z**

**REQUEST FOR QUOTATION  
CRFQ COR1800000010**

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

E. Must have Audio In with a minimum 3 V  
Input Range: High Z, 150 ohms, 600 ohms,  
and 1 K ohms

F. Must have a 30 V Input Range with a  
minimum 10 K

**3.1.35.2** Input Level must have the following at a minimum:

A. Audio In, Port with a minimum 3 V Range:  
10 mV rms to 3.2 V rms 30 V Range: 1 V  
rms to 30 V rms

B. Must have a Scope Port with a minimum  
2.0 VDC Range: 10 mV rms to 1 V rms  
and 40 VDC Range: 1 V rms to 28.28 V  
rms

C. Must have display unit resolution minimum  
Volts of 0.001 V, mV: 0.001 mV, dBuV  
with a minimum of 0.001 dBuV, dBm with  
a minimum of 0.001 dBm and a minimum  
of 0.001 Watts

D. Must have a minimum Accuracy of  $\pm 5\%$   
AUDIO IN Port

**3.1.36 P25 Measurements**

**3.1.36.1** Must have Modulation Fidelity with a minimum  
range of 0 to 10%, minimum Resolution of 0.1%,  
and Accuracy with a minimum of 5.0% of  
reading (2.5 to 10%)

**3.1.36.2** Must have Symbol Deviation with a minimum range  
of 1620 to 1980 Hz, a minimum Resolution of 0.1 Hz,  
and a minimum accuracy of  $\pm 10$  Hz (1620 to 1980  
Hz)

**3.1.36.3** Must have Symbol Clock Error with a minimum  
range of  $\pm 12$  ppm, a minimum resolution of 0.01  
ppm, and a minimum Accuracy of 1 ppm  
( $\pm 0.0048$  Hz)



**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.37 DMR Measurements**

**3.1.37.1** Must have FKS Error with a minimum range of 0 to 10%, minimum resolution of 0.1%, and Accuracy less than 5.0% of reading (2.5 to 10%)

**3.1.37.2** Must have Symbol Deviation with a minimum range of 1745 to 2140 Hz, minimum resolution of 0.1 Hz, and a minimum accuracy of  $\pm 10$  Hz

**3.1.38 Oscilloscope**

**3.1.38.1** Must have Scope with Audio IN, Demodulation that includes a minimum band width of 5 kHz

**3.1.38.2** Must have Input Impedance

**3.1.38.3** Must have Scope Input with a minimum 2.0 V Range and 53 K ohms and 40 V Range: 1M ohms

**3.1.38.4** Audio I/O Input must have a minimum 3 V Range with 150 ohms, 600 ohms, 1k ohm, High Z and a minimum 30 V Range with 10 k ohms

**3.1.38.5** Must have coupling scope with the following:

A. AC, DC, and GND

B. Audio In with AC only

C. FM Internal Demodulation with DC

D. AM Internal Demodulation with AC

**3.1.38.6** Vertical Range must have the following at a minimum:

A. Scope, Audio In with 10mV to 10V-div in a 1, 2, 5 sequence

B. FM internal Demodulation with 0.1 kHz to 50 kHz / div in a 1, 2, 5 sequence

**REQUEST FOR QUOTATION  
CRFQ COR1800000010**

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- C. AM Internal Demodulation with 5, 10, 20, 50% / div
- D. Vertical Accuracy with a minimum 10% of full Scale (DC to 5 kHz)
- E. Horizontal Sweep with a minimum 0.5 ms / div to 0.1 sec / div
- F. Horizontal Accuracy with a minimum 3% of Full Scale
- G. Trigger Type with Internal (Auto, Normal)
- H. Trigger Level with Variable on Vertical Scale
- I. Two markers display vertical measurement (Voltage, kHz, % modulation), must display delta in tune between markers

**3.1.39 Channel Analyzer**

- 3.1.39.1 Must have a minimum range of 2 MHz to 1 GHz
- 3.1.39.2 Must have a minimum span of 10 kHz to 5 MHz (1,2,5 steps)
- 3.1.39.3 Windows must be Hanning, Flat Top, Rectangle
- 3.1.39.4 Vertical Scale shall be a minimum of 2, 5, 10, 15, 20 dB/div
- 3.1.39.5 Marker Bandwidth shall be a minimum of 1 kHz to 5 MHz (1, 2, 5 steps)
- 3.1.39.6 Marker Offset shall be a minimum  $\pm 1$  kHz to  $\pm \frac{1}{2}$  Span (1, 2, 5 steps)
- 3.1.39.7 Shall have a minimum Power Band Width (PdB) Accuracy  $\pm 3$  dB typical (30 dB signal to noise)

**REQUEST FOR QUOTATION**  
**CRFQ COR180000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.39.8** Noise Floor shall be a minimum -123 dBm (preamp OFF) and a minimum -140 dBm (preamp on) (Span 100kHz), Typical

**3.1.40 Digital Multimeter (DMM)**

**3.1.40.1** Must have AC/DC Voltmeter with a minimum Range of 200 mV, 2 V, 20 V, 200 V, 2000V, Auto (150 VAC RMS to VDC MAX input, Category II)

**3.1.40.2** Resolution must be a minimum of 3.5 digits (2000 Counts)

**3.1.40.3** Must have a minimum accuracy of DC  $\pm 1\%$  FS  $\pm 1$  count and AC:  $\pm 5\%$  FS  $\pm 1$  count  $+25\text{mV}$

**3.1.40.4** AC/DC Ammeter must have a minimum range of 200mA, 2 A, 20A, Auto

**3.1.40.5** Maximum Open Circuit Input Voltage shall have a minimum 30 V RMS referenced to Common or EARTH GROUND, Category I

**3.1.40.6** Resolution must be a minimum of 3.5 digits (2000 counts) with a minimum accuracy of DC;  $\pm 5\%$  FS  $\pm 1$  Count, AC;  $\pm 5\%$  FS  $\pm 1$  count

**3.1.40.7** AC Volts Frequency Range must be a minimum of 50 Hz to 10 kHz

**3.1.41 Ohmmeter**

**3.1.41.1** Must have a minimum range of 200 ohms, 2 ohms, 20 k ohms, 200 k ohms, 2M ohms, 20 M ohms, Auto

**3.1.41.2** Resolution must be a minimum of 3.5 digits (2000 Counts)

**3.1.41.3** Must have a minimum accuracy of  $\pm 5\%$  FS  $\pm 1$  count

**3.1.42 IN-Line Power Meter**

**3.1.42.1** Must be RF Measurement Type

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.42.2** Shall have Average Power, Peak, Burst, Crest, CCDF

**3.1.42.3** Shall have a frequency range of a minimum of 25 MHz to 1GHz

**3.1.42.4** Shall have a minimum Power Range of 500 mW to 500 W Average

**3.1.42.5** Insertion VSWR shall be less than 1.05

**3.1.42.6** Insertion Loss shall be less than 0.05 dB

**3.1.42.7** Directivity shall be a minimum 29 dB up to 50 MHz, 30 dB from 51 to 1000 MHz

**3.1.42.8** Shall have average power with the following minimum functionality

A. Average Forward Power Range with a minimum of 500mV to 200 W average

B. Peak / Average Ratio, Max of 12 dB

C. Accuracy, Average Forward Power with a minimum of  $\pm 4\%$  of reading + 166 mW  
Maximum accuracy performance at 25°C ( $\pm 10^\circ\text{C}$ )

D. Return Loss of a minimum 0 to 23dB

E. VSWR minimum of 1.15 to 99.9

**3.1.42.9** Burst Average Power must have the minimum functionality:

A. Burst Average Power Range with a minimum of 13.5 to 500 W Average

B. Burst Width of a minimum of 1 $\mu\text{s}$  to 5 ms

C. Repetitions Rate Min of 200 Hz

**REQUEST FOR QUOTATION  
CRFQ COR180000010**

**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**D. Duty Cycle (D)** with a minimum of 0.001 to 1.0 ( $D = \text{Burst Width} / \text{Period}$ )

**E. Accuracy, Burst Average Power** must be a minimum of  $\pm 6\%$  of reading  $+0.116 / D$  mW

**3.1.42.10 Peak Envelope Power** must have the following minimum functionality:

**A. Peak Envelope Power Range** must be a minimum of 13.3 to 1300 W

**B. Peak Envelope Power Accuracy** must have a Burst width greater than 200  $\mu\text{s}$ :  $\pm 7\%$  of reading, +0.70 W, 1  $\mu\text{s}$  burst width less than 200  $\mu\text{s}$ :  $\pm 10\%$  of reading, +1.40W

**C. 0.5  $\mu\text{s}$  burst width less than 1  $\mu\text{s}$**  with  $\pm 15\%$  of reading, +1.40W

**D. Burst width less than 0.5  $\mu\text{s}$** :  $\pm 20\%$  of reading, +1.40 W

**3.1.42.11** Must have Crest Factor with a minimum Measurement Range of 500 mW to 300 W, 13.3 W Minimum Peak and accuracy with Liner Sum of Peak and Average Power Accuracies

**3.1.42.12** Must have Complementary Cumulative Distribution Function (CCDF) with a minimum Measurement Range of 0.1 to 100%, minimum Threshold Measurement of 13.5 to 500 W, minimum Measurement Uncertainty of  $\pm 0.2\%$ . Must have Level set Accuracy of As Peak Envelope, Power Accuracy  $+2.0\%$

**3.1.43 Speaker Output**

**3.1.43.1** Must have Speaker with ON or OFF

**3.1.43.2** Output must be a minimum of 75 dBa Min at 0.5 m, 600 to 1800 Hz, max volume

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.43.3** Must have speaker disconnects when headphones are installed

**3.1.44 Volume Control**

**3.1.44.1** Must have level range with a minimum scale of 0 to 100

**3.1.45 Input / Output Connections**

**3.1.45.1** Input/Output Connections must have the following at a minimum:

- A. T / R Connector Type: N-Type Female
- B. Antenna Connector Type: N-Type Female
- C. Generator Connector Type: N-Type Female
- D. Scope Connector Type: BNC Female
- E. Audio In, Connector Type: BNC Female
- F. Audio Out, Connector Type: BNC Female
- G. Headphone Jack with 3.5 mm Jack
- H. USB Connectors (Qty 3) Type with USB type A
- I. External 10 MHz Reference Input with BNC Female
- J. Ethernet Connector type RJ45
- K. DC Power in Connector: 2 position 2.5 mm Jack
- L. GND Connector: Banana
- M. DMM (Qty 3) Banana
- N. IN (In-line power meter): N-type Female
- O. Out (In-line power meter): N-Type Female

**3.1.46 Front Panel Indicators**

**3.1.46.1** Must have System Indicator with the following functions:

- A. Power on / Awake mode
- B. Sleep Mode
- C. Shutting down
- D. When battery temperature when greater than 60°C
- E. When battery life when less than 5%

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

F. When battery is at full charge and when charging

**3.1.47 Microphone Connector**

**3.1.47.1** Must have six pin microphone connectors with the following as a minimum:

- A. Pin number 1, Ground
- B. Pin Number 2, Speaker+, Output, 75 dBm min at 0.5 m, 600 to 1800 Hz, Max Volume
- C. Pin number 3, PTT, Input, GND, open (with internal pullup)
- D. Pin number 4, Mic / Audio, Input, 0 to 30mVrms, Voiced tone (Whistle) 300 Hz to 3 kHz
- E. Pin Number 5 Mic select 1, Ground, Open with pullup
- F. GND = 3 V DC Bias (Active Mic) and Mic audio gain of 2 open = 0 V DC bias and Mic Audio Gain 3
- G. Pin number 6 Mic Select 2, Ground, open with pullup

**3.1.48 Environmental / Physical**

**3.1.48.1** Overall Dimensions shall not exceed 14 inches Wide, a maximum of 12 inches Long, and maximum 6 inches Deep

**3.1.48.2** Test Set Weight shall not exceed 20 pounds

**3.1.48.3** Test Set shall meet or exceed MIL-PRF- 28800F, Class 3, EN61326-1 Class A, EN61000-3-2, EN61000-3-3, UL 61015-1, EN61010-1

**3.1.49 AC Input Power (AC to DC Converter / Charger Unit)**

**3.1.49.1** AC Input Voltage Range shall be a minimum of 100 to 250 VAC, 3 A max, 63 HZ

**3.1.49.2** AC Input Voltage Fluctuation shall be less than 10% of the normal input voltage

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

**3.1.50 DC Input Power**

**3.1.50.1** Must have a minimum voltage range of 11 to 24 VDC

**3.1.50.2** Maximum Power shall be 55 W, 65 W Charging battery

**3.1.50.3** Typical Power shall be a minimum of 30 W

**3.1.50.4** Shall have Fused 5 A, 32 VDC, Type F

**3.1.51 Battery**

**3.1.51.1** Battery Type shall be Lithium Ion (Li Ion) battery pack

**3.1.51.2** Battery Operation Time shall be 100% Back light with a minimum of 2 ½ hours Typical

**3.1.51.3** Minimum Backlight (Still Viewable) of 3 hours Typical

**3.1.51.4** Battery Charge Time of a minimum of 4 hours Unit power OFF Typical and a minimum 4 hours Unit power ON Typical

**3.1.52 AeroFlex 8800SX or Equal Options and Accessories**

**3.1.52.1** Standard Accessories shall include at a minimum:

- A. Fuse, 5A, 32 V, Mini Blade
- B. AC Power Cord – USA
- C. Adapter, N(male) to BNC(female), Qty 3
- D. Internal Battery
- E. Power Supply
- F. Front Cover

**3.1.52.2** Options shall include at a minimum:

- A. 113334 8800OPT01 DMR
- B. 113335 8800OPT02 dPMR
- C. 113336 8800OPT03 NXDN
- D. 113337 8800OPT04 P25
- E. 138895 8800OPT05P25 Phase II
- F. 140215 8800OPT06DMR Repeater Test
- G. 113338 8800OPT09 ARIB T98



**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- E.** 113339 8800OPT10 Tracking Generator
- F.** 113340 8800OPT1 Occupied Bandwidth
- G.** 113309 8800OPT12 Internal Precision Power Meter (Meter + Sensor)
- H.** 113342 8800OPT13 External Precision Thu-line Meter (for use with Bird WPS Sensor)
- I.** 113343 8800OPT14 PTC
- J.** 113344 8800OPT15 AAR Channel Plan
- K.** 139836 8800OPT20 R&S NRT-Z Power Sensor Support
- L.** 139837 8800OPT21 Selectable Notch Filters
- M.** 139838 8800OPT22 SNR Meter
- N.** 138525 8800OPT101 Kenwood NXDN Auto Test
- O.** 138526 8800OPT102 Kenwood 5X20 P25 Series Auto Test
- P.** 138527 8800OPT103 Motorola APX Auto test
- Q.** 138528 8800OPT104 Motorola MOTOTRBO Auto Test
- R.** 139315 8800OPT105 Motorola ASTRO 25 XTS / XTL Auto Test
- S.** 138313 Calibration Certificate – 8800 Series
- T.** 82560 AC27003 Attenuator -20 dB / 150 W
- U.** 67076 Spare Internal Battery
- V.** 114479 External Battery Charger
- W.** 114477 Hard Transit Case
- X.** 114478 Soft Carrying Case
- Y.** 114475 Antenna Kit
- Z.** 114348 Precision DTF / VSWR Accessory Kit for 8800
- AA.** 63927 AC25081 Site Survey Software
- BB.** 927935017D Bird Power Sensor
- CC.** 114312 Mounting Bracket
- DD.** 112861 Microphone
- EE.** 62404 DC Cord / Cigarette Adapter
- FF.** 63936 AC24009 DMM Test Leads
- GG.** 112277 10 AMP Current Shunt, 0.01 Ohm

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

HH. 67411 Scope Probe Kit

**3.1.53 Extended Warranties**

**3.1.53.1** Extended Standard Warranty must be a minimum of 60 Months with Scheduled Calibration.

**4. CONTRACT AWARD:**

- 4.1 Contract Award:** The Contract is intended to provide Agencies with a purchase price on all Contract Items. The Contract shall be awarded to the Vendor that provides the Contract Items meeting the required specifications for the lowest overall total cost as shown on the Pricing Pages.
- 4.2 Pricing Pages:** Vendor shall complete the Exhibit A Pricing Pages by inserting the requested information in the appropriate spaces and performing the calculations necessary to arrive at a total cost. Vendor should complete the Pricing Pages in their entirety as failure to do so may result in Vendor's bids being disqualified.

The Pricing Pages contain a list of the Contract Items and estimated purchase volume. The estimated purchase volume for each item represents the approximate volume of anticipated purchases only. No future use of the Contract or any individual item is guaranteed or implied.

Vendor should electronically enter the information into the Pricing Pages through wvOASIS, if available, or as an electronic document. In most cases, the Vendor can request an electronic copy of the Pricing Pages for bid purposes by sending an email request to the following address: Crystal.G.Rink@wv.gov

**PLEASE READ THIS SECTION IN ITS ENTIRETY:**

**IF VENDOR IS SUBMITTING AN ELECTRONIC BID:**

Vendor MUST complete the ATTACHED Pricing Page, Exhibit A. If bidding electronically, vendor is to put \$0.00 on the commodity line in WVOasis, complete the Excel pricing page, and upload into WVOasis as an attachment. Only pricing submitted via Exhibit A pricing page will be evaluated for award.

**5. ORDERING AND PAYMENT:**

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

- 5.1 Ordering:** Vendor shall accept orders through wvOASIS, regular mail, facsimile, e-mail, or any other written form of communication. Vendor may, but is not required to, accept on-line orders through a secure internet ordering portal/website. If Vendor has the ability to accept on-line orders, it should include in its response a brief description of how Agencies may utilize the on-line ordering system. Vendor shall ensure that its on-line ordering system is properly secured prior to processing Agency orders on-line.
- 5.2 Payment:** Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia.

**6. DELIVERY AND RETURN:**

- 6.1 Delivery Time:** Vendor shall deliver standard orders within two to four weeks after orders are received. Vendor shall deliver emergency orders within two to three working day(s) after orders are received. Vendor shall ship all orders in accordance with the above schedule and shall not hold orders until a minimum delivery quantity is met.
- 6.2 Late Delivery:** The Agency placing the order under this Contract must be notified in writing if orders will be delayed for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the delayed order, and/or obtaining the items ordered from a third party.

Any Agency seeking to obtain items from a third party under this provision must first obtain approval of the Purchasing Division.

- 6.3 Delivery Payment/Risk of Loss:** Standard order delivery shall be F.O.B. destination to the Agency's location. Vendor shall include the cost of standard order delivery charges in its bid pricing/discount and is not permitted to charge the Agency separately for such delivery. The Agency will pay delivery charges on all emergency orders provided that Vendor invoices those delivery costs as a separate charge with the original freight bill attached to the invoice.
- 6.4 Return of Unacceptable Items:** If the Agency deems the Contract Items to be unacceptable, the Contract Items shall be returned to Vendor at Vendor's expense and with no restocking charge. Vendor shall either make arrangements for the return within five (5) days of being notified that items are unacceptable, or permit the Agency to arrange for the return and reimburse Agency for delivery expenses. If the original packaging cannot be utilized for the return, Vendor will supply the Agency with appropriate return packaging upon request. All returns of unacceptable items shall be F.O.B. the Agency's location. The returned product shall either be replaced,

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.

- 6.5 Return Due to Agency Error:** Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.

**7. VENDOR DEFAULT:**

**7.1** The following shall be considered a vendor default under this Contract.

- 7.1.1** Failure to provide Contract Items in accordance with the requirements contained herein.
- 7.1.2** Failure to comply with other specifications and requirements contained herein.
- 7.1.3** Failure to comply with any laws, rules, and ordinances applicable to the Contract Services provided under this Contract.
- 7.1.4** Failure to remedy deficient performance upon request.

**7.2** The following remedies shall be available to Agency upon default.

- 7.2.1** Immediate cancellation of the Contract.
- 7.2.2** Immediate cancellation of one or more release orders issued under this Contract.

**REQUEST FOR QUOTATION**  
**CRFQ COR1800000010**  
**AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or Equal**

---

7.2.3 Any other remedies available in law or equity.

**8. MISCELLANEOUS:**

- 8.1 No Substitutions:** Vendor shall supply only Contract Items submitted in response to the Solicitation unless a contract modification is approved in accordance with the provisions contained in this Contract.
- 8.2 Vendor Supply:** Vendor must carry sufficient inventory of the Contract Items being offered to fulfill its obligations under this Contract. By signing its bid, Vendor certifies that it can supply the Contract Items contained in its bid response.
- 8.3 Reports:** Vendor shall provide quarterly reports and annual summaries to the Agency showing the Agency's items purchased, quantities of items purchased, and total dollar value of the items purchased. Vendor shall also provide reports, upon request, showing the items purchased during the term of this Contract, the quantity purchased for each of those items, and the total value of purchases for each of those items. Failure to supply such reports may be grounds for cancellation of this Contract.
- 8.4 Contract Manager:** During its performance of this Contract, Vendor must designate and maintain a primary contract manager responsible for overseeing Vendor's responsibilities under this Contract. The Contract manager must be available during normal business hours to address any customer service or other issues related to this Contract. Vendor should list its Contract manager and his or her contact information below.

**Contract Manager:** Summer Bailey  
**Telephone Number:** 304-553-7526  
**Fax Number:** 1-866-301-1761  
**Email Address:** summer.bailey@pomeroy.com

State of West Virginia  
**VENDOR PREFERENCE CERTIFICATE**

Certification and application is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Vendor Preference, if applicable.

1. **Application is made for 2.5% vendor preference for the reason checked:**  
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or,**  
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification;  
 Bidder is a resident vendor partnership, association, or corporation with at least eighty percent of ownership interest of bidder held by another entity that meets the applicable four year residency requirement; **or,**  
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or,**
2. **Application is made for 2.5% vendor preference for the reason checked:**  
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or,**
3. **Application is made for 2.5% vendor preference for the reason checked:**  
 Bidder is a nonresident vendor that employs a minimum of one hundred state residents, or a nonresident vendor which has an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia and employs a minimum of one hundred state residents, and for purposes of producing or distributing the commodities or completing the project which is the subject of the bidder's bid and continuously over the entire term of the project, on average at least seventy-five percent of the bidder's employees or the bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years and the vendor's bid; **or,**
4. **Application is made for 5% vendor preference for the reason checked:**  
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or,**
5. **Application is made for 3.5% vendor preference who is a veteran for the reason checked:**  
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or,**
6. **Application is made for 3.5% vendor preference who is a veteran for the reason checked:**  
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.
7. **Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with *West Virginia Code* §5A-3-59 and *West Virginia Code of State Rules*.**  
 Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) rescind the contract or purchase order; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

**Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.**

Bidder: Pomeroy

Signed: Summer Bailey

Date: 11-28-2017

Title: Technology Solutions Executive

\*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

STATE OF WEST VIRGINIA  
Purchasing Division

# PURCHASING AFFIDAVIT

**CONSTRUCTION CONTRACTS:** Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

**ALL OTHER CONTRACTS:** Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

**EXCEPTION:** The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

**DEFINITIONS:**

**"Debt"** means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

**"Employer default"** means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

**"Related party"** means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

**AFFIRMATION:** By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: Pomeroy IT Solutions Sales Co Inc

Authorized Signature: Summer Bailey Date: 11-28-2017

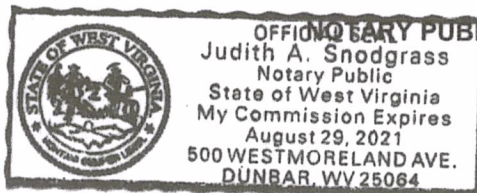
State of West Virginia

County of Kanawha, to-wit:

Taken, subscribed, and sworn to before me this 28<sup>th</sup> day of November, 2017.

My Commission expires Aug 29, \_\_\_\_\_, 2021.

AFFIX SEAL HERE



Judith A. Snodgrass  
Purchasing Affidavit (Revised 07/07/2017)

# West Virginia Ethics Commission



## Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of \$100,000 or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

*"Business entity"* means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation.

*"Interested party"* or *"Interested parties"* means:

- (1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
- (2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
- (3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

*"State agency"* means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of *W. Va. Code* § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

*This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: [ethics@wv.gov](mailto:ethics@wv.gov); website: [www.ethics.wv.gov](http://www.ethics.wv.gov).*



West Virginia Ethics Commission  
**Disclosure of Interested Parties to Contracts**

(Required by W. Va. Code § 6D-1-2)

Contracting Business Entity: Pomeroy IT Solutions Sales Address: 1020 Petersburg Road, Hebron KY 41048  
Company, Inc a DE Corporation Address: Principal Place of Business

Authorized Agent: Tom Froman, VP SLED Address: 1020 Petersburg Road, Hebron KY 41048

Contract Number: COR1800000010 Contract Description: Radio Tester

Governmental agency awarding contract: Department of Administration / Department of Corrections

Check here if this is a Supplemental Disclosure

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below (attach additional pages if necessary):

1. Subcontractors or other entities performing work or service under the Contract

Check here if none, otherwise list entity/individual names below.

2. Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)

Check here if none, otherwise list entity/individual names below.

3. Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)

Check here if none, otherwise list entity/individual names below.

Signature: [Signature] Date Signed: 11-28-2017

**Notary Verification**

State of West Virginia, County of Kanawha:

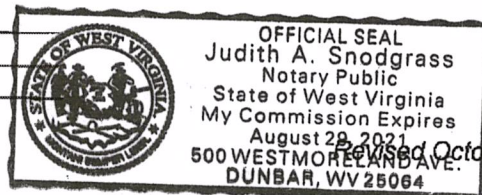
I, Judith A. Snodgrass, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 28<sup>th</sup> day of Nov, 2017.

Judith A. Snodgrass  
Notary Public's Signature

**To be completed by State Agency:**

Date Received by State Agency: \_\_\_\_\_  
Date submitted to Ethics Commission: \_\_\_\_\_  
Governmental agency submitting Disclosure: \_\_\_\_\_



Revised October 7, 2017

Exhibit A	CRFQ COR180000010		
AeroFlex 8800SX Digital Radio Test Set (Service Monitor) or equal.			
Line Number	Description	Qty Bid	Unit Price
1	AeroFlex 8800SX or Equal	1	\$ 24,892.66
2	8800OPT01 DMR	1	\$ 2,886.14
3	8800OPT02 dPMR	1	\$ 2,886.14
4	8800OPT03 NXDN	1	\$ 2,886.14
5	8800OPT04 P25	1	\$ 2,886.14
6	8800OPT05 P25 Phase II	1	\$ 6,546.66
7	8800OPT06 DMR Repeater Test	1	\$ 2,886.14
8	8800OPT09 ARIB T98	1	\$ 2,886.14
9	8800OPT10 Tracking Generator	1	\$ 1,448.06
10	8800OPT11 Occupied Bandwidth	1	\$ 1,448.06
11	8800OPT12 Internal Precision Power Meter (Meter + Sensor)	1	\$ 4,942.11
12	8800OPT13 External Precision Thru-Line Meter (for use with Bird WPS Sensor)	1	\$ 1,448.06
13	8800OPT14 PTC	1	\$ 4,977.86
14	8800OPT15 AAR Channel Plan	1	\$ 396.02
15	8800OPT20 R&S NRT-Z Power Sensor Support	1	\$ 1,448.06
16	8800OPT21 Selectable Notch Filters	1	\$ 1,448.06
17	8800OPT22 SNR Meter	1	\$ 1,448.06
18	8800OPT 101 Kenwood NXDN Auto-Test	1	\$ 3,272.16
19	8800OPT 102 Kenwood 5X20 Auto-Test	1	\$ 3,272.16
20	8800OPT103 Motorola APX Auto-Test	1	\$ 3,272.16
21	8800OPT104 Motorola MOTOTRBO Auto-Test	1	\$ 3,272.16
22	8800OPT105 Motorola Astro 25 XTS / XTL	1	\$ 3,401.66
23	Calibration Certificate 8800	1	\$ 657.52
24	AC27003 Attenuator - 20 dB / 150 W	1	\$ 1,192.77
25	Spare Internal Battery	1	\$ 382.10
26	External Battery Charger	1	\$ 312.40
27	Hard Transit Case	1	\$ 998.10
28	Soft Carrying Case	1	\$ 404.49
29	Antenna Kit	1	\$ 192.93
30	Precision DTF / VSWR Accessory Kit for 8800	1	\$ 3,708.76
31	AC25081 Site Survey Software	1	\$ 13,194.92
32	5017D Bird Power Sensor	1	\$ 3,141.42
33	Mounting Bracket	1	\$ 292.44
34	Microphone	1	\$ 254.44
35	DC Cord / Cigarette Adapter	1	\$ 95.89
36	AC24009 DMM Test Leads	1	\$ 296.12
37	10 AMP Current Shunt, 0.01 Ohm	1	\$ 349.16
38	Scope Probe Kit	1	\$ 170.54
39	Extended Standard Warranty 60 Months with Scheduled Calibration	1	\$ 2,740.60
		<b>Total Bid Amount</b>	\$ 112,635.41

# 8800SX Digital Radio Test Set

Hybrid Bench and Field Portable Design

2016 Brochure

The most important thing we build is trust

**COBHAM**



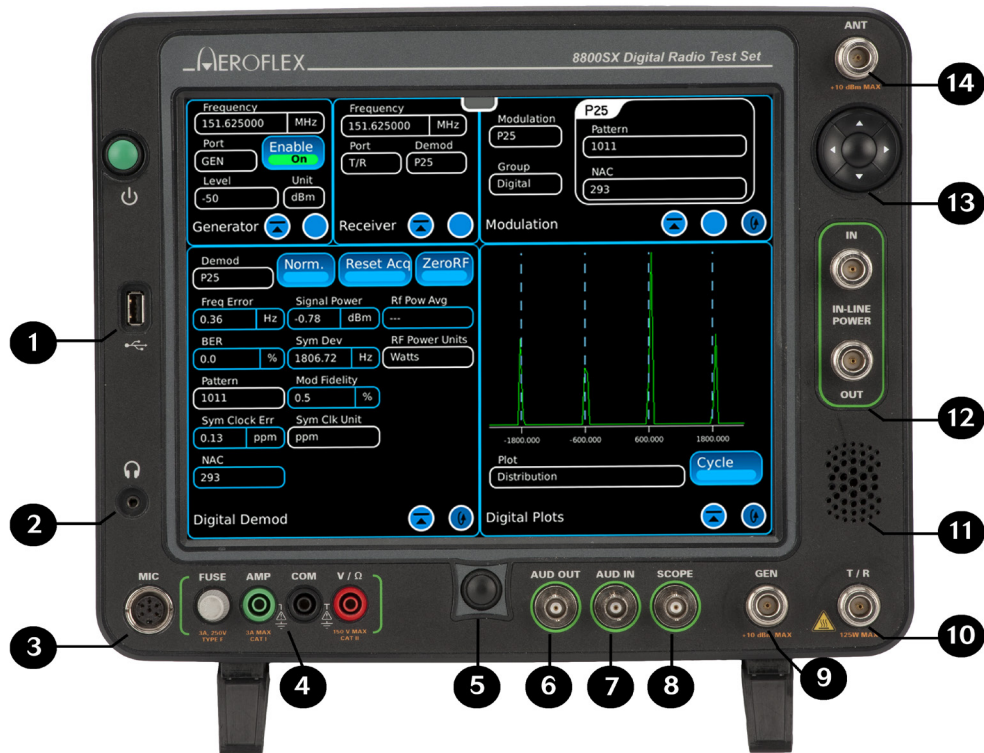
## Cobham 8800SX Digital Radio Test Set

The NEW 8800SX expands upon the unprecedented features of the 8800 Series with a new 10 MHz external reference and new software capabilities to further speed testing of today's Land Mobile Radio systems.

With its hybrid portable design, the industry's largest color touch-screen display, ruggedness, internal battery, power accuracy, advanced automated test and alignment, fast VSWR/Return Loss and Cable Fault measurements, the 8800SX offers RF professionals a whole new experience in radio test.

### At A Glance

- Dimensions: 34.3 cm x 29.3cm x 14.6 cm
- Display Size: 30.5 cm (12 inches)
- Weight: 17 lbs (Base Unit)
- Battery: Internal, 2.5+ Hours Operation
- Rugged: 30 G Shock
- Test Range: -140 dBm to 500 Watts
- LMR Tests: P25, P25 Phase 2, DMR, NXDN™, dPMR™, ARIB T98, FM, AM, DMR Repeater
- PTC Test: Tests PTC radios for Class 1 Railroads



1. USB
2. Headphone Jack
3. Microphone
4. Digital Multi-Meter
5. Home Key Control

6. Audio Out Port, BNC
7. Audio In Port, BNC
8. Oscilloscope Port, BNC
9. RF GEN Port, Type N
10. T/R Duplex Port, Type N

11. Internal Loudspeaker
12. In-Line Power Meter (Optional)
13. Arrow Controls
14. Antenna Port, Type N

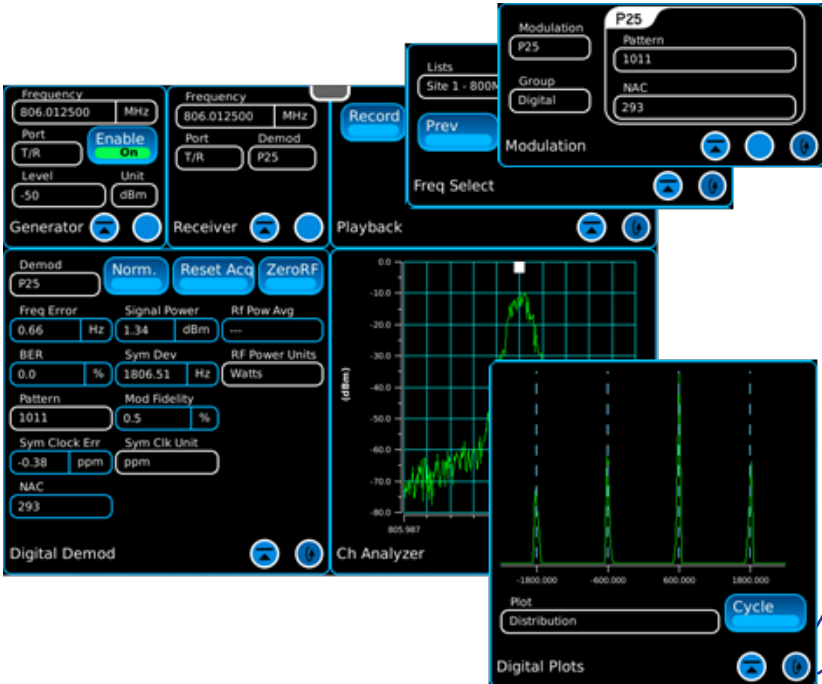
### Hybrid Portable Design

The 8800SX combines the performance and features of a bench-level test set with the portability and ruggedness of a field-level instrument. Weighing only 17 lbs (7.71 kg), an internal battery with 2.5+ hour of operation, and rugged 30 G shock rating, now test professionals will no longer compromise portability for critical test features. Advanced features ranging from automated test and alignment to digital modulation analysis plots to an internal 500 W (4% accuracy) in-line power meter are all available within a one-box solution.



### Unprecedented Display Size and Easy to Use Interface

The 8800SX is designed for maximum test efficiency. With the industry’s largest display, ultra-fast store and recall “Presets”, and its unique “Fast-Stack” user interface that allows test tiles to be stacked on one another and quickly accessed, test professionals can set up analog and digital tests in seconds and have instant access to more displayed meters and test functions.



Exclusive “Fast Stack” Feature

8800SX User Interface with “Fast Stack” Tile Access

## Complete Digital and Analog Test Suite

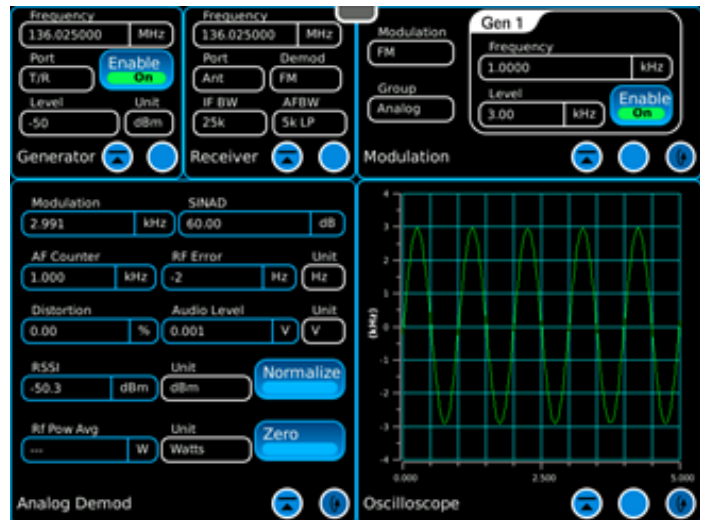
The global land mobile radio (LMR) market is rapidly transitioning from analog to digital. Therefore, test instrumentation must test both legacy analog systems as well as the new emerging digital standards. The 8800S is designed with advanced frequency, power, and modulation analysis instruments for both analog and digital systems.

### The 8800SX LMR System Tests:

- P25
- DMR
- dPMR
- AM
- Positive Train Control
- P25 Phase 2
- NXDN
- ARIB T98
- FM

### Analog Test Features:

- Audio Oscilloscope
- Channel Analyzer
- Dual Modulation Source
- Audio Function Generator
- Tone Remote/Two-Tone/Tone Sequential
- Meters
  - RF Error
  - RF Power
  - Frequency
  - SINAD
  - Distortion
  - Audio Frequency
  - Audio Level
  - DMM
  - SNR

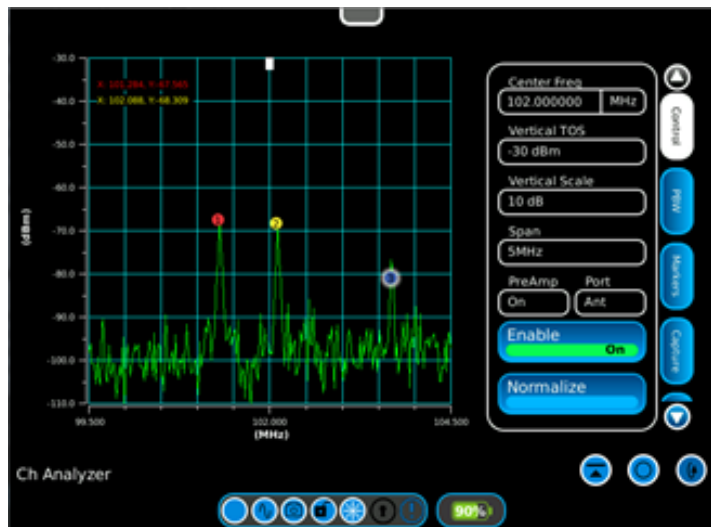


Example Analog Test Setup

### Expanded Channel Analyzer with Markers

The channel analyzer offers a unique expanded display mode, which dedicates the entire screen to the analyzer. Combining the expanded mode with the industry's largest color display provides test professionals with an easy-to-see spectrum display; regardless of the test distance.

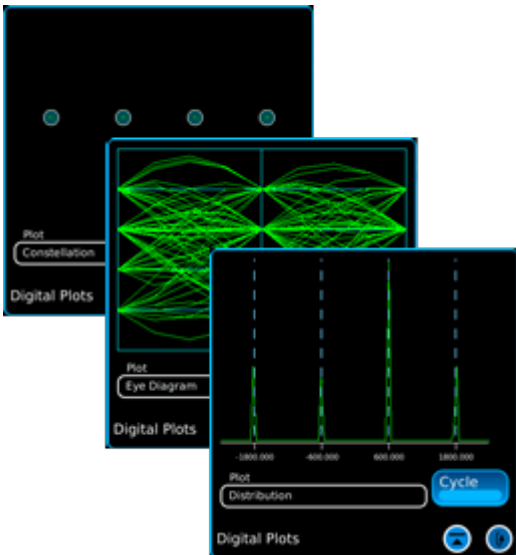
The channel analyzer now sweeps approximate four times per second and offers up to six color markers for identifying signals and interference. An on-screen marker table provides users with instant frequency, level, and delta information on monitored signals.



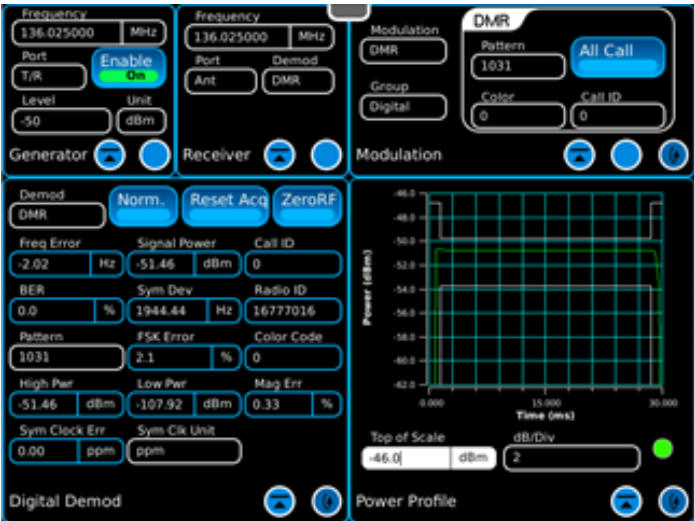
Channel Analyzer with Markers

Digital Test Features:

- Digital Test Patterns
- Distribution, Constellation, Eye Diagram Plots
- TDMA Burst Profile with Mask for DMR and P25 Phase 2
- Digital Voice Quality Verification
- Meters
  - Signal Power      - Slot Power
  - FSK Error          - Symbol Deviation
  - Magnitude Error   - Symbol Clock Error



Modulation Analysis Plots



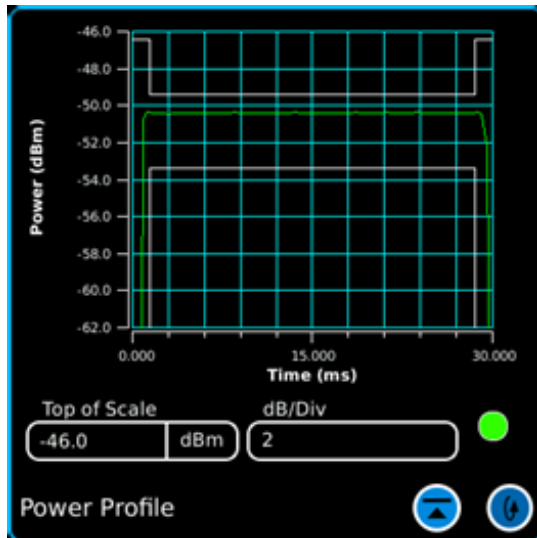
Example Digital Test Setup

Digital Modulation Plots

Proper analysis of a radio’s modulator requires digital modulation analysis plots, such as Distribution, Eye Diagram, and Constellation. These plots provide visual diagnostics of issues, such as deviation and symbol clock errors, to catch failing radios before they are deployed. The 8800SX provides these plots as well as an exclusive “Cycle” features, which allows ultra-fast toggling between the digital plots; ensuring full analysis in minimal time.

DMR Burst Power Profile Plot

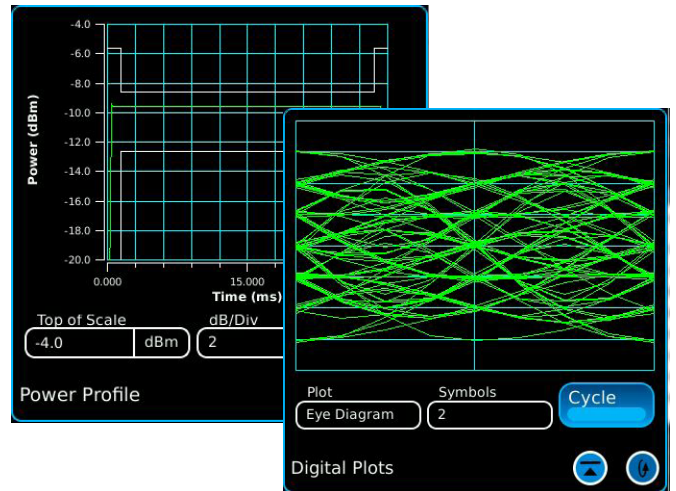
DMR is an ETSI standard with specific pass and fail parameters defined for the TDMA burst power in a slot. The Burst Power Profile plot on the 8800SX captures and displays the power profile of the burst in the active slot. Additionally, the 8800SX offers an **exclusive** pass and fail mask, defined with the ETSI standard’s burst profile parameters, to visually indicate incorrect burst power. Proper bursts will display in green while burst errors will display in red.



DMR Burst Profile Plot with Mask

## P25 Phase 2 Analysis

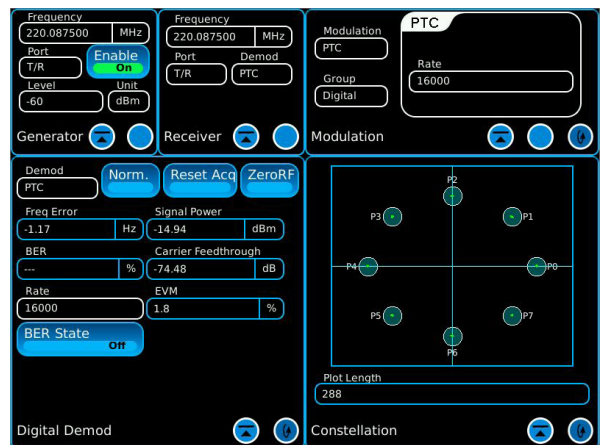
P25 Phase 2, as part of the TIA/EIA-102 Technical Standard requires analysis of the TDMA burst profile as well as tests specific to P25 Phase 2 modulation. The 8800SX provides analysis of the HDQPSK downlink and HCPM uplink modulation formats used in the Phase 2 standard.



P25 Phase 2 Screen Shots

## Positive Train Control Analysis

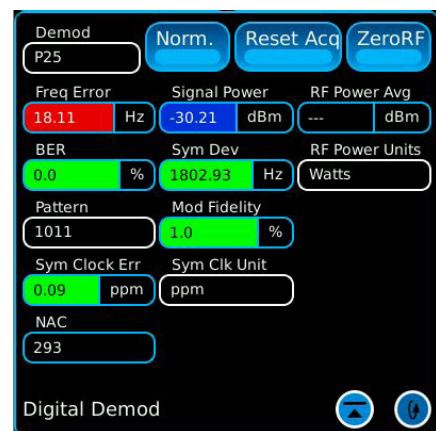
Recently enacted laws require that railroads provide remote monitoring and control of trains to ensure that the US railroad system provides the highest level of safety available. The 8800SX provides a Positive Train Control option that allows Class 1 railroad operators the ability to test their radio control systems in the field or in the lab to ensure that the radio meets stringent PTC RF parameters.



Positive Train Control Test

## Color Meters

The 8800SX features color-coded meters for quick indication of pass and fail test results. Using the configuration tile, upper and lower limits for each meter can be set and saved by the user. Measurements that exceed the set limits will display "red" for values above the limit and "blue" for values below the limit. Now test professionals can perform fast "Go, No-Go" measurements simply by monitoring meter color indications.



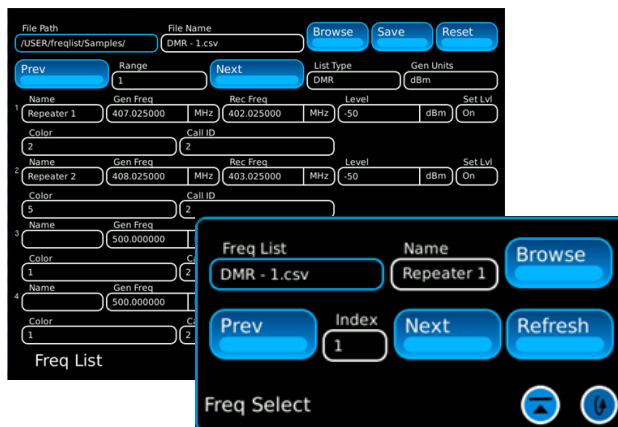
Meters with Color Pass/Fail Indicators



## Frequency List

Land mobile radios are often tested at multiple frequencies, which requires the various transmit and receive frequencies to be set on the test instrument, which can be time consuming. The 8800SX' frequency list feature provides a quick and easy way to test multiple frequencies. Frequency lists can be created using a configuration tool that allow users to:

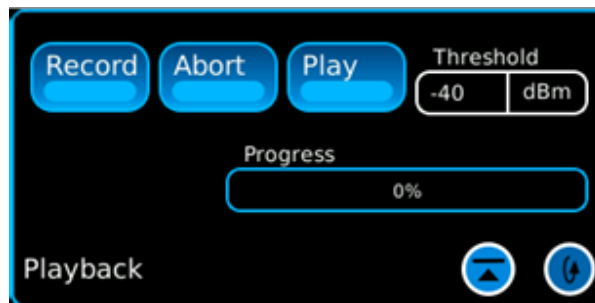
- Create, Edit and Store Frequency Lists
- Set 8800SX Generator and Receiver Frequencies and Generator Level
- Add CTCSS, DCS codes for Analog Testing
- Add NAC, Color, CC, or RAN Code for Digital Testing



Frequency Select Control and Configuration Tiles

## Digital Voice Tests

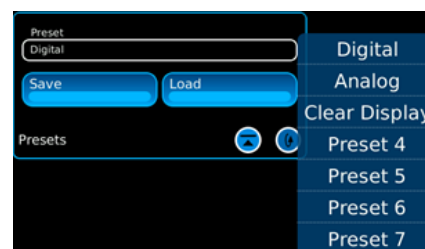
The 8800SX provides digital voice quality testing with its unique Record & Playback feature for P25, DMR, dPMR, NXDN, and ARIB T98 radio systems. Now users can record live voice from a radio under test, regardless of vocoder type, and play back the recording to the radio for audio quality verification. An “ideal” audio recording can be saved for each digital modulation type (P25, DMR, etc.) allowing for fast play back and audio quality verification of the radio under test.



Record & Playback Tile for Voice Quality Testing

## Quick Presets

The Presets feature allows for common analog and digital tests to be set up in seconds on the 8800SX. Three default presets and seven user-defined presets are included. A Preset saves open tiles, tile locations, modulation type, audio routing, and filter settings.



Presets Manager

## Internal In-Line Power Meter

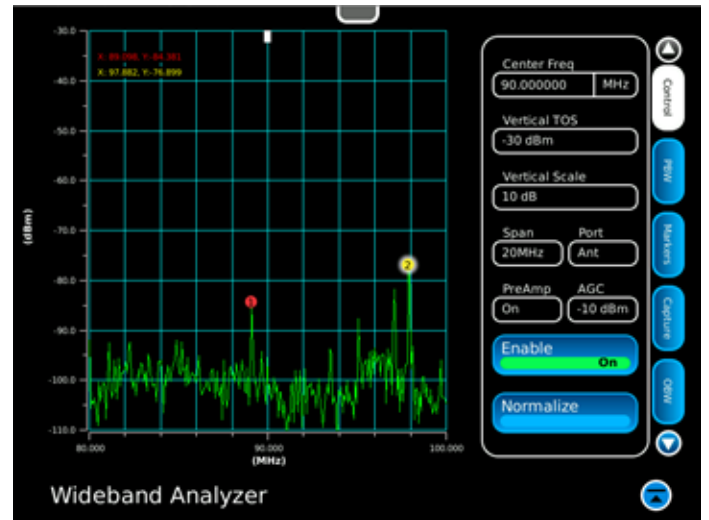
The 8800SX features an optional internal, 500 W in-line power meter with 4% accuracy. In-line power meters are especially useful test tools at remote repeater sites with high-power transmitters and cable/antenna networks. Now test professionals can measure true average and peak power, including VSWR. Since the in-line meter is built-in, you can ensure that this valuable tool will not be forgotten.



In-Line Power Meter Tile

## Wideband Analyzer

In addition to the full suite of field-level test instrumentation, the 8800SX features a 50 MHz Wideband Analyzer with six color markers. This powerful feature allows desired signals, interferers, and other spectrum anomalies to be viewed. Screen hold and capture features provide instant storage of screen images to be saved and exported to a PC for later analysis and documentation.

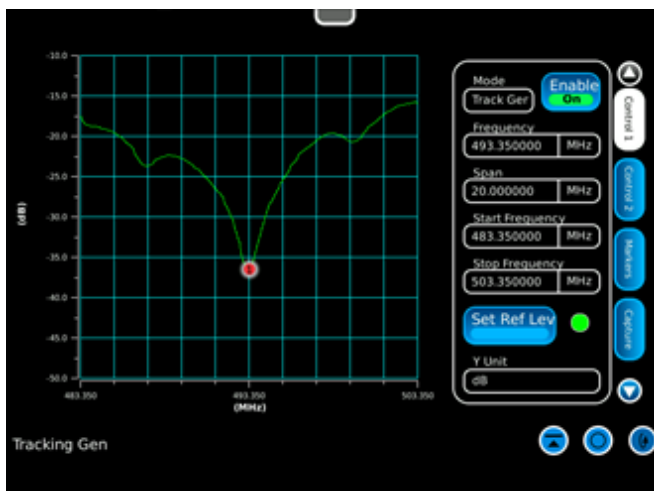


Wideband Analyzer with Color Markers

## Tracking Generator

RF professionals maintain antenna transmission networks and tune duplexers, in addition to radio tests. With the optional tracking generator (88XXOPT10) and Precision VSWR/DTF Kit (114348), the 8800SX provides a simple, fast tool for VSWR, Return Loss, Insertion Loss, and Distance to Fault measurements.

The 8800SX' soft case permits complete operation of the test set while inside the case. It is also specially designed with compartments for the return loss bridge and power divider, which allows for VSWR, Return Loss, and Distance-to-Fault measurements to be performed **in the case**. This exclusive feature test set up and ensures that these important accessories are not forgotten.



Tracking Generator with VSWR Measurement



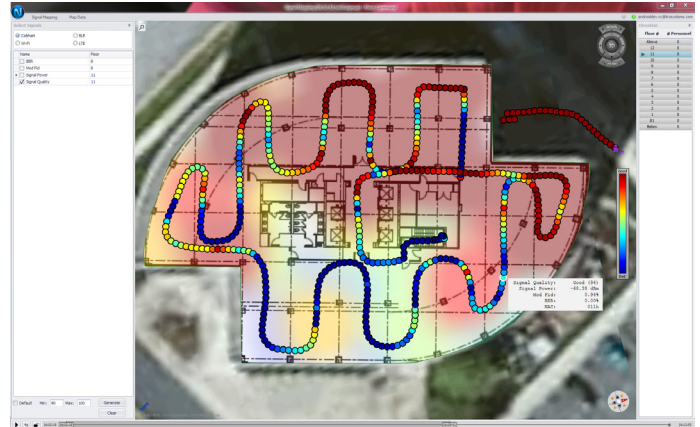
The 8800SX in Soft Case with Return Loss Bridge Connected

## NEON® Signal Mapper Package

Cobham and TRX Systems are providing a new joint solution that integrates TRX's NEON Signal Mapper Application with the Cobham 8800SX. NEON Signal Mapper automates the geo-referencing cloud storage, and 3D visualization of LMR test data for technicians who use Cobham test equipment to record and analyze two-way radio signals inside buildings and outdoors.

The NEON Signal Mapper includes the following:

- TRX Systems Tracking Unit with Belt Clip (1 Year Warranty)
- USB Cable and Wall Adapter for Charging
- 1 Year Signal Mapper Software License with NEON Cloud Access
- Portable Wireless Router/Access Point



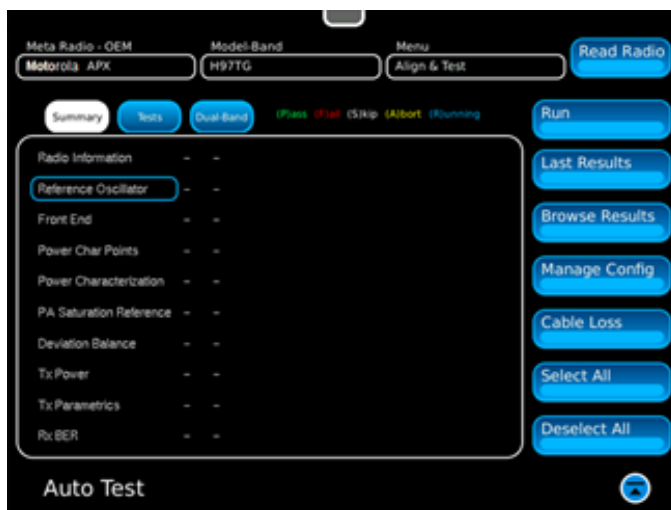
## Auto-Test

The 8800SX is designed for complete automated radio test and alignment for analog and digital radios. Using the accurate instrumentation and high-speed remote command architecture, the 8800SX optimizes radio performance in minutes; with minimal human interaction.

Available automated tests and alignments are available for various radio manufacturers, such as Motorola MOTOTRBO™. A complete list of supported manufacturers is provided in the options section.



*The 8800SX Auto-Test Setup*



*The 8800SX Auto-Test Summary Setup*

The 8800SX provides a unique test result for each radio tested. The test result includes Date/Time, Radio Model Number, Serial Number, Firmware Version, and other information uniquely identifying the radio under test. It also includes the specific results of each test and alignment performed.

Test results are automatically stored and can be exported through USB to an external PC for printing and for documentation purposes.

Multiple automated test and alignment options can be installed on the 8800SX. Operators are only required to know radio type, such as Motorola MOTOTRBO; not radio model number. The unique “Read Radio” feature queries the radio to gather the specific model number, as well as apply the specific test and alignment parameters for that model number as determined by the manufacturers. Specific tests and alignments can be selected and configured. Pressing “Run” enables the program and executes the selected tests.

The 8800SX also provides the required DMM with an optional Current Shunt for doing critical MOTOTRBO mobile radio power alignments.



*Test Results Summary*

## Select 8800SX Accessories Overview

### *Soft Case* 114478

The soft case allows full operation of the 8800SX while inside the case. The laptop style design is lightweight and provides extra protection during field operation. Storage pockets provide extra space for spare batteries, test cables, etc.



### *Hard Transit Case* 114477

The hard transit case features form-fitted slots for the 8800SX, protective cover, precision VSWR/DTF Kit, power supply, 150 W attenuators, spare battery, and more.



### *Precision DTF/VSWR Accessory Kit* 114348

This accessory kit provides all items necessary for accurate and VSWR, Return Loss, and Distance-to-Fault measurement. The kit includes a case, return loss bridge, power divider, 50 Ω calibrator, and two N-type test cables specifically designed for the 8800SX.



### *Bird 5017D Thru-Line Power Sensor* 92793

The 8800SX also supports the Bird 5017D Thru-Line Power Sensor as an external power meter for users that already have the 5017D. This capability requires 88XXOPT13 and provides simultaneous forward and reverse power measurements up to 500 W and VSWR measurements that are displayed on the 8800SX screen.



## 8800SX Options and Accessories

139942 8800SX Digital Radio Test Set

### Standard Accessories

Fuse, 5 A, 32 V, Mini Blade	Power Supply
AC Power Cord - USA	AC Power Cord - China
AC Power Cord - Europe	AC Power Cord - UK
Adapter, N(m) to BNC(f), Qty 3	Front Cover
Internal Battery	

### Options

113334	8800OPT01 DMR
113335	8800OPT02 dPMR
113336	8800OPT03 NXDN
113337	8800OPT04 P25
138895	8800OPT05 P25 Phase 2
140215	8800OPT06 DMR Repeater Test
113338	8800OPT09 ARIB T98
113339	8800OPT10 Tracking Generator
113340	8800OPT11 Occupied Bandwidth
113309	8800OPT12 Internal Precision Power Meter (Meter + Sensor)
113342	8800OPT13 External Precision Thru-Line Meter (for use with Bird WPS Sensor)
113343	8800OPT14 PTC
113344	8800OPT15 AAR Channel Plan
139836	8800OPT20 R&S NRT-Z Power Sensor Support
139837	8800OPT21 Selectable Notch Filters
139838	8800OPT22 SNR Meter
138525	8800OPT101 Kenwood NXDN Auto-Test
138526	8800OPT102 Kenwood 5X20 P25 Series Auto-Test
138527	8800OPT103 Motorola APX Auto-Test
138528	8800OPT104 Motorola MOTOTRBO™ Auto-Test
139315	8800OPT105 Motorola ASTRO® 25 XTS®/XTL™ Auto-Test

### Languages

113350	8800OPT300 Simplified Chinese
113351	8800OPT301 Traditional Chinese

113352	8800OPT302 Spanish
113353	8800OPT303 Portuguese
113354	8800OPT304 Malay/Indonesian
113355	8800OPT305 Korean
113356	8800OPT306 Arabic
113357	8800OPT307 Polish
113358	8800OPT308 Russian
113359	8800OPT309 Japanese
113360	8800OPT310 German
113361	8800OPT311 French
139625	8800OPT312 Italian

### Accessories

138313	Calibration Certificate - 8800 Series
82560	AC27003 Attenuator - 20 dB/150 W
67076	Spare Internal Battery
114479	External Battery Charger
114477	Hard Transit Case
114478	Soft Carrying Case
114475	Antenna Kit
114348	Precision DTF/VSWR Accessory Kit for 8800
140747	NEON Signal Mapper Package for Indoor Coverage Mapping
63927	AC25081 Site Survey Software
92793	5017D Bird Power Sensor
114312	Mounting Bracket
112861	Microphone
62404	DC Cord/Cigarette Adapter
63936	AC24009 DMM Test Leads
112277	10 AMP Current Shunt, 0.01 Ohm
67411	Scope Probe Kit

### Extended Warranties

114481	Extended Standard Warranty 36 Months
114482	Extended Standard Warranty 60 Months
114483	Extended Standard Warranty 36 Months with Scheduled Calibration
114484	Extended Standard Warranty 60 Months with Scheduled Calibration

### Cobham AvComm

10200 W York Street  
Wichita, KS 67215, USA  
T: (316) 522-4981 E: AvComm.TechSales@aeroflex.com

[www.aeroflex.com](http://www.aeroflex.com)

