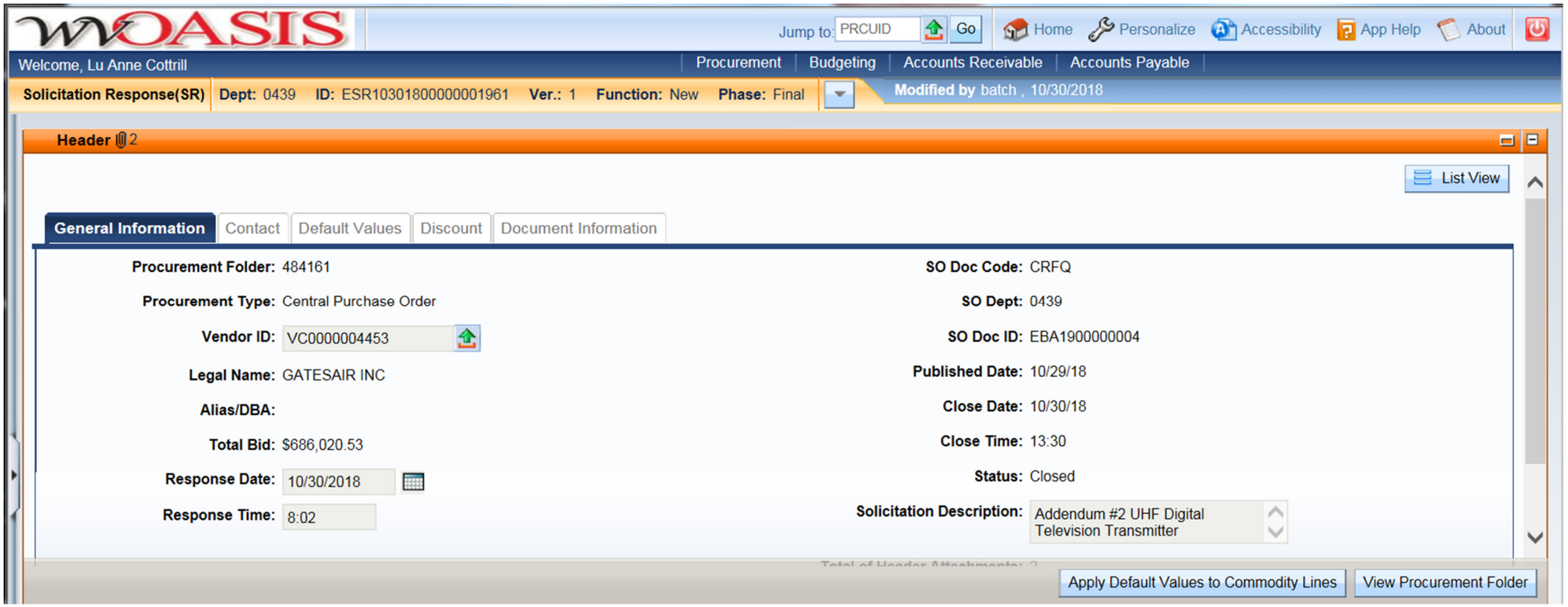
The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency 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.


wvOASIS
Jump to: PRCUID Go
Home
Personalize
Accessibility
App Help
About
Welcome, Lu Anne Cottrill
Procurement
Budgeting
Accounts Receivable
Accounts Payable
Solicitation Response(SR) Dept: 0439 ID: ESR10301800000001961 Ver.: 1 Function: New Phase: Final
Modified by batch , 10/30/2018
Header 2
List View
General Information
Contact
Default Values
Discount
Document Information
Procurement Folder: 484161
Procurement Type: Central Purchase Order
Vendor ID: VC0000004453
Legal Name: GATESAIR INC
Alias/DBA:
Total Bid: $686,020.53
Response Date: 10/30/2018
Response Time: 8:02
SO Doc Code: CRFQ
SO Dept: 0439
SO Doc ID: EBA1900000004
Published Date: 10/29/18
Close Date: 10/30/18
Close Time: 13:30
Status: Closed
Solicitation Description: Addendum #2 UHF Digital Television Transmitter
Apply Default Values to Commodity Lines
View Procurement Folder

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

State of West Virginia
Solicitation Response

Proc Folder : 484161
Solicitation Description : Addendum #2 UHF Digital Television Transmitter
Proc Type : Central Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2018-10-30 13:30:00	SR 0439 ESR10301800000001961	1

VENDOR

VC0000004453

GATESAIR INC

Solicitation Number: CRFQ 0439 EBA1900000004

Total Bid : $686,020.53 **Response Date:** 2018-10-30 **Response Time:** 08:02:56

Comments:

FOR INFORMATION CONTACT THE BUYER

Stephanie L Gale

(304) 558-8801
stephanie.l.gale@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	30,000 Watt Liquid Cooled UHF Digital Television Transmitter	1.00000	EA	$686,020.530000	$686,020.53

Comm Code	Manufacturer	Specification	Model #
52161523			

Extended Description : Total from Attached Pricing Page

Cost Proposal

GatesAir
5300 Kings Island Drive, Suite 101
Mason, OH 45040
Phone: 518-587-9562
Brian.Szewczyk@gatesair.com

30,000 Watt Liquid Cooled

Digital Television Transmitter

Solicitation No. EBA 1900000004

Presented to:

Stephanie L. Gale, Buyer

State of West Virginia, Purchasing Department

By:

Brian Szewczyk, Regional Sales Manager

Primary Contacts

Trademarks

Contact Information

GatesAir has office locations around the world. For locations and contact information see: http://www.gatesair.com/contact

Sales Team

Brian Szewczyk
Regional Sales Manager
GatesAir
5300 Kings Island Drive
Mason, OH 45040
Phone: 518-587-9562

Brian.Szewczyk@gatesair.com

Systems Architect

Rich Lohmueller
Proposal Manager
GatesAir
5300 Kings Island Drive
Mason, OH 45040
Phone: 1-513-459-3482
fax :1-513-459-3796
rlohmuel@gatesair.com

The Americas

Corporate Headquarters
5300 Kings Island Drive
Cincinnati, OH, USA, 45040
Tel: 1 800-622-0022
Fax: 513-459-3796

Manufacturing Facility
3200 Wismann Lane
PO Box 4290
Quincy, IL, USA, 62301
Tel: 217-222-8200

GATESAIR®

GATESAIR®

GatesAir efficiently leverages wireless spectrum to maximize performance for multichannel TV and radio services, offering the industry's broadest portfolio helping broadcasters wirelessly deliver and monetize content. With nearly 100 years in broadcasting, GatesAir's exclusive focus on the over-the-air market helps broadcasters optimize services today and prepare for future revenue-generating business opportunities. All research, development and innovation is driven from the company's facilities in Mason, Ohio and fulfilled by the long-standing manufacturing center in Quincy, Illinois.

GatesAir's turnkey solutions are built on three pillars: Create, Transport and Transmit. The company is best known for powering over-the-air analog and digital radio/TV stations and networks worldwide with the industry's most operationally efficient transmitters. Groundbreaking innovations in low, medium and high-power transmitters reduce footprint, energy use and more to establish the industry's lowest total cost of ownership. Support for all digital standards and convergence with mobile networks ensure futureproof systems.

In television, GatesAir supplies proven, trusted wireless UHF and VHF solutions across all power requirements to support single-station over-the-air broadcasters on up to large national networks. The industry's most reliable software-definable exciters ensure broadcasters can optimize analog networks and quickly transition to digital TV in the field, with support for all major global DTV standards. GatesAir also supplies a wide array of over-the-air accessories to maximize transmitter control, network redundancy and signal compliance – along with installation, commissioning and ongoing support services – to deliver the industry's strongest turnkey approach for customers worldwide.

GatesAir has a well-established, on-the-ground presence in markets around the world. Every day, our more than 300 employees strive to deliver world-class solutions and service to customers in more than 130 countries. And we staff dozens of sales and support facilities in markets as diverse as France, Germany, China, Argentina, Mexico, Singapore, Australia and Dubai. This round-the-world presence ensures that every customer feels comfortable doing business with GatesAir.

Contact Information

	+1 513 459 3400
Americas	Americas@gatesair.com
Europe, Middle East Asia and Africa	+33 1 47 92 44 20 EMEA-APAC@gatesair.com

For more information, please visit gatesair.com

Global Service Locations

Table of Contents

GatesAir Standard Terms and Conditions of Sale
http://www.gatesair.com/documents/StandardTermsandConditions.pdf

#EBA1900000004 30kW DTV Transmitter

Bid Forms

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: 484161
Doc Description: Addendum #2 UHF Digital Television Transmitter
Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2018-10-29	2018-10-30 13:30:00	CRFQ 0439 EBA1900000004	3

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

Vendor Name, Address and Telephone Number:

GatesAir
5300 Kings Island Dr.
Mason, OH 45040
513-459-3400

FOR INFORMATION CONTACT THE BUYER
Stephanie L Gale
(304) 558-8801
stephanie.l.gale@wv.gov

Signature X [signature] **FEIN #** 46-4956212 **DATE** 10/30/18

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

ADDITIONAL INFORMATION:

Addendum #2 issued to:

1. Provide the attached drawing.

End of Addendum #2 .

INVOICE TO	SHIP TO
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD BEAVER WV25813 US	PURCHASING ADMINISTRATOR EDUCATIONAL BROADCASTING 600 CAPITOL ST CHARLESTON WV 25301-1223 US

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	30,000 Watt Liquid Cooled UHF Digital Television Transmitter	1.00000	EA	$686,020.53	$686,020.53

Comm Code	Manufacturer	Specification	Model #
52161523	GatesAir	30kW	ULXTE-50

Extended Description :

Total from Attached Pricing Page

ADDITIONAL TERMS AND CONDITIONS

See attached document(s) for additional Terms and Conditions

SOLICITATION NUMBER: CRFQ EBA1900000004
Addendum Number: 1

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

[ ] Modify bid opening date and time

[ ] Modify specifications of product or service being sought

[✓] Attachment of vendor questions and responses

[ ] Attachment of pre-bid sign-in sheet

[ ] Correction of error

[ ] Other

Description of Modification to Solicitation:

Addendum #1 issued to:

1 Provide responses to vendor questions.

End of Addendum #1.

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.

2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, 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.

1. Is there a transmitter room layout drawing available to assist with electrical service layout and new transmitter placement?

   This will be provided as soon as possible as a subsequent addendum.

2. Is there a station test load existing on site to test new transmitter into the load?

   We currently do not have a station load at the site.

3. Section 3.1.1.7.2 states all combiners shall be liquid-cooled. Would air-cooled combiners be considered or must they be liquid-cooled?

   Subassemblies operating at levels less than 100 watts RMS can utilize air cooled combiners and reject loads.

4. Section 3.1.1.7.2.1 states all combiner reject loads shall be liquid-cooled. Air-cooled rejects loads are commonly supplied at these levels, would they be considered or must they be liquid-cooled?

   Air cooled reject loads will be accepted for levels less than 100 watts RMS.

SOLICITATION NUMBER: CRFQ EBA1900000004
Addendum Number: 2

The purpose of this addendum is to modify the solicitation identified as ("Solicitation") to reflect the change(s) identified and described below.

Applicable Addendum Category:

[ ] Modify bid opening date and time

[ ] Modify specifications of product or service being sought

[ ] Attachment of vendor questions and responses

[ ] Attachment of pre-bid sign-in sheet

[ ] Correction of error

[✓] Other

Description of Modification to Solicitation:

Addendum #2 issued to:

1. Provide the attached drawing.

End of Addendum #2 .

Additional Documentation: Documentation related to this Addendum (if any) has been included herewith as Attachment A and is specifically incorporated herein by reference.

Terms and Conditions:

1. All provisions of the Solicitation and other addenda not modified herein shall remain in full force and effect.

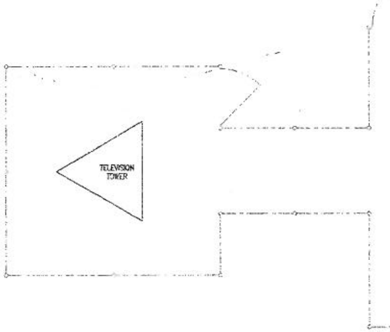
2. Vendor should acknowledge receipt of all addenda issued for this Solicitation by completing an Addendum Acknowledgment, a copy of which is included herewith. Failure to acknowledge addenda may result in bid disqualification. The addendum acknowledgement should be submitted with the bid to expedite document processing.

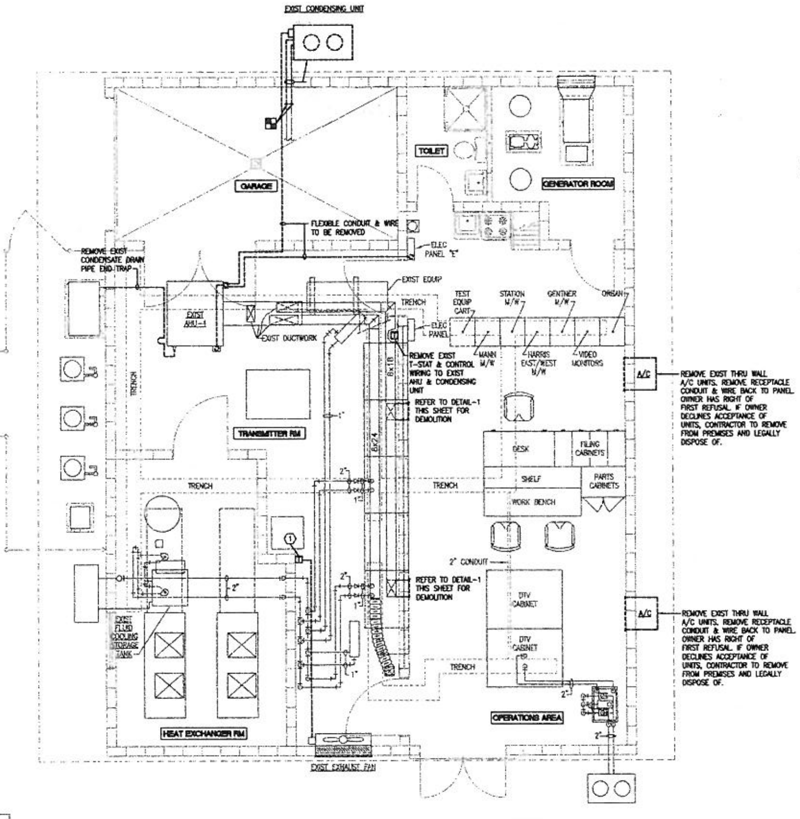
PLAN NOTES

(1) CONTRACTOR SHALL FURNISH AND INSTALL NEW CONTROL WIRING FROM FAN MOTOR STARTER AUXILIARY CONTACTOR FORMERLY WIRED TO DEMOLISHED THERMOSTAT AND CONNECT TO NEW DDC CONTROLLER.

GENERAL NOTES

1. REFER TO SHEET M1 FOR ADDITIONAL NOTES.

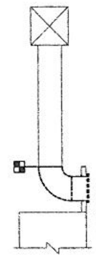




NORTH

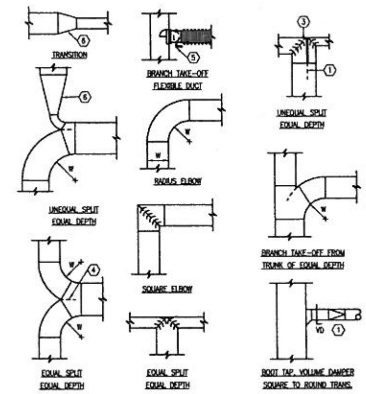
FLOOR PLAN

SCALE: 1/4"=1'-0"



DETAIL-1

NOT TO SCALE

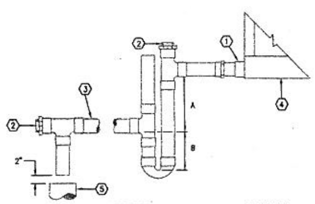


DETAIL NOTES

(1) TRUNK DUCT MUST BE NOT LESS THAN 2" DEEPER THAN BRANCH DUCT.
(2) 1" IN 4" SLOPE.
(3) DOUBLE THICKNESS TURNING VANES - TYPICAL.
(4) SPLITTER.
(5) TWIST-LOK FITTING WITH DAMPER AND 454 EXTRACTOR
(6) 3 TO 1 MAX. SLOPE.

MISCELLANEOUS DUCT DETAILS

NOT TO SCALE



	A DIMENSION	B DIMENSION
DRAW THRU COIL	STATIC PRESSURE IN PAN	1.5 x STATIC PRESSURE IN PAN
BLOW THRU COIL	1" MINIMUM	2.0 x STATIC PRESSURE IN PAN

DETAIL NOTES

(1) DRAIN LINE SHALL BE AT LEAST SAME SIZE AS DRAIN NIPPLE.
(2) CLEAN OUT.
(3) PITCH DOWN TOWARD DRAIN.
(4) DRAIN PAN.
(5) OPEN DRAIN OR ROOF.

HVAC DRAIN TRAP DETAIL

NOT TO SCALE

TED A. ZACHWIEJA REGISTERED 10127

ZDS DESIGN/ CONSULTING SERVICES
Mechanical • Electrical • IAQ • Energy • Commissioning
91 Smiley Drive St. Albans, WV 25177
Ph: (304) 755-0075 Fx: (304) 755-0076

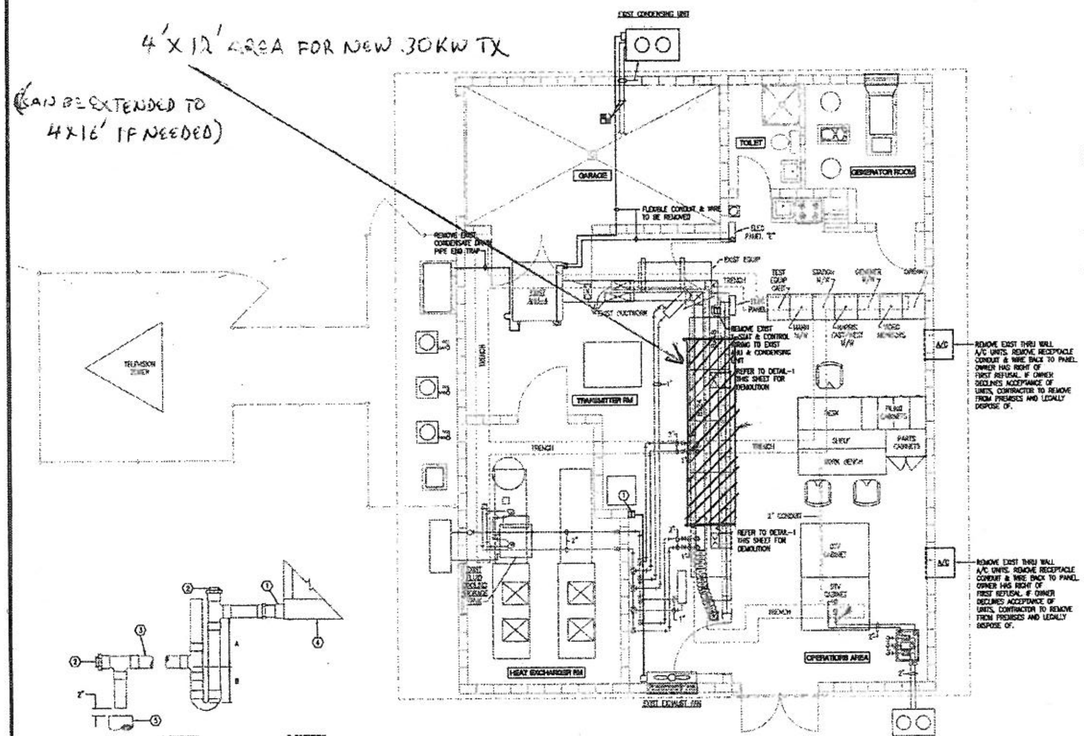
WV Public Broadcasting Transmitter Station Chestnut Ridge, WV

Mechanical/Electrical Demolition

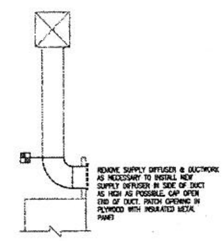
DATE	REMARKS

Date 2-20-03
Project Number WPB021C
Reviewed By T. Zachwieja
Drawn By M. Cochran
Drawing Number MED1

c:/dwg/commerci/wpb021/wpb21m02.dwg



FLOOR PLAN
SCALE: 1/4"=1'-0"
NORTH



DETAIL-1
NOT TO SCALE

	A DIMENSION	B DIMENSION
DRAW THRU COIL	STATIC PRESSURE IN PAN	1.5 x STATIC PRESSURE IN PAN
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2. CLEAN OUT.
3. PITCH DOWN TOWARD DRAIN.
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5. OPEN DRAIN OR ROOF.

HVAC DRAIN TRAP DETAIL
NOT TO SCALE

PLAN NOTES

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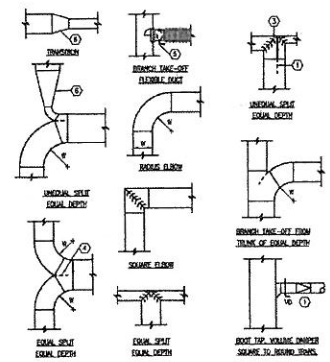
GENERAL NOTES

1. REFER TO SHEET M1 FOR ADDITIONAL NOTES.



DETAIL NOTES

1. TRUNK DUCT MUST BE NOT LESS THAN 2" DEEPER THAN BRANCH DUCT.
2. 1" IN 4" SLOPE.
3. DOUBLE THICKNESS TURNING VANES - TYPICAL.
4. SPLITTER.
5. TWIST-LOK FITTING WITH DAMPER AND 456 EXTRACTOR
6. 3 TO 1 MAX. SLOPE.

MISCELLANEOUS DUCT DETAILS
NOT TO SCALE

DATE	REMARKS

Date: 2-20-03
Project Number: WPB021C
Reviewed By: T. Zachwieja
Drawn By: M. Cochran
Drawing Number: MED1

ZDS DESIGN/CONSULTING SERVICES
Mechanical • Electrical • IAQ • Energy • Commissioning

WV Public Broadcasting
Transmitter Station
Chestnut Ridge, WV

Mechanical/Electrical Demolition

ADDENDUM ACKNOWLEDGEMENT FORM
SOLICITATION NO.: EBA1900000004

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)

[x]	Addendum No. 1	[ ]	Addendum No. 6
[x]	Addendum No. 2	[ ]	Addendum No. 7
[ ]	Addendum No. 3	[ ]	Addendum No. 8
[ ]	Addendum No. 4	[ ]	Addendum No. 9
[ ]	Addendum No. 5	[ ]	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.

GatesAir
Company

Authorized Signature

10/30/18
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.
Revised 6/8/2012

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.

Jeff Hills, Vice President Finance
(Name, Title)

Jeff Hills, Vice President Finance
(Printed Name and Title)

5300 Kings Island Dr. Mason, OH 45040
(Address)

513-459-3424
(Phone Number) / (Fax Number)

Jeff@gatesair.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.

GatesAir
(Company)

VP, Finance
(Authorized Signature) (Representative Name, Title)

Jeff Hills Vice President Finance
(Printed Name and Title of Authorized Representative)

10/24/18
(Date)

513-459-3424
(Phone Number) (Fax Number)

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 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 exceed 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: GatesAir

Authorized Signature: _____ Date: 10/24/18

State of Ohio

County of Warren, to-wit:

Taken, subscribed, and sworn to before me this 24th day of October, 2018.

My Commission expires _____, 20___.

AFFIX SEAL HERE

NOTARY PUBLIC STATE OF OHIO

ERIN G. ROSEN, Attorney at Law
Notary Public, State of Ohio
My Commission has no expiration date.
Section 147.03 O. R. C.

NOTARY PUBLIC _____

GATESAIR®

Exhibit A Price Form

REQUEST FOR QUOTATION
EBA705 LIQUID COOLED TRANSMITTER

Exhibit A, Pricing Page

Item#	Description	Part#	Quan	Cost	Total
1	TRANSMITTER	ULXTE-50	1	$559,597.90	$559,597.90
2	MASK FILTER SYSTEM	6PPXX271E	1	$40,622.48	$40,622.48
3	INTEGRATION/COMMISSIONING	ULXTE-50 INSTALL	1	$74,800.15	$74,800.15
Total		FREIGHT	1	$11,000.00	$11,000.00
				TOTAL	$686,020.53

Authorized Signature: _____ **Date:** 10/30/18

Revised 10/27/2014

#EBA1900000004 30kW DTV Transmitter

Detailed Quotation

Quote Number: Q-79125
www.gatesair.com

To:

West Virginia Educational Broadcasting Authority
124 INDUSTRIAL PARK DRIVE
Beaver WV, 25813 USA

Attn: Stephanie Gale
(304) 558-8801
stephanie.l.gale@wv.gov

From:

GatesAir, Inc.
5300 Kings Island Drive, Suite 101
Mason OH, 45040 USA

Brian Szewczyk
Global Sales
brian.szewczyk@gatesair.com

Summary – All Prices are in USD

Summary	**Amount**
1. Transmitter	$559,597.90
2. Mask Filter System	$40,622.48
3. Installation/Commissioning	$74,800.15

Total Equipment/Services	$675,020.53
Estimated Shipping from Factory	$11,000.00
Total Quote Price (Optional Items Not Included)	**$686,020.53**

Any freight amount shown is estimated and actual amounts will be billed to customer

Is the purchase of this equipment or services exempt from sales tax? YES or NO
If NO - sales tax will be added to your invoices at the rate assigned to the ship to address.

If YES - Sales Tax Exemption Number _____ COPY OF CERTIFICATE MUST BE ATTACHED

Who can we contact regarding sales tax questions on behalf of your company?

Name: _____

Phone Number: _____

Bill To:
West Virginia Educational Broadcasting Authority
124 INDUSTRIAL PARK DRIVE
Beaver WV, 25813 USA
Attn:
Stephanie Gale
(304) 558-8801
stephanie.l.gale@wv.gov

Ship To:
WNPB-TV
1309 Sand Springs Road
Morgantown WV, USA
Attn:
Stephanie Gale
(304) 558-8801
stephanie.l.gale@wv.gov

Quote #: Q-79125
Payment Terms: Net 30 Days
Effective Date: October 30, 2018
Valid Through: November 30, 2018
Send Orders to
orders@gatesair.com
Freight Terms: Destination Prepaid
Estimated Shipment from Factory: 90 Days

1. Transmitter

No.	Product #	Qty	Net Unit Price	Ext. Price
1	ULXTE-50	1	$512,800.00	$512,800.00

TRANSMITTER, ULXTE-50
GatesAir Maxiva Series ULXTE-50 High Efficiency Broadband Liquid-Cooled, Solid-State, Television Transmitter, 6-1/8" EIA flanged.
Transmitter output power before mask filter: E-Type Band A Power Amplifier Module 470-590Mhz: 31700W
Three-Phase 208/220/240 Volts, or 380/400/415 Volts WYE, 50/60Hz.

I. TRANSMITTER CONTROL SUPPLIED WITH:
(1) System / Transmitter Manager (STM) with:
- Web Remote with RJ45 connector
- Transmitter Monitor & Display Logic Board
- Life Support Logic Board
- Exciter switcher assembly
- (2) redundant Switch Mode Power supplies (hot swappable)
- System forward & reflected power monitoring
- Wireless access point/device

(1) XTE (TM) Multi Standard Exciter with:
Modulation software upgradeable
- RTAC(TM) (Real-Time Adaptive Correction)
- Easy-to use operator interface via standard Web browser and external PC
- Front panel display and control
- Built-in compliance monitoring
- (2) ASI/SMPTE-310 inputs with auto-switching
- (2) IP Transport inputs with auto-switching
- 10MHz and 1PPS input for timing reference
- Integrated GPS receiver (Antenna/cable sold separately)
- Built in battery UPS
- For ATSC 1.0 modulation, optional SFN (software key required)
Note: secondary exciter available as an option

II. TRANSMITTER SYSTEM:
(5) 13RU PA power block with:
- (10) Compact UHF High Efficiency Plug-In LDMOS Power Amplifier Modules with pre-driver
- (2) Phase and gain modules with auto switching
- (11) Compact High Efficiency Switch Mode Plug-In Power Supplies
- (1) Primary 2-Way RF Power Splitter/Divider
- (2) 5-Way RF Power Splitter/Divider
- (1) 10-Way Liquid Cooled RF Power Combiner with Reject Loads

No.	Product #	Qty	Net Unit Price	Ext. Price
	Power Block controller includes: - Power block control, monitoring & protection - Liquid flow monitoring - Cooling systems pump control - Power block forward & reflected power monitoring (2) Transmitter Equipment cabinet, designed for multi block systems. Standard AC distribution includes: - Control AC breakers and wiring - Power bock AC Distribution without power block breakers Note: Customer supplies AC wall breakers for each block and control AC input. (1) Power block 2 port Hybrid combiner with liquid cooled reject load. (1) Power block 3 port Hybrid combiner with liquid cooled reject loads. (1) Hybrid cabinet combiner with Air Cooled reject load External I/O board with parallel remote interface III. MISCELLANEOUS COMPONENTS INCLUDED (1) System Directional Coupler Assembly for Power Metering and RTAC (Pre-Filter) (5) Power block Directional Coupler Assembly (2) Broadband Low Pass filter (Harmonic Filter) (1) Factory Test at Rated Customer Power IV. (2) External indoor Pump Module & cooling systems (typical), not included with transmitter line item, sold separately (see separate line items below), line items include: (1) external indoor pump module with: - Pump module control interface board - (2) Pump AC inverters - (2) Heat exchanger AC inverters - (2) Liquid cooling pumps (1) Heat Exchanger & cooling lines: - 50kW Heat Exchanger (dual fan) - Kit cooling system hose assembly and hardware V. TECHNICAL MANUALS (1) Maxiva ULXTE Series Transmitter Manual (1) Maxiva ULXTE Series Transmitter Drawing Package VI. OPTIONS (not included, sold separately): - Mask Filter - Post Mask Filter Directional Coupler - Secondary exciter - AC distribution single AC feed to cabinet with Power block breakers (Delta) - AC distribution single AC feed to cabinet with Power block breakers (Wye)			
2	PA-ULXTE-E-BAND-A	50	$0.00	$0.00
	ASSY, PA MODULE, ULXTE, BAND "A" "888E BAND A PALLET/MODULE TYPE" UHF 470-590MHz BANDED MODULE "FOR PA MODULE SELECTION WITH MAIN TRANSMITTER LINE ITEM" "MUST HAVE TRANSMITTER LINE ITEM"			
3	XTE-EXCITER-MS	1	$10,350.00	$10,350.00
	XTE Multi Standard Exciter with: - Modulation software upgradeable - RTAC(TM) (Real-Time Adaptive Correction) - Easy-to use operator interface via standard Web browser and external PC - Front panel display and control - Built-in compliance monitoring - Two ASI inputs with auto switching - IP input - 10MHz and 1PPS inputs - Integrated GPS (Antenna sold separately)			

No.	Product #	Qty	Net Unit Price	Ext. Price
	- Built in UPS -For ATSC modulation optional SFN (software key required)			
4	XTE-SW-AT-1-2	2	$0.00	$0.00
	XTE ATSC 1.0/2.0 MODULATION SOFTWARE			
5	9710080087	1	$451.75	$451.75
	KIT, ULXTE SYSTEM THIS KIT INCLUDES 50FT CU STRAP, 100FT RG223 COAX CABLE, 150FT 2 COND CABLE (INTERLOCK), SMA & N CONNECTORS, WAGO TOOL			
6	9929139090	2	$451.75	$903.50
	KIT, INSTALL MATERIAL, MAXIVA 1 PA CAB INCLUDES MATERIAL TO INSTALL SINGLE PA CAB, UNISTRUT 10 FT LENGTH			
7	9950333006	2	$6,600.00	$13,200.00
	ASSY, EXTERNAL (INDOOR) PUMP MODULE, HE II 50/60HZ, 208-240V/308-415V INCLUDES: (2) PUMPS (1) PUMP CONTROLLER (2) PUMP INVERTERS 2HP (2) HEAT EXCHANGER INVERTERS 2HP PUMP MODULE FRAME			
8	9810147001	2	$5,097.00	$10,194.00
	HEAT EXCHANGER, GATESAIR 50HE, DUAL FAN 3 PHASE INVERTER RATED, 1HP FAN MOTORS 50KW NOMINAL HEAT DISIPATION			
9	7740156080	2	$2,251.50	$4,503.00
	KIT, PLUMBING FLX/VLX/ULXT HOSE Plumbing Kit, Hose For use with FLX/VLX/ ULXT transmitter. Includes: * 2 - 50ft Hoses * Hose Barbs * Manifold *Sight Flow Indicator * Misc. plumbing parts * Hardware Kit			
10	0217510003	50	$8.40	$420.00
	ADDITIONAL COOLING SYSTEM HOSE, RUBBER, 1-1/2" ID			
11	511010030	4	$116.36	$465.44
	EXTENDED LIFE ANTIFREEZE/COOLANT_ CONCENTRATE_ETHYLENE GLYCOL, DIETHYLENE GLYCOL_CASE OF SIX (1-GALLON CONTAINERS)_AF2000-6PK_ *MSDS REQD EACH SHIPMENT**			
12	480TO208-150KVA	1	$6,310.21	$6,310.21
	150 Kva Transformer three phase 480v Delta primary, 208v Wye secondary, K-13 Rated			
13	ULX-1YRWARRANTY	1	$0.00	$0.00
	Maxiva ULXTE Standard 1 year Warranty Valid for 15 months from date of shipment Additional Details of this warranty are covered in the GatesAir General Terms and Conditions.			
			1. Transmitter TOTAL:	$559,597.90

2. Mask Filter System

No.	Product #	Qty	Net Unit Price	Ext. Price
14	6PPXX271E	2	$12,815.08	$25,630.16
	6PPXX271E RFS Reflective Standard ATSC Mask Filter, 25kW Liquid Cooled, UHF, 6 Pole filter, Factory Tunable Band Width 6MHZ, 4-1/16in Flanged Input & Output			
15	7740156095	2	$168.60	$337.20
	Kit, Mask filter plumbing kit for use with external Pump Module System			
16	9710023203	1	$1,827.15	$1,827.15
	COUPLER, UHF 6-1/8" Flanged, 4 PORT, 48DB, 48DB, 48DB FWD; 48DB RFLD			
17	9929138119	1	$12,827.97	$12,827.97
	Kit RF Line, 6-1/8", 50OHM INCLUDES 6-1/8" FLANGED XMISSION LINE (10 FT LENGTHS) INTERCONNECTING THE PA CABINET AND RF SYSTEM. 1 EA 0860004046 * FLUX, SILVER BRAZING 1 TZ 0860004060 SOLDER, HARD SILVER, 1/16 DIA 4 EA 3591056000 PIPE HANGER, J-TYPE 6.00" INS 3 EA 6180634007 XMSN LINE 6-1/8EIA 120" (CU) 2 EA 6200586000 CONN, AIC 6-1/8 6 EA 6200638000 FLANGE, FIXED 6-1/8EIA (BRASS) 6 EA 6200713000 HDWE KIT FOR 6-1/8EIA (SST) 4 EA 6201336000 EQ ELBOW/90 6-1/8EIA (CU)			
			2. Mask Filter System TOTAL:	$40,622.48

3. Installation/Commissioning

No.	Product #	Qty	Net Unit Price	Ext. Price
18	ULXTE-50 INSTALL	1	$74,800.15	$74,800.15
	WNPB-TV ULXTE-50 INSTALL-COMM. GatesAir Standard Terms and Conditions and the GatesAir standard statement of Work for Service Apply Includes labor and expenses for GatesAir Service Representatives to perform work on site as listed below. Includes complete installation and interconnection of a complete ULXTE-50 transmitter and associated equipment such as RF Mask Filters, external (indoor) pump module assemblies, 50HE Dual Fan Heat Exchangers, Dual HT Exchanger plumbing kits, dummy load, and ULXT Hose Plumbing Kits. Includes installation of cooling system utilizing GatesAir supplied rubber hose plumping kit. Includes installation of RF components utilizing clip coupling components and assumes soft soldiering of cooling system components as necessary on site. Customer to supply appropriate acetylene and oxygen tanks. Includes complete system commissioning into know good customer supplied test load. The commissioning test will be performed utilizing GatesAir calibrated test equipment and standard commissioning test/documentation to GatesAir standard specifications. The project will be considered and planned to be a start to finish project without delay from the installation to the commissioning of system into known good test load. Any customer delays or issues that delay the project once GatesAir personnel are on site will be charged to the customer at GatesAir Standard rates plus expenses. GatesAir will perform the electrical services with the use of a local certified electrician to perform the required electical work needed that directly affects the installation of the GatesAir ULXTE-50 transmitter system. This Includes connecting electrical from existing 480VAC main service to supplied 480 to 208VAC step-down transformer, installing the ULXTE-50 breaker panel and required fuses along with the wiring from the stepdown transformer to the breaker panel, and the electrical wiring from the electrical panel to the GatesAir ULXTE-50 transmitter system and associated GatesAir supplied equipment. GatesAir reserves the right to add charges to the customers invoice for any charges that fall outside GA standard transmitter electrical installation. Project details and assumptions: Assumes all GatesAir supplied equipment has been delivered to site prior to the arrival of the GatesAir service representatives. Assumes site access a minimum of 6 days a week and 10 hours per day.			

No.	Product #	Qty	Net Unit Price	Ext. Price
	Assumes there is adequate space within the facilities to support the installation of all supplied equipment without the removal of any existing equipment. Assumes adequate and proper space existing external to the building to support cooling system. Assumes appropriate electrical and HVAC work to support new equipment has been completed prior to the arrival of the GatesAir services representatives. Assumes GatesAir hired electrician shall be on site the day of or day after the arrival of the GatesAir Services Representatives at the site to discuss equipment layout and final AC connection to each. Assumes electrical work can be completed without delaying installation and commissioning of equipment. Any delays that a considered customer delays can be charged to the customer at GatesAir daily rates plus expenses. Assumes customer qualified staff shall be available to support GatesAir Service Representatives with appropriate site access and other needs as they arise. The normal GatesAir work schedule is (6) days a week and a maximum of (10) hours per day unless other arrangements are negotiated prior to project start dates or depending on the scope of work for the project. Assumes customer's antenna connection is within 12ft of location of RF mask filter. Does not include repair of any existing transmitters or any other customer equipment that will be reused in final configuration. Repairs if required and agreed upon will be charged at the standard GatesAir daily rates plus expenses. Does not include Installation or Commissioning Services of any GatesAir supplied equipment as related to towers, antennas or transmission line from tower to building. Does not include any work beyond commissioning and operational testing of any GatesAir supplied remote control equipment at site, customer responsible for configuration and connection to any link to studio that may exist. Please refer to GatesAir Standard Terms and Conditions of installation and the GatesAir standard statement of Work for Services for other details Does not include any taxes, duties or VAT as related to services performed on-site.			
			3. Installation/Commissioning TOTAL:	$74,800.15

TOTAL:	$675,020.53

This Quote, and any Order resulting from this Quote, is subject to the Standard Terms and Conditions of Sale for GATESAIR which can be located at http://www.gatesair.com/company/legal-compliance/terms-conditions, which are incorporated herein by reference. The Standard Terms and Conditions for GATESAIR shall apply to the exclusion of any other terms and conditions except where expressly agreed in writing and signed by GATESAIR. For a hard copy of the terms and conditions, please call U.S. (513) 459-3502 or fax your request to (513) 459-3796, Attn.: Legal Dept., or email your request to GAContracts@gatesair.com.

As a part of its marketing efforts, GatesAir may publish general information about this order including customer name, solutions acquired, application for which the solutions are intended, and deal value. GatesAir will not publicize specific prices or other specific Confidential Information.

___ I do not authorize GatesAir to publicize this order.

Total Equipment/Services	$675,020.53
Estimated Shipping from Factory	$11,000.00
Total Quote Price (Optional Items Not Included)	**$686,020.53**

Any freight amount shown is estimated and actual amounts will be billed to customer

GatesAir Approval: _____
Brian Szewczyk , Global Sales

Customer Approval: _____

Title: _____

Date: _____

Purchase Order #: _____

Return signed quote to orders@gatesair.com or brian.szewczyk@gatesair.com

Optional Line Items

Optional Test Load

Product #	Qty	Net Unit Price	Ext. Price
BRDDA40F15	1.00	$18,279.94	$18,279.94
Bird "Digital Air Series" forced-air cooled dummy load. 40kW, 6-1/8 EIA flanged; 115V operation. Designed especially to accompany air-cooled digital transmitters, exhibiting excellent VSWR characteristics across the entire UHF Band.			
		Optional Test Load TOTAL:	$18,279.94

Optional Items - not included in Quote Total

Technical Proposal

GatesAir
5300 Kings Island Drive, Suite 101
Mason, OH 45040
Phone: 518-587-9562
Brian.Szewczyk@gatesair.com

30,000 Watt Liquid Cooled

Digital Television Transmitter

Solicitation No. EBA 1900000004

Presented to:

Stephanie L. Gale, Buyer

State of West Virginia, Purchasing Department

By:

Brian Szewczyk, Regional Sales Manager

Primary Contacts

Trademarks

Contact Information

GatesAir has office locations around the world. For locations and contact information see: http://www.gatesair.com/contact

Sales Team

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PO Box 4290
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Tel: 217-222-8200

GATESAIR®

Table of Contents

GatesAir Standard Terms and Conditions of Sale
http://www.gatesair.com/documents/StandardTermsandConditions.pdf

GATESAIR®

Compliance Statement

Description	Response	Clarification
REQUEST FOR QUOTATION EBA 705 LIQUID COOLED TRANSMITTER		
SPECIFICATIONS		
1. PURPOSE AND SCOPE: The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Educational Broadcasting Authority (EBA) to establish a contract for the one-time purchase of a 30,000 Watt Liquid Cooled UHF Digital Television Transmitter.	Understood	
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" means High Power Liquid Cooled UHF Television Transmitter 2.2 as more fully described by these specifications. 2.3 "Pricing Page" means the pages, contained in wvOASIS or attached as Exhibit A, upon which Vendor should list its proposed price for the Contract Items. 2.4 "Solicitation" means the official notice of an opportunity to supply the State with goods or services that is published by the Purchasing Division.	Understood	
3. GENERAL REQUIREMENTS: 3.1 Mandatory Contract Item Requirements: Contract Item must meet or exceed the mandatory requirements listed below.		
3.1.1 Item 1: 30,000 Watt Liquid Cooled UHF Digital Television Transmitter	Comply	ULXTE-50 Liquid cooled UHF transmitter is Capable of 30kW after the mask filter.
3.1.1.1 Manufacturer Qualifications		
3.1.1.1.1 The manufacturer shall have been a provider of broadcast television transmitters for at least 10 years.	Comply	GatesAir has been an innovator in over-the-air broadcasting for nearly 100 years, and today offers the industry's broadest portfolio to help broadcasters deliver and monetize content. The company's roots date to 1922, when Henry C.

Description	Response	Clarification
		Gates founded the Gates Radio and Supply Company. Upon the sale of Gates Radio to Harris Intertype Corporation in 1957. Later Harris Broadcast became GatesAir where we have continued the Broadcast product legacy with in innovative high efficiency broadcast transmitter solutions and complete turn key solutions.
3.1.1.1.1.1 All transmission products shall be compliant will all FCC specifications for service in the United States.	Comply	ATSC 3.0: A/321:2016, A/322:2017, A/330:2016 ATSC A-53, 8-VSB DTV standard RoHS 2011/65/EU Directive 2014/53/EU Safety: EN 60215 EMC: EN 301-489-1 Manufacturing: ISO 9001: 2008 FCC Product & Mask Compliance
3.1.1.1.1.2 Manufacturer shall have produced solid state liquid cooled transmitters with power levels of at least 50,000 watts.	Comply	GatesAir produces Liquid cooled transmitter capable of greater than 150kW using the ULXTED-240
3.1.1.1.1.3 The manufacturer shall have replacement parts available in the continental United States for a period of 10 years from the date of installation.	Comply	Service Replacement parts are stocked in the Manufacturing faculty located in Quincy IL. and will be available for at least 10 years from date of installation.
3.1.1.1.1.4 The manufacturer shall warrant the transmitter and all associated components to be free from defect for 15 months from the date of on-air commissioning.	Comply	The transmitter and all associated components are warrantied to be free from defects for 15 months from the date of on-air commissioning.
3.1.1.2 General		
3.1.1.2.1 Transmitter shall operate on 480V 3 phase power.	Comply	The ULXTE Maxiva UHF high efficiency transmitter can operate using 480V with the use of a 480V to 208V 3 phase step-down transformer that will be provided with the transmitter.
3.1.1.2.2 Step down power (120v, 220V, etc) for exciters and subassemblies shall be derived from the 480V power source.	Comply	The same step-down transformer used for the Transmitter can be used for the lower voltage components.
3.1.1.2.2.1 Vendor shall provide all electrical components required for connection to the 480V 3 phase service.	Comply	All electrical components will be provided including step-down transformers, surge suppressor, wiring, breakers and conduit, based upon a typical AC wiring configuration

Description	Response	Clarification
3.1.1.2.3 All power components with the exception of power supplies shall be liquid cooled.	Comply with Clarification	The ULXTE Maxiva UHF high efficiency transmitter cabinet RF components, including all PA modules, primary PA Module combiners & reject loads are liquid-cooled. The in-cabinet PA Power Block combiners are air-cooled, using liquid-cooled reject loads. All AC to DC Power supplies are air-cooled.
3.1.1.2.3.1 Power components shall include combiners and filters.	Comply	The RF mask filters provided are liquid cooled design. The Hybrid combiners outside the PA cabinets are typical air-cooled, combiners (Hybrids) can be provided in a liquid-cooled design if required.
3.1.1.2.3.2 Exciters and low-level assemblies are permitted to utilize air cooling.	Comply	The XTE exciter are air-cooled design.
3.1.1.2.4 Transmitter shall be capable of operation at an output power level of 30,000 watts.	Comply	The ULXTE-50 can operate using the 888E+ type modules at 30kW after the filter.
3.1.1.2.4.1 Power output shall be measured POST mask filter ·	Comply	The ULXTE-50 can operate using the 888E+ type modules at 30kW after the filter.
3.1.1.2.5 Transmitter shall be installed and operated using the ATSC 1.0 specification.	Comply	The ULXTE Maxiva UHF high efficiency transmitter is designed for Both ATSC 1.0 (8VSB) as well as ATSC 3.0 (OFDM) Modulations at 30kW using the 888E+ type high efficiency modules.
3.1.1.2.5.1 Transmitter shall have the ability to upgrade to the ATSC 3.0 specification.	Comply	The transmitter can be upgraded to ATSC 3.0 by uploading the ATSC 3.0 software into the exciter. No hardware changes required.
3.1.1.2.5.1.1 No reduction in power shall be accepted when changing modulation from ATSC 1.0 to 3.0	Comply	The ULXTE Maxiva UHF high efficiency transmitter is designed for Both ATSC 1.0 (8VSB) as well as ATSC 3.0 (OFDM) Modulations at 30kW using the 888E+ type high efficiency modules.
3.1.1.2.5.1.2 Additional power amplifiers, power supplies, or interstage devices shall not be permitted for transitioning to ATSC 3.0.	Comply	The ULXTE Maxiva UHF high efficiency transmitter is designed for Both ATSC 1.0 (8VSB) as well as ATSC 3.0 (OFDM) Modulations at 30kW using the 888E+ type high efficiency modules.
3.1.1.2.6 Transmitter shall be constructed as a single, inclusive unit.	Comply	The ULXTE-50 Maxiva UHF high efficiency transmitter is designed using two cabinets combined by a Hybrid Combiner to a single output, the unit is provided as a single all-inclusive unit. The pump modules and heat exchangers are designed as separate units and will be installed separately from the transmitter PAs, they will be connected by plumbing and control wiring.

Description	Response	Clarification
3.1.1.2.6.1 Transmitter shall operate between channel 14 (470 MHz) and channel36 (608 MHz).	Comply	The ULXTE Maxiva UHF high efficiency transmitter is designed using the 888E+ type high efficiency modules and is the latest state of the art design for frequencies between 470-610MHz.
3.1.1.2.6.1.1 No tuning or adjustment shall be required to change frequency within the range of 470 to 608 MHz.	Comply	The ULXTE Maxiva UHF high efficiency transmitter is designed using the 888E+ type high efficiency modules and is the newest state of the art design for Frequencies between 470-610MHz.
3.1.1.2.6.2 Transmitter shall be supplied with dual exciters.	Comply	Dual exciters are included.
3.1.1.2.6.2.1 Exciters shall be configured for "hot-standby" operation with automatic switchover upon failure of one of the exciters. ·	Comply	Dual exciters are in a passive-reserve, hot-standby configuration.
3.1.1.2.6.3 All modules and subassemblies shall be built by the same manufacturer (No exciter from manufacturer A, Power blocks from manufacturer B, Control from manufacturer C, etc)	Comply	The complete ULXTE Maxiva UHF high efficiency transmitter is designed and built in the USA by GatesAir.
3.1.1.2.6.3.1 Industry standard sub-assemblies such as RF components and power supplies are permitted with the stipulation that the Vendor shall maintain an inventory of every component and subassembly for a minimum of 10 years from date of commissioning.	Comply	All transmitter components will be available for 10 years or more, after commissioning.
3.1.1.2.6.3.2 Vendor shall provide reverse compatible parts and assemblies- future iterations of software and hardware must not require upgrades to the installed units for compatibility.	Comply	
3.1.1.2.7 Complete system shall operate with a minimum of 40% efficiency at rated power.	Comply	The ULXTE Maxiva transmitter design is high-efficiency design, providing up to at least 40% efficiency at full operating power, including all components of the transmitter up to the cabinet output and including the liquid cooling system.
3.1.1.2.8 Transmitter shall store operating parameters in non-volatile memory during a power	Comply	

Description	Response	Clarification
outage to allow return to normal operation upon power restoration.		
3.1.1.2.9 Transmitter shall have protective measures to prevent damage to assemblies and sub-assemblies	Comply	Each solid-state RF module shall employ internal self-protection circuitry and shall fold back power or shut down in the event of one or more of the following fault conditions occurring: • High VSWR / High reflected power • RF input overdrive • Heat sink over-temperature • Over voltage / Under voltage • Transistor Over Current Each PA Module DC Power Supply shall be protected against overload conditions, including the following: • Over temperature • Over voltage • Over current
3.1.1.2.9.1 These measures at a minimum shall protect against: 3.1.1.2.9.1.1 Overtemperature 3.1.1.2.9.1.2 Cooling system failure 3.1.1.2.9.1.3 Loss of single AC Phase 3.1.1.2.9.1.4 VSWR	Comply	Exciter fault VSWR Cooling fault/failure Overtemperature fault PA Module fault /failure PA Power Supply fault /failure AC phase loss External interlock
3.1.1.2.9.1.4.1 During high VSWR conditions transmitter shall decrease operating power to a safe level and restore to full power operation upon cessation of reflective anomalies.	Comply	VSWR Foldback circuitry shall be provided, allowing uninterrupted operation at reduced power if VSWR slowly increases beyond a preset point. As VSWR increases, forward power shall be reduced automatically to maintain a constant level of reflected power. Decreasing VSWR shall cause the power level to increase until the original output power is restored

Description	Response	Clarification
3.1.1.3 Control and Operation 3.1.1.3.1 System monitoring and Control shall be on the front panel in plain view. 3.1.1.3.1.1 Monitoring 3.1.1.3.1.1.1 The following parameters shall be available for display on the front panel 3.1.1.3.1.1.1.1 Forward average power 3.1.1.3.1.1.1.2 Reflected average power 3.1.1.3.1.1.1.3 VSWR 3.1.1.3.1.1.1.4 Power Amplifier Supply Voltages 3.1.1.3.1.1.1.5 Power Amplifier Supply Currents 3.1.1.3.1.1.1.6 Control System Supply Voltages 3.1.1.3.1.1.1.7 Control System Supply Currents 3.1.1.3.1.1.1.8 AC Supply Voltages 3.1.1.3.1.1.1.9 Power Amplifier Module Aggregate Currents 3.1.1.3.1.1.1.10 Power Amplifier Module Aggregate RF Forward Power 3.1.1.3.1.1.1.11 Power Amplifier Module Aggregate RF Reflected Power 3.1.1.3.1.1.1.12 Power Amplifier Heatsink Temperatures	Comply	The following parameters are monitored and are available for display on the transmitter front panel display: • Forward average power • Reflected average power • VSWR • All PA Power supply voltages • All PA Power supply currents • Control system PS voltages • Control system PS currents • AC line voltages • Fault summary log • Cooling status • PA Module currents • PA heatsink temperatures • PA forward powers • PA Module reflected powers • Exciter fault • Control system fault • Cooling fault • PA Module fault • PA Power Supply fault • AC phase loss • External interlock
3.1.1.3.1.1.2 Fault Summary Log which shall include: 3.1.1.3.1.1.2.1 Exciter Fault 3.1.1.3.1.1.2.2 VSWR Fault 3.1.1.3.1.1.2.3 Control System Fault 3.1.1.3.1.1.2.4 Power amplifier Module Fault 3.1.1.3.1.1.2.5 Cooling System Fault 3.1.1.3.1.1.2.6 Power amplifier Power Supply Fault 3.1.1.3.1.1.2.7 External Interlock 3.1.1.3.1.1.2.8 AC Phase Loss		

Description	Response	Clarification
3.1.1.3.1.1.2.9 Fault events shall be stored in memory for recall and display on the transmitter front panel 3.1.1.3.1.1.2.10 Cooling system Status		
3.1.1.3.1.2 Transmitter "On" and "Off" shall use dedicated buttons or switches.	Comply	Transmitter on and off is controlled via the front panel from dedicated tactile buttons requiring depression to actuate.
3.1.1.3.1.3 Touchscreen control is permitted PROVIDING there are tactile switches available for the following functions: 3.1.1.3.1.3.1 Transmitter On. 3.1.1.3.1.3.2 Transmitter Off. 3.1.1.3.1.3.3 Fault Reset.	Comply	The transmitter on tactile button is the reset as well as transmitter On.
3.1.1.3.2 There shall be a main system controller controlling: 3.1.1.3.2.1 Power Cabinet 3.1.1.3.2.2 VSWR foldback 3.1.1.3.2.3 External interlock 3.1.1.3.2.4 Power Raise and Lower functions 3.1.1.3.2.5 Remote control interface	Comply	A main system level controller is responsible for all system level functions, including: multiple power block, multiple amplifier cabinet control, remote control interface and VSWR Foldback, external interlock and power raise/lower functions.
3.1.1.3.2.5.1 Transmitter shall have a Web based control and monitoring interface included.	Comply	An HTML web GUI control and monitoring interface is included. The remote PC, tablet, or mobile phone shall use a standard web browser (i.e. Internet Explorer, Firefox, etc.) and not require any custom software.
3.1.1.3.2.5.2 Web GUI shall use a standard HTML protocol	Comply	An HTML web GUI control and monitoring interface is included. The remote PC, tablet, or mobile phone shall use a standard web browser (i.e. Internet Explorer, Firefox, etc.) and not require any custom software.
3.1.1.3.2.5.2.1 Java, Javascript, and similar translation software is specifically forbidden.	Comply	

Description	Response	Clarification
3.1.1.3.2.5.3 Transmitter shall have the ability for external remote control and monitoring.	Comply	ULXTE Transmitter includes as standard an SNMP interface & A Web-based remote control/monitoring system
3.1.1.3.2.5.4 Remote control connections shall be parallel with no additional components or modifications required.	Comply	The ULXTE transmitter is designed for unattended remote-control operation and is compatible with standard commercial parallel remote-control systems.
3.1.1.4 Exciter		
3.1.1.4.1 Exciter shall be a purpose-built assembly, modified PC chassis-based units will not be acceptable.	Comply	The XTE exciter is a purpose-built device using embedded processing technology to create all Input, waveform and RF generation.
3.1.1.4.2 Exciter shall be a stand-alone unit- with the ability to operate outside of the transmitter main assembly for testing.	Comply	The EXT exciter is a self-contained unit, including RF enclosure, regulated power supplies, baseband circuits, modulator, up-converter, RF amplifier and frequency processing circuits. It provides a fully-processed and pre-corrected, on channel, ATSC 1.0 RF signal. Two modulation codes can be stored in the exciter simultaneously, allowing a fast change between revisions of the software, or between ATSC 1.0 and ATSC 3.0.
3.1.1.4.2.1 Exciter shall operate on standard US power (110-230VAC, 50- 60Hz	Comply	The exciter operates on standard US power (110-230VAC, 50- 60Hz)
3.1.1.4.2.2 Exciter shall utilize a standard IEC power cord for standalone operation.	Comply	The exciter utilizes a standard IEC power cord for standalone operation.
3.1.1.4.2.3 Exciter shall generate a fully processed, pre-corrected, on channel ATSC-l.RF signal.	Comply	The XTE exciter provides a fully-processed and pre-corrected, on channel, ATSC 1.0 RF signal.
3.1.1.4.3 Exciter shall accept both ASI/SMPTE 310 inputs AND lGBE TSoIP inputs.	Comply	The XTE exciter includes two (2) ASI/SMPTE-310M inputs along with (2) 1GBE TSoIP inputs. These provide redundancy with seamless auto-switching. ASI inputs are HD-BNC female, 75 ohms
3.1.1.4.3.1 Exciter shall have 2 (two) ASI/SMPTE 310 inputs capable of automatically switching for redundant operation.	Comply	The XTE exciter includes two (2) ASI/SMPTE-310M inputs and provide redundancy with seamless auto-switching operation.
3.1.1.4.3.1.1 Inputs shall be HD-BNC female with a termination impedance to 75 Ohms.	Comply	The ASI/SMPTE-310M inputs are HD-BNC female, 75 ohms termination impedance.
3.1.1.4.3.2 Exciter shall have 2 (two) lGBE TSoIP inputs capable	Comply	The XTE exciter includes two (2) native 1GBE TSoIP inputs. These provide redundancy with

Description	Response	Clarification
of automatically switching for redundant operation.		seamless auto-switching. TSoIP input connectors are RJ-45, female The exciter TSoIP inputs can also be used with native IP inputs, compatible with the ATSC 3.0 standard.
3.1.1.4.3.2.1 Inputs shall be RJ45 female.	Comply	TSoIP input connectors are RJ-45, female
3.1.1.4.4 The reference shall be one (1) high stability temperature-controlled oscillator from which all frequencies shall be generated. 3.1.1.4.4.1 Stability of the oscillator shall be 4.2 X 10"'8 Hertz per month 3.1.1.4.4.2 An internal GPS receiver shall be included for precision frequency referencing. 3.1.1.4.4.3 An external GPS reference input shall be included. 3.1.1.4.4.3.1 The reference input shall be BNC female 3.1.1.4.4.3.2 The reference input termination impedance shall be 75 Ohms.		The XTE exciter includes a single high stability temperature-controlled crystal oscillator (TCXO) used to generate all required frequencies. The stability of the internal TCXO is better than 4.2 x 10-8 per month (< 36Hz/Month frequency drift). An internal GPS receiver for precision frequency control is included. External GPS reference inputs are included. The inputs are HD-BNC 75 ohms, including 10MHz/1 PPS for SFN synchronization. An adapter from HD-BNC to BNC will be provided.
3.1.1.5 Power Amplifiers		
3.1.1.5.1 All power amplifier modules shall be solid state.	Comply	All RF amplifier stages are 100% solid-state
3.1.1.5.1.1 All RF power modules shall be liquid cooled.	Comply	The ULXTE RF Power Amplifier modules are liquid-cooled.
3.1.1.5.1.2 All RF power modules shall be "hot-swappable" under full power transmitter operation.	Comply	The ULXTE Solid-state RF PA modules are capable of being easily removed and replaced during normal on-air operation of the transmitter. It is not necessary to reduce RF drive, remove cabinet power, or make any adjustments when replacing modules.
3.1.i.5.1.2.1 All RF modules shall have self-sealing coolant connectors, allowing module replacement without isolating or diverting coolant utilizing manual cutoff valves.	Comply	The ULXTE PA Module liquid connectors are self-sealing and hot-pluggable.
3.1.1.5.1.3 All Power Amplifier modules shall be broadband from 470 to 608 MHz.	Comply	All Power Amplifier modules are broadband from 470 to 610 MHz.
3.1.1.5.1.3.1 Tuning or configuration shall not be	Comply	With the ULXTE transmitter, no tuning, jumper changes, or other manual adjustments are

Description	Response	Clarification
required for change in frequency of operation.		required when changing frequency of operation or replacing any 888E amplifier Module with any spare PA module. This allows a single spare amplifier to be easily used in any transmitter in a network, between channels 14 and 36.
3.1.1.5.1.3.2 Power output shall be uniform for operation from 470 to 608 MHz.	Comply	
3.1.1.5.1.4 Power Amplifiers both as individual units and combined shall operate with identical average power levels under both ATSC 1.0 and ATSC 3.0 modulation standards.	Comply	The power amplifiers utilize the newest technology LDMOS devices, Ampleon BLF-888E asymmetrical Doherty RF devices which are utilized to operate with identical average power levels under both ATSC 1.0 and ATSC 3.0 modulation standards.
3.1.1.6 Power Supplies		
3.1.1.6.1 The number of amplifier power supplies shall be equal to the number of amplifiers	Comply	Each ULXTE PA Module has its own DC Power Supply in a one to one relationship of power supply to PA module.
3.1.1.6.1.1 Each power supply shall be independent and be replaceable during full power operation.	Comply	Each ULXTE, DC Power Supply is a completely separate and independent assembly from the PA module and is separately hot-pluggable.
3.1.1.6.1.1.1 Power supplies shall be removable and not require transmitter to be turned off to re-install.	Comply	Power supplies can be removed and reinstalled with transmitter running. A power supply can be removed and replaced in less than 30 seconds.
3.1.1.6.1.2 Power supplies shall tolerate +/- 15% input variation while maintaining a constant output voltage.	Comply	To ensure stable performance for the ULXTE transmitter each power supply is designed to operate over a wide range of conditions, the output voltage is regulated from zero to full rated load current, and for AC line voltage fluctuations of up to -15% and +15% from nominal.
3.1.1.6.1.3 Each power supply shall have internal protection at a minimum for: 3.1.1.6.1.3.1 High Temperature 3.1.1.6.1.3.2 Overvoltage 3.1.1.6.1.3.3 Overcurrent	Comply	Each DC Power Supply is protected against overload conditions, including the following: Over temperature Over voltage Over current
3.1.1.6.1.3.3.1 Power Supply overload status shall be available locally and remotely.	Comply	

Description	Response	Clarification
3.1.1.6.1.3.4 Each Power Supply shall have status indicators providing the following information 3.1.1.6.1.3.4.1 Input voltage OK 3.1.1.6.1.3.4.2 Output voltage OK 3.1.1.6.1.3.4.3 High Temperature 3.1.1.6.1.3.4.4 Voltage and/or Current fault	Comply	Each Power supply has status indicators with multicolor LED's including but not limited to the following alarms: Input okay Output okay Over-temperature Warning s & Faults Voltage & Current Faults
3.1.1.7 RF Dividers and Combiners		
3.1.1.7.1 All RF dividers and Combiners shall be broad band and able to operate at any frequency between channel 14 (470 MHz) and channel 36 (608 :MHz).	Comply	
3.1.1.7.1.1 No tuning or phasing shall be required to change operating frequency.	Comply	
3.1.1.7.2 All combiners shall be liquid cooled.	Partial Comply (see detailed technical explanation)	GatesAir has carefully engineered and optimized the combining design for the best technical solution. Our solution is based many years of experience and knowledge in this area: 1. The internal combiners that combine the Power Amplifier modules within each Power Block are 100% liquid cooled. These are inside of each liquid-cooled Power Block, comprising 10 PA's. 2. Each tx cabinet, includes a single 2-way, or 3-way hybrid combiner that combines the 2 or 3 Power Blocks located inside the cabinet. These only need convection-cooling as they have extremely low insertion loss and therefore generate very little heat. Because of this there is no requirement for the complexity of liquid-cooling. 3. Externally to the cabinets, there is a single 3.98dB air-cooled hybrid combiner. This is used to combine the outputs of the two transmitter racks. This has extremely low insertion loss and only needs convection cooling, avoiding the complexity of any liquid-cooling system.

Description	Response	Clarification
		Our approach has been designed to provide the most reliable system solution, removing as much heat as possible with the liquid cooling where appropriate but using convection cooling for items that generate very little heat.
3.1.1.7.2.1 All combiner reject loads shall be liquid cooled.	Comply	GatesAir has carefully engineered and optimized the reject load design for the best technical solution. Our solution is based many years of experience and knowledge in this area: 1. The internal reject loads within each Power Block are 100% liquid cooled. These are inside of each liquid-cooled Power Block, comprising 10 PA's. 2. Each tx cabinet, includes a single 2-way, or 3-way hybrid combiner that combines the 2 or 3 Power Blocks inside the cabinet. These are liquid-cooled. 3. Externally there is a single 3.98dB air-cooled hybrid combiner. This is used to combine the outputs of the two transmitter racks. The reject load for this combiner is typically air-cooled. The reason for an air-cooled load to be used at this point is due to the following technical points: a) The reject load normally dissipates virtually no power, under normal operating conditions. The final combiner reject load only dissipates power when there is a transmitter fault that results in one cabinet not producing its normal RF power. b) An air-cooled load for the final combining state is totally independent of each PA cabinet's liquid cooling system. A liquid-cooled load would require its own cooling system to be independent which adds complexity to the system. This also reduces the system efficiency as the coolant must be circulated all of the time, even when there is no power (heat) to be removed.

<table>
<tr><th>Description</th><th>Response</th><th>Clarification</th></tr>
<tr><td></td><td></td><td>However, GatesAir can provide a liquid-cooled reject load for the external final combiner, if this is required. This needs to be stated at the time o0f the order.</td></tr>
<tr><td>3.1.1.7.2.1.1 Combiner reject loads shall be of sufficient size to accommodate a worst-case amplifier failure or removal.</td><td>Comply</td><td></td></tr>
<tr><td>3.1.1.7.2.1.1.1 Vendor shall provide an operational chart indicating transmitter power output during multiple module failures and preferred configuration for best acceptable practice for reduced power operation.</td><td>Comply</td><td>Please refer to table below for power levels during PA module removal.

<table>
<tr><th>Model: ULXTE-50
Fault Status</th><th>% of Max.</th><th>Post Filter Pout (kW)</th></tr>
<tr><td>No Faults</td><td>100%</td><td>30.0</td></tr>
<tr><td>Any Single PA or PS OFF</td><td>96.0%</td><td>28.8</td></tr>
<tr><td>Any 2 PA's or PS’s OFF</td><td>92.2%</td><td>27.7</td></tr>
<tr><td>Any 3 PA's or PS’s OFF</td><td>88.4%</td><td>26.5</td></tr>
<tr><td>Any 4 PA's or PS’s OFF</td><td>84.6%</td><td>25.4</td></tr>
</table>

There is no “preferred configuration” for reduced power operation. The system has been designed to operate continuously, even in the event of one or more PA modules being removed from operation.</td></tr>
<tr><td colspan="3">3.1.1.8 Cooling System</td></tr>
<tr><td>3.1.1.8.1 Complete cooling system shall be provided with the transmitter.</td><td>Comply</td><td>The ULXTE-50 Maxiva cooling systems are designed as a completely redundant cooling system. Each PA Cabinet has a complete cooing system including Pump Module with two redundant pumps and heat exchanger with Dual fans to provide the highest cooling system redundancy and reliability in the industry.</td></tr>
<tr><td>3.1.1.8.1.1 All components shall be provided including but not limited to:
3.1.1.8.1.1.1 Plumbing, Pumps, Fans, Ducting, Heat Exchangers, Sensors and Monitoring, and Filters.
3.1.1.8.1.1.2 Positive Lockout/Tagout disconnect</td><td>Comply</td><td>The ULXTE Transmitter system includes Plumbing, Pumps, Fans, Ducting, Heat Exchangers, Sensors, Monitoring, Filters, and Positive Lockout/Tagout disconnect switches installed for pumps and fan assemblies.</td></tr>
</table>

Description	Response	Clarification
switches shall be installed for pumps and fan assemblies		
3.1.1.8.1.1.3 Cooling system shall include dual outdoor heat exchangers 3.1.1.8.1.1.3.1 Heat exchangers shall have a SOKW heat dissipation rating 3.1.1.8.1.1.3.2 Heat exchangers shall have dual lHP fans for redundant operation.	Comply	The ULXTE outdoor heat exchanger cooling system includes a fluid cooler heat exchanger with dual fans, each with individual control. The Fans have variable speed controller used to maintain optimum coolant temperature and to conserve energy. The Fan motors are 3/4hp. 1HP fans are not required.
3.1.1.8.1.1.4 Cooling system shall include dual pumps for redundant operation. 3.1.1.8.1.1.4.1 Pump changeover shall be automatic in the event of a pump failure or by manual control from the transmitter control panel. 3.1.1.8.1.1.4.2 Pumps shall operate in parallel with both pumps individually able to accommodate full power operation. 3.1.1.8.1.1.4.3 Liquid Flow Rate shall be adjustable for efficient heat transfer. 3.1.1.8.1.1.4.4 Rate may be adjusted by varying pump speeds or a waste-gate mixture control 3.1.1.8.1.1.4.5 Valves shall be provided to allow pump replacement during full power operation. 3.1.1.8.1.1.4.6. Power output shall not be de-rated during single pump operation.	Comply	The ULXTE Maxiva liquid-cooled transmitter system pump module includes dual, redundant pumps with automatic changeover in the event of a pump failure shall be provided. The pumps also are capable of manual changeover from the transmitter control panel, or remotely. Pump speed (and liquid flow rate) are adjustable, to maximize transmitter system efficiency. The Pumps operate in parallel mode and each pump is capable of individually handling the full load at rated power and temperature. It is possible to safely isolate and replace a pump, while the other pump is in operation and the transmitter operating at full power at maximum rated ambient temperature.

Description	Response	Clarification
3.1.1.8.2 Liquid Coolant shall be a readily available “off the shelf” product. 3.1.1.8.2.1 Vendor shall provide brand and formulation of recommended coolant. 3.1.1.8.2.2 Vendor shall specify the coolant/water ratio for operation, in addition to testing, flushing and replacement schedules. 3.1.1.8.2.3 MSDS information shall be provided, with handling instructions for both the coolant concentrate and water/coolant mixtures. 3.1.1.8.2.4 Coolant shall have included in the formulation anti-corrosion and other stabilization products.	Comply	The ULXTE Maxiva transmitter system utilizes off the shelf, Prestone AF2000 coolant available at any auto parts store. The coolant ratio is 50%-50% mix of ethylene glycol (Prestone) and Distilled water. A MSDS information document will be included with transmitter documentation upon order.
3.1.2 Item 2: Mask Filter 3.1.2.1 Vendor shall provide am ATSC Mask Filter 3.1.2.2 Filter shall be liquid cooled	Comply	Mask filter is liquid-cooled.
3.1.2.2.1 All plumbing and accessories necessary for integration into the transmitter cooling system shall be provided by the vendor.	Comply	
3.1.2.3 Filter shall be rated for continuous full power operation.	Comply	
3.1.2.4 Filter shall be factory tunable for 6MHz bandwidth.	Comply	
3.1.2.5 All RF connections and components shall be rated for continuous full power operation.	Comply	
3.1.2.6 Vendor shall supply all interconnection components required to integrate transmitter and mask filter into the transmission feed line.	Comply	
3.1.3 Item 3: Integration and Commissioning **3.1.3.1 Installation**		
3.1.3.1.1 Vendor shall provide installation of all assemblies and subassemblies.	Comply	

Description	Response	Clarification
3.1.3.1.1.1 Sub-contractors are permitted with the stipulation that responsibility for correct installation and adherence to manufacturer's instructions.	Comply	
3.1.3.1.1.1.1 Certification of sub-contractors shall be the sole responsibility of the vendor	Comply	
3.1.3.1.2 Vendor shall be responsible for the entire installation from the AC disconnect panel to the output of the Mask Filter	Comply	
3.1.3.2 Commissioning 3.1.3.2.1 Vendor shall ensure that all systems are installed correctly and are operating as designed	Comply	
3.1.3.2.2 Vendor shall certify FCC compliance with both ATSC 1.0 and ATSC 3.0 operation.	Comply	
3.1.3.2.3 Vendor shall demonstrate backup system operation by deliberately failing (or a reasonable simulation of sub-system failure) of all redundant systems	Comply	
3.1.3.2.4 Entire system shall operate a minimum of 24 hours error free before commissioning is accepted.	Comply	
3.1.3.2.4.1 Transmitter shall be operated at full power into a resistive load during commissioning testing.	Comply	
3.1.3.2.4.2 Power failure during commissioning testing will not negate the test and be excepted from the "no error" stipulation IF the transmitter recovers to nominal operation without intervention.	Comply	
4. CONTRACT AWARD: 4.1 Contract Award: The Contract is intended to provide Agencies with a purchase price for the Contract Items. The Contract shall be awarded to the	Understood	

Description	Response	Clarification
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 Page: Vendor should complete the Pricing Page in full as failure to complete the Pricing Page in its entirety may result in Vendor's bid being disqualified.	Comply	
Vendor should type or electronically enter the information into the Pricing Page to prevent errors in the evaluation.	Comply	
5. PAYMENT: 5.1 Payment: Vendor shall accept payment in accordance with the payment procedures Of the State of West Virginia.	Comply	
6. DELIVERY AND RETURN: 6.1 Shipment and Delivery: Vendor shall ship the Contract Items immediately after being awarded this Contract and receiving a purchase order or notice to proceed.	Comply	
Vendor shall deliver the Contract Items within 90 working days after receiving a purchase order or notice to proceed. Contract Items must be delivered to Agency at WNPB Transmitter Site, 1309 Sand Springs Road, Morgantown WV	Comply	
6.1.1 Prior coordination is required for delivery	Comply	
6.1.2 Use of GPS navigation is strongly discouraged. There is a history of guidance systems directing drivers to an impassable section of road.	Understood	
6.2 Late Delivery: The Agency placing the order under this Contract must be notified in writing if the shipment of the Contract Items will be delayed	Comply	

Description	Response	Clarification
for any reason. Any delay in delivery that could cause harm to an Agency will be grounds for cancellation of the Contract, and/or obtaining the Contract Items from a third party.		
Any Agency seeking to obtain the Contract Items from a third party under this provision must first obtain approval of the Purchasing Division.	Comply	
6.3 Delivery Payment/Risk of Loss: Vendor shall deliver the Contract Items F.O.B. destination to the Agency's location.	Comply	
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, or the Agency shall receive a full credit or refund for the purchase price, at the Agency's discretion.	Comply	
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	Comply	

Description	Response	Clarification
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.		

GATESAIR®

Equipment List

Equipment List

1. Transmitter

No.	Product #	Qty
1	ULXTE-50	1

TRANSMITTER, ULXTE-50
GatesAir Maxiva Series ULXTE-50 High Efficiency Broadband Liquid-Cooled, Solid-State, Television Transmitter, 6-1/8" EIA flanged.
Transmitter output power before mask filter: E-Type Band A Power Amplifier Module 470-590Mhz: 31700W
Three-Phase 208/220/240 Volts, or 380/400/415 Volts WYE, 50/60Hz.

I. TRANSMITTER CONTROL SUPPLIED WITH:
(1) System / Transmitter Manager (STM) with:
- Web Remote with RJ45 connector
- Transmitter Monitor & Display Logic Board
- Life Support Logic Board
- Exciter switcher assembly
- (2) redundant Switch Mode Power supplies (hot swappable)
- System forward & reflected power monitoring
- Wireless access point/device

(1) XTE (TM) Multi Standard Exciter with:
Modulation software upgradeable
- RTAC(TM) (Real-Time Adaptive Correction)
- Easy-to use operator interface via standard Web browser and external PC
- Front panel display and control
- Built-in compliance monitoring
- (2) ASI/SMPTE-310 inputs with auto-switching
- (2) IP Transport inputs with auto-switching
- 10MHz and 1PPS input for timing reference
- Integrated GPS receiver (Antenna/cable sold separately)
- Built in battery UPS
- For ATSC 1.0 modulation, optional SFN (software key required)
Note: secondary exciter available as an option

II. TRANSMITTER SYSTEM:
(5) 13RU PA power block with:
- (10) Compact UHF High Efficiency Plug-In LDMOS Power Amplifier Modules with pre-driver
- (2) Phase and gain modules with auto switching
- (11) Compact High Efficiency Switch Mode Plug-In Power Supplies
- (1) Primary 2-Way RF Power Splitter/Divider
- (2) 5-Way RF Power Splitter/Divider
- (1) 10-Way Liquid Cooled RF Power Combiner with Reject Loads
Power Block controller includes:
- Power block control, monitoring & protection
- Liquid flow monitoring
- Cooling systems pump control
- Power block forward & reflected power monitoring
(2) Transmitter Equipment cabinet, designed for multi block systems.
Standard AC distribution includes:
- Control AC breakers and wiring
- Power bock AC Distribution without power block breakers
Note: Customer supplies AC wall breakers for each block and control AC input.
(1) Power block 2 port Hybrid combiner with liquid cooled reject load.
(1) Power block 3 port Hybrid combiner with liquid cooled reject loads.
(1) Hybrid cabinet combiner with Air Cooled reject load
External I/O board with parallel remote interface

No.	Product #	Qty
	III. MISCELLANEOUS COMPONENTS INCLUDED (1) System Directional Coupler Assembly for Power Metering and RTAC (Pre-Filter) (5) Power block Directional Coupler Assembly (2) Broadband Low Pass filter (Harmonic Filter) (1) Factory Test at Rated Customer Power IV. (2) External indoor Pump Module & cooling systems (typical), not included with transmitter line item, sold separately (see separate line items below), line items include: (1) external indoor pump module with: - Pump module control interface board - (2) Pump AC inverters - (2) Heat exchanger AC inverters - (2) Liquid cooling pumps (1) Heat Exchanger & cooling lines: - 50kW Heat Exchanger (dual fan) - Kit cooling system hose assembly and hardware V. TECHNICAL MANUALS (1) Maxiva ULXTE Series Transmitter Manual (1) Maxiva ULXTE Series Transmitter Drawing Package VI. OPTIONS (not included, sold separately): - Mask Filter - Post Mask Filter Directional Coupler - Secondary exciter - AC distribution single AC feed to cabinet with Power block breakers (Delta) - AC distribution single AC feed to cabinet with Power block breakers (Wye)	
2	PA-ULXTE-E-BAND-A	50
	ASSY, PA MODULE, ULXTE, BAND "A" "888E BAND A PALLET/MODULE TYPE" UHF 470-590MHz BANDED MODULE "FOR PA MODULE SELECTION WITH MAIN TRANSMITTER LINE ITEM" "MUST HAVE TRANSMITTER LINE ITEM"	
3	XTE-EXCITER-MS	1
	XTE Multi Standard Exciter with: - Modulation software upgradeable - RTAC(TM) (Real-Time Adaptive Correction) - Easy-to use operator interface via standard Web browser and external PC - Front panel display and control - Built-in compliance monitoring - Two ASI inputs with auto switching - IP input - 10MHz and 1PPS inputs - Integrated GPS (Antenna sold separately) - Built in UPS -For ATSC modulation optional SFN (software key required)	
4	XTE-SW-AT-1-2	2
	XTE ATSC 1.0/2.0 MODULATION SOFTWARE	
5	9710080087	1
	KIT, ULXTE SYSTEM THIS KIT INCLUDES 50FT CU STRAP, 100FT RG223 COAX CABLE, 150FT 2 COND CABLE (INTERLOCK), SMA & N CONNECTORS, WAGO TOOL	
6	9929139090	2
	KIT, INSTALL MATERIAL, MAXIVA 1 PA CAB	

No.	Product #	Qty
	INCLUDES MATERIAL TO INSTALL SINGLE PA CAB, UNISTRUT 10 FT LENGTH	
7	9950333006	2
	ASSY, EXTERNAL (INDOOR) PUMP MODULE, HE II 50/60HZ, 208-240V/308-415V INCLUDES: (2) PUMPS (1) PUMP CONTROLLER (2) PUMP INVERTERS 2HP (2) HEAT EXCHANGER INVERTERS 2HP PUMP MODULE FRAME	
8	9810147001	2
	HEAT EXCHANGER, GATESAIR 50HE, DUAL FAN 3 PHASE INVERTER RATED, 1HP FAN MOTORS 50KW NOMINAL HEAT DISIPATION	
9	7740156080	2
	KIT, PLUMBING FLX/VLX/ULXT HOSE Plumbing Kit, Hose For use with FLX/VLX/ ULXT transmitter. Includes: * 2 - 50ft Hoses * Hose Barbs * Manifold *Sight Flow Indicator * Misc. plumbing parts * Hardware Kit	
10	0217510003	50
	ADDITIONAL COOLING SYSTEM HOSE, RUBBER, 1-1/2" ID	
11	511010030	4
	EXTENDED LIFE ANTIFREEZE/COOLANT_ CONCENTRATE_ETHYLENE GLYCOL, DIETHYLENE GLYCOL_CASE OF SIX (1-GALLON CONTAINERS)_AF2000-6PK_ *MSDS REQD EACH SHIPMENT**	
12	480TO208-150KVA	1
	150 Kva Transformer three phase 480v Delta primary, 208v Wye secondary, K-13 Rated	
13	ULX-1YRWARRANTY	1
	Maxiva ULXTE Standard 1 year Warranty Valid for 15 months from date of shipment Additional Details of this warranty are covered in the GatesAir General Terms and Conditions.	

2. Mask Filter System

No.	Product #	Qty
14	6PPXX271E	2
	6PPXX271E RFS Reflective Standard ATSC Mask Filter, 25kW Liquid Cooled, UHF, 6 Pole filter, Factory Tunable Band Width 6MHZ, 4-1/16in Flanged Input & Output	
15	7740156095	2
	Kit, Mask filter plumbing kit for use with external Pump Module System	
16	9710023203	1

No.	Product #	Qty
	COUPLER, UHF 6-1/8" Flanged, 4 PORT, 48DB, 48DB, 48DB FWD; 48DB RFLD	
17	9929138119	1

Kit RF Line, 6-1/8", 50OHM
INCLUDES 6-1/8" FLANGED XMISSION LINE (10 FT LENGTHS) INTERCONNECTING THE PA CABINET AND RF SYSTEM.
1 EA 0860004046 * FLUX, SILVER BRAZING
1 TZ 0860004060 SOLDER, HARD SILVER, 1/16 DIA
4 EA 3591056000 PIPE HANGER, J-TYPE 6.00" INS
3 EA 6180634007 XMSN LINE 6-1/8EIA 120" (CU)
2 EA 6200586000 CONN, AIC 6-1/8
6 EA 6200638000 FLANGE, FIXED 6-1/8EIA (BRASS)
6 EA 6200713000 HDWE KIT FOR 6-1/8EIA (SST)
4 EA 6201336000 EQ ELBOW/90 6-1/8EIA (CU)

3. Installation/Commissioning

No.	Product #	Qty
18	ULXTE-50 INSTALL	1

WNPB-TV ULXTE-50 INSTALL-COMM.
GatesAir Standard Terms and Conditions and the GatesAir standard statement of Work for Service Apply
Includes labor and expenses for GatesAir Service Representatives to perform work on site as listed below.
Includes complete installation and interconnection of a complete ULXTE-50 transmitter and associated equipment such as RF Mask Filters, external (indoor) pump module assemblies, 50HE Dual Fan Heat Exchangers, Dual HT Exchanger plumbing kits, dummy load, and ULXT Hose Plumbing Kits.
Includes installation of cooling system utilizing GatesAir supplied rubber hose plumping kit.
Includes installation of RF components utilizing clip coupling components and assumes soft soldiering of cooling system components as necessary on site. Customer to supply appropriate acetylene and oxygen tanks.
Includes complete system commissioning into know good customer supplied test load. The commissioning test will be performed utilizing GatesAir calibrated test equipment and standard commissioning test/documentation to GatesAir standard specifications.
The project will be considered and planned to be a start to finish project without delay from the installation to the commissioning of system into known good test load. Any customer delays or issues that delay the project once GatesAir personnel are on site will be charged to the customer at GatesAir Standard rates plus expenses.
GatesAir will perform the electrical services with the use of a local certified electrician to perform the required electical work needed that directly affects the installation of the GatesAir ULXTE-50 transmitter system. This Includes connecting electrical from existing 480VAC main service to supplied 480 to 208VAC step-down transformer, installing the ULXTE-50 breaker panel and required fuses along with the wiring from the stepdown transformer to the breaker panel, and the electrical wiring from the electrical panel to the GatesAir ULXTE-50 transmitter system and associated GatesAir supplied equipment. GatesAir reserves the right to add charges to the customers invoice for any charges that fall outside GA standard transmitter electrical installation.
Project details and assumptions:
Assumes all GatesAir supplied equipment has been delivered to site prior to the arrival of the GatesAir service representatives.
Assumes site access a minimum of 6 days a week and 10 hours per day.
Assumes there is adequate space within the facilities to support the installation of all supplied equipment without the removal of any existing equipment.
Assumes adequate and proper space existing external to the building to support cooling system.
Assumes appropriate electrical and HVAC work to support new equipment has been completed prior to the arrival of the GatesAir services representatives.
Assumes GatesAir hired electrician shall be on site the day of or day after the arrival of the GatesAir Services Representatives at the site to discuss equipment layout and final AC connection to each. Assumes electrical work can be completed without delaying installation and commissioning of equipment.
Any delays that a considered customer delays can be charged to the customer at GatesAir daily rates plus expenses.
Assumes customer qualified staff shall be available to support GatesAir Service Representatives with appropriate site access and other needs as they arise. The normal GatesAir work schedule is (6) days a week and a maximum of (10) hours per day unless other arrangements are negotiated prior to project start dates or depending on the scope of work for the project.
Assumes customer's antenna connection is within 12ft of location of RF mask filter.
Does not include repair of any existing transmitters or any other customer equipment that will be reused in final configuration. Repairs if required and agreed upon will be charged at the standard GatesAir daily rates plus expenses.
Does not include Installation or Commissioning Services of any GatesAir supplied equipment as related to towers, antennas or transmission line from tower to building. Does not include any work beyond commissioning and operational testing of any GatesAir supplied remote control equipment at site, customer responsible for configuration and connection to any link to studio that may exist.

No.	Product #	Qty
	Please refer to GatesAir Standard Terms and Conditions of installation and the GatesAir standard statement of Work for Services for other details Does not include any taxes, duties or VAT as related to services performed on-site.	

Optional Test Load

Product #	Qty
BRDDA40F15	1.00
Bird "Digital Air Series" forced-air cooled dummy load. 40kW, 6-1/8 EIA flanged; 115V operation. Designed especially to accompany air-cooled digital transmitters, exhibiting excellent VSWR characteristics across the entire UHF Band.	

GATESAIR®

Data Sheets

GATESAIR®

Connecting What's Next

PowerSmart® Plus

Maxiva™ ULXTE with PowerSmart® Plus

High-Efficiency UHF Liquid-Cooled TV Transmitter

Maxiva™ ULXTE with PowerSmart®Plus

We did it again.

GatesAir has once again shattered the expectations of what is possible with high-power, solid-state transmitters in terms of efficiency, power density, and performance.

- Choice of ultra-wideband high-efficiency Power Amplifiers (PA's), or band-optimized PA's for the ultimate, market-leading AC to RF power efficiency
- Lighter power amplifier (PA) module - 1/3 of the weight of other products currently available
- Simpler spares handling, easy one-person task
- Separate, hot-swappable, compact power supply for each PA
- Optimized higher performance Real-Time Adaptive Correction. Ensures maximum transmitter performance continuously, under varying operating conditions, without the need for manual adjustment

More services usually means higher expenses. Higher operating expenses challenge the bottom line. Maxiva ULXTE transmitters with PowerSmart®Plus technology drive down total cost of ownership while allowing broadcasters to get the most out of their spectrum. Broadband designs that increase bandwidth while simplifying maintenance. Superior power density that maximizes TV coverage while reducing transmitter size and weight. Unparalleled performance that enhances picture quality while lowering utility bills. GatesAir has once again shattered the expectations of what is possible with high-power, solid-state transmitters.

Product Overview

The Maxiva ULXTE is a liquid-cooled TV transmitter that powers over-the-air delivery across the UHF television spectrum. Built on GatesAir's groundbreaking PowerSmart® Plus architecture, Maxiva ULXTE offers today's digital broadcaster the most compact, energy-efficient solutions to reliably deliver rich, high-quality multi-format content to viewers at home, or on the move.

The new PowerSmart® Plus architecture used in Maxiva ULXTE assures low cost of ownership through reduced size, weight and energy use while improving performance.

The Maxiva ULXTE transmitter utilizes the latest 50-Volt LDMOS amplifier devices, new compact high-efficiency power supplies and the new Maxiva XTE exciter with advanced real-time adaptive correction (RTAC) for outstanding signal performance. Two power amplifier options are available:

1. Band optimized PA modules. Each PA covers approximately 1/3 of the entire UHF band and provides unsurpassed system level efficiency and performance.
2. Fully broadband high-efficiency PA modules. Ideal for spares consolidation and/or N+1 applications.

Modular designs simplify installation and reduce ongoing maintenance, dramatically lowering total cost of ownership over the life of the transmitter.

Designed with future broadcasting needs in mind, the ULXTE transmitter is capable of multiple modulation schemes for UHF digital operation — including ATSC 3.0, ATSC 1.0, ATSC MDTV, DVB-T2, DVB-T2 Lite, ISDB-Tb, DVB-T/H and future digital standards.

Savings You Can Count On!

The Maxiva ULXTE with PowerSmart® Plus is the highest efficiency broadband UHF transmitter on the market.

PowerSmart® Plus

New PowerSmart® Plus amplifier technology for UHF provides a market-leading combination of efficiency, power density, and broadband operation

Savings in The Details!

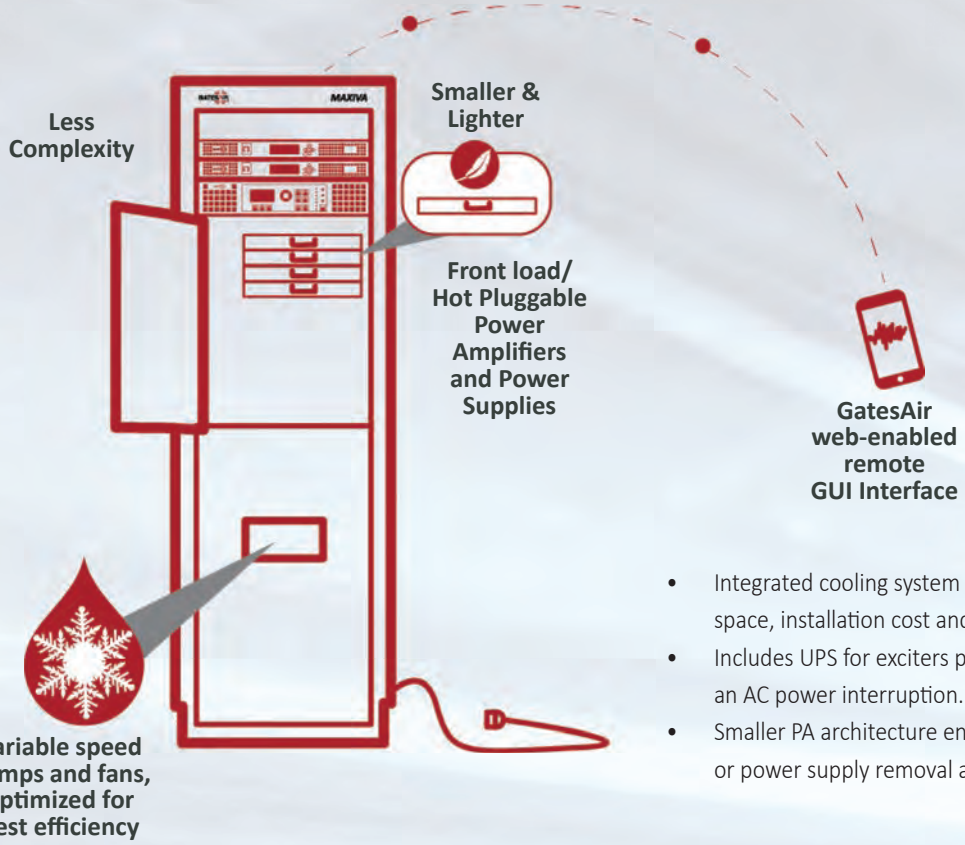
- Choice of 100% broadband, high-efficiency amplifiers modules, or band-optimized amplifiers for the ultimate system efficiency
- New high-efficiency DC power supplies
- Integrated high-efficiency pump system for certain power classes
- Hot-swappable light-weight PA modules
- Hot-swappable compact DC power supplies
- Incorporates the newest technology Maxiva XTE exciter for best-in-class adaptive precorrection and native IP transport inputs
- RoHS compliant / CE compliant
- Support for all worldwide digital modulation standards
- Modular & upgradeable architecture
- All-digital linear and nonlinear pre-correction: Real-Time Adaptive Correction (RTAC)
- Rugged, reliable design and construction
- Ideal for N+1 configurations since all transmitters can be identical and use the same PA's, minimizing spares requirements
- Lowest energy usage
- Minimum operating cost

EFFICIENT & COMPACT

100% BROADBAND

SIMPLER Servicing

Savings You Can Count On!



- Integrated cooling system for systems up to 10 PAs. Saves floor space, installation cost and time.
- Includes UPS for exciters provides fastest power-up time following an AC power interruption.
- Smaller PA architecture ensures higher RF power during PA module or power supply removal and servicing.

Key Features

Features	Included	Available
Choice of ultra-wideband high-efficiency PA's, or band-optimized PA's for the ultimate in AC to RF efficiency	•	
Fast-acting linear and non-linear Real-Time Adaptive Correction (RTAC), for optimum performance at all times	•	
Web remote with SNMP	•	
Parallel Remote Control	•	
Exciter internal UPS	•	
Internal dual redundant cooling pumps (for models ULXTE-2 to ULXTE-10)	•	
ASI/T2MI over IP / IP transport input	•	
Internal GPS/GLONASS reciever for SFN timing	•	
Dual exiters and switcher		•
N+1 systems and multi-transmitters per rack		•
Extended warranties and Service Level Agreements (SLA) to suit any requirement		•

Maxiva™ XTE — The Heart of the Transmitter

The new GatesAir Maxiva™ XTE exciter provides broadcasters with a powerful, software-defined platform, enabling the ultimate in performance, stability and durability. Featuring unparalleled signal processing power, a smaller footprint and advanced native IP transport input capabilities, Maxiva XTE builds upon a strong legacy of groundbreaking technological advances, pioneered by several decades of GatesAir innovations. Dramatically increased processing power together with new, advanced Real Time Adaptive Correction techniques, provides optimum signal performance over a wide variety of modulations and RF amplifier topologies.

The Maxiva XTE supports a full range of digital broadcast standards, including ATSC, ATSC 3.0, DVB-T/H, DVB-T2, ISDB-T, DAB/DAB+/DMB. It is upgradeable to future new modulations as they become available.

Real-Time Adaptive Correction

GatesAir's exclusive Real-Time Adaptive Correction (RTAC) technology, standard in Maxiva transmitters, keeps your station within compliance while maximizing coverage. Featuring simultaneous linear and nonlinear adaptive pre-correction, RTAC interoperates with the Maxiva XTE exciter to continuously monitor transmitter output and performance while automatically adapting for system nonlinearities — delivering the optimal level of correction for your digital over-the-air signal. Real-time measurement of shoulder levels and SNR/MER are also provided.

Advanced Global Monitoring and Control

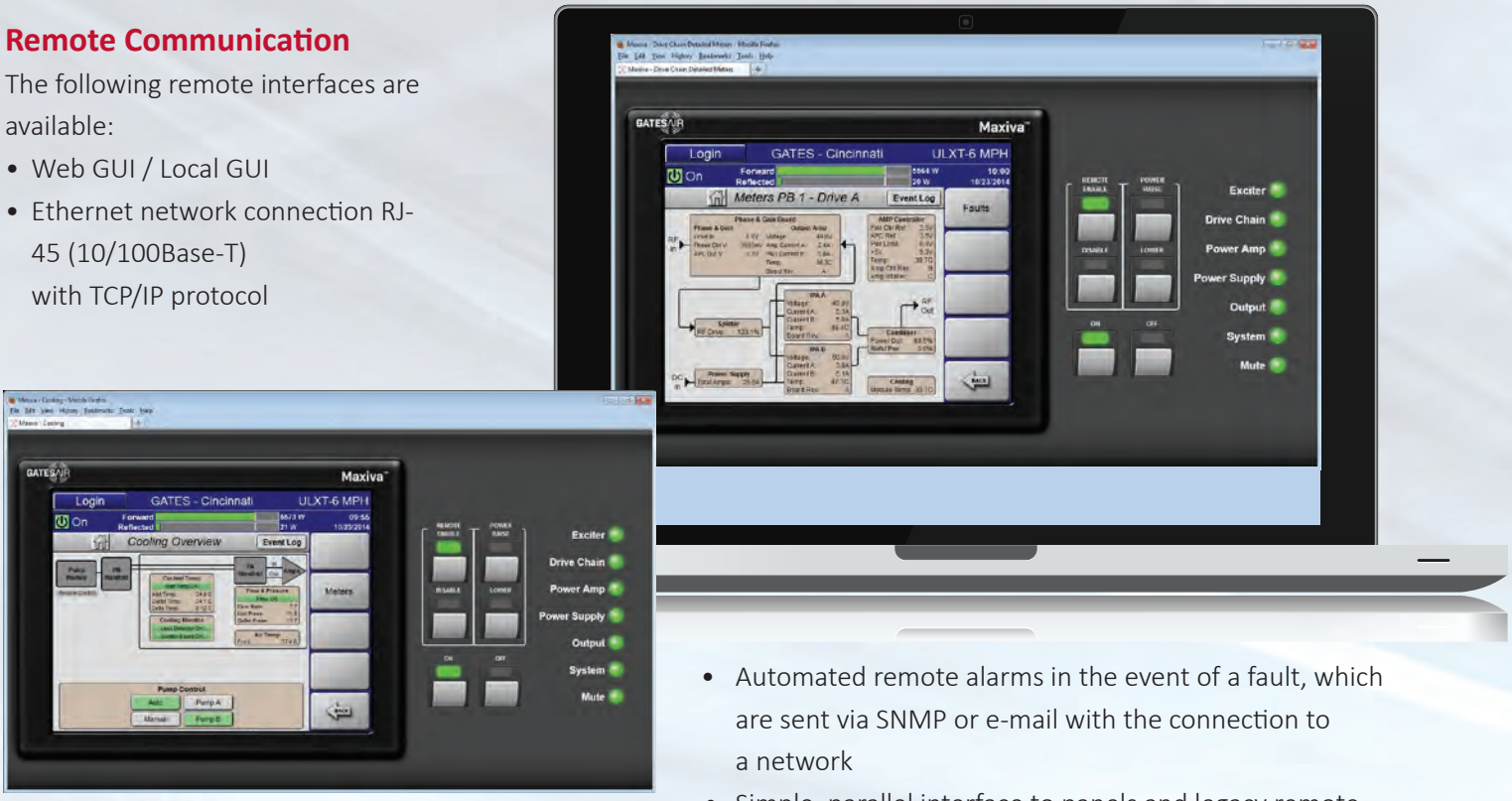
In addition to local control, the Maxiva ULXTE transmitter can be controlled from anywhere in the world with an intuitive, browser-based graphical user interface (GUI) over TCP/IP via a telecom or network connection with password protection. A rear RJ-45 jack is provided for LAN/WAN connection.

Full Simple Network Management Protocol (SNMP) facilities are provided for network management of the entire transmission system using industry-standard MIB protocols.

Remote Communication

The following remote interfaces are available:

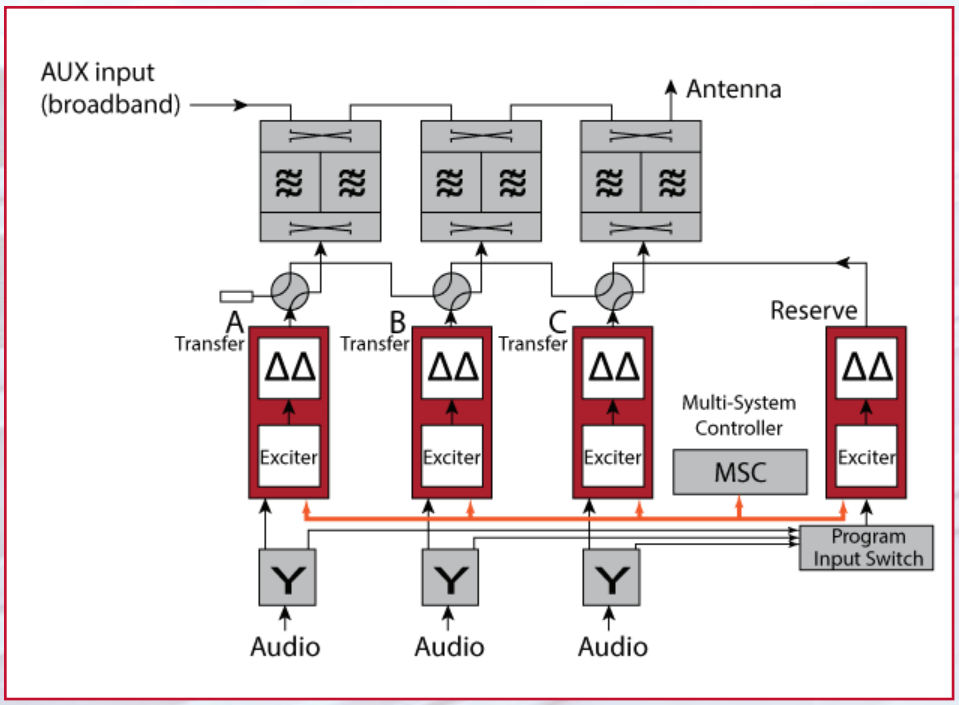
- Web GUI / Local GUI
- Ethernet network connection RJ-45 (10/100Base-T) with TCP/IP protocol

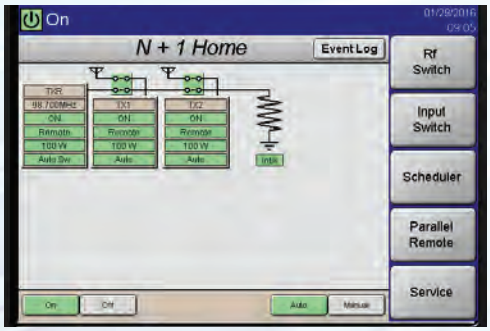


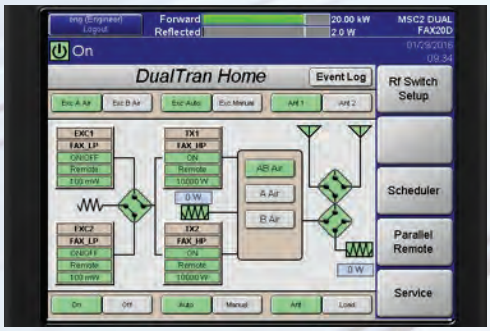
- Automated remote alarms in the event of a fault, which are sent via SNMP or e-mail with the connection to a network
- Simple, parallel interface to panels and legacy remote control systems

Multi-System Controller (MSC2)

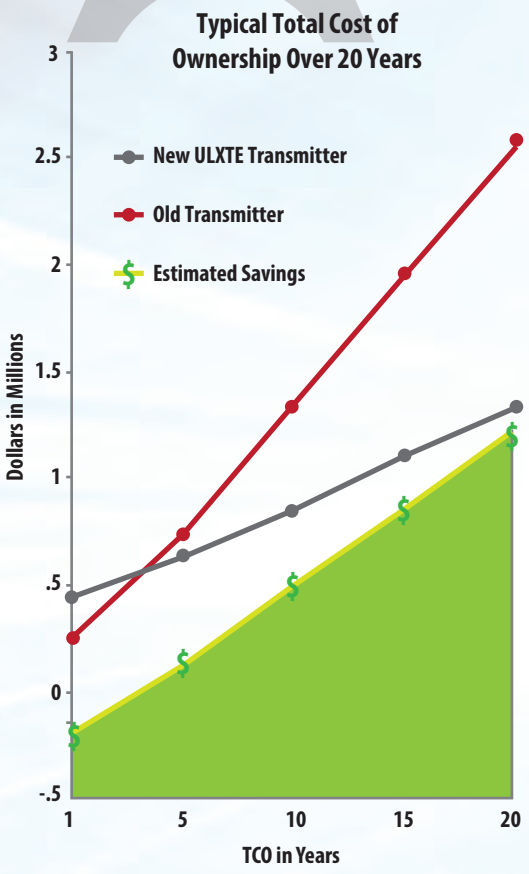
To support greater redundancy, the Multi-System Controller (MSC2) supports a range of backup options, including 1+1, full N+1 and dual-transmitter installations. The MSC2 monitors and controls the transmitter systems and controls RF switching.







What is Total Cost of Ownership (TCO)?



TCO is the total cost to own and operate the transmitter system over time. This includes the initial equipment cost, installation/commissioning cost, routine and unscheduled maintenance costs, and ongoing repair and operational costs — and don't forget, rising energy costs. In fact, the lifetime operational expense of a transmitter is estimated at greater than five times the initial product cost.

While power to the transmitter is the biggest item, other factors can also adversely affect the system efficiency. These include:

- AC transformers and voltage regulators ahead of transmitter
- Heat load to the room (affects HVAC costs)
- RF system losses
- RF feeder loss to antenna
- Antenna gain and pattern

Maxiva UHF transmitters now incorporate GatesAir PowerSmart®Plus technology to help broadcasters save money and reduce carbon footprints. PowerSmart®Plus technology delivers superior operational efficiency through broadband designs that simplify installation, improve performance, and streamline ongoing operation – including maintenance. This comes courtesy of a modular design that eliminates tuning, reduces weight, enhances redundancy through separate power supplies, and minimizes overall labor.

PowerSmart®Plus technology also lowers monthly bills through sharp power efficiency increases, and reduces rack space requirements (exceeding 50 percent) through a dramatic increase in power density. These industry-leading strides in performance and physical size reduction combine to deliver the best possible total cost of ownership over the life of the transmitter – and return money to the pockets of our customers.

PowerSmart® Plus

Otimized Amplification

PowerSmart®Plus incorporates band-optimized amplifiers that have been designed to provide the maximum efficiency and performance. Alternatively, GatesAir also offers fully broadband amplifiers, ideal for +1 redundancy applications and/or spares consolidation.

Compact Footprint

As the most compact, liquid-cooled UHF transmitter, the Maxiva ULXTE is ideal for crowded, shared transmitter sites. The Maxiva ULXTE transmitter reduces facility space requirements, simplifies installation, lowers shipping costs and streamlines maintenance.

Highest Power Density

The Maxiva ULXTE provides the highest power density per rack in a UHF transmitter. Fewer amplifier racks are required for all power levels and modulations.

Reduced Service Costs

Hot-pluggable, redundant power amplifier (PA) and universal power supply (PS) modules make on-air servicing easy and eliminate costly service interruptions. Light-weight universal PA pallets and modules facilitate overnight/ same-day shipping for simple, cost-effective spares management. With lightweight subassemblies, the Maxiva ULXTE eliminates two-person lift requirements for routine maintenance and troubleshooting.

Global Monitoring and Control

The Maxiva ULXTE transmitter can be controlled from anywhere in the world with an intuitive, browser-based GUI or SNMP over TCP/ IP via a telecom or network connection with password protection.

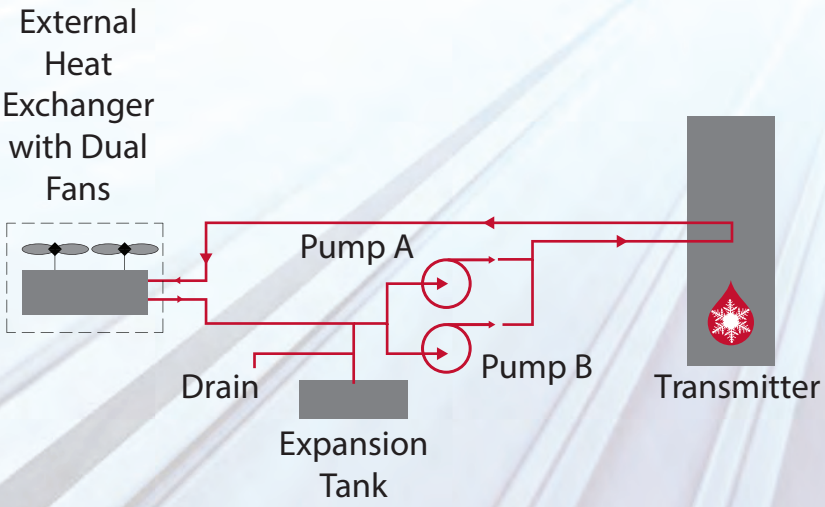
High-Efficiency Liquid-Cooling System

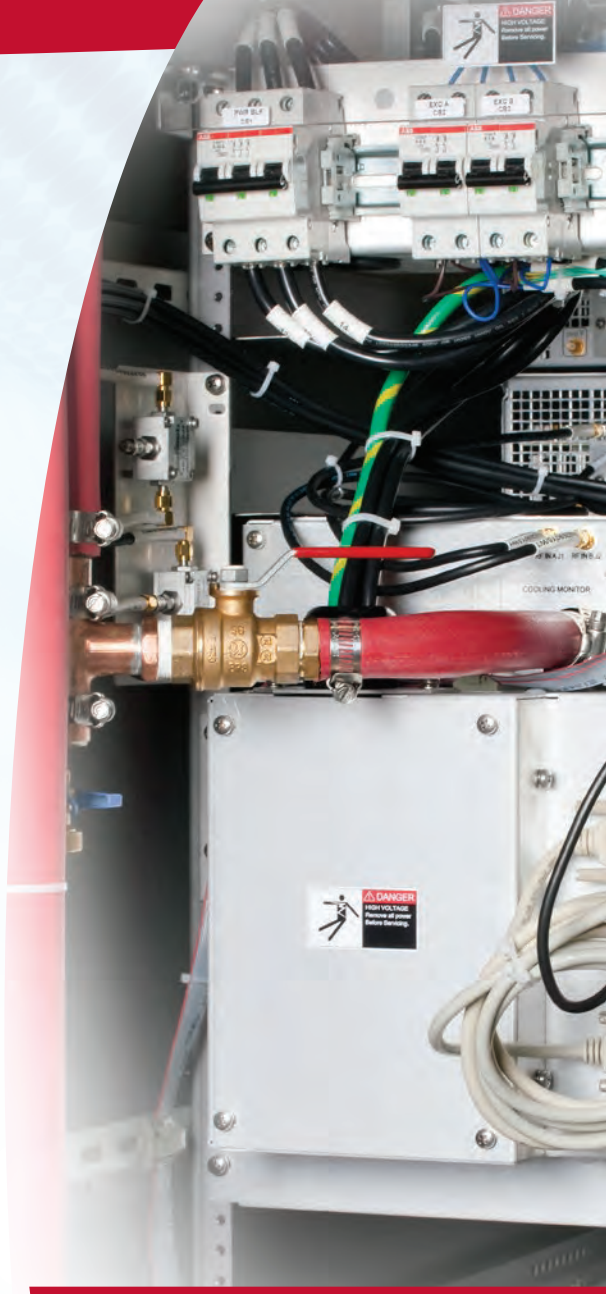
All Maxiva ULXTE systems feature a high-efficiency liquid-cooling system that has been carefully engineered for maximum efficiency over a wide range of ambient conditions and operating power levels.

Integrated or external high-efficiency, low-noise pump modules are available for all single power block versions of Maxiva ULXTE. The integrated pump option minimizes the use of valuable floor space and simplifies installation requirements. Higher power level systems use a compact and efficient external pump module.

The closed-loop liquid-cooling system utilizes a pump module with 100% redundant cooling pumps and auto-changeover capability. The liquid-to-air outdoor heat exchanger also includes dual fans for maximum redundancy. The pump motor speed is controlled based on coolant requirements, and the heat exchanger fan motors are also speed controlled to provide the optimum cooling performance over a wide range of ambient weather conditions. These design features translate to maximum reliability at the lowest energy consumption in a small footprint.

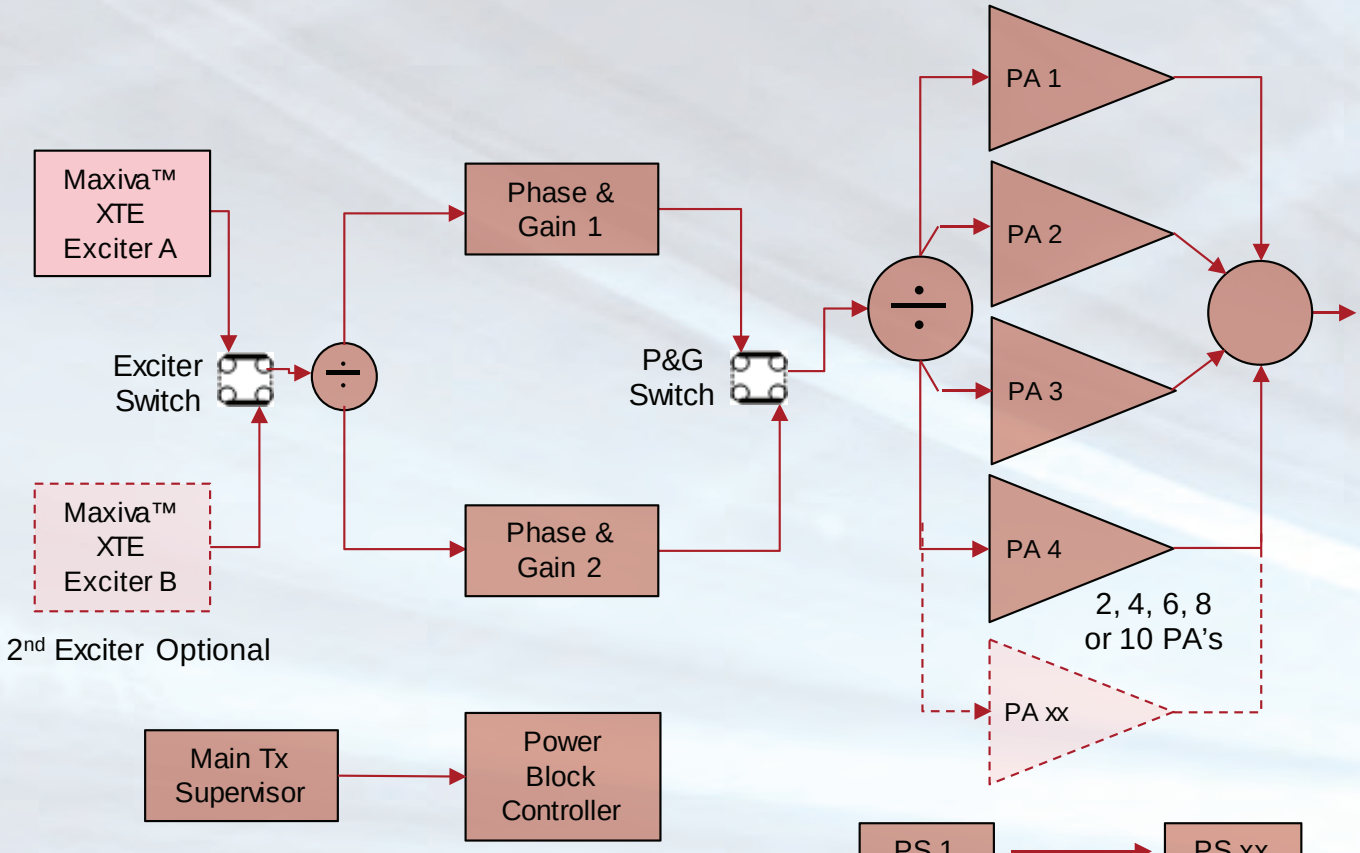
The Maxiva ULXTE cooling system has been carefully engineered to allow for on-air servicing or replacement of pumps and fans, further maximizing on-air availability and minimizing revenue loss.





Maxiva ULXTE Block Diagram

2-10 PA system, Dual Drive System Shown



Separate exciter and P&G switching for RF path redundancy

Legend:

P&G: Phase and Gain
PA: Power Amplifier
PS: Power Supply

: Drive Switch
: Power Divider
: Power Combiner

Maxiva ULXTE Models and Power Levels

ULXTE Model	Number of PAs	Number of Power Blocks	Total Number of Racks	Type "E" Band A PA's (470-590MHz, ch. 14-33) Pre-Filter Average Power (All Modulations) (Watts)	Type "D" Broadband PA's (470-698MHx, ch. 14-51) Pre-Filter Average Power (All Modulations)[2] (Watts)	Type "D" Band A-B-C PA's (3 Bands, 470 -820MHz) Pre-Filter Average Power (All Modulations) (Watts)
ULXTE-2	2	1	1	1,440	1,092 - 1,200	1,200
ULXTE-4	4			2,880	2,184 - 2,400	2,400
ULXTE-6	6			4,320	3,276 - 3,600	3,600
ULXTE-8	8			5,520	4,186 - 4,600	4,600
ULXTE-10	10			6,600	5,005 - 5,500	5,500
ULXTE-12	12	2		8,500	6,370 - 7,000	7,000
ULXTE-16	16			10,800	8,190 - 9,000	9,000
ULXTE-20	20			12,900	9,828 - 10,800	10,800
ULXTE-24	24	3		16,100	12,194 - 13,400	13,400
ULXTE-30	30			19,200	14,651 - 16,100	16,100
ULXTE-40	40	4	2	25,300	19,474 - 21,400	21,400
ULXTE-50	50	5		31,700	24,115 - 26,500	26,500
ULXTE-60	60	6		38,000	28,938 - 31,800	31,800
ULXTE-72	72	9	3	47,200	36,309 - 39,900	39,900
ULXTE-80	80	8		50,100	38,493 - 42,300	42,300
ULXTE-90	90	9		56,400	43,225 - 47,500	47,500
ULXTE-120	120	12	4	75,100	57,200 - 62,800	62,800
ULXTE-150	150	15	5	92,800	72,100 - 78,400	78,400
ULXTE-20 [1]	20	2	2 + 1 Control	13,200	9,900 - 10,900	10,900
ULXTE-40 [1]	40	4	2 + 1 Control	25,800	19,600 - 21,600	21,600
ULXTE-60 [1]	60	3x2	2 + 1 Control	38,500	29,302 - 32,200	32,200
ULXTE-80 [1]	80	4x2	4 + 1 Control	50,700	38,948 - 42,800	42,800
ULXTE-100 [1]	100	5x2	4 + 1 Control	63,400	48,230 - 53,000	53,000
ULXTE-120 [1]	120	6x2	4 + 1 Control	76,100	57,876 - 63,600	63,600
ULXTE-144 [1]	144	9x2	6 + 1 Control	94,400	72,618 - 79,800	79,900
ULXTE-160 [1]	160	8x2	6 + 1 Control	100,300	76,986 - 84,600	84,600
ULXTE-180 [1]	180	9x2	6 + 1 Control	112,900	86,450 - 95,000	95,000
ULXTE-240 [1]	240	12x2	8 + 1 Control	150,200	114,400 - 125,600	125,600

[1] RF Power for Dualtran models do not include final combiner losses

[2] Max. Range shown- Use UAXTE_ULXTE_Power_Calculator_RevB-120616.xlxs for specific per levels on each channel

Specifications

Specifications and designs are subject to change without notice.

General	
Frequency Range	UHF TV Band
Transmission Standards	ATSC 3.0, ATSC, DVB-T/H DVB-T2, DVB-T2 Lite, ISDB-Tb
Channel Bandwidth	6, 7 or 8 MHz (system dependent)
Rated Power Output	See chart on previous page
Output Power Reduction Range	0 to-10 dB
RF Load Impedance	50 ohms
VSWR	Protected against open or short circuit, all phase angles. Capable of operation into infinite VSWR with user-adjustable fold back threshold. Factory pre-set to 2.8% of nominal nameplate power (VSWR = 1.4:1)
RF Output Connector	1-5/8", 3-1/8" or 4-1/16" EIA (dependent upon power level)
Transmitter Dimensions	See chart on previous page
Transmitter Weight	See chart on previous page

AC Mains	
AC Line Voltage	3 phase: 380 to 415 V, or 208 to 240 V, 47-63Hz- specify voltage when ordering
AC Line Variation	±15%, between 208 to 230 V or 380 to 400 V
Power Factor.	>0.95

Environmental	
Altitude	Up to 3,000 m (9,843 ft) elevation above mean sea level
Ambient Temperature	0° to 45° C (32° to 113° F) at sea level (upper limit derated 2° C (3.6°F) per 300 m (984 ft) elevation AMSL)
Humidity	95%, non-condensing
Cooling Method	Liquid-cooled, using 50/50 mix of ethylene or propylene glycol and water
Acoustic Noise	<65 dBA (measured 1 m (3.3 ft) in front of cabinet)
Frequency Stability	Without precision frequency control/GPS: ±150 Hz/month (2.3 x 10-7ppm)

External Inputs	
GPS Input	SMA female, 50 ohms, (+5 V DC @ 100 mA max output for active antenna)
1 PPS Input	BNC female, user selectable 50 ohms or high impedance termination
10 MHz Reference Frequency Input	BNC female, 50 ohms

Monitoring Outputs	
RF monitor (exciter)	SMA female
1 PPS	BNC female
10MHz	BNC female

OFDM TV Specification DVB-T/H / DVB-T2 / ATSC 3.0 / ISDB-Tb / DTMB	
Power Output (average)	Power levels available for all applications [see table]
Systems	DVB-T/H, standard EN 300 744 DVB-T2, DVB-T2 Lite, standard EN 302 755 v1.3.1 ISDB-Tb, Brazil ANATEL standard DTMB (China CTTB/CMMB)
ASI/T2MI Inputs	2 inputs BNC female; 75 ohms according to EN 50083-9 Supports seamless switching between ASI/T2MI inputs for DVB-T2 (for DVB- H2 main/2 hierarchical)
IP Transport Inputs	2 inputs, 1000Base-T, RJ-45
Crest Factor	13 dB maximum
Shoulder Level	<-37 dB (before mask filter)
END	<0.5 dB
MER	≥34 dB (typically >36 dB)
Harmonics (before filter)	<-40 dB
Central Carrier Suppression	>75 dB
DVB-T2 Modes	Supports multiple PLP's, MISO, extended bandwidth mode, PAPR reduction, DVB-T2 Lite
SFN Delay	Static and Dynamic, 0 to 1 second per ETSI TS 101 191 V1.4.1 (2004-06)

ATSC 1.0 Specification	
Power Output (average)	Power levels available for all applications [see table]
System	ATSC A-53, 8-VSB DTV standard, ATSC Mobile DTV
Data Input	19.39 Mb/s, configurable as SMPTE-310M or ASI (user selectable)
Impedance	75 ohms, unbalanced
Input Connector	2 inputs, BNC female
Signal to Noise (EVM)	>27 dB (EVM <4%), Typical >32 dB (EVM <2.5 %)
Phase Noise	<104 dBc/Hz @ 20 kHz offset (ATSC A/64)
Harmonic Radiation & Spurious	Meets mask requirements specified in FCC 5th and 6th report and order
Sideband Performance	Compliant with FCC radiation mask, when measured at the output of GatesAir-supplied output filter

Remote Control	
Parallel Remote	Sub-D connector
Ethernet/SNMP	RJ-45, twisted pair

Compliance	RoHS 2002/95/EC R&TTE 1999/5/EC Safety: EN 60215 EMC: EN 301-489-1 Manufacturing: ISO 9001: 2008

TV Transmitter Technical Engineering Data Sheet

Transmitter Type: **ULXTE-50** UHF, Liquid Cooled, Transmitter, 50 Power Amplifier Module System
5 Power Blocks, 10 PA per Block, Single 44RU cabinet, External Pump Module.

Transmitter Data:		
RF Out Put Line Size:	6-1/8" EIA Flanged	6-1/8" EIA Flanged
Power Amplifier Type:	**Broadband PA Pallet**	**TYPE E pallets**
Frequency Range:	470-750 MHz	Band A) 470-608 MHz
Nominal Pre Mask Filter RF Power Output	24110 W - 26500 W *	31700 W
Quantity of PA Modules:	50	50
Quantity of PA Blocks:	5	5
Maximum. Transmitter Power Consumption (kVA)	~90.6 KVA	~95.3 KVA
Typical Transmitter Power Consumption (kVA)	~76.1 KVA	~80.1 KVA
Max. Power Factor:	>0.95	>0.95
Typical Power factor:	>0.99	>0.99
Maximum. Transmitter Currents (208V 3 Phase)	~252 Amp	~265 Amp
Typical Transmitter Currents (208V 3 Phase)	~211 Amp	~222 Amp
Maximum. Transmitter Currents (380V 3 Phase)	~138 Amp	~145 Amp
Typical Transmitter Currents (380V 3 Phase)	~116 Amp	~122 Amp

Cooling System:

Cooling system Type:	Liquid Cooled	Liquid Type:	50% Prestone AF2000 (Ethylene & Diethylene Glycol) and 50% Distilled Water
Coolant Volume:	~152.0 Liters (40.2 Gallons)	Pump Modules	2
Minimum Transmitter Coolant Flow	~117.3 Liters (31.0 Gallons)	Heat Exchanger Size:	50kW ea
Typical Transmitter Liquid Flow:	~177.9 Liters (47.0 Gallons)	Heat exchangers required:	2
External Cooling System Power Consumption:	at 25°C:1.7kVA	Max. at 45°C:	7.0 KVA
Max transmitter coolant inlet temperature:	55°C at 50° C ambient outdoor temperature		

System Electrical Data

AC Main Configurations: 208V to 240V (3) Wire or 380V to 415V (4) Wire (with Neutral)

Earthing / Grounding: AC safety ground via third wire of mains inlets (PE green wire). AC safety ground should have unbroken connection back to earth post at mains distribution panel. Threaded ground stud provided on rear of amplifier chassis for connection to rack buss-bar where required by prevailing safety norms. Connection should be via unpainted surfaces and soldered/brazed for low resistance.

Main breaker size (208-240V):	450 Amp**	Step down Transformer size 480V to 208V:	150.0 KVA
Main breaker size (380-415V):	250 Amp**	Step down Transformer size 480V to 380V:	150.0 KVA

				Max. Cooling system current	Max. Accessories Current	Max. Total System Current
Broadband PA Transmitter System kVA:	**~99.6 KVA**	(maximum.)	208-240V	19 Amp	6 Amp	277 Amp
Transmitter Accessories kVA:	~2.0 KVA		380-415V	11 Amp	3 Amp	151 Amp
(includes transmitter, cooling system & additional equipment)						

				Max. Cooling system current	Max. Accessories Current	Max. Total System Current
Type E Band A PA Transmitter System kVA:	**~104.3 KVA**	(maximum.)	208-240V	19 Amp	6 Amp	290 Amp
Transmitter Accessories kVA:	~2.0 KVA		380-415V	11 Amp	3 Amp	159 Amp
(includes transmitter, cooling system & additional equipment)						

Environmental:

Transmitter operating Temperature:	0 to 45° C	
Maximum. Transmitter Latent Heat to the Room:	(At 25°C Room Ambient with 55°C liquid temperature)	9.7kW (maximum, with 5°C liquid temperature rise)
Typical Transmitter Latent Heat to the Room:	(At 25°C Room Ambient with 55°C liquid temperature)	7.2kW (typical, with 5°C liquid temperature rise)
Maximum. Heat Load to the cooling system:	57.1kW	
Transmitter Noise to the room:	=<65dBA	

Mechanical:

Number Of Transmitter Cabinets:	2 (44RU)		
44RU Transmitter Cabinet Dimensions:	Width 648mm(25.50in) Height 2138mm(84.2in) Depth 1238.3mm(48.75in)	Total Transmitter Weight: Cabinet Clearance:	1740 kg (3835 LBS) 1 meter (front and back)
External Pump Module Dimensions:	Width 593.1mm(23.35in) Height 1808.99mm(71.22in) Depth 1161.49mm(45.73in)	External Pump Module Weight: Pump Module Clearance:	100.7 kg (222.0 LBS) 1 meter (front), 1/2 meter (sides)
Heat Exchanger Dimensions: (Vertical Air Flow)	Width1573.58mm(59.50) Height 884.66mm(34.82in) Depth 887.22mm(34.93in)	Heat exchanger Weight: Heat exchanger Clearance:	190.5 kg (420.0 LBS) 1 meter (all sides) 10 meters from exhausted air side.

*For Broadband Power amplifier modules the efficiency and power level can change per frequency or channel of operation, please contact GatesAir engineering for an accurate power level at your frequency or channel of operation.

**See Engineering for additional details. Additional breakers will be required for cooling system, exciters, and other possible system components including but not limited to mask filters, surge suppressors, and test load cooling fans. Transformer required for 480V 3 phase operation, see GatesAir engineering for additional details.

Band IV/V (UHF) PeakPower+™ bandpass filter

Product Description

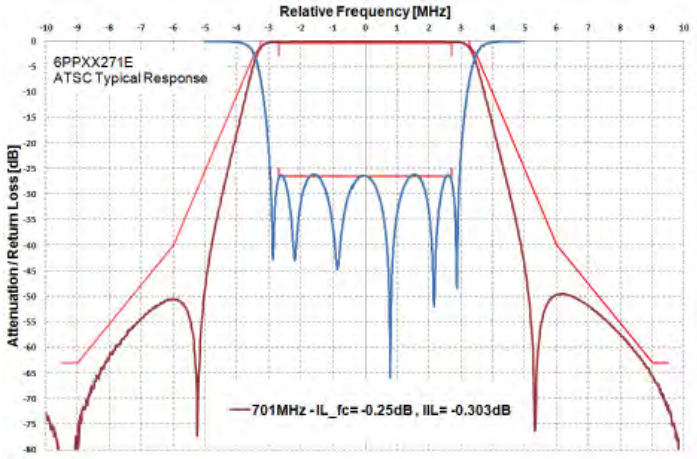
The RFS 6PPXX271E is designed for mask filtering applications associated with DTV television transmission. It is a 6-pole water cooled filter incorporating dual cross coupling to meet the mask requirements.

Features

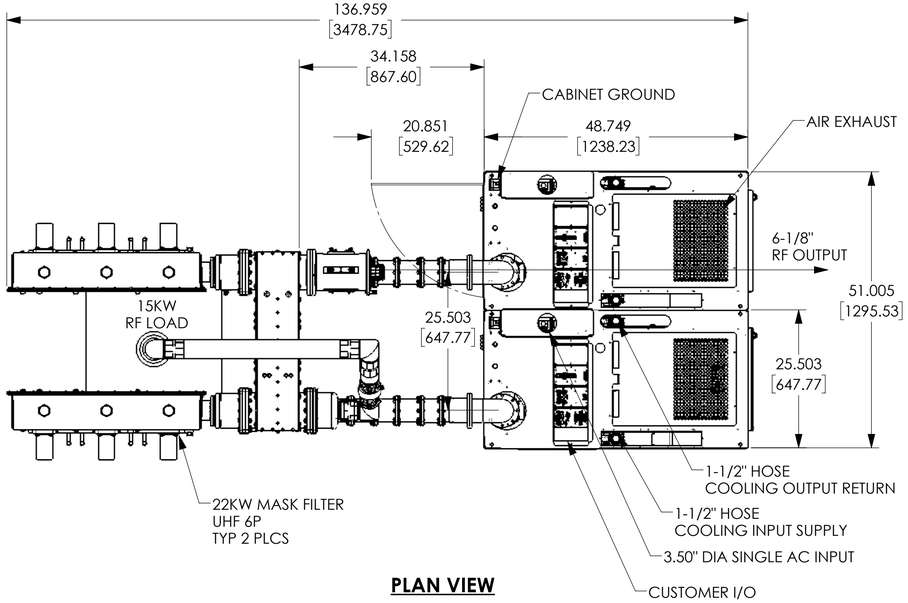
- 25 kW power rating.
- Very compact for easy integration into equipment.
- Very low insertion loss (lowest for this size).
- Highest power rating for size/class.
- Tunable over 470 – 755 MHz.
- Adjustable bandwidth, available for 6 & 8 MHz channels for global applications.
- External, non-invasive coupling adjustment.
- Tunable for ETSI non-critical, ISDB-T critical, and ATSC applications.
- -5 to 55ºC ambient temperature operation.
- Water cooled.

Specifications

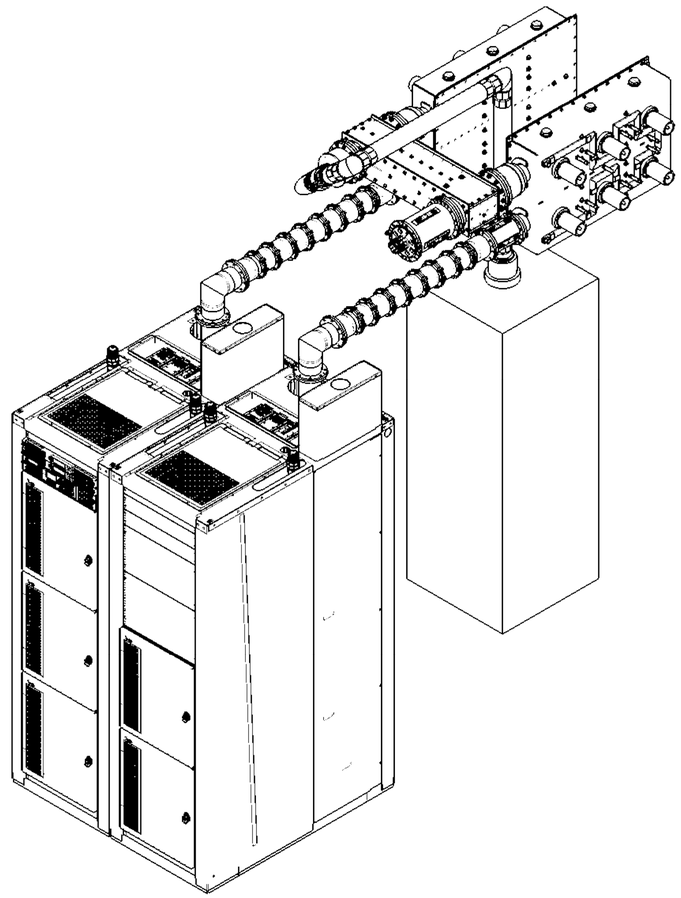
Model	6PPXX271E		
Weight	120 kg/265 lb approx.		
Dimensions, L x W x H mm (inches)	960 x 576 x 467 (50.5 x 27.3 x 23.7)		
Colour	Black		
Filter type	6 Pole with dual cross coupling - 270 mm ground plane spacing - Water Cooled		
Maximum Coolant Temp, °C	55		
Flow Rate, l/min	3 ≤ rate ≤12		
Maximum Propylene Glycol / Water Concentration, %	50		
Input / Output Connectors	4-1/2"IEC Unflanged Female (Optional), 3-1/8"EIA Unflanged Female (Optional)		
Out-of-Band Emissions Mask	DVB-T ETSI non-critical	ISDB-T	ATSC
Channel Bandwidth MHz	8	6	6
Frequency Bandwidth MHz	474-754	473-755	473-701
Output power rating, kW average (with maximum temp. rise)	25 @ 474MHz 27 @ 754MHz	25 @ 473MHz 25 @ 755MHz	30 @ 473MHz 30 @ 701MHz
Input Power Rating, kW average	26.2 @ 474MHz 28.5 @ 754MHz	26.4 @ 473MHz 26.8 @ 755MHz	31.6 @ 473MHz 31.8 @ 701MHz
Insertion loss, dB	<0.19 @ 474MHz <0.22 @ 754MHz	<0.28 @ 473MHz <0.33 @ 755MHz	<0.25 @ 473MHz <0.28 @ 701MHz
Attenuation, dB	<0.6 ±3.8MHz >4.2 ±4.2MHz >26 ±6MHz >41 ±12MHz	<0.55 ±2.79MHz >11 ±3.15MHz >26 ±4.5MHz >53 ±9MHz	<0.2 ±2.69MHz >1.0 ±3.25MHz >3.0±3.5MHz >40.0±6MHz >65.0 ±9.0MHz
VSWR average across carriers	<1.12	<1.2	< 1.1
VSWR maximum peak across carriers	<1.17	<1.23	<1.16
Group delay variation, nS	<550 (fc±3.8 MHz)	<540 (fc±2.79 MHz)	<150 (fc±2.69 MHz)
Maximum temperature rise, °C	<40		
Freq drift - Tx operation, kHz/°C	<2		
Freq drift - Ambient temperature, kHz/°C	<2		
Maximum operating temp, °C	80		
Ambient temperature, °C	-5 to 55		

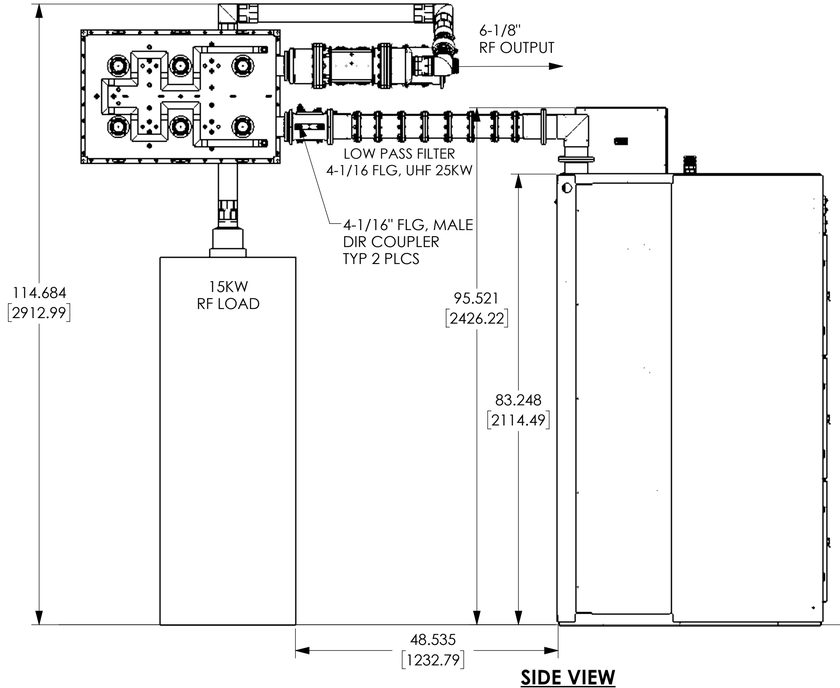


Drawings

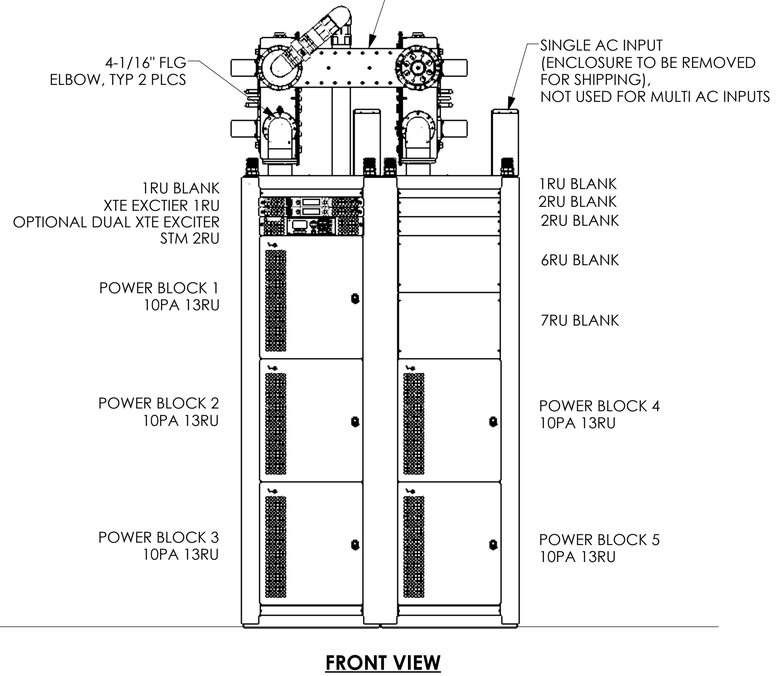


PLAN VIEW





SIDE VIEW



FRONT VIEW

FORMAT:
ULXTE-50PA 995-0650-001
COMMON CABINET:
ULXTE-(10-W) 3 PWR BLKS; 981-0600-003
ULXTE-(10-W) 2 PWR BLKS; 981-0600-005

RF COMPONENTS KIT CEILGING MTG FOR 50PA, SEE SHEET 2
971-0080-226

DWG SCALE: 1:24

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP
STANDARDS SPEC 817-1152-001

NOTES
- ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

REVISION

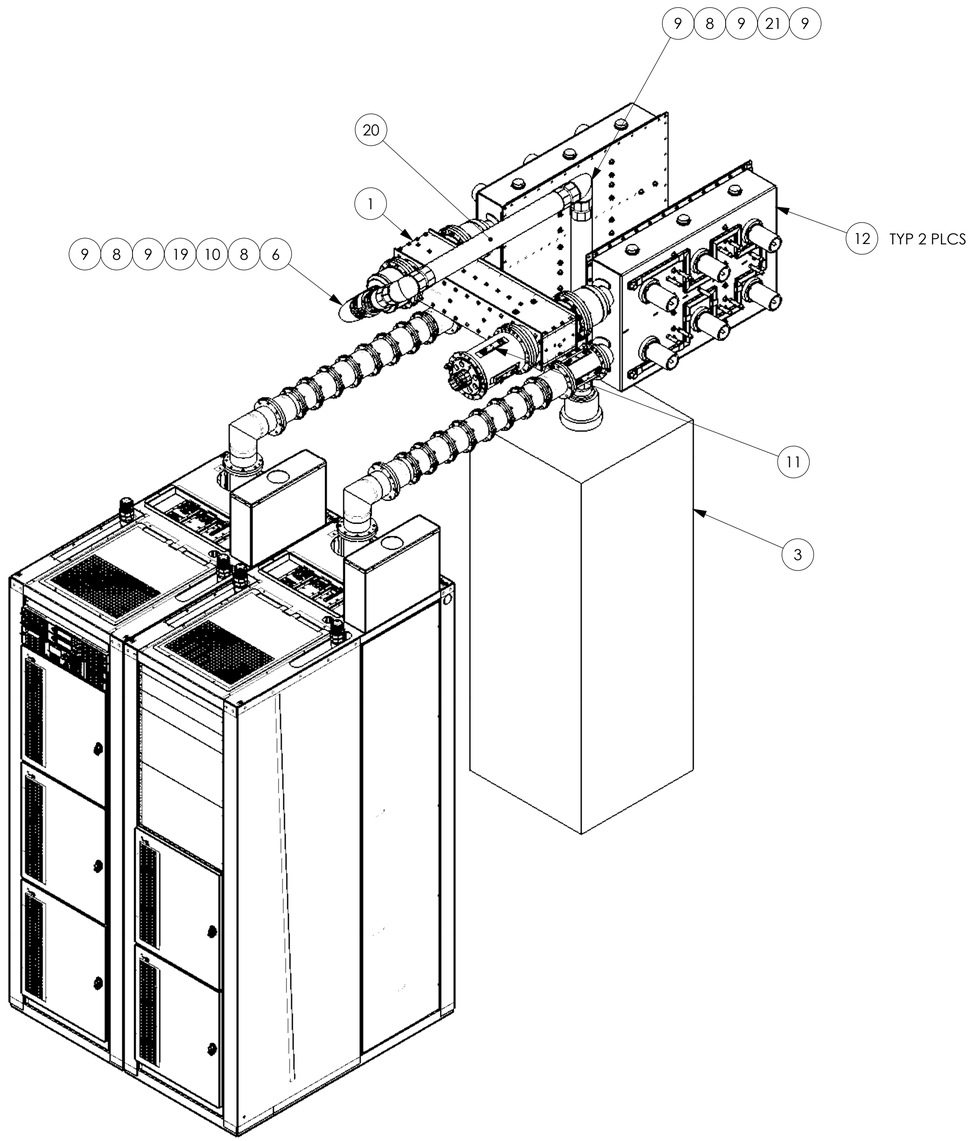
LTR	ZONE	DATE	DFTM	ENG	ECO NBR
C		07/21/2017	KAG	DB	P61977
UPDATED LAYOUT PER BOM CHANGE					
B		05/25/2017	KAG		P61753
UPDATED PER LOW PASS FILTER & COMBINING HYBRID					

DRAWN BY	K GLASCOCK
DATE	12/13/2016
MECH CHK	K GLASCOCK
PROJ ENG	D BLICKHAN
MFG ENG	J FENTON
SIZE	D
SHEET	1 OF 4

TITLE:
LAYOUT, ULXTE-50 IN (2) C3 CABINETS, W/MULTI BPF, CLG MTG

GATESAIR P/N: **9950650001**

DWG NO: **8950650002** REV **C**



Number	Description	BOM.Qty	BOM.POS NBR
9710080226	KIT, RF EXT, ULXTE-50, CEILING MTG	BOM QTY	BOM POS NBR
7920061000	COMBINER, HYBRID 3.98DB 40KW UHF	1.000	0001
7000806000	RF LOAD, 10KW 3-1/8U 230V	1.000	0003
6200544000	CONN, AIC 3-1/8	1.000	0006
6202275000	EQ ELBOW/90 3-1/8	3.000	0008
6200581000	COUPLING 3-1/8	5.000	0009
9710023223	CPLR UHF VOLTAGE PROBE, 3-1/8" 48DB	1.000	0010
9710023203	CPLR UHF 6-1/8 4-PORT 48DB	1.000	0011
9172577291	MASK 22KW 6P UHF	2.000	0012
6202172000	HDWE KIT FOR 4-1/16" EIA	2.000	0017
6200713000	HDWE KIT FOR 6-1/8" EIA	2.000	0018
6180304000	XMSN LINE 3-1/8U 120" (CU)	1.000	
CUT LENGTHS:			
OUTER	INNER		
7.00" [177.80]	5.47" [138.93]	1.000	0019
32.00" [812.80]	30.47" [773.93]	1.000	0020
32.25" [819.15]	30.72" [780.28]	1.000	0021

EXTERNAL RF KITS AND RF COAX CUT LENGTHS ONLY APPLY TO SUGGESTED LAYOUT SHOWN FIELD VERIFY ALL CUTS

DWG SCALE: 1:24

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP STANDARDS SPEC 817-1152-001

NOTES
- ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

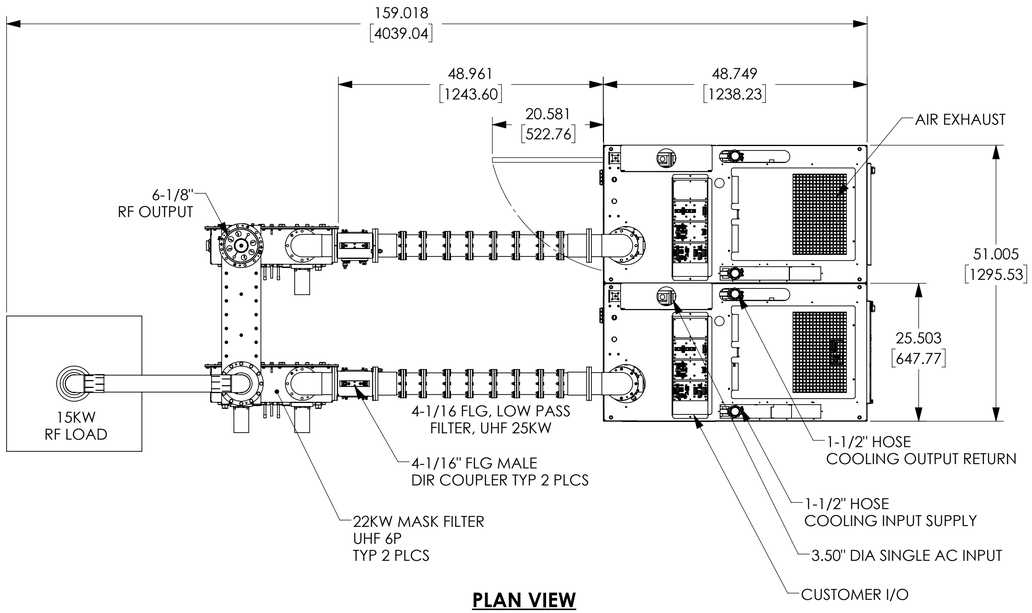
REVISION	LTR	ZONE	DATE	DFTM	ENG	ECO NBR
	C		07/21/2017	KAG	DB	P61977
	UPDATED LAYOUT PER BOM CHANGE					
	B		05/25/2017	KAG		P61753
	UPDATED PER LOW PASS FILTER & COMBINING HYBRID					

DRAWN BY K GLASCOCK
DATE 12/13/2016
MECH CHK K GLASCOCK
PROJ ENG D BLICKHAN
MFG ENG J FENTON
D SHEET 2 OF 4

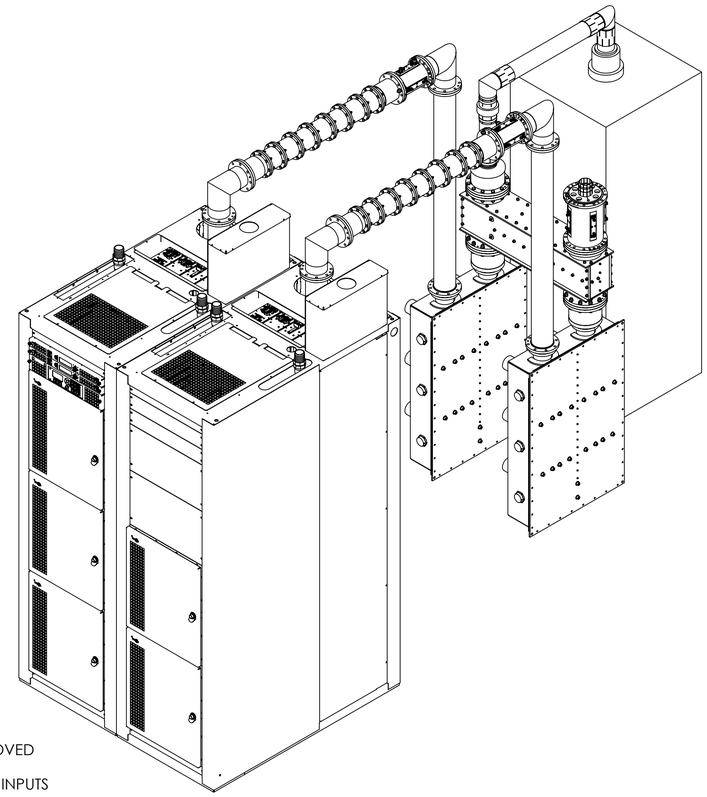
TITLE: **LAYOUT, ULXTE-50 IN (2) C3 CABINETS, W/MULTI BPF CLG MTG**

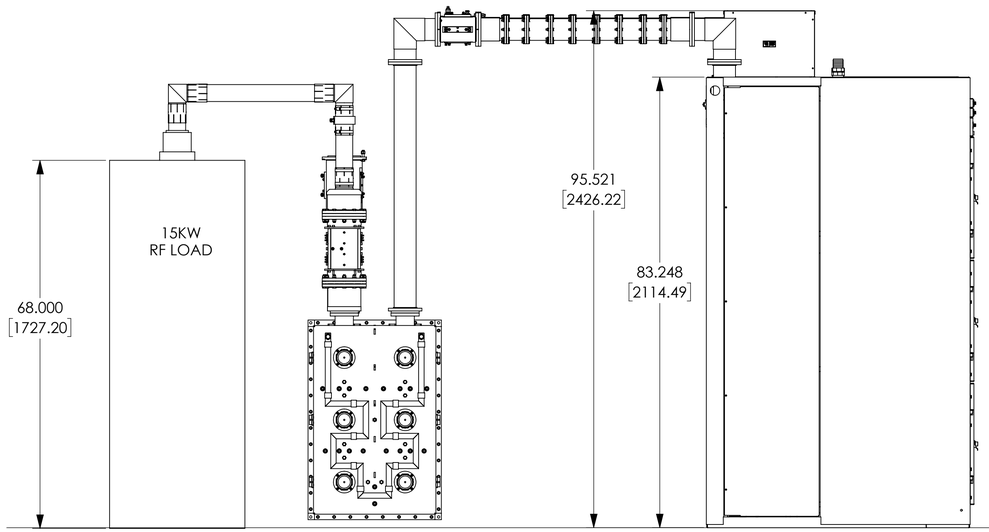
GATESAIR P/N: **9950650001**

DWG NO: **8950650002** REV **C**

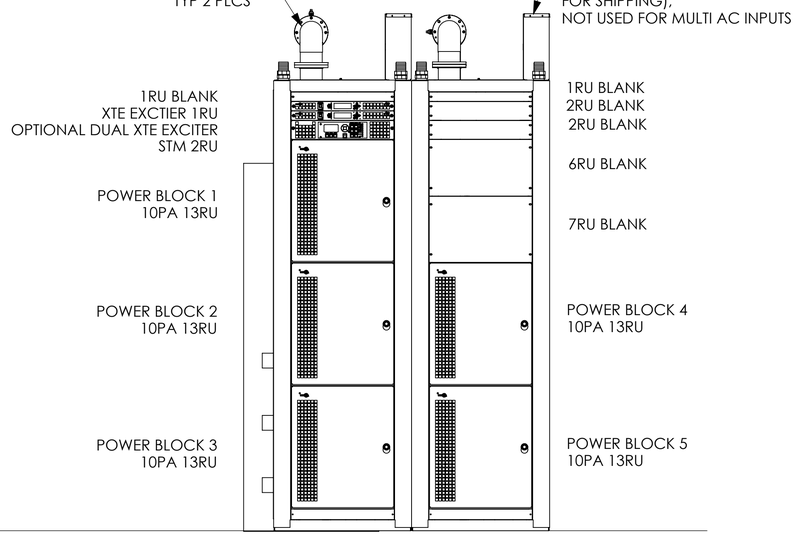


PLAN VIEW





SIDE VIEW



FRONT VIEW

FORMAT:
ULXTE-50PA 995-0650-001
COMMON CABINET:
ULXTE-(10-W) 3 PWR BLKS; 981-0600-003
ULXTE-(10-W) 2 PWR BLKS; 981-0600-005

RF COMPONENTS KIT FLOOR MTG FOR 50PA, SEE SHEET 4
971-0080-326

DWG SCALE: 1:24

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP
STANDARDS SPEC 817-1152-001

NOTES
- ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

REVISION

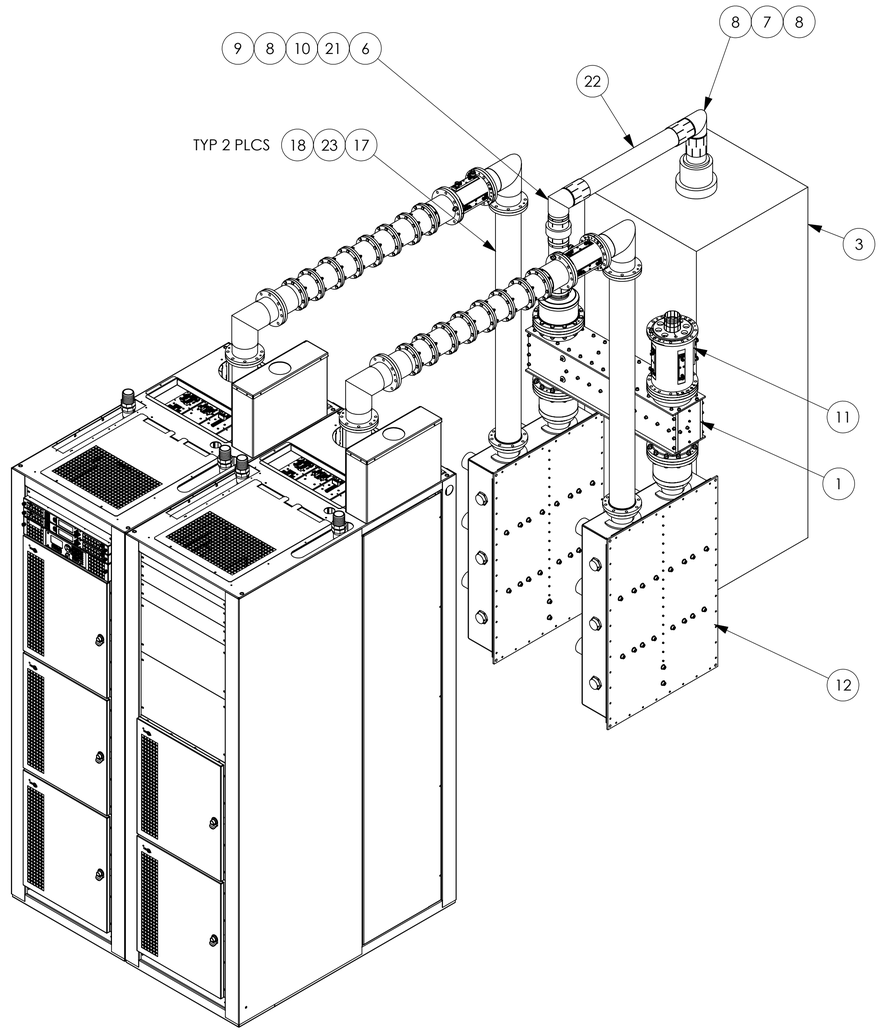
LTR	ZONE	DATE	DFTM	ENG	ECO NBR
C		07/21/2017	KAG	DB	P61977
UPDATED LAYOUT PER BOM CHANGE					
B		05/25/2017	KAG		P61753
UPDATED PER LOW PASS FILTER & COMBINING HYBRID					

DRAWN BY	K GLASCOCK
DATE	3/22/2017
MECH CHK	K GLASCOCK
PROJ ENG	.
MFG ENG	.
D	SHEET 3 OF 4

TITLE:
LAYOUT, ULXTE-50 IN (2) C3 CABINETS, W/MULTI BPF, FLR MTG

GATESAIR P/N: **9950650001**

DWG NO: **8950650002** REV **C**



9710080326	KIT, RF EXT, ULXTE-50, FLOOR MTG		
7920061000	COMBINER, HYBRID 3.98DB 40KW UHF	1.000	0001
7001422113	RF LOAD, 15KW 3-1/8U	1.000	0003
6202142000	EQ ELBOW/90 4-1/16 FLG EIA (CU)	2.000	0004
6200544000	CONN, AIC 3-1/8	1.000	0006
6202137000	CONN, AIC 4-1/16	2.000	0007
6202275000	EQ ELBOW/90 3-1/8	2.000	0008
6200581000	COUPLING 3-1/8	3.000	0009
9710023223	CPLR UHF VOLTAGE PROBE, 3-1/8" 48DB	1.000	0010
9710023203	CPLR UHF 6-1/8 4-PORT 48DB	1.000	0011
9172577291	MASK 22KW 6P UHF	2.000	0012
6202397000	FLANGE, SWIVEL 4-1/16EIA	2.000	0017
62023930000	FLANGE, FIXED 4-1/16EIA	2.000	0018
6202172000	HDWE KIT FOR 4-1/16" EIA	4.000	0019
6200713000	HDWE KIT FOR 6-1/8" EIA	2.000	0020
6180304000	XMSN LINE 3-1/8U 120" (CU)	1.000	
	CUT LENGTHS:		
OUTER	INNER		
8.75" [222.25]	7.22" [183.38]	1.000	0021
23.00" [584.20]	21.47" [545.33]	1.000	0022
6180709000	XMSN LINE 4-1/16U 120" (CU)	1.000	
	CUT LENGTHS:		
OUTER	INNER		
45.50" [1155.70]	43.25" [1098.55]	1.000	0023

EXTERNAL RF KITS AND RF COAX CUT LENGTHS ONLY APPLY TO SUGGESTED LAYOUT SHOWN FIELD VERIFY CUTS

DWG SCALE: 1:24

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP
STANDARDS SPEC 817-1152-001

NOTES
- ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

REVISION	LTR	ZONE	DATE	DFTM	ENG	ECO NBR
	C		07/21/2017	KAG	DB	P61977
	UPDATED LAYOUT PER BOM CHANGE					
	B		05/25/2017	KAG		P61753
	UPDATED PER LOW PASS FILTER & COMBINING HYBRID					

DRAWN BY	K GLASCOCK
DATE	3/22/2017
MECH CHK	K GLASCOCK
PROJ ENG	.
MFG ENG	.

TITLE: **LAYOUT, ULXTE-50 IN (2) C3 CABINETS, W/MULTI BPF, FLR MTG**

GATESAIR P/N: **9950650001**

DWG NO: **8950650002** REV **C**

D SHEET 4 OF 4

MODEL	#PA'S	TRANSMITTER POWER	SYSTEM AC MAIN TOTAL KVA (INCLUDES COOLING SYSTEM AND ACCESSORIES)	TRANSMITTER KVA	COOLING SYSTEM MAX KVA (@45C AMBINET)	TYPICAL ACCESSORIES KVA (REJECT LOADS)
ULXTE–50	50	24.1–26.5 KW (BROADBAND PA)	99.6KVA (BROADBAND PA)	90.6KVA (BROADBAND PA)	25°C = 1.5KW / 45°C = 7KW (3.5KVA PER PUMP SYSTEM)	2KVA
		31.7 KW (TYPE E PA)	104.3KVA (TYPE E PA)	95.3KVA (TYPE E PA)		

AC MAIN VOLTAGE	SYSTEM AC MAIN TOTAL CURRENT (INCLUDES COOLING SYSTEM AND ACCESSORIES)	TRANSMITTER CURRENT	COOLING SYSTEM MAX CURRENT (@45C AMBINET)	TYPICAL ACCESSORIES CURRENT (REJECT LOADS) VARIES WITH FAULT CONDTIONS
208–240V	277A (BROADBAND PA @208V)	252A (BROADBAND PA @208V)	19.4A TOTAL CURRENT/PHASE (9.7A PER PHASE/PUMP SYS)	6A
	290A (TYPE E PA @208V)	265A (TYPE E PA @208V)		
380–415V	151A (BROADBAND PA @380V)	138A (BROADBAND PA @380V)	10.6A TOTAL CURRENT/PHASE (5.3A PER PHASE/PUMP SYS)	3A
	159A (TYPE E PA 380V)	145A (TYPE E PA @380V)		

1. SYSTEM AC MAINS TOTAL POWER CONSUMPTION (kVA/CURRENT) DATA REPRESENTS THE TYPICAL POWER CONSUMPTION FOR THIS TRANSMITTER. ANY ADDITIONAL EQUIPMENT NOT ILLUSTRATED ON DRAWING NEEDS TO BE ADDED TO THE TOTAL SYSTEM KVA. INCREASE MAIN BREAKER/WIRE SIZE APPROPRIATELY

2. PHASE TO PHASE CURRENTS MAY NOT BE EQUAL DEPENDING ON THE SYSTEM CONFIGURATONS. USE MAX PHASE CURRENT FOR SIZING AC CONDITIONING EQUIPMENT (AVR, UPS, GENERATOR, ETC.)

3. WHEN CONNECTED TO A 380–415VAC 3 PHASE WYE POWER CONFIGURATION, NEUTRAL CURRENT CAN BE EQUAL TO OR EXCEED PHASE CURRENTS DUE TO SWITCH MODE POWER SUPPLY HARMONICS. FINAL INSTALLATION SHALL ENSURE NEUTRAL CONDUCTOR IS PROPERLY SIZED AND THAT ALL LOCAL REGULATIONS ARE MET. NEUTRAL NOT REQUIRED FOR 208/240V FEEDS.

4. MAIN BREAKER SIZE BASED ON SYSTEM AC MAIN TOTAL VOLT AMPS DIVIDED BY LINE VOLTAGE (208 OR 380VAC MAIN VOLTAGE) DIVIDED BY 1.732 THEN MULTIPLY BY 140%. ROUND UP TO THE NEAREST COMMON BREAKER SIZE.

5. CIRCUIT BREAKERS REQUIRED TO WITHSTAND 10X INRUSH REFER TO LOCAL CODE FOR PROPER WIRE SIZING.

6. CONFIRM AND SPECIFY VOLTAGE AND TYPE OF POWER FOR PROPER SIZING FOR THE TRANSMITTER SURGE SUPPRESSION SYSTEM.

7. REFER TO ULXTE DOC PACKAGE PRIMARY AND SECONDARY CABINET WIRING DIAGRAMS FOR TRANSMITTER CABINET AC INTERCONECT DETAILS.

8. AC DISTRIBUTION SINGLE FEED PER CABINET
AC MAIN CONNECTION TO TRANSMITTER CABINET TERMINAL BOARD TB2: ENTRANCE OPENING 2–1/2"EMT, MAX CONDUCTOR SIZE 300MCM. 3 COND PLUS GROUND NO NEUTRAL /4 COND PLUS GROUND W/NEUTRAL.

9. AC DISTRIBUTION MULTIPLE FEED PER CABINET
AC MAIN CONNECTION TO TRANSMITTER CABINET TERMINAL BOARD TB3, TB4, TB5: ENTRANCE OPENING 1–1/2"EMT, MAX CONDUCTOR SIZE 2/0. 3 COND PLUS GROUND NO NEUTRAL /4 COND PLUS GROUND W/NEUTRAL.

10. CONTROL AC DISTRIBUTION. MULTIPLE FEED PER CABINET ONLY
AC MAIN CONNECTION TO TRANSMITTER CABINET CB1: ENTRANCE OPENING 1/2"EMT, FOR OPTION DUAL FEED REMOVE JUMPERS BETWEEN CB1 AND CB2. CONNECT 2ND FEED TO CB2. TYPICAL WIRE SIZE 12 AWG.

11. REFER TO ULXTE DOC PACKAGE 'COOLING SYSTEM PUMP MODULE' DRAWING FOR TRANSMITTER COOLING SYTEM AC INTERCONECT DETAILS.

12. SUPPLIED WITH HEAT EXCHANGER. PLACEMENT DETERMINED ON SITE

13. AC CORD SUPPLIED WITH REJECT LOADS INCLUDE A MOLDED IEC CONNECTOR, TERMINATED AS REQUIRED.

14. CONNECTED BY 2" COPPER STRAP (OR EQUIVALENT PER LOCAL CODE) TO STATION GROUND SYSTEM. GATESAIR SUPPLIED.

15. TYPICALLY SUPPLIED BY CUSTOMER.

NOTES

REVISION

LTR	ZONE	DATE	DFTM	ENG	ECO NBR
C	.	11-15-17	DN	BAR	P62569
REVISE NOTE FOUR					
B	.	2/10/17	.	.	P61215
REVISED					

DRAWN BY	K BUNTE
DATE	12-09-16
ENG CHK	S ROSSITER
PROJ ENG	D BLICKHAN
MFG ENG	J FENTON
D	SHEET 1 OF 3

TITLE
WIRING DIAG, AC POWER FLOW
ULXTE-50
,

DWG NO. 8399363657 . REV C

208/240 VAC L1 L2
50/60 HZ L3
3 WIRE PLUS GND GND

REQUIRED EQUIPMENT AND CONNECTIONS
FOR 480 VAC MAINS VOLTAGE

480VAC L1 L2
60 HZ L3
3 WIRE PLUS GND GND

175A

STEP DOWN TRANSFORMER
480 TO 208/230/240VAC
150 KVA

STEPDOWN TRANSFORMER SIZE BASED ON TYPICAL TRANSMITTER KVA REQUIREMENT
REFER TO LOCAL CODES AND VERFIY COMPLIANCE BEFORE ORDERING

AC PANELBOARD
(TYPICALLY SUPPLIED BY CUSTOMER)

SURGE SUPPRESSOR

20A
450A
20A
SAFETY GROUND

REJECT LOAD
L/N GND

TX CABINET 1
(PRIMARY)

EXC 'A'
EXC 'B'
STM PS1
STM PS2
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND

EXCITER CONTROL AC INPUT

CB1 L2 L3 TB1-11
CB2 L1 L3 TB1-12
REMOVE JPRS BETWEEN CB1 & CB2 IF DUAL AC FEED (OPTIONAL FEED)

CB3 CB4 CB5
TB3 TB4 TB5

20A
20A
80A
80A
80A
SAFETY GROUND

STANDARD MULTIPLE AC FEED PER CABINET SHOWN. SEE INSETS BELOW FOR OPTIONAL AC FEED PER CABINET CONNECTION POINTS.

TX CABINET 2
(SECONDARY)

POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND

CB4 CB5
TB4 TB5

80A
80A
SAFETY GROUND

CONTROL UNIT
PUMP MODULE HE2
995-0333-006

50HE HEAT EXCHANGER
DISCONNECT SWITCH

8 OPTIONAL SINGLE AC FEED TO CABINET 1

PRIMARY CABINET
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND
TB2 L1 L2 L3 GND
SAFETY GROUND
AC PANELBOARD
L1 L2 L3 GND
250A

8 OPTIONAL SINGLE AC FEED TO CABINET 2

SECONDARY CABINET
POWER BLOCK L1-L2-L3 GND
POWER BLOCK L1-L2-L3 GND
TB2 L1 L2 L3 GND
SAFETY GROUND
AC PANELBOARD
L1 L2 L3 GND
175A

208-240VAC 50/60HZ
OR 480VAC 60HZ

NOTES

REVISION	LTR	ZONE	DATE	DFTM	ENG	ECO NBR
	C	.	11-15-17	DN	BAR	P62569
	SHOW 3 PHASE WIRING. REVISE NOTES.					
	B	.	2/10/17	.	.	P61215
	REVISED					

DRAWN BY	K BUNTE
DATE	12-09-16
ENG CHK	S ROSSITER
PROJ ENG	D BLICKHAN
MFG ENG	J FENTON

D SHEET 2 OF 3

TITLE
WIRING DIAG, AC POWER FLOW
ULXTE-50
.

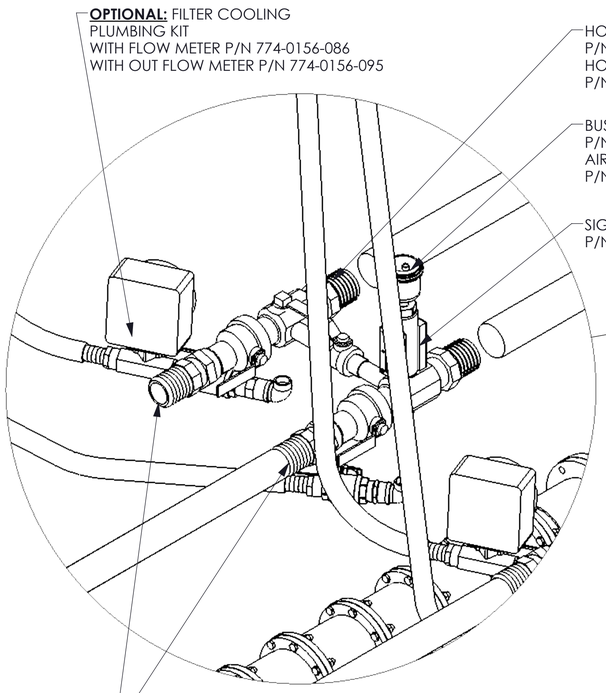
DWG NO. 8399363657 . REV C

HE II EXTERNAL PUMP MODULE
FOR ULXTE TRANSMITTERS
SYSTEM PLUMBING HOSE KIT
1-1/2" HOSE; P/N 774-0156-080 SHOWN
COPPER PIPE KIT P/N 774-0156-081 OPTIONAL

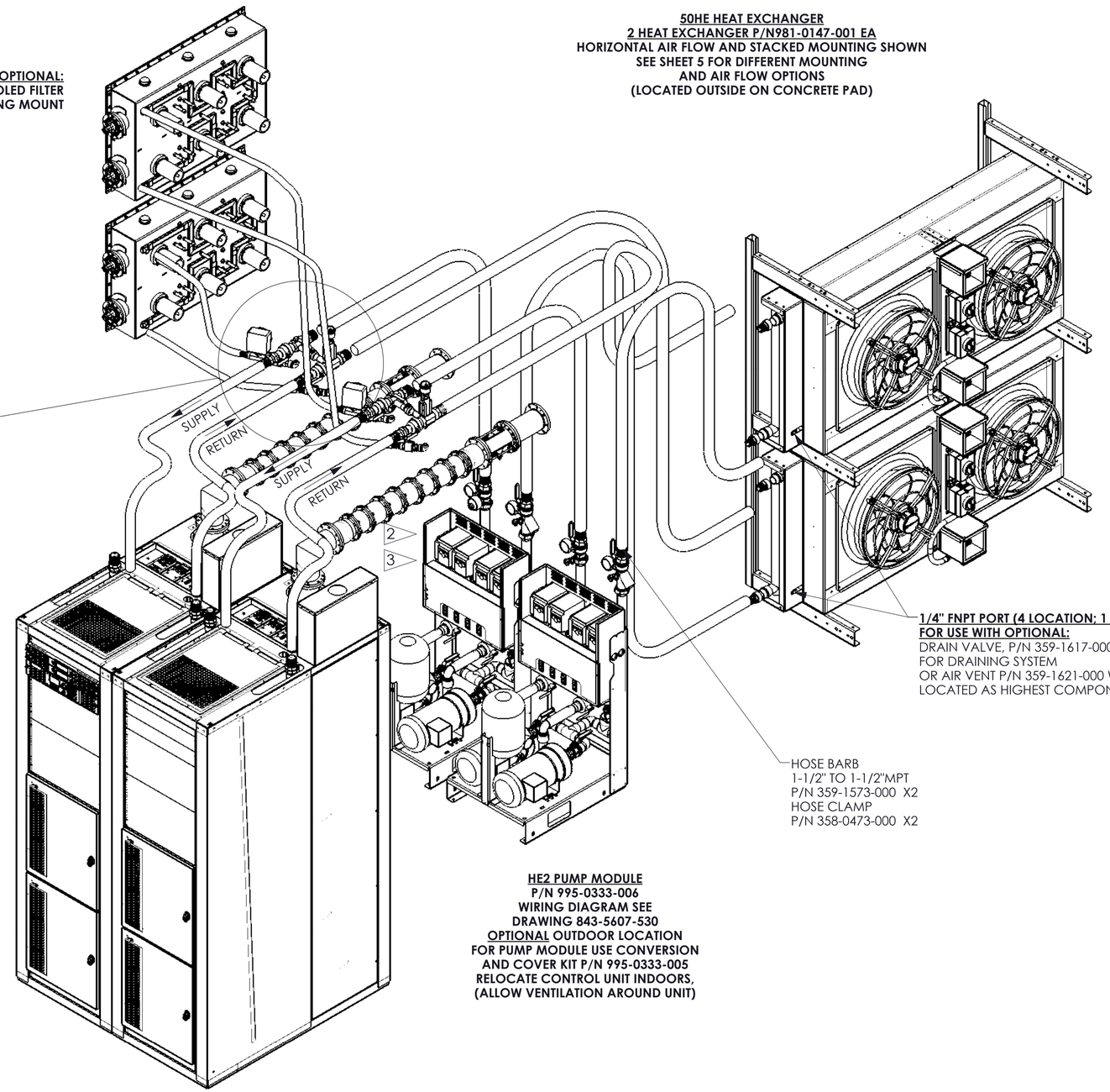
1

OPTIONAL: LIQUID COOLED FILTER
FLOOR OR CEILING MOUNT

50HE HEAT EXCHANGER
2 HEAT EXCHANGER P/N981-0147-001 EA
HORIZONTAL AIR FLOW AND STACKED MOUNTING SHOWN
SEE SHEET 5 FOR DIFFERENT MOUNTING
AND AIR FLOW OPTIONS
(LOCATED OUTSIDE ON CONCRETE PAD)



MAINFOLD, SUPPLY & RETURN
P/N 943-5585-257



ULXTE-40PA

HE2 PUMP MODULE
P/N 995-0333-006
WIRING DIAGRAM SEE
DRAWING 843-5607-530
OPTIONAL OUTDOOR LOCATION
FOR PUMP MODULE USE CONVERSION
AND COVER KIT P/N 995-0333-005
RELOCATE CONTROL UNIT INDOORS,
(ALLOW VENTILATION AROUND UNIT)

1/4" FNPT PORT (4 LOCATION; 1 EACH COLLECTOR TUBE)
FOR USE WITH OPTIONAL:
DRAIN VALVE, P/N 359-1617-000 USE AS REQUIRED
FOR DRAINING SYSTEM
OR AIR VENT P/N 359-1621-000 WHEN HEAT EXCHANGER IS
LOCATED AS HIGHEST COMPONENT IN SYSTEM

HOSE BARB
1-1/2" TO 1-1/2"MPT
P/N 359-1573-000 X2
HOSE CLAMP
P/N 358-0473-000 X2

ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

DWG SCALE: 1:12

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP
STANDARDS SPEC 817-1152-001

NOTES

1. MAXIMUM TOTAL HOSE RUN LENGTH NOT TO EXCEED 30 METERS (100 FEET)
2. WIRING FROM CONTROL UNIT TO PUMPS AND HEAT EXCHANGERS IS SUPPLIED BY CUSTOMER
3. THERMISTOR WIRE FOR MONITORING TEMP OF COOLANT GOING TO XMTR SHOULD BE ROUTED & CLAMPED TO COPPER PIPE AT PUMP MODULE, "H" ASSEMBLY OR TRANSMITTER

REVISION

LTR	ZONE	DATE	DFTM	ENG	ECO NBR
SEE SHEET 1					

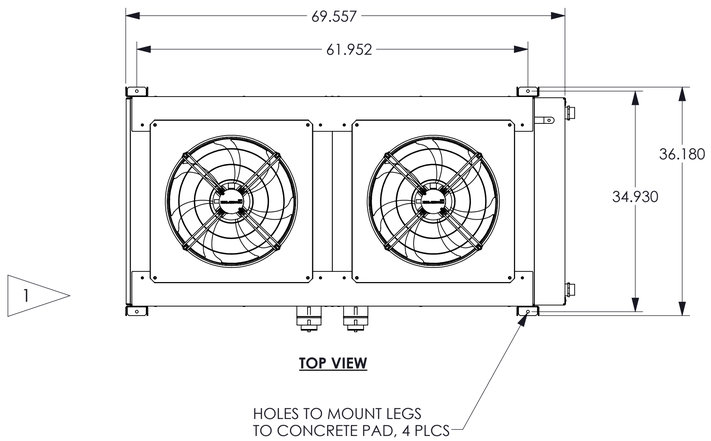
DRAWN BY	N SMITH
DATE	01/05/2017
MECH CHK	N SMITH
PROJ ENG	D BLICKHAN
MFG ENG	.
D	SHEET 3 OF 5

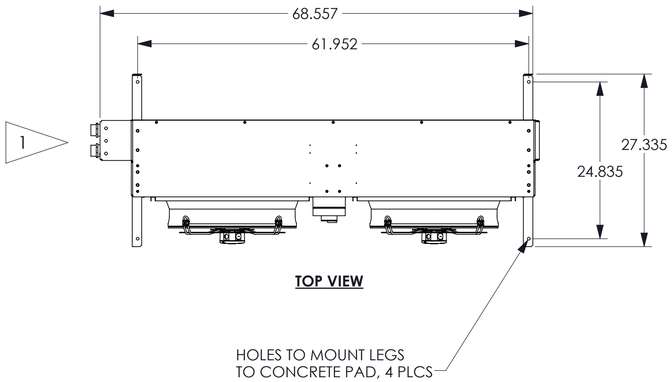
TITLE:
ULXTE TRANSMITTER CABINET, HE2 EXTERNAL PUMP

GATESAIR P/N:
ULXTE-40 SYSTEM COOLING

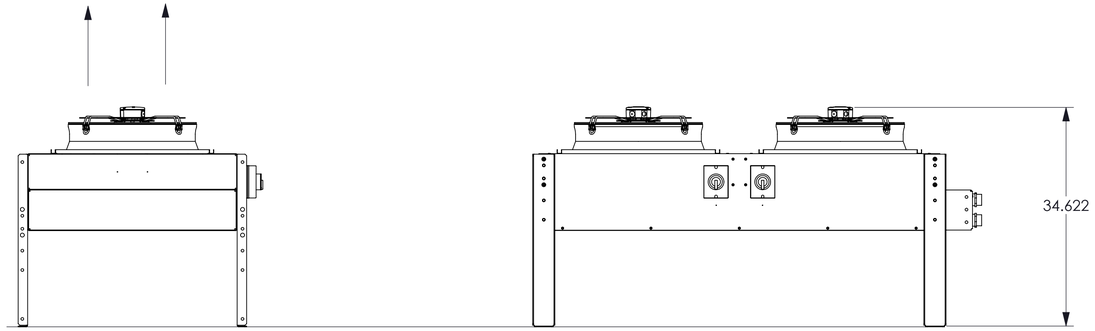
DWG NO: **8435623166** REV **B**

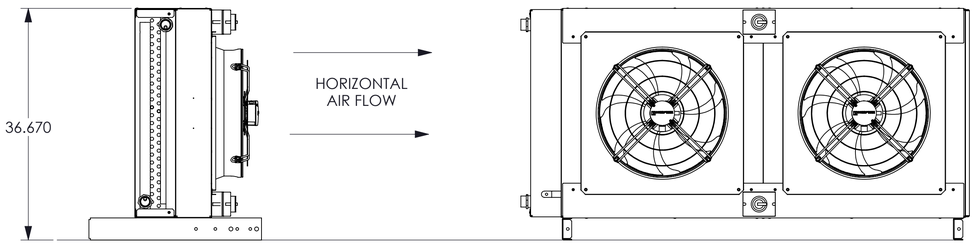
50HE DUAL FAN
P/N 981-0147-001
50HESCE DUAL FAN
(CORROSIVE ENVIRONMENT)
P/N 981-0147-002
CONFIGURABLE FOR
VERTICAL OR HORIZONTAL AIR FLOW
FOR SPECIFICATIONS SEE
DRAWING 843-5607-717





VERTICAL
AIR FLOW





NOTES

1. RECOMMENDED CLEARANCE ALL AROUND HEAT EXCHANGER TO BE MINIMUM 24.00" TO ENSURE PROPER AIR FLOW
2. HEAT EXCHANGER PRESSURE DROP NOT TO EXCEED 3 PSI @ 15 GPM

ROHS COMPLIANT PER DIRECTIVE 2002/95/EC

REVISION

LTR	ZONE	DATE	DFTM	ENG	ECO NBR

DWG SCALE: 1:8

TOLERANCES UNLESS NOTED
.X ±0.030 .XX ±0.015 .XXX ±0.005
HOLES ±0.005 ANGLES ±1°
ALL √ INDICATES 125 MICRO INCH

ALL DIMENSIONS IN INCHES
UNLESS OTHERWISE NOTED

MUST COMPLY WITH WORKMANSHIP
STANDARDS SPEC 817-1152-001

DRAWN BY	N SMITH
DATE	01/05/2017
MECH CHK	N SMITH
PROJ ENG	D BLICKHAN
MFG ENG	.
D	SHEET 5 OF 5

TITLE:
HEAT EXCHANGERS,
50HE DUAL FANS

GATESAIR P/N: **8520000177**

DWG NO: **8435623166** REV **B**

GATESAIR®

Company Information

GATESAIR®

GatesAir efficiently leverages wireless spectrum to maximize performance for multichannel TV and radio services, offering the industry's broadest portfolio helping broadcasters wirelessly deliver and monetize content. With nearly 100 years in broadcasting, GatesAir's exclusive focus on the over-the-air market helps broadcasters optimize services today and prepare for future revenue-generating business opportunities. All research, development and innovation is driven from the company's facilities in Mason, Ohio and fulfilled by the long-standing manufacturing center in Quincy, Illinois.

GatesAir's turnkey solutions are built on three pillars: Create, Transport and Transmit. The company is best known for powering over-the-air analog and digital radio/TV stations and networks worldwide with the industry's most operationally efficient transmitters. Groundbreaking innovations in low, medium and high-power transmitters reduce footprint, energy use and more to establish the industry's lowest total cost of ownership. Support for all digital standards and convergence with mobile networks ensure futureproof systems.

In television, GatesAir supplies proven, trusted wireless UHF and VHF solutions across all power requirements to support single-station over-the-air broadcasters on up to large national networks. The industry's most reliable software-definable exciters ensure broadcasters can optimize analog networks and quickly transition to digital TV in the field, with support for all major global DTV standards. GatesAir also supplies a wide array of over-the-air accessories to maximize transmitter control, network redundancy and signal compliance – along with installation, commissioning and ongoing support services – to deliver the industry's strongest turnkey approach for customers worldwide.

GatesAir has a well-established, on-the-ground presence in markets around the world. Every day, our more than 300 employees strive to deliver world-class solutions and service to customers in more than 130 countries. And we staff dozens of sales and support facilities in markets as diverse as France, Germany, China, Argentina, Mexico, Singapore, Australia and Dubai. This round-the-world presence ensures that every customer feels comfortable doing business with GatesAir.

Contact Information

	+1 513 459 3400
Americas	Americas@gatesair.com
Europe, Middle East Asia and Africa	+33 1 47 92 44 20 EMEA-APAC@gatesair.com

For more information, please visit gatesair.com

Global Service Locations

Meeting Customer Requirements

GatesAir is a company that can serve any need — from a single component to the design and deployment of an entire facility. Customers who partner with GatesAir not only gain access to the industry's broadest technology portfolio, they also gain access to a team of industry insiders who will collaborate to specify a broadcast operation's technology requirements by business outcomes — enabling broadcast operations to work smarter, faster and more profitably.

Technology Innovation

For nearly a century, GatesAir has pioneered the technologies that drive the world's leading television and radio broadcast operations. Our legacy of innovation has earned us nearly 250 global patents and more than 50 industry awards. From developing the world's first digital broadcast FM exciter, to helping launch the first commercial DTV station in the U.S., to enabling the first TV broadcast of a sporting event in 3D, GatesAir innovation helps our global customers keep pace with a continually evolving market.

Company Ownership

GatesAir is a portfolio company of The Gores Group, a global investment firm headquartered in Los Angeles, California. Founded in 1987, The Gores Group has approximately $3.3 billion in assets under management and a diverse portfolio that includes technology, telecommunications, business services, industrial, health-care, media & entertainment, and consumer products.

The Gores Group collaborates closely with portfolio companies to establish viable operational blueprints, launch marketing and product initiatives and determine areas to invest for growth, to build stronger and better companies. For more information, please visit www.gores.com

Global Service and Support

GatesAir provides unrivaled long-term customer support for users of GatesAir-branded hardware and GatesAir-developed software solutions, as well as GatesAir-distributed equipment.

One of the most compelling reasons for selecting broadcast equipment from GatesAir is the level of support you will receive. We call it sustaining support, because its purpose is to sustain your equipment to a level that provides the highest return on your investment. We also want to sustain your confidence in GatesAir as your preferred supplier.

Service Bulletins

Service bulletins are produced to make customers aware of performance improvement, field modifications requirements and other corrective measures when it is considered to be of significant importance to the operation and performance of the equipment. GatesAir sends the bulletins to the original purchaser or if known, to the current user of the product in question. All bulletins are kept on file in the event there is a request for all bulletins of a particular model.

Update Kits

In addition to the service bulletins mentioned above, GatesAir makes available update parts kits that may be purchased by customers wishing to keep their equipment up-to-date. In cases where the updates involve issues of safety or necessary corrections to meet specifications, the kits are provided at no cost to the end user.

Hardware and Equipment

Our customers can call Field Service during our regular business hours, 8-5 M-F. Customers who require off-air emergency support can call 24 hours a day, 7 days a week and be connected with an on-call engineer. Call +1 217-222-8200 or e-mail: tsupport@gatesair.com; tsupport.europe@gatesair.com; tsupport.asia@gatesair.com

On Hand for Timely Delivery

Need something repaired? Notify the service support center for your product and region and call us for a RMA so we know it is coming. The GatesAir in–house technical repair facility provides our customers with the best repair, refurbishment, and upgrade opportunities available. Staffed by technically expert and product knowledgeable engineers and technicians, we perform services ranging from simple troubleshooting and component replacement to complete overhauls and refurbishments of all types of equipment. Our process includes testing your equipment using original factory test procedures. No repaired equipment will be returned until it performs to "as new" functionality or we will contact you to explain the problem and work out an alternative course of action. Need short term replacement modules? Our services also include a rental program, which enables you to stay on the air while your equipment is being repaired. We have over 60 modules available for rent to support the vast majority of GatesAir –built equipment in service. For a complete list of rental equipment please contact the repair call center at 1-888-534-8246.

Onsite Support

When it's critical to have an added level of onsite support, GatesAir has an experienced team ready to assist you:

- Diagnose, troubleshoot, calibrate and check network interoperability
- Maintain, proof or evaluate current and existing systems
- Customize onsite support packages specifically to your needs.

Specialized Services

Onsite Field Checkout Commissioning Services: One of our trained engineers will review and verify that your installation meets manufacturer specifications. They will ensure product integration and interfaces for interoperability, and make sure your new or existing project gets online quickly.

GoLive Support Services: For on-air cutovers or system launches. Arrange to have a factory-trained specialist onsite when your system goes live to make sure you have the support you need while you perform this critical operation.

Radio and Television Transmission Services: GatesAir's highly trained, highly experienced staff has installed, commissioned and maintained hundreds of radio and television transmitters worldwide. Transmission onsite field engineers from GatesAir provide these ongoing transmission services:

- Turnkey installations
- Installation assistance and commissioning
- Preventive and after-warranty maintenance
- Troubleshooting and equipment repair
- Program Management

Support Pre-staging

Factory pre-staging is available on large system installs and makes sure everything is working as a complete system before it gets shipped to a remote location. It also reduces onsite setup time. Customers may preview their systems in person by visiting the factory for a Factory Acceptance Test.

Interoperability

Understanding how your existing products will operate with new products is one of the key components to ensuring your systems' interoperability. At GatesAir we recognize this is critical to the build-out success, so we've defined a group of pre-qualified product, guaranteed to be interoperable. Whether your product came from GatesAir or from another third-party provider, GatesAir will test and evaluate the interoperability of those products, before you've designed the complete system. This is the GatesAir Interoperability Evaluation Service. For more information, contact us.

Project Management

Make your next project a huge success with GatesAir's project management services. GatesAir Professional Services allows your organization to leverage our technology leadership, project management, and broadcast and media expertise to build and grow your business. Whether you are upgrading or expanding your current plant, designing a disaster recovery solution, building a new facility, or re-engineering your workflows, GatesAir has consultants that can help you plan and deliver successful projects.

Training

Investing in the industry's most advanced and dependable broadcasting equipment is the first step to building a reliable and efficient operation. The second is securing the knowledge your team needs to maintain and operate your equipment at peak performance. GatesAir is also the only manufacturer to sponsor a training center with a full complement of general training classes as well as GatesAir product courses. Customized training is also available.

International Training

As part of our commitment to helping broadcasters around the world, GatesAir offers an annual two-week training session for broadcast engineers from developing nations. This program is a joint effort between GatesAir and the United States Telecommunications Training Institute (USTTI). Since 1983 over 250 engineers from 60 countries have participated in this program.

Service Agreements

GatesAir Service agreements ensure your products are supported after their standard warranty period expires. Have your service in place to take over when your warranty expires. GatesAir offers multiple levels of Services to fit your individual needs. Let us help you find the right level of support coverage.

GatesAir performs services ranging from simple troubleshooting and component replacement to complete overhauls and refurbishments of all types of equipment. Staffed by expert engineers and technicians, our process includes testing your equipment using original factory test procedures. GatesAir also offers a rental program, which enables you to stay on the air while your equipment is being repaired. We have modules available for rent to support the vast majority of GatesAir–built equipment in service.

World's Largest Transmitter Facilities!

Meeting customer requirements for delivery and quality is foremost for Gatesair. GatesAir maintains an ISO9001 registered transmitter manufacturing facility in Quincy, IL USA.
Several buildings in the Quincy location are dedicated to manufacturing. The main manufacturing building at 30th and Wismann Lane is 125,000 square feet and houses the following functions: Sheet Metal and Machine Shop, Printed Wiring Board Assembly and Test, Cable Assembly, High Power Module Assembly and Test, L-Band/UHF/VHF Product Assembly and Test and FM Radio Product Assembly and Test. There are three leased buildings totaling 55,000 square feet used for AM Radio Product Assembly and Test and Phasor/Antenna Control Unit Assembly and Test. These buildings are located 3 miles north of the main manufacturing facility.

Beyond the manufacturing space in Quincy, Illinois there is a 100,000 square foot administrative building which houses Manufacturing Engineering, Finance, Order Administration, Service, Service Parts, Sales Support and the Order Administration functions. There is also a separate 15,000 square feet building where technical training courses are offered to customers.

Production capacity

In any given day, there are approximately 15 different models of transmitters simultaneously being assembled and tested at the Quincy, Illinois manufacturing facilities:

- FM transmitters, a mix of solid state and tube units
- VHF transmitters, all solid state
- UHF transmitters, all solid state
- L-Band transmitters, all solid state

The mix and volume of product coming out of the GateAir factory is unmatched by any other transmitter manufacturer. The operation runs one full shift per day. There are only a couple of areas where there are 2 shifts running today, so future needs for expanded output will come from more personnel working on a second shift.

$2-3 million of capital is invested in the Manufacturing operation each year. All GatesAir manufacturing plants are a subject of continuous improvement and capital investment. Most of the capital investment is driven by new technologies, new products and efficiency improvements for the operation. Formal customer acceptance is an option available that demonstrates the product performing to specification, at the same time, giving the customer an opportunity to confirm confidence by inspecting the manufacturing process.

Quality

GatesAir manufacturing facilities have been ISO 9001 registered since December 1994. There is a comprehensive and documented quality system in place that covers all major facets of the operation: the management review process, product design, order administration, inspections, all manufacturing operations, purchasing, equipment calibration, and training. This system is monitored through an on-going internal and external audit program.

There is an intense focus on improving the manufacturing operation. A team of 10-15 people work to transform and change an area. The team is given a very specific mandate on what goals need to be achieved. The team is trained on some very specific principles, which will help them achieve the goals: once piece flow, waste identification and removal, spaghetti diagrams, kanban pull systems, and workplace organization. The team then implements the changes.

To ensure transmitters are manufactured under the most exacting conditions, GatesAir has voluntarily sought and achieved ISO Quality Standard registration. GatesAir is registered with current certification on file for the following manufacturing, testing, environmental and quality standards: ISO 9001:2008 – Certificate of Registration of Quality Management System; ISO 14001:2004 – Certificate of Registration of Environmental Management System; OSHAS 18001:2007 – Certificate of Registration of Occupational Health and Safety Management System

RoHS – All products/parts/materials offered conform fully with Directive 2011/65/EU – European Union (EU) Restriction on Hazardous Substances – sets limits on the use of restricted substances found in electronic equipment: Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent Chromium (Cr-V1), Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE).

WEEE Directive – HBC is fully compliant with EU Directive 2002/96/EC– The European Union Directive on Waste from Electrical and Electronic Equipment

Shipping

Our shipping and packing department is the best in the world for getting the orders to the customer on time and undamaged. The Shipping department ships product to over 100 countries each year. There is extensive traffic knowledge on how to ship product anywhere in the world using almost any mode of transportation. The packing and crating for all shipments (domestic and international) is done in-plant. The knowledge gained in preparing shipments for international shipment over the past 40 years is important to making sure the equipment arrives in good condition.

NSAI

Certificate of Registration of Occupational Health and Safety Management System to BS OHSAS 18001:2007

The National Standards Authority of Ireland certifies that:

GatesAir, Inc.
3200 Wismann Lane
Quincy, IL 62305
USA

has been assessed and deemed to comply with the requirements of the above standard in respect of the scope of operations given below:

Manufacturing, Order Management, Program Management, Supply Chain Management, Sustaining Engineering and Repair of Radio, Television, and Networking Products for use in Broadcast Communications and Related Media Industries.

Approved by:
Geraldine Larkin
Chief Executive Officer

Approved by:
Lisa Greenleaf
Operations Manager

Registration Number: 18.4117X
Certification Granted: Sep 04, 2007
Effective Date: Jan 15, 2018
Expiry Date: Feb 22, 2019

ANAB ACCREDITED
MANAGEMENT SYSTEMS CERTIFICATION BODY

National Standards Authority of Ireland, 20 Trafalgar Square, Nashua, New Hampshire, NH 03063, USA T +1 603 882 4412

18001:2007-US (3.0)

NSAI

Certificate of Registration of Quality Management System to ISO 9001:2015

The National Standards Authority of Ireland certifies that:

GatesAir, Inc.
3200 Wismann Lane
Quincy, IL 62305
USA

has been assessed and deemed to comply with the requirements of the above standard in respect of the scope of operations given below:

Manufacturing, Order Management, Program Management, Supply Chain Management, Sustaining Engineering and Repair of Radio, Television, and Networking Products for use in Broadcast Communications and Related Media Industries.

Approved by:
Geraldine Larkin
Chief Executive Officer

Approved by:
Lisa Greenleaf
Operations Manager

Registration Number: 19.1841/A
Certification Granted: Dec 22, 1994
Effective Date: Jan 15, 2018
Expiry Date: Feb 22, 2019

ANAB ACCREDITED
MANAGEMENT SYSTEMS CERTIFICATION BODY

National Standards Authority of Ireland, 20 Trafalgar Square, Nashua, New Hampshire, NH 03063, USA T +1 603 882 4412

NSAI

Certificate of Registration of Environmental Management System to ISO 14001:2015

The National Standards Authority of Ireland certifies that:

GatesAir, Inc.
3200 Wismann Lane
Quincy, IL 62305
USA

has been assessed and deemed to comply with the requirements of the above standard in respect of the scope of operations given below:

Manufacturing, Order Management, Program Management, Supply Chain Management, Sustaining Engineering and Repair of Radio, Television, and Networking Products for use in Broadcast Communications and Related Media Industries.

Approved by:
Geraldine Larkin
Chief Executive Officer

Approved by:
Lisa Greenleaf
Operations Manager

Registration Number: 14.4127X
Certification Granted: Sep 04, 2007
Effective Date: Jan 15, 2018
Expiry Date: Feb 22, 2019

ANAB ACCREDITED MANAGEMENT SYSTEMS CERTIFICATION BODY

National Standards Authority of Ireland, 20 Trafalgar Square, Nashua, New Hampshire, NH 03063, USA T +1 603 882 4412