



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
EBA342

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
SHELLY MURRAY 304-558-8801



Larcan
 1390 Overlook Drive
 Lafayette, CO 80026

SHIP TO

EDUCATIONAL BROADCASTING
 AUTHORITY
 600 CAPITOL STREET
 CHARLESTON, WV
 25301-1223 304-558-3400

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
04/05/2011				

BID OPENING DATE: 05/11/2011 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		840-65		
<p>THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA EDUCATIONAL BROADCASTING AUTHORITY, IS SOLICITING BIDS FOR ONE (1) 2 KW CHANNEL 29 DIGITAL TELEVISION TRANSMITTER SYSTEM PER THE ATTACHED SPECIFICATIONS.</p> <p>TECHNICAL QUESTIONS MUST BE SUBMITTED IN WRITING TO SHELLY MURRAY IN THE WEST VIRGINIA PURCHASING DIVISION VIA MAIL AT THE ADDRESS SHOWN AT THE TOP OF THIS RFQ, VIA FAX AT 304-558-4115, OR VIA E-MAIL AT SHELLY.L.MURRAY@WV.GOV. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 04/25/2011 AT THE CLOSE OF BUSINESS. ALL TECHNICAL QUESTIONS RECEIVED, IF ANY, WILL BE ADDRESSED BY ADDENDUM AFTER THE DEADLINE.</p> <p>TELEVISION TRANSMITTERS</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM WITH THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID, AND IS TERMINATED WITHOUT FURTHER ORDER.</p> <p>NOTICE</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

RECEIVED

MAY 11 A 10:26

PURCHASING DIVISION
 STATE OF WV

GENERAL TERMS & CONDITIONS REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.
 2. The State may accept or reject in part, or in whole, any bid.
 3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
 4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
 5. Payment may only be made after the delivery and acceptance of goods or services.
 6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
 7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
 8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
 9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
 10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
 11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
 12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
 13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.htm and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
 14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.
 15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
 16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.
- I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
EBA342

PAGE
2

ADDRESS CORRESPONDENCE TO ATTENTION OF
SHELLY MURRAY
304-558-8801

RFQ COPY
 TYPE NAME/ADDRESS HERE

VENDOR

SHIP TO

**EDUCATIONAL BROADCASTING
 AUTHORITY
 600 CAPITOL STREET
 CHARLESTON, WV
 25301-1223 304-558-3400**

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
04/05/2011				

BID OPENING DATE: **05/11/2011** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: SHELLY MURRAY</p> <p>RFQ. NO.: EBA342</p> <p>BID OPENING DATE: 05/11/2011</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID: 610 792 7284</p> <p>CONTACT PERSON (PLEASE PRINT CLEARLY): JOE WOZNIAK, REGIONAL SALES MGR.</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE TELEPHONE **610-792-7283** DATE **5-10-11**

TITLE **REGIONAL SALES MGR.** FEIN **52-0854061** ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

Request for Quotations EBA342

Digital Television Transmitter System

The West Virginia Educational Broadcasting Authority (WVEBA) is conducting a request for quotations for one (1) 2 kW channel 29 digital television transmitter system.

The West Virginia Educational Broadcasting Authority operates a statewide network of television transmitters. This project will add a digital translator to the WSWP site at Welch, WV. The power requirements for the site will be addressed in the specifications. The bid shall be awarded to a single vendor.

1. Transmitter

- 1.1. The transmitter manufacturer shall have a service department that is staffed 24 hours a day, 365 days a year.
- 1.2. The transmitter manufacturer shall have been manufacturing broadcast digital television transmitters for the North American market for at least ten years.
- 1.3. The vendor shall provide two sets of technical manuals. These manuals shall include installation instructions, operating instructions, tuning instructions, maintenance instructions, and troubleshooting procedures. The manuals shall also include parts list that includes the part number, circuit designator, description, and generic number whenever possible. The manuals shall include wiring diagrams with wire numbers and circuit schematics with component designators and values.
- 1.4. The transmitter shall be capable of providing adequate power to meet the licensed authorization.
- 1.5. Transmitter shall be FCC approved for the service and power levels anticipated, the ATSC 8-VSB digital television signal produced shall be high quality and comply with all applicable FCC regulations and EIA standards.
- 1.6. All components shall have adequate capacity to allow transmitter to operate at its maximum rated power level for 24 hours a day, 365 days a year.
 - 1.6.1. Maximum power shall not be less than 2.0kW measured at the output of the mask filter
- 1.7. Vendor shall provide a mask filter meeting FCC requirement for "Stringent Mask" and all interconnecting hardware.
- 1.8. Vendor shall provide all hardware, transmission line, couplers, adapters necessary for connection between the transmitter and the supplied mask filter.
- 1.9. Mask filter shall output to a 1 5/8" EIA connector
- 1.10. Transmitter shall be solid state with field replaceable RF modules.
 - 1.10.1. Solid state RF modules shall be front access, plug-in units capable of being removed or installed during the normal on-air operation of the transmitter. It shall not be necessary to reduce RF drive, remove cabinet power, or make any adjustments when replacing modules.
 - 1.10.2. No soldering shall be required to change RF modules
 - 1.10.3. In the event of a RF or device failure the PA module will continue to operate at reduced power
 - 1.10.4. All PA modules shall be completely identical and interchangeable with no degradation in performance.
 - 1.10.5. RF modules shall be field replaceable by one person
- 1.11. Transmitter shall be air cooled. Liquid cooled designs will not be considered.

- 1.12. Transmitter shall have the ability to exhaust air used for cooling the transmitter outdoors. Air intake shall be from indoor air
- 1.13. The transmitter shall be of a very compact design and comprise 19" rack mount assemblies.
- 1.14. The transmitter shall include any enclosures needed to house the individual sub-assemblies.
- 1.15. Transmitter shall have protection against excessive VSWR, RF input overdrive, over-temperature, over or under voltage, and over current conditions.
- 1.16. Transmitter shall have metering of: voltage, current, RF power (forward and reverse), cooling fault, PA fault, exciter fault, and power supply fault available for display on the front panel
 - 1.16.1. These parameters shall be available for remote telemetry.
- 1.17. Transmitter shall have remote control capability
- 1.18. Transmitter shall be FCC approved for the service and power levels anticipated
- 1.19. Transmitter shall be configured to operate on single phase 220V AC
- 1.20. Upon loss of power the transmitter shall restart in it's last powered state when power is returned
- 1.21. Exciters shall provide pre-correction and equalization
 - 1.21.1. Equalization shall be adaptive.
 - 1.21.2. Fully automatic correction of both linear and non-linear distortions shall be performed in a seamless and continuous manner.
- 1.22. If an external power amplifier is used to attain the required power level, sensing shall be provided to allow adaptive equalization of the entire transmitter system
- 1.23. The exciter shall include an internal UPS or battery back-up system capable of maintaining frequency lock on the master oscillator and synthesizer to allow fast recovery after a power failure of up to 2 hours.
- 1.24. The exciter shall accept a SMPTE-310 digital stream
- 1.25. A receiver capable of decoding an off air 8VSB ATSC stream and rebranding the program PID tables shall be provided.
- 1.26. Receiver shall accept an ASI input in addition to the 8VSB signal.
 - 1.26.1. Inputs shall be selectable
- 1.27. The receiver shall output to a SMPTE-310 stream
- 1.28. Vendor shall provide a power meter
 - 1.28.1. Frequency range 9 kHz to 110 GHz
 - 1.28.2. Power range -70 to +44 dBm sensor dependant
 - 1.28.3. If a power sensor is required vendor shall provide a sensor rated for the transmitter frequency and power levels anticipated at the sample port
 - 1.28.4. A power sensor cable, if needed shall be provided
 - 1.28.5. Meter input shall be a N type female connector, 50 ohms
 - 1.28.6. Agilent E4416A or equal

2. Site requirements

2.1. Welch, West Virginia

- 2.1.1. Transmitter shall operate on channel 29
- 2.1.2. Transmitter Power Output (TPO) required shall be 1706 watts average power.
- 2.1.3. TPO shall be measured at the output of the mask filter.

3. Future Upgrades

- 3.1. Vendor shall have demonstrated upgrade capabilities of hardware and software not limited to the following:

- 3.1.1. Hardware upgrade would primarily consist of additional modules to increase power output
- 3.1.2. Software upgrades relating to the advances in processing and adaptive correction and equalization

4. Optional Equipment

- 4.1. The following options will not be part of the winning bid decision making. The options may or may not be purchased.
 - 4.1.1. Vendor is requested to include an option for dual redundant exciters.
 - 4.1.1.1. The optional redundant exciter system shall be able to detect a fault in the primary exciter and switch to the redundant exciter if a fault is detected automatically
 - 4.1.2. Vendor is requested to provide an option for commissioning services for the transmitter.
 - 4.1.3. Vendor is requested to provide optional pricing for installation of the transmitter.
 - 4.1.3.1 Items to be installed in and or to vendor supplied cabinet:
 - * Power Supplies
 - * RF modules
 - * Exciter connections
 - * connect RF amplifiers to RF combiner and duplexing system.
 - 4.1.4. Vendor is requested to provide optional pricing for a spare RF PA module for the transmitter.
 - 4.1.5. Vendor is requested to provide optional pricing for a 120/240V single phase, split phase 225 amp surge suppressor
 - 4.1.5.1. Nominal operating voltage: 120 to 480 VAC
 - 4.1.5.2. Surge capacity per phase: Minimum of 200 kA
 - 4.1.5.3. Surge capacity per mode: Minimum of 100 kA
 - 4.1.5.4. Connection: Series
 - 4.1.5.5. Response time: <1ns
 - 4.1.5.6. LEA Danasystem DS21-225A or equal

5. Shipping and delivery

- 5.1. Vendor shall provide shipping
- 5.2. Shipping charges shall be included in the equipment price
- 5.3. Delivery shall be FOB Destination
- 5.4. The receiving facility shall be WSWP studios:
 - WV Educational Broadcasting Authority
 - 124 Industrial Park Road
 - Beaver, WV 25801
 - Attn: Jeremy Scott
 - 304-254-7840
- 5.5. Shipper shall provide 24 hours notice to arrange off-loading
- 5.6. Shipper shall provide off-loading equipment and be responsible for off-loading transmitter and associated hardware.

6. Warranty

- 6.1. All products shall be warranted for a period of one year.
- 6.2. Bidders shall state their warranty policy.

7. Support

7.1. Vendor shall provide toll-free phone support for all items for a minimum of five years

8. Invoicing

Tammy Treadway
WV Educational Broadcasting Authority
PO Box 9004
Beckley, WV 25802-9004
304-254-7840

EBA342 – WV EBA Pricing Page

Digital Television Transmitter System. Shipping charges shall be included in product pricing.

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
1	1	Solid state transmitter	\$109,520.00	\$109,520.00
2	1	Mask Filter	\$6,480.00	\$6,480.00
3	1	Hardware necessary for connection between transmitter and mask filter.	incl.	incl.
4	1	Transmission line necessary for connection between transmitter and mask filter.	\$1,049.00	\$1,049.00
5	1	Couplers necessary for connection between transmitter and mask filter.	N/A	N/A
6	1	Adapters necessary for connection between transmitter and mask filter.	\$200.00	\$200.00
7	1	Receiver capable of decoding an off air 8VSB ATSC stream and rebranding the program PID tables	\$4,200.00	\$4,200.00
8	1	Power meter, Agilent E4416A or equal.	\$8,648.00	\$8,648.00
TOTAL				\$130,097.00

The following options WILL NOT be part of the winning bid decision making. These options MAY or MAY NOT be purchased individually.

1	1	Dual redundant exciter system	\$18,000.00	\$18,000.00
2	1	Commissioning services for the transmitter	\$8,750.00	\$8,750.00
3	1	Installation of the transmitter	\$3,000.00	\$3,000.00
4	1	Spare RF PA module	\$9,360.00	\$9,360.00
5	1	220V single phase, split phase 225 amp surge suppressor. LEA Danasystem DS21-225A or equal.	\$3,050.00	\$3,050.00
TOTAL				


Signature of Vendor Representative Submitting Bid

5/10/11
Date

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: 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 the debt owed is an amount greater than one thousand dollars in the aggregate.

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.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "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.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this 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.

Under penalty of law for false swearing (**West Virginia Code §61-5-3**), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: LARCAN USA INC.

Authorized Signature: [Signature] Date: May 9, 2011

State of Pennsylvania

County of Montgomery to-wit:

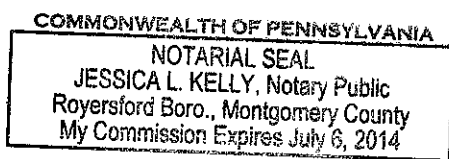
Taken, subscribed, and sworn to before me this 9 day of May, 2011.

My Commission expires July 6, 2014.

AFFIX SEAL HERE

NOTARY PUBLIC

[Signature]





LARCAN USA Inc.

602 King Road
Royersford, PA 19468-1561

Telephone: 610-792-7283
Facsimile: 610-792-7284

May 10, 2011

Shelly Murray, Buyer
State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Charleston, WV 25305-0130

Subject: RFQ Number: EBA342

Dear Ms. Murray:

Thank you very much for the opportunity to submit the enclosed bid for the subject RFQ. We are one of the well-respected suppliers in the industry. We thought we'd point out some of the ways which the equipment we are offering meets the specifications of the RFQ. We've decided to highlight these things. We would be glad to address any questions regarding the ways we fully meet all the requirements of these specifications. We take no exceptions.

EBA342 Specification/Feature & Benefit

- 1.1 This transmitter is manufactured in Mississauga, Ontario, Canada and is supported by facilities there and at our Colorado manufacturing facility. Our service is accessible 24 hours a day, 365 days a year by phone.
- 1.2 LARCAN has been manufacturing television transmitters for nearly 60 years. We have been manufacturing digital television transmitters since the ATSC digital transmission service was authorized in 1997.
- 1.10 Plug-In RF Modules: The LARCAN model DTT2KSU offered is equipped with four front-accessible power amplifier modules that plug-in to a Stripline combiner. They are hot-swappable. We use very rugged connectors and tight tolerances on the module housing to make it so any technician can remove and replace modules while virtually eliminating the risk of creating a problem due to breakage. This technique which LARCAN pioneered in 1988 is a time-proven method of eliminating the problems that can occur when cables are used to combine PA outputs. This minimizes long term maintenance costs.
- 1.10.5 Because the power supplies are not mounted on the PA modules, the weight of the PA's is kept to a relatively low 35 pounds which one person can typically handle.

LARCAN USA, Inc.

Subject: State of West Virginia RFQ #EBA342

1.10.6 The DTT2KSU is an air-cooled transmitter, an approach LARCAN has successfully employed in high power transmitter design for over 20 years.

1.11 Our pull-through air-cooling approach is ideal for meeting your requirement for exhausting the cooling air. The blower supplied with the transmitter is typically mounted directly above the power amplifier cabinet. This low pressure blower, which has a life expectancy equal to the transmitter, pulls air through the cabinet and allows the user to easily connect an air duct to exhaust the air to the outside. This approach eliminates the use of much less reliable "muffin-type" fans that typically have a 5 year life expectancy. It also eliminates the possible need for another external blower to overcome back pressure that would result from rear cabinet plenums. It also eliminates the interlock that would be necessary with that design causing the transmitter to possibly shut-down entirely when the rear of the cabinet is opened.

Please note: the mask filter quoted is designed and built to our specifications. If another mask filter is selected, it must be approved by LARCAN engineering so that compliance with FCC specifications can be assured.

We will gladly answer any questions. I can be reached as follows:

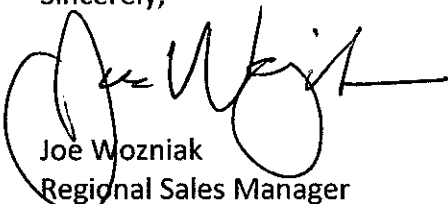
Phone: 610-792-7283

Mobile: 267-408-3037

Email: jwozniak@larcan.com

We look forward to the opportunity to supply this equipment to the West Virginia Educational Broadcasting Authority.

Sincerely,



Joe Wozniak
Regional Sales Manager
LARCAN USA, Inc.



RFQ No. EBA342

MATERIAL LIST

Prepared For:

**Department of Administration
Purchasing Division
Building 15
2019 Washington Street, East
Charleston, WV 25305-0130
Attn: Shelly Murray**

Prepared By:

**Joe Wozniak
Regional Sales Manager
LARCAN USA Inc.
602 King Road
Royersford, Pennsylvania 19468**

**Phone: (610) 792-7283
Fax: (610) 792-7284
Email: jwozniak@larcan.com**

Material List Number:

**Q11-01-054
WSWP
LARCAN DTT2KSU Transmitter**

Material List Date:

May 11, 2011

GROUP A: 2kW UHF DIGITAL TELEVISION TRANSMITTER

A.1 1 **LARCAN MAGNUM Series Model DTT2KSU
 DIGITAL SOLID STATE UHF TRANSMITTER**

- 2kW average DTV power, ATSC Compliant
- Broadband LDMOS Power Amplifier Technology
- Broadband Stripline Combiners
- Redundant Amplifiers and Multiple Power Supplies
- Air Cooling with External, "Pull-Thru" Method of Air Circulation
- Hot Pluggable PA Modules
- RS-232 PC Interface

ACKNOWLEDGED:

Channel:	<u>29</u>				
Pilot Frequency	<u>560.3044</u>	MHz			
DTV Average TPO:	<u>1706</u>	W			
Supply Voltage:	<u>220</u>	VAC			
	<u>Single</u>	Phase,	<u>60</u>	Hz	
Altitude:	<u>TBD</u>	Feet AMSL			

Complete UHF Transmitting System consisting of (1) Cabinet Containing:

- (4) Broadband Amplifier Modules
- (1) 28 VDC Regulated Power Supplies
- (1) 4-Way Stripline Combiner
- (1) Cabinet Controller with LCD Touchscreen
- (1) LARCAN ATSC DTV HD Pulse Exciter
 - ATSC-Compliant 8-VSB Modulator with UHF Up-Converter
 - Linear and non-linear adaptive pre-correction
 - Front Control Panel
 - Dual ASI or SMPTE 310M Input
 - High stability, low noise
- (1) LCD Output Power Meter
- (1) Control and Monitoring System with Integrated Diagnostics and Adjustable VSWR Trip
- (1) Harmonic Filter
- (1) Exhaust Blower
- (1) Set Spare Directional Couplers
- (1) Transmitter Hardware Kit
- (1) Factory Test at Operating Power
- (2) Sets of Instruction Manuals

- (1) APC Smart UPS 1000 LCD, 1kVA
 AC 120V
 Typical Back Up Time: 140 minutes @ 70W load
 Note: UPS unit dedicated to LARCAN Pulse Exciter

GROUP A: 2kW UHF DIGITAL TELEVISION TRANSMITTER – Continued

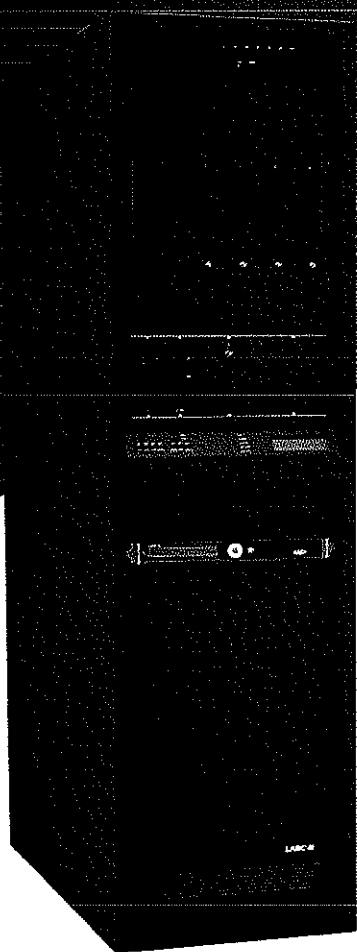
- A.2 1 LARCAN UHF 6-Sections DTV Reflective Mask Filter, 1-5/8" Unflanged/Recessed Input/Output, Model 41D1974G3. Includes LARCAN 1-5/8" 3-Port Directional Coupler Line Section, Unflanged/Recessed, Model 31C1204G3
- A.3 1 1-5/8" Flexible HELIAX Coaxial Cable (AVA7-50), terminated with 1-5/8" Connectors (AL7E158-PS) at both ends. Length of 10' (each)
- A.4 3 Field Flange, 1-5/8", Model 201-014
- A.5 1 K-Tech 8-VSB Terrestrial Signal to DVB-ASI and SMPTE-310M Signal Converter with PSIP Updating capability. Null Packet Insertion/Deletion and PCR Correction, 1RU frame, Model VSB-FRQ-200
- A.6 1 Agilent Power meter - EPM-P series, single channel, Model E4416A. Includes power sensor cable, E9288A length 5-ft
- A.7 1 AT-E9327A Peak and Average Power Sensor, 50 MHz to 18 GHz, 5 MHz bandwidth

OPTIONAL

- | | | |
|-------|---|---|
| OPT.1 | 1 | Redundant LARCAN ATSC DTV HD Pulse Exciter <ul style="list-style-type: none">• ATSC-Compliant 8-VSB Modulator with UHF Up-Converter• Linear and non-linear adaptive pre-correction• Front Control Panel• Dual ASI or SMPTE 310M Input• High stability, low noise |
| OPT.2 | 1 | LARCAN Hot Standby Auto/Manual Exciter Switchover Unit, Model 40D1844 |
| OPT.3 | 1 | LARCAN On-Site Check Out and Proof of Performance using LARCAN supplied test equipment. <ul style="list-style-type: none">• Includes all transportation and local living expenses.• Individual, bound Transmitter Test Data Report with separate reading and waveform photographs is provided after completion of Proof of Performance. |
| OPT.4 | 1 | LARCAN Installation of the DTT2KSU Transmitter. <ul style="list-style-type: none">• Includes all transportation and local living expenses.• Price is based on LARCAN field technician performing of work.• Does not include site modifications or installation for HVAC and Civil works.• Service conditioned on availability of the necessary floor space, and for the site to be prepared and clear of obstruction to minimize job delays or interruption to the installation schedule.• All items relating to HVAC installation as well as transmitter placement shall be completed prior to LARCAN arrival. |
| OPT.5 | 1 | Spare Power Amplifier Module for Magnum Transmitter, Model 41D2329G1 |
| OPT.6 | 1 | LEA Surge Suppressor, Model DS21-225A |

MAGNUM

*Digital Solid State UHF Transmitter
1kW to 20kW and beyond*



*MAGNUM 2kW
ATSC Transmitter*

MAGNUM: The Definitive in Digital Power

LARCAN's Magnum Series – an award winning solution that delivers new technology and innovation at its best. A 'bullet-proof' design – Magnum is an elegant, no-nonsense transmitter that fits your broadcast needs.

It's a smart choice for broadcasters that demand a superior digital signal.

Magnum Delivers like no other transmitter!

- **100% Solid State UHF Transmitter**
- **Broadband Amplifier (No Tuning Adjustments)**
- **Customizable Cooling System**
- **Extensive Monitoring and Diagnostics**
- **Cost Effective, High Performance**
- **Reliable and User Friendly**
- **Magnum is the product of engineering at its best!**

MAGNUM

Digital Solid State UHF Transmitter
1kW to 20kW and beyond

LARCON
We hear you. Loud and clear.

Magnum – A Smart Digital Choice

Magnum is the work of engineering at its best – a solid and superior design for broadcasters who want the ultimate in a digital signal.

The award winning Magnum series of digital solid-state UHF transmitters is built on pure performance, delivering the definitive in digital power.

Innovative features include our broadband LDMOS amplifiers, which require no tuning and offer the ruggedness and reliability you've come to expect from LARCON.

**Looking for the best in digital?
We hear you. Loud and clear.**



DTT2KSU ATSC SPECIFICATIONS

Output

Power	2000 Watts
Frequency	470-860 MHz
Output Connector	1-5/8" EIA
Out-of-Band Emissions	FCC Mask
Signal-to-Noise	30dB
EVM	3%
Pilot Phase Noise	-105 dBc/Hz (20kHz offset)
Precise Frequency Offset	Any offset, 1Hz step size
Frequency Stability	±150 Hz

INPUT

Interface	SMPTE310M or ASI
Bit Rate	19.39 MHz
Symbol Clock Frequency	10.762238 MHz
Impedance	75 Ohms

GENERAL

Voltage	200-240VAC, 50/60Hz (1 Φ or 3 Φ)
No. of Cabinets	1
Cooling	Forced Air

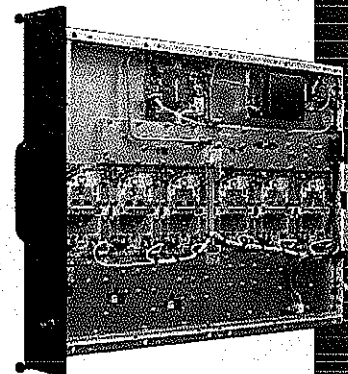
ENVIRONMENTAL

Temperature Range	0-45 deg C
Humidity	95% non-condensing
Altitude	10,000 ft AMSL

DIMENSIONS

Height	78 inches
Width	22 Inches
Depth	42 Inches

Magnum's PA Module design combines the expertise and experience of our legendary M Series transmitters with superior serviceability and reliability. The result is innovation – unprecedented levels of power density and superior linearity.



LARCON
We hear you. Loud and clear.

U.S. Tel: 1-303-665-8000 Fax: 1-303-673-9900 Canada Tel: 1-905-564-9222 Fax: 1-905-564-9244
www.larcon.com Email: sales@larcon.com

PULSE_{HD}

ATSC Modulator



PULSE_{HD}

DIGITAL MODULATOR

RF IN
RF OUT
RF MON
RF CAL

LARCAN PULSE_{HD} ATSC MODULATOR



ETHERNET

Pulse_{HD} ATSC Modulator

Start to Success Digital Solutions for DTV

Pulse Series is the result of LARCAN 'True Technology' at its best, offering design innovation that is uniquely our own – rugged, reliable and renowned. An integral part of our Broadcast Solutions – Pulse Series is the heart of our transmitters, for any worldwide standard.

Pulse HD ATSC Modulator is LARCAN's next generation digital modulator - featuring powerful precorrection algorithms for both Linear and Non-Linear system effects, operational in four independent modes. Features such as Transport Stream input switching, and built-in GPS functionality make the Pulse HD an innovative, feature-rich, high quality, and rugged solution for High Power digital transmitters. Built on a powerful hardware platform, the Pulse HD can be field upgraded, enabling enhancements such as ATSC-M/H compatibility.

PULSE HD – Technical Features:

- Dual Transport Stream Inputs; Independently Configurable for DVB-ASI or SMPTE310M
- State-of-the-art Signal Processing / Field-upgradeable Firmware
- Built-in GPS Receive Functionality
- Digital Adaptive Pre-correction for Linear and Non-linear
- Frequency Agile On-channel RF Output.

PULSE HD

LARCAN: Award Winning Innovation

LARCAN's new PULSE modulator with multiple correction modes allows you to tailor your system's operation to your own requirements.

Continuous mode: the correction algorithm runs continuously, incrementally adjusting the correction to maintain optimum performance.

Auto-Run mode: The transmitter output performance is monitored constantly and correction is performed should the performance stray beyond a user preset limit.

Run-to-Target mode: The correction algorithm will run until the performance meets or exceeds a predetermined value and stops.

Idle mode: The modulator simply holds the existing correction values.

These correction modes are available for both the Linear and the Non-Linear correction functions independently.

PULSE HD Specifications

INPUTS

NO. OF INPUTS:	2
FORMAT:	75 ohm SMPTE310M (19.39 Mbps) or, ASI/ATSC EN50083-9, ETSI TR 101 891 (3.5 to 19.39Mbps) (Independantly Configurable)
TS SWITCHING:	Manual or one of several Automatic modes (primary / secondary priority configuration)
10MHz IN:	50 Ohm 0.1 to 3Vp-p
1PPS:	50 Ohm or High Impedance selectable 0.1 to 3Vp-p (Trigger Level: 0.25 to 2.5Vp-p)
GPS IN:	50 Ohm impedance +5VDC bias supply for antenna available, (selectable through command)
TEST MODES:	PRBS Auto PRBS Single carrier

OUTPUTS

RF OUT:	54 to 806 MHz 0 to +10dBm 50 ohm ATSC A/53 Compliant
10MHz OUT:	Selectable 10MHz Frequency Reference 50 Ohm
1PPS:	50 Ohm
FREQUENCY STABILITY:	+/- 150Hz
PHASE NOISE:	105dBc/Hz
MONITORING:	TS Monitor, RF Output Monitor

PRECORRECTION

TYPES:	Linear/Non-Linear/Peak Envelope Limiting
MODES (lin. and non-lin.):	Continuous Mode Run-to-Target Auto-Run Idle
SENSE INPUTS (2)	50 Ohm +15dBm +/-6dB

PHYSICAL

COMMUNICATIONS INTERFACE:	ETHERNET/LAN; RJ-45
DIMENSIONS:	1.75"H x 19"W x 17"D Weight: 7.3 lbs
AC POWER:	110/220 VAC
POWER CONSUMPTION:	70W
TEMPERATURE:	0 to 50 °C (32 to 122 °F)
HUMIDITY:	90% non-condensing
ALTITUDE:	7500 feet above sea level max.