



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](http://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](http://WVPurchasing.gov) with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.

## Header 2

List View

### General Information

Contact

Default Values

Discount

Document Information

Procurement Folder: 739235

SO Doc Code: CRFQ

Procurement Type: Central Purchase Order

SO Dept: 0439

Vendor ID: 000000127835

SO Doc ID: EBA2000000029

Legal Name: PROPAGATION SYSTEMS INC

Published Date: 7/10/20

Alias /DBA:

Close Date: 7/17/20

Total Bid: \$99,885.00

Close Time: 13:30

Response Date: 07/17/2020

Status: Closed

Response Time: 11:22

Solicitation Description: ADDENDUM 1 : HIGH POWER VHF TV TRANSMIT ANTENNA

Total of Header Attachments : 2

Total of All Attachments : 2



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

State of West Virginia  
 Solicitation Response

Proc Folder : 739235

Solicitation Description : ADDENDUM 1 : HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type : Central Purchase Order

Date issued	Solicitation Closes	Solicitation Response	Version
	2020-07-17 13:30:00	SR 0439 ESR07172000000000231	1

VENDOR
000000127835 PROPAGATION SYSTEMS INC

Solicitation Number: CRFQ 0439 EBA2000000029

Total Bid : \$99,885.00      Response Date: 2020-07-17      Response Time: 11:22:13

Comments:

**FOR INFORMATION CONTACT THE BUYER**  
 Dusty J Smith  
 (304) 558-2063  
 dusty.j.smith@wv.gov

Signature on File	FEIN #	DATE
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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	HIGH POWER VHF TV TRANSMIT ANTENNA	1.00000	EA	\$99,885.000000	\$99,885.00

Comm Code	Manufacturer	Specification	Model #
43221703			

<b>Extended Description :</b>	HIGH POWER VHF TV TRANSMIT ANTENNA
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**Comments:** Additional option included on pricing page.



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

State of West Virginia  
 Request for Quotation  
 13 – Equipment

Proc Folder: 739235

Doc Description: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-06-26	2020-07-14 13:30:00	CRFQ 0439 EBA2000000029	1

**BID RECEIVING LOCATION**

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

**VENDOR**

Vendor Name, Address and Telephone Number:  
 Propagation Systems, Inc.  
 719 Pensacola Road  
 Ebensburg, PA 15931  
 814-472-5540

**FOR INFORMATION CONTACT THE BUYER**

Dusty J Smith  
 (304) 558-2063  
 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 7-17-2020

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

**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.

*Douglas A. Ross* PRESIDENT  
(Name, Title)  
Douglas A. Ross, President  
719 Pensacola Road, Ebensburg, PA 15931  
(Printed Name and Title)  
(Address)  
814-472-5540 / 814-472-5676  
(Phone Number) / (Fax Number)  
doug@psibroadcast.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.

Propagation Systems, Inc.  
(Company)  
*Douglas A. Ross* PRESIDENT  
(Authorized Signature) (Representative Name, Title)  
Douglas A. Ross, President  
(Printed Name and Title of Authorized Representative)  
July 17, 2020  
(Date)  
814-472-5540 / 814-472-5676  
(Phone Number) (Fax Number)

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.:**

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

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

**Addendum Numbers Received:**

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

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

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

Propagation Systems, Inc.

Company



Authorized Signature

July 17, 2020

Date

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

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 exceeds five percent of the total contract amount.

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

**WITNESS THE FOLLOWING SIGNATURE:**

Vendor's Name: Propagation Systems, Inc.

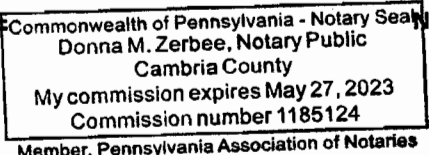
Authorized Signature: *[Signature]* Date: July 17, 2020

State of PA

County of Cambria, to-wit:

Taken, subscribed, and sworn to before me this 17 day of July, 2020

My Commission expires 5/27/23, 20  

**AFFIX SEAL HERE**  **NOTARY PUBLIC** *[Signature]*  
*Purchasing Affidavit (Revised 01/19/2018)*





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

State of West Virginia  
 Request for Quotation  
 13 - Equipment

Proc Folder: 739235

Doc Description: HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-06-26	2020-07-14 13:30:00	CRFQ 0439 EBA2000000029	1

**BID RECEIVING LOCATION**

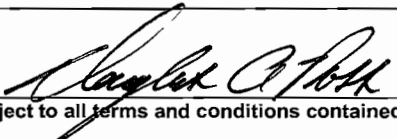
BID CLERK  
 DEPARTMENT OF ADMINISTRATION  
 PURCHASING DIVISION  
 2019 WASHINGTON ST E  
 CHARLESTON WV 25305  
 US

**VENDOR**

Vendor Name, Address and Telephone Number:  
 Propagation Systems, Inc.  
 719 Pensacola Road  
 Ebensburg, PA 15931  
 814-472-5540

**FOR INFORMATION CONTACT THE BUYER**

Dusty J Smith  
 (304) 558-2063  
 dusty.j.smith@wv.gov

Signature X  FEIN # 23-2876660 DATE 7-17-2020

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

**ADDITIONAL INFORMATION:**

ONE TIME

THE STATE OF WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, EDUCATIONAL BROADCASTING AUTHORITY, IS SOLICITING BIDS FOR THE ONE-TIME PURCHASE OF HIGH POWER VHF TV TRANSMIT ANTENNA PER THE ATTACHED DOCUMENTS.

QUESTIONS REGARDING THE SOLICITATION MUST BE SUBMITTED IN WRITING TO DUSTY.J.SMITH@WV.GOV PRIOR TO THE QUESTION PERIOD DEADLINE CONTAINED IN THE INSTRUCTIONS TO VENDORS SUBMITTING BIDS.

\*\*\*\*PLEASE NOTE MAKE SURE YOU DOWNLOAD BOTH OF THE SOLICITATIONS \*\*\*\*

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WSWP-TV 124 INDUSTRIAL PARK RD	
BEAVER	WV25813	BEAVER	WV 25813
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
1	HIGH POWER VHF TV TRANSMIT ANTENNA	1.00000	EA		

Comm Code	Manufacturer	Specification	Model #
43221703			

**Extended Description :**

HIGH POWER VHF TV TRANSMIT ANTENNA

**SCHEDULE OF EVENTS**

Line	Event	Event Date
1	TECHNICAL QUESTIONS DUE AT 10AM	2020-07-06

<b>EBA200000029</b>	<b>Document Phase</b> Final	<b>Document Description</b> HIGH POWER VHF TV TRANSMIT ANTENNA	<b>Page 3</b> <b>of 3</b>
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**ADDITIONAL TERMS AND CONDITIONS**

See attached document(s) for additional Terms and Conditions



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

State of West Virginia  
 Request for Quotation  
 13 – Equipment

Proc Folder: 739235

Doc Description: ADDENDUM 1 : HIGH POWER VHF TV TRANSMIT ANTENNA

Proc Type: Central Purchase Order

Date Issued	Solicitation Closes	Solicitation No	Version
2020-07-10	2020-07-17 13:30:00	CRFQ 0439 EBA2000000029	2

**BID RECEIVING LOCATION**

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

**VENDOR**

Vendor Name, Address and Telephone Number:  
 Propagation Systems, Inc.  
 719 Pensacola Road  
 Ebensburg, PA 15931  
 814-472-5540

**FOR INFORMATION CONTACT THE BUYER**

Dusty J Smith  
 (304) 558-2063  
 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 7-17-2020

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

**ADDITIONAL INFORMATION:**

ADDENDUM 1 IS ISSUED FOR THE FOLLOWING REASONS:

1. AGENCY RESPONSES TO VENDORS QUESTIONS
2. BID OPENING IS CHANGED FROM JULY 14, 2020 TO JULY 17, 2020 TIME 1:30PM.

NO OTHER CHANGES

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WSWP-TV 124 INDUSTRIAL PARK RD	
BEAVER	WV25813	BEAVER	WV 25813
US		US	

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
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HIGH POWER VHF TV TRANSMIT ANTENNA

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<b>EBA2000000029</b>	<b>Document Phase</b> Final	<b>Document Description</b> ADDENDUM 1 : HIGH POWER VHF TV TRANSMIT ANTENNA	<b>Page 3</b> <b>of 3</b>
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Purchasing Division  
 2019 Washington Street East  
 Post Office Box 50130  
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State of West Virginia  
 Request for Quotation  
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Doc Description: ADDENDUM 1 : HIGH POWER VHF TV TRANSMIT ANTENNA

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Date Issued	Solicitation Closes	Solicitation No	Version
2020-07-10	2020-07-17 13:30:00	CRFQ 0439 EBA2000000029	2

**BID RECEIVING LOCATION**

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

**VENDOR**

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 719 Pensacola Road  
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 814-472-5540

**FOR INFORMATION CONTACT THE BUYER**

Dusty J Smith  
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 dusty.j.smith@wv.gov

Signature X

FEIN # 23-2876660

DATE 7-17-2020

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

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ADDENDUM 1 IS ISSUED FOR THE FOLLOWING REASONS:

1. AGENCY RESPONSES TO VENDORS QUESTIONS
2. BID OPENING IS CHANGED FROM JULY 14, 2020 TO JULY 17, 2020 TIME 1:30PM.

NO OTHER CHANGES

INVOICE TO		SHIP TO	
CHIEF FINANCIAL OFFICER EDUCATIONAL BROADCASTING 124 INDUSTRIAL PARK RD		SITE MANAGER EDUCATIONAL BROADCASTING WSWP-TV 124 INDUSTRIAL PARK RD	
BEAVER	WV25813	BEAVER	WV 25813
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Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Total Price
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Comm Code	Manufacturer	Specification	Model #
43221703			

Extended Description :

HIGH POWER VHF TV TRANSMIT ANTENNA

**SCHEDULE OF EVENTS**

Line	Event	Event Date
1	TECHNICAL QUESTIONS DUE AT 10AM	2020-07-06



**SOLICITATION NUMBER: EBA2000000029**

**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 IS ISSUED FOR THE FOLLOWING REASONS:

1. AGENCY RESPONSES TO VENDORS QUESTIONS
2. BID OPENING IS CHANGED FROM JULY 14, 2020 TO JULY 17, 2020 TIME 1:30PM.

NO OTHER CHANGES

**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.

# ATTACHMENT A

## Questions for CRFQ: EBA2000000029 High Power VHF Antenna

### Question

1. Is there a maximum transmitter power output level available? This will allow us to determine the minimum antenna gain required to achieve the 30 kW effective radiated power specified.

### Answer

1. **9.8 kW**

### Question

2. Is there an overall antenna height limitation?

### Answer

2. **No**

### Question

3. What is the diameter of the hole in the center of the tower top mounting flange?

### Answer

3. **1 foot 6-3/8 inches**

### Question

4. Mechanical Interface. The existing antenna is mounted on a support pole. Will that pole be removed, or do you want the new antenna to mount on the existing support pole?

### Answer

4. **The existing pole can be used if desired, or it can be removed.**

### Question

5. If the pole will be removed, does the new antenna need to match the entire existing "above tower top" aperture?

### Answer

5. **No, unless the antenna will exceed the current overall height, in which case we will need to file another study with the FAA.**

### Question

6. Transmission Line. is the existing transmission line to be reused or replaced? Existing line is stated to be 3-1/8" EIA. What is the length of transmission line for the vertical run? horizontal run?

### Answer

6. **Transmission line will be replaced with new line. Vertical run is 400 feet to top of steel, horizontal run is 70 feet. Numbers are rounded up to accommodate for extra if needed.**

### Question

7. Is a new antenna factory optimized input elbow complex required?

### Answer

7. **Yes**

### Question

8. Do you want a VSWR Sweep/ Checkout after installation?

### Answer

8. **Yes**

### Question

9. What transmitter power is available to achieve the 30 kW ERP with 25% Vpol?

### Answer

9. **9.8 kW**

### Question

10. I was working on the High-Power VHF TV antenna bid and noticed there is no mention on transmission line length needed. Is that something you can provide?

### Answer

10. **Vertical run is 400 feet to top of steel, horizontal run is 70 feet. Numbers are rounded up to accommodate for extra if needed.**

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.: EBA2000000029**

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

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

**Addendum Numbers Received:**

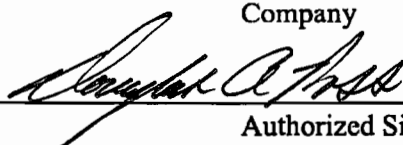
(Check the box next to each addendum received)

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input type="checkbox"/> Addendum No. 2            | <input type="checkbox"/> Addendum No. 7  |
| <input type="checkbox"/> Addendum No. 3            | <input type="checkbox"/> Addendum No. 8  |
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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.

Propagation Systems, Inc.

\_\_\_\_\_  
Company

  
\_\_\_\_\_  
Authorized Signature

July 17, 2020

\_\_\_\_\_  
Date

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

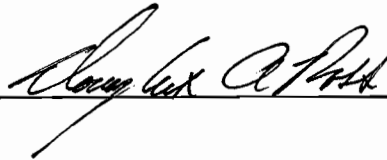
Request for Quotation, CRFQ# 0439 EBA2000000029  
High-Power VHF Television Transmit Antenna

Pricing Page\*  
Propagation Systems, Inc.

2 Options are Proposed for High Power VHF Television Transmit Antenna as Described in Solicitation

Description	Quan	Unit Cost	Total Cost
<b>OPTION 1</b> Antenna Model: PSIVLP4OIM-8-EP 3-1/8" Rigid Transmission Line & Accessories	1	\$99,885	\$99,885
<b>OPTION 2</b> Antenna Model: PSIVLP4OIM-8-EP 3" Flex Line w/ additional 3-1/8" Rigid Line Components	1	\$89,046	\$89,046

Authorized Signature



Date

7/17/2020

\*State of WV Purchasing Division "Pricing Page" was not included in solicitation documents.  
Please accept this copy as offer(s) for Propagation Systems, Inc.



# Propagation Systems, Inc.

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## Quality Broadcast Antenna Systems

Propagation Systems, Inc. proposes to supply a complete antenna and transmission line system to the West Virginia Public Broadcasting Network that meet the requirements of request for quotation number EBA2000000029.

The proposed antenna system is a top mount, elliptically polarized, omni directional slot type antenna with radome enclosed radiating elements. The antenna support mast will be designed to attach directly to the existing tower top bolt hole pattern. The support structure will include climbing pegs and multiple pick points for possible installation by helicopter. Provision will be made for beacon mounting; a beacon is not included with the antenna. If Propagation Systems, Inc. is awarded the contract to supply the antenna system, additional tower information will be required to determine hardware requirements to attach to the tower top plate.

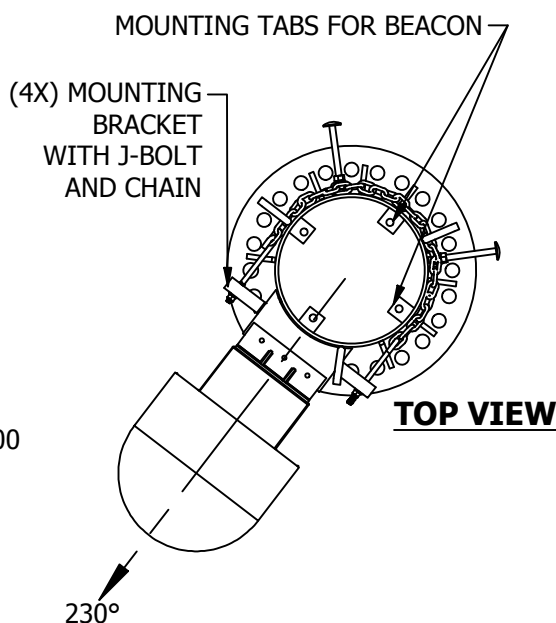
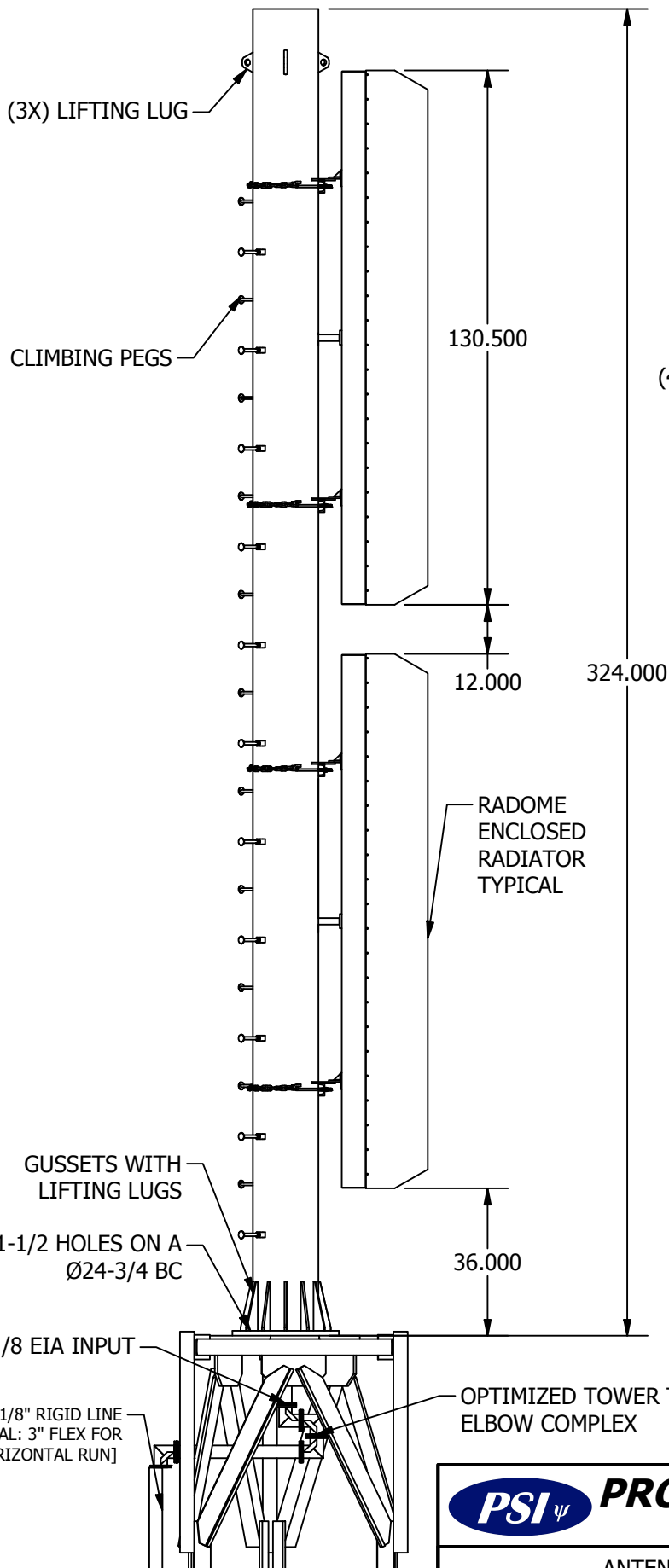
The antenna is to be supplied with the necessary transmission line to connect to the transmitter. The proposed transmission line is 3-1/8" EIA 50-ohm rigid with an option to use 3" flexible 50-ohm coaxial cable for the vertical and horizontal run as a lower cost alternative.

The standard rigid line option will include an optimized tower top elbow complex/U-link and custom line sections to connect the antenna input to the vertical transmission line run. All the necessary hangers and adapter brackets (if necessary) will be supplied with the vertical and horizontal runs. All additional rigid line components such as elbows, couplings, gas barrier, field cut sections, hangers to make the necessary connection to the transmitter is to be supplied. No pressurization equipment such as regulators or dehydrators will be supplied.

As a lower-cost option, 3" flex line can be supplied for the vertical and horizontal run. With this option the proposed flex line will start at the inside wall of the transmitter room and continue to the tower top where it will transition to a rigid transmission line elbow complex at the base of the antenna. All other rigid transmission line components inside the building for connection to the transmitter are also included.

If awarded the contract, within 30 days of award a site visit will be scheduled with West Virginia engineering staff for job and material planning. All shipping costs of all supplied materials is included in the price and will be coordinated with West Virginia Broadcasting Network staff per the requirements of the bid specifications.

PSI will provide a field engineer to sweep antenna after delivery and prior to installation along with post installation sweep measurements of transmission line and antenna.



SYSTEM SPECIFICATIONS	
ERP. H-POL:	30 kW
ERP. V-POL:	7.6 kW
LINE:	3-18 RIGID 455 FT
LINE LOSS:	0.61 dB
TPO:	6.8 kW

ANTENNA SPECIFICATIONS	
INPUT:	3-1/8 EIA
RATING:	20 kW
H-POL GAIN:	5.11 (7.08 dB)
V-POL GAIN:	1.30 (1.13 dB)
LENGTH:	27 FT (8.23 M)
WEIGHT:	2026 LBS (919 kg)
WIND AREA:	63.3 FT <sup>2</sup> (5.9 M <sup>2</sup> )

NOTE: 1. WEIGHT AND WIND AREA ARE ESTIMATED. WIND AREA IN ACCORDANCE WITH TIA/EIA-222-F  $\Sigma$ (CaAc)

**PROPAGATION SYSTEMS, INC.**  
 EBENSBURG, PENNSYLVANIA USA

**ANTENNA ELEVATION AND SPECIFICATIONS**

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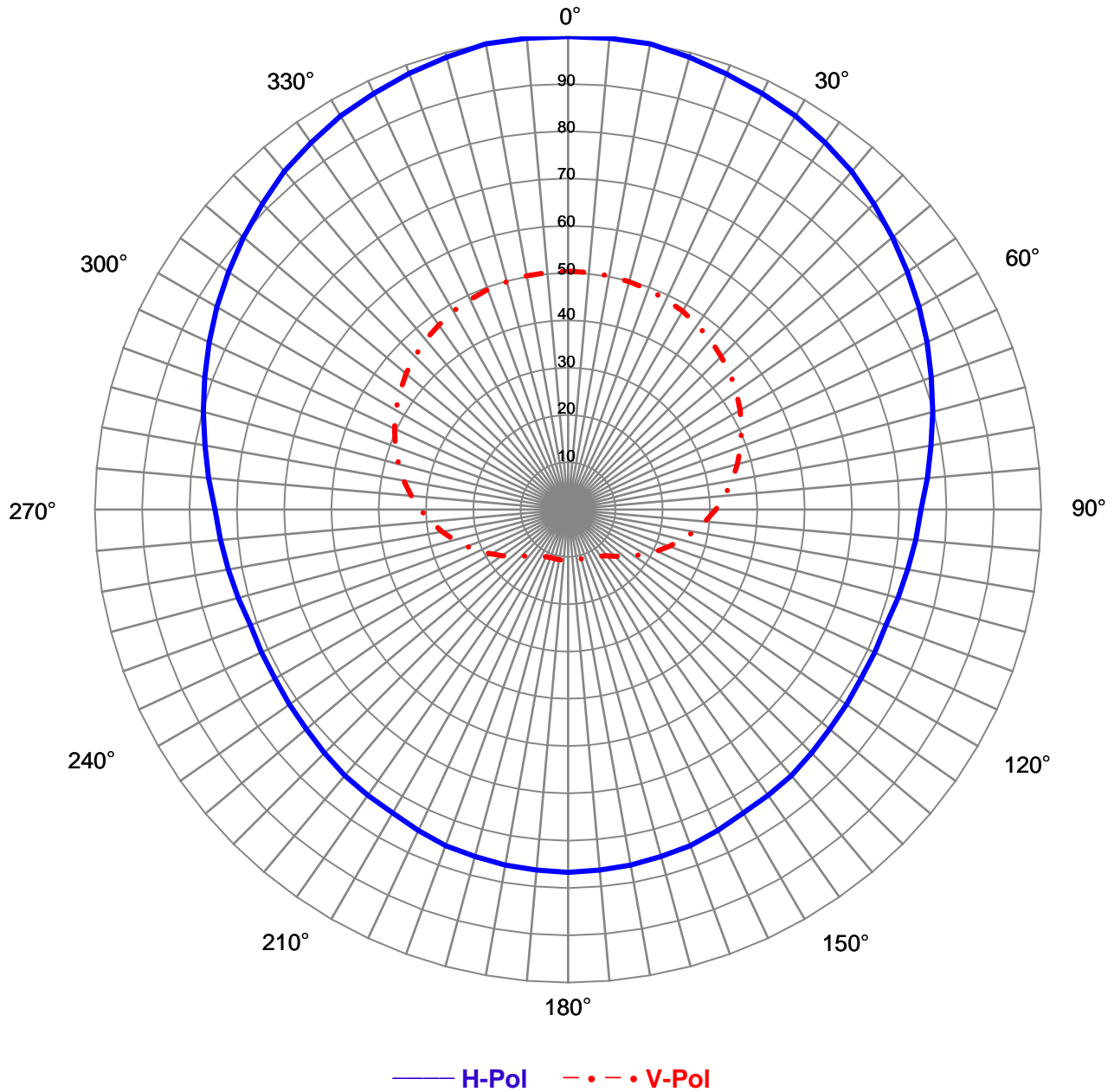
TOLERANCES UNLESS OTHERWISE NOTED  
 FRACTIONS X/X ±1/16"  
 DECIMALS XX ±.01"  
 DECIMALS XXX ±.005"  
 ANGLES ±3°

MODEL NO. : PSIVLP40IM-8-EP	AUTHOR: Hayden.Potts	CREATION DATE: 7/15/2020
CHANNEL: CHANNEL 8	APPROVED BY:	APPROVAL DATE:
SCALE: 1 / 40	DRAWING NO. : PR2462-011	REVISION:





### Relative Field Azimuth Plane Pattern



Pattern Type:	<b>Relative Field</b>	Antenna Type	<b>VHF Slot</b>
Antenna Model:	<b>PSIVLP4OIM-8-EP</b>	Channel:	<b>8</b>
Polarization:	<b>Elliptical</b>	Pattern:	<b>"OIM"</b>
Gain (H-pol):	<b>5.11 (7.08 dB)</b>	Station:	<b>WSWP</b>
Gain (V-pol):	<b>1.30 (1.13 dB)</b>	Date:	<b>7/16/2020</b>



**PROPAGATION SYSTEMS INC.**

Relative Field Tabulation

Antenna Model: PSIVLP4OIM-8-EP

Gain (H-pol): 5.11 (7.08 dBd)

Station: WSWP

Angle	Relative Field	Power Gain	Gain dB	Angle	Relative Field	Power Gain	Gain dB
0	1.000	5.11	7.08	180	0.767	3.01	4.78
5	1.000	5.11	7.08	185	0.765	2.99	4.76
10	1.000	5.11	7.08	190	0.763	2.97	4.73
15	0.990	5.01	7.00	195	0.760	2.95	4.69
20	0.980	4.91	6.91	200	0.756	2.92	4.65
25	0.971	4.81	6.82	205	0.749	2.86	4.57
30	0.961	4.72	6.74	210	0.741	2.81	4.48
35	0.947	4.58	6.61	215	0.738	2.78	4.44
40	0.933	4.45	6.48	220	0.734	2.75	4.40
45	0.914	4.27	6.30	225	0.728	2.71	4.33
50	0.895	4.09	6.12	230	0.722	2.66	4.25
55	0.876	3.92	5.93	235	0.719	2.64	4.21
60	0.857	3.75	5.74	240	0.715	2.61	4.17
65	0.837	3.58	5.54	245	0.715	2.61	4.16
70	0.817	3.41	5.33	250	0.714	2.61	4.16
75	0.798	3.25	5.12	255	0.722	2.66	4.25
80	0.779	3.10	4.91	260	0.729	2.72	4.34
85	0.763	2.97	4.73	265	0.738	2.78	4.44
90	0.746	2.84	4.54	270	0.746	2.84	4.54
95	0.738	2.78	4.44	275	0.763	2.97	4.73
100	0.729	2.72	4.34	280	0.779	3.10	4.91
105	0.722	2.66	4.25	285	0.798	3.25	5.12
110	0.715	2.61	4.17	290	0.817	3.41	5.33
115	0.715	2.61	4.17	295	0.837	3.58	5.54
120	0.715	2.61	4.17	300	0.857	3.75	5.74
125	0.719	2.64	4.21	305	0.876	3.92	5.93
130	0.722	2.66	4.25	310	0.895	4.09	6.12
135	0.728	2.71	4.33	315	0.914	4.27	6.30
140	0.734	2.75	4.40	320	0.933	4.45	6.48
145	0.737	2.78	4.44	325	0.947	4.58	6.61
150	0.741	2.80	4.47	330	0.961	4.72	6.74
155	0.748	2.86	4.57	335	0.971	4.82	6.83
160	0.756	2.92	4.65	340	0.981	4.92	6.92
165	0.760	2.95	4.69	345	0.991	5.01	7.00
170	0.763	2.97	4.73	350	1.000	5.11	7.08
175	0.765	2.99	4.76	355	1.000	5.11	7.08



**PROPAGATION SYSTEMS INC.**

ERP Tabulation

Antenna Model: PSIVLP4OIM-8-EP

ERP (H-pol): 30 kW (14.77 dBk)

Station: WSWP

Angle	Relative Field	ERP kW	ERP dBk	Angle	Relative Field	ERP kW	ERP dBk
0	1.000	30.0	14.77	180	0.767	17.6	12.47
5	1.000	30.0	14.77	185	0.765	17.6	12.44
10	1.000	30.0	14.77	190	0.763	17.5	12.42
15	0.990	29.4	14.68	195	0.760	17.3	12.38
20	0.980	28.8	14.60	200	0.756	17.1	12.34
25	0.971	28.3	14.51	205	0.749	16.8	12.26
30	0.961	27.7	14.43	210	0.741	16.5	12.17
35	0.947	26.9	14.30	215	0.738	16.3	12.13
40	0.933	26.1	14.17	220	0.734	16.2	12.09
45	0.914	25.1	13.99	225	0.728	15.9	12.01
50	0.895	24.0	13.81	230	0.722	15.6	11.94
55	0.876	23.0	13.62	235	0.719	15.5	11.90
60	0.857	22.0	13.43	240	0.715	15.3	11.86
65	0.837	21.0	13.23	245	0.715	15.3	11.85
70	0.817	20.0	13.02	250	0.714	15.3	11.85
75	0.798	19.1	12.81	255	0.722	15.6	11.94
80	0.779	18.2	12.60	260	0.729	15.9	12.03
85	0.763	17.4	12.42	265	0.738	16.3	12.13
90	0.746	16.7	12.23	270	0.746	16.7	12.23
95	0.738	16.3	12.13	275	0.763	17.4	12.42
100	0.729	15.9	12.03	280	0.779	18.2	12.60
105	0.722	15.6	11.94	285	0.798	19.1	12.81
110	0.715	15.3	11.86	290	0.817	20.0	13.02
115	0.715	15.3	11.86	295	0.837	21.0	13.23
120	0.715	15.3	11.86	300	0.857	22.0	13.43
125	0.719	15.5	11.90	305	0.876	23.0	13.62
130	0.722	15.6	11.94	310	0.895	24.0	13.81
135	0.728	15.9	12.01	315	0.914	25.1	13.99
140	0.734	16.2	12.09	320	0.933	26.1	14.17
145	0.737	16.3	12.12	325	0.947	26.9	14.30
150	0.741	16.5	12.16	330	0.961	27.7	14.43
155	0.748	16.8	12.25	335	0.971	28.3	14.52
160	0.756	17.1	12.34	340	0.981	28.9	14.60
165	0.760	17.3	12.38	345	0.991	29.4	14.69
170	0.763	17.5	12.42	350	1.000	30.0	14.77
175	0.765	17.6	12.44	355	1.000	30.0	14.77



**PROPAGATION SYSTEMS INC.**

Relative Field Tabulation

Antenna Model: PSIVLP4OIM-8-EP

Gain (V-pol): 1.30 (1.13 dBd)

Station: WSWP

Angle	Relative Field	Power Gain	Gain dB	Angle	Relative Field	Power Gain	Gain dB
0	0.504	1.30	1.13	180	0.108	0.06	-12.22
5	0.503	1.29	1.12	185	0.108	0.06	-12.24
10	0.502	1.29	1.10	190	0.108	0.06	-12.26
15	0.499	1.27	1.04	195	0.108	0.06	-12.26
20	0.495	1.25	0.98	200	0.108	0.06	-12.26
25	0.490	1.23	0.89	205	0.110	0.06	-12.06
30	0.484	1.20	0.79	210	0.113	0.07	-11.86
35	0.476	1.16	0.64	215	0.120	0.07	-11.32
40	0.468	1.12	0.49	220	0.128	0.08	-10.80
45	0.458	1.07	0.29	225	0.140	0.10	-9.99
50	0.447	1.02	0.09	230	0.153	0.12	-9.24
55	0.434	0.96	-0.17	235	0.170	0.15	-8.30
60	0.420	0.90	-0.44	240	0.187	0.18	-7.46
65	0.404	0.84	-0.78	245	0.208	0.22	-6.57
70	0.389	0.77	-1.13	250	0.228	0.27	-5.76
75	0.370	0.70	-1.54	255	0.249	0.32	-4.99
80	0.352	0.63	-1.98	260	0.270	0.37	-4.28
85	0.332	0.56	-2.48	265	0.291	0.43	-3.63
90	0.312	0.50	-3.02	270	0.312	0.50	-3.02
95	0.291	0.43	-3.63	275	0.332	0.56	-2.48
100	0.270	0.37	-4.28	280	0.352	0.63	-1.98
105	0.249	0.32	-4.99	285	0.370	0.70	-1.54
110	0.228	0.27	-5.76	290	0.389	0.77	-1.13
115	0.208	0.22	-6.57	295	0.404	0.84	-0.78
120	0.187	0.18	-7.46	300	0.420	0.90	-0.44
125	0.170	0.15	-8.30	305	0.434	0.96	-0.17
130	0.153	0.12	-9.24	310	0.447	1.02	0.09
135	0.140	0.10	-9.99	315	0.458	1.07	0.29
140	0.128	0.08	-10.80	320	0.468	1.12	0.49
145	0.120	0.07	-11.32	325	0.476	1.16	0.64
150	0.113	0.07	-11.86	330	0.484	1.20	0.79
155	0.110	0.06	-12.06	335	0.490	1.23	0.89
160	0.108	0.06	-12.26	340	0.495	1.25	0.98
165	0.108	0.06	-12.26	345	0.499	1.27	1.04
170	0.108	0.06	-12.26	350	0.502	1.29	1.10
175	0.108	0.06	-12.24	355	0.503	1.29	1.12



**PROPAGATION SYSTEMS INC.**

ERP Tabulation

Antenna Model: PSIVLP4OIM-8-EP

ERP (V-pol): 7.6 kW (8.82 dBk)

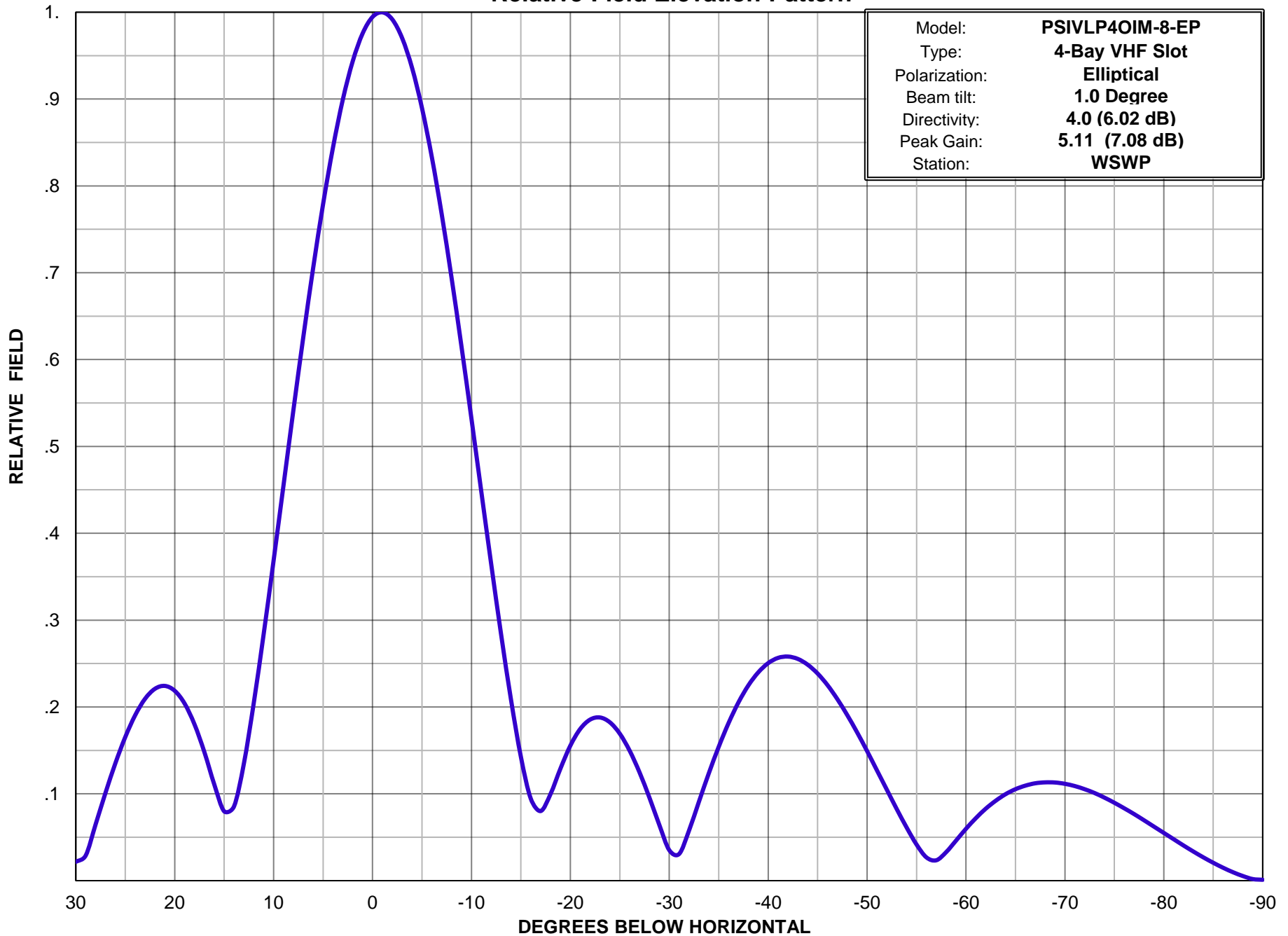
Station: WSWP

Angle	Relative Field	ERP kW	ERP dBk	Angle	Relative Field	ERP kW	ERP dBk
0	0.504	7.6	8.82	180	0.108	0.4	-4.53
5	0.503	7.6	8.80	185	0.108	0.4	-4.55
10	0.502	7.6	8.79	190	0.108	0.3	-4.57
15	0.499	7.5	8.73	195	0.108	0.3	-4.57
20	0.495	7.4	8.67	200	0.108	0.3	-4.57
25	0.490	7.2	8.57	205	0.110	0.4	-4.37
30	0.484	7.0	8.47	210	0.113	0.4	-4.18
35	0.476	6.8	8.33	215	0.120	0.4	-3.63
40	0.468	6.6	8.18	220	0.128	0.5	-3.12
45	0.458	6.3	7.98	225	0.140	0.6	-2.30
50	0.447	6.0	7.78	230	0.153	0.7	-1.55
55	0.434	5.6	7.51	235	0.170	0.9	-0.61
60	0.420	5.3	7.24	240	0.187	1.1	0.23
65	0.404	4.9	6.91	245	0.208	1.3	1.12
70	0.389	4.5	6.56	250	0.228	1.6	1.92
75	0.370	4.1	6.15	255	0.249	1.9	2.69
80	0.352	3.7	5.71	260	0.270	2.2	3.40
85	0.332	3.3	5.20	265	0.291	2.5	4.06
90	0.312	2.9	4.67	270	0.312	2.9	4.67
95	0.291	2.5	4.06	275	0.332	3.3	5.20
100	0.270	2.2	3.40	280	0.352	3.7	5.71
105	0.249	1.9	2.69	285	0.370	4.1	6.15
110	0.228	1.6	1.92	290	0.389	4.5	6.56
115	0.208	1.3	1.12	295	0.404	4.9	6.91
120	0.187	1.1	0.23	300	0.420	5.3	7.24
125	0.170	0.9	-0.61	305	0.434	5.6	7.51
130	0.153	0.7	-1.55	310	0.447	6.0	7.78
135	0.140	0.6	-2.30	315	0.458	6.3	7.98
140	0.128	0.5	-3.12	320	0.468	6.6	8.18
145	0.120	0.4	-3.63	325	0.476	6.8	8.33
150	0.113	0.4	-4.18	330	0.484	7.0	8.47
155	0.110	0.4	-4.37	335	0.490	7.2	8.57
160	0.108	0.3	-4.57	340	0.495	7.4	8.67
165	0.108	0.3	-4.57	345	0.499	7.5	8.73
170	0.108	0.3	-4.57	350	0.502	7.6	8.79
175	0.108	0.4	-4.55	355	0.503	7.6	8.80



Relative Field Elevation Pattern

Model:	<b>PSIVLP4OIM-8-EP</b>
Type:	<b>4-Bay VHF Slot</b>
Polarization:	<b>Elliptical</b>
Beam tilt:	<b>1.0 Degree</b>
Directivity:	<b>4.0 (6.02 dB)</b>
Peak Gain:	<b>5.11 (7.08 dB)</b>
Station:	<b>WSWP</b>



**Propagation Systems Inc.**

Relative Field Tabulation Elevation Pattern

Antenna Model: PSIVLP4IOM-8-EP

Gain (H-pol): 5.11 (7.08 dBd)

Gain (V-pol): 1.30 (1.13 dBd)

Station: WSWP

Angle	Field	dB	Angle	Field	dB	Angle	Field	dB
-90	0.001	-60.00	-50	0.149	-16.52	-10	0.532	-5.48
-89	0.002	-54.81	-49	0.171	-15.36	-9	0.615	-4.23
-88	0.005	-45.51	-48	0.191	-14.40	-8	0.693	-3.18
-87	0.010	-40.27	-47	0.209	-13.60	-7	0.767	-2.30
-86	0.015	-36.57	-46	0.225	-12.95	-6	0.833	-1.59
-85	0.021	-33.72	-45	0.238	-12.45	-5	0.890	-1.02
-84	0.027	-31.43	-44	0.249	-12.09	-4	0.936	-0.58
-83	0.033	-29.50	-43	0.255	-11.86	-3	0.970	-0.26
-82	0.040	-27.86	-42	0.258	-11.77	-2	0.992	-0.07
-81	0.048	-26.42	-41	0.257	-11.82	-1	1.000	0.00
-80	0.055	-25.19	-40	0.250	-12.03	0	0.995	-0.05
-79	0.062	-24.11	-39	0.240	-12.40	1	0.976	-0.21
-78	0.070	-23.15	-38	0.225	-12.96	2	0.944	-0.50
-77	0.077	-22.31	-37	0.205	-13.75	3	0.900	-0.92
-76	0.083	-21.58	-36	0.182	-14.82	4	0.844	-1.47
-75	0.090	-20.94	-35	0.154	-16.24	5	0.779	-2.17
-74	0.096	-20.39	-34	0.124	-18.16	6	0.706	-3.03
-73	0.101	-19.92	-33	0.091	-20.83	7	0.626	-4.07
-72	0.105	-19.55	-32	0.058	-24.77	8	0.542	-5.32
-71	0.109	-19.26	-31	0.031	-30.24	9	0.455	-6.83
-70	0.112	-19.05	-30	0.035	-29.08	10	0.369	-8.66
-69	0.113	-18.94	-29	0.064	-23.86	11	0.284	-10.92
-68	0.113	-18.92	-28	0.095	-20.40	12	0.205	-13.76
-67	0.112	-19.01	-27	0.125	-18.09	13	0.135	-17.38
-66	0.109	-19.22	-26	0.150	-16.50	14	0.086	-21.35
-65	0.105	-19.55	-25	0.169	-15.43	15	0.080	-21.95
-64	0.100	-20.04	-24	0.182	-14.79	16	0.111	-19.11
-63	0.092	-20.73	-23	0.188	-14.52	17	0.148	-16.59
-62	0.083	-21.63	-22	0.185	-14.64	18	0.180	-14.89
-61	0.072	-22.86	-21	0.175	-15.15	19	0.204	-13.81
-60	0.060	-24.48	-20	0.155	-16.17	20	0.219	-13.21
-59	0.046	-26.70	-19	0.129	-17.78	21	0.224	-12.99
-58	0.033	-29.66	-18	0.100	-20.01	22	0.221	-13.12
-57	0.023	-32.58	-17	0.080	-21.92	23	0.209	-13.58
-56	0.027	-31.43	-16	0.094	-20.50	24	0.190	-14.40
-55	0.042	-27.60	-15	0.143	-16.92	25	0.165	-15.63
-54	0.061	-24.26	-14	0.208	-13.62	26	0.135	-17.38
-53	0.082	-21.68	-13	0.283	-10.95	27	0.101	-19.91
-52	0.105	-19.60	-12	0.364	-8.77	28	0.065	-23.78
-51	0.127	-17.93	-11	0.448	-6.98	29	0.029	-30.77