



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

**Solicitation**

NUMBER
EBA427

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
CONNIE OSWALD 304-558-2157

VENDOR

\*820163637 814-472-5540  
 Propagation Systems, Inc.  
 719 Pensacola Road  
 PO Box 113  
 Ebensburg, PA 15931

SHIP TO

EDUCATIONAL BROADCASTING  
 AUTHORITY  
 VARIOUS LOCALES AS INDICATED  
 BY ORDER

DATE PRINTED
--------------

09/06/2012

BID OPENING DATE:

10/04/2012

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA		840-10		
<p>THE STATE OF WEST VIRGINIA AND ITS AGENCY THE WEST VIRGINIA EDUCATIONAL BROADCASTING AUTHORITY (WVEBA) REQUEST A QUOTE TO PROVIDE A CHANNEL 28 DIGITAL TELEVISION ANTENNA SYSTEM AND ACCESSORIES FOR THE CEDARVILLE, WV AREA ACCORDING TO THE ATTACHED SPECIFICATIONS.</p> <p>BID OPENING: OCTOBER 4, 2012 AT 1:30 PM</p> <p>REFERENCE ATTACHED INSTRUCTIONS TO BIDDERS.</p>						
<p>ANTENNAS AND ACCESSORIES, TELEVISION</p> <p>TO PROVIDE A CHANNEL 28 DIGITAL TELEVISION ANTENNA SYSTEM AND ASSOCIATED HARDWARE FOR THE CEDARVILLE, WEST VIRGINIA AREA ACCORDING TO THE ATTACHED SPECIFICATIONS.</p> <p>REFERENCE ATTACHED INSTRUCTIONS TO BIDDERS.</p>						

RECEIVED  
 2012 OCT -4 AM 9:55  
 WV PURCHASING  
 DIVISION

SIGNATURE <i>Raymond A. Holt</i>	TELEPHONE 814-472-5540	DATE October 3, 2012
TITLE President	FEIN 23-2876660	ADDRESS CHANGES TO BE NOTED ABOVE

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



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10/04/2012

BID OPENING TIME

1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
***** THIS IS THE END OF RFQ EBA427 ***** TOTAL						
<div style="border: 1px solid black; padding: 5px; display: inline-block;">           PACKAGE WITH ANTENNA OPTION 1: \$ 24,737            PACKAGE WITH ANTENNA OPTION 2: \$ 18,561         </div>						

SIGNATURE

TELEPHONE 814-472-5540

DATE October 3, 2012

TITLE President

FEIN 23-2876660

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 VARIOUS LOCALES AS INDICATED  
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DATE PRINTED
09/20/2012

BID OPENING DATE:

10/04/2012

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
				ADDENDUM NO. 1		
				1. TO PROVIDE ANSWERS TO QUESTIONS RECEIVED FOR THIS SOLICITATION.		
				2. TO PROVIDE ADDENDUM ACKNOWLEDGMENT. THIS DOCUMENT SHOULD BE SIGNED AND RETURNED WITH YOUR BID. FAILURE TO SIGN AND RETURN MAY RESULT IN DISQUALIFICATION OF YOUR BID.		
				END OF ADDENDUM NO. 1		

SIGNATURE 	TELEPHONE 814-472-5540	DATE October 3, 2012
TITLE President	FEIN 23-2876660	ADDRESS CHANGES TO BE NOTED ABOVE

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

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.:** EBA427

**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:**

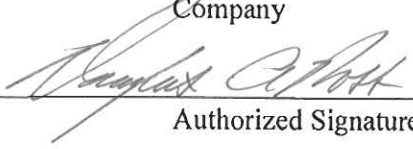
(Check the box next to each addendum received)

- |  |  |
|--|--|
| <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

October 3, 2012

\_\_\_\_\_  
Date

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

Revised 6/8/2012

**Request For Quotation  
EBA427 Channel 28 Digital Television Antenna System  
and Associated Hardware for Cedarville, WV**

**SPECIFICATIONS**

**1. PURPOSE and SCOPE:** The West Virginia Purchasing Division is soliciting bids on behalf of the West Virginia Educational Broadcasting Authority (WVEBA) for a channel 28 digital television antenna system and associated hardware for the Cedarville, West Virginia area.

**Overview:**

West Virginia Public Broadcasting operates a statewide network of television transmitters. This project will add a digital translator to the WSWP transmitter. Antenna pattern and power level are addressed below.

**2. DEFINITIONS:**

- 2.1 **“Desired Item”** is a Channel 28 digital television antenna system and associated hardware for the Cedarville, WV area.
  
- 2.2 **“Bid Pricing Page”** means the page upon which Vendor should list its proposed price for the Desired Items in the manner requested by thereon. The “Bid Pricing Page” is included on the last page of this RFQ.
  
- 2.3 **“RFQ”** means the official Request for Quotation published by the Purchasing Division and is hereby identified as EBA427.

### 3. GENERAL REQUIREMENTS:

UNDERSTOOD **3.1 Mandatory Desired Item Requirements:** Vendor must meet or exceed the mandatory requirements listed below.

COMPLY 3.1.1 Desired item shall be from a registered vendor of West Virginia through the Secretary of State's office and shall have paid the necessary fees, and also a registered vendor with the State Purchasing Division and pay the \$125 registration fee.

COMPLY 3.1.2 Desired item shall provide West Virginia Worker's Compensation Certificate, (or letter stating that your company does not employ any West Virginia residents. Attachment included.

UNDERSTOOD **3.2** The bid shall be awarded to a single vendor.

COMPLY **3.3** All products shall be warranted for a minimum of one year. Bidders shall include their warranty policy. Attachment included.

EXCEPTION **3.4** Vendor shall offer toll free technical support for the antenna for a minimum of five years We offer telephone and email technical support. However, we do not have a toll free telephone line.

COMPLY **3.5** Respondents to this request must have manufactured low power UHF antennas for a minimum of ten years.

**4. GENERAL MECHANICAL SPECIFICATIONS**

- COMPLY  
\_\_\_\_\_
  - COMPLY  
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  - COMPLY  
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  - COMPLY  
\_\_\_\_\_
- 4.1 All antenna structural elements shall be designed and fabricated in accordance with TIA/EIA standard RS-222-F, Structural Standards for Steel Antenna, Towers, and Supporting Structures.
  - 4.2 All hardware shall be constructed of non-ferrous material (brass, copper, stainless steel, etc.) or be galvanized.
    - 4.2.1 Steel elements shall be hot-dip galvanized in accordance with ASTM A123
    - 4.2.2 Zinc coating shall be applied with a minimum thickness of 0.002 inches (0.05 mm)
    - 4.2.3 Antenna shall be structural strength, light weight aluminum manufacture.
    - 4.2.4 Bidders shall state materials used in antenna construction
  - 4.3 Vendor shall provide mounting adapters for the antenna.
    - 4.3.1 The antenna shall be side mounted to the tower.
    - 4.3.2 The tower is free standing, constructed by Hemp Hill LLC; mounting adaptors shall be constructed accordingly to side mount the antenna. (See exhibit E-1, for tower dimensions (thirteen (13) pages ).
  - 4.4 Vendor shall certify the pattern and gain for the antenna
  - 4.5 The antenna, transmission line, and connectors shall be rated for at least 3kW average power
  - 4.6 All materials shall be new, no surplus or refurbished components will be allowed
  - 4.7 Antenna dimensions shall not exceed length of 23ft, weight 130 lb, and windload CaAc 18.2 sq ft per EIA 222-F, (see Exhibit E- 2 ).

## 4.8 Transmission Line

COMPLY

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4.9 Vendor shall provide transmission line

COMPLY

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4.7.1 Transmission line shall be 1 5/8" air dielectric flexible coax (Dielectric Flexline or equal)

COMPLY

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4.7.2 Impedance shall be 50 Ohms

COMPLY

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4.10 Vendor shall provide connectors for the transmission line

COMPLY

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4.10.1 Connector size (transmitter end) shall be 1-5/8" EIA, Antenna connector size shall be 1-5/8" EIA

4.10.2 The line shall be shipped with one connector (the antenna end) attached from the factory, and the other end to be attached in the field

COMPLY

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COMPLY

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4.11 The line shall be pressurized

4.11.1 All necessary gas barriers and connectors shall be provided

Vendor shall provide all hangers, clamps, grounding kits, hoisting grips, and all other hardware necessary for installation.

COMPLY

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COMPLY

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4.12 A dehydrator shall be provided.

4.12.1 A dehydrator shall be provided with the following specifications:

Normal Capacity: 200 SCFD (160 SCFD @ 50Hz)

Maximum Capacity: 300 SCFD (240 SCFD @ 50 Hz)

Dew Point: -40 degrees F (-40 degrees C)

Operating Voltage: 115V/60-50Hz

Operating Amps: 2.0 Amps (115V)

Circuit Protection: (manual reset) 5 Amp (115V)

Compressor: 1/8 H.P.

Air Outlet: 1/4" NPT Fitting

Dielectric Technologies, SPX Model 300TLS or equivalent.

COMPLY

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### 4.13 Antenna

COMPLY	4.14 The antenna shall be side mounted
COMPLY	4.15 The antenna shall be of structural strength light weight aluminum manufacture
COMPLY	4.16 The antenna shall be equipped with a radome, heaters for anti-icing are not acceptable
COMPLY	4.17 The UHF antenna shall be a horizontally polarized, directional; side mounted, slotted cylinder type designed for digital channel 28. Recommended pattern attached (see Exhibit E-3).
COMPLY	4.18 There shall be no external radiating elements which would be susceptible to icing affecting both antenna patterns and wind load
COMPLY	4.19 Antenna shall have a peak gain of 25.2 (14.01 dB) at channel 28 with smooth elevation pattern including null fill. Elevation and azimuth patterns shall be supplied with the bid.
COMPLY	4.20 The antenna input shall be 1-5/8" EIA
COMPLY	4.21 Antenna beam tilt shall be 1.5 degree.
COMPLY	4.22 Input Power handling capabilities of the antenna shall be 3kW average or greater.
COMPLY	4.23 Antenna dimensions shall not exceed length of 23ft, weight 130 lb, and windload CaAc 18.2 sq ft per EIA 222-F
COMPLY	4.24 During factory assembly of the antenna the antenna elevation patterns and gain shall be determined through anechoic chamber or scaled field measurement techniques. Measurement results shall be supplied before antenna shipment.
COMPLY	4.25 Antenna VSWR shall not exceed 1.10:1
COMPLY	4.25.1 Field tuning of the antenna will not be allowed

**PSI is offering two antenna options. Both options comply with the specifications listed above. Detailed description for each antenna is provided as an attachment.**

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## 5 SPECIFIC SITE REQUIREMENTS (see Exhibit E- 4 )

### 5.15 Cedarville

- UNDERSTOOD 5.15.1 The transmitter shall operate on channel 28
- UNDERSTOOD 5.15.2 Transmitter TPO shall be 500 Watts average  
measured at the output of the mask filter
- COMPLY 5.15.3 The antenna shall exhibit a peak gain of 14.21  
dB
- UNDERSTOOD 5.15.4 ERP maximum for the site shall be 10.1kW.
- UNDERSTOOD 5.15.5 The transmission line length shall be 235 feet
- UNDERSTOOD 5.15.6 Transmission line run shall be 200 feet vertical  
and 35 feet horizontal (see exhibit E-5 for site  
layout.)
- UNDERSTOOD 5.15.7 The connection to the transmitter shall be 1-  
5/8" EIA flange

### 5.16 Directional tabulation

- COMPLY 5.16.1 Antenna shall closely match the pattern  
provided in the exhibits for Azimuth (see E-6 & E-7)  
and Elevation (see E-8, E-9 & E-10).

- COMPLY 5.17 An option for an electrical system check of the antenna  
and transmission line shall be included after installation to  
verify that the system was installed properly. The pricing  
for this option shall be listed as an item separate from the  
main antenna system pricing and will not be factored into  
the bid award.

## 6 SHIPPING and DELIVERY

- COMPLY  
\_\_\_\_\_
- 6.15 Vendor shall provide shipping  
The receiving facility shall be West Virginia Public Broadcasting, Cedarville site. Directions shall be provided for shipping by WVEBA.
- COMPLY  
\_\_\_\_\_
- 6.16 Shipper shall provide 24 hours notice to arrange off-loading
- COMPLY  
\_\_\_\_\_
- 6.17 Shipper shall be responsible for off-loading materials
- COMPLY  
\_\_\_\_\_
- 6.18 Shipping and delivery costs shall be included in the price of the antenna.
- UNDERSTOOD  
\_\_\_\_\_
- 6.19 Delivery Payment/Risk of Loss: Vendor shall deliver the Desired Items F.O.B. destination to the Agency's location.
- 6.20 Return of Unacceptable Items: If the Agency deems the Desired Items to be unacceptable, the Desired 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.
- UNDERSTOOD  
\_\_\_\_\_
- 6.21 **Return Due to Agency Error:** Items ordered in error by the Agency will be returned for credit within 30 days of receipt, F.O.B. Vendor's location. Vendor shall not charge a restocking fee if returned products are in a resalable condition. Items shall be deemed to be in a resalable condition if they are unused and in the original packaging. Any restocking fee for items not in a resalable condition shall be the lower of the Vendor's customary restocking fee or 5% of the total invoiced value of the returned items.
- UNDERSTOOD  
\_\_\_\_\_

## 7 CONTRACT AWARD:

7.1 Contract Award: The Contract is intended to provide Agencies with a purchase price for the Desired Items. The Contract shall be awarded to the Vendor that provides the Desired Items meeting the required specifications for the lowest overall total cost as shown on the Bid Pricing Page(s).

UNDERSTOOD

7.2 Bid Pricing Page: Vendor should complete the Bid Pricing Page. Vendor should complete the Bid Pricing Page in full as failure to complete the Bid Pricing Page in its entirety may result in Vendor's bid being disqualified.

COMPLY

7.3 Notwithstanding the foregoing, the Purchasing Division may correct errors as it deems appropriate. Vendor should type or electronically enter the information into the Bid Pricing Page to prevent errors in the evaluation.

COMPLY

## 8 SITE CONTACT

8.1 Jeremy Scott

West Virginia Educational Broadcasting Authority

P. O. Box 9004

Beckley, WV 25802-9004

Phone 304-254-7840

## 9 PAYMENT

9.1 Vendor shall accept payment in accordance with the payment procedures of the State of West Virginia. Methods of payment must include the West Virginia Purchasing Card. Payment in advance is not permitted under this contract.

UNDERSTOOD

## 10. INVOICING

10.1 After 100% acceptance by the WVEBA, payment shall be made in arrears.

10.2 Any item with a cost of over \$1,000 shall be listed on the invoice separately.

10.3 Submit invoice to the following:

Tammy Treadway

WV Educational Broadcasting Authority

PO Box 9004

Beckley, WV 25802-9004

304-254-7840



## ANTENNA OPTION 2 - PSILP12WDC-28

### PRICING PAGE

**Basis for Award:** The Contract shall be awarded to the Vendor with the lowest overall cost meeting the specifications.

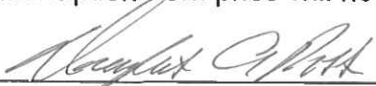
**EBA427 Channel 27 Digital Television Antenna System and Associated Hardware for Cedarville, WV**

NOTE: Shipping and delivery costs shall be included in price.

ITEM NUMBER	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
1	1	Antenna & Accessories	\$12,306	\$12,306
2	1	Miscellaneous Hardware (nuts, bolts, washers, etc.)	INCLUDED	INCLUDED
3	1	Mounting Adapters	\$375	\$375
4	1	Dehydrator	\$1,435	\$1,435
5	1	Transmission Line & Connectors	\$4,445	\$4,445
<b>TOTAL</b>			<b>\$18,561</b>	<b>\$18,561</b>

OPTION ITEM 1      Electrical System check of Antenna and Transmission line      \$1,850      \$1,850

NOTE: Option Item price will not be factored into bid award.

  
 \_\_\_\_\_  
 Signature

October 3, 2012

\_\_\_\_\_  
 Date

Propagation Systems, Inc.

\_\_\_\_\_  
 Company Name

814-472-5540

\_\_\_\_\_  
 Phone

814-472-5676

\_\_\_\_\_  
 Fax

doug@psibroadcast.com

\_\_\_\_\_  
 Email

**CERTIFICATION AND SIGNATURE PAGE**

By signing below, I certify that I have reviewed this Solicitation in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Propagation Systems, Inc.

\_\_\_\_\_  
(Company)



\_\_\_\_\_  
(Authorized Signature)

Douglas A. Ross, President

\_\_\_\_\_  
(Representative Name, Title)

814-472-5540

814-472-5676

\_\_\_\_\_  
(Phone Number)

\_\_\_\_\_  
(Fax Number)

October 3, 2012

\_\_\_\_\_  
(Date)





# Propagation Systems, Inc.

Quality Broadcast Antenna Systems

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RE: EBA427 Section 3.3

## **WARRANTY**

### **LIMITED WARRANTY AND LIMITATION OF LIABILITY**

Unless otherwise specifically offered in writing, Seller warrants its products to be free of defects in material and workmanship for a period of two years from the date of shipment, and to conform to its standard specifications at the time of shipment. Seller agrees to service, adjust and/or replace at its option any defective parts of any equipment, returned to its Ebensburg, PA plant, freight pre-paid, within the specified warranty period. This warranty is subject to the conditions that, notice of any defect must be received by the Seller in writing within 30 days of the discovery of the defect, within the warranty period, and that Seller's inspection of the returned equipment substantiates to Seller's satisfaction the claimed defect. Seller is not liable for warranty work if notice of defect is given after the warranty period, even though Buyer deems the defect to have occurred during the warranty period.

**THE SOLE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES AND THE SOLE REMEDIES FOR SELLER'S LIABILITY OF ANY KIND WITH RESPECT TO PRODUCTS OR SERVICES PROVIDED UNDER THE PURCHASE ORDER OR ANY OTHER PERFORMANCE BY SELLER SHALL BE LIMITED TO THE REMEDIES PROVIDED HEREIN. BUYER AGREES THAT SELLER SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR FOR ANY LOSS OF PROFIT, REVENUE OR DATA, EVEN IF SELLER SHALL HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH POTENTIAL LOSS OR DAMAGE. SELLER SHALL NOT BE LIABLE FOR ANY CLAIM AGAINST BUYER BY AN OTHER PARTY. EXCEPT AS SPECIFICALLY PROVIDED HEREIN, SELLER DOES NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR THE LIMITATION OR EXCLUSION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.**



# Propagation Systems, Inc.

Quality Broadcast Antenna Systems

## Bid Response to RFQ No. EBA427

Channel 28 Digital Television System

October 3, 2012

Propagation Systems, Inc. is offering two antenna options in response to RFQ: EBA427.

### ANTENNA OPTION 1: PSILP12WDC-28

PSI Reference: PR1756-A

The proposed antenna is a 12-Bay single slot type antenna producing a cardioid type pattern matching the specified Dielectric type pattern. The peak gain will meet or exceed those proposed in the RFQ.

The antenna is constructed of aluminum with a full fiberglass radome that can be pressurized with the feeding transmission line. Custom mounts are supplied that will accommodate the leg of the self-supporting tower. All brackets and mounting hardware is hot dip galvanized.

The antenna is end fed with a 1-5/8" EIA input connector rated at 5 kW of average power.

### Corresponding Transmission Line & Accessories

<u>Qty</u>	<u>Model No.</u>	<u>Description</u>
235	HCA158-50J	1-5/8" Air dielectric coaxial cable
1	HCA158-50J	1-5/8" EIA gas block connector installed
1	158EIA-HCA158-002	1-5/8" EIA gas block connector, loose
7	CLAMP-158	Standard hanger kits
2	HOIST1-158L	Hoisting grips
3	GKFORM60-158	Grounding kits
1	921248-158	Wall Feed Thru
1	APD-20-C	Automatic dehydrator



# Antenna Specifications

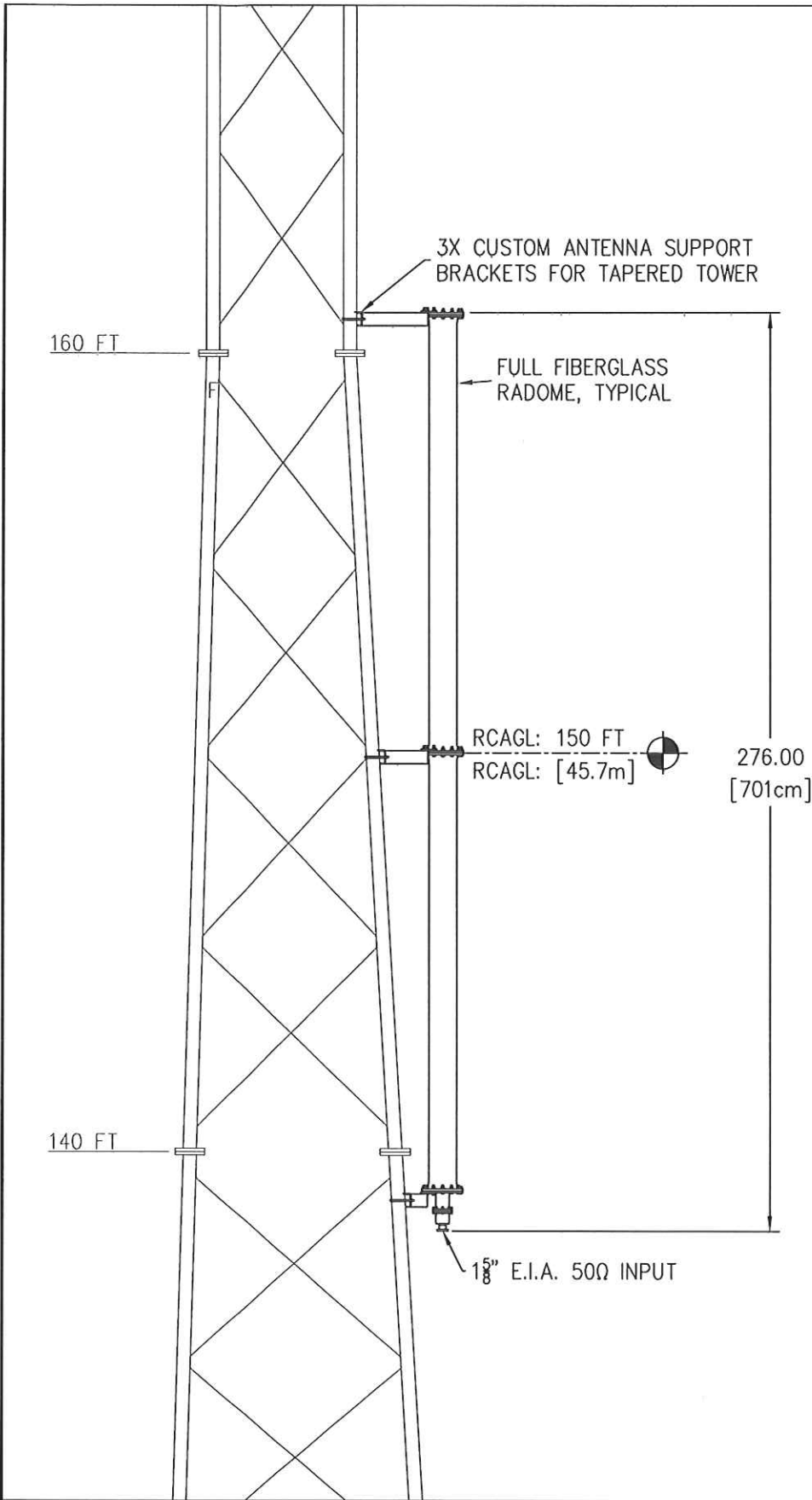
PROPOSAL NUMBER:	PR1756-A	DATE:	10/2/2012
CUSTOMER:	WV Educational Broadcast	ANTENNA TYPE:	PSILP12WDC-28
CALL LETTERS:	W28DR-D	CHANNEL:	28
LOCATION:	Cedarville, WV	REVISION:	

## Electrical Specifications

RMS GAIN MAIN LOBE	12.0	10.79	dB
RMS GAIN AT HORIZONTAL	8.77	9.43	dB
AZIMUTH DIRECTIVITY	2.1	3.22	dB
PEAK DIRECTIONAL GAIN	25.2	14.01	dB
ELEVATION PATTERN	PR1756-Elevation		
AZIMUTH PATTERN	PR1756-Azimuth		
BEAM TILT	1.5 Degree		
AVERAGE POWER RATING	5 kW		
INPUT SIZE	1-5/8" EIA end fed		
INPUT IMPEDANCE	50 Ohm		

## Mechanical Specifications

HEIGHT WITH LIGHTNING PROTECTION	NA	Ft	NA	M
ANTENNA LENGTH	23.0	Ft	7.01	M
CENTER OF RADIATION	11.5	Ft	3.51	M
WIND AREA (CaAa) No Ice EIA 222-F	16.24	Sq. Ft	1.51	Sq. M
OVERTURN MOMENT	NA	Ft LB	NA	Kg M
WEIGHT	130	LB	58.9	Kg



ANTENNA ONLY	
APPROXIMATE SPECIFICATIONS	
LENGTH:	23.0 FT [7.01m]
RATING:	5 kW
INPUT:	1 5/8" E.I.A. 50Ω
GAIN:	25.2 (14.01 dBd)
WEIGHT:	130 LB [58.9 Kg]
WINDAREA:	16.24 FT <sup>2</sup> [1.51m <sup>2</sup> ]
TIA-222-F (NO ICE)	

REV.	MADE BY	CHECKED BY	DATE	CHANGE

This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making or finish any information for the making of drawings, prints or other reproductions hereof, or for the design or making of any item, parts, object, apparatus or parts thereof, except upon the written permissions of PSI first obtained. The acceptance of this drawing will be construed as an acceptance of the foregoing agreement.

10/3/2012 2:24:04 PM by: LK/ML/1320 PCL 6

**PSI** **PROPAGATION SYSTEMS, INC.**  
 Ebensburg, Pennsylvania USA (814) 472-5540

TITLE: PROPOSED ANTENNA, OPTION ONE  
 for CHANNEL 28

MODEL: PSILP12WDC-28

SCALE: 1:50

DRAWN BY: D.G. Keller

APPROVED: [Signature]

CHAN/FREQ: CHANNEL 28

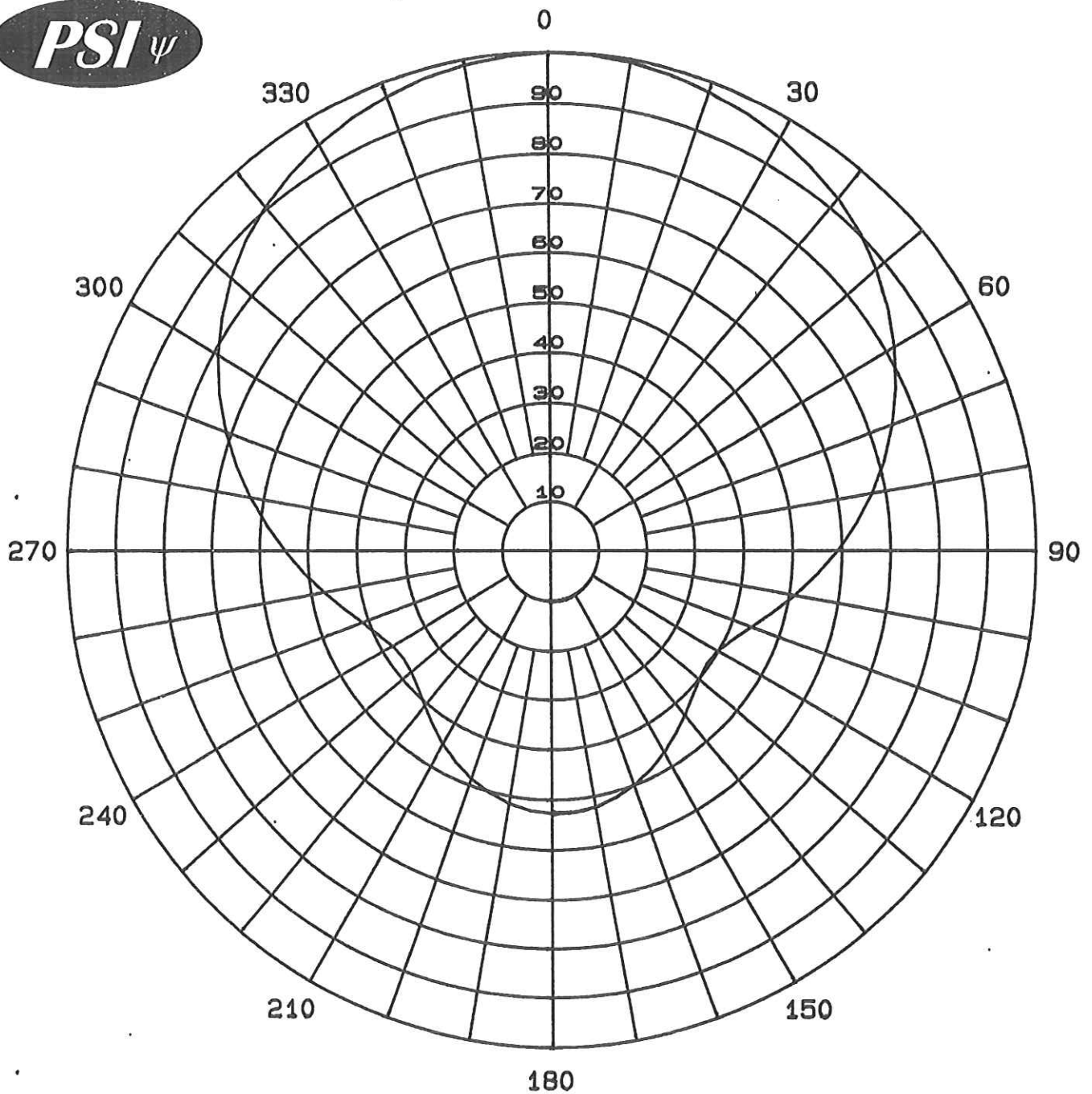
DATE: 10/02/12

DRAWING NO.: PR1756-A

REV. [ ]

SIZE: A

PR1756-A



Calculated Relative Field  
Azimuth Plane Pattern  
Antenna: PSILP12WDC-28  
Channel: 28  
Directivity: 2.1 (3.22 dB)  
Peak Gain: 25.2 (14.01 dB)  
Pattern: PR1756 Azimuth  
Station: W28DR-D

**Propagation Systems Inc.**  
**PO Box 113**  
**Ebensburg, PA 15931**

**PROPAGATION SYSTEMS INC.**  
 Relative Field Tabulation  
 Antenna Model: PSILP12WDC-28  
 Gain: 25.2 (14.01 dBd)

Angle	Relative Field	Power Gain	Gain dB
0	1.000	25.20	14.01
10	0.990	24.70	13.93
20	0.973	23.86	13.78
30	0.946	22.55	13.53
40	0.907	20.73	13.17
50	0.857	18.51	12.67
60	0.792	15.81	11.99
70	0.713	12.81	11.08
80	0.628	9.94	9.97
90	0.547	7.54	8.77
100	0.474	5.66	7.53
110	0.414	4.32	6.35
120	0.378	3.60	5.56
130	0.378	3.60	5.56
140	0.408	4.19	6.23
150	0.449	5.08	7.06
160	0.487	5.98	7.76
170	0.515	6.68	8.25
180	0.527	7.00	8.45
190	0.522	6.87	8.37
200	0.500	6.30	7.99
210	0.467	5.50	7.40
220	0.430	4.66	6.68
230	0.400	4.03	6.06
240	0.398	3.99	6.01
250	0.440	4.88	6.88
260	0.510	6.55	8.17
270	0.590	8.77	9.43
280	0.671	11.35	10.55
290	0.748	14.10	11.49
300	0.818	16.86	12.27
310	0.877	19.38	12.87
320	0.924	21.52	13.33
330	0.958	23.13	13.64
340	0.980	24.20	13.84
350	0.994	24.90	13.96

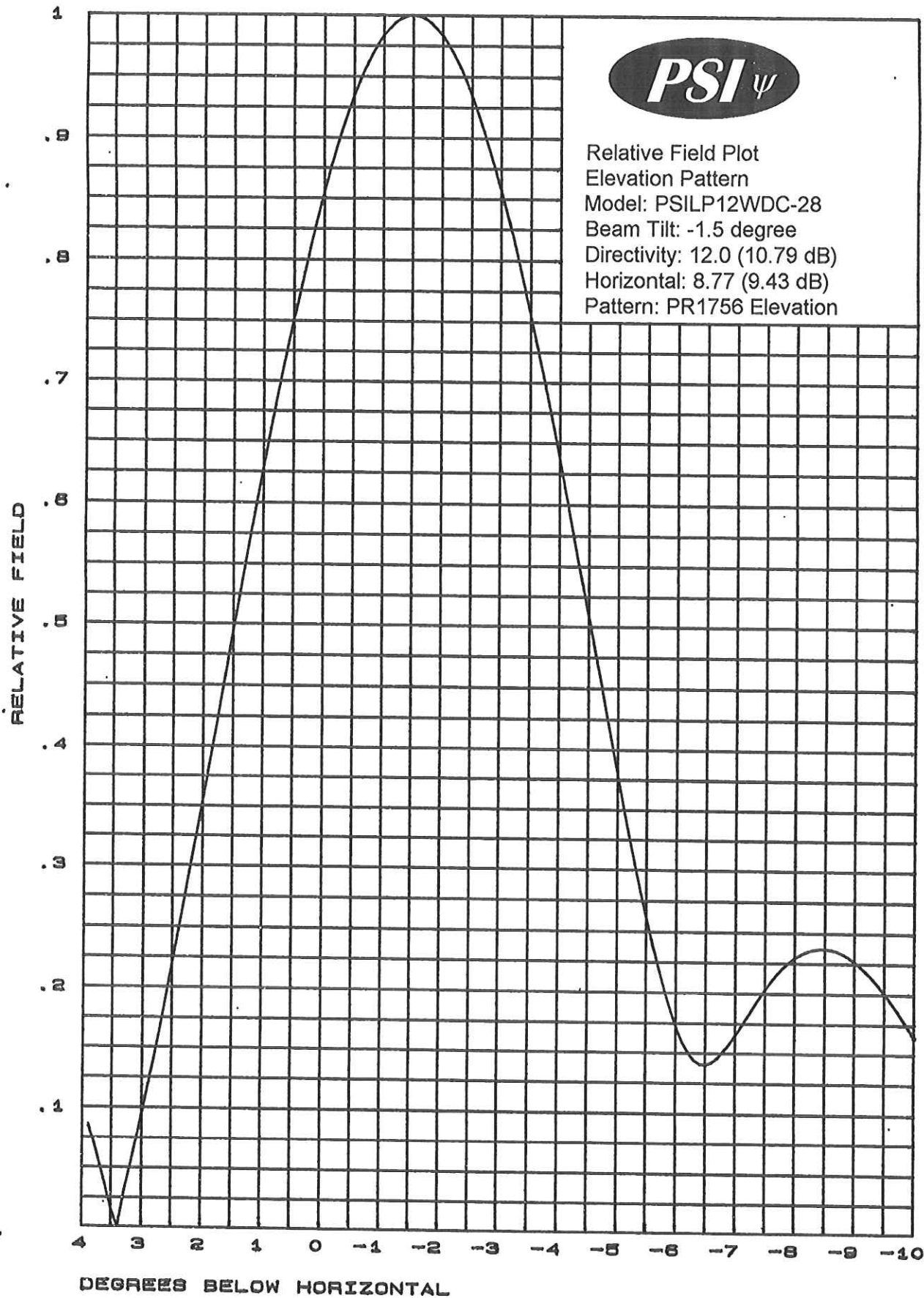
**PROPAGATION SYSTEMS INC.**

Relative Field Tabulation

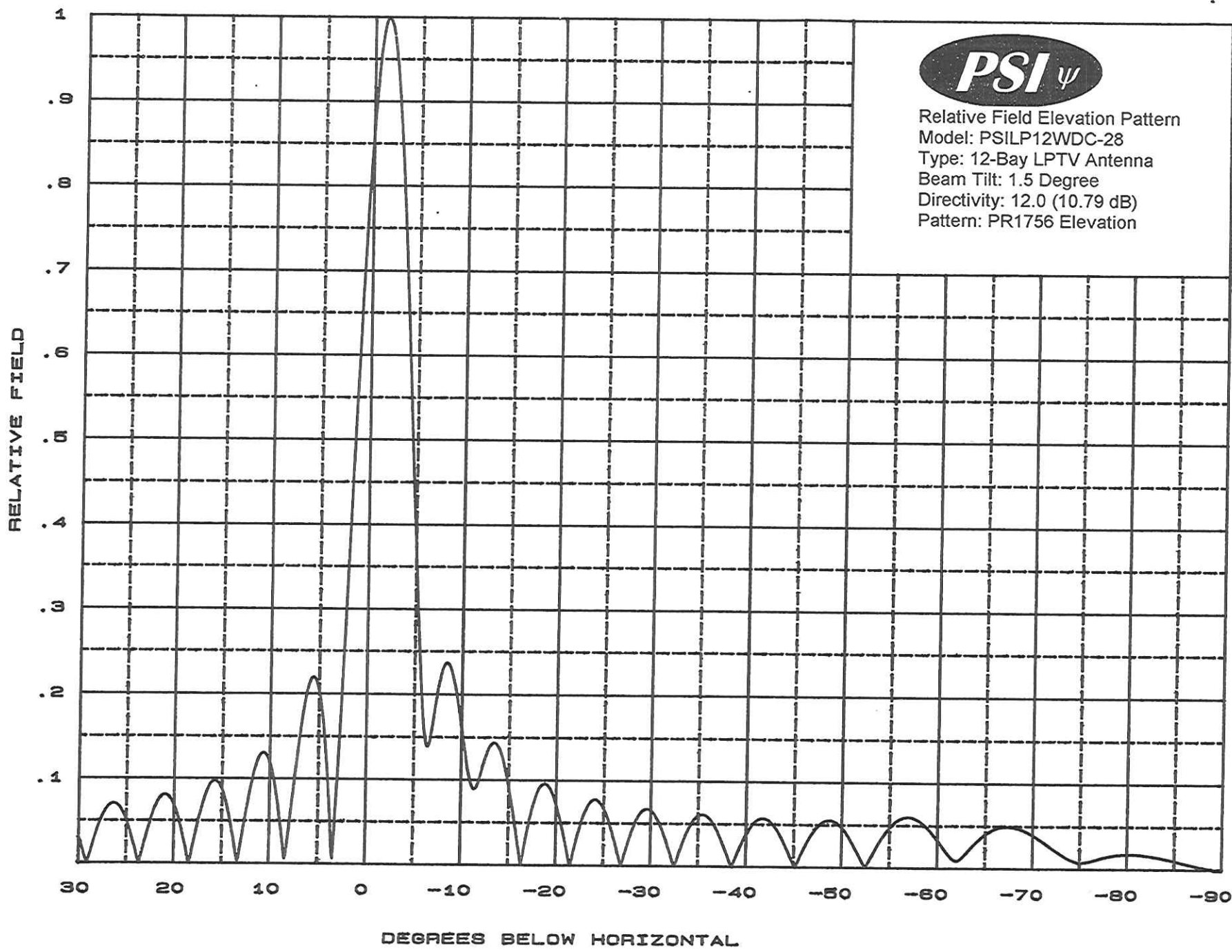
Antenna Model: PSILP12WDC-28

Peak ERP: 10.1 kW (10.04 dBk)

Angle	Relative Field	ERP kW	ERP dBk
0	1.000	10.10	10.04
10	0.990	9.90	9.96
20	0.973	9.56	9.81
30	0.946	9.04	9.56
40	0.907	8.31	9.20
50	0.857	7.42	8.70
60	0.792	6.34	8.02
70	0.713	5.13	7.11
80	0.628	3.98	6.00
90	0.547	3.02	4.80
100	0.474	2.27	3.56
110	0.414	1.73	2.38
120	0.378	1.44	1.59
130	0.378	1.44	1.59
140	0.408	1.68	2.26
150	0.449	2.04	3.09
160	0.487	2.40	3.79
170	0.515	2.68	4.28
180	0.527	2.81	4.48
190	0.522	2.75	4.40
200	0.500	2.53	4.02
210	0.467	2.20	3.43
220	0.430	1.87	2.71
230	0.400	1.62	2.08
240	0.398	1.60	2.04
250	0.440	1.96	2.91
260	0.510	2.63	4.19
270	0.590	3.52	5.46
280	0.671	4.55	6.58
290	0.748	5.65	7.52
300	0.818	6.76	8.30
310	0.877	7.77	8.90
320	0.924	8.62	9.36
330	0.958	9.27	9.67
340	0.980	9.70	9.87
350	0.994	9.98	9.99







Relative Field Elevation Pattern  
Model: PSILP12WDC-28  
Type: 12-Bay LPTV Antenna  
Beam Tilt: 1.5 Degree  
Directivity: 12.0 (10.79 dB)  
Pattern: PR1756 Elevation



# Propagation Systems, Inc.

Quality Broadcast Antenna Systems

## ANTENNA OPTION 2: PSILP12WDC-28

PSI Reference: PR1756-B

The proposed antenna is a 12-Bay single slot type antenna producing a cardioid type pattern matching the specified Dielectric type pattern. The peak gain will meet or exceed those proposed in the RFQ.

The antenna is constructed of aluminum. This option includes a slot cover radome that encloses the antenna radiating elements and is not pressurized. Custom mounts are supplied that will accommodate the leg of the self-supporting tower. All brackets and mounting hardware is hot dip galvanized.

The antenna is end fed with a 1-5/8" EIA input connector rated at 5 kW of average power.

## Corresponding Transmission Line & Accessories

<u>Qty</u>	<u>Model No.</u>	<u>Description</u>
235	HCA158-50J	1-5/8" Air dielectric coaxial cable
1	HCA158-50J	1-5/8" EIA gas block connector installed
1	158EIA-HCA158-002	1-5/8" EIA gas block connector, loose
7	CLAMP-158	Standard hanger kits
2	HOIST1-158L	Hoisting grips
3	GKFORM60-158	Grounding kits
1	921248-158	Wall Feed Thru
1	APD-20-C	Automatic dehydrator



# Antenna Specifications

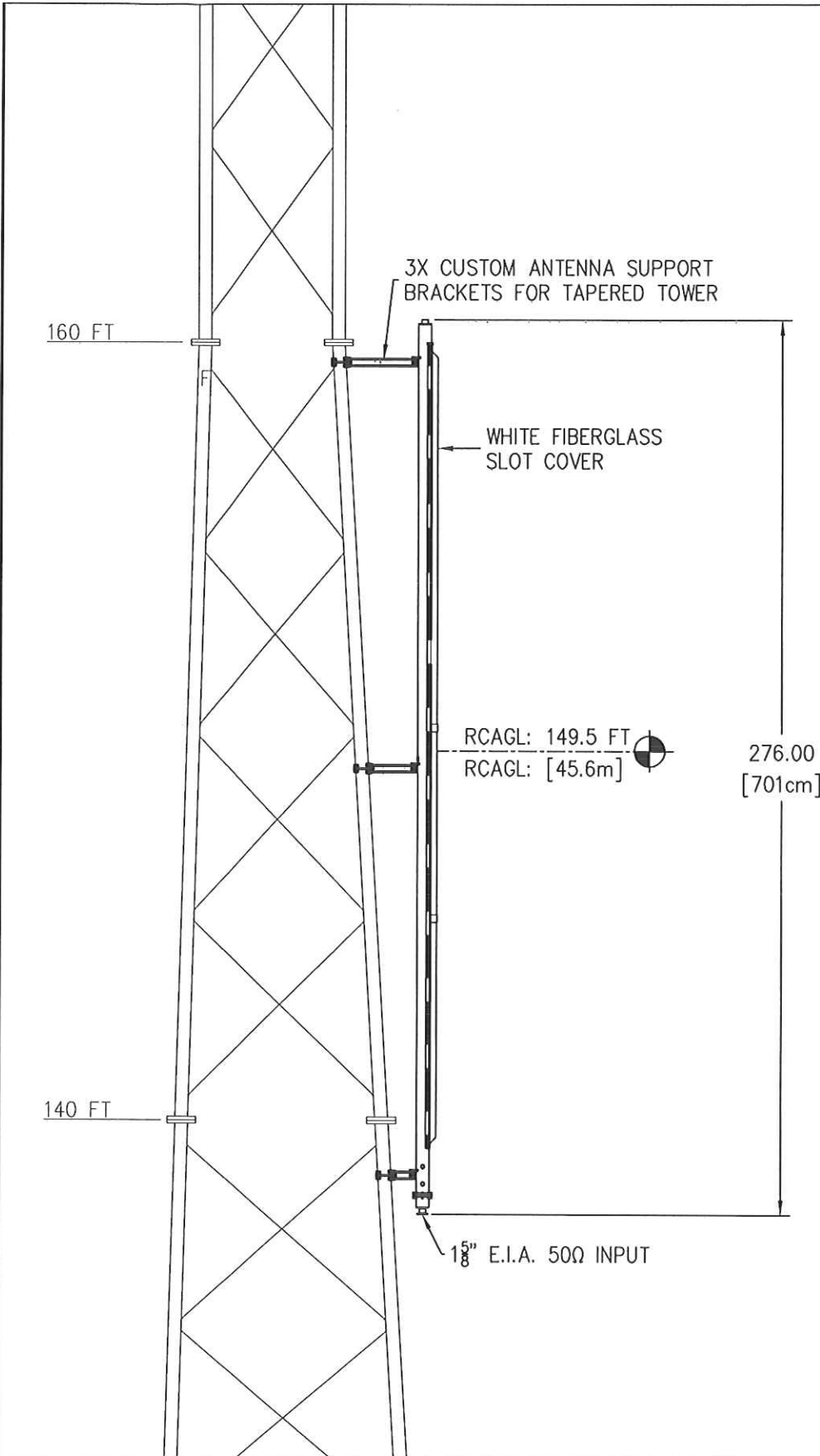
PROPOSAL NUMBER:	PR1756-B	DATE:	10/2/2012
CUSTOMER:	WV Educational Broadcast	ANTENNA TYPE:	PSILP12WDC-28
CALL LETTERS:	W28DR-D	CHANNEL:	28
LOCATION:	Cedarville, WV	REVISION:	

## Electrical Specifications

RMS GAIN MAIN LOBE	12.0	10.79	dB
RMS GAIN AT HORIZONTAL	8.77	9.43	dB
AZIMUTH DIRECTIVITY	2.1	3.22	dB
PEAK DIRECTIONAL GAIN	25.2	14.01	dB
ELEVATION PATTERN	PR1756-Elevation		
AZIMUTH PATTERN	PR1756-Azimuth		
BEAM TILT	1.5 Degree		
AVERAGE POWER RATING	5 kW		
INPUT SIZE	1-5/8" EIA end fed		
INPUT IMPEDANCE	50 Ohm		

## Mechanical Specifications

HEIGHT WITH LIGHTNING PROTECTION	NA	Ft	NA	M
ANTENNA LENGTH	23.0	Ft	7.01	M
CENTER OF RADIATION	11.5	Ft	3.51	M
WIND AREA (CaAa) No Ice EIA 222-F	9.62	Sq. Ft	.89	Sq. M
OVERTURN MOMENT	NA	Ft LB	NA	Kg M
WEIGHT	94	LB	42.6	Kg



ANTENNA ONLY	
APPROXIMATE SPECIFICATIONS	
LENGTH:	23.0 FT [7.01m]
RATING:	5 kW
INPUT:	1 5/8" E.I.A. 50Ω
GAIN:	25.2 (14.01 dBd)
WEIGHT:	94 LB [42.6 Kg]
WINDAREA:	9.62 FT <sup>2</sup> [.89m <sup>2</sup> ]
TIA-222-F (NO ICE)	

REV.	MADE BY	CHECKED BY	DATE	CHANGE

This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making or finish any information for the making of drawings, prints or other reproductions hereof, or for the design or making of any item, parts, object, apparatus or parts thereof, except upon the written permissions of PSI first obtained. The acceptance of this drawing will be construed as an acceptance of the foregoing agreement.

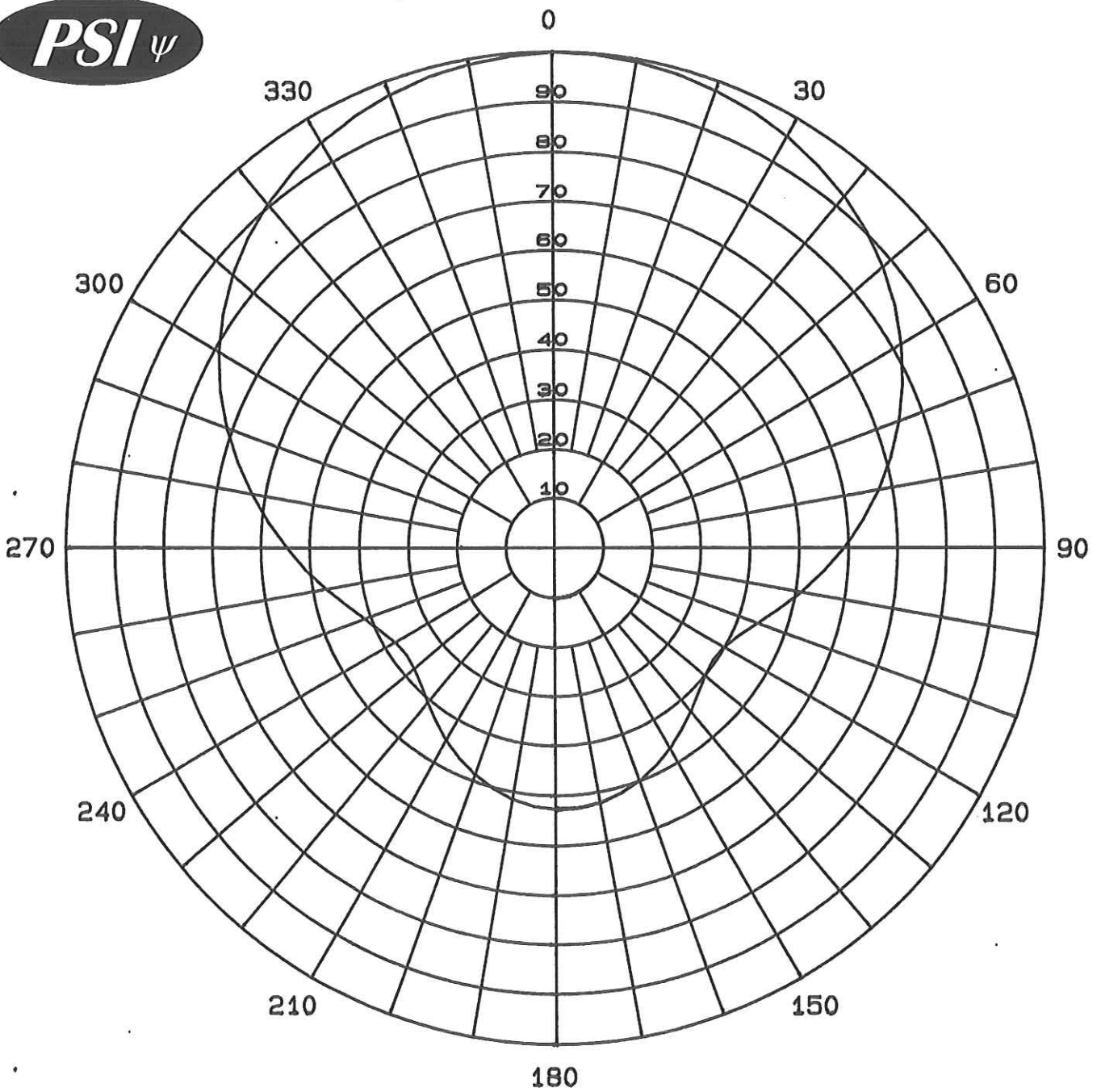
SIZE: A

**PSI** **PROPAGATION SYSTEMS, INC.**  
 Ebensburg, Pennsylvania USA (814) 472-5540

TITLE: PROPOSED ANTENNA, OPTION TWO  
 for CHANNEL 28

MODEL: PSILP12WDC-28	CHAN/FREQ: CHANNEL 28	DATE: 10/02/12
SCALE: 1:50	DRAWN BY: D.G. Keller	APPROVED:
DRAWING NO.: PR1756-B		REV.

PR1756-B



Calculated Relative Field  
Azimuth Plane Pattern  
Antenna: PSILP12WDC-28  
Channel: 28  
Directivity: 2.1 (3.22 dB)  
Peak Gain: 25.2 (14.01 dB)  
Pattern: PR1756 Azimuth  
Station: W28DR-D

**Propagation Systems Inc.**  
**PO Box 113**  
**Ebensburg, PA 15931**

**PROPAGATION SYSTEMS INC.**  
 Relative Field Tabulation  
 Antenna Model: PSILP12WDC-28  
 Gain: 25.2 (14.01 dBd)

Angle	Relative Field	Power Gain	Gain dB
0	1.000	25.20	14.01
10	0.990	24.70	13.93
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70	0.713	12.81	11.08
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90	0.547	7.54	8.77
100	0.474	5.66	7.53
110	0.414	4.32	6.35
120	0.378	3.60	5.56
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140	0.408	4.19	6.23
150	0.449	5.08	7.06
160	0.487	5.98	7.76
170	0.515	6.68	8.25
180	0.527	7.00	8.45
190	0.522	6.87	8.37
200	0.500	6.30	7.99
210	0.467	5.50	7.40
220	0.430	4.66	6.68
230	0.400	4.03	6.06
240	0.398	3.99	6.01
250	0.440	4.88	6.88
260	0.510	6.55	8.17
270	0.590	8.77	9.43
280	0.671	11.35	10.55
290	0.748	14.10	11.49
300	0.818	16.86	12.27
310	0.877	19.38	12.87
320	0.924	21.52	13.33
330	0.958	23.13	13.64
340	0.980	24.20	13.84
350	0.994	24.90	13.96

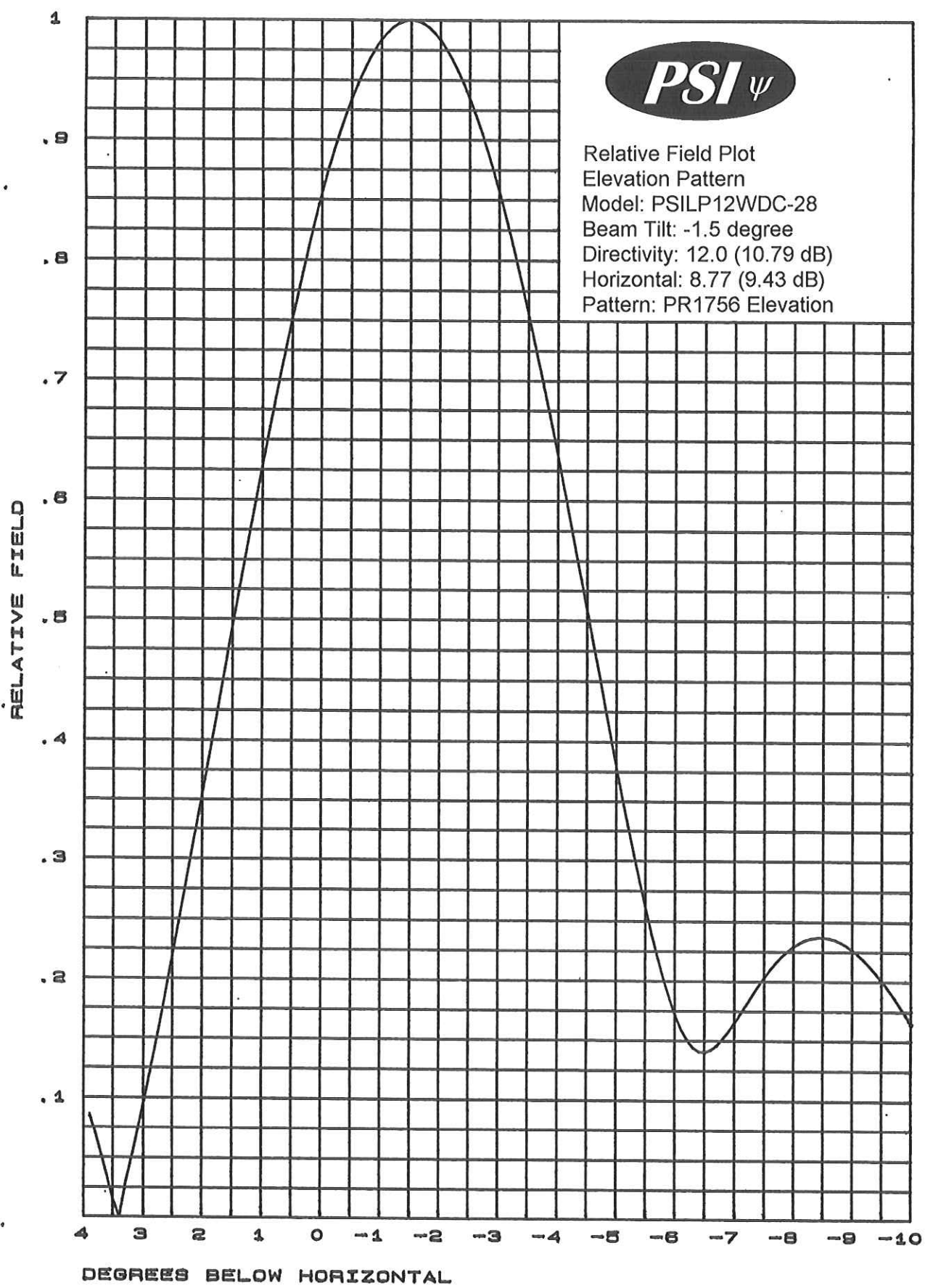
**PROPAGATION SYSTEMS INC.**

Relative Field Tabulation

Antenna Model: PSILP12WDC-28

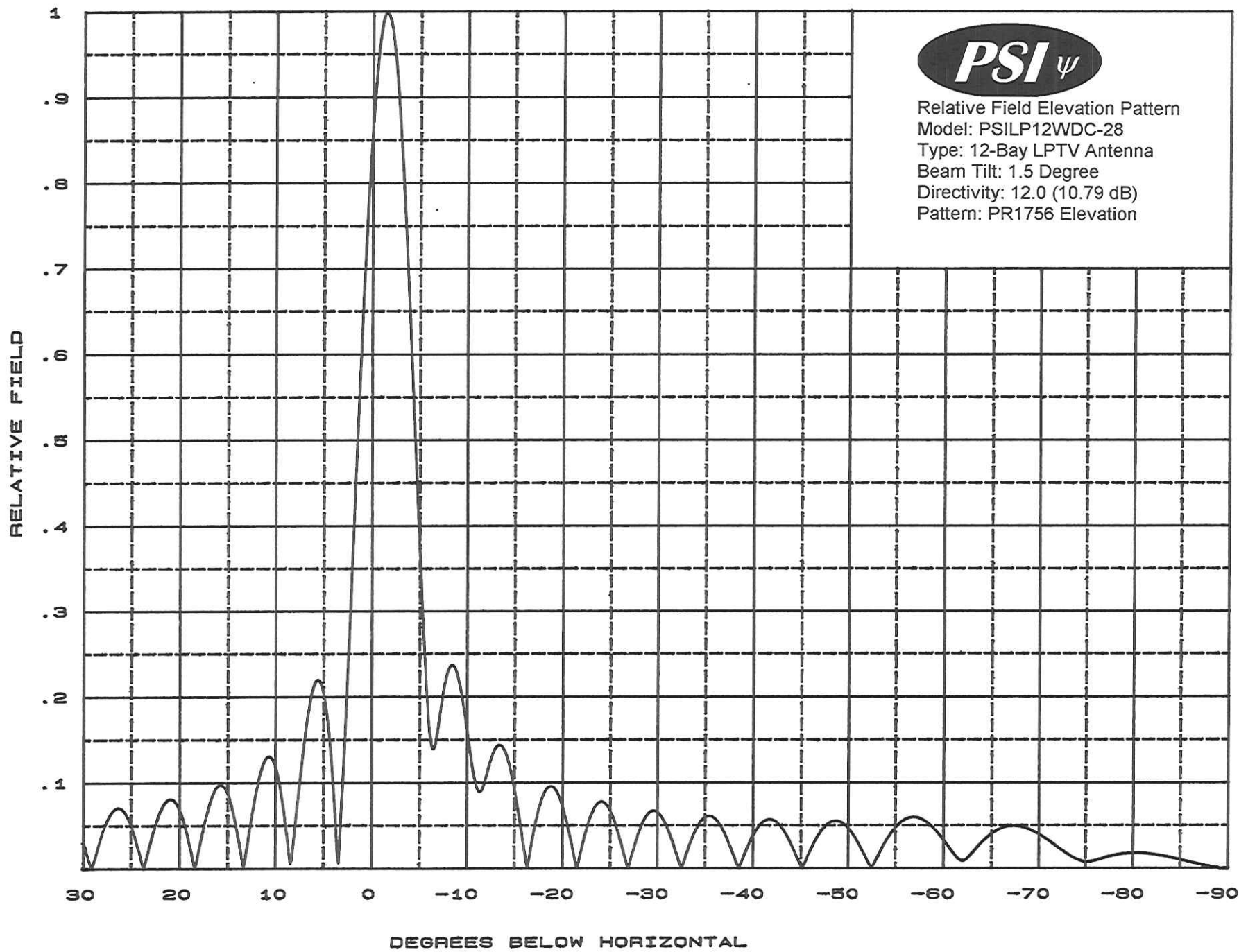
Peak ERP: 10.1 kW (10.04 dBk)

Angle	Relative Field	ERP kW	ERP dBk
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90	0.547	3.02	4.80
100	0.474	2.27	3.56
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150	0.449	2.04	3.09
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180	0.527	2.81	4.48
190	0.522	2.75	4.40
200	0.500	2.53	4.02
210	0.467	2.20	3.43
220	0.430	1.87	2.71
230	0.400	1.62	2.08
240	0.398	1.60	2.04
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300	0.818	6.76	8.30
310	0.877	7.77	8.90
320	0.924	8.62	9.36
330	0.958	9.27	9.67
340	0.980	9.70	9.87
350	0.994	9.98	9.99



Relative Field Plot  
 Elevation Pattern  
 Model: PSILP12WDC-28  
 Beam Tilt: -1.5 degree  
 Directivity: 12.0 (10.79 dB)  
 Horizontal: 8.77 (9.43 dB)  
 Pattern: PR1756 Elevation





Relative Field Elevation Pattern  
Model: PSILP12WDC-28  
Type: 12-Bay LPTV Antenna  
Beam Tilt: 1.5 Degree  
Directivity: 12.0 (10.79 dB)  
Pattern: PR1756 Elevation