



**Certification**  
**Antenna Model: PSIFMR-2-DA**  
**Frequency: 105.7 MHz**

**Green County CBC, Inc.**  
**WGRK**  
**Ref: J1007FM-633**



# Propagation Systems, Inc.

Quality Broadcast Antenna Systems

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**Directional FM Antenna  
WGRK  
Green County CBC, Inc.  
Greensburg, KY**

A standard model PSIFMR antenna with parasitic elements was used in conjunction with the customer's 12" face triangular tower to create the necessary directional radiation pattern. The final antenna consists of two radiating elements each secured to the tower with a custom-mounting bracket. The antenna bays are full wave spaced and there are two vertical and one horizontal parasitic elements per bay. The antenna array is end fed from an existing 1-5/8" flexible transmission line. Each radiating element receives equal power and phase.

Pattern testing was performed using a 1/3 scale model element and tower. The azimuth plane measurements were taken on a ground reflection test range. This type of test range utilizes the reflected signal and direct signal from the source antenna to form an interference pattern on the antenna under test. The antenna and tower under test was mounted to a turntable that allowed the structure to be rotated 360° in the azimuth plane. The source antenna was located approximately 75 ft. from the antenna under test. The source height above ground was adjusted to peak the first lobe of the interference pattern at the antenna under test.

The test antenna was mounted in the center of rotation of the turntable. The antenna and mounting structure were rotated clockwise while data was recorded in a counter clockwise direction. All feed cables to the antenna were secured and grounded during pattern measurements. A Hewlett Packard 8753A-network analyzer operating at 317.1 MHz was used as both the source and receiver. The level of the received signal was compared with a standard dipole to establish the directivity of the final pattern. The final pattern measured does not exceed the envelope pattern and is 90% of the envelope RMS.

The antenna is to be mounted 83 meters (272 ft) above ground level on the southeast tower leg and positioned 161° True. The antenna will be positioned correctly when mounted directly off the tower leg, in line with the tower leg guy wire. At this elevation the antenna will be within the allowed +2m/-4m tolerance. No other antenna can be installed within 10 ft of any radiating element. Any guy wires located within 25 ft. of any radiating element must be replaced with a non-metallic substitute. It is recommended that

a broadcast engineer be present to supervise the installation of the antenna and that he or she certifies that the antenna has been installed according to the enclosed instructions.

An input power level of 3.62 kW will be necessary at the antenna input in order to reach the required 5.1 kW ERP. The transmitter output power requirements are dependent upon the transmission line size and length used to feed the antenna. For example, the length of 1-5/8" air dielectric transmission line feeding the antenna is estimated to be 290 ft. The efficiency for this length of line is 86.3% with a resulting transmitter output power of 4.2 kW. The final length of transmission line must be determined after installation.

### **Antenna Specifications**

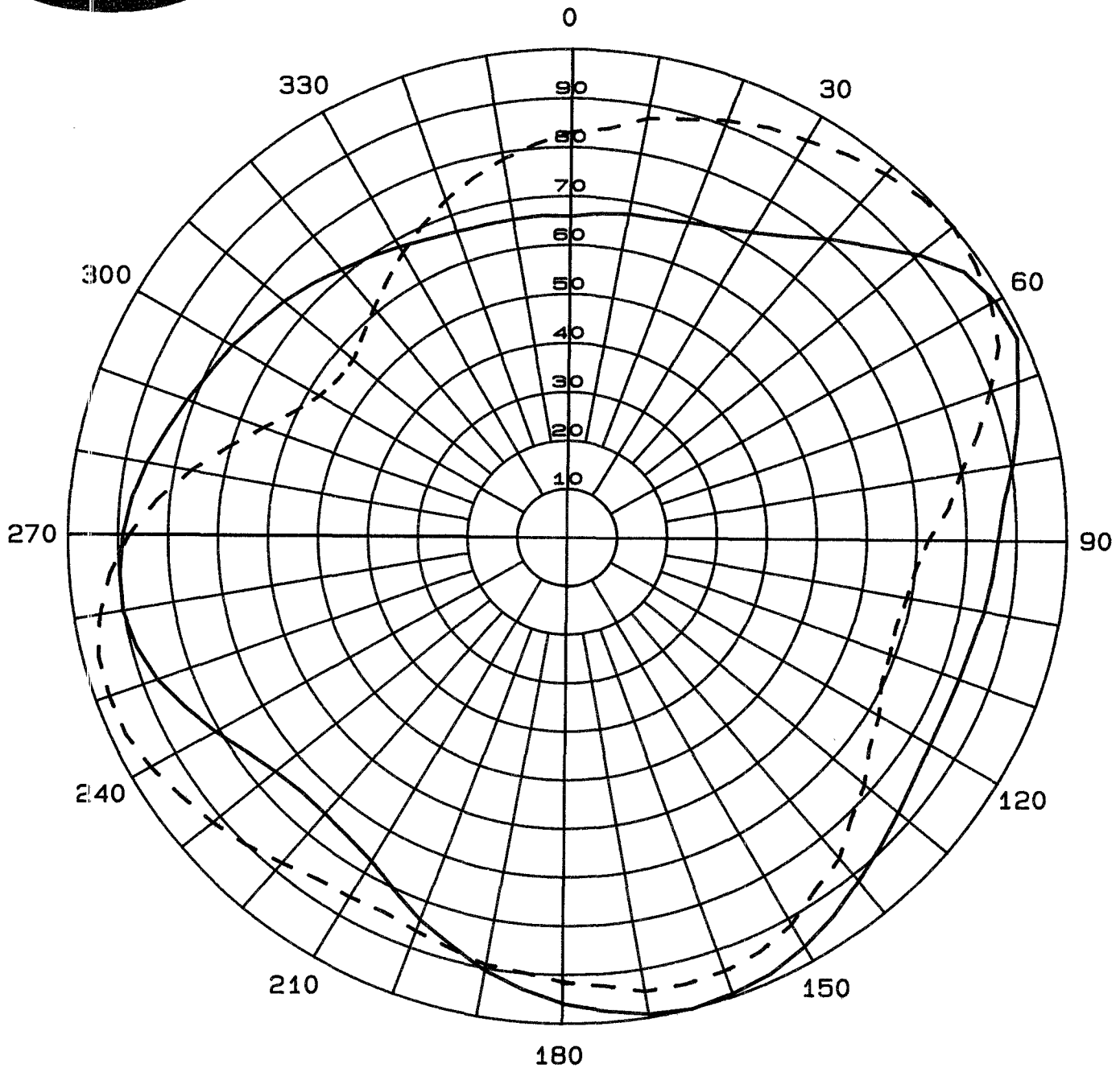
Antenna Model	PSIFMR-2-DA
Type	2-bay directional FM antenna
Bay Spacing	Full wave spaced elements
Frequency	105.7 MHz
Polarization	Circular
Envelope RMS	.982
Composite RMS	.887
Gain (h-pol)	1.41 (1.49 dB)
RMS (h-pol)	.834
Gain (v-pol)	1.41 (1.49 dB)
RMS (v-pol)	.839
ERP	5.1 kW
Antenna input power	3.62 kW
Input	1-5/8" EIA end fed input
Power rating	9 kW
Length	20 ft.- 9 9/16 in.
Weight	147 lbs.
Wind Area	13.62 sq. ft.

### **Statement of Certification**

This is to certify the antenna has been designed, fabricated and tested under my supervision and it meets the required envelope pattern limitations set forth in the stations construction permit.



Douglas A. Ross  
President  
Propagation Systems Inc.



Measured Relative Field  
Azimuth Plane Pattern  
Antenna: PSIFMR-2-DA  
Type: 2-Bay Directional FM  
H-pol Gain (solid): 1.41 (1.49 dB)  
V-pol Gain (dash): 1.41 (1.49 dB)  
Frequency: 105.7 MHz  
WGRK Greensburg, KY

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

## Measured Relative Field Tabulation

Antenna: PSIFMR-2-DA

Green County CBC, Inc.

Station: WGRK

Frequency: 105.7 MHz

Location: Greensburg, KY

### Horizontal Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.660	0.614	-2.12
10	0.676	0.644	-1.91
20	0.690	0.671	-1.73
30	0.727	0.745	-1.28
40	0.805	0.914	-0.39
50	0.911	1.170	0.68
60	0.983	1.362	1.34
70	0.957	1.291	1.11
80	0.904	1.152	0.62
90	0.863	1.050	0.21
100	0.848	1.014	0.06
110	0.837	0.988	-0.05
120	0.842	1.000	0.00
130	0.872	1.072	0.30
140	0.917	1.186	0.74
150	0.966	1.316	1.19
160	0.993	1.390	1.43
170	0.992	1.388	1.42
180	0.957	1.291	1.11
190	0.904	1.152	0.62
200	0.839	0.993	-0.03
210	0.772	0.840	-0.76
220	0.746	0.785	-1.05
230	0.756	0.806	-0.94
240	0.808	0.921	-0.36
250	0.870	1.067	0.28
260	0.903	1.150	0.61
270	0.891	1.119	0.49
280	0.857	1.036	0.15
290	0.814	0.934	-0.30
300	0.780	0.858	-0.67
310	0.748	0.789	-1.03
320	0.714	0.719	-1.43
330	0.685	0.662	-1.79
340	0.665	0.624	-2.05
350	0.663	0.620	-2.08

#### Maximum Value

Field 1.00

Gain 1.41 (1.49 dB)

Azimuth Bearing 165 degrees

#### Minimum Field

Field 0.660

Gain .614 (-2.12 dB)

Azimuth Bearing 0 degrees

### Vertical Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.831	0.974	-0.12
10	0.874	1.077	0.32
20	0.913	1.175	0.70
30	0.943	1.254	0.98
40	0.980	1.354	1.32
50	1.000	1.410	1.49
60	0.973	1.335	1.25
70	0.898	1.137	0.56
80	0.798	0.898	-0.47
90	0.723	0.737	-1.33
100	0.690	0.671	-1.73
110	0.689	0.669	-1.74
120	0.724	0.739	-1.31
130	0.783	0.864	-0.63
140	0.856	1.033	0.14
150	0.913	1.175	0.70
160	0.944	1.257	0.99
170	0.945	1.259	1.00
180	0.914	1.178	0.71
190	0.891	1.119	0.49
200	0.863	1.050	0.21
210	0.856	1.033	0.14
220	0.879	1.089	0.37
230	0.919	1.191	0.76
240	0.956	1.289	1.10
250	0.972	1.332	1.25
260	0.950	1.273	1.05
270	0.879	1.089	0.37
280	0.766	0.827	-0.82
290	0.651	0.598	-2.24
300	0.577	0.469	-3.28
310	0.565	0.450	-3.47
320	0.612	0.528	-2.77
330	0.672	0.637	-1.96
340	0.734	0.760	-1.19
350	0.787	0.873	-0.59

#### Maximum Value

Field 1.00

Gain 1.41 (1.49 dB)

Azimuth Bearing 50 degrees

#### Minimum Field

Field 0.565

Gain .45 (-3.47 dB)

Azimuth Bearing 310 degrees

## ERP Tabulation

Antenna: PSIFMR-2-DA  
Green County CBC, Inc.  
Station: WGRK  
Frequency: 105.7 MHz  
Location: Greensburg, KY  
Maximum ERP: 5.1 kW (7.08 dBk)

### Horizontal Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.660	2.222	3.47
10	0.676	2.331	3.67
20	0.690	2.428	3.85
30	0.727	2.695	4.31
40	0.805	3.305	5.19
50	0.911	4.233	6.27
60	0.983	4.928	6.93
70	0.957	4.671	6.69
80	0.904	4.168	6.20
90	0.863	3.798	5.80
100	0.848	3.667	5.64
110	0.837	3.573	5.53
120	0.842	3.616	5.58
130	0.872	3.878	5.89
140	0.917	4.289	6.32
150	0.966	4.759	6.78
160	0.993	5.029	7.01
170	0.992	5.019	7.01
180	0.957	4.671	6.69
190	0.904	4.168	6.20
200	0.839	3.590	5.55
210	0.772	3.040	4.83
220	0.746	2.838	4.53
230	0.756	2.915	4.65
240	0.808	3.330	5.22
250	0.870	3.860	5.87
260	0.903	4.159	6.19
270	0.891	4.049	6.07
280	0.857	3.746	5.74
290	0.814	3.379	5.29
300	0.780	3.103	4.92
310	0.748	2.853	4.55
320	0.714	2.600	4.15
330	0.685	2.393	3.79
340	0.665	2.255	3.53
350	0.663	2.242	3.51

#### Maximum Value (H-pol)

Field 1.00  
ERP 5.1 kW (7.08 dBk)

Azimuth Bearing 165 degrees

#### Minimum Field (H-pol)

Field 0.660  
ERP 2.222 kW (3.47 dBk)

Azimuth Bearing 0 degrees

### Vertical Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.831	3.522	5.47
10	0.874	3.896	5.91
20	0.913	4.251	6.29
30	0.943	4.535	6.57
40	0.980	4.898	6.90
50	1.000	5.100	7.08
60	0.973	4.828	6.84
70	0.898	4.113	6.14
80	0.798	3.248	5.12
90	0.723	2.666	4.26
100	0.690	2.428	3.85
110	0.689	2.421	3.84
120	0.724	2.673	4.27
130	0.783	3.127	4.95
140	0.856	3.737	5.73
150	0.913	4.251	6.29
160	0.944	4.545	6.58
170	0.945	4.554	6.58
180	0.914	4.261	6.29
190	0.891	4.049	6.07
200	0.863	3.798	5.80
210	0.856	3.737	5.73
220	0.879	3.940	5.96
230	0.919	4.307	6.34
240	0.956	4.661	6.68
250	0.972	4.818	6.83
260	0.950	4.603	6.63
270	0.879	3.940	5.96
280	0.766	2.992	4.76
290	0.651	2.161	3.35
300	0.577	1.698	2.30
310	0.565	1.628	2.12
320	0.612	1.910	2.81
330	0.672	2.303	3.62
340	0.734	2.748	4.39
350	0.787	3.159	5.00

#### Maximum Value (V-pol)

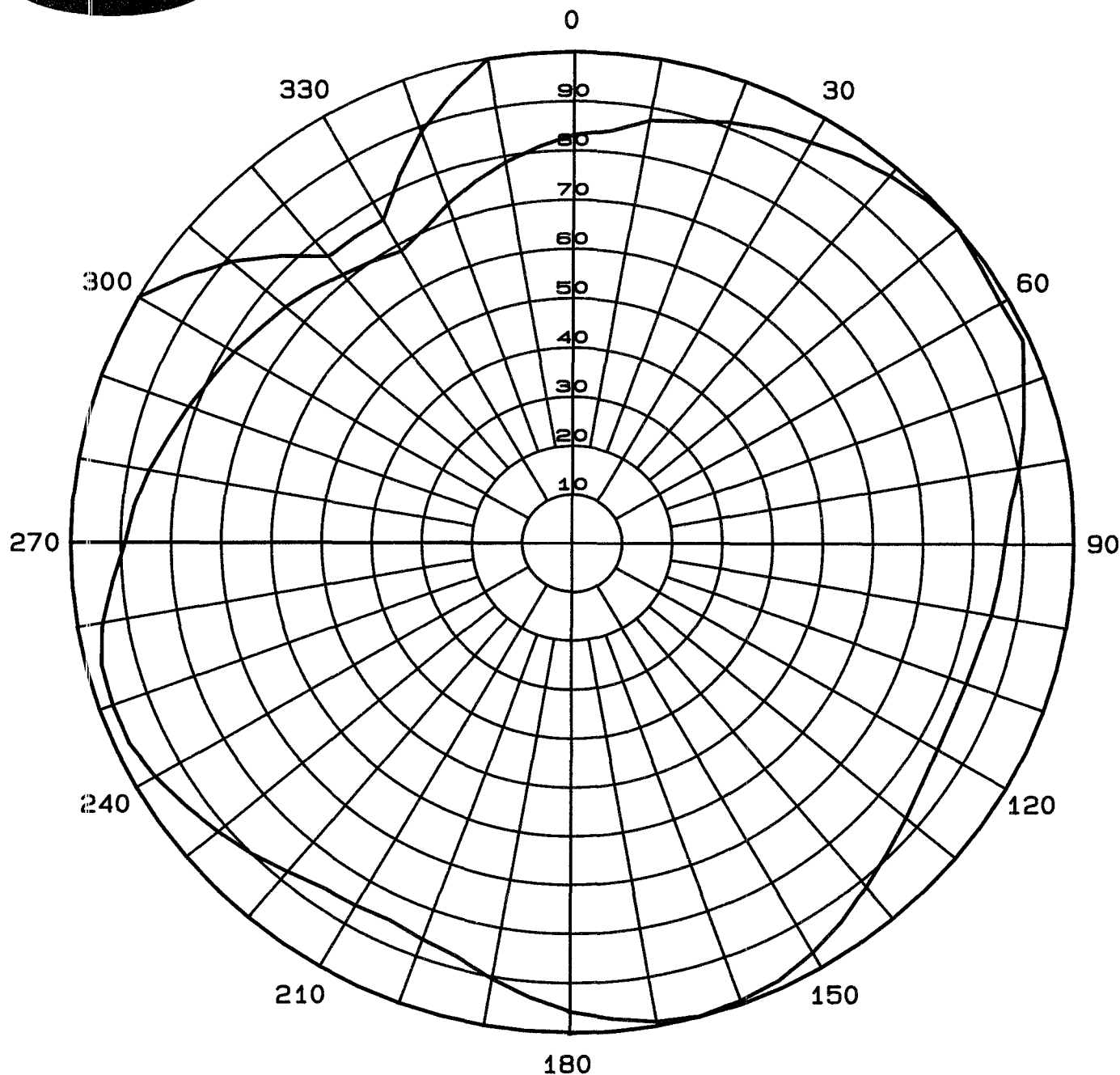
Field 1.00  
ERP 5.1 kW (7.08 dBk)

Azimuth Bearing 50 degrees

#### Minimum Field (V-pol)

Field 0.565  
ERP 1.628 kW (2.12 dBk)

Azimuth Bearing 310 degrees



Measured Composite and  
Maximum Envelope Pattern  
Antenna: PSIFMR-2-DA  
Type: 2-Bay Directional FM  
Composite RMS: .887  
Envelope RMS: .982  
ERP: 5.1 (7.08 dBk)  
Frequency: 105.7 MHz

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

WGRK Greensburg, KY

## Composite Pattern Tabulation

Antenna: PSIFMR-2-DA

Green County CBC, Inc.

Station: WGRK

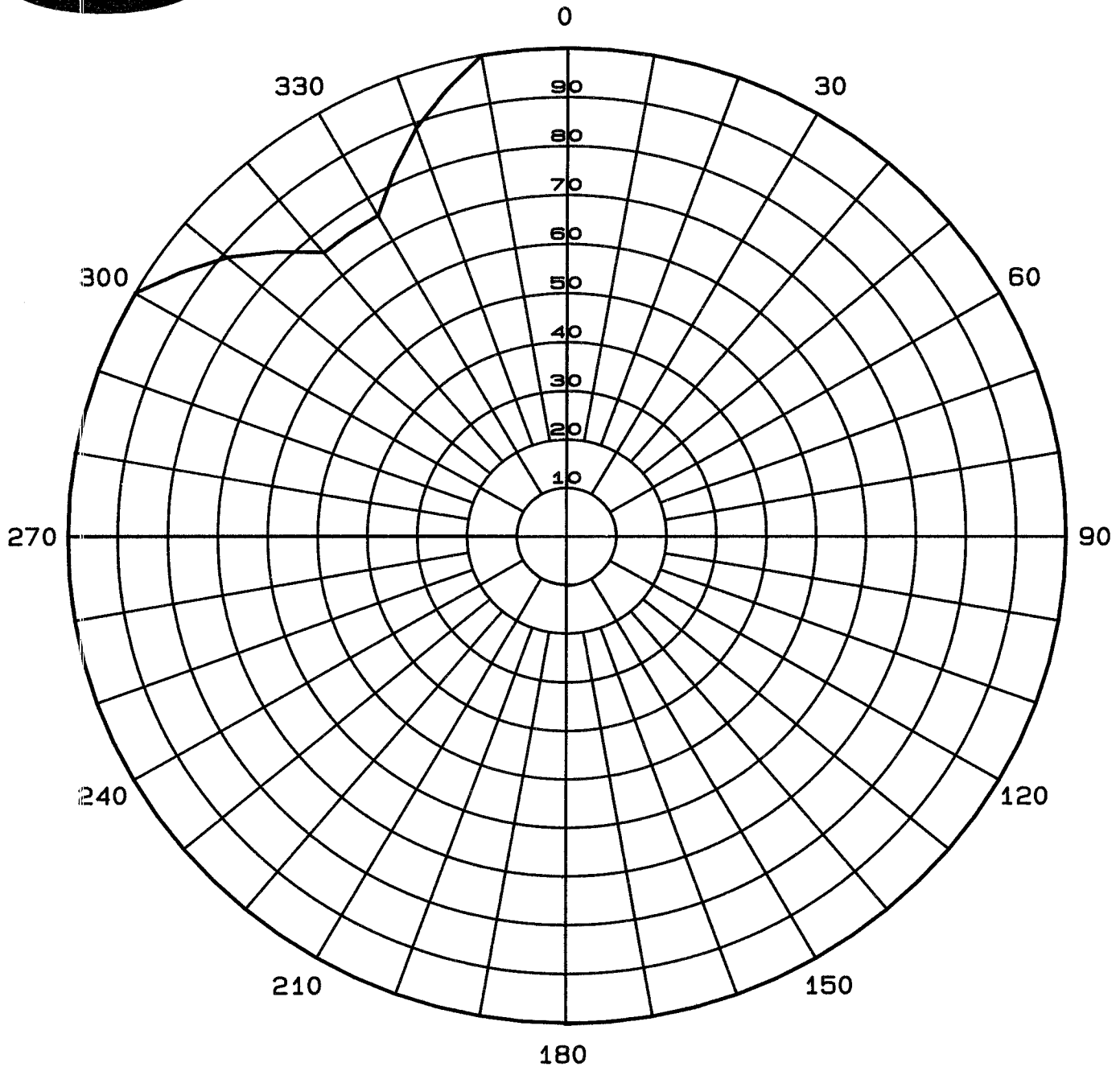
Frequency: 105.7 MHz

Location: Greensburg, KY

Maximum ERP: 5.1 kW (7.08 dBk)

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.831	3.522	5.47
10	0.874	3.896	5.91
20	0.913	4.251	6.29
30	0.943	4.535	6.57
40	0.980	4.898	6.90
50	1.000	5.100	7.08
60	0.983	4.928	6.93
70	0.957	4.671	6.69
80	0.904	4.168	6.20
90	0.863	3.798	5.80
100	0.848	3.667	5.64
110	0.837	3.573	5.53
120	0.842	3.616	5.58
130	0.872	3.878	5.89
140	0.917	4.289	6.32
150	0.966	4.759	6.78
160	0.993	5.029	7.01
170	0.992	5.019	7.01
180	0.957	4.671	6.69
190	0.904	4.168	6.20
200	0.863	3.798	5.80
210	0.856	3.737	5.73
220	0.879	3.940	5.96
230	0.919	4.307	6.34
240	0.956	4.661	6.68
250	0.972	4.818	6.83
260	0.950	4.603	6.63
270	0.891	4.049	6.07
280	0.857	3.746	5.74
290	0.814	3.379	5.29
300	0.780	3.103	4.92
310	0.748	2.853	4.55
320	0.714	2.600	4.15
330	0.685	2.393	3.79
340	0.734	2.748	4.39
350	0.787	3.159	5.00





Maximum Envelope  
Relative Field Pattern  
Antenna: PSIFMR-2-DA  
Type: 2-Bay Directional FM  
ERP: 5.1 (7.08 dBk)  
Envelope RMS: .982  
Frequency: 105.7 MHz  
WGRK Greensburg, KY

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

## Maximum Envelope Tabulation

Antenna: PSIFMR-2-DA

Green County CBC, Inc.

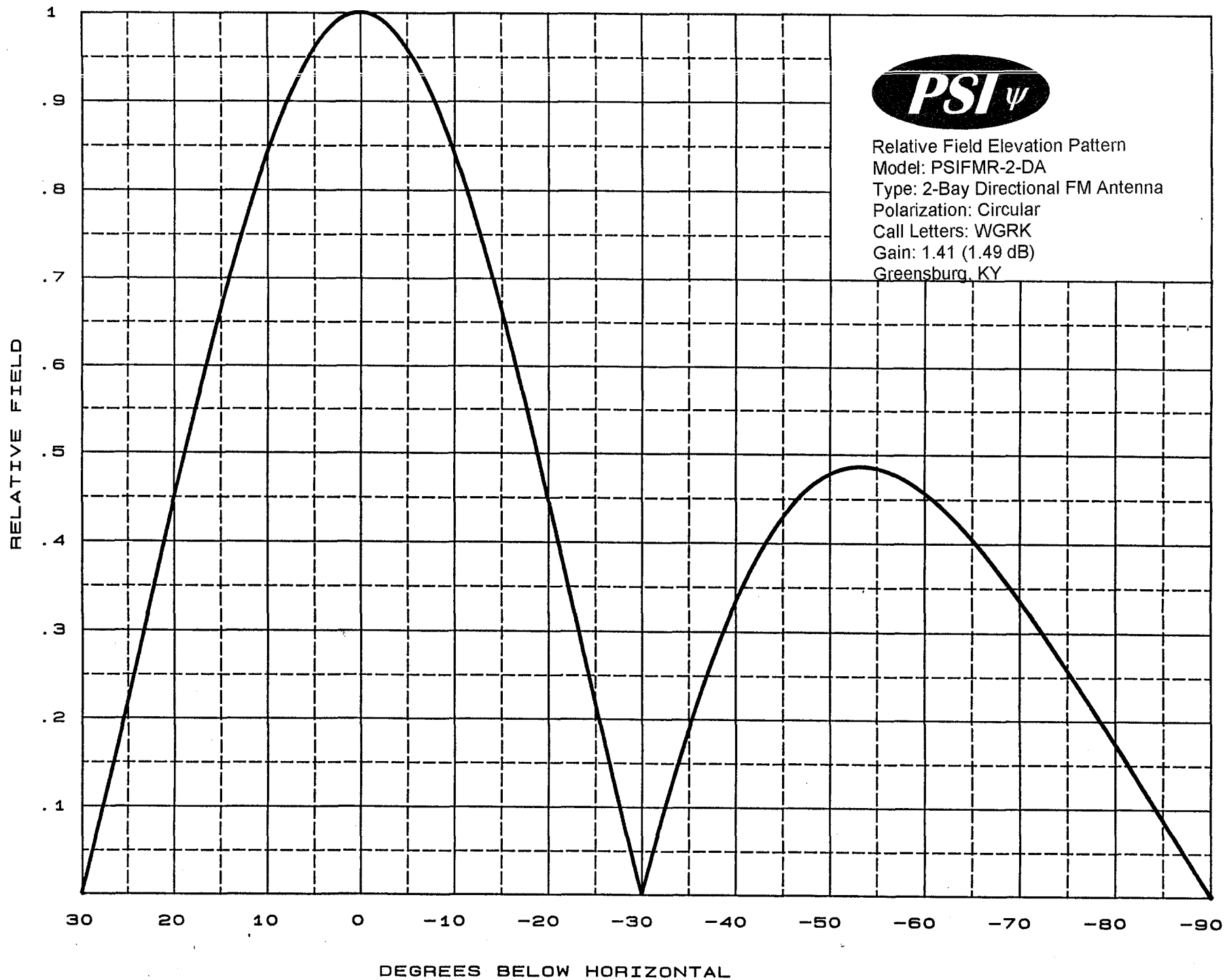
Station: WGRK

Frequency: 105.7 MHz

Location: Greensburg, KY

Maximum ERP: 5.1 kW (7.08 dBk)

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	1.000	5.100	7.08
10	1.000	5.100	7.08
20	1.000	5.100	7.08
30	1.000	5.100	7.08
40	1.000	5.100	7.08
50	1.000	5.100	7.08
60	1.000	5.100	7.08
70	1.000	5.100	7.08
80	1.000	5.100	7.08
90	1.000	5.100	7.08
100	1.000	5.100	7.08
110	1.000	5.100	7.08
120	1.000	5.100	7.08
130	1.000	5.100	7.08
140	1.000	5.100	7.08
150	1.000	5.100	7.08
160	1.000	5.100	7.08
165	1.000	5.100	7.08
170	1.000	5.100	7.08
180	1.000	5.100	7.08
190	1.000	5.100	7.08
200	1.000	5.100	7.08
210	1.000	5.100	7.08
220	1.000	5.100	7.08
230	1.000	5.100	7.08
240	1.000	5.100	7.08
250	1.000	5.100	7.08
260	1.000	5.100	7.08
270	1.000	5.100	7.08
280	1.000	5.100	7.08
290	1.000	5.100	7.08
300	1.000	5.100	7.08
310	0.890	4.040	6.06
320	0.760	2.946	4.69
330	0.760	2.946	4.69
340	0.890	4.040	6.06
350	1.000	5.100	7.08



# INSTRUCTION MANUAL

Green Country CBC, Inc.

WGRK

105.7 MHz

Antenna Model: PSIFMR-2-DA

## Uncrating

When uncrating the antenna system, open each crate carefully so that the crates may be used to return any merchandise that may have been damaged in shipping. Separate all parts and confirm that all items on the packing list have been received. If any parts are missing, notify PSI or it's agent prior to assembling the antenna. If any parts are damaged through shipment or are missing, promptly notify the shipping carrier and PSI.

## General Notes:

1. Review antenna elevation and plan the installation. The antenna brackets are for tower leg mount only. The antenna is to be mounted on the south/east tower leg positioned 161 degrees true. Be aware of possible mounting conflicts such as other antennas, guy wires, tower leg flanges, conduits etc. and plan accordingly.
2. All bays are to be aligned to the same azimuth angle.
3. Use only the supplied hardware and O-ring at all 1-5/8" flange connections.
4. Exercise care when assembling the inner conductors of the coaxial line. The bullet should fit firmly in the inner conductor in order to assure a proper connection.
5. Check a bracket on the tower for proper fit.
6. Install one bay/inter-bay assembly at a time.
7. Keep all transmission lines free from dirt and moisture. All Teflon insulators must be clean and dry.
8. The antenna must be pressurized with dry air or nitrogen.
9. The antenna has been tuned at the factory and should not require field adjustment. However a fine matcher has been supplied and if the antenna requires tuning, consult the factory before adjustments are made.
10. The antenna system should be tested before the erector leaves the premises to insure that the complete antenna system is functioning properly.

## Installation Procedure

### Step One

The antenna must be installed one bay/inter-bay assembly at a time. Starting with bay 1, attach the element to inter-bay 1 block. Use only the supplied 5/16-18 x 7/8" hardware and O-ring. The element must be positioned with the insulators down. Refer to drawing J1007FM-633-010. Next attach the shorting stub to the tee block and then the bay-mounting bracket to the boom of bay 1 using the supplied hose clamps. Attach the horizontal parasitic element per drawing 33-00180 to the inter-bay block using the supplied 5/16-18 x 7/8" hardware and attach the inter-bay bracket approximately 12"-18" below the bay. The first bay/inter-bay assembly is now ready to be installed on the tower. **The inter-bay inner conductor is not captivated. Take precautions to secure all inner conductors during erection.** Carefully hoist the first bay/inter-bay assembly to the correct location on the tower and secure the brackets to the south/east tower leg using the 1/2-13 x 6" bolts, nuts and locks. Next attach the vertical parasitic assembly to the tower leg behind the bay using the supplied U-bolts. Position the parasitic with the black band toward the east. The vertical and horizontal parasitic elements must not touch.

## Step Two

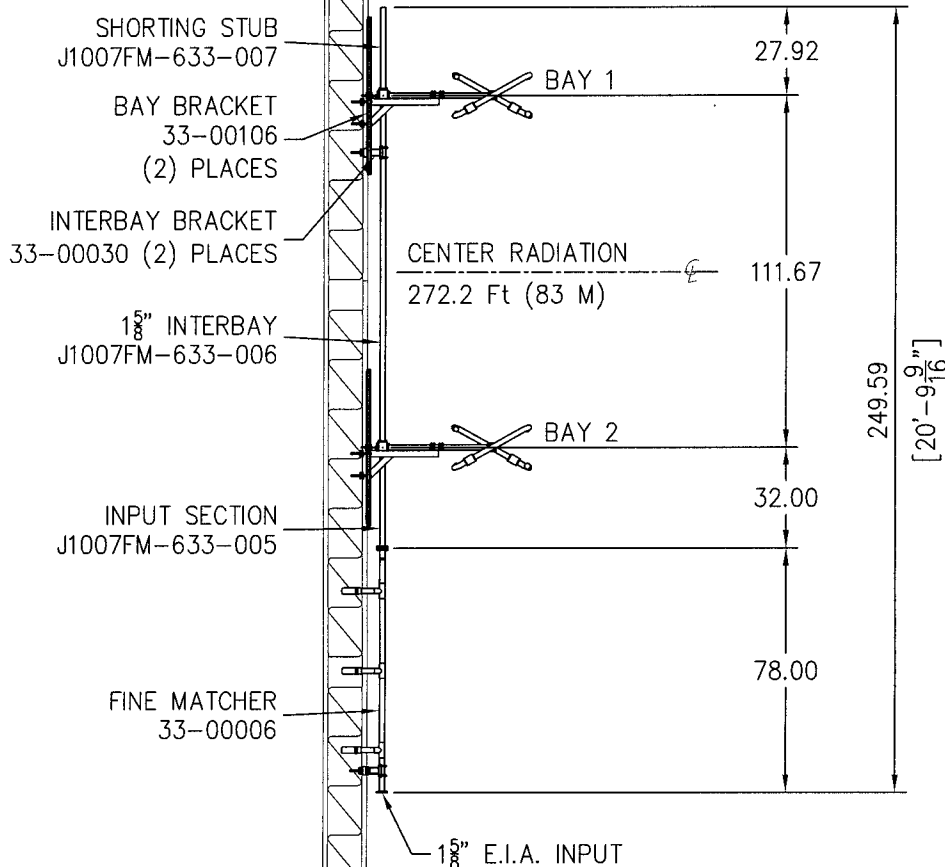
Follow the same procedure with bay 2. Inter-bay 2 or input section is a short section of transmission line that has been pre-assembled to the fine matcher/tuner. Connect the bay as shown in drawing J1007FM-633-011, with insulators down. Attach the parasitic, the bay-mounting bracket and the inter-bay bracket near the base of the fine matcher. Hoist the assembly and connect with inter-bay 1 using the supplied 5/16-18 x 7/8" bolts, locks and O-ring. Attach the vertical parasitic assembly to the tower leg behind the bay. Position the parasitic with the black band toward the east. The vertical and horizontal parasitic elements must not touch.

## Step Three

**Check all bolted connections for tightness.** Connect the main transmission line to the antenna input located at the tuner base. Do not allow the weight of the feed line to be supported by the antenna. Pressurize the antenna system to a maximum of 5 lbs. with dry air or nitrogen. The antenna system should be tested before the erector leaves the premises to insure that the complete antenna system is functioning properly. The antenna has been tested at the factory and the tuner has been adjusted for optimum match conditions, see attached test data. If the antenna-input match (VSWR) is greater than a 1.1:1, confirm the antenna was installed properly. If the VSWR is greater than 1.15:1 contact the factory for instructions before applying power to the antenna. If the VSWR is greater than 1.1:1 but less than 1.15:1 the tuner can be adjusted, using the appropriate test equipment, for minimum reflected power.

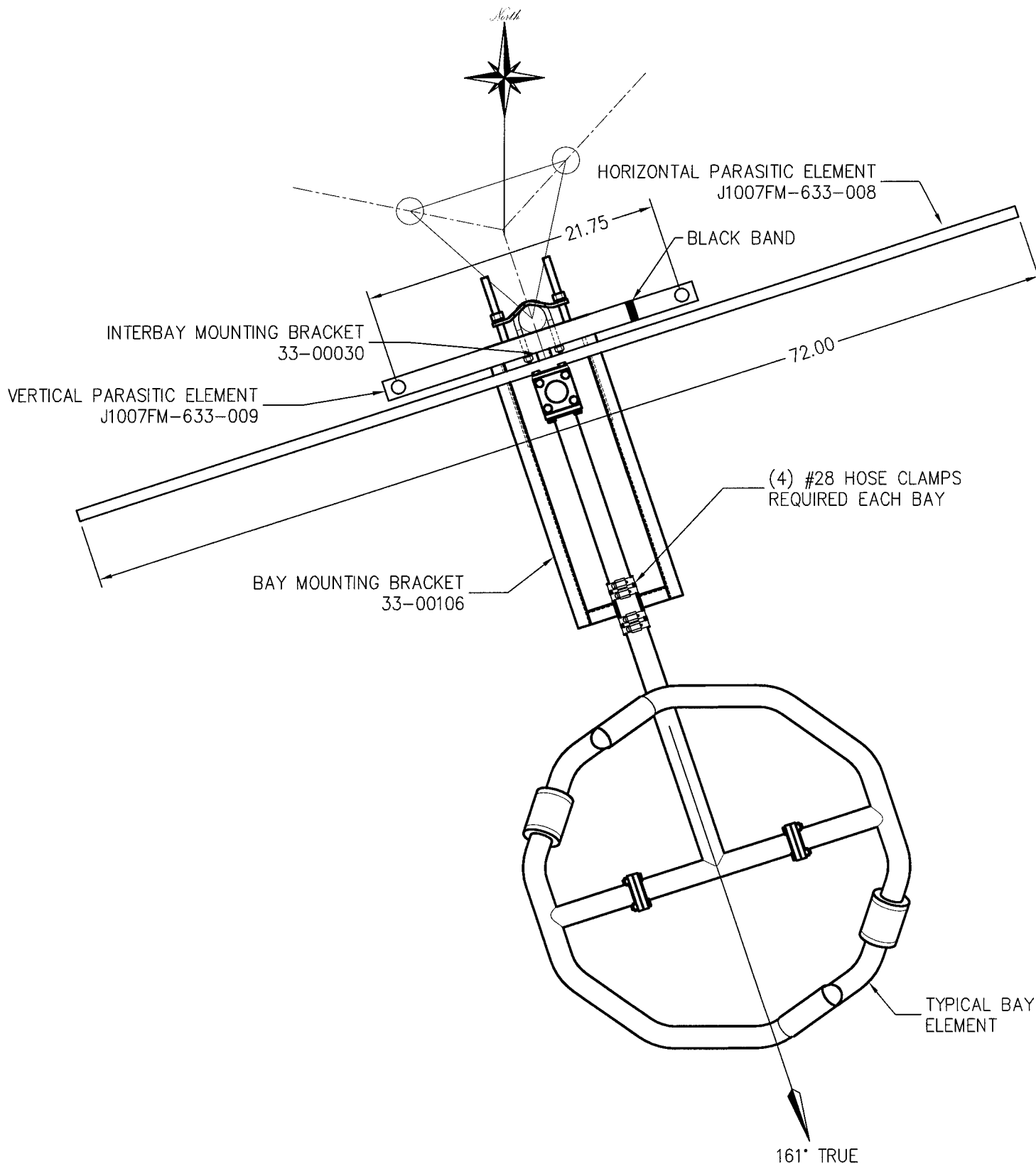
## **Drawing Index**

<u>Drawing</u>	<u>Title</u>
J1007FM-633-001	Antenna Elevation
J1007FM-633-002	Antenna Orientation
J1007FM-633-010	Bay 1 Side View
J1007FM-633-011	Bays 2 Side View and Fine Matcher
J1007FM-633-007	Shorting Stub
J1007FM-633-008	Block Mounted Horizontal Parasitic
J1007FM-633-009	Vertical Parasitic Assembly
33-00180	Horizontal Parasitic Mounting Details
33-00106	Bay Bracket Outline
33-00030	Inter-Bay Bracket Outline
33-00006	Tuner Outline

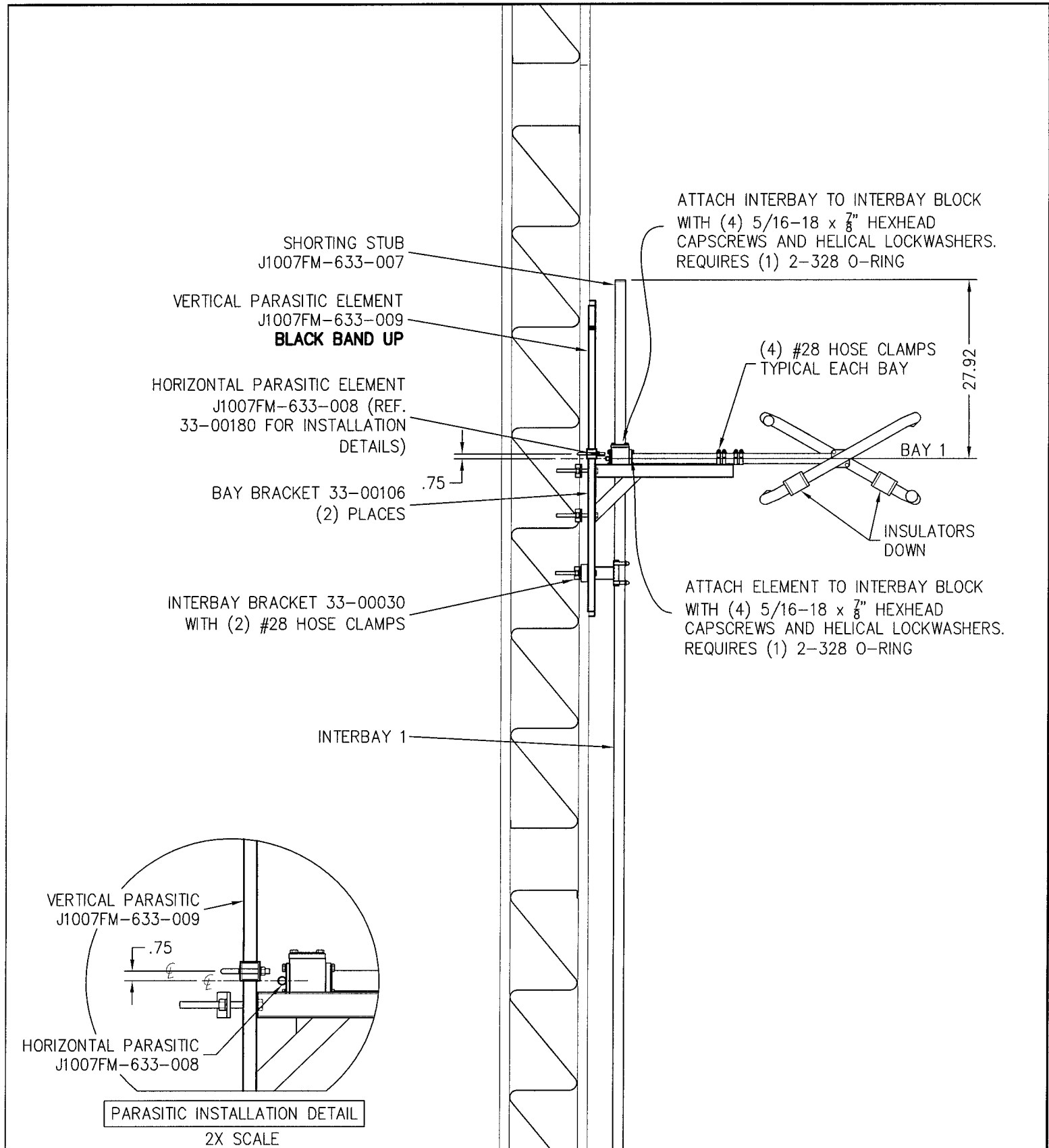


SPECIFICATIONS	
FREQUENCY:	105.7 MHz
BAY SPACING:	1λ
LENGTH:	249.59" (20.8 Ft)
APERTURE:	111.67" (9.31 Ft)
RATING:	9 kW
GAIN:	1.41 (1.49 dB)
WEIGHT:	146.74 LB (66.7 Kg)
WINDAREA:	13.62 Sq.Ft. (1.27 Sq.M)
TIA-222-F (NO ICE)	
NOTES:	
1. ANTENNA HAS BEEN PRETUNED AT THE FACTORY. NO ADJUSTMENT OF THE TUNER SHOULD BE NECESSARY.	
2. REF. J1007FM-633-010 FOR ASSEMBLY DETAILS OF BAY 1 REF. J1007FM-633-011 FOR ASSEMBLY DETAILS OF BAY 2	
3. FINE MATCHER IS SHOWN ROTATED FOR DRAWING CLARITY	

<b>PROPAGATION SYSTEMS, INC.</b> Ebensburg, Pennsylvania USA    814-472-5540														
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 forgoing agreement.	SIZE  <div style="font-size: 2em; font-weight: bold;">A</div>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="3">ANTENNA ELEVATIONS AND SPECIFICATIONS</th></tr> <tr> <td style="width: 33%;">MODEL: PSIFMR-2-DA</td><td style="width: 33%;">DRAWN BY: D.G. Kellar</td><td style="width: 34%;">DATE: 10/17/07</td></tr> <tr> <td>CHANNEL/FREQUENCY: 105.7 MHz</td><td>APPROVED BY:</td><td>DATE:</td></tr> <tr> <td>SCALE: 1:60</td><td>DRAWING NO.: J1007FM-633-001</td><td>REV. 0</td></tr> </table>	ANTENNA ELEVATIONS AND SPECIFICATIONS			MODEL: PSIFMR-2-DA	DRAWN BY: D.G. Kellar	DATE: 10/17/07	CHANNEL/FREQUENCY: 105.7 MHz	APPROVED BY:	DATE:	SCALE: 1:60	DRAWING NO.: J1007FM-633-001	REV. 0
ANTENNA ELEVATIONS AND SPECIFICATIONS														
MODEL: PSIFMR-2-DA	DRAWN BY: D.G. Kellar	DATE: 10/17/07												
CHANNEL/FREQUENCY: 105.7 MHz	APPROVED BY:	DATE:												
SCALE: 1:60	DRAWING NO.: J1007FM-633-001	REV. 0												

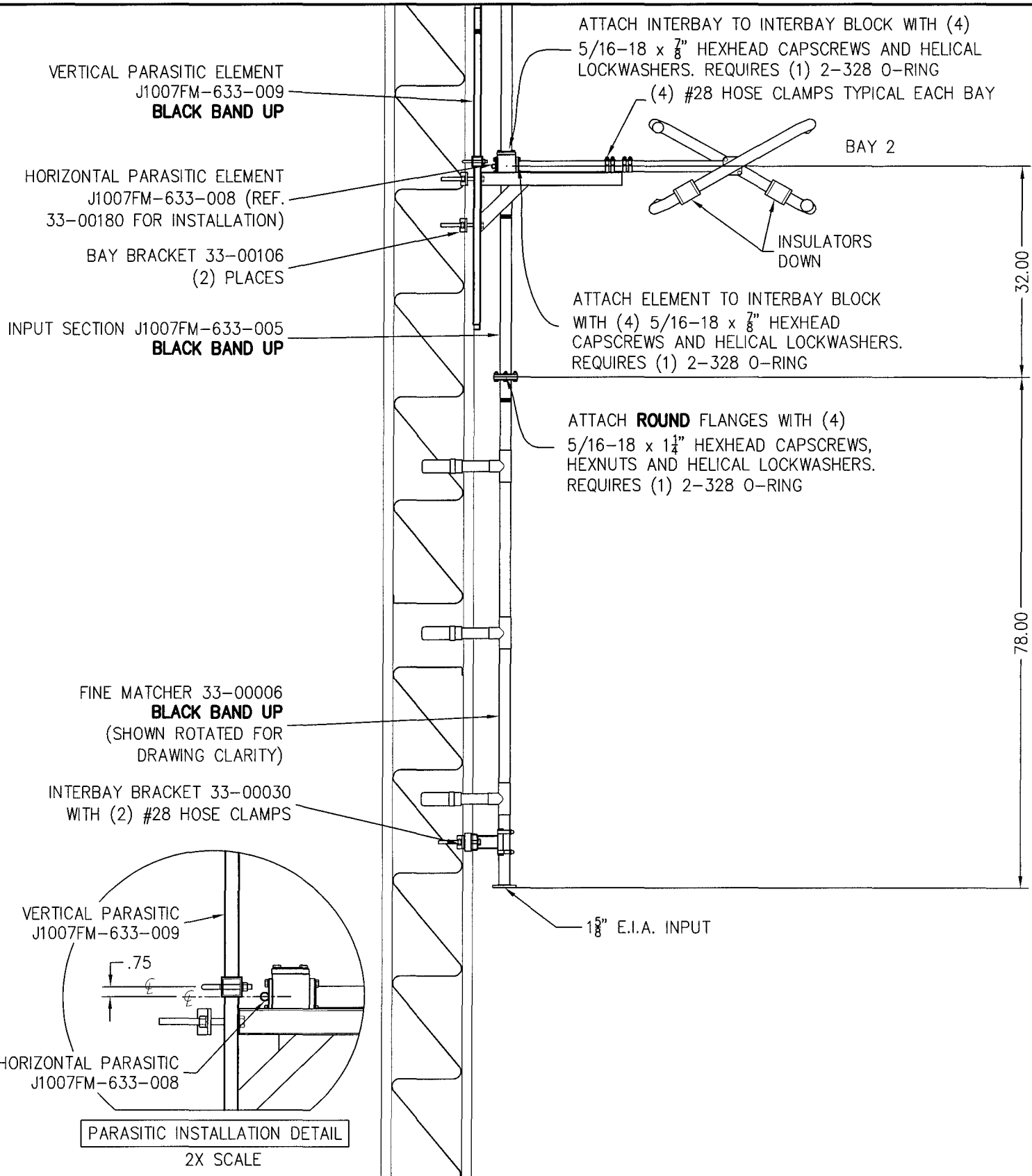


REV.		MADE BY	CHECKED BY	DATE	CHANGE
<p>This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used 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 forgoing agreement.</p>					
SIZE					<p><b>PROPAGATION SYSTEMS, INC.</b></p> <p>Ebensburg, Pennsylvania USA 814-472-5540</p> <p>ANTENNA PLAN VIEW AND ORIENTATION</p>
A					
MODEL: PSIFMR-2-DA					
CHANNEL/FREQUENCY: 105.7 MHz					
SCALE: 1:10					<p>DRAWN BY: D.G. Kellar</p> <p>APPROVED BY:</p> <p>DRAWING NO.: J1007FM-633-002</p> <p>DATE: 10/22/07</p> <p>REV. 0</p>



REV.		MADE BY	CHECKED BY	DATE	CHANGE
<p>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 forgoing agreement.</p>					
<p>SIZE</p> <p>A</p>					<p><b>PROPAGATION SYSTEMS, INC.</b></p> <p>Ebensburg, Pennsylvania USA 814-472-5540</p>
<p>MODEL: PSIFMR-2-DA</p>					<p>DRAWN BY: D.G. Kellar</p>
<p>CHANNEL/FREQUENCY: 105.7 MHz</p>					<p>DATE: 11/21/07</p>
<p>SCALE: 1:20</p>					<p>DRAWING NO.: J1007FM-633-010</p>
					<p>REV. 0</p>



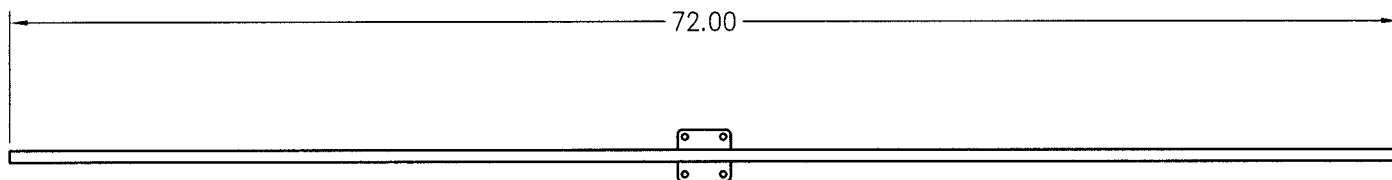


PARASITIC INSTALLATION DETAIL  
2X SCALE

REV.			MADE BY			CHECKED BY			DATE			CHANGE			SIZE		
<p>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.</p>															A		
<h1>PROPAGATION SYSTEMS, INC.</h1>																	
Ebensburg, Pennsylvania USA 814-472-5540																	
ELEVATIONS AND ASSEMBLY AT BAY 2																	
MODEL:			PSIFMR-2-DA			DRAWN BY:			D.G. Kellar			DATE:			11/21/07		
CHANNEL/FREQUENCY:			105.7 MHz			APPROVED BY:						DATE:					
SCALE:			1: 20			DRAWING NO.:			J1007FM-633-011			REV.			0		

26.17

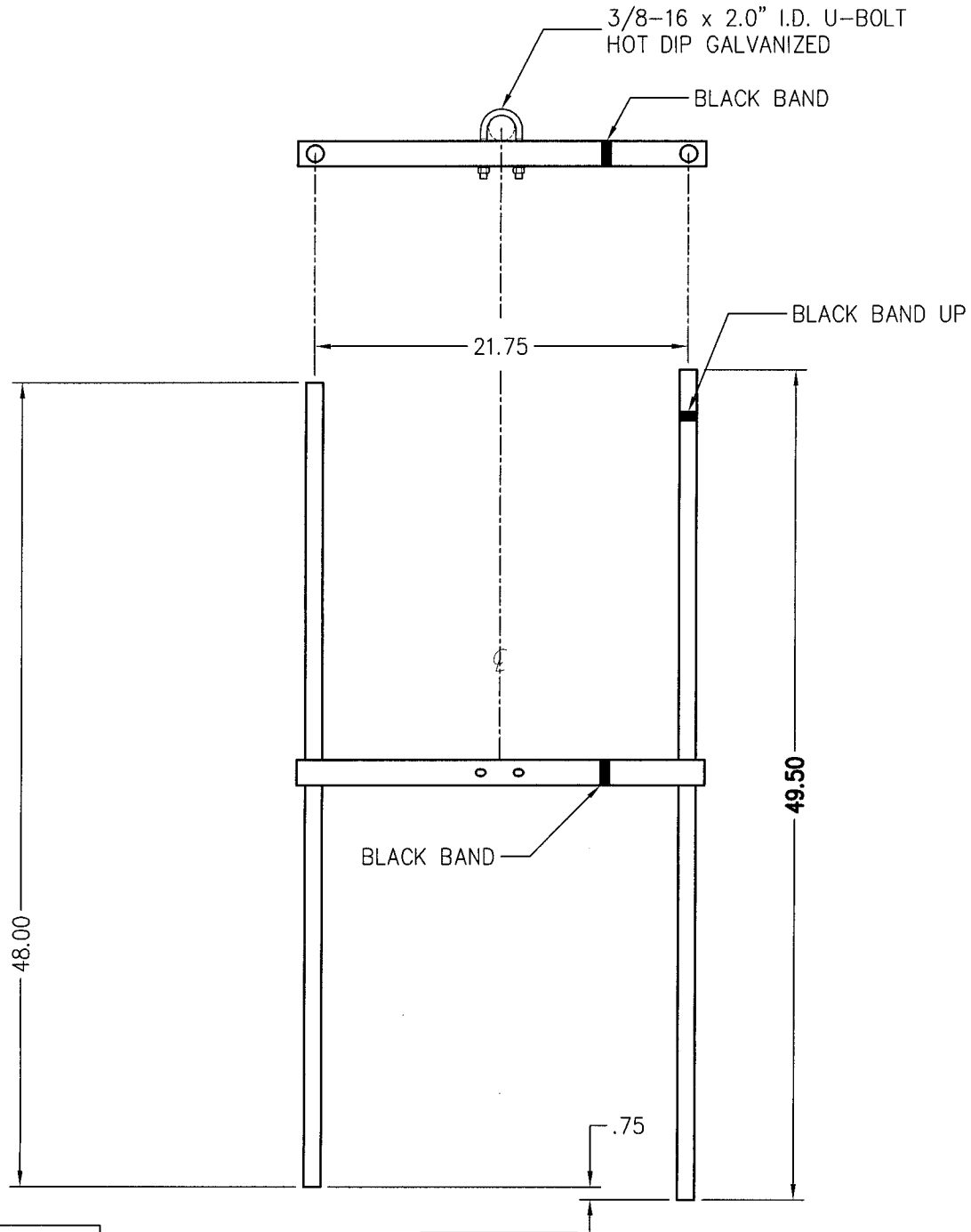
				<b>PROPAGATION SYSTEMS, INC.</b>	
				Ebensburg, Pennsylvania USA 814-472-5540	
REV.	MADE BY CHECKED BY	DATE	CHANGE	SHORTING STUB OUTLINE	
<p>This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property 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 forgoing agreement.</p>				MODEL: PSIFMR-2-DA	
				DRAWN BY: D.G. Kellar	
				DATE: 10/24/07	
				CHANNEL/FREQUENCY: 105.7 MHz	
SCALE: 1:4		APPROVED BY:		DATE:	
DRAWING NO.: J1007FM-633-007		REV. 0			



NOTES:

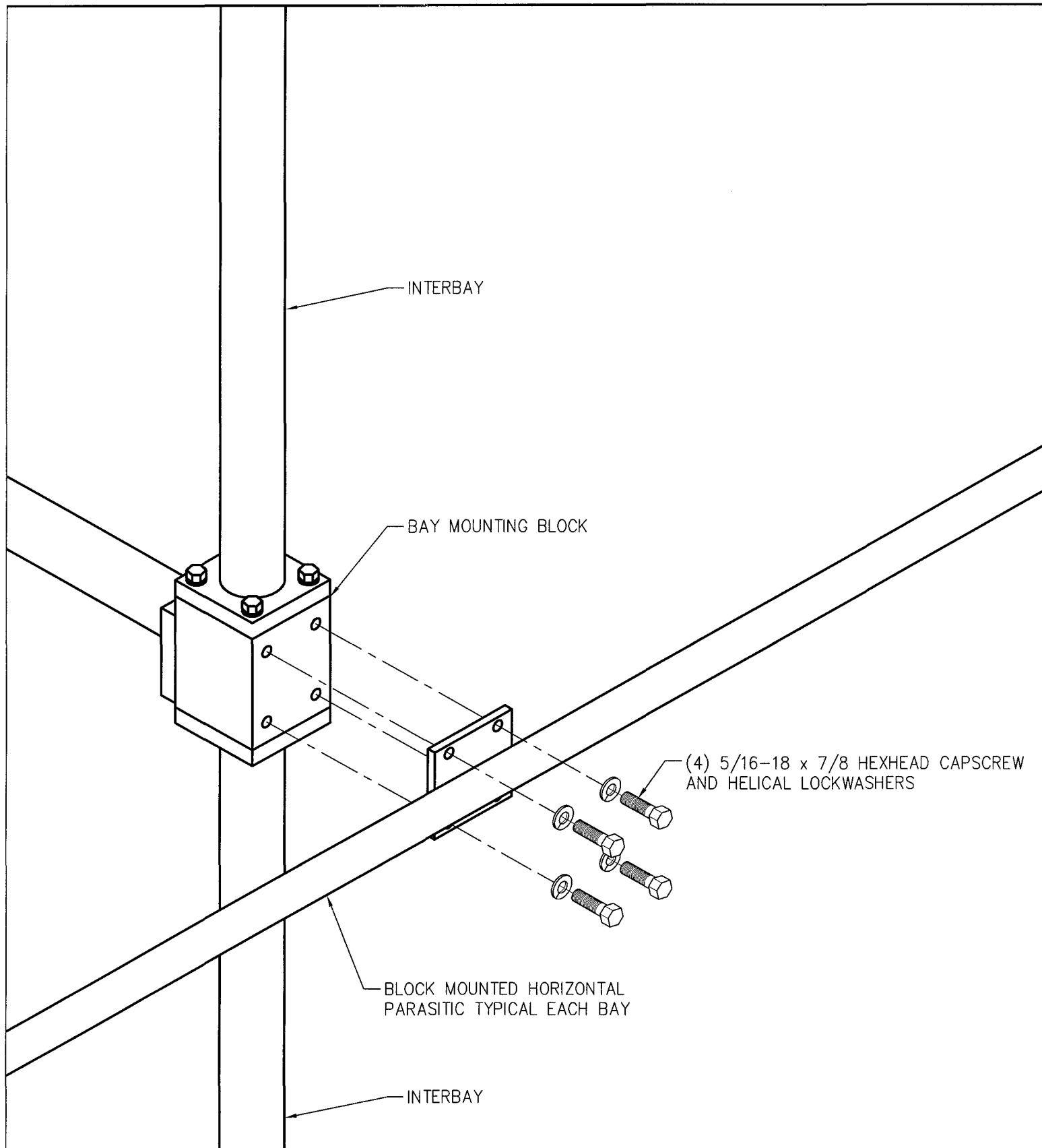
1. (2) REQUIRED
2. WEIGHT: 2.25 LB/EA
3. WIND AREA: .38 SQ. FT./EA

REV.		MADE BY	CHECKED BY	DATE	CHANGE	<b>PROPAGATION SYSTEMS, INC.</b> Ebensburg, Pennsylvania USA 814-472-5540 <b>BLOCK MOUNTED HORIZONTAL PARASITIC</b>						
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 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 forgoing agreement.						SIZE  <div style="font-size: 2em; text-align: center;">A</div>	MODEL:	PSIFMR-2-DA	DRAWN BY:	D.G. Kellar	DATE:	11/20/07
							CHANNEL/FREQUENCY:	105.7 MHz	APPROVED BY:		DATE:	
							SCALE:	1:10	DRAWING NO.:	J1007FM-633-008	REV.	0



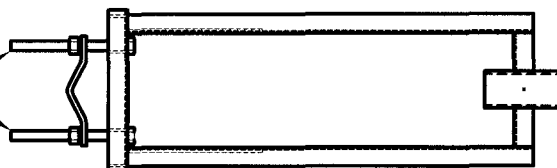
- NOTES:
1. (2) REQUIRED
  2. WEIGHT: 8.5 LB
  3. WIND AREA: 1.22 SQ. FT.

REV.		MADE BY	CHECKED BY	DATE	CHANGE
<p>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 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 forgoing agreement.</p>					
<p>SIZE</p> <p>A</p>					<p><b>PROPAGATION SYSTEMS, INC.</b></p> <p>Ebensburg, Pennsylvania USA 814-472-5540</p> <p>TOWER MOUNTED VERTICAL PARASITIC</p>
MODEL:		PSIFMR-2-DA		DRAWN BY:	D.G. Kellar
CHANNEL/FREQUENCY:		105.7 MHz		APPROVED BY:	
SCALE:		1:10		DRAWING NO.:	J1007FM-633-009
					DATE: 11/20/07
					REV. 0

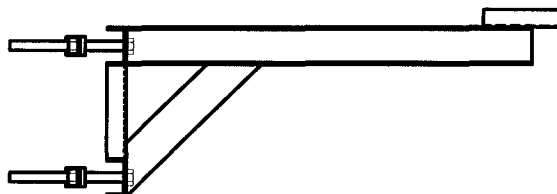


This drawing is loaned subject to the express understanding and agreement that the drawing and information therein contained are, and shall remain the property of PSI, and will not be otherwise utilized or disposed of, directly or indirectly, and will not be used in whole or in part or assist in making 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 forgoing agreement.			<b>PROPAGATION SYSTEMS, INC.</b> Ebensburg, Pennsylvania USA 814-472-5540 HORIZONTAL PARASIC ELEMENT MOUNTING ISOMETRIC		
REV.	MADE BY CHECKED BY	DATE	CHANGE	SIZE	MODEL: PSIFM CHANNEL/ FREQUENCY: SCALE: 1:4
			DRAWN BY: D.G. Kellar DATE: 11/21/07 APPROVED BY: DATE: DRAWING NO.: 33-00180 REV: 0		

1/2-13 x 6" HEXHEAD  
GALVANIZED BOLT ASSEMBLIES



TOP VIEW

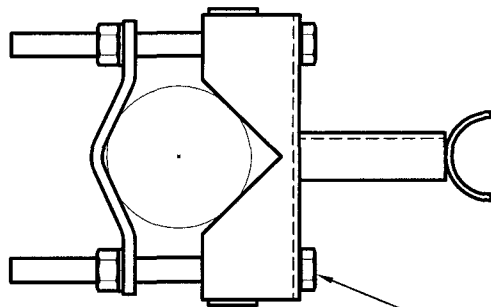


SIDE VIEW

NOTES:

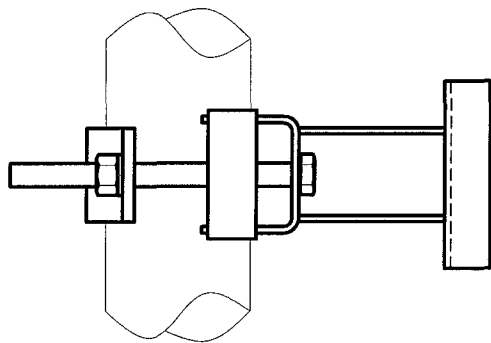
1. APPROXIMATE WEIGHT: 12.8 Lbs/Each
2. HOT DIP GALVANIZED

				<b>PROPAGATION SYSTEMS, INC.</b>			
				Ebensburg, Pennsylvania USA 814-472-5540			
				BAY MOUNTING BRACKET			
REV.	MADE BY CHECKED BY	DATE	CHANGE	MODEL:	DRAWN BY: D.G. Kellar	DATE: 8/01/02	
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 forgoing agreement.				CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:	
				SCALE: 1:10	DRAWING NO.: 33-00106	REV. 0	

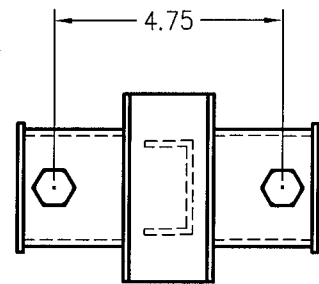


PLAN VIEW

1/2-13 x 6" GALVANIZED HEXHEAD BOLT  
HEXNUT AND HELICAL LOCKWASHERS  
(2) PLACES EACH BRACKET

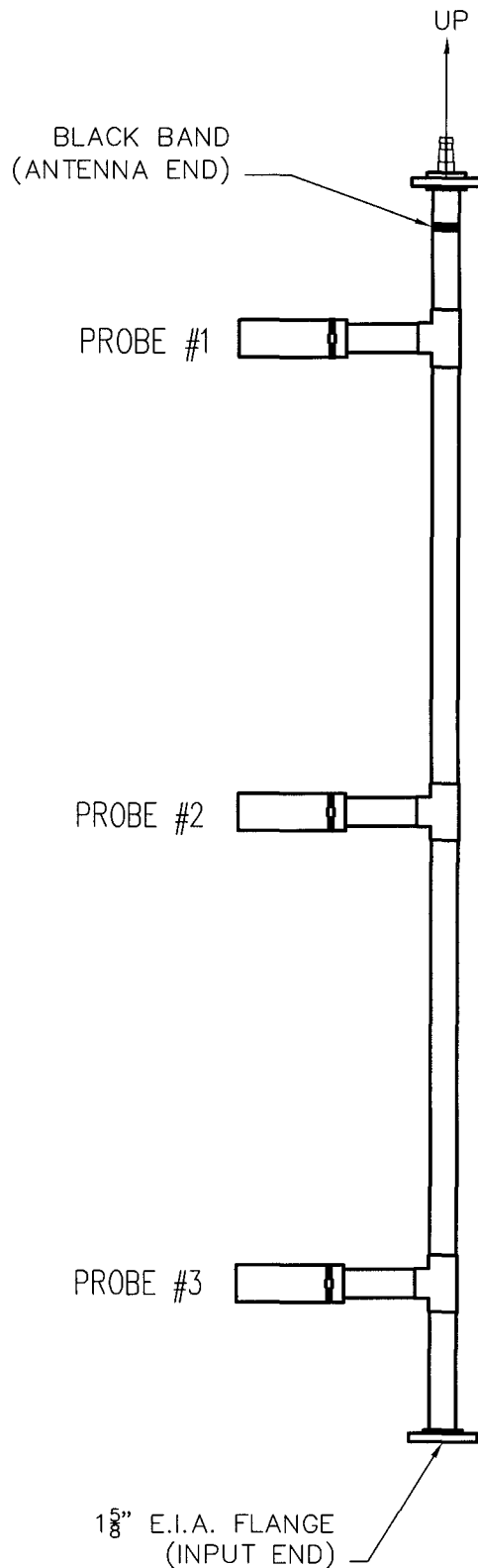


SIDE VIEW



FRONT VIEW

				<b>PROPAGATION SYSTEMS, INC.</b>				
				Ebensburg, Pennsylvania USA 814-472-5540				
				SUPPORT BRACKET OUTLINE				
REV.	MADE BY	CHECKED BY	DATE	CHANGE	MODEL:	DRAWN BY:	DATE:	
						P. MCINTOSH	12-19-00	
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 forgoing agreement.					CHANNEL/FREQUENCY:		APPROVED BY:	
					SCALE:		DRAWING NO.:	
					1:4		33-00030	
							REV. 0	



				<b>PROPAGATION SYSTEMS, INC.</b>			
				Ebensburg, Pennsylvania USA 814-472-5540			
				<b>3 PROBE TUNER ASSEMBLY</b>			
REV.	MADE BY	CHECKED BY	DATE	CHANGE	MODEL:	DRAWN BY:	DATE:
						D. RICHEY	1-28-98
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 forgoing agreement.				SIZE	CHANNEL/FREQUENCY:	APPROVED BY:	DATE:
				A			
					SCALE:	DRAWING NO.:	
				1:16	33-00006		0



BUCKNER HILL ROAD

STEEL SPIKE SET  
IN PAVEMENT

34.58'

IRON PIN WITH CAP  
MARKED TRAVERSE POINT

DUE NORTH (TRUE)

166.90'

N 71°48'42"E

TOWER

N

**INFORMATION SKETCH FOR  
COMMONWEALTH BROADCASTING COMPANY**

P.O. BOX 1053  
CAMPBELLVILLE, KENTUCKY 42719

SHOWING THE  
WGRK TOWER SITE  
GREEN COUNTY, KENTUCKY

20 10 0 20



SCALE: 1 INCH = 20 FEET

**MILLER LAND SURVEYING, INC.**

ROBERT L. MILLER, JR.  
110 E. FIRST STREET  
CAMPBELLVILLE, KY 42718  
PHONE: (270) 465-2831

J1007FM-633  
FMR-2-DA

FINAL

CH1 MEM log MAG 10 dB/ REF 0 dB 1: -51.302 dB

