Propagation Systems, Inc.
Quality Broadcast Antenna Systems

Directional FM Antenna
WSMA
CSN International
Scituate, MA

A PSIFMPV panel antenna was used in conjunction with the customer's triangular face tower to create the necessary directional radiation pattern. The final antenna consists of three vertically polarized panel antennas each secured to the tower with a custom-mounting bracket. Two bays of one panel per bay are positioned 0° true and one bay of one panel is positioned 237° true. The panels are rotated off vertical to produce the necessary omni directional horizontal component. The antennas are fed from a power divider network.

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 271.5 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 85% of the envelope RMS.

The antenna is to be mounted with the center of radiation at 81 meters (265.7 ft) above ground level according to the enclosed drawing. At this elevation the antenna will be within the +2m/-4m tolerance allowed by the FCC and will have sufficient clearance above and below the existing antennas mounted on the tower. It is recommended that a broadcast engineer be present to supervise the installation of the antenna and that he or she certifies the antenna has been installed according to the enclosed instructions. It is

also recommended any metallic guy wire that passes within 25 ft. of any radiating element be replaced with the appropriate non-metallic guy substitute.

An input power level of 1.83 kW will be required at the antenna input in order to reach the licensed 7.7 kW ERP. The transmitter output power requirements are dependent upon the transmission line size and length used to feed the antenna. The final length of transmission line must be determined after installation.

Antenna Specifications

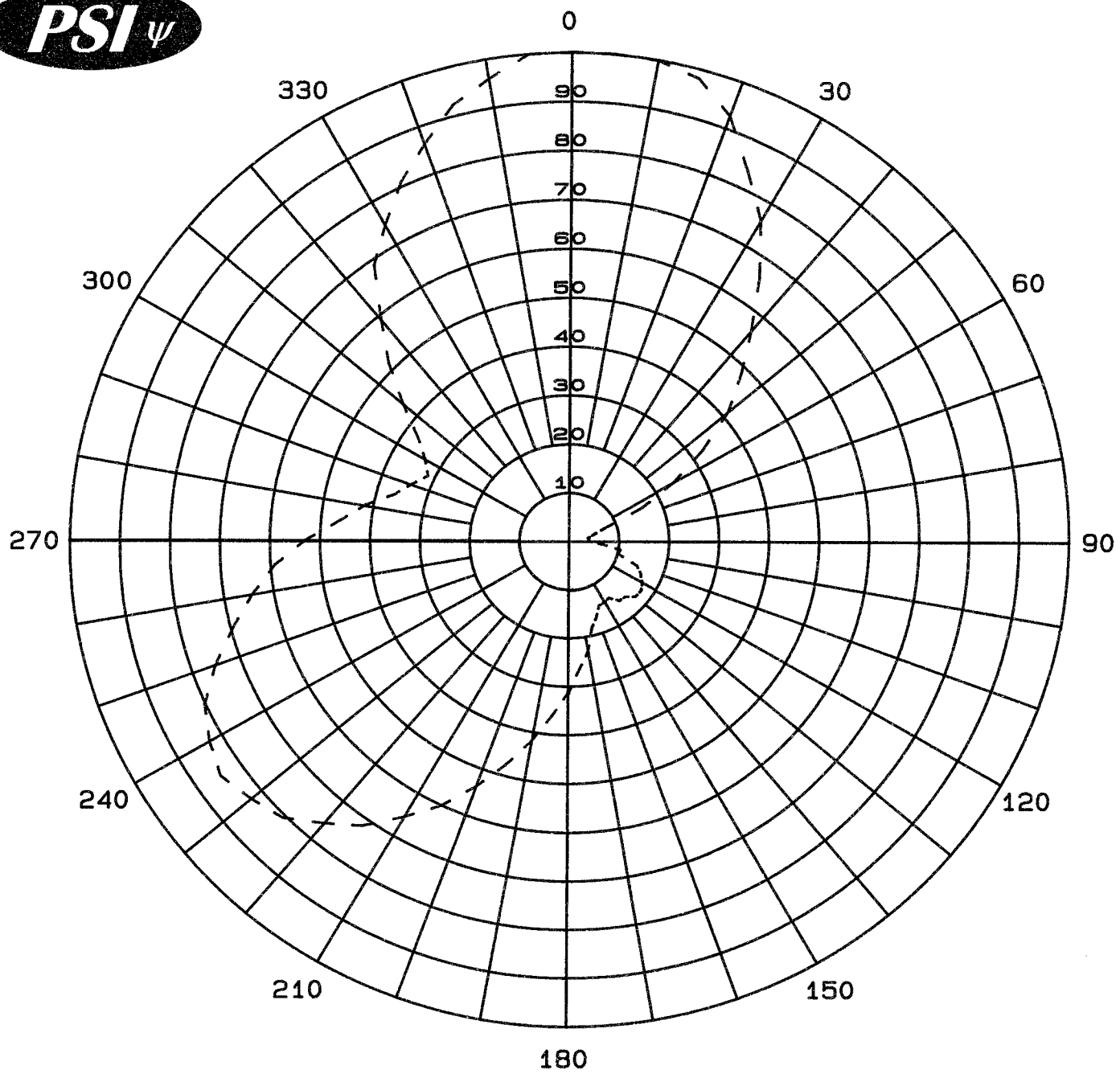
Antenna Model	PSIFMPV-2C-DA
Type	FM directional panel antenna
Frequency	90.5 MHz
Polarization	Vertical directional
	Mixed horizontal omni directional
Envelope RMS	.666
Measured RMS	.567
Gain	4.2 (6.23 dB)
ERP	7.7 kW (8.86 dBk) vertical polarization
	.005 kW (-23.0 dBk) horizontal polarization
Input Power	1.83 kW
Input Type	1-5/8" EIA center fed
Power Rating	12 kW
Length	18.1 ft.
Weight	245.3 lbs.
Wind Area	52.3 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 4/30/08

Douglas A. Ross
President
Propagation Systems Inc.



Measured Relative Field
Azimuth Plane Pattern
Antenna: PSIFMPV-2C-DA
Type: FM Directional Antenna
Polarization: Vertical-Elliptical
Peak Gain: 4.2 (6.23 dB)
Frequency: 90.5 MHz
Station: WSMA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Scituate, MA

Measured Relative Field Tabulation

Antenna: PSIFMPV-2C-DA
CSN International
Station: WSMA
Frequency: 90.5 MHz
Location: Scituate, MA

Calculated Horizontal Polarization

Angle	Relative Field	Power Gain	Gain (dB)
0	0.027	0.001	-31.47
10	0.027	0.001	-31.47
20	0.027	0.001	-31.47
30	0.027	0.001	-31.47
40	0.027	0.001	-31.47
50	0.027	0.001	-31.47
60	0.027	0.001	-31.47
70	0.027	0.001	-31.47
80	0.027	0.001	-31.47
90	0.027	0.001	-31.47
100	0.027	0.001	-31.47
110	0.027	0.001	-31.47
120	0.027	0.001	-31.47
130	0.027	0.001	-31.47
140	0.027	0.001	-31.47
150	0.027	0.001	-31.47
160	0.027	0.001	-31.47
170	0.027	0.001	-31.47
180	0.027	0.001	-31.47
190	0.027	0.001	-31.47
200	0.027	0.001	-31.47
210	0.027	0.001	-31.47
220	0.027	0.001	-31.47
230	0.027	0.001	-31.47
240	0.027	0.001	-31.47
250	0.027	0.001	-31.47
260	0.027	0.001	-31.47
270	0.027	0.001	-31.47
280	0.027	0.001	-31.47
290	0.027	0.001	-31.47
300	0.027	0.001	-31.47
310	0.027	0.001	-31.47
320	0.027	0.001	-31.47
330	0.027	0.001	-31.47
340	0.027	0.001	-31.47
350	0.027	0.001	-31.47

Omni directional

Measured Vertical Polarization

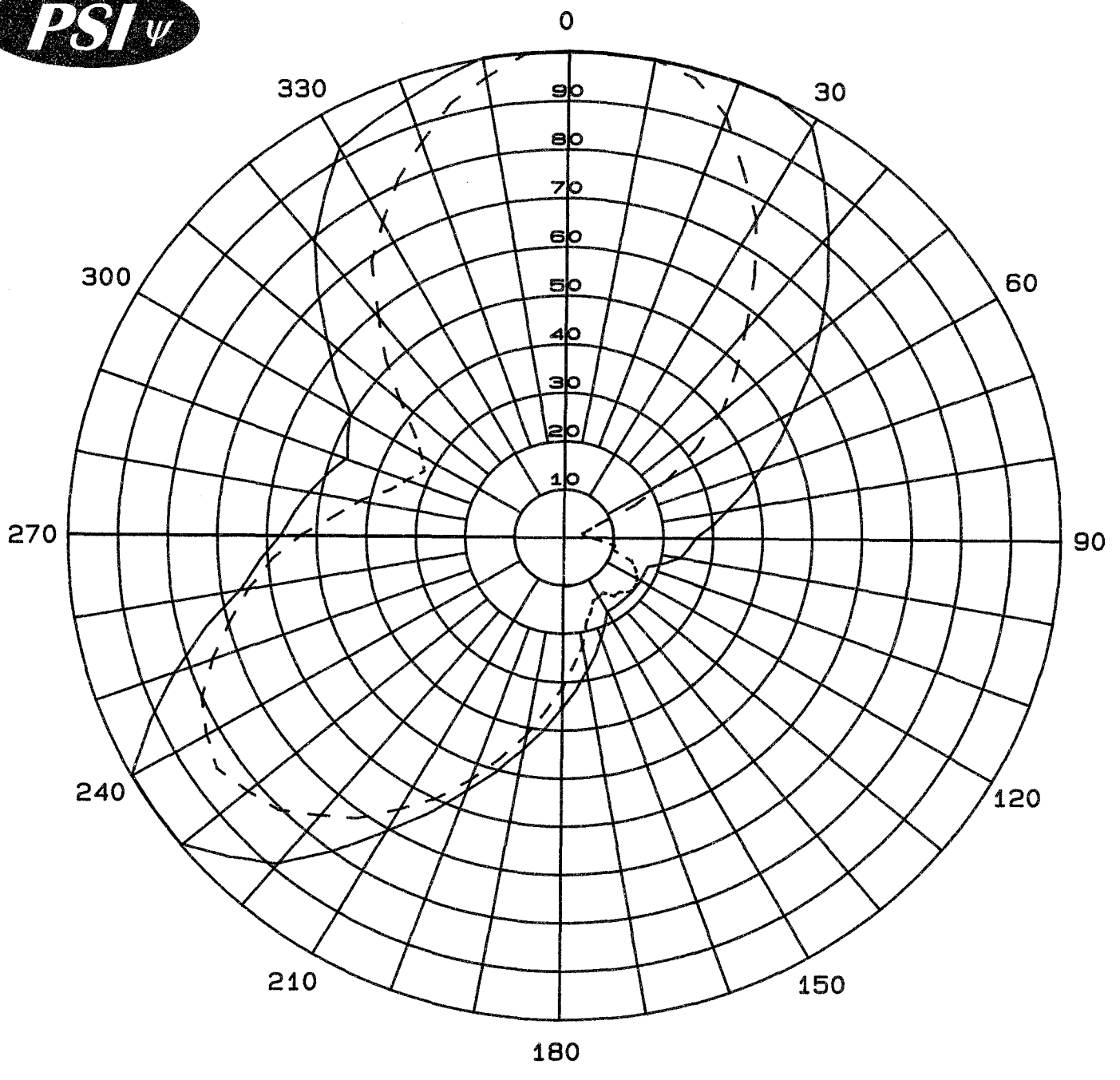
Angle	Relative Field	Power Gain	Gain (dB)
0	1.000	4.20	6.23
10	0.998	4.18	6.22
20	0.925	3.59	5.56
30	0.760	2.43	3.85
40	0.565	1.34	1.27
50	0.415	0.72	-1.41
60	0.240	0.24	-6.16
70	0.074	0.02	-16.38
80	0.038	0.01	-22.17
90	0.038	0.01	-22.17
100	0.104	0.05	-13.43
110	0.145	0.09	-10.54
120	0.171	0.12	-9.11
130	0.176	0.13	-8.86
140	0.159	0.11	-9.74
150	0.145	0.09	-10.54
160	0.166	0.12	-9.37
170	0.231	0.22	-6.50
180	0.314	0.41	-3.83
190	0.419	0.74	-1.32
200	0.538	1.22	0.85
210	0.656	1.81	2.57
220	0.760	2.43	3.85
230	0.827	2.87	4.58
240	0.828	2.88	4.59
250	0.752	2.38	3.76
260	0.643	1.74	2.40
270	0.528	1.17	0.69
280	0.415	0.72	-1.41
290	0.336	0.47	-3.24
300	0.334	0.47	-3.29
310	0.437	0.80	-0.96
320	0.590	1.46	1.65
330	0.746	2.34	3.69
340	0.862	3.12	4.94
350	0.958	3.85	5.86

Maximum Value

Field	1.00
Gain	4.2 (6.23 dB)
Azimuth Bearing	0-5 degrees

Minimum Field

Field	0.038
Gain	.01 (-22.17 dB)
Azimuth Bearing	80, 90 degrees



Maximum Envelope and
Measured Pattern
Antenna: PSIFMPV-2C-DA
Type: FM Directional Antenna
Polarization: Vertical-Elliptical
Peak ERP: 7.7 kW (8.86 dBk)
Frequency: 90.5 MHz
Station: WSMA Scituate, MA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

ERP Tabulation

Antenna: PSIFMPV-2C-DA
CSN International
Station: WSMA
Frequency: 90.5 MHz
Location: Scituate, MA
Maximum ERP: 7.7 kW (8.86 dBk)

Calculated Horizontal Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	0.027	0.005	-22.60
10	0.027	0.005	-22.60
20	0.027	0.005	-22.60
30	0.027	0.005	-22.60
40	0.027	0.005	-22.60
50	0.027	0.005	-22.60
60	0.027	0.005	-22.60
70	0.027	0.005	-22.60
80	0.027	0.005	-22.60
90	0.027	0.005	-22.60
100	0.027	0.005	-22.60
110	0.027	0.005	-22.60
120	0.027	0.005	-22.60
130	0.027	0.005	-22.60
140	0.027	0.005	-22.60
150	0.027	0.005	-22.60
160	0.027	0.005	-22.60
170	0.027	0.005	-22.60
180	0.027	0.005	-22.60
190	0.027	0.005	-22.60
200	0.027	0.005	-22.60
210	0.027	0.005	-22.60
220	0.027	0.005	-22.60
230	0.027	0.005	-22.60
240	0.027	0.005	-22.60
250	0.027	0.005	-22.60
260	0.027	0.005	-22.60
270	0.027	0.005	-22.60
280	0.027	0.005	-22.60
290	0.027	0.005	-22.60
300	0.027	0.005	-22.60
310	0.027	0.005	-22.60
320	0.027	0.005	-22.60
330	0.027	0.005	-22.60
340	0.027	0.005	-22.60
350	0.027	0.005	-22.60

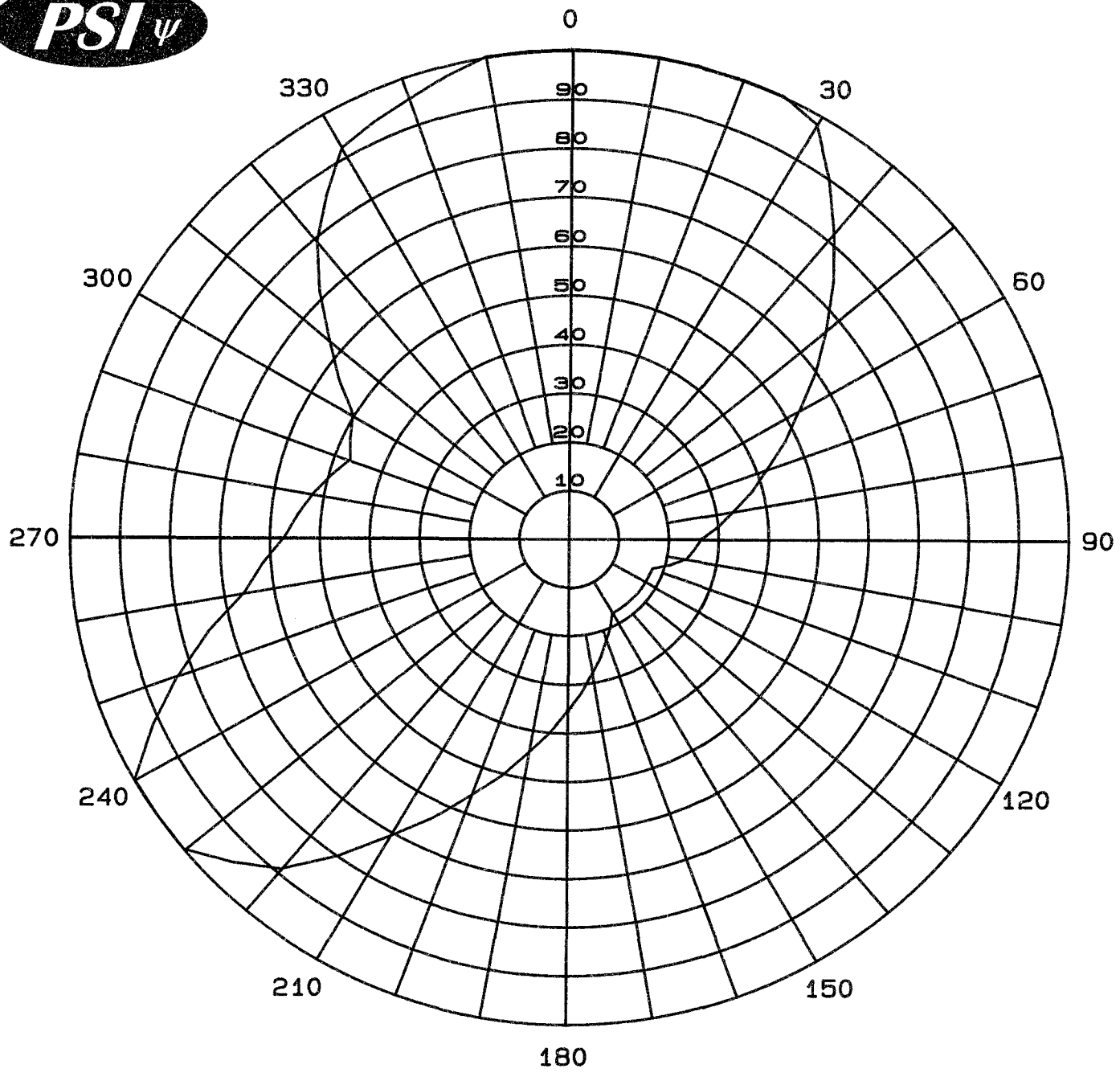
Omni directional

Measured Vertical Polarization

Angle	Relative Field	ERP (kW)	ERP (dBk)
0	1.000	7.700	8.86
10	0.998	7.669	8.85
20	0.925	6.588	8.19
30	0.760	4.448	6.48
40	0.565	2.458	3.91
50	0.415	1.326	1.23
60	0.240	0.444	-3.53
70	0.074	0.042	-13.75
80	0.038	0.011	-19.54
90	0.038	0.011	-19.54
100	0.104	0.083	-10.79
110	0.145	0.162	-7.91
120	0.171	0.225	-6.48
130	0.176	0.239	-6.22
140	0.159	0.195	-7.11
150	0.145	0.162	-7.91
160	0.166	0.212	-6.73
170	0.231	0.411	-3.86
180	0.314	0.759	-1.20
190	0.419	1.352	1.31
200	0.538	2.229	3.48
210	0.656	3.314	5.20
220	0.760	4.448	6.48
230	0.827	5.266	7.22
240	0.828	5.279	7.23
250	0.752	4.354	6.39
260	0.643	3.184	5.03
270	0.528	2.147	3.32
280	0.415	1.326	1.23
290	0.336	0.869	-0.61
300	0.334	0.859	-0.66
310	0.437	1.470	1.67
320	0.590	2.680	4.28
330	0.746	4.285	6.32
340	0.862	5.721	7.58
350	0.958	7.067	8.49

Maximum Value (V-pol)
Field 1.00
ERP 7.7 kW (8.86 dBk)
Azimuth Bearing 0-5 degrees

Minimum Field (V-pol)
Field 0.038
ERP .011 kW (-19.54 dBk)
Azimuth Bearing 80, 90 degrees



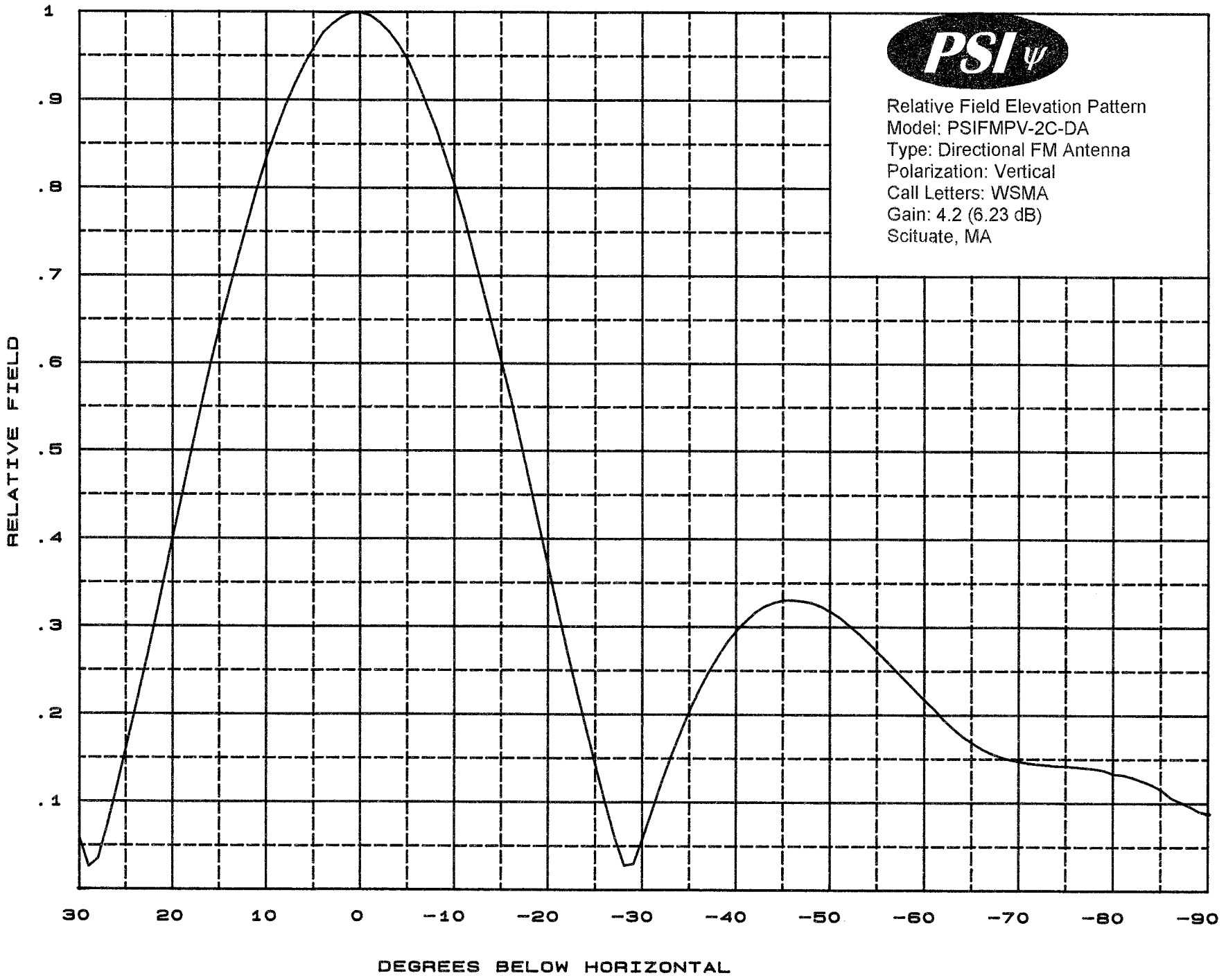
Maximum Envelope
Azimuth Plane Pattern
Antenna: PSIFMPV-2C-DA
Type: FM Directional Antenna
Polarization: Vertical-Elliptical
Peak ERP: 7.7 kW (8.86 dBk)
Frequency: 90.5 MHz
Station: WSMA Scituate, MA

Propagation Systems Inc.
PO Box 113
Ebensburg, PA 15931

Envelope Pattern

Antenna: PSIFMPV-2C-DA
Station: WSMA
Frequency: 90.5 MHz
Location: Scituate, MA
Maximum ERP: 7.7 kW (8.86 dBk)

Angle	Relative Field	ERP kW	ERP dBk
0	1.000	7.70	8.86
10	1.000	7.70	8.86
20	1.000	7.70	8.86
30	0.980	7.40	8.69
40	0.820	5.18	7.14
50	0.670	3.46	5.39
60	0.532	2.18	3.38
70	0.423	1.38	1.39
80	0.336	0.87	-0.61
90	0.267	0.55	-2.60
100	0.214	0.35	-4.53
110	0.180	0.25	-6.03
120	0.179	0.25	-6.08
130	0.179	0.25	-6.08
140	0.178	0.24	-6.13
150	0.178	0.24	-6.13
160	0.224	0.39	-4.13
170	0.282	0.61	-2.13
180	0.355	0.97	-0.13
190	0.447	1.54	1.87
200	0.562	2.43	3.86
210	0.708	3.86	5.87
220	0.891	6.11	7.86
230	1.000	7.70	8.86
240	1.000	7.70	8.86
250	0.831	5.32	7.26
260	0.660	3.35	5.26
270	0.570	2.50	3.98
280	0.520	2.08	3.18
290	0.466	1.67	2.23
300	0.500	1.93	2.84
310	0.629	3.05	4.84
320	0.792	4.83	6.84
330	0.920	6.52	8.14
340	0.954	7.01	8.46
350	1.000	7.70	8.86


PSI ψ
Relative Field Elevation Pattern
Model: PSIFMPV-2C-DA
Type: Directional FM Antenna
Polarization: Vertical
Call Letters: WSMA
Gain: 4.2 (6.23 dB)
Scituate, MA
RELATIVE FIELD
1
.9
.8
.7
.6
.5
.4
.3
.2
.1
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
DEGREES BELOW HORIZONTAL

INSTRUCTION MANUAL

WSMA
90.5 MHz
Scituate, TX
Antenna Model: PSIFMPV-2C-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 have been designed for tower leg mount only. Be aware of possible mounting conflicts such as other antennas, guy wires, tower leg flanges, conduits etc. and plan accordingly.
2. Use only the supplied hardware and O-ring at flange connections.
3. Exercise care when assembling the inner conductors of the coaxial line.
4. Check a bracket on the tower leg for proper fit.
5. Install one panel at a time.
6. Keep all transmission lines free from dirt and moisture. All Teflon insulators must be clean and dry.
7. The antenna requires pressurization.
8. 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.
9. 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

Review the enclosed drawings and read all steps for a general overview of the antenna installation. Begin by attaching the galvanized steel mounting support channel to each panel. Each panel requires two channels. The channels mount to the panels with 3/8-16 x 2" bolts, nuts and locks. The top and bottom channels for each panel are drilled differently and are marked upper and lower for correct alignment. When assembled properly the panels will be tilted 1.5 degrees. See drawing J1007FM-634-003 for an overview.

Step Two

Next attach the dipole elements to each panel using the supplied 3/8-16 x 2" bolts, nuts and locks. All of the antenna insulators must be positioned down. Use caution not to rest the panels on the anchor insulator connector or the dipole elements. The dipoles elements have been labeled 1 thru 6. Refer to drawing J1007FM-634-003.

Step Three

Hoist bay one panel to the correct elevation and secure the mounting channel to the north leg with the supplied ½-13 x 6" bolts and back plate. The offset brackets will tilt the panels 1.5 degrees. Attach a stiff arm to the southeast tower leg using the ½-13 x 6" bolts and back plate. Attach the other end to one of the square center horizontal panel members using the supplied 3/8-16 x 2" square U-bolt. Adjust the position of the stiff arm along the panel so that the panel is directed 0 degrees true. Note; the panel will be rotated 3 degrees clockwise from the tower leg orientation. Refer to drawing J1007FM-634-002. Follow the same procedure for the bay two panel, making sure the tilt of both panels is the same.

Step Four

Hoist the single panel that mounts to the southwest tower leg and secure to the tower leg at the center point of radiation. This panel will be centered vertically between the two north panels. Attach a stiff arm to the southeast tower leg and to one of the square center horizontal panel members using the supplied 3/8-16 x 2" square U-bolt. Adjust the position of the stiff arm along the panel so that the panel is directed 237 degrees true. The position of the panel will be directly off the southwest leg and will also be tilted 1.5 degrees.

Step Five

Assemble the power divider feed network as shown in drawing J1007FM-634-028. If properly supported and tower member spacing allows insertion of the network into the tower, the power divider network may be hoisted as an assembled unit. Position the fine matcher with the black band toward the elbow.

Use the supplied 5/16-18 x 1-1/4" bolts, nuts, locks and O-ring at all 1-5/8" flange connections. When assembling use caution not to split the anchor insulator connector. Attach a mounting bracket to each power divider using the supplied hose clamps. Secure the power divider network inside the tower to one of the available tower legs using the ½-13 x 6" bolts and back plate. Position the elbow near the center of radiation.

Step Six

Connect the ½" coaxial cable to each panel using the supplied ¼-20 x ¾" bolts, locks and O-ring. Each cable is the same length. Connect the opposite end of the north panels to the 4-way power divider and the southwest panel to the 2-way divider. Use the supplied ¼-20 x 1-1/4" bolts, nuts, locks and O-ring at the power divider end. When assembling use caution not to split the anchor insulator connector. Secure the cables to the tower members with the supplied tie wraps.

Step Seven

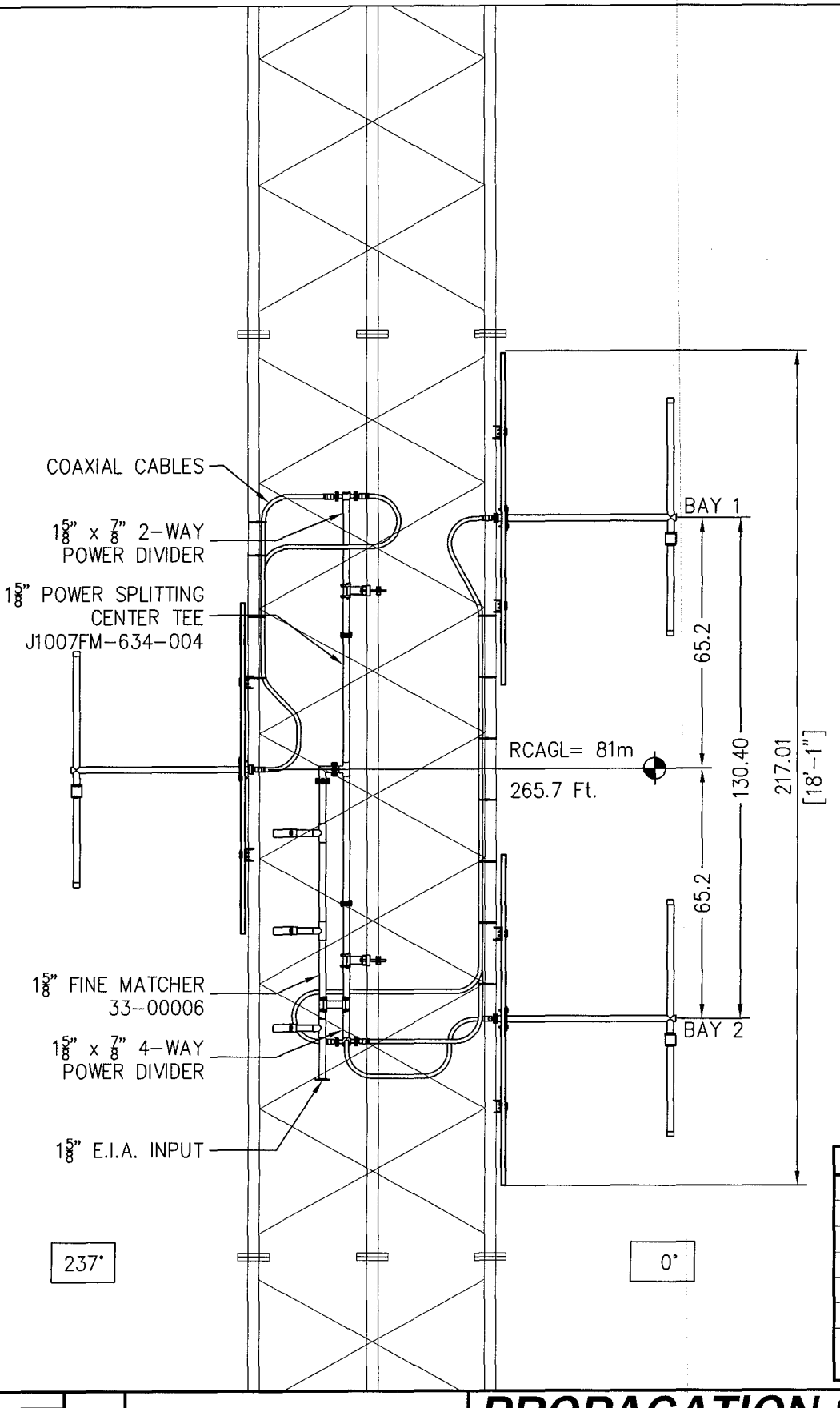
Check all bolted connections for tightness. Connect the main transmission line to the antenna input located at the tuner base. Do not allow the weight of the feed line to be supported by the antenna. The antenna system should be tested before the erector leaves the premises to insure that the complete antenna system is functioning properly. The antenna has been tuned at the factory and the fine matcher 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 under low power, using the appropriate test equipment, for minimum reflected power. Pressurize the antenna system to a maximum of 5 lbs. with dry air or nitrogen.

Drawing Index

Drawing	Title
J1007FM-634-001	Antenna Elevation and Specifications
J1007FM-634-002	Antenna Array and Orientation
J1007FM-634-003	Antenna Power Divider Schematic
J1007FM-634-000	Panel Outline
J1007FM-634-025	Fastener Details
J1007FM-634-028	Power Divider Network
J1007FM-634-005	Vertical Element
J1007FM-634-004	Center Tee
J1007FM-634-024	Coaxial Cable Details
J1007FM-634-006	Reflector Panel
J1007FM-634-016	Upper Panel Mounting Channel
J1007FM-634-027	Lower Panel Mounting Channel
J1007FM-634-017	Stiff-arm at 0° Degree Bays
J1007FM-634-020	Stiff-arm at 237° Degree Bay
33-00030	Support Bracket Outline
33-50032	Tuner Bracket for Center Feed
33-00006	3-Probe Tuner Assembly
33-00137	2-Way Power Divider
33-00181	4-Way Power Divider
12-00014	1-5/8" Flange Connection
11-00013	7/8" EIA Threaded Flange Assembly
11-00014	7/8" EIA Bolted Flange Assembly

Antenna Specifications

Model	PSIFMPV-2C-DA
Description	2-bay, 3-panel directional FM broadcast antenna
Configuration	Center fed
Frequency	90.5 MHz
Polarization	Vertical
Gain	4.2 (6.23 dB)
Input	1-5/8" EIA
Rating	12 kW
Length	18.1 ft.
Weight	245.3 lbs.
Wind Area	52.3 Sq. Ft.



SPECIFICATIONS
SPACING: 1.0λ
LENGTH: 18.08 Ft
APERTURE: 130.40"
RATING: 12 kW
GAIN: 4.2 (6.23 dB)
WEIGHT: 245.3 Lbs
WINDAREA: 52.3 Sq. Ft. TIA-222-F (NO ICE)

REV.	MADE BY / CHECKED BY	DATE	CHANGE

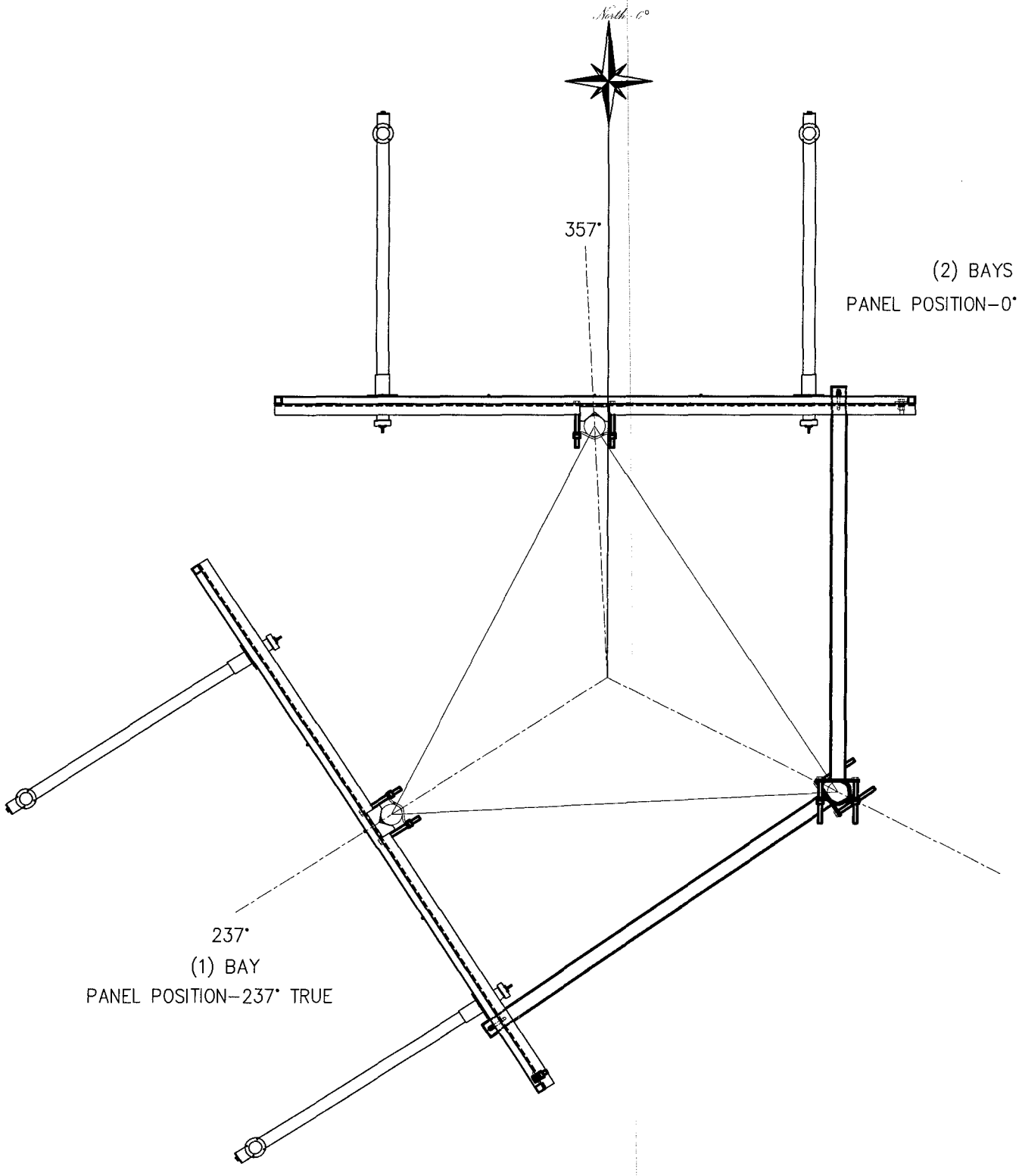
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

ANTENNA ELEVATIONS AND SPECIFICATIONS

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 10/23/07	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:40	DRAWING NO.: J1007FM-634-001	REV.	



REV.	MADE BY / CHECKED BY	DATE	CHANGE

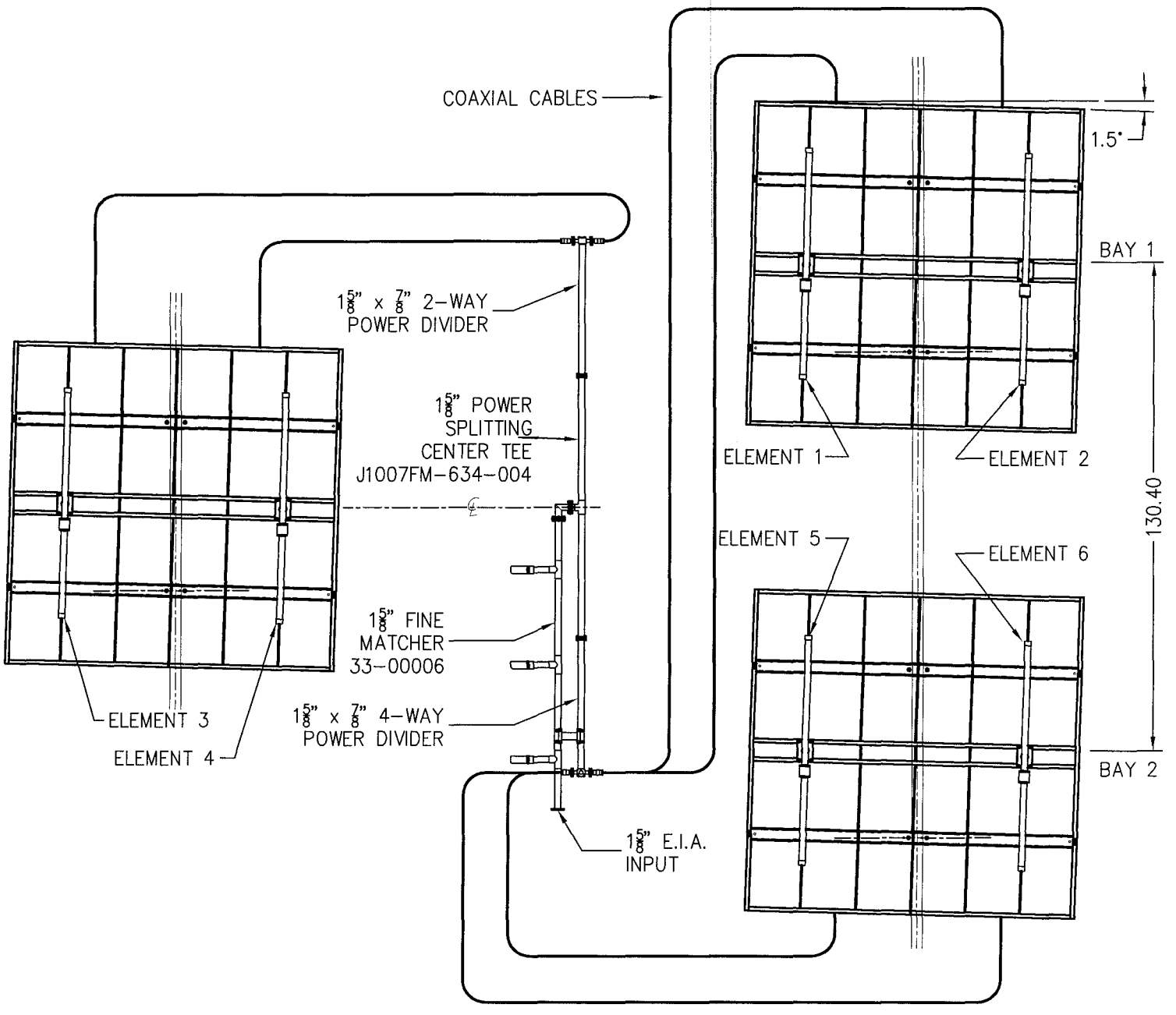
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814–472–5540

ANTENNA ARRAY AND ORIENTATION

MODEL: PSIFMPV–2C–DA	DRAWN BY: D.G. Kellar	DATE: 10/23/07
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:20	DRAWING NO.: J1007FM–634–002	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

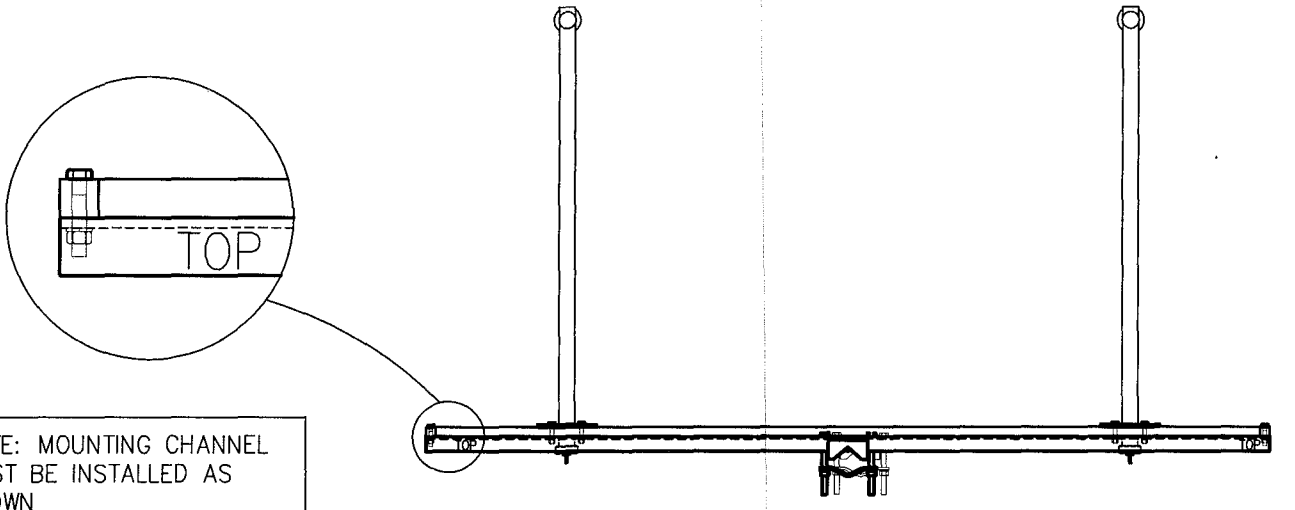
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

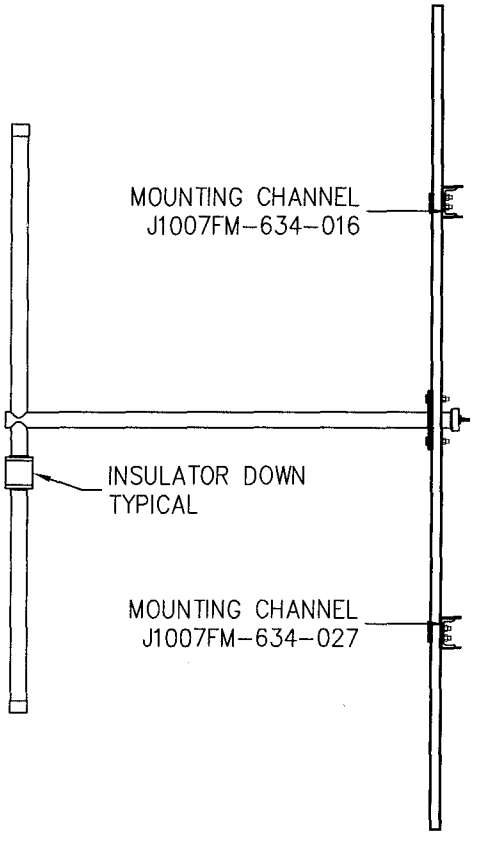
ANTENNA POWER DIVIDER SCHEMATIC

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 10/23/07
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:40	DRAWING NO.: J1007FM-634-003	REV.

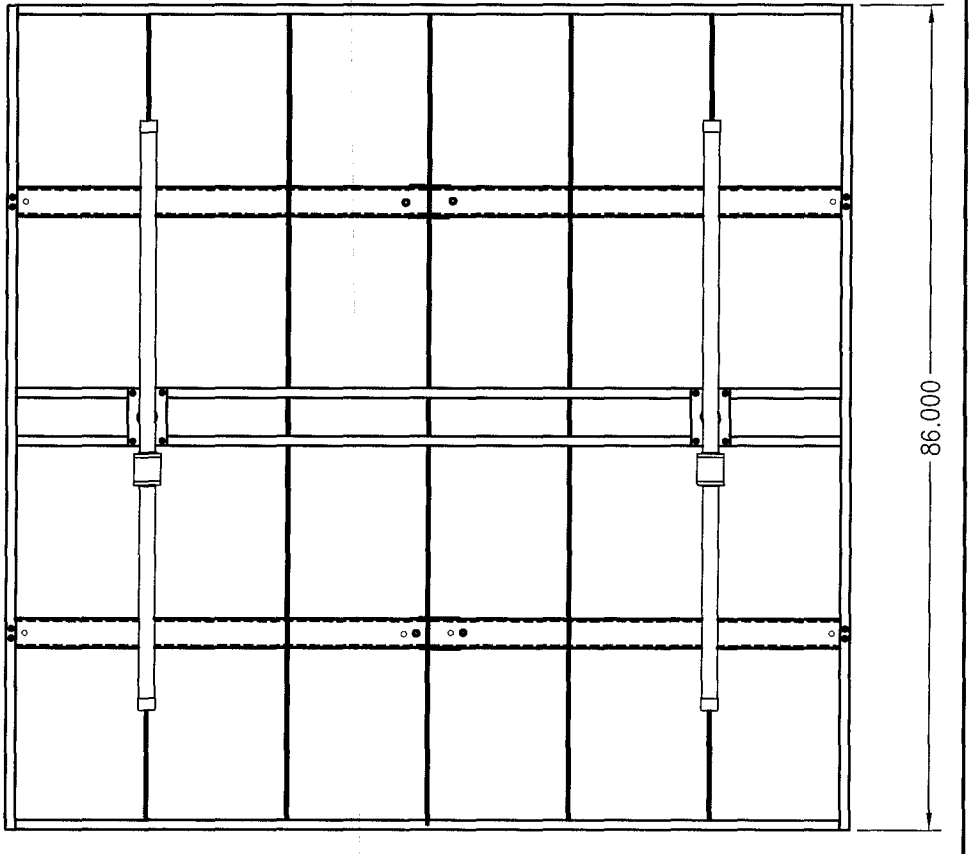


NOTE: MOUNTING CHANNEL MUST BE INSTALLED AS SHOWN

TOP VIEW



SIDE VIEW



FRONT VIEW

REV.	MADE BY / CHECKED BY	DATE	CHANGE

MATERIAL:

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

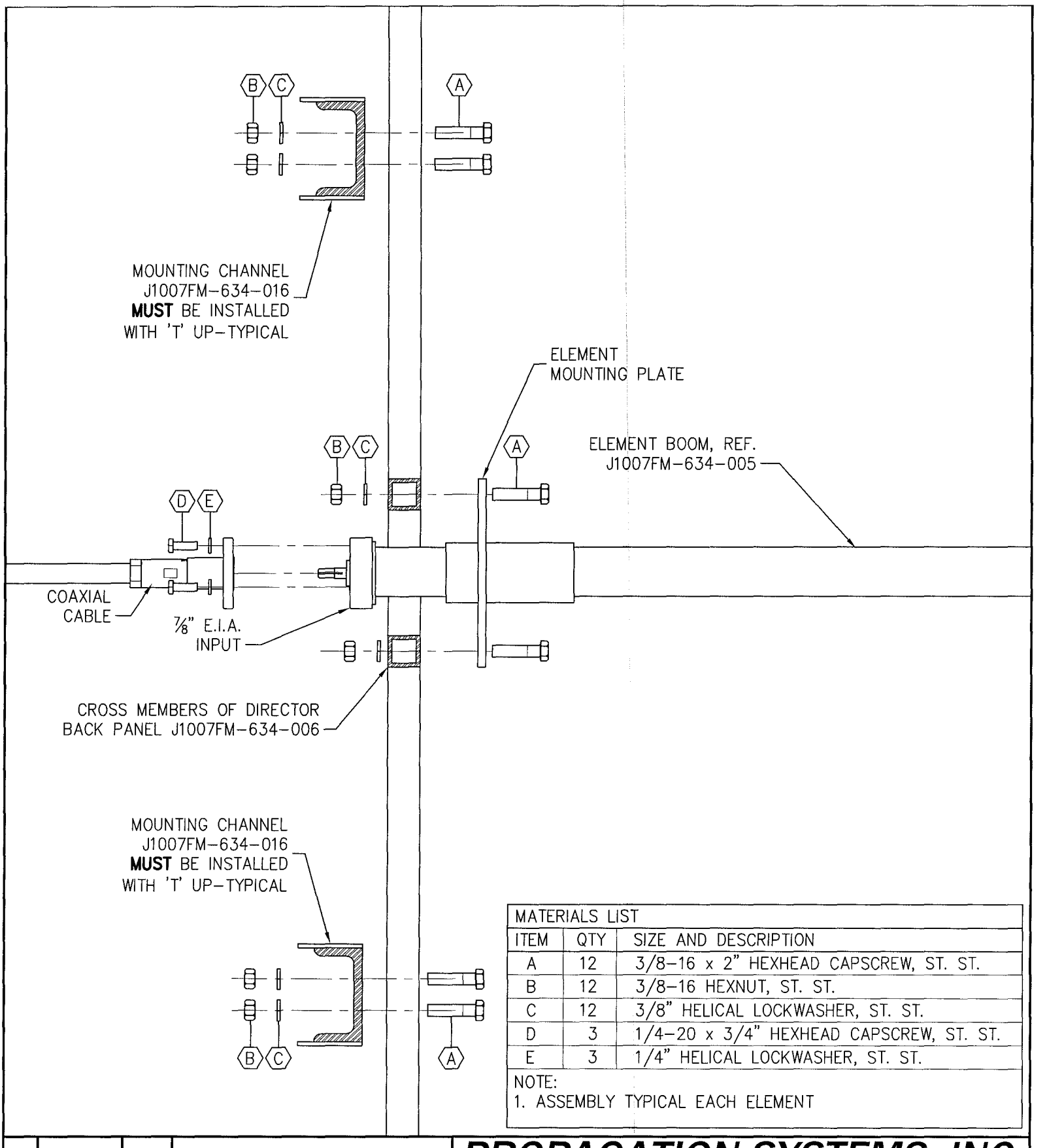
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA

PANEL ANTENNA OUTLINE

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 10/23/07	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:20	PART NO.:	DRAWING NO.: J1007FM-634-000	REV.



MATERIALS LIST		
ITEM	QTY	SIZE AND DESCRIPTION
A	12	3/8-16 x 2" HEXHEAD CAPSCREW, ST. ST.
B	12	3/8-16 HEXNUT, ST. ST.
C	12	3/8" HELICAL LOCKWASHER, ST. ST.
D	3	1/4-20 x 3/4" HEXHEAD CAPSCREW, ST. ST.
E	3	1/4" HELICAL LOCKWASHER, ST. ST.

NOTE:
1. ASSEMBLY TYPICAL EACH ELEMENT

REV.	MADE BY / CHECKED BY	DATE	CHANGE

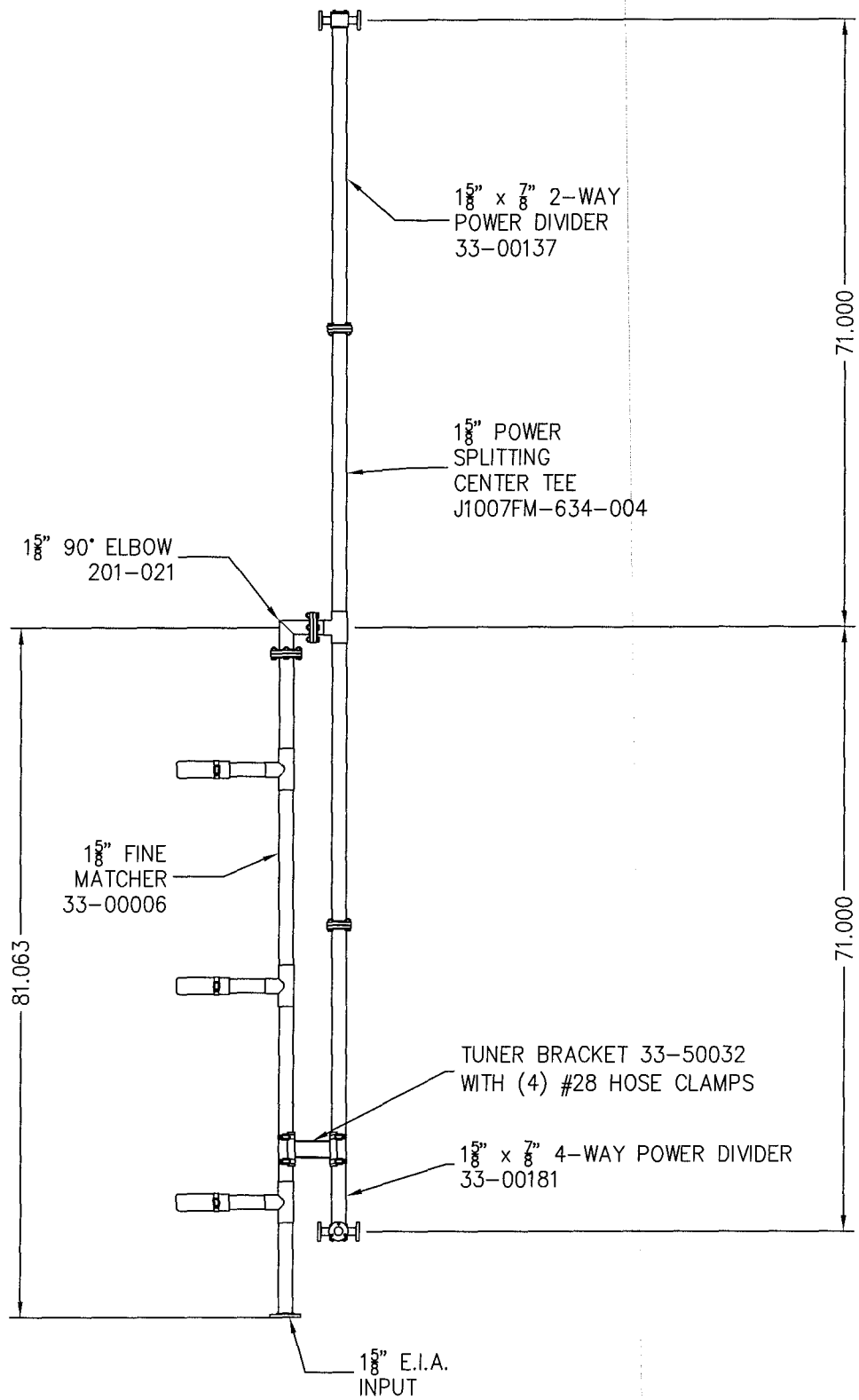
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

FASTENER DETAILS

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 3/11/08	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:4	DRAWING NO.: J1007FM-634-025	REV.	



REV.	MADE BY / CHECKED BY	DATE	CHANGE

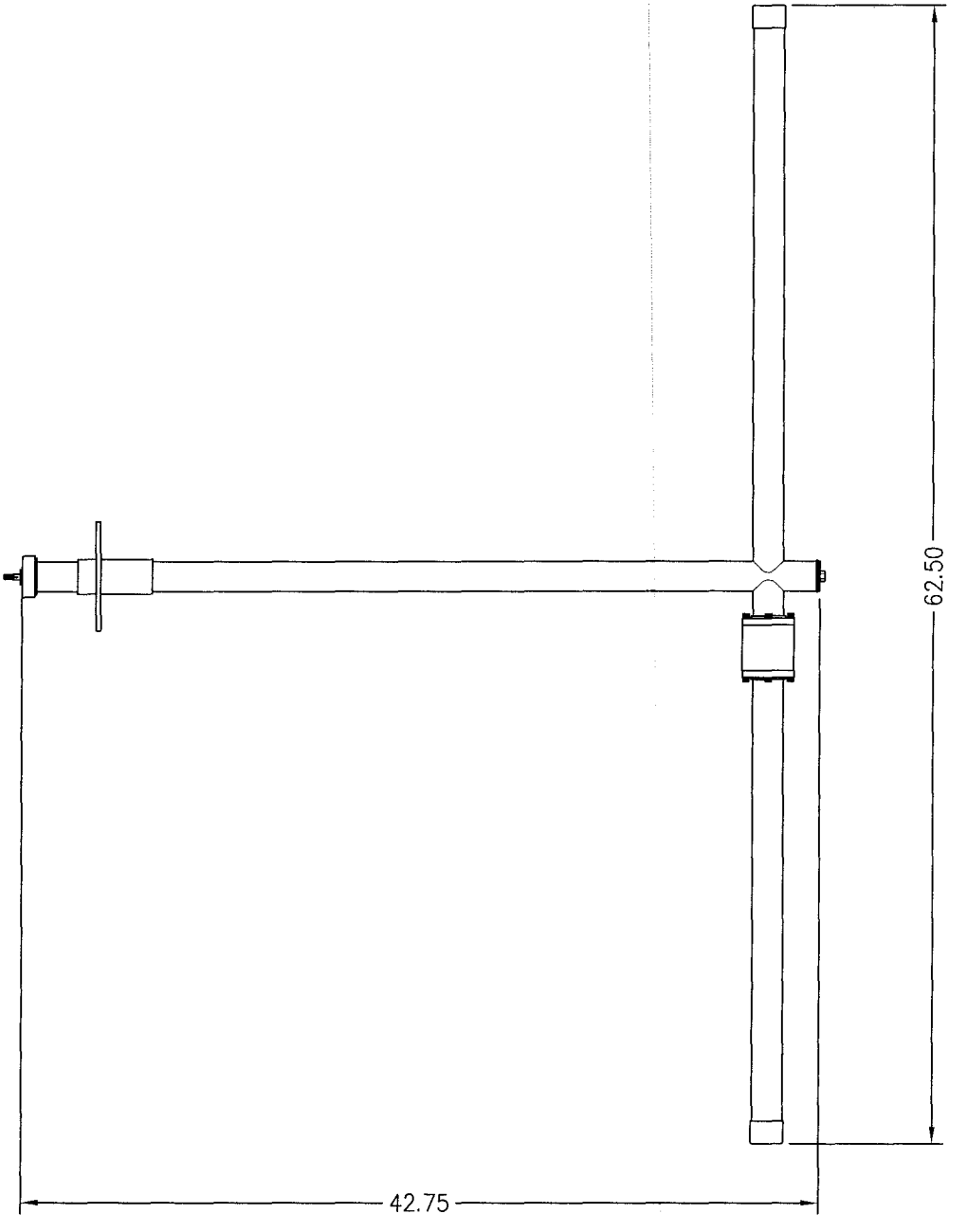
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

POWER DIVIDER NETWORK

MODEL:	DRAWN BY:	DATE:
PSIFMPV-2C-DA	D.G. Kellar	4/30/08
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:20	DRAWING NO.: J1007FM-634-028	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

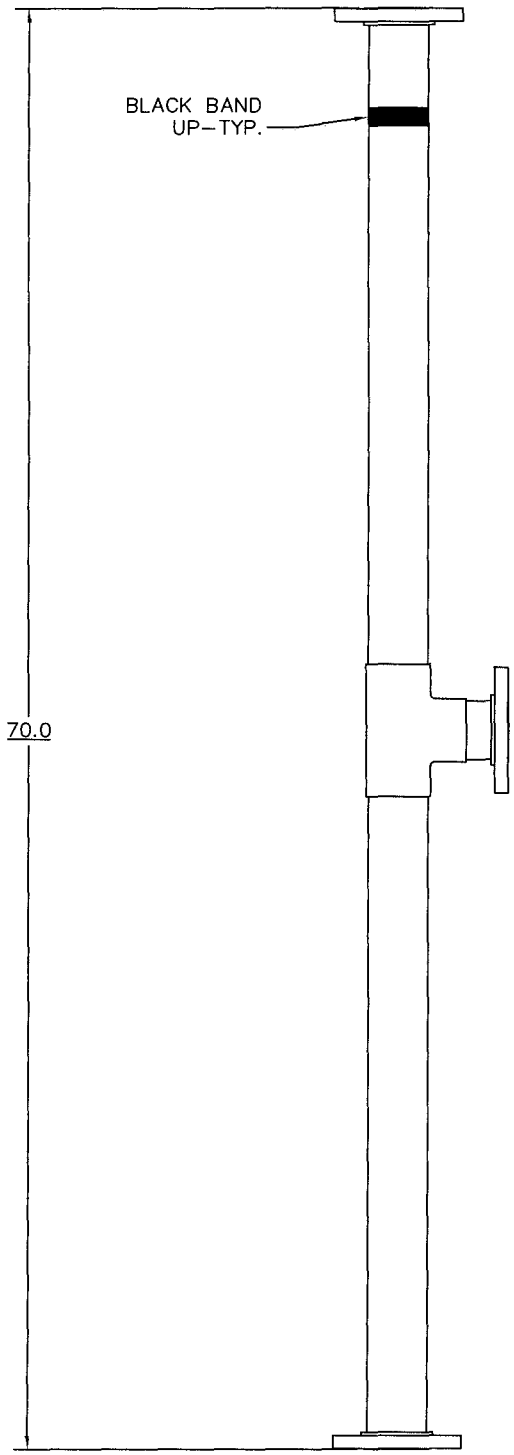
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

VERTICAL ELEMENT

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 3/11/08	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:10	DRAWING NO.: J1007FM-634-005	REV.	



REV.	MADE BY / CHECKED BY	DATE	CHANGE

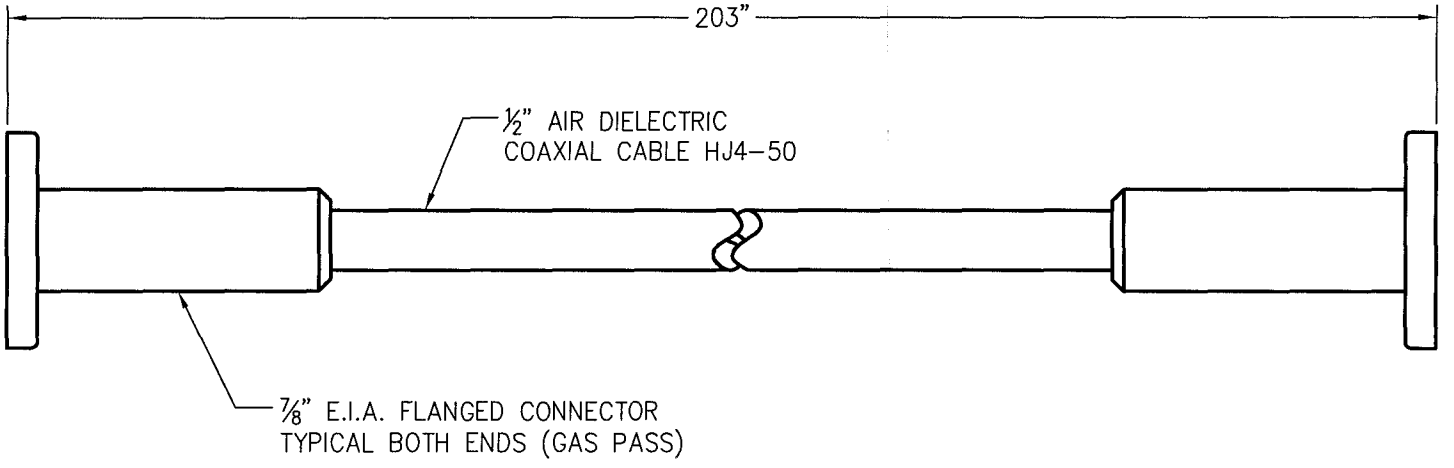
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814–472–5540

1⅝" CENTER FED POWER DIVIDER TEE

MODEL:	DRAWN BY:	DATE:
PSIFMPV–2C–DA	D.G. Kellar	11/09/07
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:5.33	DRAWING NO.: J1007FM–634–004	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

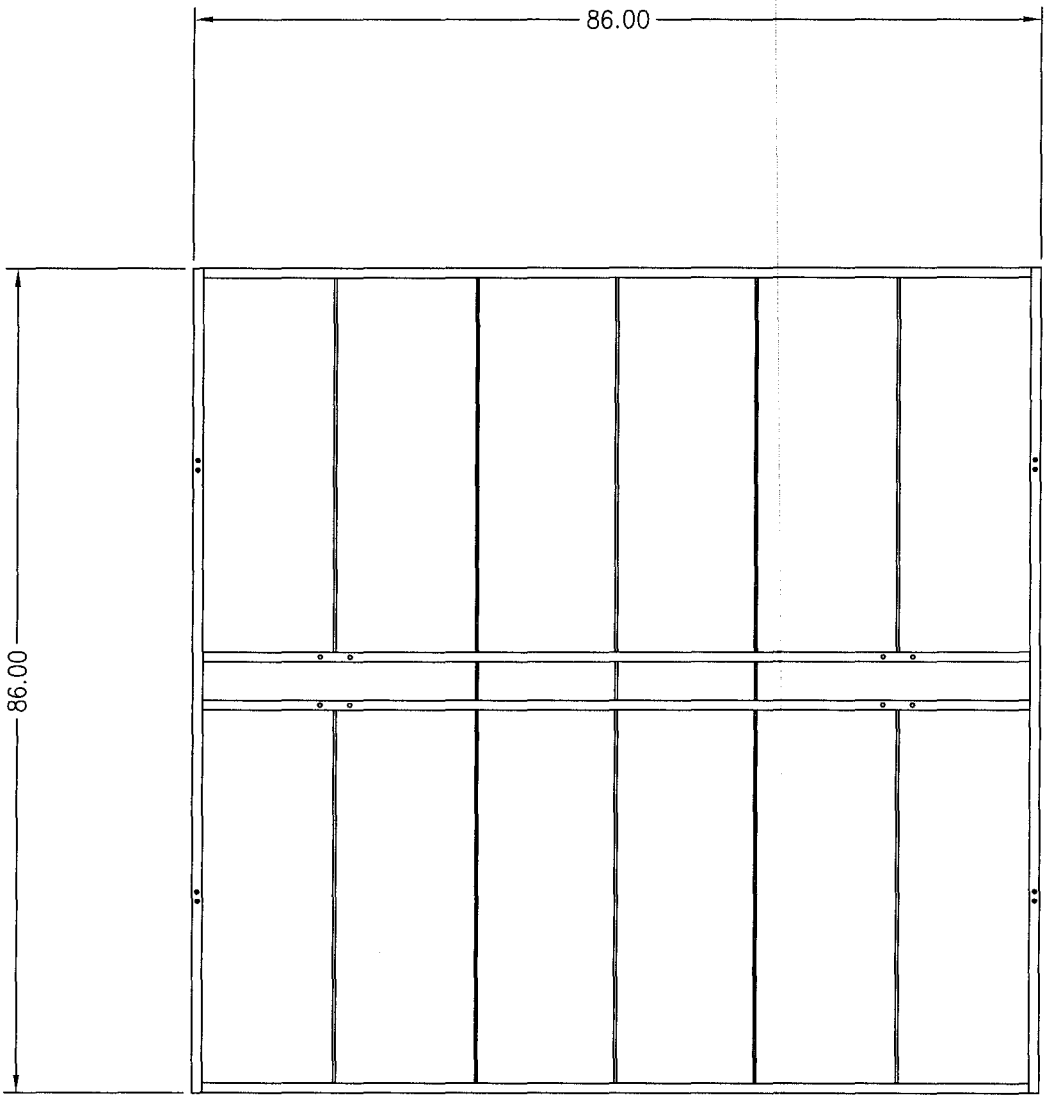
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814–472–5540

COAXIAL CABLE DETAILS

MODEL: PSIFMPV–2C–DA	DRAWN BY: D.G. Kellar	DATE: 3/11/08
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:2	DRAWING NO.: J1007FM–634–024	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

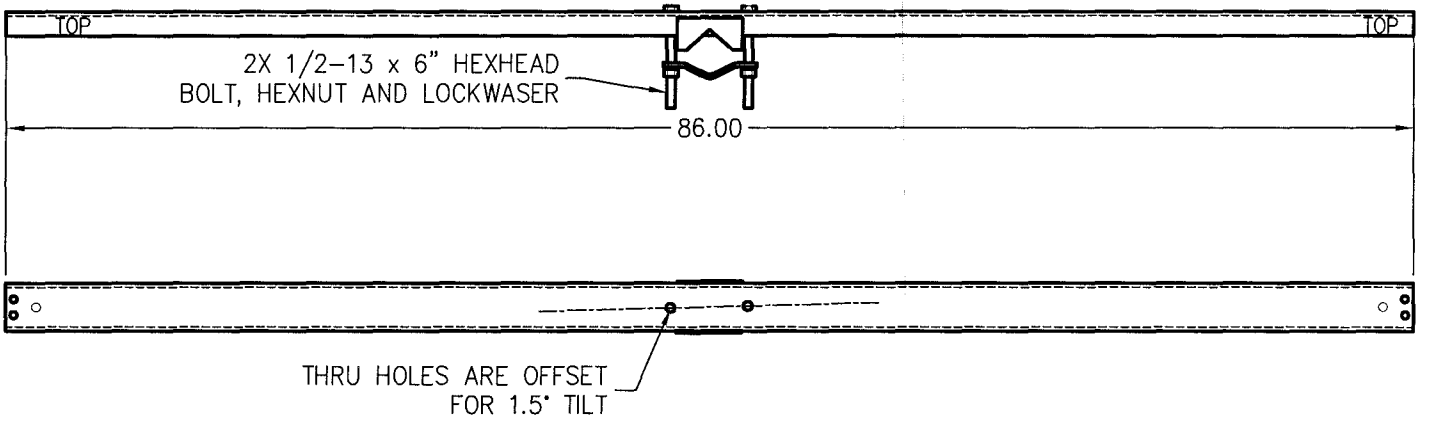
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

REFLECTOR PANEL

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 1/30/08	
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:20	DRAWING NO.: J1007FM-634-006	REV.	



NOTES:
1. (3) REQUIRED
2. WEIGHT: 37.8 LB/EACH
3. WINDAREA: 3.58 SQ. FT. EACH
4. HOT DIP GALVANIZED

REV.	MADE BY / CHECKED BY	DATE	CHANGE

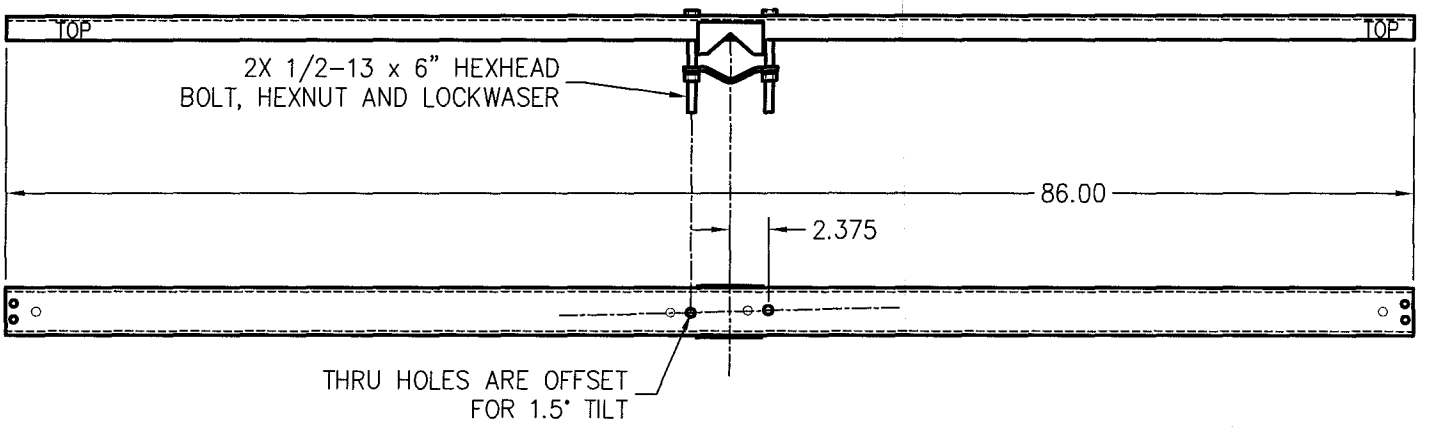
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

UPPER PANEL MOUNTING CHANNEL

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 1/31/08	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:10	DRAWING NO.: J1007FM-634-016	REV.	



NOTES:
1. (3) REQUIRED
2. WEIGHT: 37.8 LB/EACH
3. WINDAREA: 3.58 SQ. FT. EACH
4. HOT DIP GALVANIZED

REV.	MADE BY / CHECKED BY	DATE	CHANGE

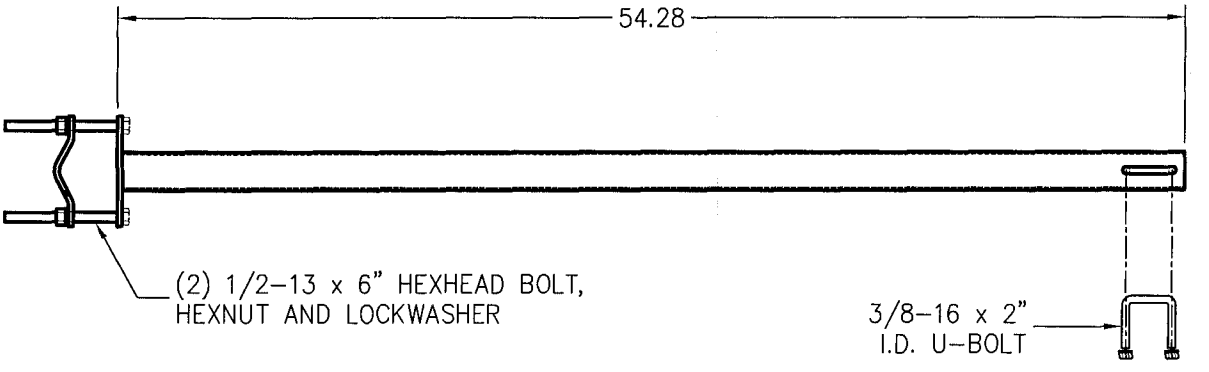
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

LOWER PANEL MOUNTING CHANNEL

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 1/31/08	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:10	DRAWING NO.: J1007FM-634-027	REV.	



NOTES:
1. (2) REQUIRED
2. WEIGHT: ±9.75 LB EACH
3. WINDAREA: .8 SQ. FT.

REV.	MADE BY / CHECKED BY	DATE	CHANGE

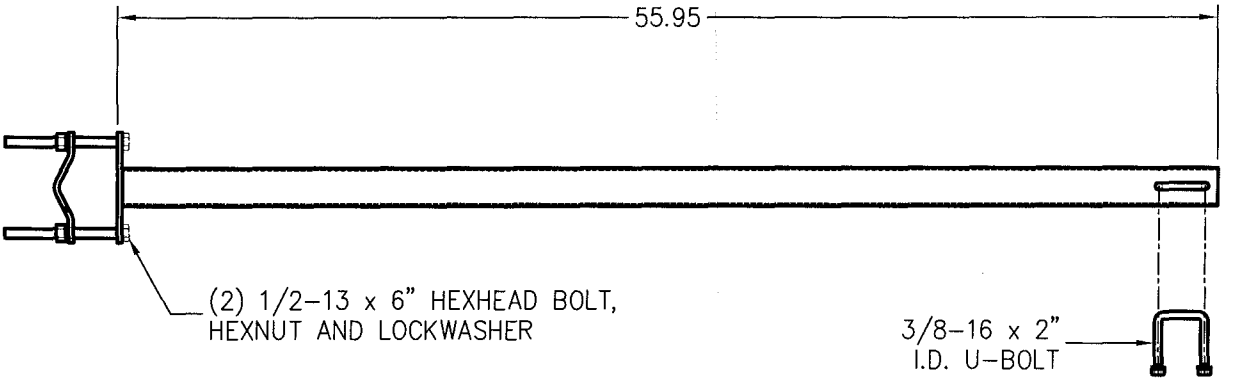
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

STIFFARM AT ZERO DEGREE BAYS

MODEL: PSIFMPV-2C-DA	DRAWN BY: D.G. Kellar	DATE: 2/01/08	
CHANNEL/FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:	
SCALE: 1:10	DRAWING NO.: J1007FM-634-017		REV.



NOTES:
1. (1) REQUIRED
2. WEIGHT: ±10.5 LB EACH
3. WINDAREA: .81 SQ. FT.

REV.	MADE BY / CHECKED BY	DATE	CHANGE

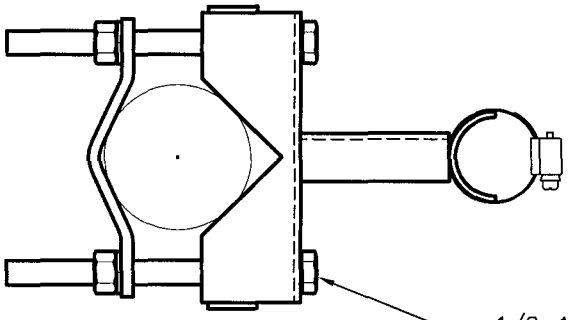
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

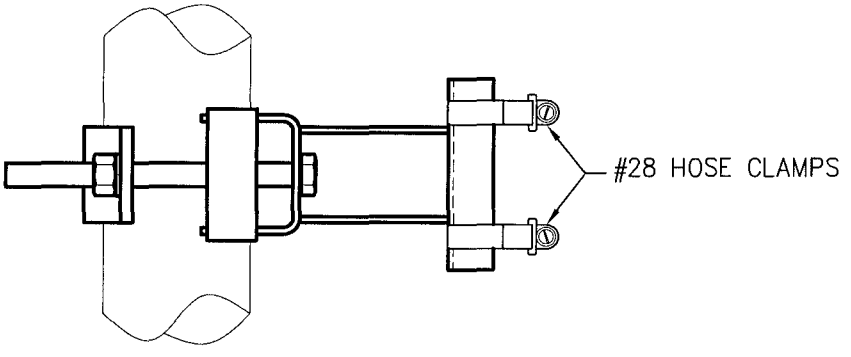
STIFFARM AT 237° BAYS

MODEL:	DRAWN BY:	DATE:
PSIFMPV-2C-DA	D.G. Kellar	2/01/08
CHANNEL/ FREQUENCY: 90.5 MHz	APPROVED BY:	DATE:
SCALE: 1:10	DRAWING NO.: J1007FM-634-020	REV.

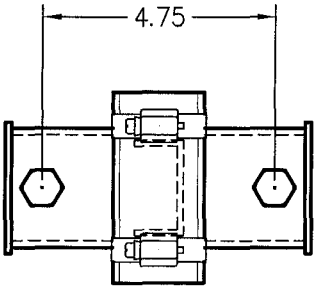


1/2–13 x 6" GALVANIZED HEXHEAD BOLT
HEXNUT AND HELICAL LOCKWASHERS
(2) PLACES EACH BRACKET

PLAN VIEW



SIDE VIEW



FRONT VIEW

REV.	MADE BY / CHECKED BY	DATE	CHANGE

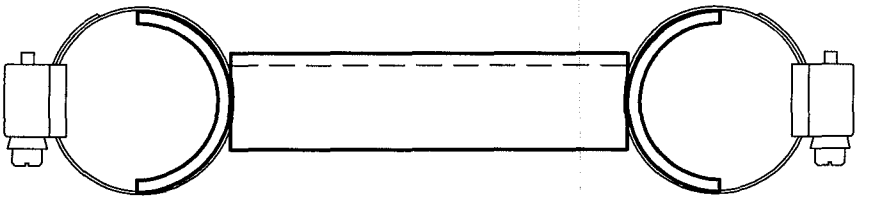
SIZE: A

PROPAGATION SYSTEMS, INC.

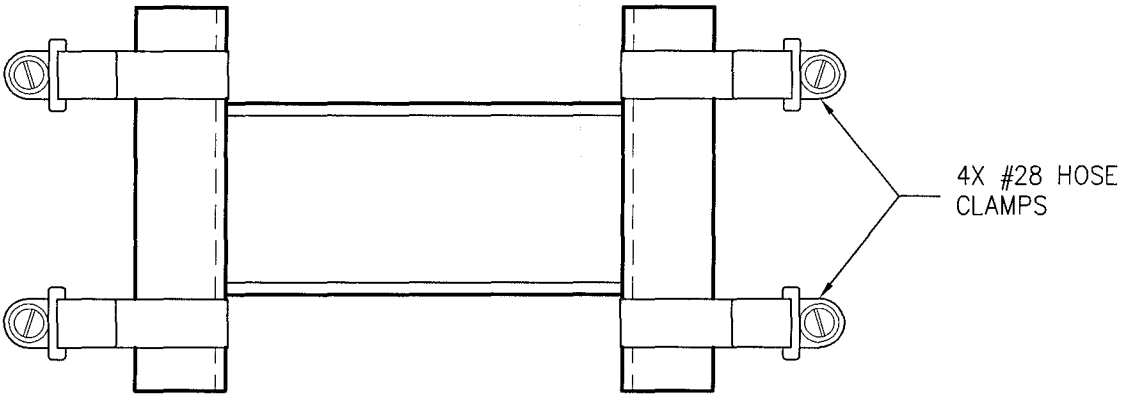
Ebensburg, Pennsylvania USA 814–472–5540

SUPPORT BRACKET OUTLINE

MODEL:	DRAWN BY: P. MCINTOSH	DATE: 12–19–00
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1: 4	DRAWING NO.: 33–00030	REV.



PLAN VIEW



SIDE VIEW

REV.	MADE BY / CHECKED BY	DATE	CHANGE

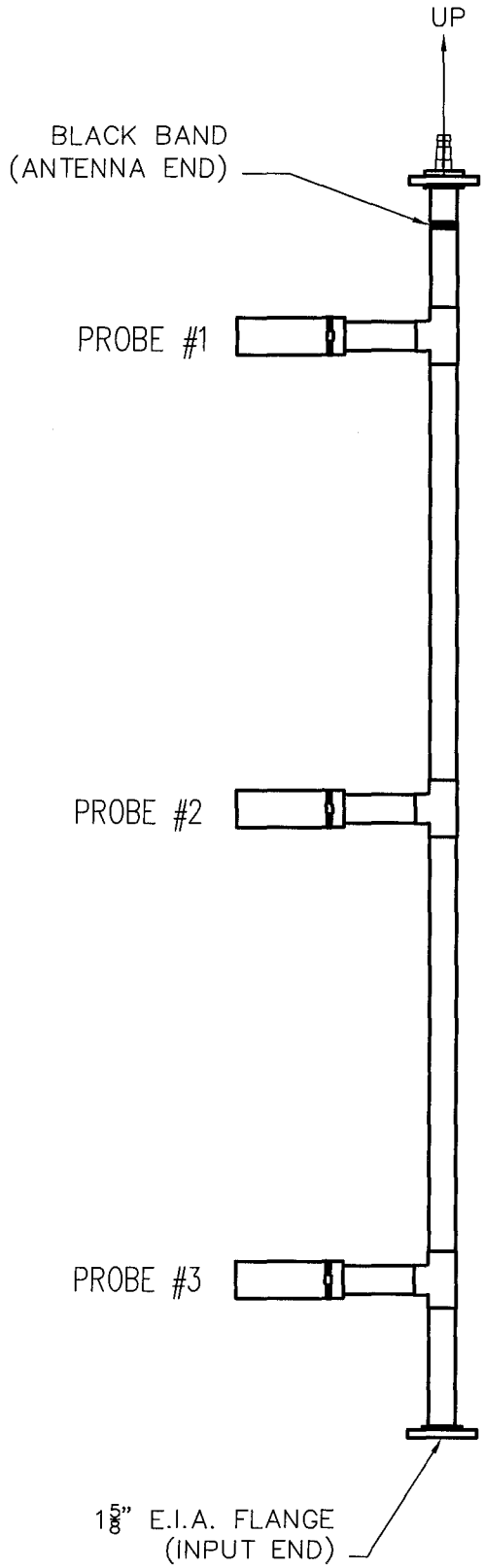
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

TUNER BRACKET FOR CENTER FEED

MODEL:	DRAWN BY: P. MCINTOSH	DATE: 9-3-99
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:2	DRAWING NO.: 33-50032	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

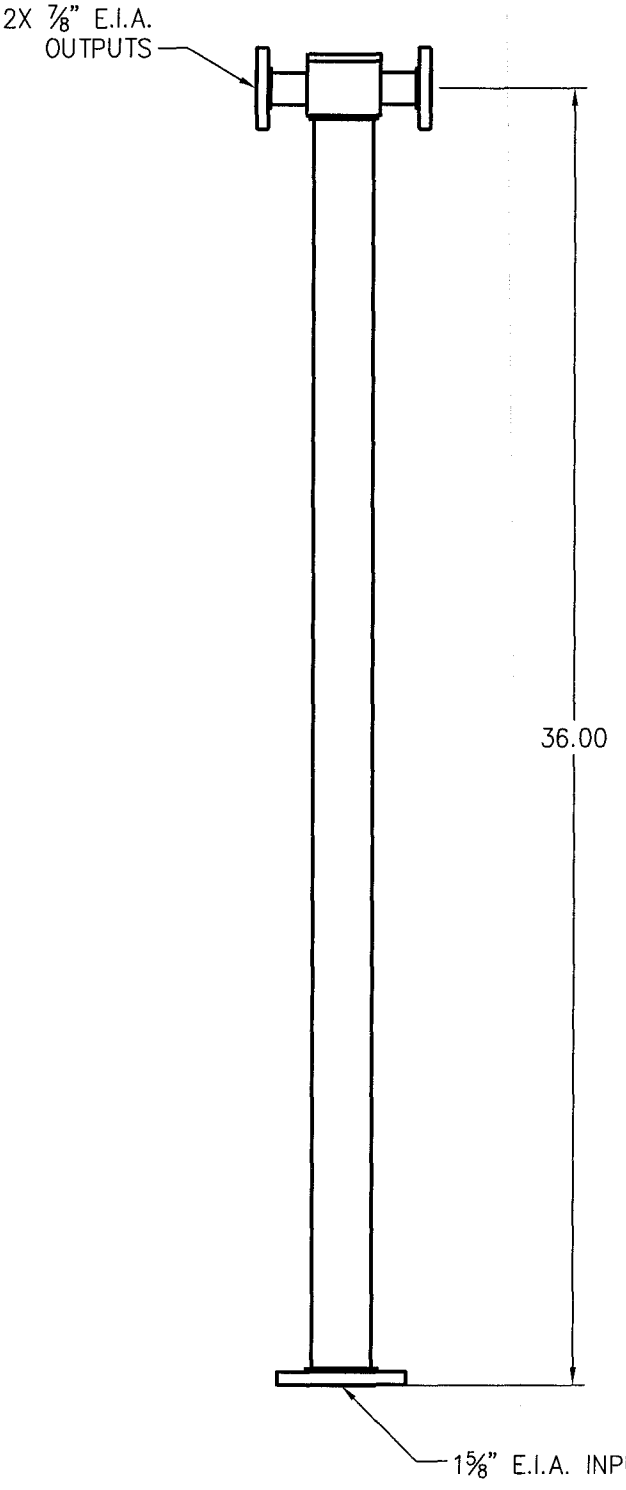
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

3 PROBE TUNER ASSEMBLY

MODEL:	DRAWN BY: D. RICHEY	DATE: 1-28-98
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:16	DRAWING NO.: 33-00006	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

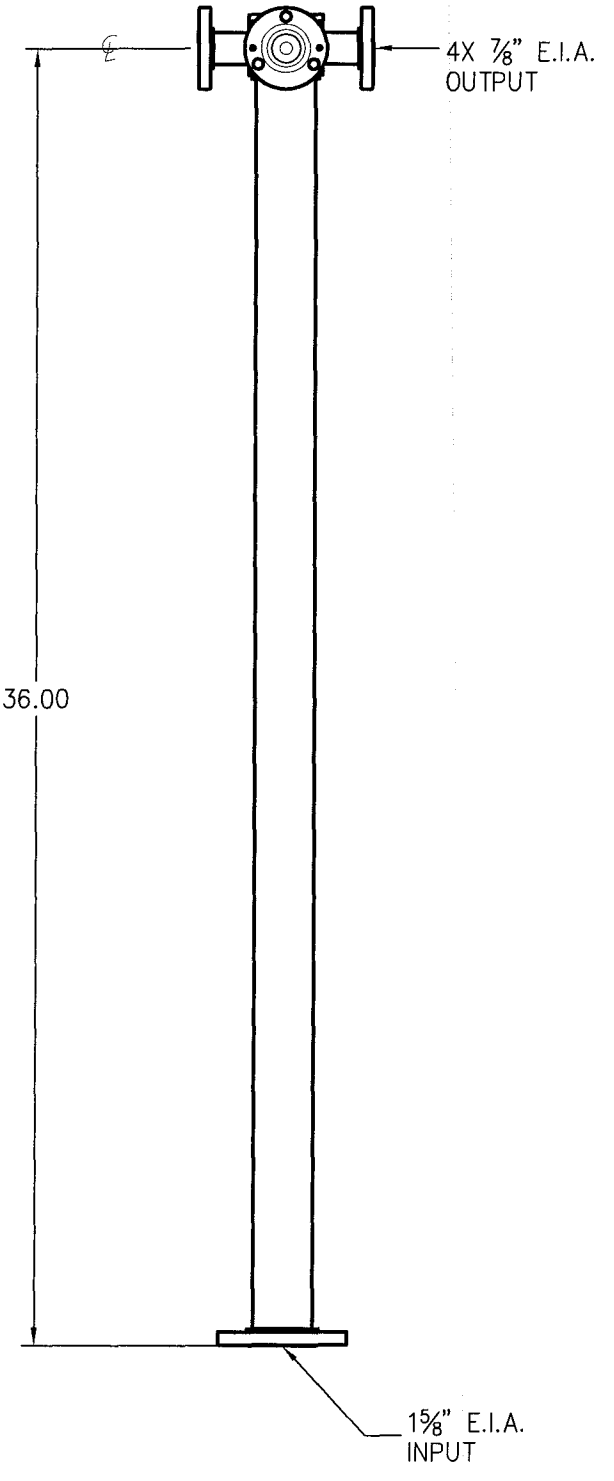
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

1 5/8" x 7/8" 2-WAY POWER DIVIDER

MODEL:	DRAWN BY: D.G. Kellar	DATE: 2/02/04
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:5.333	DRAWING NO.: 33-00137	REV.



REV.	MADE BY / CHECKED BY	DATE	CHANGE

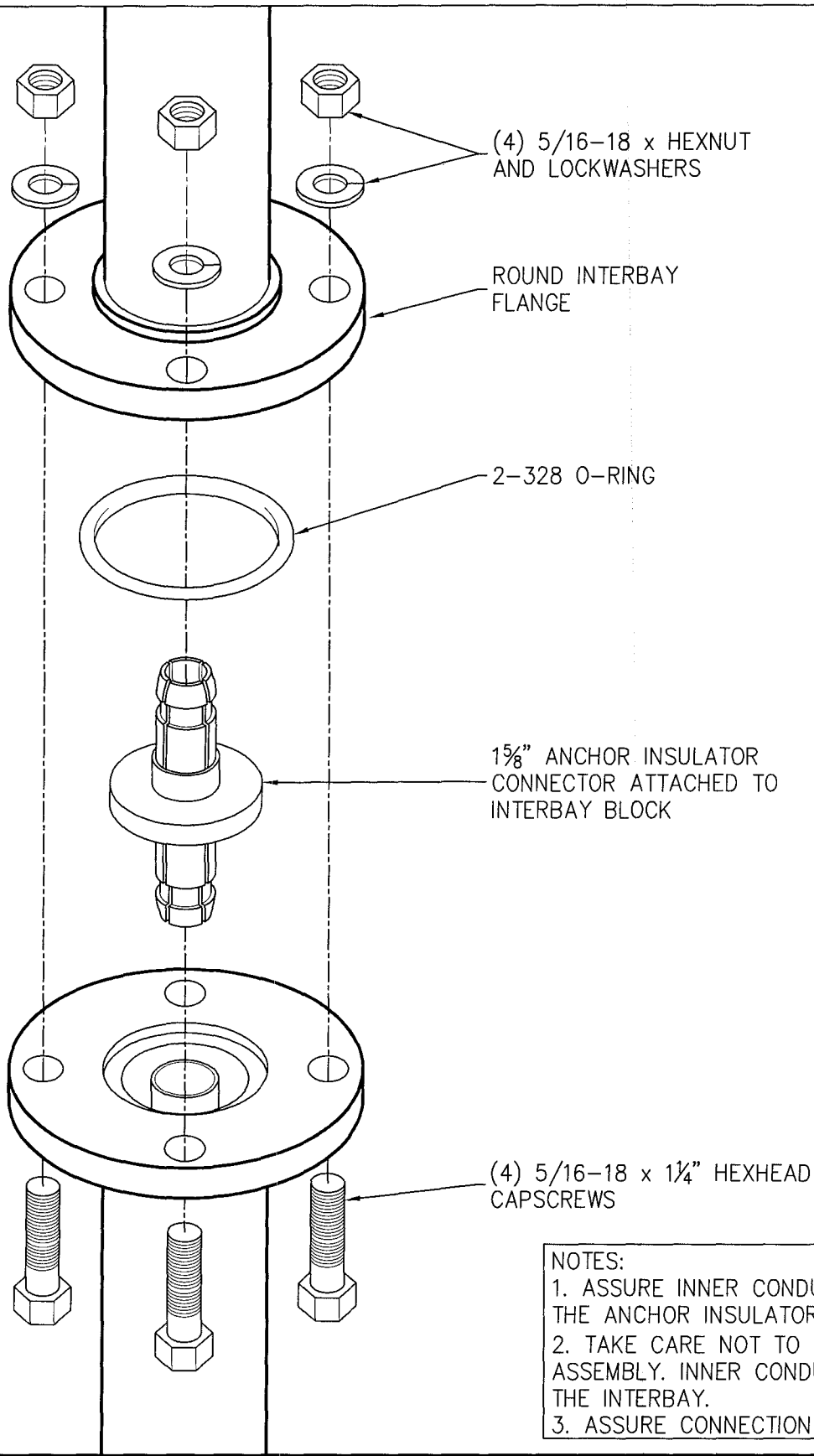
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

1 5/8" x 7/8" 4-WAY POWER DIVIDER

MODEL:	DRAWN BY: D.G. Kellar	DATE: 2/14/08
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:5.333	DRAWING NO.: 33-00181	REV.



NOTES:
1. ASSURE INNER CONDUCTOR SEATS FIRMLY ON THE ANCHOR INSULATOR CONNECTOR.
2. TAKE CARE NOT TO "SPLIT" THE BULLET DURING ASSEMBLY. INNER CONDUCTOR IS **NOT** CAPTIVE IN THE INTERBAY.
3. ASSURE CONNECTION IS DRY AND CLEAN

REV.	MADE BY / CHECKED BY	DATE	CHANGE

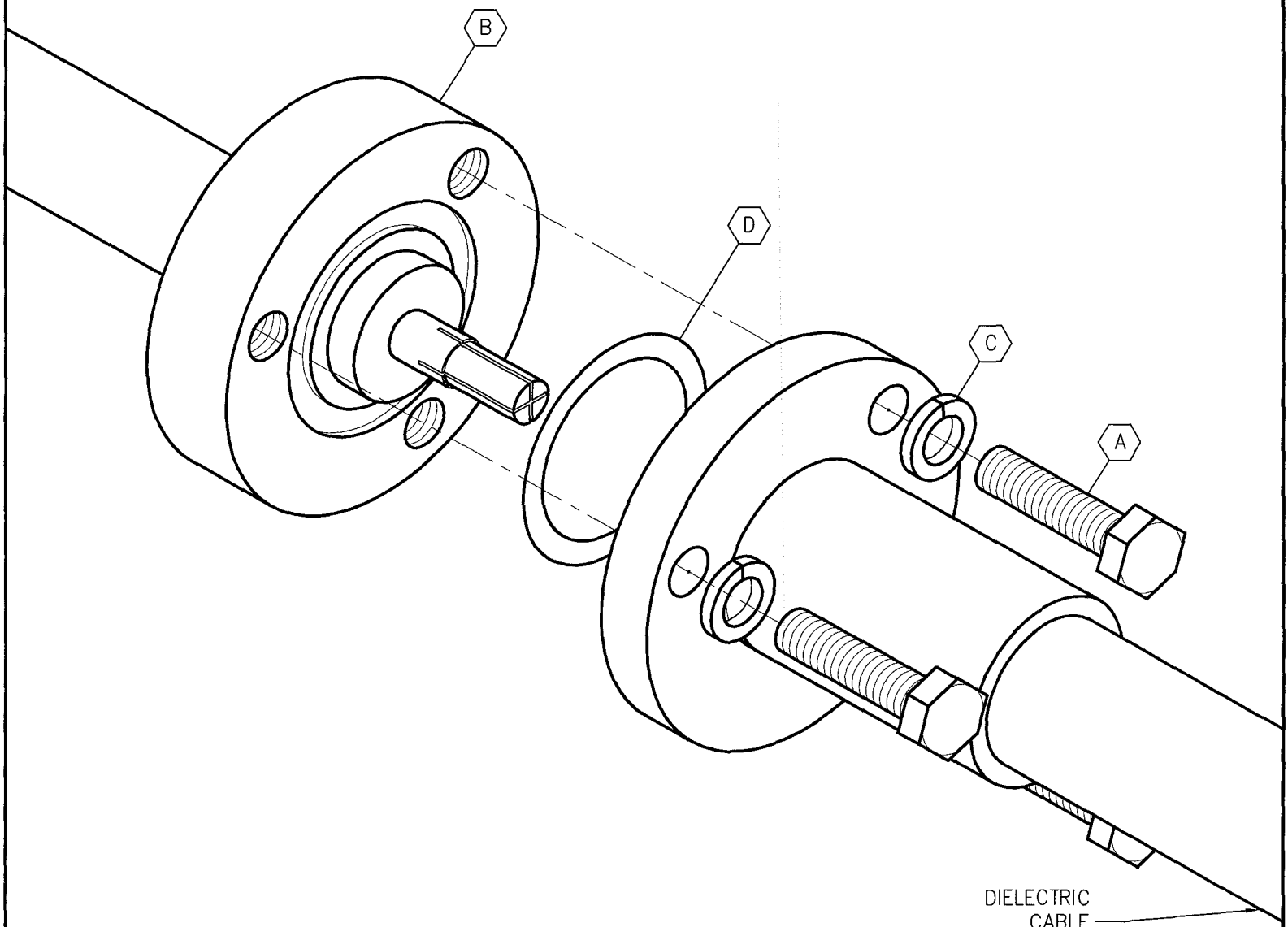
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814-472-5540

1⅝" INTERBAY FLANGE ASSEMBLY

MODEL:	DRAWN BY: D.G. Kellar	DATE: 4/03/08
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:2	DRAWING NO.: 12-00014	REV.



MATERIALS LIST		
ITEM	QTY	SIZE AND DESCRIPTION
A	3	1/4–20 x 3/4" HEXHEAD CAPSCREW, STAINLESS STEEL
B	1	FLANGE ON ANTENNA
C	3	1/4" HELICAL LOCKWASHER
D	1	#2–215 O–RING, SILICONE RUBBER
E	1	7/8" ANCHOR TEFLON CONNECTOR

NOTES:
1. ASSURE ANCHOR TEFLON CONNECTOR IS DRY AND CLEAN BEFORE ASSEMBLING.
2. TAKE CARE TO AVOID BINDING OR SPLITTING THE CONNECTOR BULLET.
3. ASSURE ANCHOR TEFLON CONNECTOR IS FIRMLY SEATED.

REV.	MADE BY / CHECKED BY	DATE	CHANGE

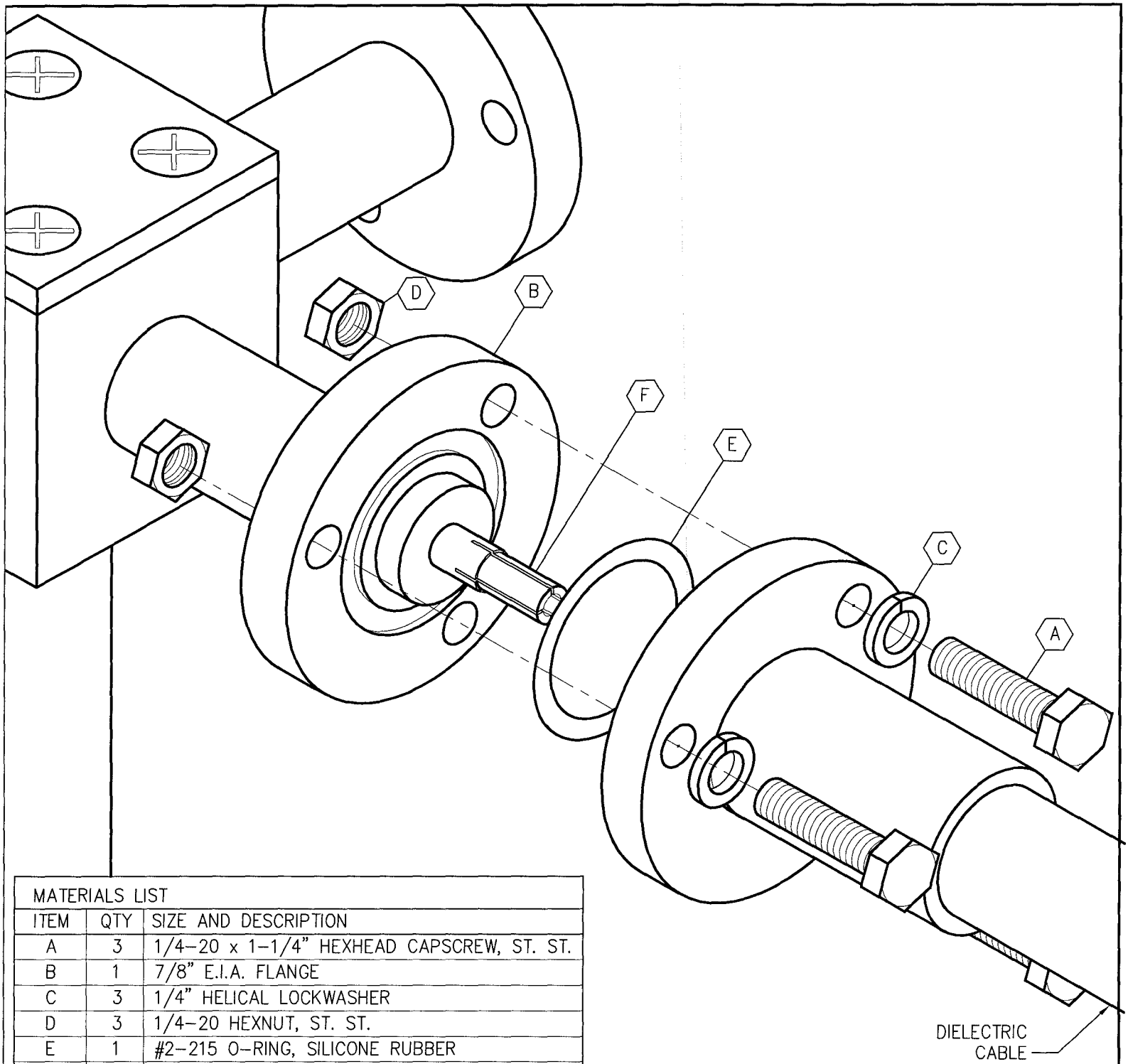
SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814–472–5540

7/8" E.I.A. THREADED FLANGE ASSEMBLY ISOMETRIC

MODEL:	DRAWN BY: D.G. Kellar	DATE: 4/30/08
CHANNEL / FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:1	DRAWING NO.: 11–00013	REV.



MATERIALS LIST		
ITEM	QTY	SIZE AND DESCRIPTION
A	3	1/4–20 x 1–1/4" HEXHEAD CAPSCREW, ST. ST.
B	1	7/8" E.I.A. FLANGE
C	3	1/4" HELICAL LOCKWASHER
D	3	1/4–20 HEXNUT, ST. ST.
E	1	#2–215 O–RING, SILICONE RUBBER
F	1	7/8" ANCHOR TEFLON CONNECTOR

NOTES:
1. ASSURE ANCHOR TEFLON CONNECTOR IS DRY AND CLEAN BEFORE ASSEMBLING.
2. TAKE CARE TO AVOID BINDING OR SPLITTING THE CONNECTOR BULLET.
3. ASSURE ANCHOR TEFLON CONNECTOR IS FIRMLY SEATED.

REV.	MADE BY / CHECKED BY	DATE	CHANGE

SIZE: A

PROPAGATION SYSTEMS, INC.

Ebensburg, Pennsylvania USA 814–472–5540

7/8" E.I.A. BOLTED FLANGE ASSEMBLY ISOMETRIC

MODEL:	DRAWN BY: D.G. Kellar	DATE: 4/30/08
CHANNEL/ FREQUENCY:	APPROVED BY:	DATE:
SCALE: 1:1	DRAWING NO.: 11–00014	REV. 0

8

J1007FM-634

FMPV-2C-DA

FINAL