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**FM DIRECTIONAL BROADCAST ANTENNA**  
**PROOF-OF-PERFORMANCE**

**MODEL JMVP-1R-DA**

**SERIAL NUMBER 12161**

**WJCY**

**Cicero, IN**



6340 Sky Creek Drive • Sacramento, California USA 95828  
(916) 383-1177 phone • (916) 383-1182 fax



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**DATE:** January 14, 2005

<b>ANTENNA GAIN</b>	<u>H-pol</u>	<u>V-pol</u>
relative	<b>2.21</b>	
(dBd)	<b>(3.44)</b>	

RMS OF THE  
AZIMUTH PATTERNS:

**FM ANTENNA FOR:**

STATION: **WJCY**

LOCATION: **Cicero, IN**

MODEL NUMBER: **JMVP-1R-DA**

FREQUENCY & ERP: **91.5 MHz, 0.480 kW**

ANTENNA INPUT POWER: **0.217 k W**

ANTENNA BOOM HEADING: **136° T.**

Composite	H-pol	V-pol
<b>0.672</b>		<b>0.672</b>

**CERTIFICATION**

This certification, along with the accompanying antenna specification sheet, antenna mounting sketches, and azimuth and elevation patterns, certifies the construction and measurement of the *JAMPRO* FM CP antenna to the station's requirements, as measured at the *JAMPRO* antenna site in Sacramento, California. The following is an outline of construction methods, pattern measurements, installation requirements, recommended maintenance and equipment used.

**CONSTRUCTION**

A standard vertically polarized FM antenna model was used and parasitic reflectors were added to create the required directional patterns. From experience and by repeated measurements, these elements were adjusted as to position until the final configuration was determined and the pattern requirements were met. These additional elements are steel, hot dipped galvanized and either bolted or welded in place. Measurements to establish their exact location are shown on the antenna mounting sketches.

**MEASUREMENT**

The full scale antenna was mounted on an exact duplicate of its final support at the station. We were careful to duplicate conduits, cables and anything peculiar to this mounting. This was then placed on a turntable at the *JAMPRO* antenna range. This directional antenna was used for receiving the radiation from a transmitting antenna that is elevated 25 feet above ground and located at a distance of 4,500 feet. This transmitting antenna is capable of transmitting either horizontal or vertical polarization. The frequency of the signal generator was accurately set to station frequency by use of a frequency counter. A spectrum analyzer was used to continuously measure field strength as the antenna under test was rotated. Field strength at each azimuth was then plotted.



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Station: **WJCY**

Model: **JMVP-1R-DA**

### **INSTALLATION**

The antenna must be installed in exactly the manner in which it was measured at the factory. This is shown in detail on the antenna mounting sketch, including the azimuth bearing of the elements. This boom must be verified by a surveyor at the site when installation is being completed. Good engineering practices should be followed in any details not covered by specific instructions.

### **MAINTENANCE**

Annual or regular inspection should be made on the antenna system. At this time, tightness of U-bolts, or other fastenings, should be routinely checked. Any deterioration of the antenna due to lightning, or other causes should be promptly repaired.

### **EQUIPMENT**

MODEL: -3000 WAVETEK SIGNAL GENERATOR, SERIAL #66479  
-8591E H.P. SPECTRUM ANALYZER, SERIAL #3308A01312, CAL'd 1/16/03  
-TUNED CAVITY DIPOLE

### **CONCLUSION**

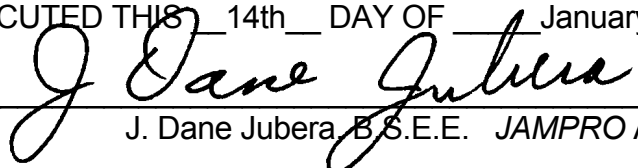
In the development of this pattern, *JAMPRO* antennas, Inc. observed known requirements of the FCC, as stated on the station construction permit.

Gain figures and required input power to achieve station ERP, as well as other details, are found on the first page.

This certification, with its calculations were performed by J. Dane Jubera, B.S.E.E., Electrical Engineer, *JAMPRO* Antennas, Inc.

EXECUTED THIS 14th DAY OF January, 2005

BY:

  
J. Dane Jubera, B.S.E.E. *JAMPRO* Antennas, Inc.



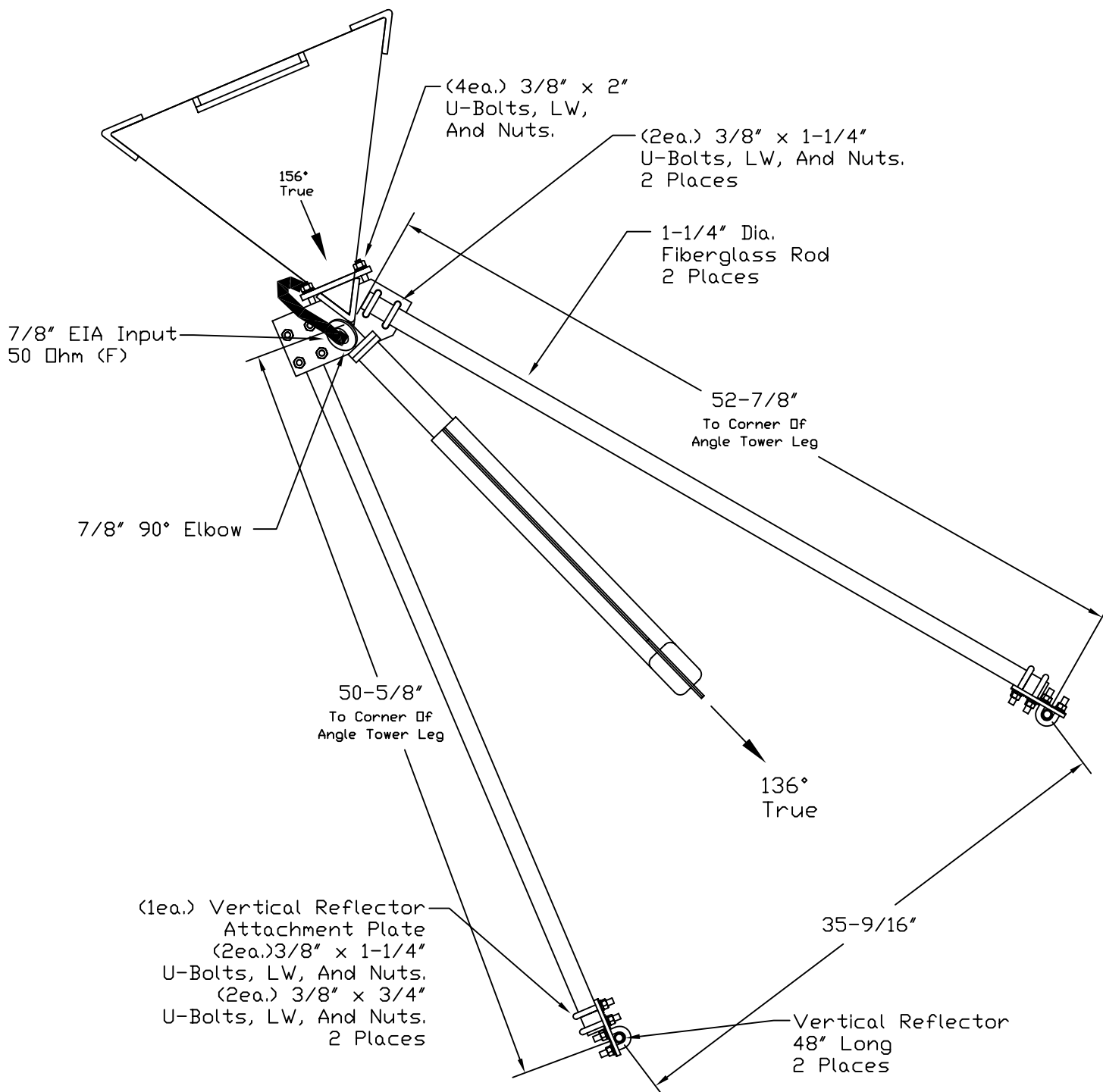
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NOTE:  
INSTALL ANTENNA AS SHOWN.  
VSWR COULD BE AFFECTED IF  
INSTALLED DIFFERENTLY.

STATION CHIEF ENGINEER TO  
DETERMINE TOWER LEG TO  
WHICH ANTENNA IS TO BE MOUNTED.

## TOP VIEW



TITLE:

12161TOP

JOB NO.

12161

ANTENNA MODEL:

JMVP-1R-DA

FREQ:

91.5 MHz

REV:

0

DATE:

10/20/04

CUSTOMER:

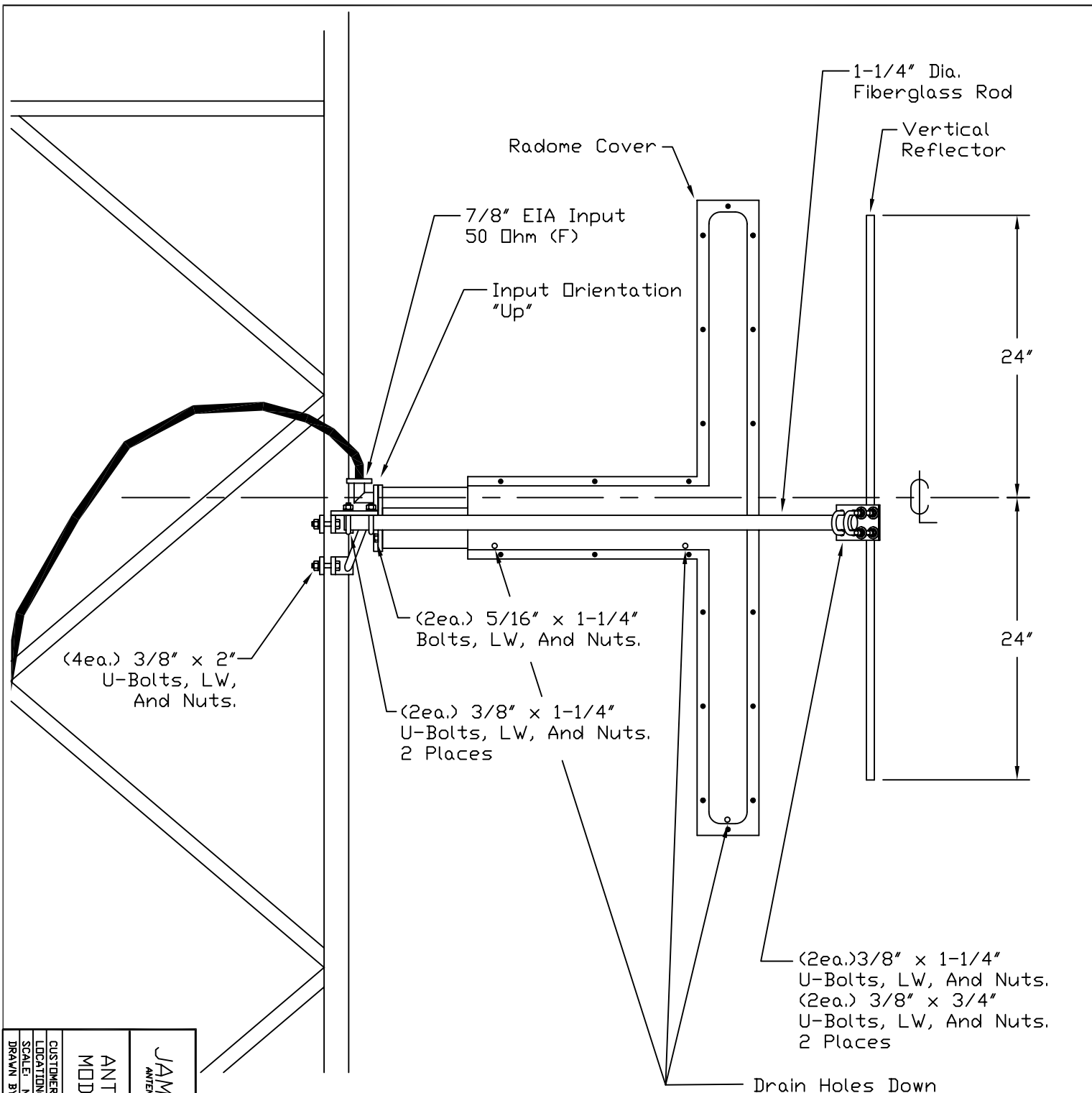
Crestek

CALL SIGN:

WJCY


SHEET:

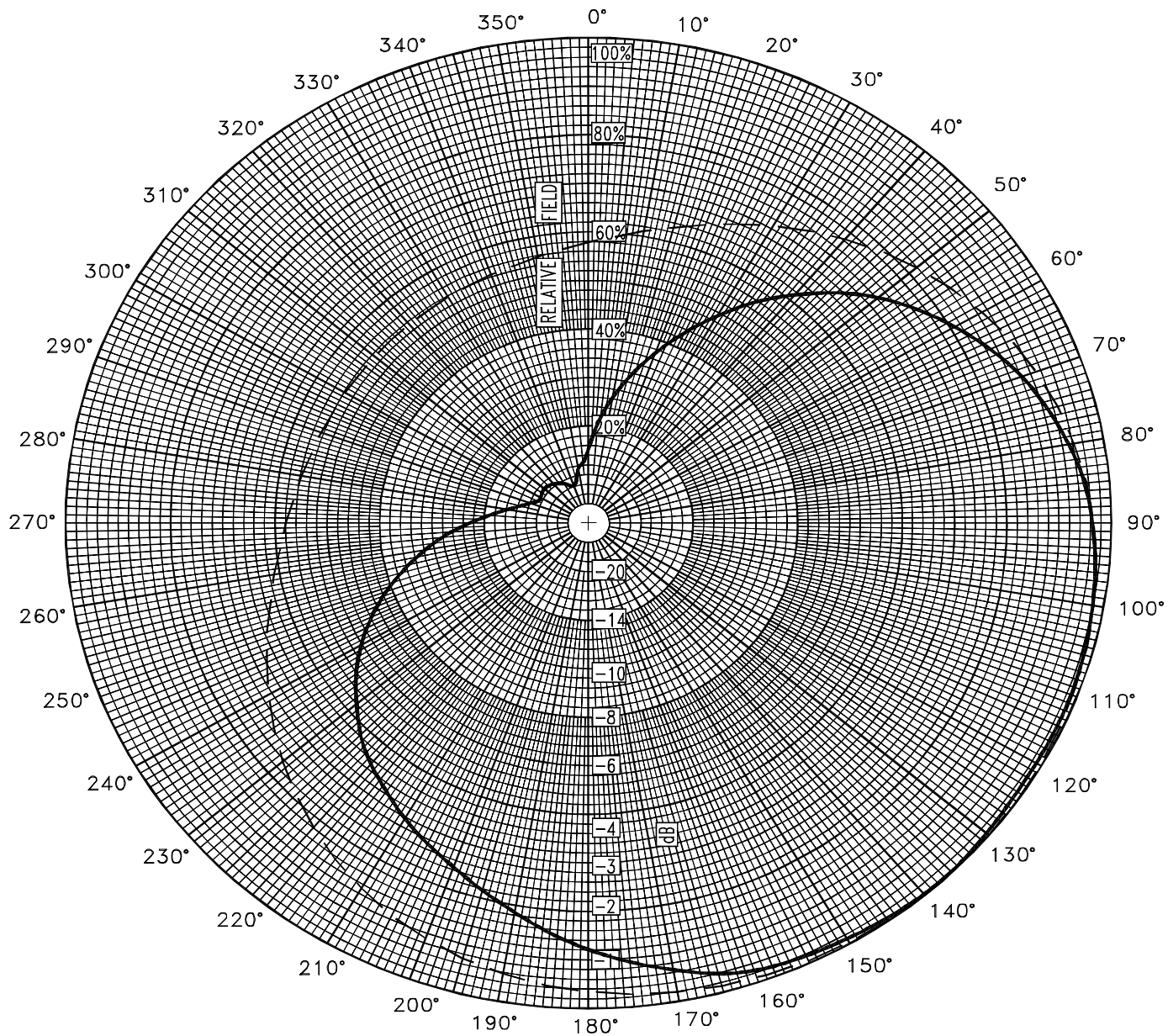
2 of 2



#### NOTES:

1. ELEMENTS MAY BE SWUNG FROM DIRECTLY OFF TOWER LEG A MAXIMUM OF 15° TO AVOID CONFLICT WITH GUY CABLES.
2. USE OF GLASS RODS OR BREAK-UP INSULATORS IN GUY CABLES IS OPTIONAL.
3. DEICERS ARE OPTIONAL. IF NOT, DISREGARD PERTINENT REFERENCES.
4. PURGE ANTENNA SYSTEM AND COAX OF MOISTURE BEFORE APPLYING ANY R.F. POWER.
5. ALL METAL PARTS ARE AT D.C. GROUND THROUGH ELEMENT GROUNDING.
6. REMOVE PAINT AT TOWER LEG CONNECTIONS TO ENSURE PROPER GROUNDING.

		<b>ANTENNA MOUNTING DRAWING</b> <b>MODEL J MVP-1R-DA</b>	
<b>P.O. Box 292880</b> <b>6340 Sky Creek Dr</b> <b>Sacramento, Ca. 95828</b>		<b>CUSTOMER</b> Crestek <b>LOCATION IN</b> <b>SCALE:</b> NONE <b>DRAWN BY:</b> R. Puckett	
<b>JOB #</b> 12161 <b>APPROVED BY:</b> <b>DATE:</b> 10/20/04		<b>FREQ:</b> 91.5 MHz <b>CALL VACY</b>	



## Azimuth Pattern

Customer: WJCY

Date: September 28, 2004

Frequency: 91.5 MHz

Type Number: JMVP-1R-DA

Notes:

COMPOSITE PATTERN ENVELOPE (H & V )



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WJCY

ERP = 0.48 kW

September 28, 2004

JMVP-1R-DA

TABULATION OF RELATIVE FIELD

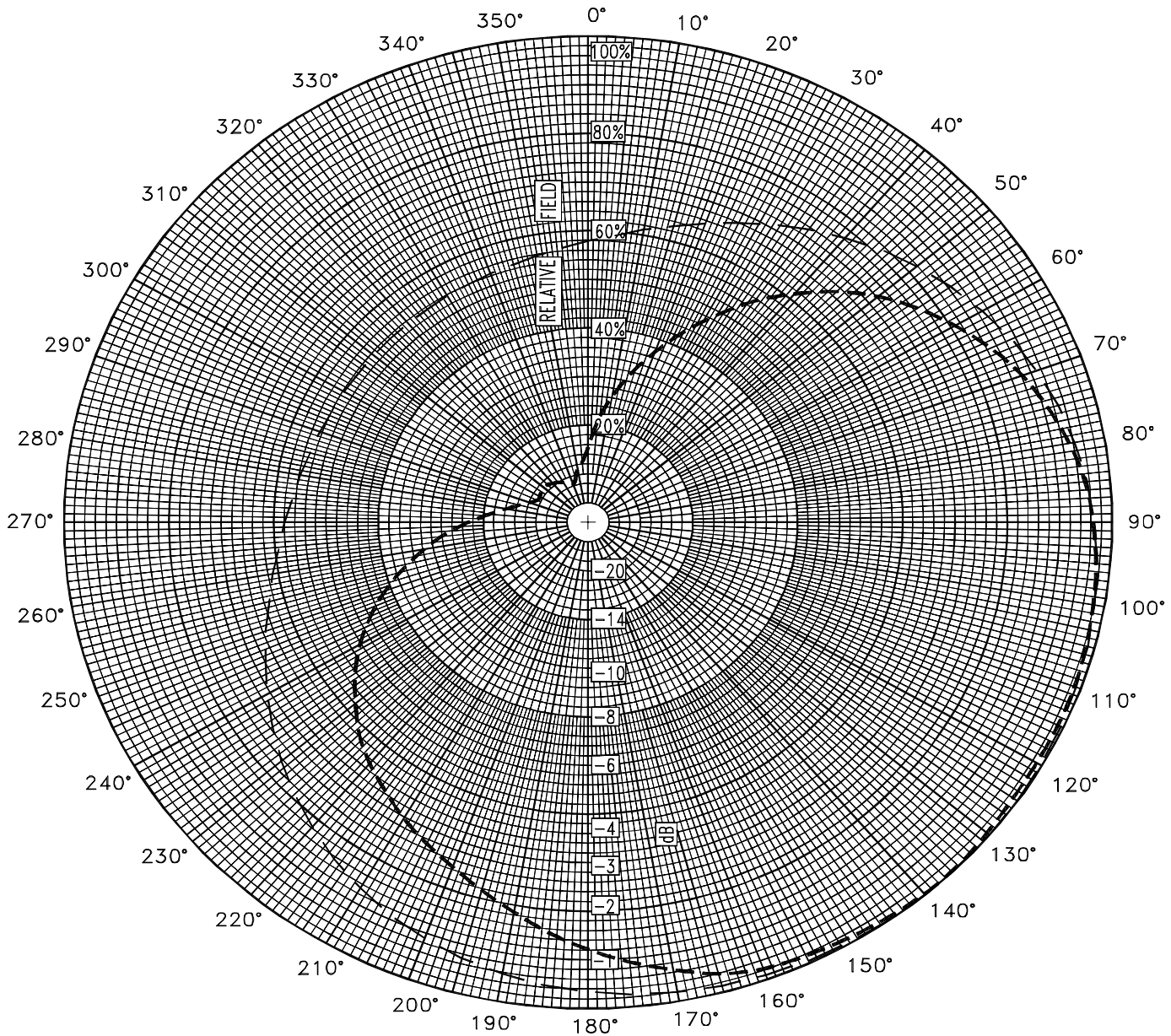
COMPOSITE MEASURED PATTERN (H & V)

<u>BEARING</u>	<u>FIELD</u>	<u>ERP</u> <u>(kW)</u>	<u>dBk</u>
0	0.155	0.01	-19.38
10	0.265	0.03	-14.72
20	0.375	0.07	-11.71
30	0.495	0.12	-9.30
40	0.615	0.18	-7.41
50	0.725	0.25	-5.98
60	0.810	0.31	-5.02
70	0.885	0.38	-4.25
80	0.935	0.42	-3.77
90	0.965	0.45	-3.50
100	0.980	0.46	-3.36
110	0.990	0.47	-3.27
120	0.990	0.47	-3.27
130	0.995	0.48	-3.23
140	1.000	0.48	-3.19
150	0.990	0.47	-3.27
160	0.980	0.46	-3.36
170	0.935	0.42	-3.77
180	0.880	0.37	-4.30
190	0.815	0.32	-4.96
200	0.755	0.27	-5.63
210	0.705	0.24	-6.22
220	0.650	0.20	-6.93
230	0.580	0.16	-7.92
240	0.505	0.12	-9.12
250	0.415	0.08	-10.83
260	0.320	0.05	-13.08
270	0.230	0.03	-15.95
280	0.160	0.01	-19.11
290	0.120	0.01	-21.60
300	0.105	0.01	-22.76
310	0.110	0.01	-22.36
320	0.105	0.01	-22.76
330	0.095	0.00	-23.63
340	0.080	0.00	-25.13
350	0.120	0.01	-21.60

Relative fields at other azimuths:

45	0.675	225	0.620
135	1.000	315	0.110





### Azimuth Pattern

Customer: WJCY	Date: September 28, 2004
Frequency: 91.5 MHz	Type Number: JMVP-1R-DA
Notes: MEASURED PATTERN IN FULL SCALE	
<div style="display: flex; justify-content: space-between; align-items: center;"> <span>———— HPOL</span> <span>..... VPOL</span> <span>---- LIMITS</span> </div>	



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WJCY ERP = 0.48 kW

September 28, 2004

JMVP-1R-DA

TABULATION OF MEASURED FIELDS

<u>BEARING</u>	<u>HORIZONTAL POLARIZATION</u>		<u>VERTICAL POLARIZATION</u>	
	<u>FIELD</u>	<u>ERP(kW)</u>	<u>FIELD</u>	<u>ERP(kW)</u>
0	0.000	0.00	0.155	0.01
10	0.000	0.00	0.265	0.03
20	0.000	0.00	0.375	0.07
30	0.000	0.00	0.495	0.12
40	0.000	0.00	0.615	0.18
50	0.000	0.00	0.725	0.25
60	0.000	0.00	0.810	0.31
70	0.000	0.00	0.885	0.38
80	0.000	0.00	0.935	0.42
90	0.000	0.00	0.965	0.45
100	0.000	0.00	0.980	0.46
110	0.000	0.00	0.990	0.47
120	0.000	0.00	0.990	0.47
130	0.000	0.00	0.995	0.48
140	0.000	0.00	1.000	0.48
150	0.000	0.00	0.990	0.47
160	0.000	0.00	0.980	0.46
170	0.000	0.00	0.935	0.42
180	0.000	0.00	0.880	0.37
190	0.000	0.00	0.815	0.32
200	0.000	0.00	0.755	0.27
210	0.000	0.00	0.705	0.24
220	0.000	0.00	0.650	0.20
230	0.000	0.00	0.580	0.16
240	0.000	0.00	0.505	0.12
250	0.000	0.00	0.415	0.08
260	0.000	0.00	0.320	0.05
270	0.000	0.00	0.230	0.03
280	0.000	0.00	0.160	0.01
290	0.000	0.00	0.120	0.01
300	0.000	0.00	0.105	0.01
310	0.000	0.00	0.110	0.01
320	0.000	0.00	0.105	0.01
330	0.000	0.00	0.095	0.00
340	0.000	0.00	0.080	0.00
350	0.000	0.00	0.120	0.01
<b>MAXIMUM FIELDS:</b>				
355	0.000	0.00		
140			1	0.48
<b>MINIMUM FIELDS:</b>				
355	0.000	0.00		
340			0.08	0.00

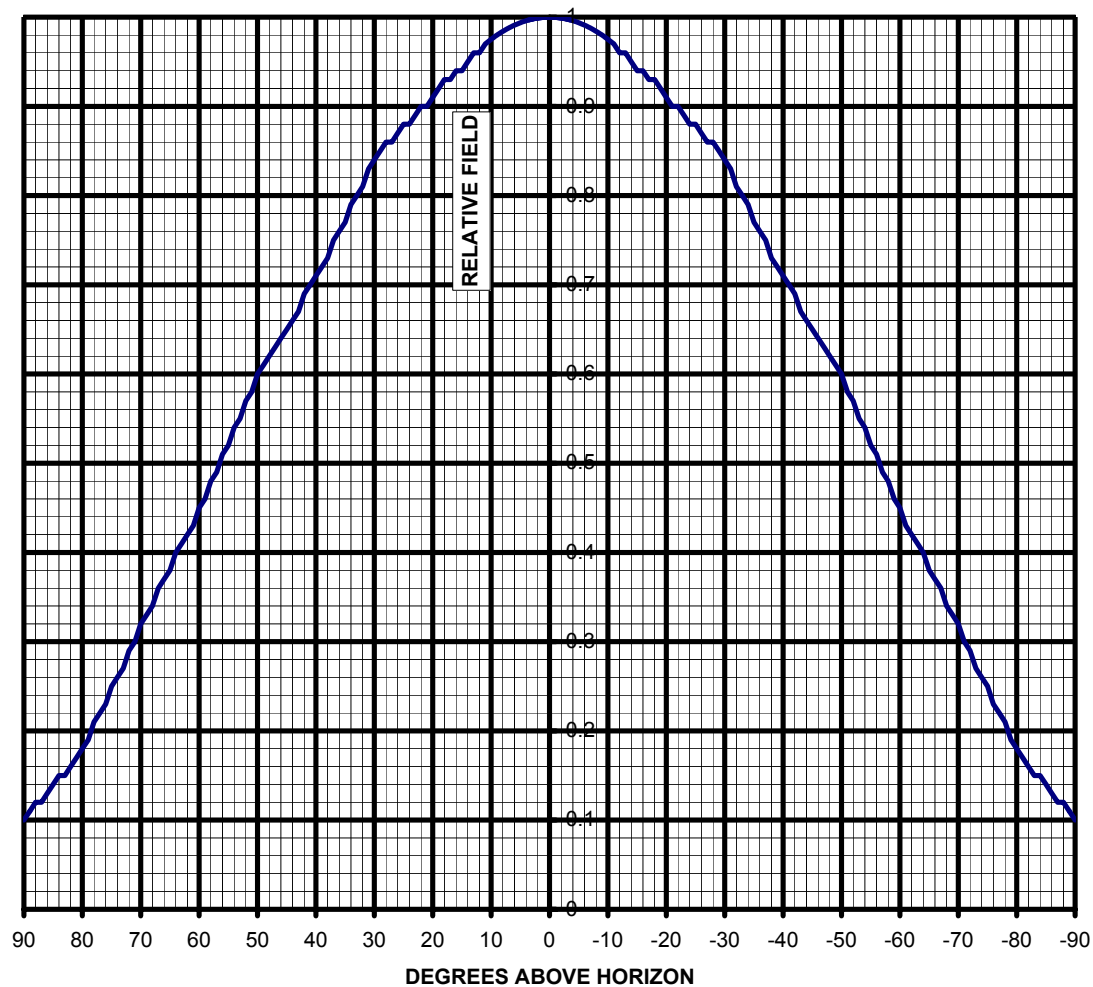


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## PLOT OF ELEVATION PLANE PATTERN

**STATION:** WJCY    91.5 MHz    JMVP-1R-DA    .00 lambda spacing





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# TABULATION OF ELEVATION PLANE PATTERN

**STATION:** WJCY 91.5 MHz JMVP-1R-DA .00 lambda spacing

<u>ELEVATION</u>	<u>RELATIVE</u>	<u>ELEVATION</u>	<u>RELATIVE</u>	<u>ELEVATION</u>	<u>RELATIVE</u>
<u>ANGLE</u>	<u>FIELD</u>	<u>ANGLE</u>	<u>FIELD</u>	<u>ANGLE</u>	<u>FIELD</u>
10	0.975	-25	0.880	-60	0.450
9	0.980	-26	0.870	-61	0.430
8	0.984	-27	0.860	-62	0.420
7	0.988	-28	0.860	-63	0.410
6	0.991	-29	0.850	-64	0.400
5	0.994	-30	0.840	-65	0.380
4	0.996	-31	0.830	-66	0.370
3	0.998	-32	0.810	-67	0.360
2	0.999	-33	0.800	-68	0.340
1	1.000	-34	0.790	-69	0.330
0	1.000	-35	0.770	-70	0.320
-1	1.000	-36	0.760	-71	0.300
-2	0.999	-37	0.750	-72	0.290
-3	0.998	-38	0.730	-73	0.270
-4	0.996	-39	0.720	-74	0.260
-5	0.994	-40	0.710	-75	0.250
-6	0.991	-41	0.700	-76	0.230
-7	0.988	-42	0.690	-77	0.220
-8	0.984	-43	0.670	-78	0.210
-9	0.980	-44	0.660	-79	0.190
-10	0.975	-45	0.650	-80	0.180
-11	0.970	-46	0.640	-81	0.170
-12	0.960	-47	0.630	-82	0.160
-13	0.960	-48	0.620	-83	0.150
-14	0.950	-49	0.610	-84	0.150
-15	0.940	-50	0.600	-85	0.140
-16	0.940	-51	0.580	-86	0.130
-17	0.930	-52	0.570	-87	0.120
-18	0.930	-53	0.550	-88	0.120
-19	0.920	-54	0.540	-89	0.110
-20	0.910	-55	0.520	-90	0.100
-21	0.900	-56	0.510		
-22	0.900	-57	0.490		
-23	0.890	-58	0.480		
-24	0.880	-59	0.460		