
FM DIRECTIONAL BROADCAST ANTENNA
PROOF-OF-PERFORMANCE

MODEL JHPC-6RFR.5CLFM DA

SERIAL NUMBER 14387

KYCC

Stockton, CA



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



6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

TABLE OF CONTENTS

A.	Engineer's Statement	1,2
B.	Mechanical Drawings	3,4
C.	Composite Azimuth Pattern, Plot	5
D.	Composite Azimuth Pattern, Tabulation	6
E.	Azimuth Pattern, Horizontal & Vertical Polarizations, Plot	7
F.	Azimuth Pattern, Horizontal & Vertical Polarizations, Tabulation	8
G.	Elevation Plane Pattern, Plot	9
H.	Elevation Plane Pattern, Tabulation	10



6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

DATE: September 24, 2008

ANTENNA GAIN	H-pol	V-pol
relative	3.68	3.68
(dBd)	(5.66)	(5.66)

**RMS OF THE
AZIMUTH PATTERNS:**

FM ANTENNA FOR:

STATION: KYCC

LOCATION: Stockton, CA

MODEL NUMBER: JHPC-6RFR.5CLFM DA

FREQUENCY & ERP: 90.1 MHz, 41.00 kW

ANTENNA INPUT POWER: 11.14 k W

ANTENNA BOOM HEADING: See Dwgs

Composite	H-pol	V-pol
0.733	0.704	0.668

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

Two bays of a standard CP FM antenna model were used, along with one bay of a Scala log periodic antenna, 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. A separate power divider was used to feed about 18% of the power to the log periodic antenna.

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.



6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

Station: **KYCC**

Model: **JHPC-6RFR.5CLFM 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
-1580 Scientific Atlanta pattern Recorder, Serial # 471, Cal'd 11/01/07
-8591E H.P. Spectrum Analyzer, Serial #3308A01312, Cal'd 12/18/07
-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 24th DAY OF September, 2008

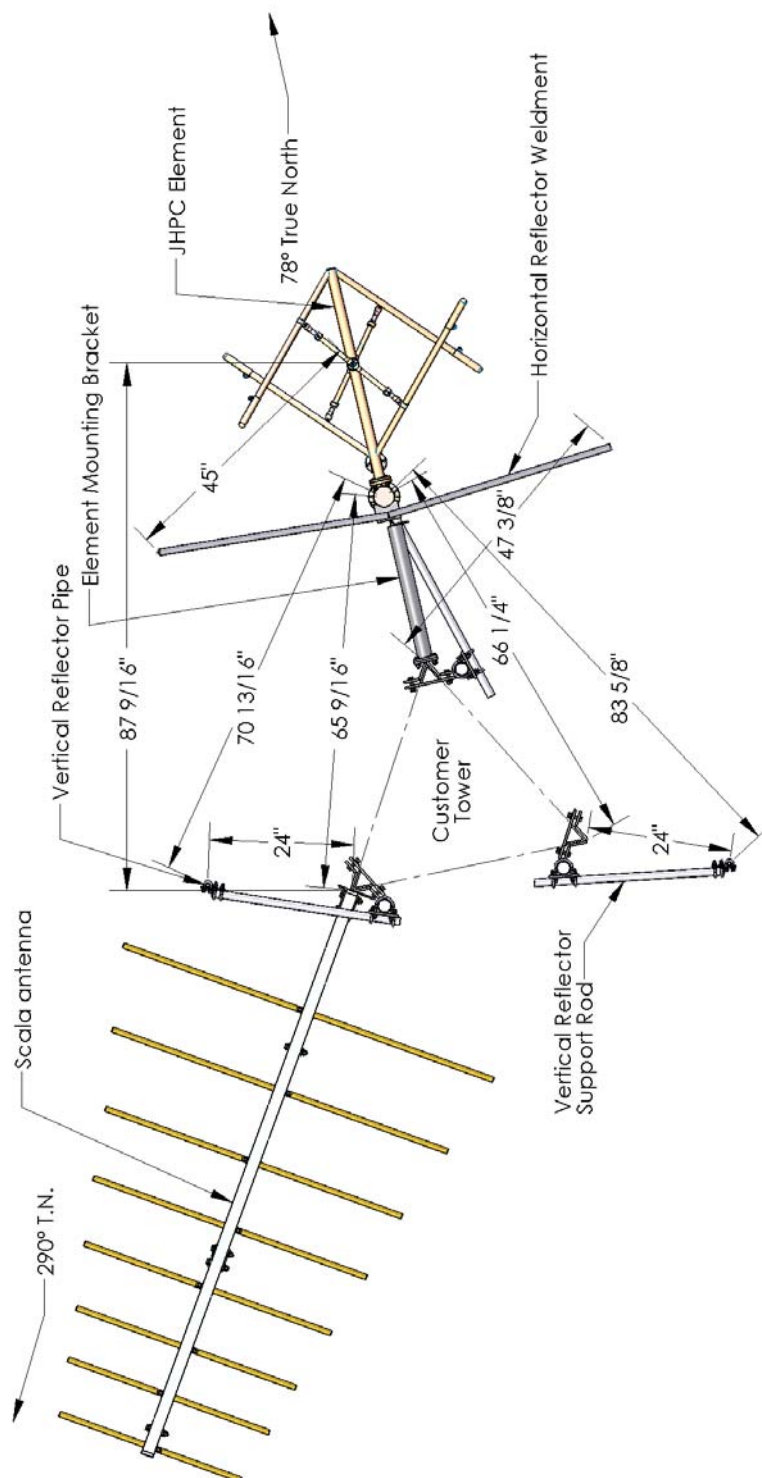
BY:

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



6340 Sky Creek Drive
Sacramento, California 95828 USA

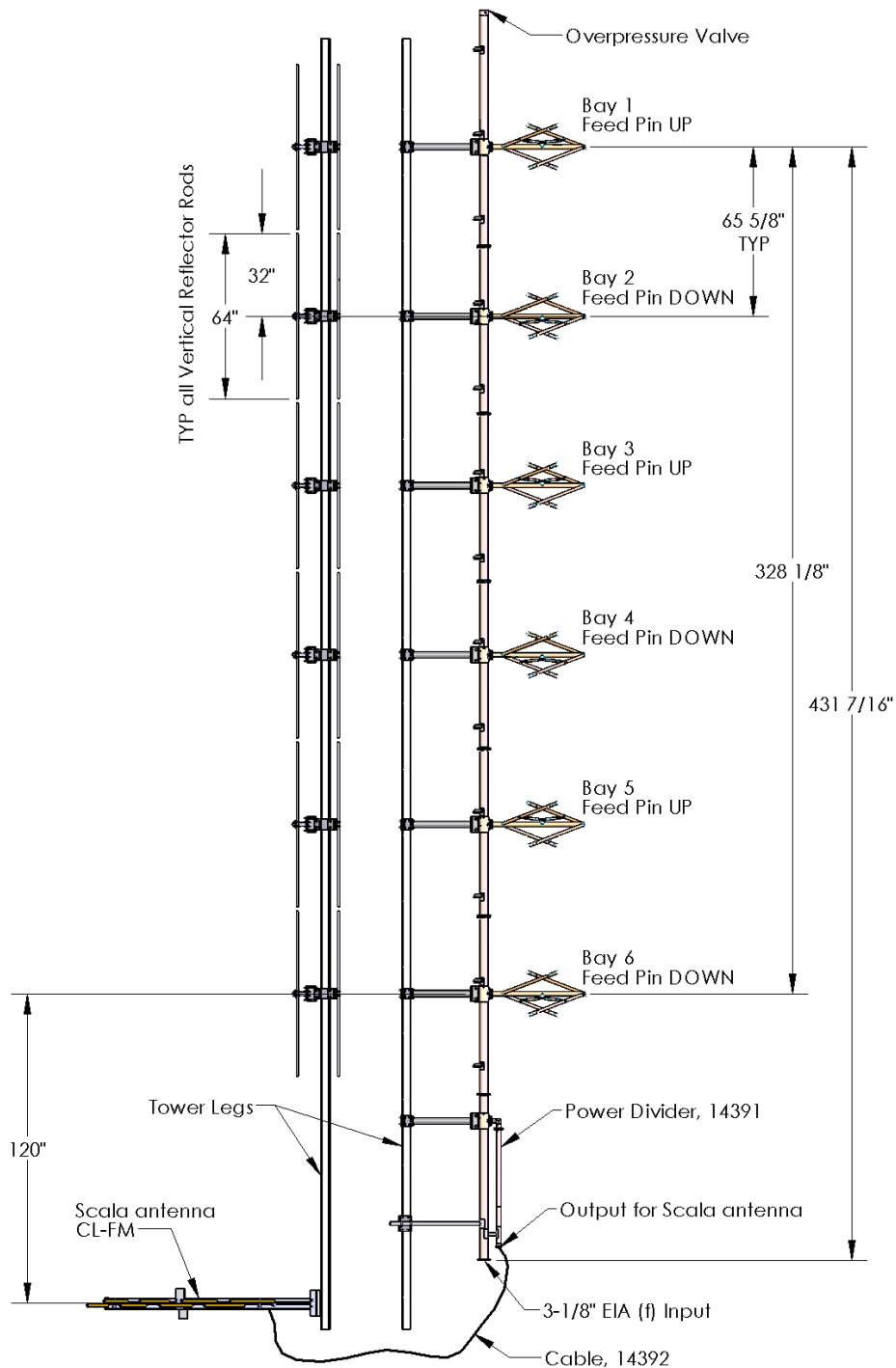
Telephone (916) 383-1177
Fax (916) 383-1182

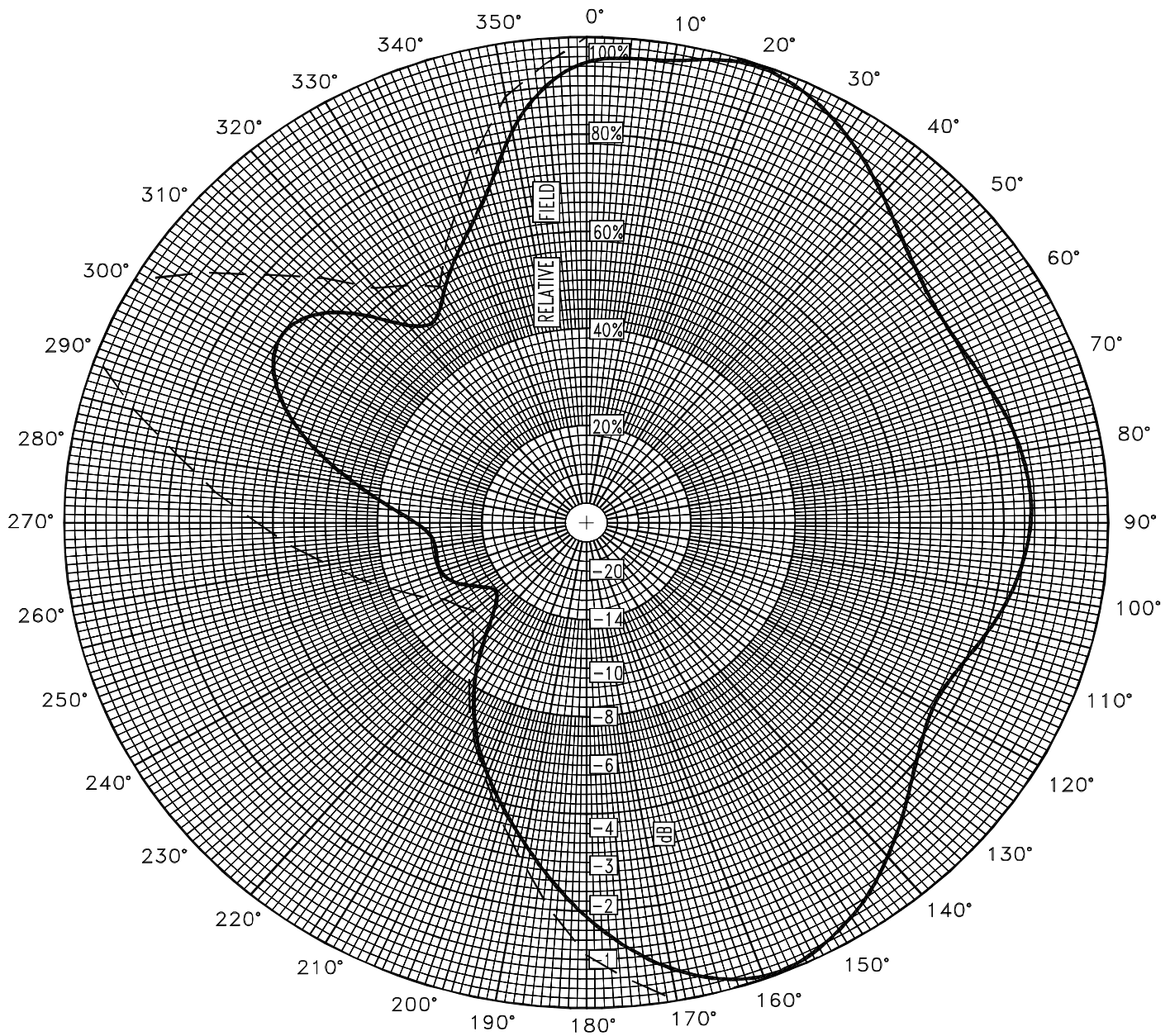




6340 Sky Creek Drive
Sacramento, California 95828 USA

Telephone (916) 383-1177
Fax (916) 383-1182





Azimuth Pattern

Customer: KYCC

Date: February 1, 2007

Frequency: 90.1 MHz

Type Number: JHPC-6RFR.5CLFM DA

Notes:

COMPOSITE PATTERN ENVELOPE (H & V)



6340 Sky Creek Drive, Sacramento, CA 95828
P.O. Box 292880, Sacramento, CA 95829-2880

(916) 383-1177 Fax: (916) 383-1182



6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

KYCC

ERP = 41.00 kW

February 1, 2007

JHPC-6RFR.5CLFM DA

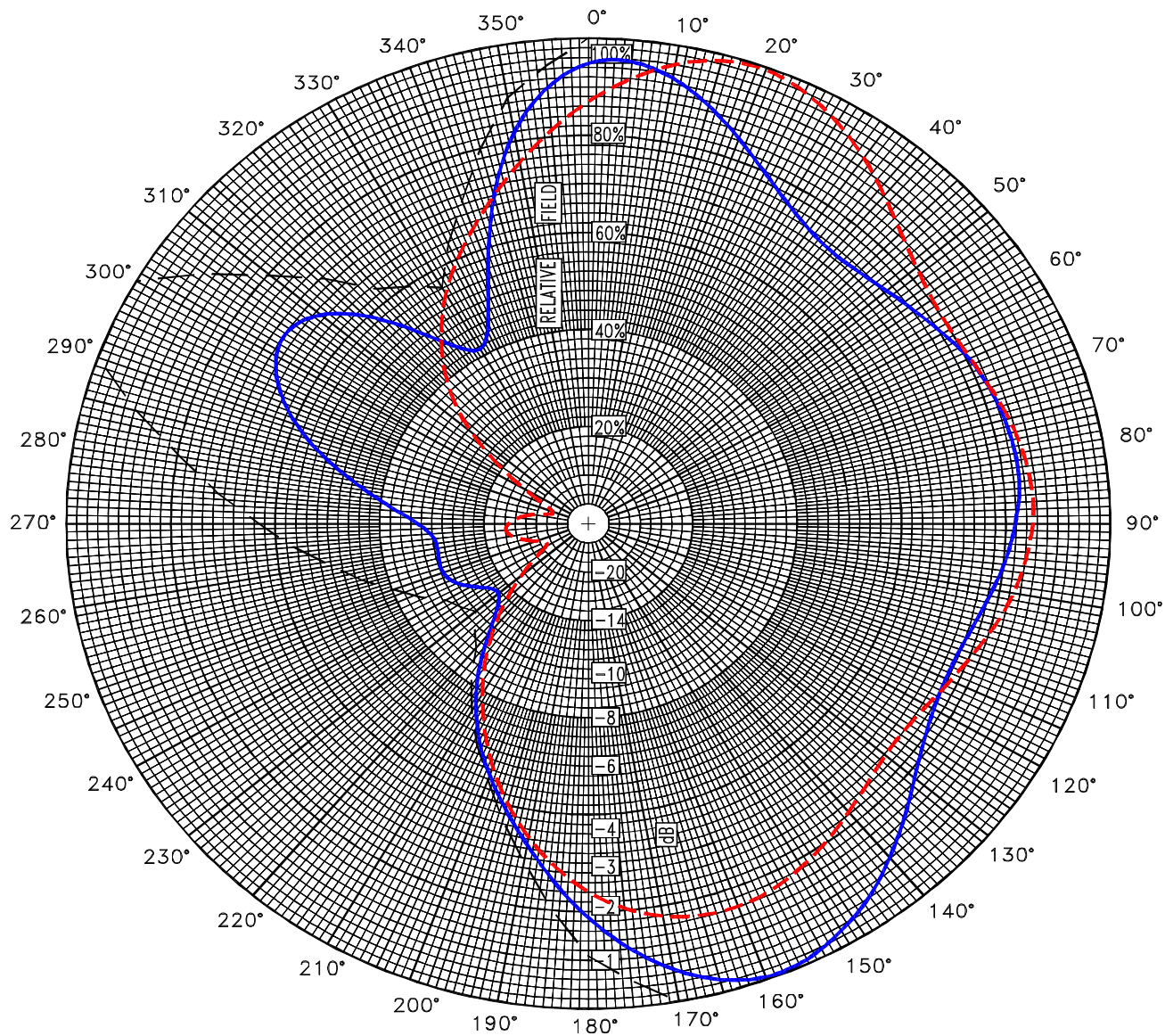
TABULATION OF RELATIVE FIELD

COMPOSITE MEASURED PATTERN (H & V)

<u>BEARING</u>	<u>FIELD</u>	<u>ERP</u> <u>(kW)</u>	<u>dBk</u>
0	0.957	37.54	15.75
10	0.965	38.15	15.81
20	1.000	41.00	16.13
30	0.957	37.56	15.75
40	0.884	32.03	15.06
50	0.821	27.64	14.42
60	0.800	26.21	14.19
70	0.820	27.54	14.40
80	0.847	29.43	14.69
90	0.854	29.92	14.76
100	0.830	28.22	14.51
110	0.786	25.30	14.03
120	0.763	23.90	13.78
130	0.816	27.28	14.36
140	0.900	33.20	15.21
150	0.971	38.65	15.87
160	1.000	41.00	16.13
170	0.936	35.95	15.56
180	0.816	27.29	14.36
190	0.674	18.64	12.71
200	0.555	12.63	11.01
210	0.434	7.73	8.88
220	0.298	3.65	5.62
230	0.219	1.96	2.93
240	0.261	2.79	4.46
250	0.298	3.64	5.61
260	0.292	3.50	5.44
270	0.325	4.33	6.36
280	0.448	8.22	9.15
290	0.600	14.75	11.69
300	0.697	19.90	12.99
310	0.676	18.74	12.73
320	0.523	11.23	10.50
330	0.550	12.40	10.93
340	0.649	17.26	12.37
350	0.830	28.23	14.51

Relative fields at other azimuths:

45	0.847	225	0.245
135	0.859	315	0.613



Azimuth Pattern

Customer: KYCC

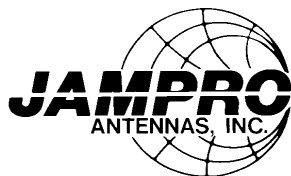
Date: February 1, 2007

Frequency: 90.1 MHz

Type Number: JHPC-6RFR.5CLFM DA

Notes: MEASURED PATTERN IN FULL SCALE

———— HPOL VPOL - - - - LIMITS



(916) 383-1177 Fax: (916) 383-1182

6340 Sky Creek Drive, Sacramento, CA 95828
P.O. Box 292880, Sacramento, CA 95829-2880



6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

KYCC

ERP = 41.00 kW

February 1, 2007

JHPC-6RFR.5CLFM 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	0.957	37.54	0.873	31.23
10	0.936	35.94	0.965	38.15
20	0.846	29.35	1.000	41.00
30	0.762	23.83	0.957	37.56
40	0.727	21.67	0.884	32.03
50	0.746	22.83	0.821	27.64
60	0.785	25.25	0.800	26.21
70	0.819	27.52	0.820	27.54
80	0.833	28.44	0.847	29.43
90	0.819	27.52	0.854	29.92
100	0.788	25.44	0.830	28.22
110	0.758	23.54	0.786	25.30
120	0.763	23.90	0.749	22.97
130	0.816	27.28	0.742	22.56
140	0.900	33.20	0.777	24.73
150	0.971	38.65	0.819	27.47
160	1.000	41.00	0.842	29.09
170	0.936	35.95	0.824	27.86
180	0.816	27.29	0.762	23.84
190	0.674	18.64	0.661	17.90
200	0.555	12.63	0.538	11.88
210	0.434	7.73	0.408	6.83
220	0.298	3.65	0.284	3.31
230	0.219	1.96	0.171	1.20
240	0.261	2.79	0.089	0.33
250	0.298	3.64	0.106	0.46
260	0.292	3.50	0.151	0.93
270	0.325	4.33	0.156	0.99
280	0.448	8.22	0.113	0.52
290	0.600	14.75	0.071	0.21
300	0.697	19.90	0.145	0.87
310	0.676	18.74	0.302	3.75
320	0.523	11.23	0.438	7.86
330	0.401	6.59	0.550	12.40
340	0.568	13.24	0.649	17.26
350	0.830	28.23	0.758	23.56

MAXIMUM FIELDS:

160	1.000	41.00		
20			1	41.00

MINIMUM FIELDS:

230	0.219	1.96		
285			0.068786	0.19

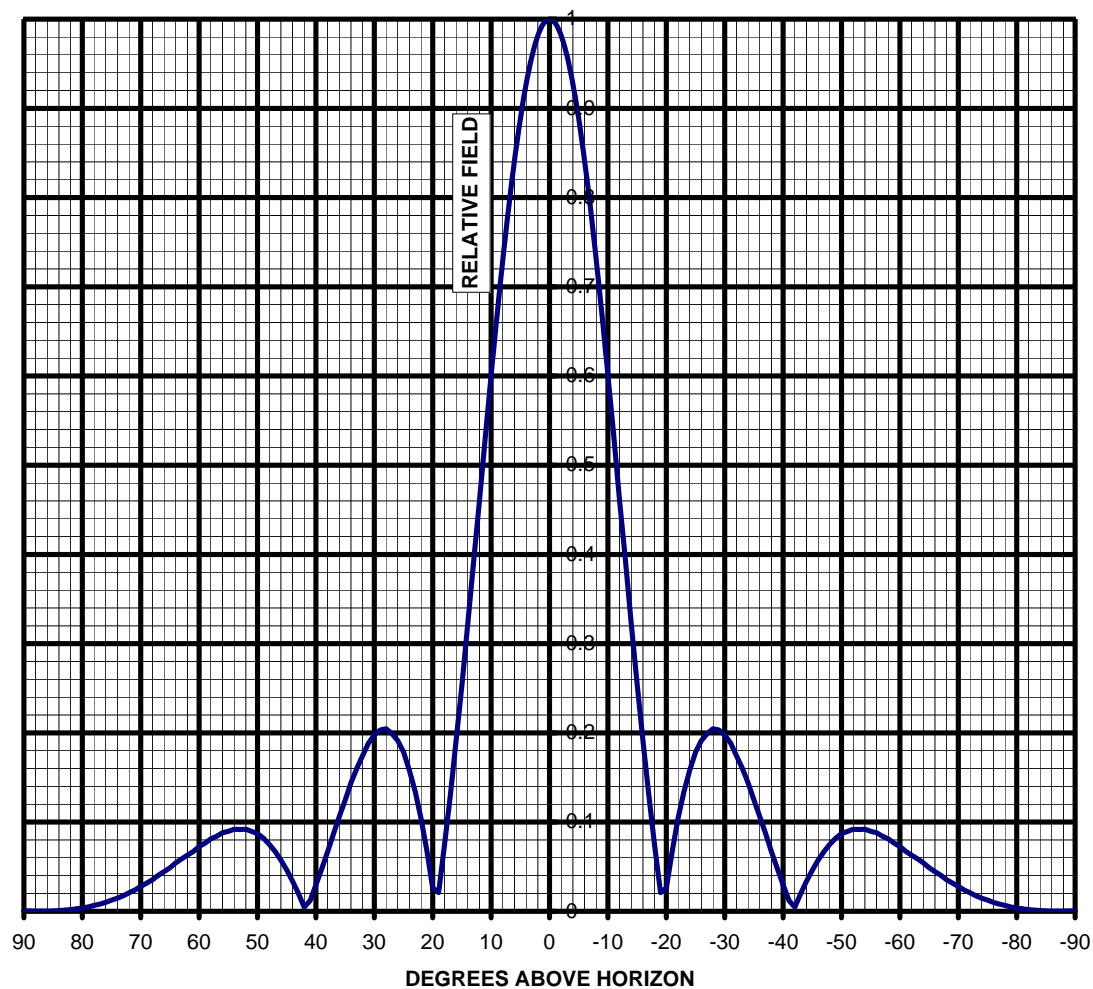


6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

PLOT OF ELEVATION PLANE PATTERN

STATION: KYCC 90.1 MHz JHPC-6RFR.5CLFM DA .50 lambda spacing





6340 Sky Creek Drive, Sacramento, California 95828
P.O. Box 292880, Sacramento, California 95829-2880

(916) 383-1177 FAX (916) 383-1182

TABULATION OF ELEVATION PLANE PATTERN

STATION: KYCC 90.1 MHz JHPC-6RFR.5CLFM DA .50 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	0.601	-25	0.178	-60	0.073
9	0.667	-26	0.191	-61	0.067
8	0.730	-27	0.199	-62	0.063
7	0.789	-28	0.205	-63	0.059
6	0.842	-29	0.203	-64	0.054
5	0.888	-30	0.198	-65	0.049
4	0.927	-31	0.189	-66	0.045
3	0.959	-32	0.175	-67	0.040
2	0.982	-33	0.160	-68	0.035
1	0.995	-34	0.144	-69	0.032
0	1.000	-35	0.125	-70	0.028
-1	0.995	-36	0.106	-71	0.024
-2	0.982	-37	0.087	-72	0.021
-3	0.959	-38	0.067	-73	0.017
-4	0.927	-39	0.048	-74	0.015
-5	0.888	-40	0.030	-75	0.012
-6	0.842	-41	0.012	-76	0.010
-7	0.789	-42	0.005	-77	0.008
-8	0.730	-43	0.020	-78	0.007
-9	0.667	-44	0.034	-79	0.005
-10	0.601	-45	0.046	-80	0.004
-11	0.532	-46	0.057	-81	0.003
-12	0.460	-47	0.067	-82	0.002
-13	0.393	-48	0.075	-83	0.001
-14	0.322	-49	0.082	-84	0.001
-15	0.254	-50	0.087	-85	0.000
-16	0.191	-51	0.089	-86	0.000
-17	0.130	-52	0.092	-87	0.000
-18	0.074	-53	0.092	-88	0.000
-19	0.021	-54	0.092	-89	0.000
-20	0.026	-55	0.090	-90	0.000
-21	0.067	-56	0.088		
-22	0.104	-57	0.084		
-23	0.134	-58	0.081		
-24	0.158	-59	0.076		