

FM DIRECTIONAL BROADCAST ANTENNA
PROOF-OF-PERFORMANCE

MODEL JHPC-4 DA

SERIAL NUMBER 13556

WSRX

Naples, FL



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

EXHIBIT B



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DATE: February 16, 2007

ANTENNA GAIN	<u>H-pol</u>	<u>V-pol</u>
relative	4.48	4.48
(dBd)	(6.51)	(6.51)

RMS OF THE
AZIMUTH PATTERNS:

CERTIFICATION

FM ANTENNA FOR:

STATION: **WSRX**

LOCATION: **Naples, FL**

MODEL NUMBER: **JHPC-4 DA**

FREQUENCY & ERP: **89.5 MHz, 100.00 kW**

ANTENNA INPUT POWER: **22.32 k W**

ANTENNA BOOM HEADING: **295° T.**

Composite	<u>H-pol</u>	<u>V-pol</u>
0.741	0.667	0.702

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 CP 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: **WSRX**

Model: **JHPC-4 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.

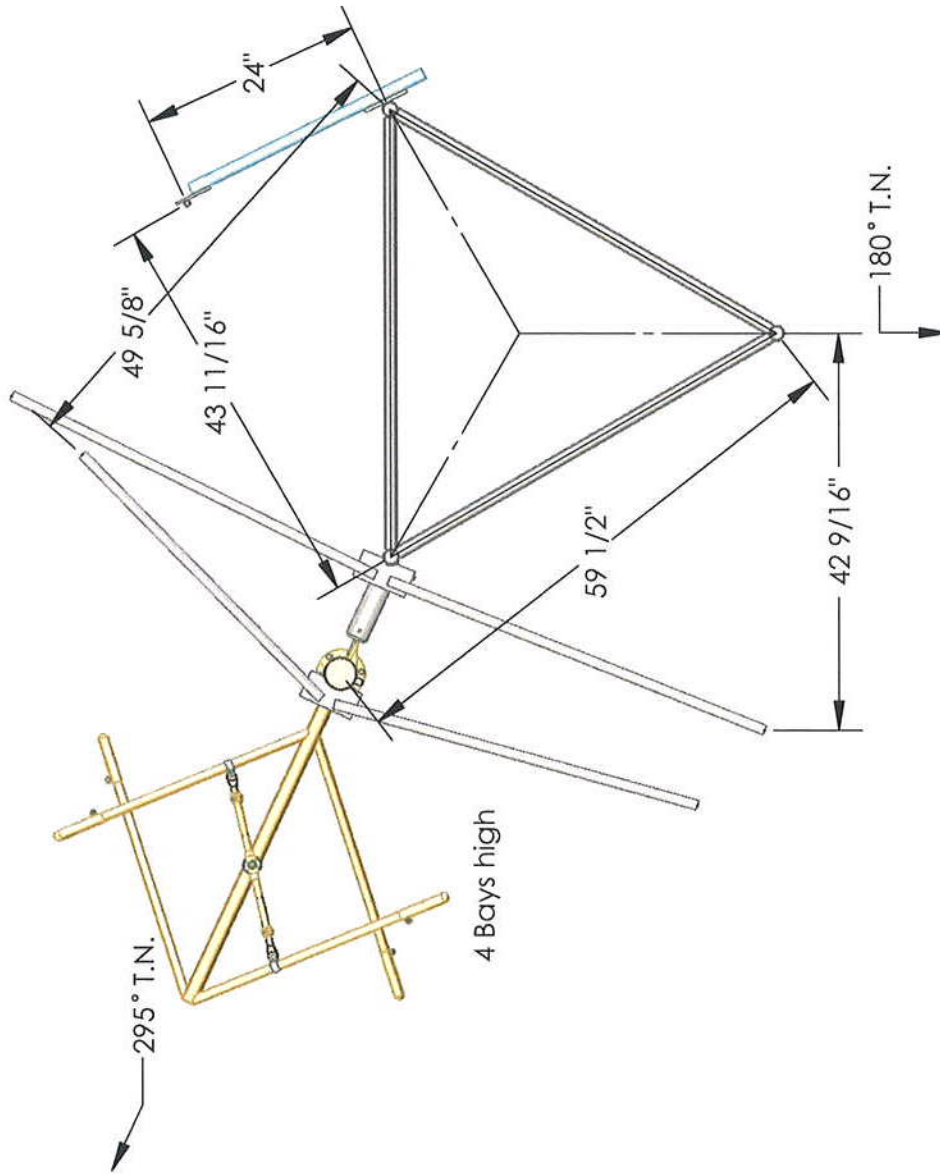
Gain figures and required input power to achieve station ERP, as well as other details, are found on the first page.

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

EXECUTED THIS 16th DAY OF February, 2007

BY:

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



PROPRIETARY AND CONFIDENTIAL
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 DRAWING IS THE SOLE PROPERTY OF
 JAMPRO ANTENNAS. ANY REPRO-
 DUCATION IN PART OR AS A WHOLE
 WITHOUT THE WRITTEN PERMISSION OF
 JAMPRO ANTENNAS IS PROHIBITED.

DIMENSIONS ARE IN INCHES
 UNLESS OTHERWISE NOTED
 TOLERANCES:
 FRACTIONAL: $\pm 1/32"$
 ANGULAR: $MACH \pm .5^\circ$ BEND $\pm 1^\circ$
 TWO PLACE DECIMAL $\pm .01"$
 THREE PLACE DECIMAL $\pm .005"$

COMMENTS:

MATERIAL DESCRIPTION

WEIGHT: 2290.202 lbs. FINISH

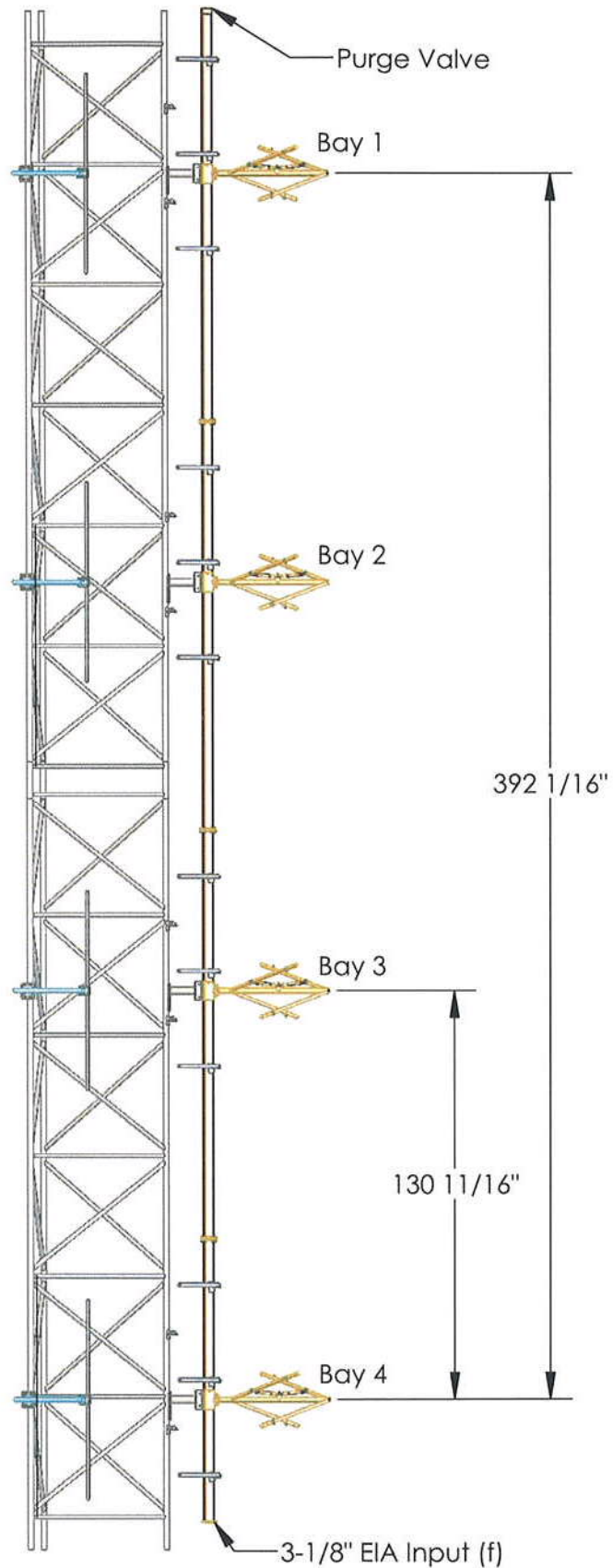
NAME	DATE
SM	31 Jan 2007
DRAWN	
LAST REVISED	
CHECKED	
ENG APPR.	
MFG APPR.	

DO NOT SCALE DRAWING

JAMPRO ANTENNAS
 Assembly

SIZE DWG. NO. **A** 13556-00

REV. SHEET 3 OF 6



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THREE PLACE DECIMAL $\pm .005"$

COMMENTS:

	NAME	DATE
DRAWN	SM	31 Jan 2007
CHECKED		
ENG APPR.		
MFG APPR.		

Jampro Antennas
Assembly

WEIGHT 2290.202 lbs.

FINISH

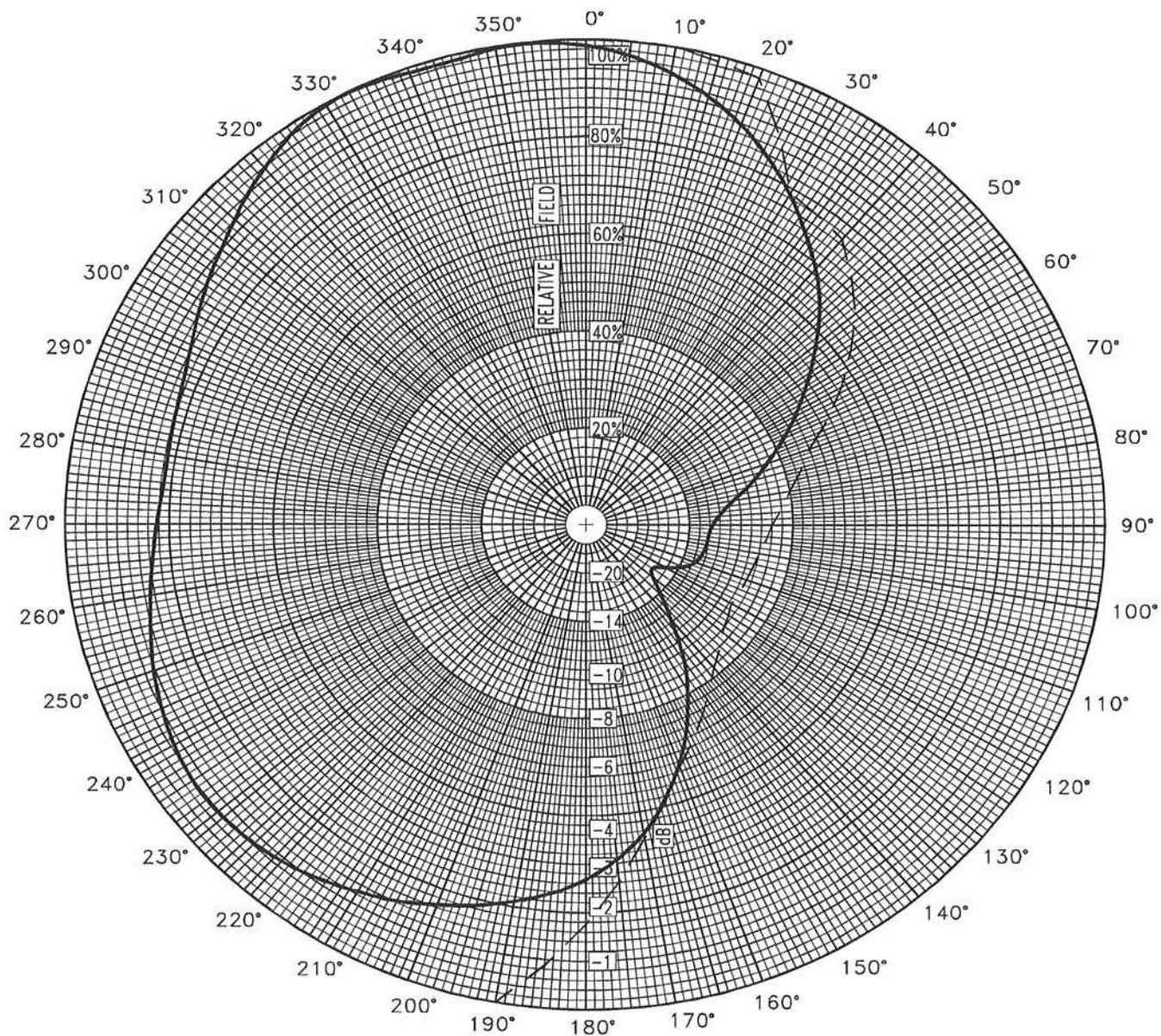
MATERIAL

DESCRIPTION

DO NOT SCALE DRAWING

SIZE DWG. NO. **A** 13556-00

REV. SHEET 1 OF 6



Azimuth Pattern

Customer: WSRX

Date: January 25, 2007

Frequency: 89.5 MHz

Type Number: JHPC-4 DA

Notes:

COMPOSITE PATTERN ENVELOPE (H & V)



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WSRX

ERP = 100.00 kW

January 25, 2007

JHPC-4 DA

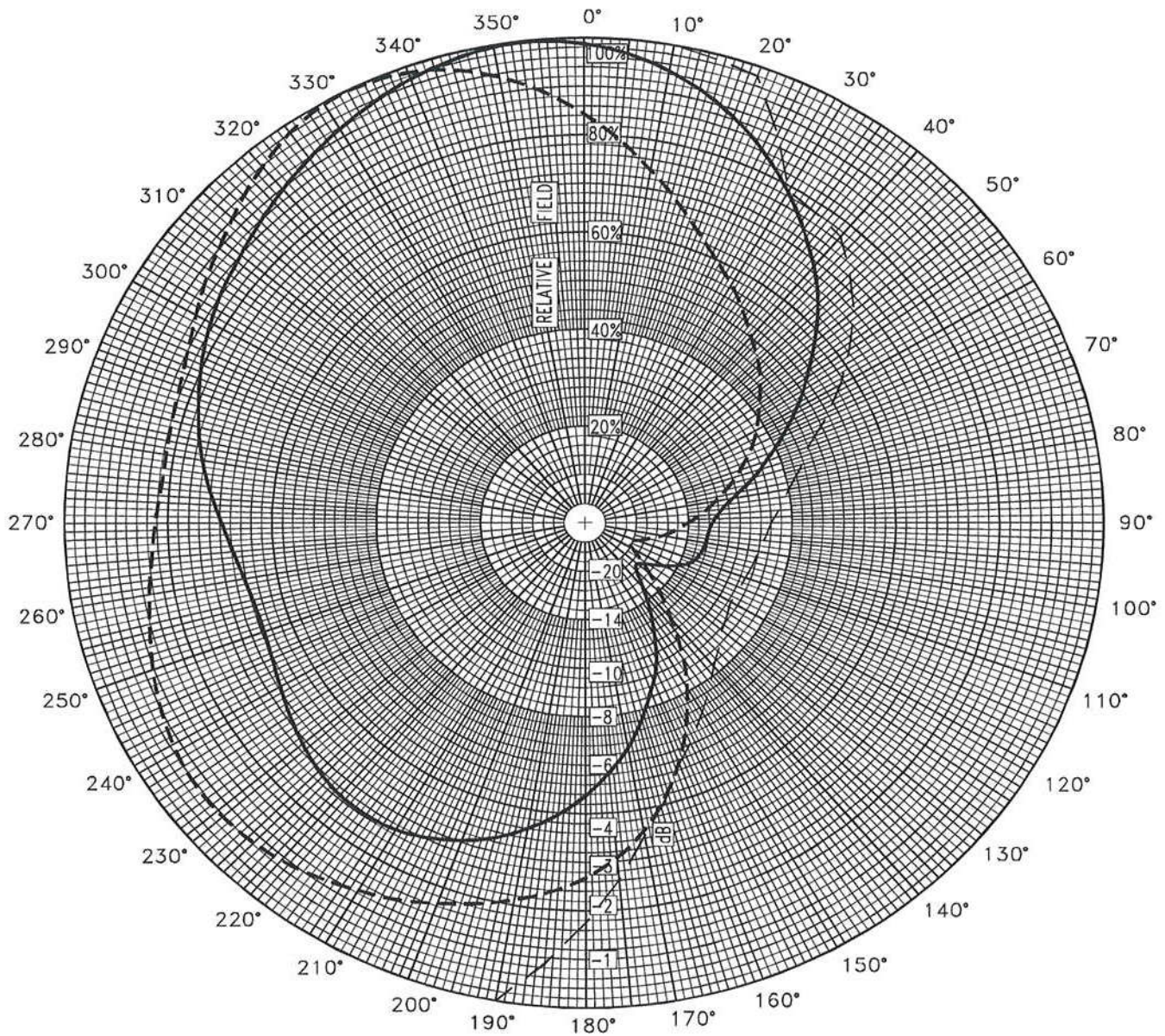
TABULATION OF RELATIVE FIELD

COMPOSITE MEASURED PATTERN (H & V)

<u>BEARING</u>	<u>FIELD</u>	<u>ERP</u> <u>(kW)</u>	<u>dBk</u>
0	0.990	97.96	19.91
10	0.948	89.90	19.54
20	0.880	77.36	18.89
30	0.790	62.41	17.95
40	0.692	47.95	16.81
50	0.582	33.90	15.30
60	0.475	22.56	13.53
70	0.374	14.02	11.47
80	0.288	8.32	9.20
90	0.244	5.97	7.76
100	0.237	5.61	7.49
110	0.226	5.13	7.10
120	0.177	3.13	4.96
130	0.165	2.72	4.35
140	0.255	6.50	8.13
150	0.395	15.60	11.93
160	0.530	28.09	14.49
170	0.650	42.25	16.26
180	0.735	54.02	17.33
190	0.790	62.41	17.95
200	0.835	69.72	18.43
210	0.875	76.56	18.84
220	0.910	82.81	19.18
230	0.925	85.56	19.32
240	0.915	83.72	19.23
250	0.885	78.32	18.94
260	0.850	72.25	18.59
270	0.825	68.06	18.33
280	0.815	66.42	18.22
290	0.825	68.06	18.33
300	0.860	73.96	18.69
310	0.905	81.90	19.13
320	0.960	92.16	19.65
330	1.000	100.00	20.00
340	0.990	98.01	19.91
350	0.999	99.87	19.99

Relative fields at other azimuths:

45	0.643	225	0.920
135	0.210	315	0.935



Azimuth Pattern

Customer: WSRX

Date: January 25, 2007

Frequency: 89.5 MHz

Type Number: JHPC-4 DA

Notes: MEASURED PATTERN IN FULL SCALE

HPOL VPOL ---- LIMITS



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WSRX

ERP = 100.00 kW

January 25, 2007

JHPC-4 DA

TABULATION OF MEASURED FIELDS

BEARING	HORIZONTAL POLARIZATION		VERTICAL POLARIZATION	
	FIELD	ERP(kW)	FIELD	ERP(kW)
0	0.990	97.96	0.845	71.40
10	0.948	89.90	0.740	54.76
20	0.880	77.36	0.640	40.96
30	0.790	62.41	0.570	32.49
40	0.692	47.95	0.500	25.00
50	0.582	33.90	0.445	19.80
60	0.475	22.56	0.385	14.82
70	0.374	14.02	0.320	10.24
80	0.288	8.32	0.255	6.50
90	0.244	5.97	0.200	4.00
100	0.237	5.61	0.155	2.40
110	0.226	5.13	0.110	1.21
120	0.177	3.13	0.110	1.21
130	0.125	1.57	0.165	2.72
140	0.175	3.06	0.255	6.50
150	0.269	7.24	0.395	15.60
160	0.369	13.62	0.530	28.09
170	0.474	22.43	0.650	42.25
180	0.565	31.91	0.735	54.02
190	0.641	41.13	0.790	62.41
200	0.698	48.70	0.835	69.72
210	0.733	53.74	0.875	76.56
220	0.735	54.01	0.910	82.81
230	0.709	50.29	0.925	85.56
240	0.677	45.80	0.915	83.72
250	0.655	42.97	0.885	78.32
260	0.663	43.91	0.850	72.25
270	0.696	48.49	0.825	68.06
280	0.746	55.62	0.815	66.42
290	0.788	62.04	0.825	68.06
300	0.828	68.61	0.860	73.96
310	0.859	73.86	0.905	81.90
320	0.899	80.86	0.960	92.16
330	0.939	88.10	1.000	100.00
340	0.976	95.20	0.990	98.01
350	0.999	99.87	0.935	87.42
MAXIMUM FIELDS:				
350	0.999	99.87		
335			1	100.00
MINIMUM FIELDS:				
130	0.125	1.57		
115			0.08	0.64

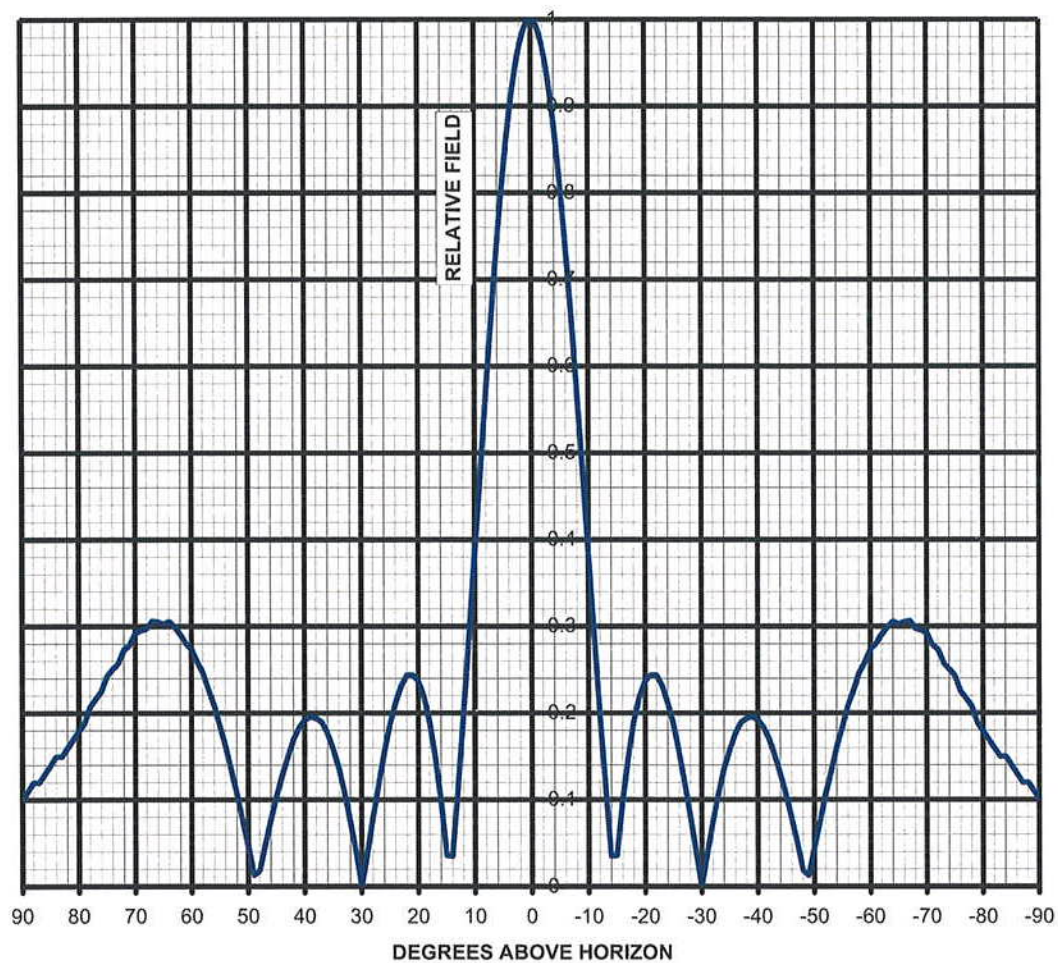


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PLOT OF ELEVATION PLANE PATTERN

STATION: WSRX 89.5 MHz JHPC-4 DA 1.00 lambda spacing





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TABULATION OF ELEVATION PLANE PATTERN

STATION: WSRX 89.5 MHz JHPC-4 DA 1.00 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	0.385	-25	0.187	-60	0.274
9	0.479	-26	0.155	-61	0.280
8	0.572	-27	0.119	-62	0.291
7	0.661	-28	0.081	-63	0.299
6	0.743	-29	0.040	-64	0.306
5	0.817	-30	0.000	-65	0.302
4	0.880	-31	0.039	-66	0.305
3	0.932	-32	0.075	-67	0.306
2	0.969	-33	0.107	-68	0.297
1	0.992	-34	0.136	-69	0.295
0	1.000	-35	0.158	-70	0.292
-1	0.992	-36	0.176	-71	0.278
-2	0.969	-37	0.189	-72	0.273
-3	0.932	-38	0.194	-73	0.257
-4	0.880	-39	0.196	-74	0.250
-5	0.817	-40	0.192	-75	0.243
-6	0.743	-41	0.183	-76	0.225
-7	0.661	-42	0.170	-77	0.216
-8	0.572	-43	0.150	-78	0.208
-9	0.479	-44	0.129	-79	0.188
-10	0.385	-45	0.105	-80	0.179
-11	0.291	-46	0.078	-81	0.169
-12	0.199	-47	0.049	-82	0.160
-13	0.114	-48	0.018	-83	0.150
-14	0.035	-49	0.013	-84	0.150
-15	0.036	-50	0.045	-85	0.140
-16	0.098	-51	0.075	-86	0.130
-17	0.149	-52	0.106	-87	0.120
-18	0.190	-53	0.134	-88	0.120
-19	0.219	-54	0.162	-89	0.110
-20	0.237	-55	0.185	-90	0.100
-21	0.244	-56	0.209		
-22	0.244	-57	0.227		
-23	0.232	-58	0.246		
-24	0.212	-59	0.259		