
JAMPRO ANTENNAS, INC.

WXVS-FM

JSCP-6D-DA

90.1 MHZ

DECEMBER 18, 2007

SERIAL NUMBER 14156





INTRODUCTION

JAMPRO JSCP-series shunt-fed FM antenna is one of the finest available to the broadcast industry. It is available on any standard U.S. FM channel (88.1 to 107.9 MHz).

The antenna has been factory tuned to a VSWR (Voltage Standing Wave Ratio) of 1.1:1 or better on a support structure simulating the structure on which the antenna will be finally mounted. A copy of the factory-measured VSWR is contained in this manual.

The azimuth circularity of an antenna when side mounted on a support structure is subject to wide variation. The JSCP radiating element circularity is ± 1.0 dB in free space; the novel radiating element design of the JSCP antenna minimizes the non-circularity of the antenna caused by mounting. Typically, circularity variations are less than ± 2 dB for mounting on up to a 30-inch face tower.

The JSCP antenna system consists of low-impedance shunt fed radiating elements (bays), each attached to a section of 3-1/8 inch transmission line, which provides power distribution and mechanical support to the elements. The line sections are attached to the support structure with hot dip galvanized steel brackets.

The JSCP radiating elements each consist of a two inch diameter support boom with one inch diameter radiating arms. The element feed system is pressurized out to the white Teflon element feed through. The antenna system input impedance is 50 ohms, fed into a 3-1/8 inch EIA female connector at the location specified on the elevation view drawing contained in this manual.



ANTENNA SPECIFICATIONS

MODEL: JSCP-6D-DA

SERIAL NO: 14156

ELECTRICAL SPECIFICATIONS

FREQUENCY: 90.1 MHz.

POLARIZATION: Circular

AZIMUTH PATTERN: Directional

GAIN: 6.32x (8.01 dBd) Hpol
6.22x (7.94 dBd) Vpol

BEAM TILT: 0.0°

NULL FILL: 0%

INPUT POWER: 20 kW avg., max

INPUT IMPEDANCE: 50 ohms, nominal

MAXIMUM VSWR: 1.1:1 over $F_c \pm .200$ MHz.

ELECTRICAL DE-ICER: 3000W @ 240 VAC
2250W @ 208 VAC

INPUT CONNECTION: EIA 3-1/8" Female, flanged

MECHANICAL/ENVIRONMENTAL SPECIFICATIONS

WEIGHT: 535 lbs. (245 kg), no ice
885 lbs (400 kg) 1/2" ice

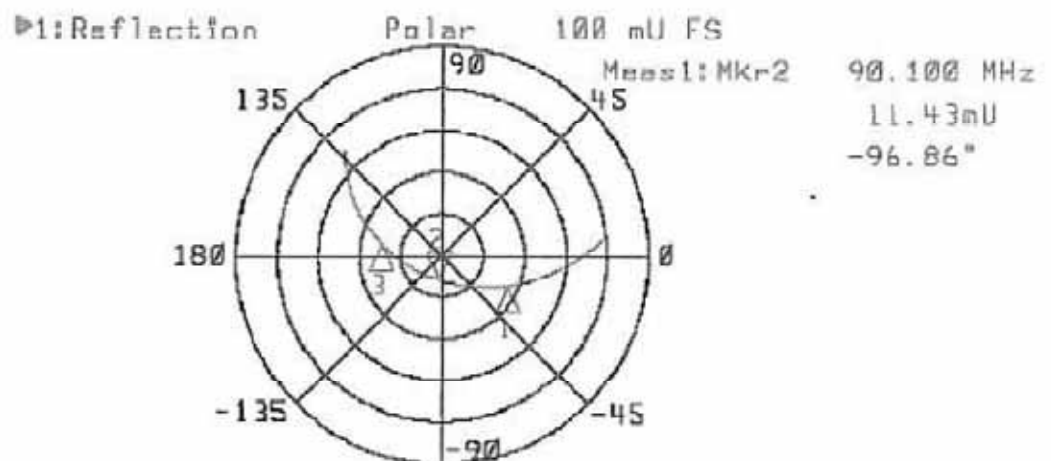
WIND SHEAR: 935 lbs. (425 kg), no ice
1440 lbs (655 kg) 1/2" ice, per RS-222F

PRESSURIZATION: 10 psi max, 3-5 psi operating

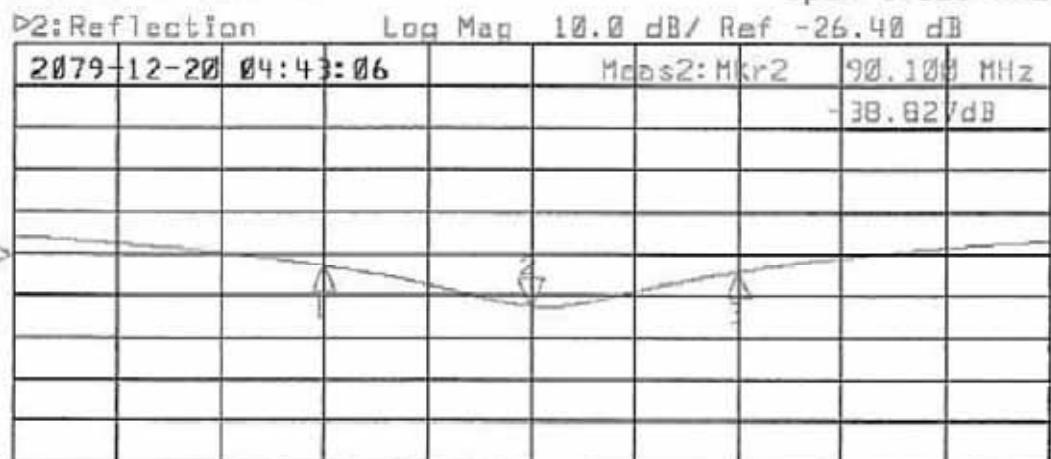
ANTI-ICING PROTECTION: Electrical De-icers w/ JI-25 Controller



IMPEDANCE DATA PLOT



Center 90.100 MHz Span 1.000 MHz



Center 90.100 MHz Span 1.000 MHz

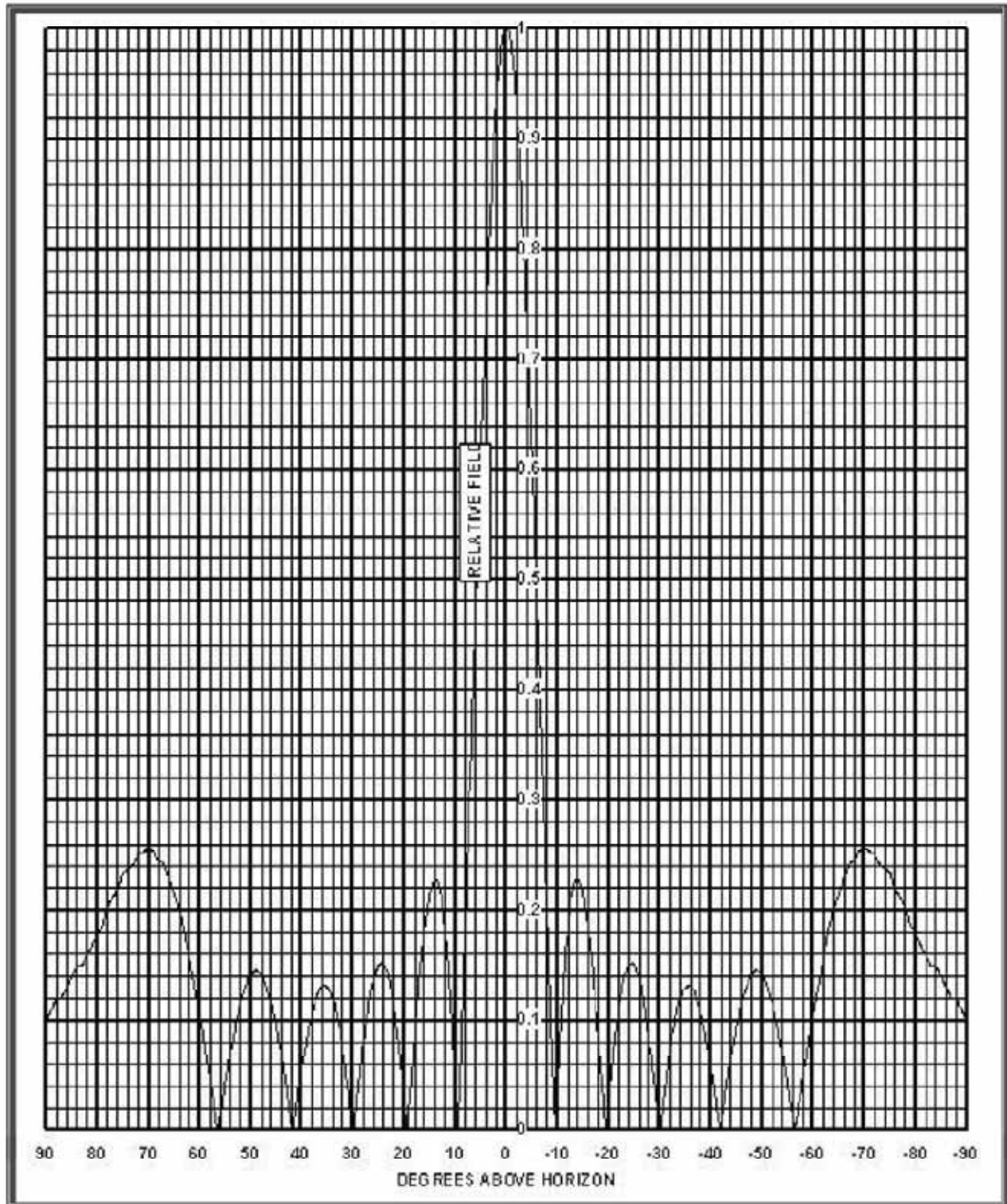
1: Mkr (MHz)	U	Deg	2: Mkr (MHz)	dB
1: 89.900	35.33m	-23.32	1: 89.9000	-29.036
2: 90.100	11.43m	-96.86	2: 90.1000	-38.827
3: 90.300	29.93m	167.9	3: 90.3000	-30.478



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ELEVATION PATTERN

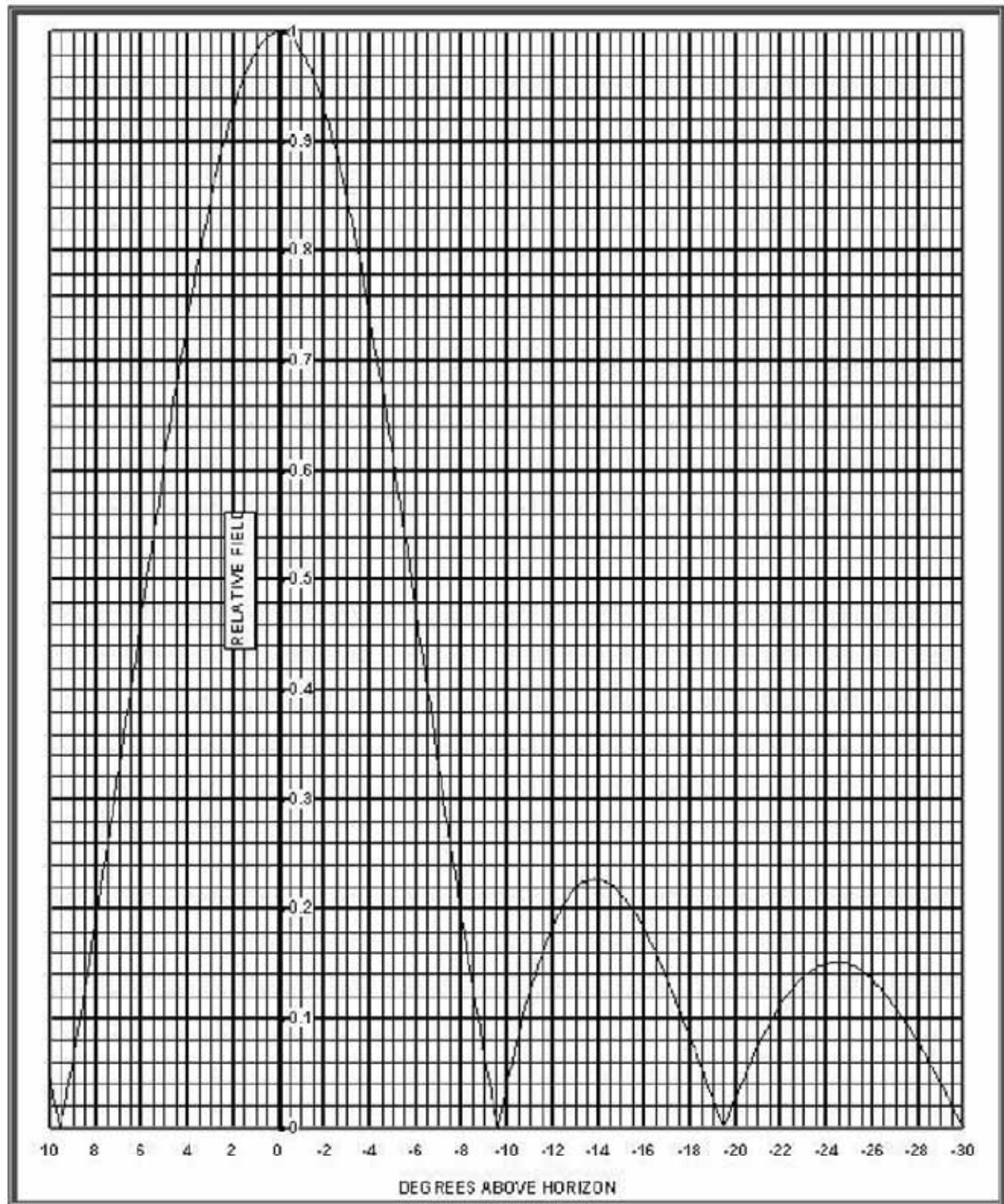




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EXPANDED ELEVATION PATTERN





ELEVATION PATTERN TABULATION

RELATIVE FIELD VS ELEVATION ANGLE

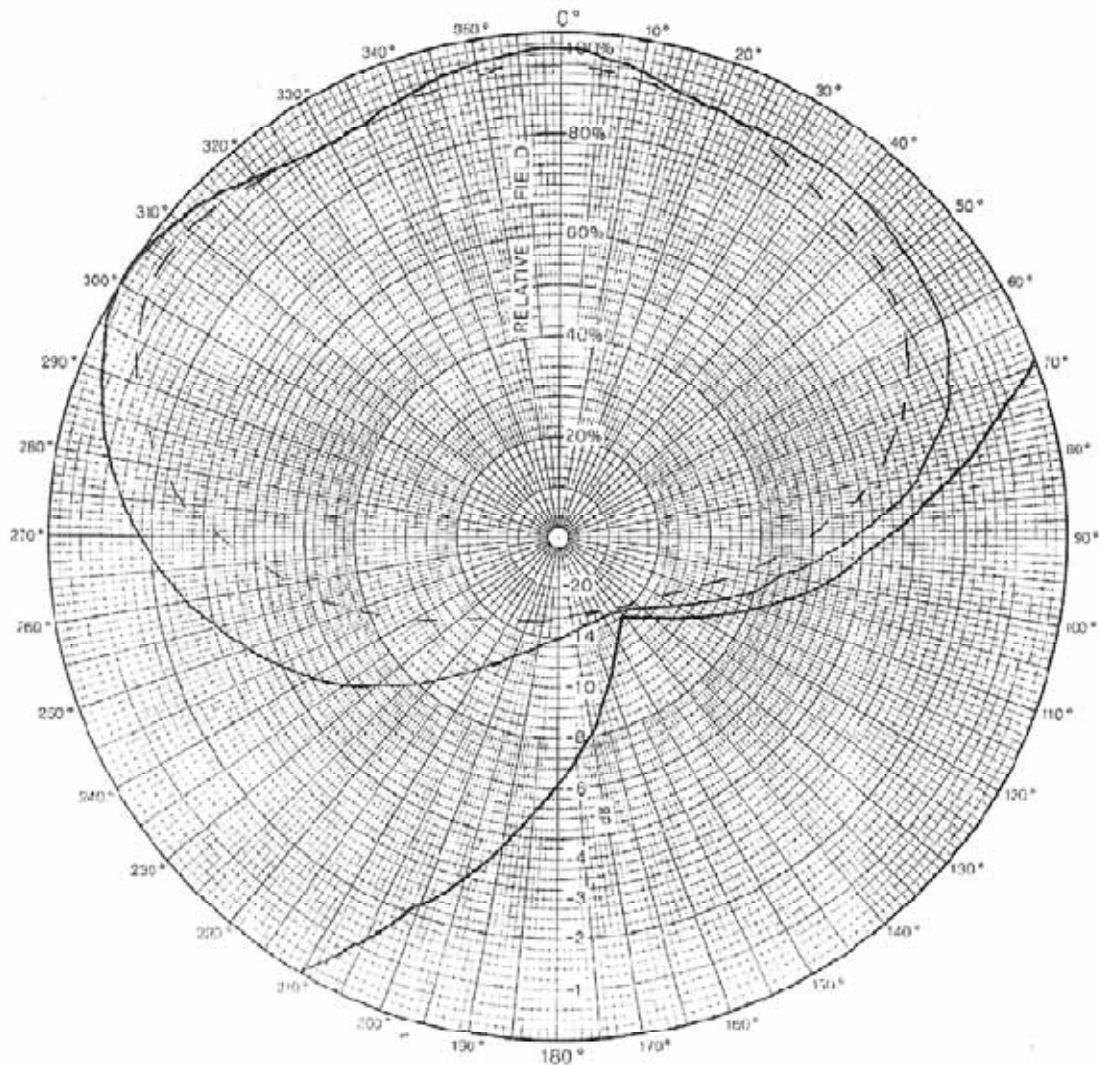
<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>	<u>ELEVATION ANGLE</u>	<u>RELATIVE FIELD</u>
10	0.041	-26	0.136	-61	0.131
9	0.068	-27	0.110	-62	0.167
8	0.192	-28	0.078	-63	0.180
7	0.329	-29	0.040	-64	0.201
6	0.472	-30	0.000	-65	0.214
5	0.611	-31	0.039	-66	0.229
4	0.739	-32	0.072	-67	0.242
3	0.847	-33	0.100	-68	0.246
2	0.930	-34	0.120	-69	0.252
1	0.982	-35	0.130	-70	0.257
0	1.000	-36	0.131	-71	0.251
-1	0.982	-37	0.124	-72	0.252
-2	0.930	-38	0.107	-73	0.241
-3	0.847	-39	0.085	-74	0.238
-4	0.739	-40	0.057	-75	0.234
-5	0.611	-41	0.026	-76	0.218
-6	0.472	-42	0.006	-77	0.212
-7	0.329	-43	0.038	-78	0.204
-8	0.192	-44	0.068	-79	0.186
-9	0.068	-45	0.094	-80	0.178
-10	0.041	-46	0.116	-81	0.169
-11	0.128	-47	0.132	-82	0.159
-12	0.185	-48	0.142	-83	0.150
-13	0.219	-49	0.145	-84	0.150
-14	0.227	-50	0.142	-85	0.140
-15	0.213	-51	0.131	-86	0.130
-16	0.182	-52	0.116	-87	0.120
-17	0.136	-53	0.094	-88	0.120
-18	0.083	-54	0.071	-89	0.110
-19	0.026	-55	0.043	-90	0.100
-20	0.028	-56	0.013		
-21	0.076	-57	0.017		
-22	0.114	-58	0.048		
-23	0.139	-59	0.077		
-24	0.151	-60	0.106		
-25	0.150				



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AZIMUTH PATTERN



Azimuth pattern

Customer WXGA-FM

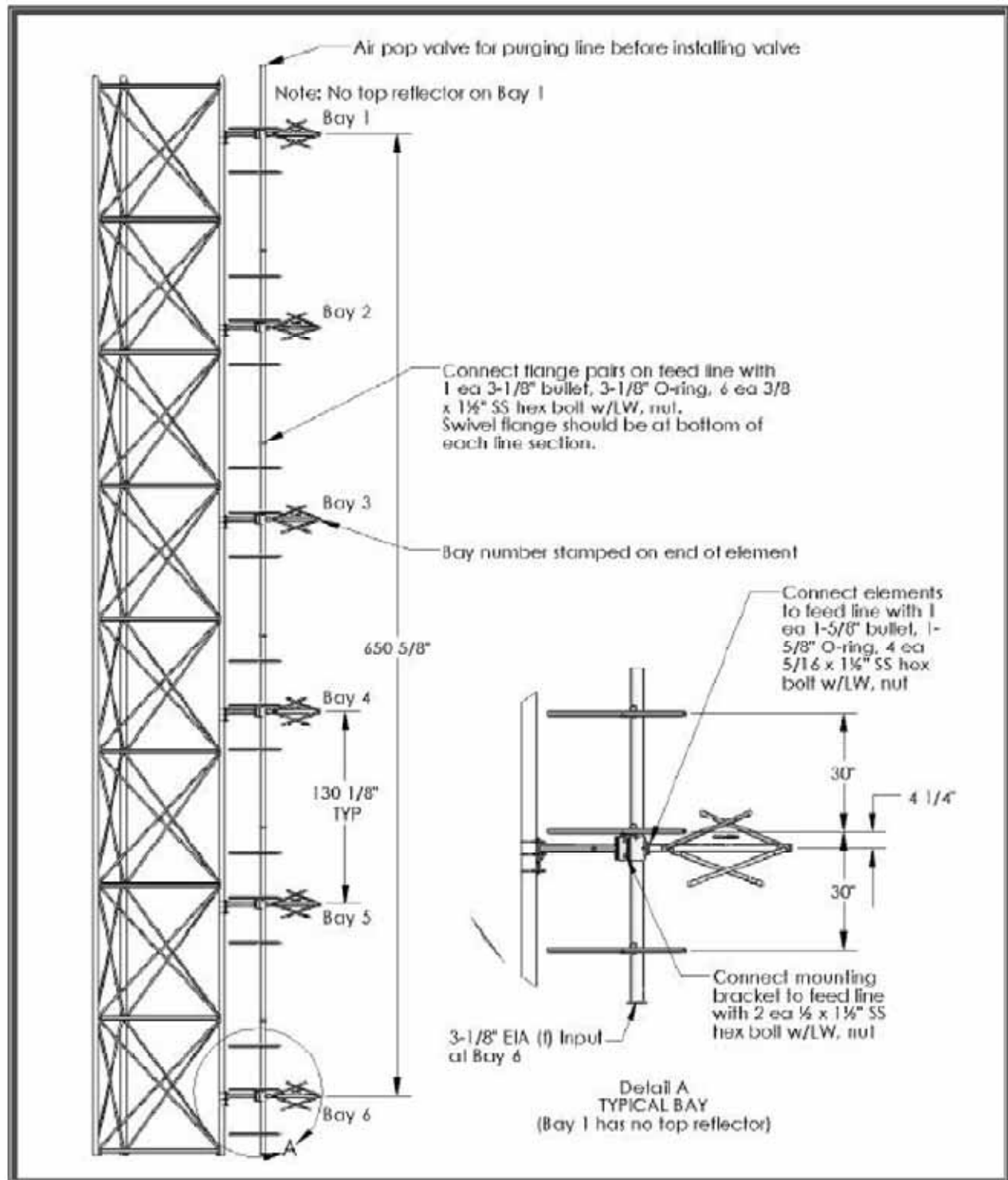
Date 2-11-86 Frequency 90.1

Notes Final measured pattern.



Cetec Antennas

SIDE VIEW

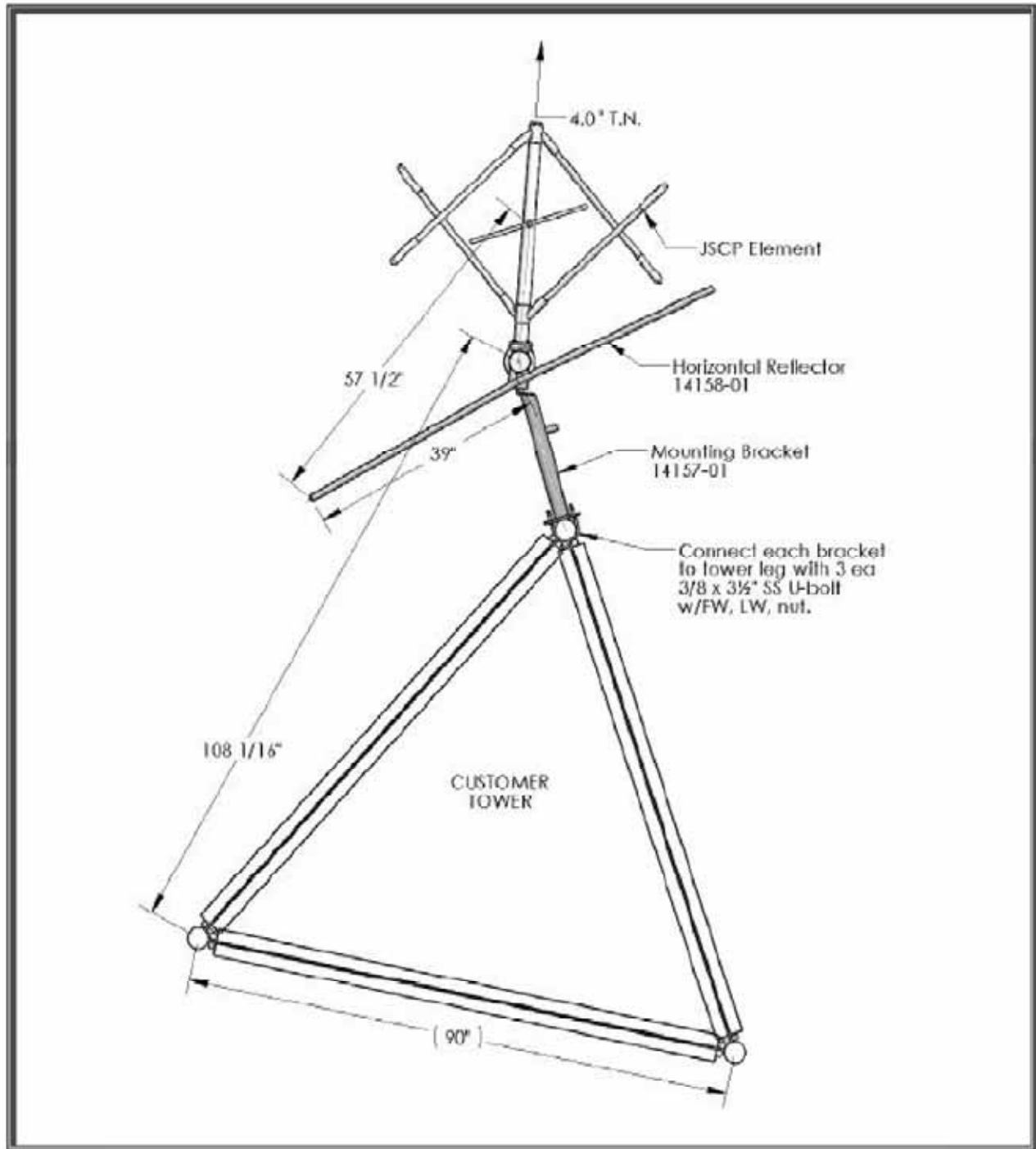




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TOP VIEW





ANTENNA ELEMENT TUNING

The JSCP antenna elements include provisions for fine tuning in the field, if necessary. First, it should be determined that indicated VSWR, if excessive, is not due to faulty installation or a defective transmission line. The line should be terminated in a high-quality 50 ohm load with a return loss of 40dB or more. This requirement normally excludes standard transmitter dummy loads, which may have a VSWR of 1.1:1 to 1.5:1 themselves. The VSWR should then be checked using adequate test equipment, such as a sweeper with CRT display or a precision generator with meter indication. A high-quality directional coupler with a directivity equal to or in excess of 40 dB should be used to properly sample the reflected power.

A properly operating transmitter-reflectometer arrangement may be used in lieu of the above to indicate relative antenna reflected power for tuning, but it will not be possible to read actual reflected power or VSWR of the antenna system due to residual error in the reflectometer system.

This residual error can be from three main sources. The first involves the placement of the reflectometer, which should be after the harmonic filter. If the reflectometer is located between the transmitter and harmonic filter, the reflectometer will indicate harmonic energy reflected back from the filter, which will cause a higher than actual reading. The second source can be spurious emissions, including harmonics that may be reflected back from the antenna system. The transmitter output should be clean of any parasitics. The third source is the inherent lack of high directivity of most transmitter reflectometers. Most reflectometers do not have better than 30 dB of directivity, which means a "perfect" 50 ohm load (1.0:1 VSWR) would indicate a VSWR of 1.07:1 or so.

To properly tune the antenna using the transmitter reflectometer check and record the VSWR before any tuning is done, with the reflectometer calibrated to the forward reading. Next, expand this reflected reading by increasing the gain to the meter (maximum reading) in order to see small changes in reflected power during tuning, again recording the reading. Then shut off the transmitter and follow the tuning procedures below. Finally, recalibrate the meter for a final check.

To tune the elements, first loosen and slide all four element tuning caps, which are clamped by a 7/16 inch hex head bolt and lock nut, outward 1/8 of an inch. Be sure that the climber is out of (below) the antenna aperture, and check the VSWR. If the VSWR has decreased, the caps should be again moved outward 1/8 inch. If the VSWR has increased, the direction is wrong and the caps should be moved 1/4 inch inward. After the first improvement, the caps should be moved 1/8 inch each time and the results written down for comparison. A point will be reached when the VSWR will start to go up again. Go back to the minimum setting and securely clamp the caps. If the VSWR reading is not changing, or can not be read, stop the



procedure at that point, recalibrate if using the transmitter reflectometer, and check the VSWR. Check the entire 400 kHz channel with sweep gear or generator, if possible.

During the tuning procedure all caps should be moved the same amount. The brass element arms have been scribed for the factory tuning setting so that if any confusion arises all arms can be set back to the original factory setting. Be sure that the rigger is out of the antenna array when checking the VSWR, especially with the transmitter. Be doubly sure that all caps are securely locked down when tuning is completed.



RF COUPLING TO MOUNTING STRUCTURES

Side mounted FM antennas, directional or omni-directional, strongly interact with the mounting structure. This RF interaction is especially stronger in the area in the extended aperture (physical aperture with 5 foot extension in top and bottom). Strong RF coupling results in high potential spots throughout this extended aperture. These high potential spots, if close proximity, are potential arcing points. To prevent occurrence of such arcing it is important all lines; including transmission lines, conduits, waveguides, and/or any floating vertical metallic runs (with or without insulation) be grounded to the tower along the line at approximately 3 foot intervals. Non compliance may result in RF burns and other damages in the lines. It is the responsibility of the customer to take appropriate actions leading to compliance with this matter.

WARNING

THIS ANTENNA, SUPPLIED BY JAMPRO ANTENNAS, HAS CERTAIN DEAD AND LIVE LOADS WHICH ARE INDICATED IN THE CATALOG. IT IS THE PURCHASER'S RESPONSIBILITY TO DETERMINE IF THE SUPPORTING STRUCTURE (TOWER, MAST, POLE, ETC.) CAN SAFELY HOLD THIS ANTENNA, TOGETHER WITH IT'S TRANSMISSION LINE, IN THE WINDS, SNOW, AND ICE CONDITIONS WHICH MAY PREVAIL. IT IS STRONGLY SUGGESTED BY JAMPRO ANTENNAS THAT A STRUCTURAL ENGINEER BE CONSULTED BY THE CUSTOMER TO DETERMINE THE OVERALL STRUCTURAL SAFETY OF THE INSTALLATION, WITH THE ADDITION OF THE ANTENNA SYSTEM.

WARNING

THIS ANTENNA SYSTEM, WHEN ENERGIZED BY AN R.F. TRANSMITTER, CAN PRESENT POTENTIALLY LETHAL HIGH VOLTAGE AND A HIGH INTENSITY R.F. FIELD IN ITS VICINITY. CARE SHOULD BE TAKEN TO NOT TOUCH OR OTHERWISE CONTACT THE ANTENNA SYSTEM WHEN ENERGIZED. IT IS NOT ADVISABLE TO BE IN THE ANTENNA APERTURE WHILE THE ANTENNA SYSTEM IS ENERGIZED. ALL MAINTENANCE OR REPAIRS SHOULD BE DONE WITH THE PRIMARY VOLTAGE TO THE TRANSMITTER DISCONNECTED AND ALL TRANSMITTER REMOTE CONTROLS DISABLED.

THE WARRANTY IS VOID IF THE SYSTEM IS NOT PRESSURIZED AT ALL TIMES.
IF EVIDENCE OF MOISTURE IS FOUND INSIDE THE ANTENNA COMPONENTS,
THIS WILL VOID THE ANTENNA WARRANTY.



damages or expenses, including without limitation injury to persons or property, loss of use of the product, riggers costs (including without limitation standby fees, move-on and move-off charges, and seasonal or overtime differentials), costs of installation of any tower or related equipment, loss of broadcast revenue, loss of station license or loss of goodwill. In addition, JAMPRO ANTENNAS, INC. shall not be liable to the customer for any costs or expenses incurred in removing or reinstalling the antenna, or for engineers, consultants, or other parties hired or engaged by the customer to evaluate, test or analyze the products supplied by JAMPRO ANTENNAS, INC. or their performance.

JAMPRO ANTENNAS, INC. shall not be liable for incidental exemplary, special, or consequential damages in any action based on tortuous acts or omissions by JAMPRO ANTENNAS, INC. in any way related to this agreement.

JAMPRO ANTENNAS, INC. and customer knowledge that such lack of liability, without limiting the generality of the foregoing, includes lack of liability for any loss of actual or anticipated revenue or profits, loss of air time, loss of actual or anticipated value of the business of either party and damages to the business reputation of either party to this agreement.

9. NO OTHER WARRANTIES MADE

This Limited Warranty is in lieu of all other express or implied warranties of JAMPRO ANTENNAS, INC. and JAMPRO does not assume, nor does it authorize any person to assume on its behalf, any other obligation or liability, either verbally or in writing.

10. OTHER RIGHTS

This Limited Warranty gives you specific legal rights. You may also have other rights, which may vary from state to state or country to country.

By affixing their signature below, customer warrants that he or she has read and understood this agreement and agrees that JAMPRO ANTENNAS, INC. will not be liable to Customer for the failure of the FCC directional antenna and pattern optimization service to achieve the radiation pattern desired at the Customer's broadcast site. Customer further understands that this document is intended to limit JAMPRO ANTENNAS, INC.'s obligations and liability to customer and to delineate the mutual obligations and expectations of customer and JAMPRO ANTENNAS, INC.

DATE: December 17, 2007 CUSTOMER NAME: _____

COMPANY: Georgia Public Tel. Comm. TITLE: _____