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S.O. 22859

Report of Test 6810-6-DA

for

CLEAR CHANNEL BROADCASTING LICENSES, INC.

WOLL 105.5 MHZ HOBE SOUND, FL

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-6-DA to meet the needs of WOLL and to comply with the requirements of the FCC construction permit, file number BPH-20020313AAQ. The WOLL antenna is to be added to the pole that WWLV is on. The WOLL antenna did not adversely affect the directional pattern of WWLV.

RESULTS:

The measured azimuth pattern for the 6810-6-DA is shown in Figure 1. Figure 1A shows the Tabulation of the Horizontal Polarization. Figure 1B shows the Tabulation of the Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BPH-20020313AAQ indicates that the Horizontal radiation component shall not exceed 50 kW at any azimuth and is restricted to the following values at the azimuths specified:

250 - 260 Degrees T: 12.5 kW

From Figure 1, the maximum radiation of the Horizontal component occurs at 147 Degrees T to 189 Degrees T and at 350 Degrees T to 038 Degrees T. At the restricted azimuth of 250 - 260 Degrees T the Horizontal component is 6.375 dB down from the maximum of 50 kW, or 11.5 kW.

The R.M.S. of the Horizontal component is 0.792. The total Horizontal power gain is 5.589. The R.M.S. of the Vertical component is 0.741. The total Vertical power gain is 5.480. See Figure 4 for calculations. The measured composite pattern has an R.M.S. value of 0.796. The R.M.S. of the FCC composite pattern is 0.934. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-6-DA was mounted on a pole of exact scale to a Tower Works mast at the WOLL site. The WWLV antenna does affect the pattern of the WOLL antenna and was in place at the time of the testing. The spacing of the antenna to the pole was varied and vertical parasitic elements were added to achieve the vertical pattern shown in Figure 1. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BPH-20020313AAQ, a single level of the 6810-6-DA was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

SUPERVISION:

Mr. Surette was graduated from Lowell Technological Institute, Lowell, Massachusetts in 1973 with the degree of Bachelor of Science in Electrical Engineering. He has been directly involved with design and development of broadcast antennas, filter systems and RF transmission components since 1974, as an RF Engineer for six years with the original Shively Labs in Raymond, ME and for a short period of time with Dielectric Communications. He is currently an Associate Member of the AFCCE and a Senior Member of IEEE. He has authored a chapter on filters and combining systems for the latest edition of the CRC Electronics Handbook and for the 9th Edition of the NAB Handbook.

EQUIPMENT:

The scale model pattern range consists of a wooden rotating pedestal equipped with a position indicator. The scale model bay is placed on the top of this pedestal and is used in the transmission mode at approximately 20 feet above ground level. The receiving corner reflector is spaced 50 feet away from the rotating pedestal at the same level above ground as the transmitting model. The transmitting and receiving signals are carried to a control building by means of RG-9/U double shielded coax cable.

The control building is equipped with:

Hewlett Packard Model 8753 Network Analyzer

PC Based Controller

Hewlett Packard 7550A Graphics Plotter

The test equipment is calibrated to ANSI/NCSL Z540-1-1994.

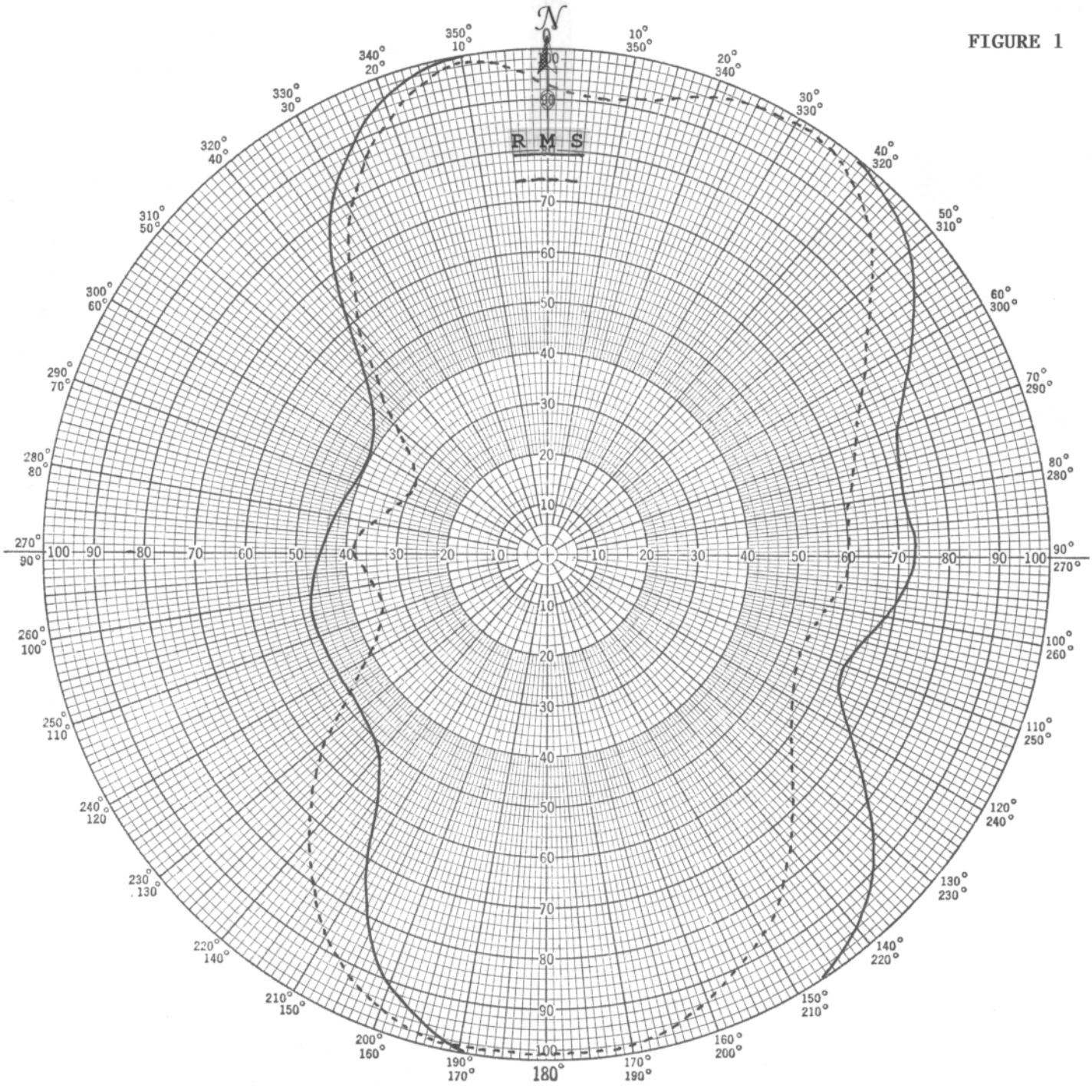
TEST PROCEDURES:

The corner reflector is mounted so that the horizontal and vertical azimuth patterns are measured independently by rotating the corner reflector by 90 degrees. The network analyzer was set to 474.75 MHz. Calibrated pads are used to check the linearity of the measuring system. For example, 6 dB padding yields a scale reading of 50 from an unpadded reading of 100 in voltage. From the recorded patterns, the R.M.S. values are calculated and recorded as shown in Figure 1.

Respectfully submitted by:

Robert A. Surette
Manager of RF Engineering
S/O 22859
March 3, 2003

FIGURE 1



Shively Labs

PROJECT NAME WOLL HOBE SOUND, FL

PROJECT NUMBER 22859 DATE 2/6/03

MODEL (X) FULL SCALE ( ) FREQUENCY 474.75/105.5 MHz

POLARIZATION HORIZ (——); VERT (----)

CURVE PLOTTED IN: VOLTAGE (X) POWER( ) DB( )

OBSERVER RAS

ANTENNA TYPE 6810-6-DA

PATTERN TYPE DIRECTIONAL AZIMUTH

REMARKS: SEE FIGURE 2 FOR MECHANICAL DETAILS

Figure 1A

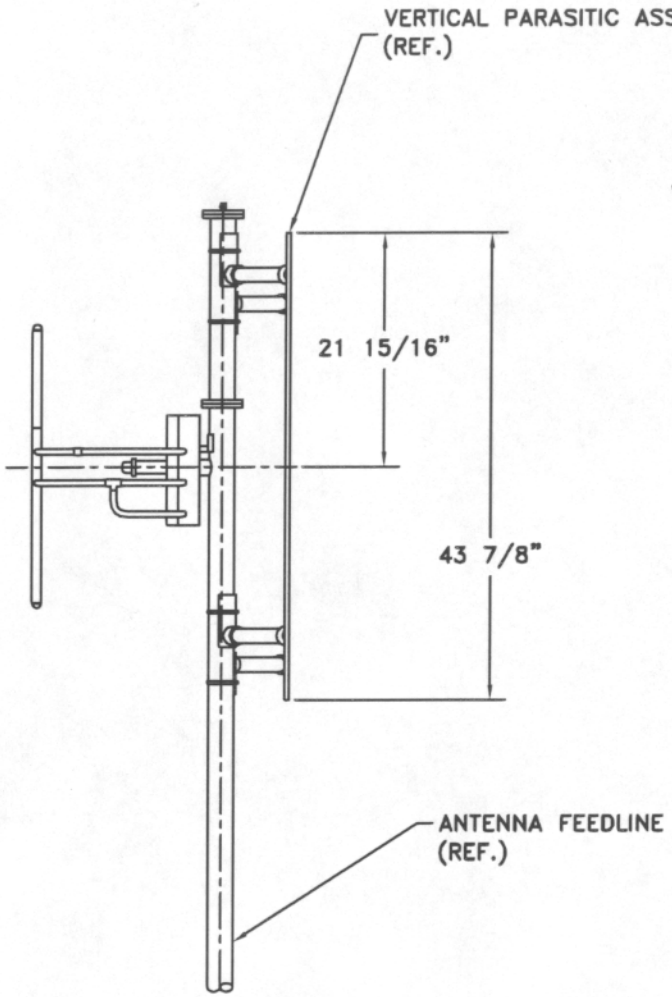
S/O 22859
TABULATION OF HORIZONTAL POLARIZATION
WOLL HOBE SOUND, FL

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	1.000	180	1.000
10	1.000	190	0.995
20	1.000	200	0.910
30	1.000	210	0.710
40	0.995	220	0.520
45	0.970	225	0.495
50	0.940	230	0.485
60	0.835	240	0.480
70	0.740	250	0.480
80	0.720	260	0.480
90	0.730	270	0.450
100	0.685	280	0.430
110	0.630	290	0.410
120	0.695	300	0.405
130	0.850	310	0.450
135	0.910	315	0.520
140	0.960	320	0.630
150	1.000	330	0.840
160	1.000	340	0.955
170	1.000	350	1.000

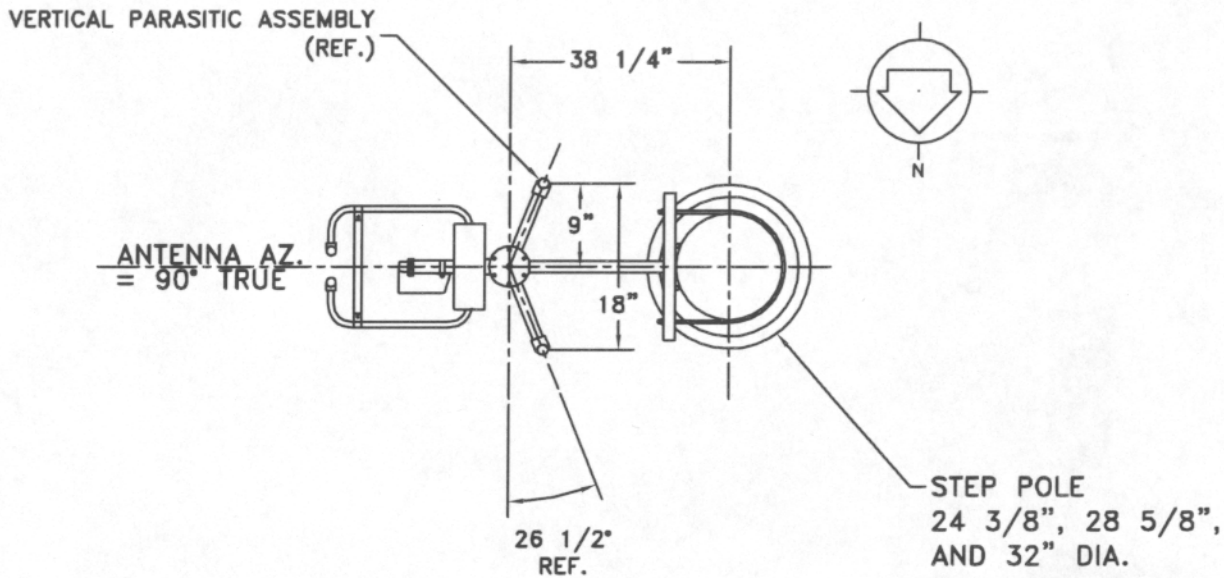
Figure 1B

S/O 22859
TABULATION OF VERTICAL POLARIZATION
WOLL HOBE SOUND, FL

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.930	180	0.990
10	0.915	190	0.990
20	0.965	200	0.960
30	0.985	210	0.875
40	0.455	220	0.730
45	0.910	225	0.660
50	0.845	230	0.570
60	0.730	240	0.410
70	0.655	250	0.350
80	0.610	260	0.350
90	0.600	270	0.385
100	0.570	280	0.350
110	0.540	290	0.310
120	0.565	300	0.300
130	0.635	310	0.390
135	0.690	315	0.480
140	0.755	320	0.580
150	0.860	330	0.780
160	0.935	340	0.910
170	0.980	350	0.985

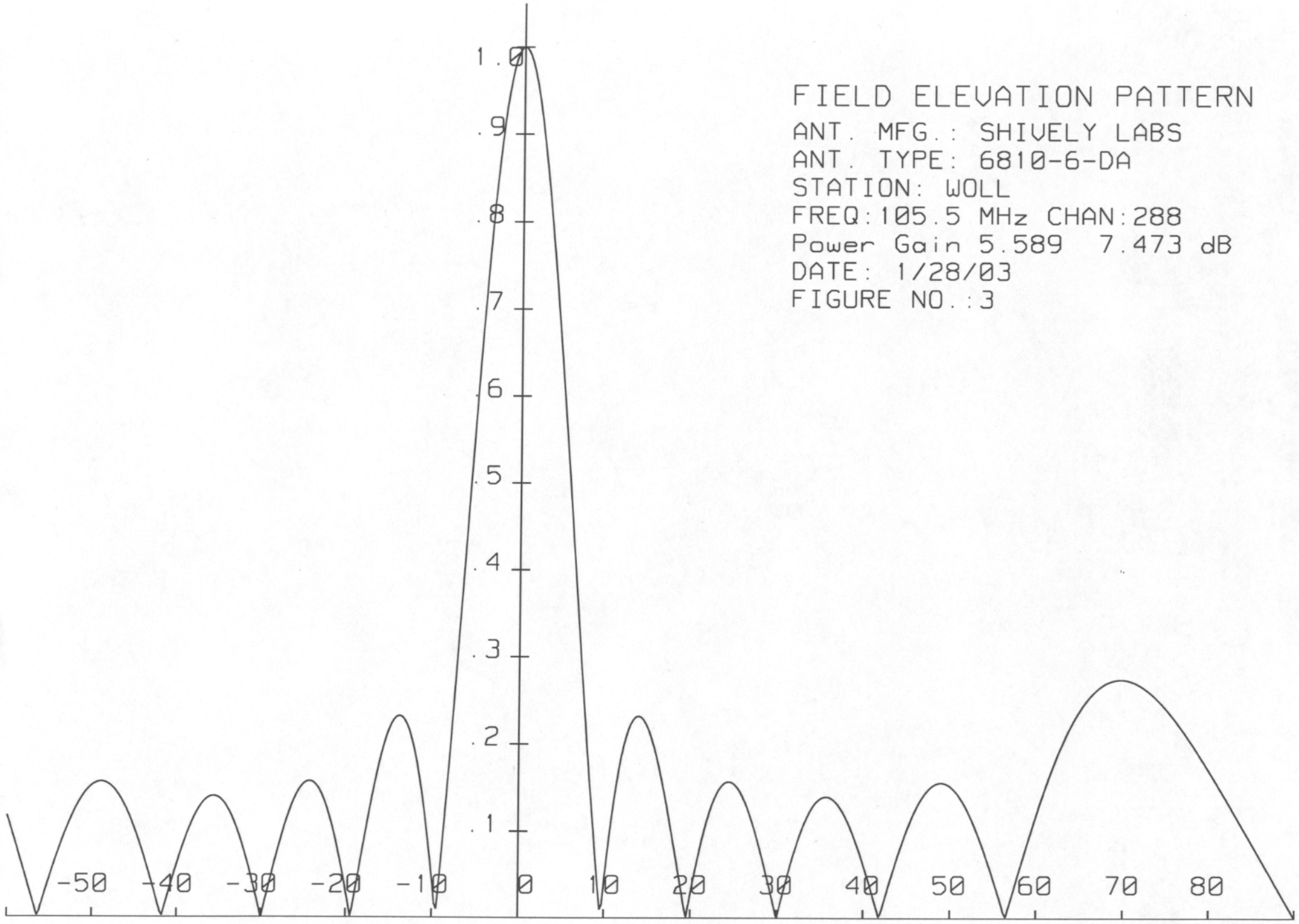


SIDE VIEW



TOP VIEW

SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC.,BRIDGTON, MAINE			
SHOP ORDER: 22859-A	FREQUENCY: 105.5	SCALE: N.T.S.	DRAWN BY: WS APPROVED BY:
TITLE: MODEL-6810-6-DIRECTIONAL ANTENNA			
DATE: 2/28/03	FIGURE 2		



FIELD ELEVATION PATTERN
ANT. MFG.: SHIVELY LABS
ANT. TYPE: 6810-6-DA
STATION: WOLL
FREQ:105.5 MHz CHAN:288
Power Gain 5.589 7.473 dB
DATE: 1/28/03
FIGURE NO.:3

FIGURE 4

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VALIDATION OF GAIN CALCULATION

WOLL HOBE SOUND, FL

MODEL 6810-6-DA

Elevation Gain of 6810-6-DA equals 3.28

The RMS values are calculated utilizing the data of a planimeter.

Horizontal RMS divided by Vertical RMS equals
$0.792 \div 0.741 = 1.069$

Elevation Gain of Horizontal Component equals
$3.28 \times 1.069 = 3.506$

Elevation Gain of Vertical Component equals
$3.28 \times 0.936 = 3.070$

Horizontal Azimuth Gain equals $1/(RMS)^2$
$1/(0.792)^2 = 1.594$

Vertical Azimuth Gain equals $1/(RMS \div Max\ Vert)^2$
$1/(0.741 \div 0.99)^2 = 1.785$

*** Total Horizontal Gain is Elevation Gain times Azimuth Gain**
3.506 x 1.594 = 5.589

*** Total Vertical Gain is Elevation Gain times Azimuth Gain**
3.070 x 1.785 = 5.480

ERP divided by Horizontal Gain equals Antenna Input Power
50 kW ÷ 5.589 = 8.946 kW

Antenna Input Power times Vertical Gain equals Vertical ERP
8.948 x 5.480 = 49.034 kW

Maximum Value of the Vertical Component squared times the Maximum ERP equals the Vertical ERP
$(0.99)^2 \times 50$ kW = 49.005 kW

NOTE: Calculating the ERP of the Vertical Component by two methods validates the total antenna gain calculations

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February 6, 2003

RE: WOLL - Hobe Sound, FL - 105.5 MHz (Our S/O 22859)

To Whom It May Concern:

The WWLV antenna (our S/O 22756) was in place when the pattern was measured for WOLL. The pattern of WOLL is affected by the presence of the WWLV antenna. Therefore, if the WWLV antenna is ever removed, a new pattern will have to be filed with the FCC. This is because the parasitic elements used on the WOLL antenna were adjusted to compensate for the presence of the WWLV antenna.

Sincerely,

Robert A. Surette
Manager, RF Engineering

RAS/slt