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S.O. 23203

Report of Test 6513-2-DA-Special (Slant)

for

FOUR RIVERS COMMUNITY BROADCASTING CORPORATION

WBYX 88.7 MHz STROUDSBURG, PA

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6513-2-DA-Special (Slant) to meet the needs of WBYX and to comply with the requirements of the FCC construction permit, file number BPED-20030425AAR.

RESULTS:

The measured azimuth pattern for the 6513-2-DA-Special (Slant) is shown in Figure 1. Figure 1A shows the Tabulation of the Vertical Polarization. The horizontal component of this antenna was developed by constructing the dipole 0.03º off of vertical. The horizontal azimuth pattern of this antenna is omni-directional and therefore is not shown. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BPED-20030425AAR indicates that the Vertical radiation component shall not exceed 4.0 kW at any azimuth and is restricted to the following values at the azimuths specified:

100 Degrees T: 0.465 kW

From Figure 1, the maximum radiation of the Vertical component occurs at 355 Degrees T to 005 Degrees T. At the restricted azimuth of 100 Degrees T the Vertical component is 10.034 dB down from the maximum of 4.0 kW, or 0.397 kW.

The total Horizontal power gain is 0.0009. The R.M.S. of the Vertical component is 0.755. The total Vertical power gain is 3.472. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.81. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6513-2-DA-Special (Slant) was mounted on a tower of exact scale to a Central Tower self-supported tower. The spacing of the antenna to the tower was varied 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 BPED-20030425AAR, a single level of the 6513-2-DA-Special (Slant) 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.

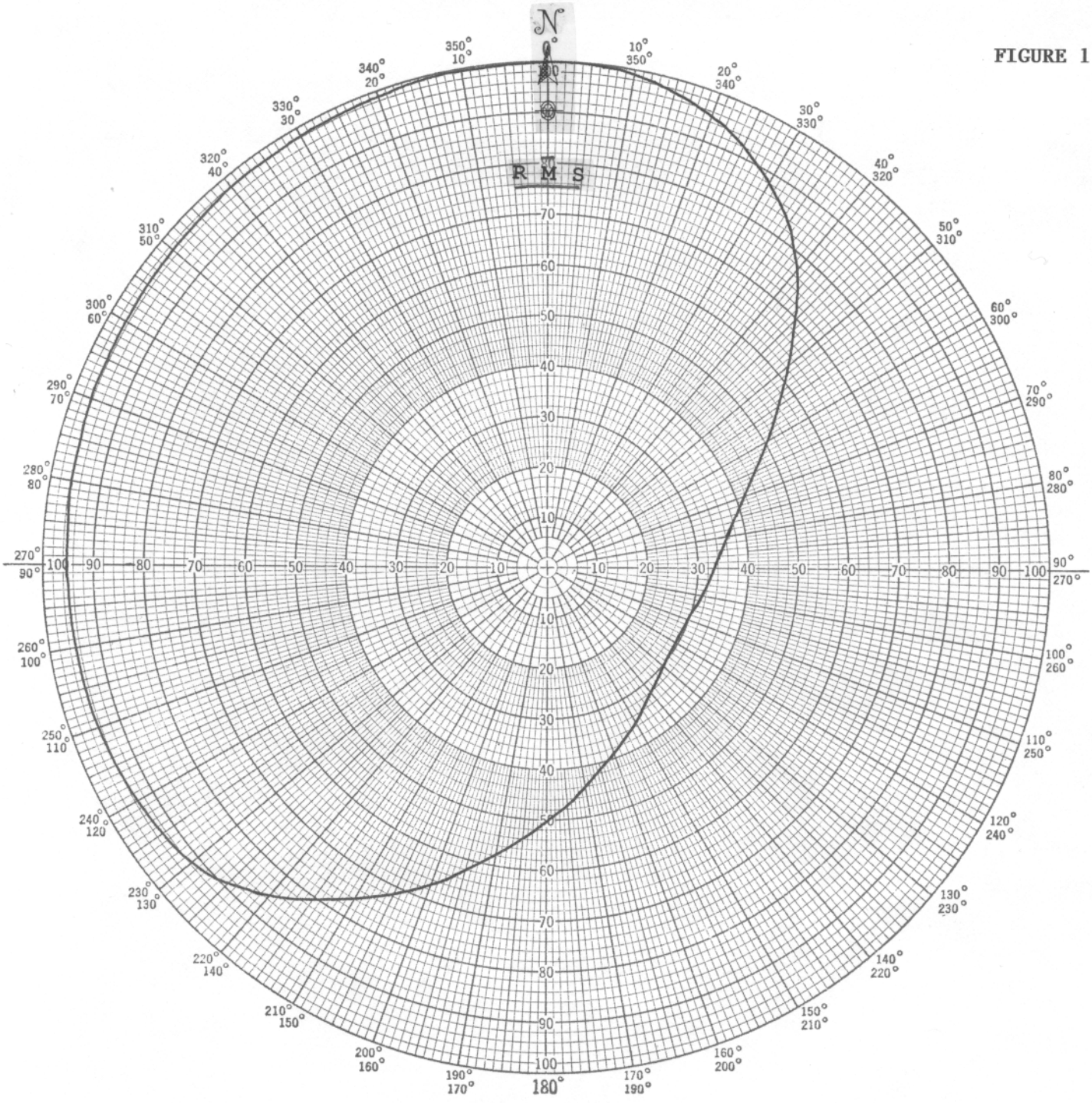
TEST PROCEDURES:

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 399.15 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 23203
January 9, 2004

FIGURE 1



Shively Labs

PROJECT NAME WBYX STROUDSBURG, PA

PROJECT NUMBER 23203 DATE 12/31/03

MODEL (X) FULL SCALE ( ) FREQUENCY 399.15/88.7 MHz

POLARIZATION VERTICAL

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

OBSERVER RAS

ANTENNA TYPE 6513-2-DA-SPECIAL (SLANT)

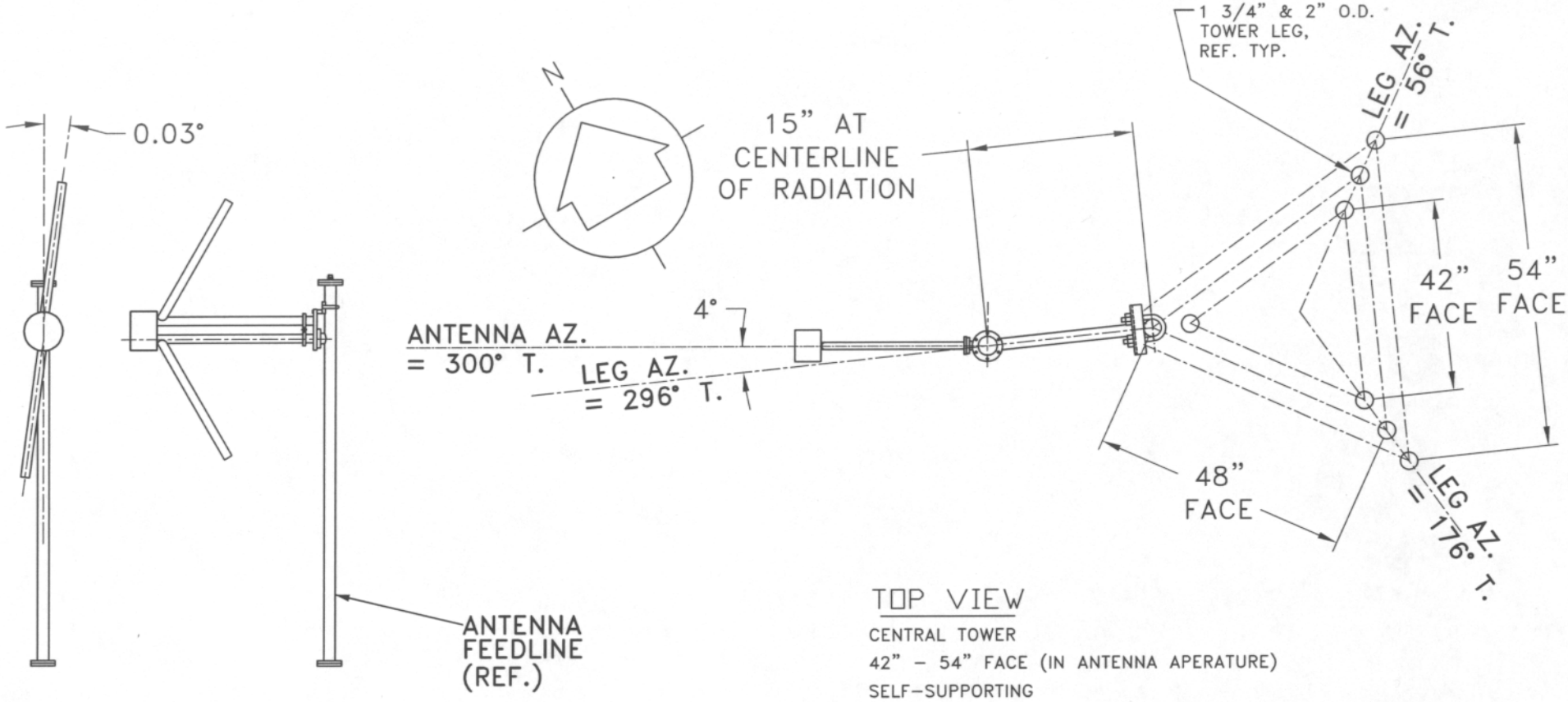
PATTERN TYPE DIRECTIONAL AZIMUTH

REMARKS: SEE FIGURE 2 FOR MECHANICAL DETAILS

Figure 1A

S/O 23203
TABULATION OF VERTICAL POLARIZATION
WBYX STROUDSBURG, PA

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	1.000	180	0.500
10	0.990	190	0.580
20	0.955	200	0.670
30	0.880	210	0.760
40	0.770	220	0.850
45	0.700	225	0.890
50	0.630	230	0.915
60	0.510	240	0.935
70	0.415	250	0.945
80	0.365	260	0.950
90	0.335	270	0.950
100	0.315	280	0.960
110	0.300	290	0.960
120	0.295	300	0.965
130	0.300	310	0.970
135	0.310	315	0.975
140	0.320	320	0.980
150	0.355	330	0.980
160	0.390	340	0.990
170	0.440	350	0.995



SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE, USA			
SHOP ORDER 23203	FREQUENCY 88.7 MHz	SCALE N.T.S.	DRAWN BY: ASP APPROVED BY:
MODEL 6513–2–DIRECTIONAL ANTENNA			
DATE 1/6/04	FIGURE 2		

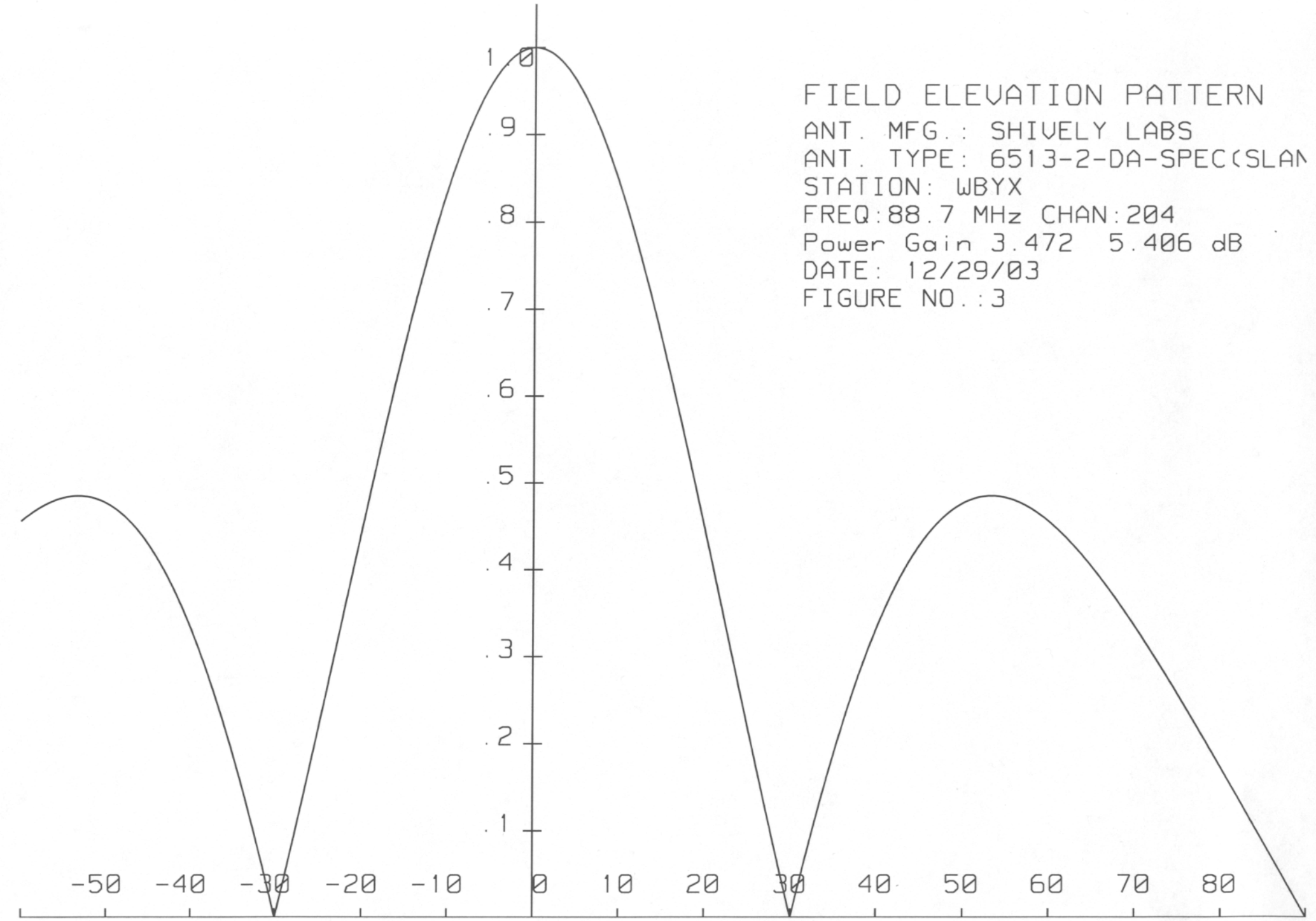

FIELD ELEVATION PATTERN
ANT. MFG.: SHIVELY LABS
ANT. TYPE: 6513-2-DA-SPEC(SLAN
STATION: WBYX
FREQ:88.7 MHz CHAN:204
Power Gain 3.472 5.406 dB
DATE: 12/29/03
FIGURE NO.:3
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80

FIGURE 4

S.O. 23203

VALIDATION OF GAIN CALCULATION

WBYX STROUDSBURG, PA

MODEL 6513-2-DA-Special (Slant)

Elevation Gain of 6513-2-DA-Special (Slant) equals
Vertical 1.9791
Horizontal 0.0009

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

Elevation Gain of Horizontal Component equals 0.0009

Elevation Gain of Vertical Component equals 1.9791

Vertical Azimuth Gain equals $1/(RMS)^2$
$1/(0.755)^2 = 1.7543$

*** Total Horizontal Gain is 0.0009**

*** Total Vertical Gain is Elevation Gain times Azimuth Gain**
1.9791 x 1.7543 = 3.472

ERP divided by Vertical Gain equals Antenna Input Power
4.0 kW ÷ 3.472 = 1.152 kW

Antenna Input Power times Horizontal Gain equals Vertical ERP
1.152 kW x 0.0009 = 0.00104 kW