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S.O. 19,892

Report of Test 6810-6R-SS-DA

for

SURREY FRONT RANGE LTD PARTNERSHIP

KGFT PUEBLO, CO

OBJECTIVE:

The objectives of this test was to demonstrate the directional characteristics of a 6810-6R-SS-DA antenna to meet the needs of KGFT and to comply with the requirements of the FCC construction permit, file number BPH-890720IG as modified by BPH-911030JG.

RESULTS:

The measured azimuth pattern for the 6810-6R-SS-DA is shown in Figure 1. Figure 1A shows the Tabulation of the Horizontal Polarization. Figure 1B shows the Tabulation of Vertical Polarization. The calculated elevation pattern of the antenna is shown in Figure 3. Construction permit file number BPH-911030JG indicates that the horizontal radiation component shall not exceed 78.00 kW at any azimuth and each component shall be restricted to the following values at the azimuths specified:

32.50 Degrees T: 58.00 kW
327.5 Degrees T: 45.00 kW
357.5 Degrees T: 14.40 kW

From Figure 1, the maximum radiation of the horizontal component occurs at 166 Degrees T to 175 Degrees T. At the restricted azimuth of 32.5 Degrees T the vertical component is 8.874 dB down from the maximum of 78.00 kW, or 10.11 kW maximum.

At the restricted azimuth of 327.5 Degrees T, the horizontal component is 11.37 dB down from the maximum of 78.00 kW, or 5.69 kW. At the restricted azimuth of 357.5 Degrees T, the horizontal component is 7.74 dB down from the maximum of 78.00 kW, or 13.12 kW.

The R.M.S. value of the horizontal component is 0.700 and the R.M.S. value of the vertical component is 0.670. The total horizontal power gain is 4.07. The total vertical power gain is 4.02.

METHOD OF DIRECTIONALIZATION:

The 6810 was mounted on a tower of exact scale to a Micro Flect self supported tower. The spacing of the antenna to the tower was varied to achieve the vertical pattern shown in Figure 1. A horizontal parasitic element was placed directly under the bay. The position of this horizontal parasitic element was changed until the horizontal pattern shown in Figure 1 was achieved. See Figure 2 for mechanical details.

METHOD OF MEASUREMENT:

As allowed by the construction permit, file number BPH-911030JG, a single level of the 6810-6R-SS-DA antenna was set up on the Howell Laboratories scale model antenna pattern measuring range. A scale of 4.5:1 was used.

SUPERVISION:

The tests were carried out under the direction of Robert A. Surette, Manager of RF Engineering. 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 both full size and scale model pattern measurements since 1974 as an RF Engineer with Shively Labs and with Dielectric Communications (a unit of General Signal). He is currently an Associate Member of the Association of Federal Communications Consulting Engineers and a Member of IEEE.

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 8505 Network Analyzer
PC Based Controller
Hewlett Packard 7550A Graphics Plotter

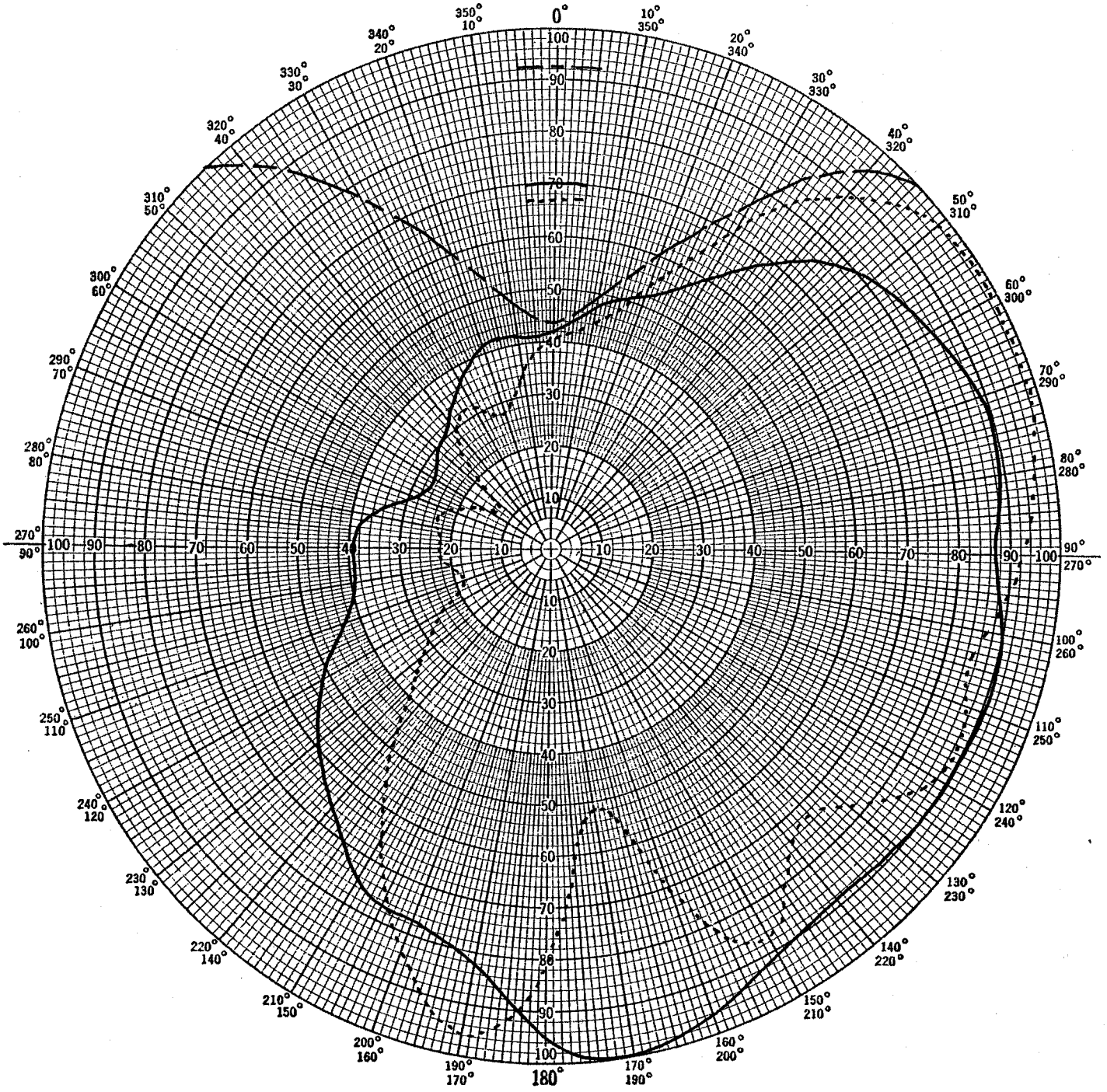
The test equipment is calibrated to MIL-STD-45662

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 453.15 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 19,892
NOV. 3, 1998



Shively Labs

PROJECT NAME KGFT Pueblo, CO

PROJECT NUMBER 19,892 DATE 11/3/98

MODEL (X) FULL SCALE ( ) FREQUENCY 453.15/100.7 MHz

POLARIZATION Horiz. (——); Vert. (- - - -)

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

OBSERVER RAS

ANTENNA TYPE 6810-6R-SS-DA

PATTERN TYPE Directional Azimuth

REMARKS: See Figure 2 for Mechanical Details

Figure 1A

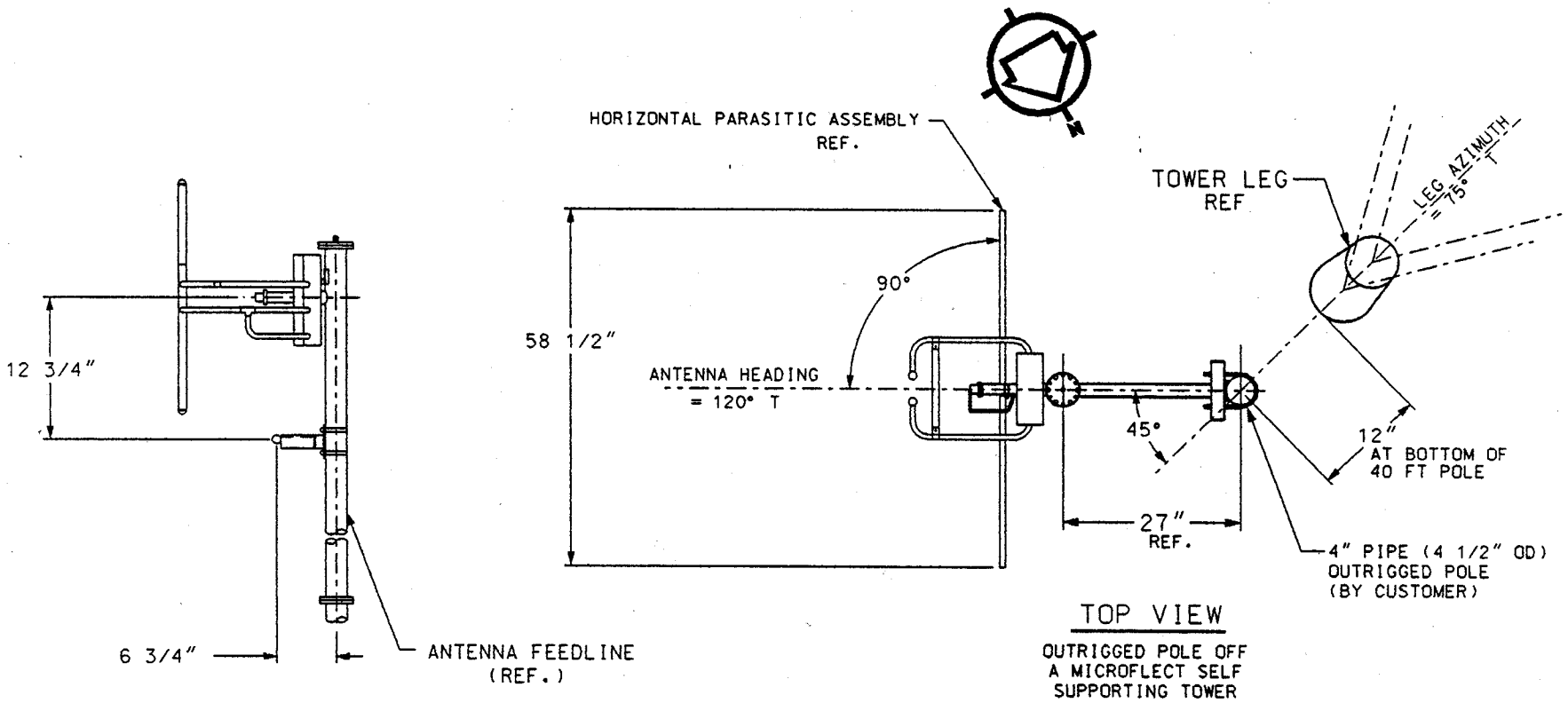
TABULATION OF HORIZONTAL POLARIZATION
KGFT PUEBLO, CO

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.420	180	0.945
10	0.475	190	0.825
20	0.520	200	0.780
30	0.600	210	0.750
40	0.725	220	0.670
45	0.780	225	0.630
50	0.820	230	0.595
60	0.860	240	0.505
70	0.890	250	0.430
80	0.880	260	0.395
90	0.860	270	0.395
100	0.900	280	0.355
110	0.910	290	0.280
120	0.910	300	0.270
130	0.900	310	0.295
135	0.900	315	0.300
140	0.900	320	0.320
150	0.920	330	0.365
160	0.970	340	0.415
170	1.000	350	0.410

Figure 1B

TABULATION OF VERTICAL POLARIZATION
KGFT PUEBLO, CO

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.400	180	0.825
10	0.440	190	0.960
20	0.535	200	0.830
30	0.710	210	0.660
40	0.885	220	0.7470
45	0.940	225	0.400
50	0.995	230	0.325
60	0.995	240	0.240
70	0.990	250	0.190
80	0.960	260	0.205
90	0.925	270	0.225
100	0.850	280	0.225
110	0.875	290	0.205
120	0.880	300	0.140
130	0.765	310	0.290
135	0.630	315	0.250
140	0.650	320	0.290
150	0.880	330	0.300
160	0.710	340	0.285
170	0.525	350	0.350



TOP VIEW

OUTRIGGED POLE OFF
A MICROFLECT SELF
SUPPORTING TOWER

SIDE VIEW

SHIVELY LABS

A DIVISION OF HOWELL LABORATORIES INC., BRIDGTON, MAINE

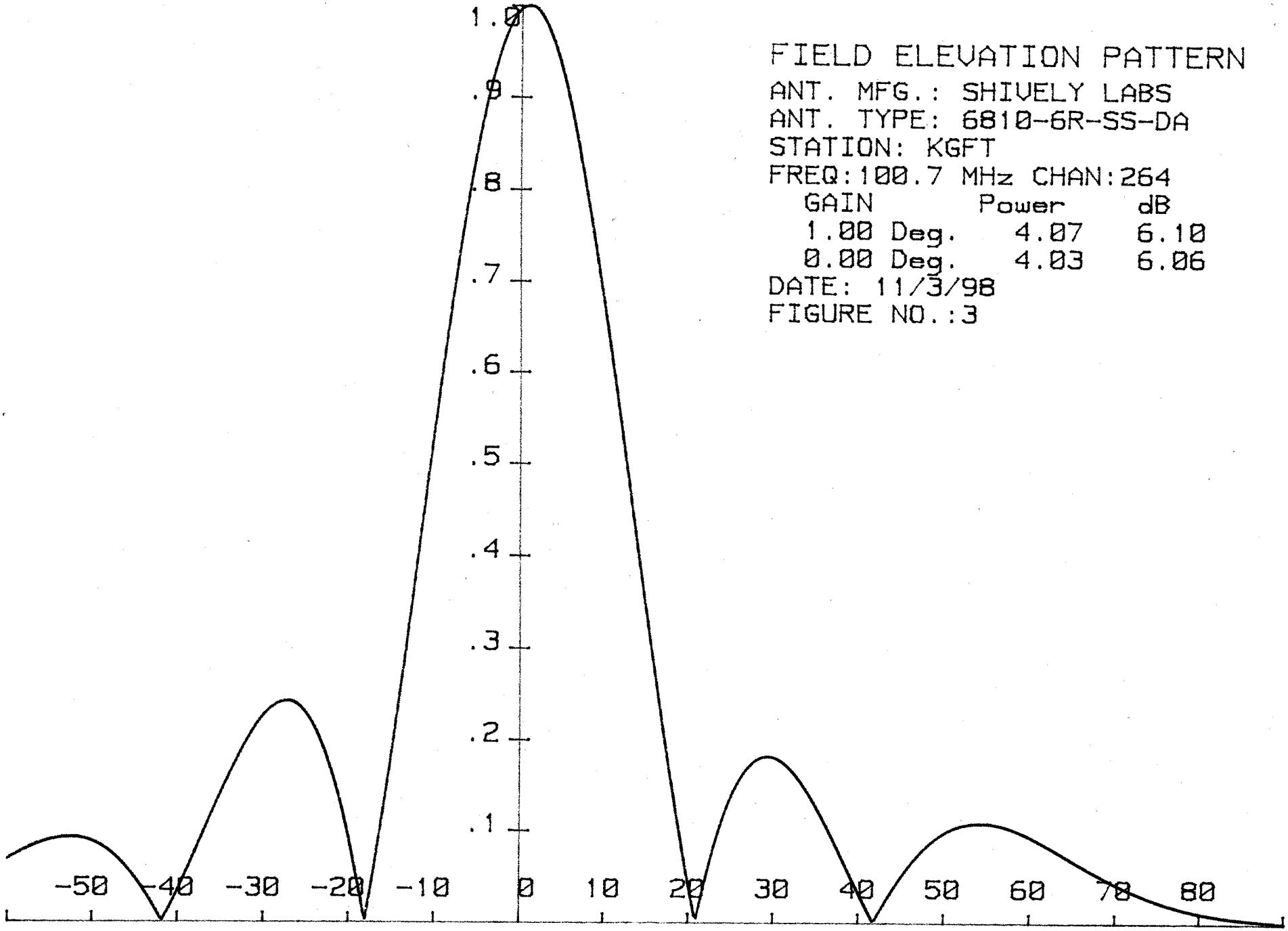
SHOP ORDER:	FREQUENCY:	SCALE:	DRAWN BY:
19,892 PUEBLO, CO	100.7 MHz	N.T.S.	NMS
			APPROVED BY:

TITLE:

MODEL-6810-6R-1/2SS-CF-BT-DIRECTIONAL ANTENNA

DATE: 6-9-98

FIGURE 2



FIELD ELEVATION PATTERN

ANT. MFG.: SHIVELY LABS
ANT. TYPE: 6810-6R-SS-DA
STATION: KGFT
FREQ:100.7 MHz CHAN:264

GAIN	Power	dB
1.00 Deg.	4.07	6.10
0.00 Deg.	4.03	6.06

DATE: 11/3/98
FIGURE NO.:3