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S.O. 22455

Report of Test 6810-3-.9SS-DA

for

THE REGENTS OF THE UNIV. OF CALIF.

KZSC 88.1 MHZ SANTA CRUZ, CA

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-3-.9SS-DA to meet the needs of KZSC and to comply with the requirements of the FCC construction permit, file number BPED-19990706ID.

RESULTS:

The measured azimuth pattern for the 6810-3-.9SS-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 BPED-19990706ID indicates that the Horizontal radiation component shall not exceed 10.0 kW at any azimuth and is restricted to the following values at the azimuths specified:

320-360 Degrees T: 0.324 kW

From Figure 1, the maximum radiation of the Horizontal component occurs at 101 Degrees T to 147 Degrees T. At the restricted azimuth of 320-360 Degrees T the Vertical component is 15.918 dB down from the maximum of 10.0 kW, or 0.256 kW.

The R.M.S. of the Horizontal component is 0.730. The total Horizontal power gain is 2.966. The R.M.S. of the Vertical component is 0.720. The total Vertical power gain is 2.908. See Figure Four for calculations. The R.M.S. of the FCC composite pattern is 0.770. Therefore this Pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-3-.9SS-DA was mounted on a tower of exact scale to a Rohn 4N/5N 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 BPED-19990706ID, a single level of the 6810-3-.9SS-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 396.45 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:

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