

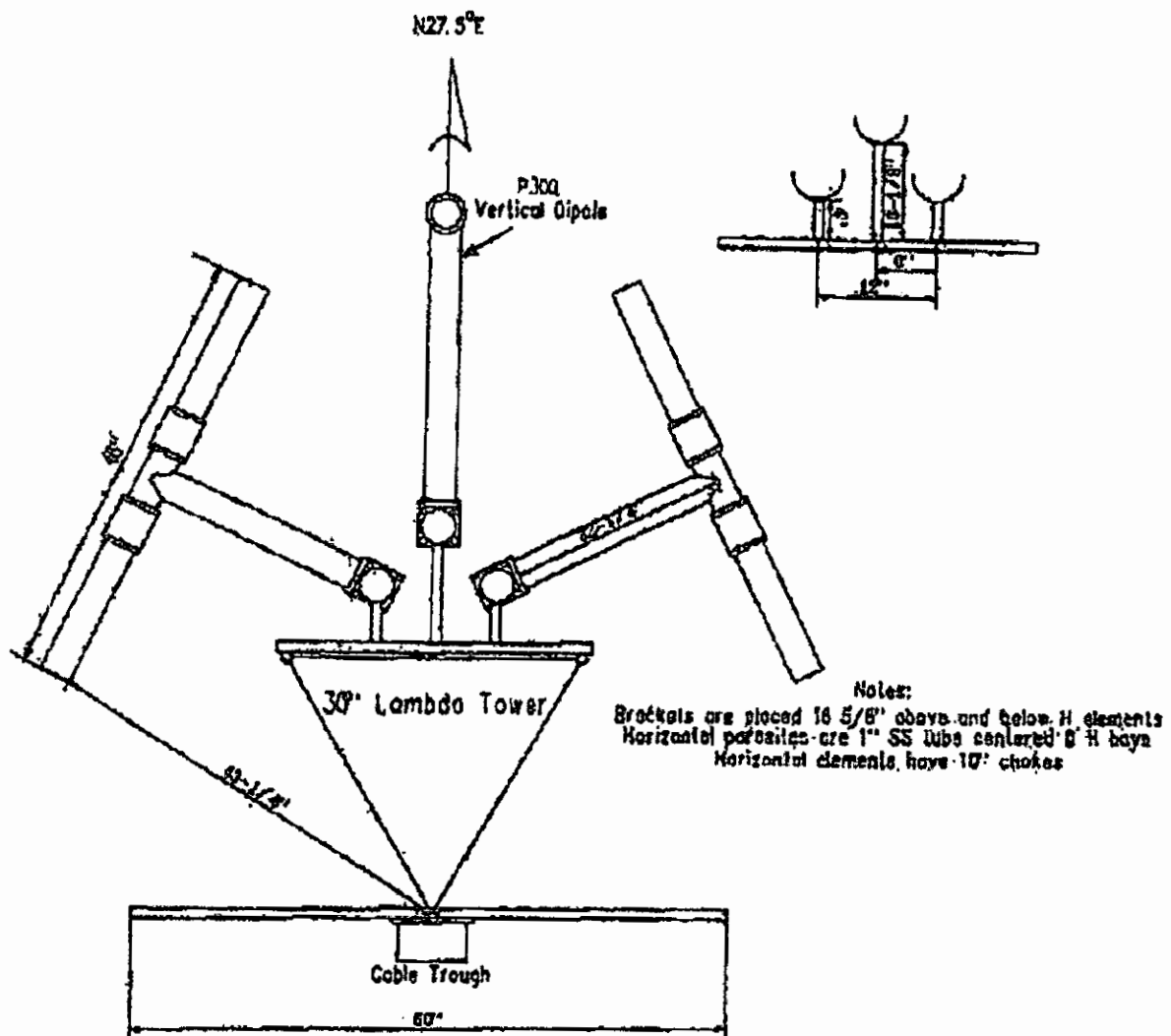
## **Compliance with Special Operating Conditions**

The KRKM Construction Permit (File Number 0000125253) contains two Special Operating Conditions:

1. *The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.*
2. *The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit. A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power: 1.2 kilowatts. Principal minima and their associated field strength limits: 200-220 degrees True: 0.056 kilowatts.*

Educational Media Foundation ("EMF") complies with, or agrees to, the conditions as follows:

1. EMF in coordination with other users of the site agrees to reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna, from radiofrequency electromagnetic fields in excess of FCC guidelines.
2. Exhibit 1-A contains the antenna proof of performance from Electronics Research, Inc demonstrating compliance with the directional antenna pattern.



# ERI Testsite Drawing

**Project:** Victorville Co FMD-(B-HW)

**Date:** June 1, 1993

**Graphs:** Final Setup

**Title:**

**Drawing by:**

**Drawing File #:** C:\CAD\N Y16

**Revision #:**

JUNE 4, 1993

DUAL POLARIZED DIRECTIONAL ANTENNA SYSTEM  
PROPOSED FOR RADIO STATION KYUB  
LOCATED IN VICTORVILLE, CA

Electronics Research, Inc. proposes to provide a custom fabricated directional antenna system that is specially designed to meet the F.C.C. requirements and the general needs of radio station KYUB.

The antenna is the Harris Corporation FMD-1B-HW configuration. The horizontal component of the dual polarized system consists of two half-wavelength spaced horizontally polarized bays using two driven horizontal dipoles and one horizontal parasitic element at each bay. The vertical component of the system consists of one vertical radiating bay using one driven vertical dipole. The vertical bay is interspersed between the horizontal bays. A power divider was used near the bottom of the antenna to feed the system. The proposed antenna was mounted on the North 27.5 degrees East tower face with bracketry to provide an antenna orientation of North 27.5 degrees East. The antenna was tested on a 30" Lambda tower, which is the structure the station plans to use to support the proposed array. All tests were performed on a frequency of 89.5 megahertz which is the center of the FM broadcast channel assigned to KYUB.

Pattern measurements were made on a fifty-acre antenna pattern range which is owned and operated by Electronics Research Inc. The tests were performed under the direction of Thomas B. Silliman, President of Electronics Research, Inc. Mr. Silliman has both the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is also a registered professional engineer in the states of Indiana, Maryland and Minnesota.

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consisted of the complete dual polarized system with the associated horizontal parasitic element. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the proposed antenna. Sections of 3-1/8 inch o.d. rigid coaxial line were used to feed the test antenna, and sections of 3-1/8 inch o.d. rigid outer conductor only were attached above the test antenna. The lines were properly grounded during all tests.

The proof-of-performance was accomplished using a supporting structure of identical dimensions and configuration as the proposed 30" Lambda tower, including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the proposed antenna will be

JUNE 4, 1993

DUAL POLARIZED DIRECTIONAL ANTENNA SYSTEM  
PROPOSED FOR RADIO STATION KYUB  
LOCATED IN VICTORVILLE, CA

(Continued)

installed. The 30" Lambda tower was erected vertically on a turntable mounted on a non-metallic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 25 feet above ground. The turntable is equipped with a motor drive and azimuth indicating mechanism, resolution of this azimuth measuring system is one-tenth of a degree.

The antenna under test was operated in the transmitting mode and fed from a Wavetek Model 3000 signal generator. The frequency of the signal source was set at 89.5 MHz and was constantly monitored by an Anritsu Model ML521B measuring receiver.

A broad-band horizontal and vertical dipole system, located approximately 628 feet from the test antenna and mounted at the same height above terrain as the center of the antenna under test, was used to receive the emitted test signals. The signals received by the dipole system were fed to the test building by way of two buried Heliac cables to an Anritsu Model ML521B measuring receiver. This data was interfaced to a Hewlett-Packard Model 9872C plotter by means of a Hewlett-Packard Model 86 computer system. Relative field strength was plotted as a function of azimuth.

The measurements were performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The horizontal component of the dual polarized system consists of two half-wavelength spaced horizontally polarized bays using two driven horizontal dipoles and one horizontal parasitic element at each bay. The vertical component of the system consists of one vertical radiating bay using one driven vertical dipole. The vertical bay is interspersed between the horizontal bays. A power divider was used near the bottom of the antenna to feed the system. The proposed antenna was mounted on the North 27.5 degrees East tower face with bracketry to provide an antenna orientation of North 27.5 degrees East. The power distribution and phase relationship of the elements should be all that is required to maintain the pattern in adjustment.

JUNE 4, 1993

DUAL POLARIZED DIRECTIONAL ANTENNA SYSTEM  
PROPOSED FOR RADIO STATION KYUB  
LOCATED IN VICTORVILLE, CA

(Continued)

The FMD-1B-HW array is to be orientated on the 30" Lambda tower at a bearing of North 27.5 degrees East. Blue prints provided with the antenna will show the proper orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Deicers are not supplied and are not available. The use of radomes is recommended if icing conditions will exist at the proposed site.

Figure #1 represents the maximum value of either the horizontal or vertical component at any azimuth. The measured horizontal plane relative field pattern, for both the horizontal and vertical polarization components, is shown on Figure #2 attached. A calculated vertical plane relative field pattern for the vertically polarized component is shown on Figure #3 attached. A calculated vertical plane relative field pattern for the horizontally polarized component is shown on Figure #3A attached. The power in the maximum will reach 1.25 kilowatts (.9691 DBK).

The power at North 205 degrees East does not exceed .060 kilowatts (-12.219 dbk).

The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component.

The envelope pattern obtained from the maximum individual horizontal or vertical components will not exceed a rate of change of 2 db per any ten degree change in azimuth as measured in the horizontal plane.

The approximate weight of the antenna minus the mounting structure is 372 lbs. The approximate windload of the antenna minus the mounting structure is 658 lbs based on 50/33 psf (112 mph wind) with no ice build up. The clear vertical length of the structure required to support the antenna is 26 feet if the antenna is to be top mounted.

The directional antenna should not be mounted on the top of an antenna tower which includes a top-mounted platform larger than the cross-sectional area of the tower in the horizontal plane. No other obstructions other than those that are specified by the blue prints supplied with the antenna are to be mounted at the same

JUNE 4, 1993

DUAL POLARIZED DIRECTIONAL ANTENNA SYSTEM  
PROPOSED FOR RADIO STATION KYUB  
LOCATED IN VICTORVILLE, CA

(Continued)

tower level as the directional antenna. No obstruction of any type is to be within 75 feet horizontally of the antenna system. The vertical distance to the nearest obstruction should be a minimum of 10 feet from the directional antenna.

The calculated maximum power gain of the horizontal component is 1.0702 (.29473 dB).

The calculated maximum power gain of the vertically polarized component is .94645 (-.23901 dB).

The calculated input power to the antenna input flange is 1.168 kilowatts (.67437 DBK) to provide a maximum horizontal ERP of 1.25 kilowatts (.9691 DBK) and a maximum vertical ERP of 1.1054 kilowatts (.43535 DBK). The input flange to the antenna is 1-5/8 inch male.

ELECTRONICS RESEARCH, INC.  
108 Market St.  
Newburgh, IN 47630

ENVELOPE VALUES FOR FIGURE: 1 JUNE 4, 1993  
HORIZONTAL PLANE RELATIVE FIELD & DBK LIST  
FOR RADIO STATION KYUB 89.5MHz

AZIMUTH	RELATIVE FIELD	DBK	POWER KW	POLARIZATION	AZIMUTH	RELATIVE FIELD	DBK	POWER KW	POLARIZATION
0.0	.938	.42	1.10	VERTICAL	180.0	.238	-11.50	.07	HORIZONTAL
5.0	.940	.44	1.11	HORIZONTAL	185.0	.226	-11.95	.06	HORIZONTAL
10.0	.972	.72	1.18	HORIZONTAL	190.0	.216	-12.32	.06	HORIZONTAL
15.0	.991	.89	1.23	HORIZONTAL	195.0	.212	-12.50	.06	VERTICAL
20.0	1.000	.97	1.25	HORIZONTAL	200.0	.213	-12.46	.06	VERTICAL
25.0	1.000	.97	1.25	HORIZONTAL	205.0	.214	-12.41	.06	VERTICAL
30.0	1.000	.97	1.25	HORIZONTAL	210.0	.214	-12.44	.06	VERTICAL
35.0	.988	.86	1.22	HORIZONTAL	215.0	.212	-12.50	.06	VERTICAL
40.0	.960	.61	1.15	HORIZONTAL	220.0	.211	-12.53	.06	HORIZONTAL
45.0	.940	.43	1.10	VERTICAL	225.0	.221	-12.15	.06	HORIZONTAL
50.0	.940	.43	1.11	VERTICAL	230.0	.233	-11.68	.07	HORIZONTAL
55.0	.940	.43	1.11	VERTICAL	235.0	.251	-11.02	.08	HORIZONTAL
60.0	.940	.43	1.11	VERTICAL	240.0	.275	-10.25	.09	HORIZONTAL
65.0	.940	.44	1.11	VERTICAL	245.0	.306	-9.32	.12	HORIZONTAL
70.0	.940	.44	1.11	VERTICAL	250.0	.343	-8.33	.15	HORIZONTAL
75.0	.937	.40	1.10	VERTICAL	255.0	.384	-7.33	.18	HORIZONTAL
80.0	.929	.33	1.08	VERTICAL	260.0	.431	-6.34	.23	HORIZONTAL
85.0	.935	.39	1.09	HORIZONTAL	265.0	.483	-5.35	.29	HORIZONTAL
90.0	.960	.62	1.15	HORIZONTAL	270.0	.541	-4.37	.37	HORIZONTAL
95.0	.978	.78	1.20	HORIZONTAL	275.0	.606	-3.38	.46	HORIZONTAL
100.0	.988	.86	1.22	HORIZONTAL	280.0	.679	-2.39	.58	HORIZONTAL
105.0	.982	.81	1.20	HORIZONTAL	285.0	.761	-1.41	.72	HORIZONTAL
110.0	.953	.55	1.13	HORIZONTAL	290.0	.844	-.50	.89	HORIZONTAL
115.0	.907	.12	1.03	HORIZONTAL	295.0	.912	.17	1.04	HORIZONTAL
120.0	.838	-.57	.88	HORIZONTAL	300.0	.955	.57	1.14	HORIZONTAL
125.0	.754	-1.48	.71	HORIZONTAL	305.0	.983	.82	1.21	HORIZONTAL
130.0	.673	-2.47	.57	HORIZONTAL	310.0	.990	.88	1.22	HORIZONTAL
135.0	.601	-3.46	.45	HORIZONTAL	315.0	.983	.82	1.21	HORIZONTAL
140.0	.536	-4.45	.36	HORIZONTAL	320.0	.971	.71	1.18	HORIZONTAL
145.0	.478	-5.43	.29	HORIZONTAL	325.0	.953	.55	1.13	HORIZONTAL
150.0	.427	-6.42	.23	HORIZONTAL	330.0	.930	.34	1.08	HORIZONTAL
155.0	.382	-7.40	.18	HORIZONTAL	335.0	.933	.37	1.09	VERTICAL
160.0	.341	-8.38	.15	HORIZONTAL	340.0	.937	.40	1.10	VERTICAL
165.0	.307	-9.29	.12	HORIZONTAL	345.0	.937	.41	1.10	VERTICAL
170.0	.277	-10.18	.10	HORIZONTAL	350.0	.938	.41	1.10	VERTICAL
175.0	.256	-10.87	.08	HORIZONTAL	355.0	.938	.41	1.10	VERTICAL

CITY OF LICENSE: VICTORVILLE, CA  
MOUNTING STRUCTURE: 30" LAMBDA TOWER  
ANTENNA TYPE: FMD-1B-HW NUMBER OF BAYS: 1  
ENVELOPE MAXIMUM RELATIVE FIELD= 1 AZIMUTH 20  
ENVELOPE MINIMUM RELATIVE FIELD=.211 AZIMUTH 220.0  
ENVELOPE R.M.S.=.75419  
MAXIMUM E.R.P.= 1.2500KW  
ANTENNA ORIENTATION: NORTH 27.5 DEGREES EAST

# HORIZONTAL PLANE RELATIVE FIELD PATTERN

Call & Location:

KYUB

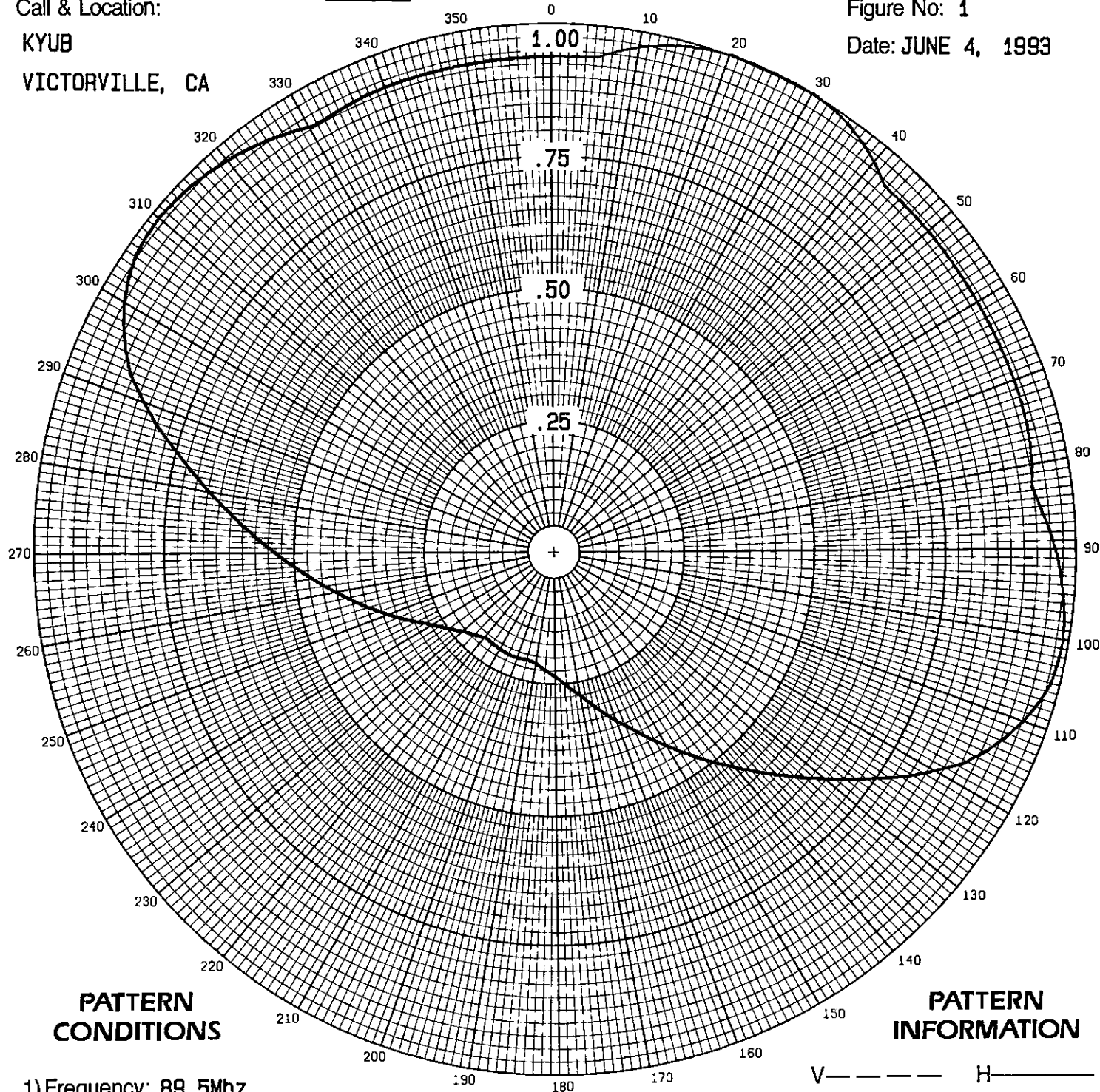
VICTORVILLE, CA

MEASURED

CALCULATED

Figure No: 1

Date: JUNE 4, 1993



## PATTERN CONDITIONS

- 1) Frequency: 89.5Mhz
- 2) Antenna Type: FMD-1B-HW
- 3) Antenna Orientation: North 27.5 Deg. East
- 4) Antenna Mounting: STANDARD
- 5) Tower Type: 30" Lambda tower
- 6) Comments: MEASURED DATA- The composite maximum value of either horizontal or vertical component of Figure# 2.

## PATTERN INFORMATION

### VERTICAL

Rms:

Maximum:

Minimum:

### HORIZONTAL

Rms: .75419

Maximum: 1 N20°E

Minimum: .21138 N220°E



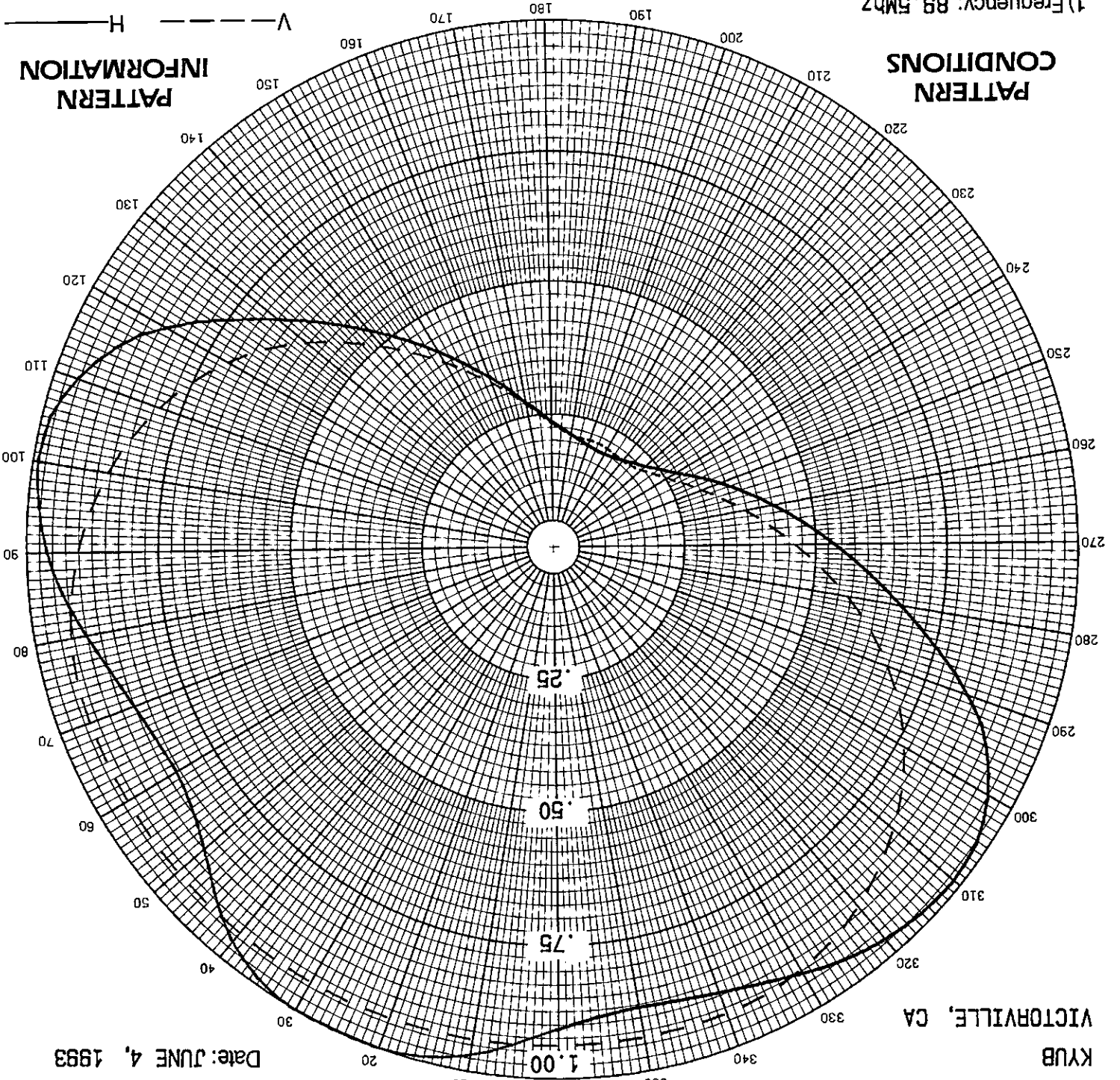
# HORIZONTAL PLANE RELATIVE FIELD PATTERN

Call & Location:  
KYUB  
VICTORVILLE, CA

MEASURED  
CALCULATED

Figure No: 2

Date: JUNE 4, 1993



FOR FIGURE: 2     JUNE 4, 1993  
HORIZONTAL PLANE RELATIVE FIELD & DBK LIST  
FOR RADIO STATION KYUB 89.5MHZ

---

AZIMUTH	H POL RELATIVE FIELD	H POL DBK	H POL POWER KW	V POL RELATIVE FIELD	V POL DBK	V POL POWER KW	AZIMUTH	H POL RELATIVE FIELD	H POL DBK	H POL POWER KW	V POL RELATIVE FIELD	V POL DBK	V POL POWER KW
0.0	.909	.14	1.034	.938	.42	1.101	180.0	.238	-11.50	.071	.236	-11.59	.069
5.0	.940	.44	1.106	.939	.42	1.101	185.0	.226	-11.95	.064	.223	-12.06	.062
10.0	.972	.72	1.180	.939	.42	1.102	190.0	.216	-12.32	.059	.215	-12.37	.058
15.0	.991	.89	1.229	.939	.42	1.102	195.0	.209	-12.62	.055	.212	-12.50	.056
20.0	1.000	.97	1.250	.939	.43	1.103	200.0	.204	-12.84	.052	.213	-12.46	.057
25.0	1.000	.97	1.250	.940	.43	1.103	205.0	.201	-12.96	.051	.214	-12.41	.057
30.0	1.000	.97	1.250	.940	.43	1.104	210.0	.201	-12.95	.051	.214	-12.44	.057
35.0	.988	.86	1.220	.940	.43	1.104	215.0	.205	-12.80	.052	.212	-12.50	.056
40.0	.960	.61	1.152	.940	.43	1.105	220.0	.211	-12.53	.056	.211	-12.53	.056
45.0	.916	.21	1.048	.940	.43	1.105	225.0	.221	-12.15	.061	.215	-12.38	.058
50.0	.872	-.22	.950	.940	.43	1.105	230.0	.233	-11.68	.068	.223	-12.05	.062
55.0	.844	-.51	.890	.940	.43	1.105	235.0	.251	-11.02	.079	.237	-11.55	.070
60.0	.832	-.63	.865	.940	.43	1.105	240.0	.275	-10.25	.095	.255	-10.90	.081
65.0	.838	-.57	.877	.940	.44	1.105	245.0	.306	-9.32	.117	.278	-10.15	.097
70.0	.851	-.43	.906	.940	.44	1.105	250.0	.343	-8.33	.147	.306	-9.33	.117
75.0	.873	-.21	.952	.937	.40	1.098	255.0	.384	-7.33	.185	.338	-8.44	.143
80.0	.902	.08	1.017	.929	.33	1.079	260.0	.431	-6.34	.232	.376	-7.53	.177
85.0	.935	.39	1.093	.917	.22	1.051	265.0	.483	-5.35	.291	.418	-6.60	.219
90.0	.960	.62	1.153	.900	.05	1.013	270.0	.541	-4.37	.366	.465	-5.68	.271
95.0	.978	.78	1.196	.879	-.15	.965	275.0	.606	-3.38	.459	.517	-4.76	.335
100.0	.988	.86	1.220	.853	-.41	.909	280.0	.679	-2.39	.576	.574	-3.85	.412
105.0	.982	.81	1.204	.823	-.73	.846	285.0	.761	-1.41	.723	.631	-3.03	.498
110.0	.953	.55	1.134	.788	-1.10	.776	290.0	.844	-.50	.890	.683	-2.34	.583
115.0	.907	.12	1.029	.749	-1.54	.701	295.0	.912	.17	1.039	.730	-1.76	.666
120.0	.838	-.57	.877	.705	-2.07	.621	300.0	.955	.57	1.141	.773	-1.27	.746
125.0	.754	-1.48	.711	.657	-2.68	.539	305.0	.983	.82	1.208	.810	-.86	.820
130.0	.673	-2.47	.566	.604	-3.41	.456	310.0	.990	.88	1.224	.843	-.52	.888
135.0	.601	-3.46	.451	.548	-4.25	.376	315.0	.983	.82	1.207	.870	-.24	.947
140.0	.536	-4.45	.359	.496	-5.13	.307	320.0	.971	.71	1.178	.893	-.01	.998
145.0	.478	-5.43	.286	.447	-6.02	.250	325.0	.953	.55	1.135	.912	.17	1.039
150.0	.427	-6.42	.228	.404	-6.91	.204	330.0	.930	.34	1.081	.925	.29	1.069
155.0	.382	-7.40	.182	.364	-7.80	.166	335.0	.910	.15	1.034	.933	.37	1.089
160.0	.341	-8.38	.145	.330	-8.67	.136	340.0	.895	.00	1.000	.937	.40	1.097
165.0	.307	-9.29	.118	.299	-9.51	.112	345.0	.885	-.09	.979	.937	.41	1.098
170.0	.277	-10.18	.096	.274	-10.29	.094	350.0	.881	-.13	.970	.938	.41	1.099
175.0	.256	-10.87	.082	.252	-10.99	.080	355.0	.889	-.05	.989	.938	.41	1.100

CITY OF LICENSE: VICTORVILLE, CA

MOUNTING STRUCTURE: 30" LAMBDA TOWER

ANTENNA TYPE: FMD-1B-HW NUMBER OF BAYS: 1

HORIZONTAL MAXIMUM RELATIVE FIELD= 1.00000 AZIMUTH 20

HORIZONTAL MINIMUM RELATIVE FIELD= .20057 AZIMUTH 208

VERTICAL MAXIMUM RELATIVE FIELD= .94040 AZIMUTH 70

VERTICAL MINIMUM RELATIVE FIELD= .21134 AZIMUTH 220

HORIZONTAL R.M.S.=.74008 VERTICAL R.M.S.=.70429

MAXIMUM HORIZONTAL E.R.P.= 1.2500KW MAXIMUM VERTICAL E.R.P.= 1.1054KW

HORIZONTAL POWER INPUT= .5154KW VERTICAL POWER INPUT= .6526KW

TOTAL POWER INPUT= 1.1680KW

MAXIMUM HORIZONTAL GAIN OF COMPLETE ARRAY= 1.07 ( .295dB)

MAXIMUM VERTICAL GAIN OF COMPLETE ARRAY= .95 ( -.239dB)

ANTENNA ORIENTATION: NORTH 27.5 DEGREES EAST

PATTERN REFERENCE #KYUBH2074

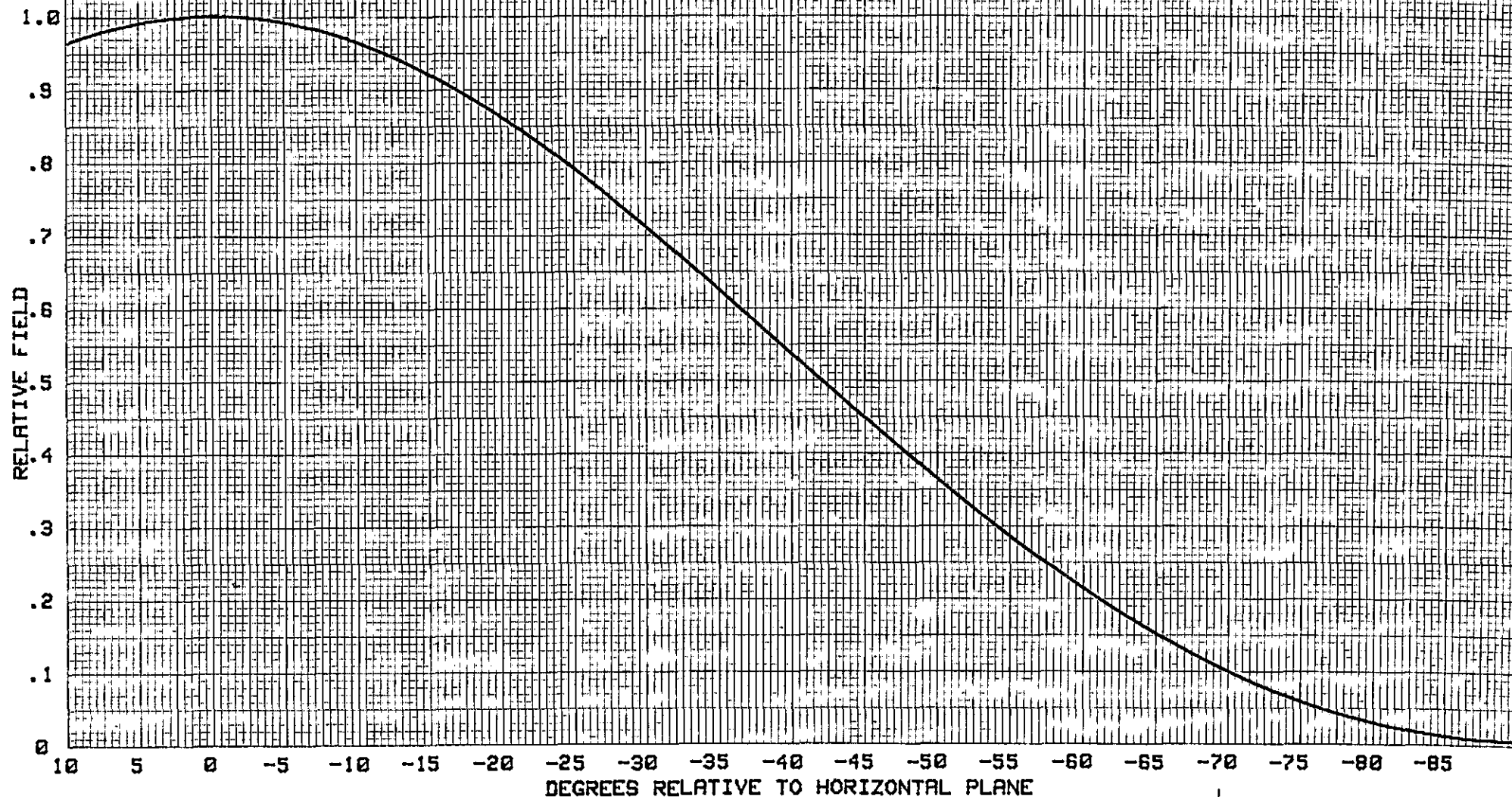
ELECTRONICS RESEARCH, INC.  
108 MARKET STREET  
NEWBURGH, IN. 47630

--- THEORETICAL ---  
VERTICAL PLANE RELATIVE FIELD

ELEMENT SPACING:  
0.5 WAVELENGTH

2 HORIZONTAL DIPOLE ELEMENTS WITH 0 DEGREE(S) BEAM TILT  
0 PERCENT FIRST NULL FILL  
0 PERCENT SECOND NULL FILL

FIGURE 3A



ELECTRONICS RESEARCH, INC.  
108 MARKET STREET  
NEWBURGH, IN. 47630

THEORETICAL  
VERTICAL PLANE RELATIVE FIELD

FIGURE 3

1 VERTICAL DIPOLE ELEMENT WITH 0 DEGREE BEAM TILT  
0 PERCENT FIRST NULL FILL  
0 PERCENT SECOND NULL FILL

