



ELECTRONICS RESEARCH INC.

7777 Gardner Rd. Chandler, In 47610 Phone (812) 925-6000 Fax (812) 925-4030

Directional Antenna System
For
WRKI, Brookfield, Connecticut

October 23, 1995

Electronics Research Inc. is providing a custom fabricated antenna system that is specially designed to meet the FCC requirements and the general needs of radio station WRKI.

The antenna is the Harris Corporation model FML-2E-DA-SP configuration. The circular polarized system consists of 2 full-wavelength spaced bays using one driven circular polarized radiating element and two vertical parasitic elements per bay. The antenna was tested on a 10 3/4" o.d. pole, which is the structure the station plans to use to support the array. All tests were performed on a frequency of 95.1 megahertz which is the center of the FM broadcast channel assigned to WRKI.

Pattern measurements were made on a sixty-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 the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University and is a registered professional engineer in the states of Indiana, Maryland and Minnesota.

EXHIBIT #B
MODIFY BLH-19960111KB
CUMULUS LICENSING LLC
WRKI (FM) RADIO STATION
CH 236B - 29.5 KW
BROOKFIELD, CONNECTICUT
February 2012

Directional Antenna System For WRKI, Brookfield, Connecticut

(Continued)

DESCRIPTION OF THE TEST PROCEDURE

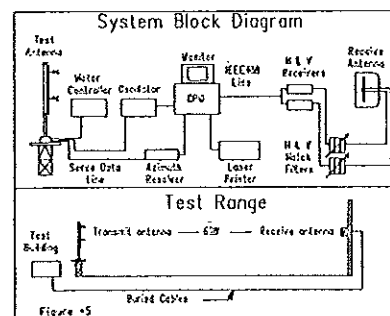
The test antenna consisted of two bay levels of the circular polarized system with the associated vertical parasitic elements. The elements and brackets that were used in this test are electrically equivalent to those that will be supplied with the antenna. A section of 3 1/8 inch o.d. rigid coaxial line was used to feed the test antenna, and a section of 3 1/8 inch o.d. rigid outer conductor only was attached above the test antenna. The lines were properly grounded during all tests.

The power distribution and phase relationship to the antenna elements was adjusted in order to achieve the directional radiation pattern for both horizontal and vertical polarization components.

The proof-of-performance was accomplished using a supporting structure of identical dimension and configuration as the 10 3/4" o.d. pole, including all braces, ladders, conduits, coaxial lines and other appurtenances that are included in the actual aperture at which the antenna will be installed. The structure 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 30 feet above ground. The turntable is equipped with a motor drive and azimuth indicating mechanism, resolution of this azimuth measuring device 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 95.1 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.



Directional Antenna System For WRKI, Brookfield, Connecticut

(Continued)

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 Laser Jet 4P printer by means of a 8386 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 coordinated graph paper in a clockwise direction. Both horizontal and vertical components were recorded separately.

CONCLUSIONS

The circular polarized system consists of 2 full-wavelength spaced bays using one driven circular polarized radiating element and two vertical parasitic elements per bay. The power distribution and phase relationship will be fixed when antenna is manufactured. Proper maintenance of the elements should be all that is required to maintain the pattern in adjustment.

The FML-2E-DA-SP array is to be oriented on the 10 3/4" o.d. pole at a bearing of North 97 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

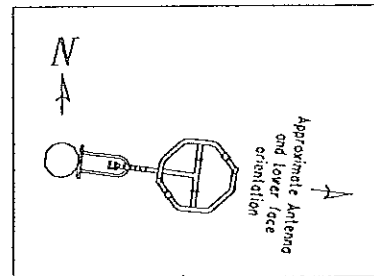


Figure #1 represents the maximum value of either the horizontal or vertical component at any azimuth. The measured horizontal plane relative field pattern, for both the horizontal and vertical polarization components, is shown on Figure #2 attached. A calculated vertical plane relative field pattern is shown on Figure #3 attached. The power in the maximum will reach 29.5 kilowatts 4.698 dBk).

Directional Antenna System
For
WRKI, Brookfield, Connecticut

(Continued)

The power at North 23 degrees East does not exceed 14.3 kilowatts (11.553 dBk).

The power at North 224 degrees East does not exceed 10.2 kilowatts (10.086 dBk).

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

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

The calculated maximum power gain of the horizontally polarized component is 1.743 (2.413 dB).

The calculated maximum power gain of the vertically polarized component is 1.743 (2.413 dB).

The calculated input power to the antenna input flange is 16.924 kilowatts (12.285 dBk) to provide a maximum horizontal ERP of 29.5 kilowatts (14.698 dBk) and a maximum vertical ERP of 29.5 kilowatts (14.698 dBk). The input flange to the antenna is 3 1/8 inch female.

Dan Dowdle (RD)

ELECTRONICS RESEARCH, INC.

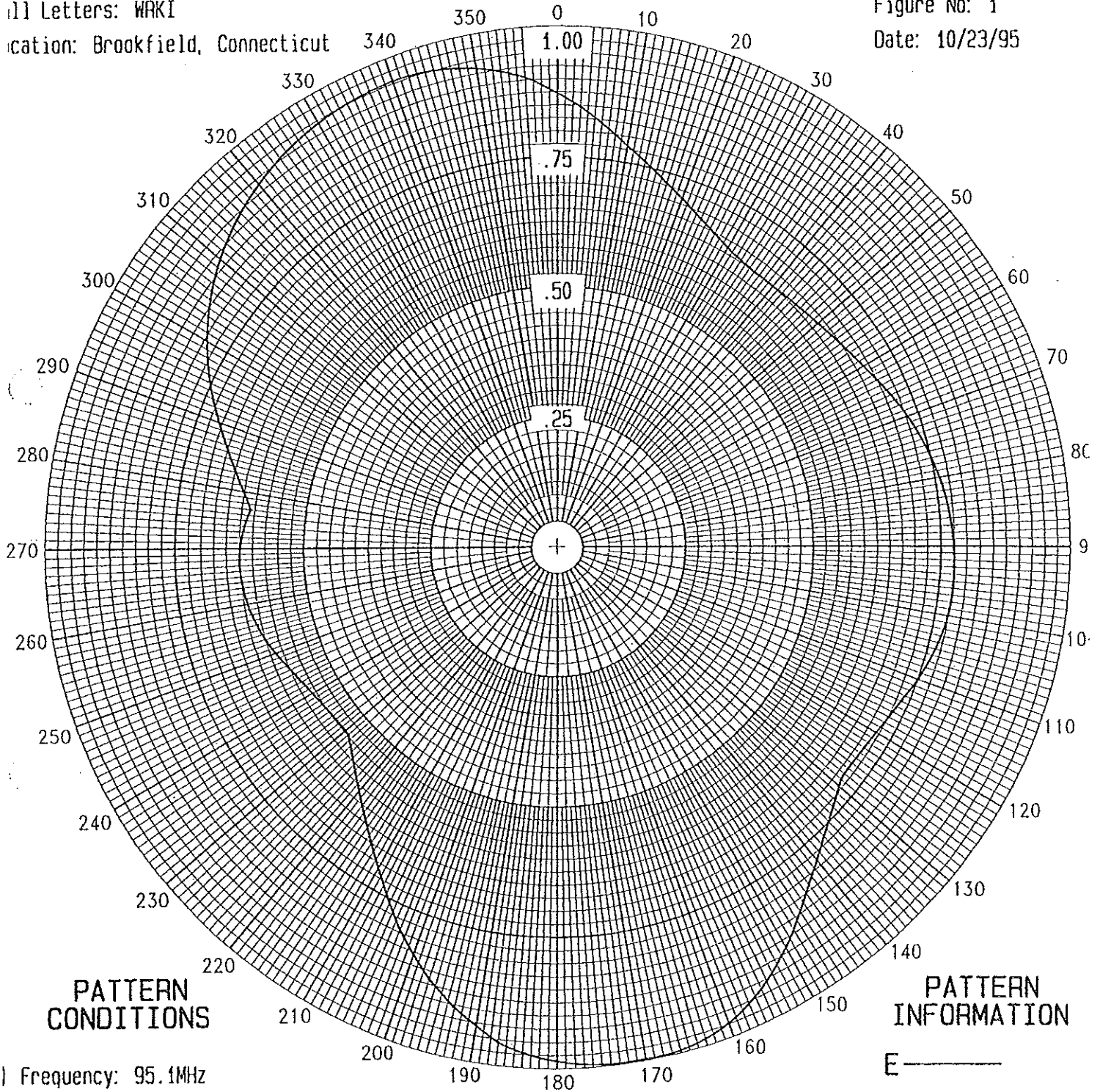
ERITM HORIZONTAL PLANE RELATIVE FIELD ENVELOPE PATTERN

Call Letters: WAKI

Location: Brookfield, Connecticut

Figure No: 1

Date: 10/23/95



PATTERN CONDITIONS

- Frequency: 95.1MHz
- Antenna Type: FML-2E-DA-SP
- Antenna Orientation: North 97 Deg. East
- Antenna Mounting: Standard
- Tower Type: 10 3/4" o.d. pole
- Comments: Envelope pattern of the horizontal and vertical components.

PATTERN INFORMATION

E ———

ENVELOPE

RMS .7795

Maximum: 1 @ 168°

Minimum: .547 @ 230°



Horizontal Plane Relative Field & dBk List

Radio Station WRKI

List For Figure# 1

Frequency: 95.1MHz

Date 10/23/95

AZIMUTH	RELATIVE FIELD	dBk	POWER kW	POLARIZATION	AZIMUTH	RELATIVE FIELD	dBk	POWER kW	POLARIZATION
0°	0.873	13.516	22.469	HORIZONTAL	180°	0.989	14.602	28.850	HORIZONTAL
5°	0.829	13.066	20.257	HORIZONTAL	185°	0.969	14.426	27.708	HORIZONTAL
10°	0.783	12.573	18.086	HORIZONTAL	190°	0.933	14.094	25.671	HORIZONTAL
15°	0.745	12.136	16.354	HORIZONTAL	195°	0.887	13.654	23.197	HORIZONTAL
20°	0.711	11.734	14.906	HORIZONTAL	200°	0.831	13.090	20.369	HORIZONTAL
25°	0.683	11.381	13.743	HORIZONTAL	205°	0.770	12.433	17.510	HORIZONTAL
30°	0.661	11.105	12.897	HORIZONTAL	210°	0.709	11.714	14.838	HORIZONTAL
35°	0.651	10.970	12.504	VERTICAL	215°	0.655	11.026	12.664	HORIZONTAL
40°	0.651	10.968	12.497	VERTICAL	220°	0.609	10.396	10.955	HORIZONTAL
45°	0.655	11.025	12.661	VERTICAL	225°	0.572	9.842	9.643	HORIZONTAL
50°	0.663	11.128	12.965	VERTICAL	230°	0.547	9.458	8.827	VERTICAL
55°	0.674	11.276	13.414	VERTICAL	235°	0.550	9.507	8.928	VERTICAL
60°	0.689	11.466	14.015	VERTICAL	240°	0.558	9.638	9.200	VERTICAL
65°	0.708	11.696	14.777	VERTICAL	245°	0.572	9.845	9.650	VERTICAL
70°	0.728	11.942	15.637	VERTICAL	250°	0.590	10.122	10.285	VERTICAL
75°	0.745	12.143	16.379	VERTICAL	255°	0.607	10.363	10.872	VERTICAL
80°	0.759	12.299	16.979	VERTICAL	260°	0.619	10.525	11.286	VERTICAL
85°	0.769	12.412	17.427	VERTICAL	265°	0.625	10.612	11.514	VERTICAL
90°	0.775	12.484	17.719	VERTICAL	270°	0.624	10.599	11.480	VERTICAL
95°	0.778	12.516	17.849	VERTICAL	275°	0.614	10.461	11.120	VERTICAL
100°	0.775	12.489	17.739	VERTICAL	280°	0.627	10.638	11.583	HORIZONTAL
105°	0.767	12.389	17.335	VERTICAL	285°	0.664	11.140	13.002	HORIZONTAL
110°	0.751	12.215	16.652	VERTICAL	290°	0.706	11.675	14.707	HORIZONTAL
115°	0.733	11.998	15.842	VERTICAL	295°	0.752	12.222	16.679	HORIZONTAL
120°	0.720	11.846	15.298	VERTICAL	300°	0.794	12.696	18.603	HORIZONTAL
125°	0.714	11.769	15.029	VERTICAL	305°	0.831	13.094	20.391	HORIZONTAL
130°	0.720	11.850	15.310	HORIZONTAL	310°	0.864	13.426	22.010	HORIZONTAL
135°	0.751	12.214	16.648	HORIZONTAL	315°	0.891	13.698	23.432	HORIZONTAL
140°	0.790	12.655	18.428	HORIZONTAL	320°	0.914	13.915	24.633	HORIZONTAL
145°	0.838	13.166	20.730	HORIZONTAL	325°	0.931	14.081	25.594	HORIZONTAL
150°	0.893	13.711	23.502	HORIZONTAL	330°	0.944	14.200	26.300	HORIZONTAL
155°	0.941	14.168	26.107	VERTICAL	335°	0.952	14.271	26.739	HORIZONTAL
160°	0.977	14.492	28.133	VERTICAL	340°	0.955	14.298	26.905	HORIZONTAL
165°	0.996	14.664	29.270	VERTICAL	345°	0.949	14.247	26.592	HORIZONTAL
170°	1.000	14.698	29.500	VERTICAL	350°	0.935	14.110	25.766	HORIZONTAL
175°	0.999	14.688	29.430	HORIZONTAL	355°	0.910	13.883	24.452	HORIZONTAL

CITY OF LICENSE: Brookfield, Connecticut

MOUNTING STRUTURE: 10 3/4" o.d. pole

ANTENNA TYPE: FML-2E-DA-SP NUMBER OF BAYS:2

ENVELOPE MAXIMUM RELATIVE FIELD=1.0000 AZIMUTH=168°

ENVELOPE MINIMUM RELATIVE FIELD=0.5470 AZIMUTH=230°

ENVELOPE RMS=.7795

MAXIMUM HORIZONTAL E.R.P.= 29.500kW MAXIMUM VERTICAL E.R.P.= 29.500kW

TOTAL POWER INPUT= 16.9241kW

MAXIMUM HORIZONTAL POWER GAIN OF THE COMPLETE ARRAY= 1.743(2.413dB)

MAXIMUM VERTICAL POWER GAIN OF THE COMPLETE ARRAY= 1.743(2.413dB)

ANTENNA ORIENTATION: North 97 degrees East

REFERENCE: WRKIV.PAT



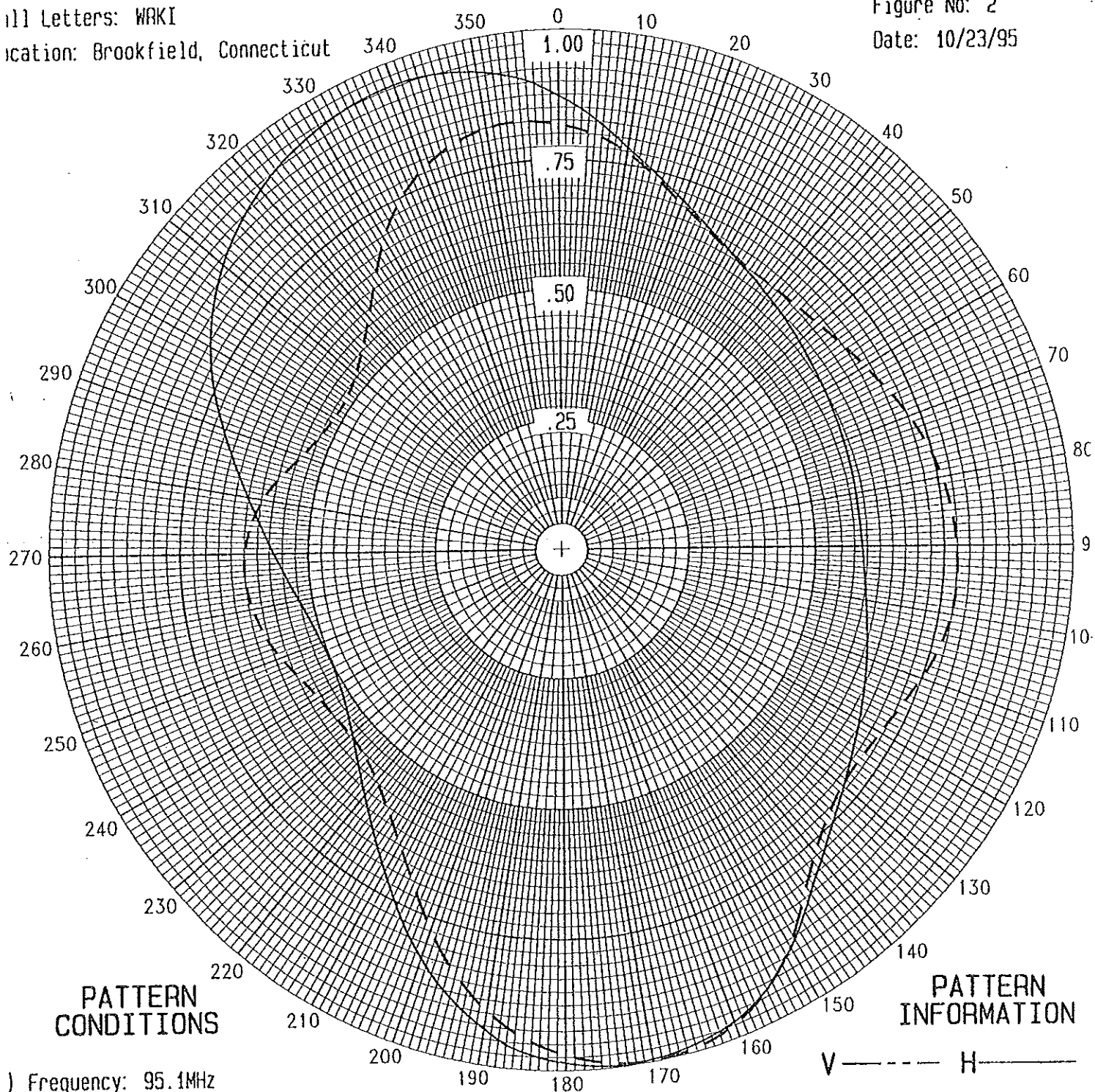
HORIZONTAL PLANE RELATIVE FIELD PATTERN

Call Letters: WAKI

Location: Brookfield, Connecticut

Figure No: 2

Date: 10/23/95



PATTERN CONDITIONS

PATTERN INFORMATION

- Frequency: 95.1MHz
- Antenna Type: FML-2E-DA-SP
- Antenna Orientation: North 97 Deg. East
- Antenna Mounting: Standard
- Tower Type: 10 3/4" o.d. pole
- Comments: The measured horizontal and vertical components.

VERTICAL	HORIZONTAL
RMS .725	RMS .7492
Maximum: 1 @ 168°	Maximum: 1 @ 173°
Minimum: .5134 @ 303°	Minimum: .503 @ 245°



Horizontal Plane Relative Field & dBk List

Radio Station WRKI

List For Figure# 2

Frequency: 95.1MHz

Date 10/23/95

ZIMUTH	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°	0.873	13.516	22.469	0.817	12.945	19.701	180°	0.989	14.602	28.850	0.973	14.462	27.941
5°	0.829	13.066	20.257	0.800	12.757	18.867	185°	0.969	14.426	27.708	0.942	14.175	26.152
10°	0.783	12.573	18.086	0.773	12.467	17.649	190°	0.933	14.094	25.671	0.898	13.761	23.774
15°	0.745	12.136	16.354	0.739	12.065	16.089	195°	0.887	13.654	23.197	0.842	13.201	20.899
20°	0.711	11.734	14.906	0.704	11.644	14.601	200°	0.831	13.090	20.369	0.774	12.467	17.650
25°	0.683	11.381	13.743	0.677	11.314	13.532	205°	0.770	12.433	17.510	0.705	11.666	14.675
30°	0.661	11.105	12.897	0.660	11.086	12.842	210°	0.709	11.714	14.838	0.649	10.947	12.437
35°	0.645	10.888	12.268	0.651	10.970	12.504	215°	0.655	11.026	12.664	0.605	10.340	10.814
40°	0.632	10.713	11.783	0.651	10.968	12.497	220°	0.609	10.396	10.955	0.574	9.873	9.712
45°	0.622	10.580	11.429	0.655	11.025	12.661	225°	0.572	9.842	9.643	0.554	9.573	9.064
50°	0.613	10.447	11.085	0.663	11.128	12.965	230°	0.542	9.383	8.675	0.547	9.458	8.827
55°	0.606	10.345	10.827	0.674	11.276	13.414	235°	0.521	9.035	8.008	0.550	9.507	8.928
60°	0.600	10.258	10.613	0.689	11.466	14.015	240°	0.508	8.814	7.610	0.558	9.638	9.200
65°	0.595	10.187	10.441	0.708	11.696	14.777	245°	0.503	8.730	7.464	0.572	9.845	9.650
70°	0.591	10.133	10.311	0.728	11.942	15.637	250°	0.506	8.780	7.551	0.590	10.122	10.285
75°	0.589	10.096	10.223	0.745	12.143	16.379	255°	0.514	8.914	7.787	0.607	10.363	10.872
80°	0.587	10.075	10.174	0.759	12.299	16.979	260°	0.527	9.127	8.179	0.619	10.525	11.286
85°	0.587	10.077	10.178	0.769	12.412	17.427	265°	0.544	9.413	8.737	0.625	10.612	11.514
90°	0.591	10.124	10.291	0.775	12.484	17.719	270°	0.567	9.766	9.476	0.624	10.599	11.480
95°	0.597	10.219	10.518	0.778	12.516	17.849	275°	0.594	10.177	10.417	0.614	10.461	11.120
100°	0.607	10.359	10.863	0.775	12.489	17.739	280°	0.627	10.638	11.583	0.596	10.202	10.475
105°	0.620	10.543	11.331	0.767	12.389	17.335	285°	0.664	11.140	13.002	0.570	9.810	9.571
110°	0.636	10.773	11.947	0.751	12.215	16.652	290°	0.706	11.675	14.707	0.543	9.399	8.708
115°	0.653	11.003	12.597	0.733	11.998	15.842	295°	0.752	12.222	16.679	0.525	9.106	8.139
120°	0.672	11.252	13.340	0.720	11.846	15.298	300°	0.794	12.696	18.603	0.515	8.941	7.836
125°	0.694	11.527	14.212	0.714	11.769	15.029	305°	0.831	13.094	20.391	0.515	8.932	7.820
130°	0.720	11.850	15.310	0.717	11.807	15.162	310°	0.864	13.426	22.010	0.527	9.133	8.191
135°	0.751	12.214	16.648	0.736	12.041	15.999	315°	0.891	13.698	23.432	0.551	9.522	8.958
140°	0.790	12.655	18.428	0.772	12.453	17.593	320°	0.914	13.915	24.633	0.587	10.074	10.173
145°	0.838	13.166	20.730	0.824	13.020	20.047	325°	0.931	14.081	25.594	0.635	10.760	11.913
150°	0.893	13.711	23.502	0.889	13.673	23.296	330°	0.944	14.200	26.300	0.694	11.524	14.202
155°	0.940	14.165	26.090	0.941	14.168	26.107	335°	0.952	14.271	26.739	0.745	12.136	16.351
160°	0.972	14.451	27.865	0.977	14.492	28.133	340°	0.955	14.298	26.905	0.783	12.575	18.091
165°	0.989	14.601	28.847	0.996	14.664	29.270	345°	0.949	14.247	26.592	0.810	12.864	19.337
170°	0.998	14.682	29.391	1.000	14.698	29.500	350°	0.935	14.110	25.766	0.824	13.018	20.035
175°	0.999	14.688	29.430	0.993	14.635	29.070	355°	0.910	13.883	24.452	0.826	13.037	20.125

CITY OF LICENSE: Brookfield, Connecticut

MOUNTING STRUTURE: 10 3/4" o.d. pole

ANTENNA TYPE: FML-2E-DA-SP NUMBER OF BAYS:2

HORIZONTAL MAXIMUM RELATIVE FIELD=1.0000 AZIMUTH=173

HORIZONTAL MINIMUM RELATIVE FIELD=0.5030 AZIMUTH=245

VERTICAL MAXIMUM RELATIVE FIELD=1.0000 AZIMUTH=168

VERTICAL MINIMUM RELATIVE FIELD=0.5134 AZIMUTH=303

HORIZONTAL RMS=.7492 VERTICAL RMS=.7250

MAXIMUM HORIZONTAL E.R.P.= 29.500kW MAXIMUM VERTICAL E.R.P.= 29.500kW

TOTAL POWER INPUT= 16.9241kW

MAXIMUM HORIZONTAL POWER GAIN OF THE COMPLETE ARRAY= 1.743(2.413dB)

MAXIMUM VERTICAL POWER GAIN OF THE COMPLETE ARRAY= 1.743(2.413dB)

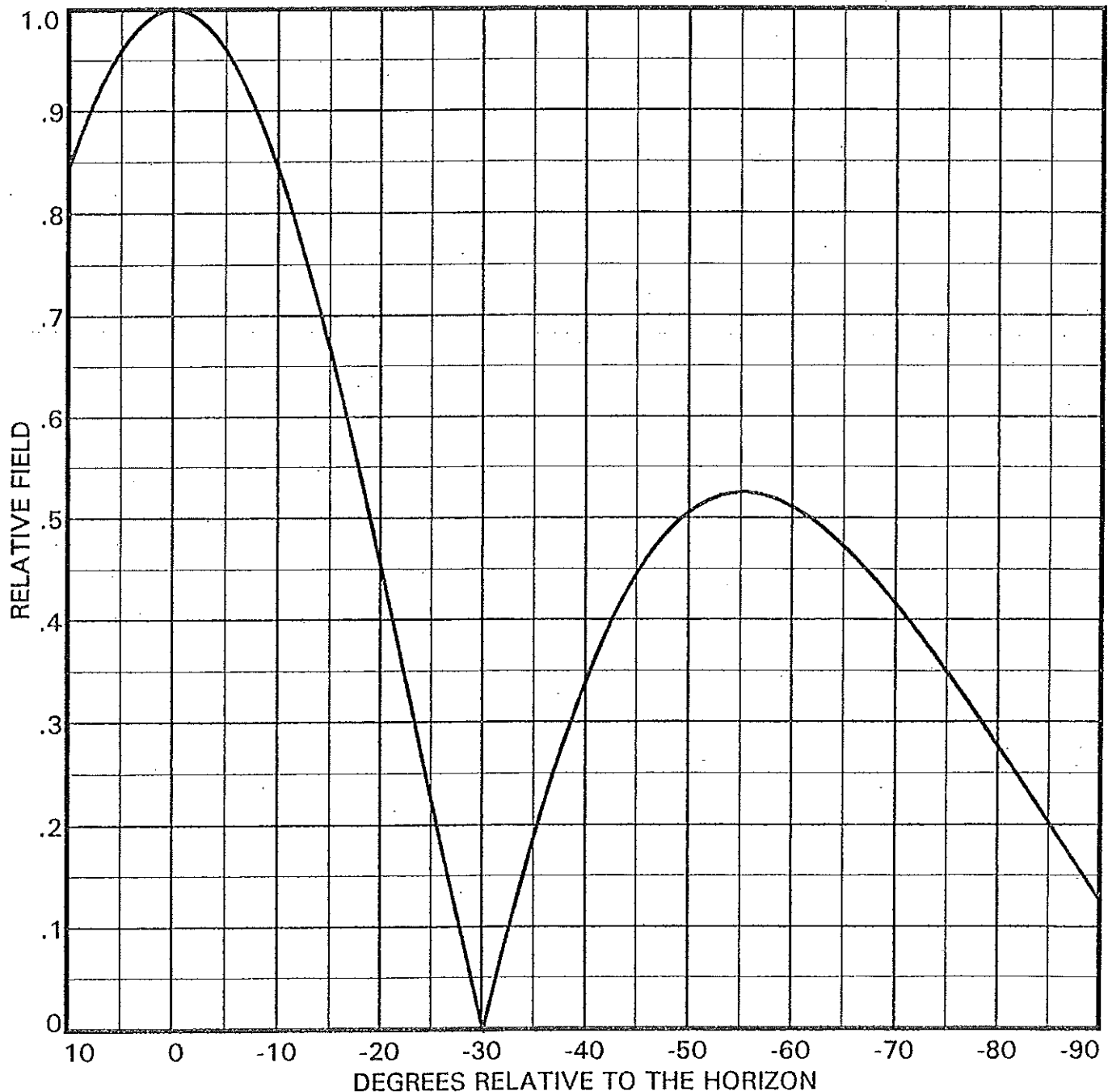
ANTENNA ORIENTATION: North 97 degrees East

REFERENCE: WRKIH.PAT WRKIV.PAT

THEORETICAL VERTICAL PLANE RELATIVE FIELD PATTERN

FIGURE # 3
Brookfield, Connecticut
WRKI
95.1MHz
2 BAY FML-2E-DA-SP ANTENNA

October 23, 1995
0 DEGREE BEAM TILT
0 PERCENT FIRST NULL FILL
0 PERCENT SECOND NULL FILL
1 WAVELENGTH SPACING



ELECTRONICS RESEARCH, INC. 7777 Gardner Rd. Chandler, In. 47610 Phone: (812) 925-6000 Fax: (812) 925-4030



CARROCCIO - COVILL & ASSOCIATES, INC.

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WAYNE A. THOMAS, P.G., R.E.M.
RALPH A. KLASS, P.E.

40 OLD NEW MILFORD ROAD
BROOKFIELD, CT 06804
(203) 775-6207
FAX (203) 775-3628

33A VILLAGE GREEN DRIVE
LITCHFIELD, CT 06759
(203) 567-3179

LICENSED IN CT, NY, VT, ME

December 15, 1995

WINE / WRKI
1004 Federal Road
Brookfield, Connecticut 06804

Attention: Mr. Pat Carlone

RE: FM Directional Antenna for WRKI
Brookfield, CT

Dear Pat:

Pursuant to your request, we performed measurements on Tuesday, December 5, 1995 at your tower site at 39 Carmen Hill Road in Brookfield, Connecticut. Using a compass and a magnetic declination chart provided by the Central Surveys Department of the State of Connecticut, we set - out an azimuth of 97 degrees east of true north. On Friday, December 15, we again visited the site to measure the installed azimuth of a device described as the FM directional antenna for WRKI Brookfield.

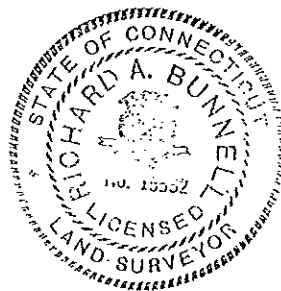
To the best of our knowledge, belief and ability, the FM directional antenna has been set at an azimuth 97 degrees east of north.

If you have any questions, please feel free to contact our office.

Very truly yours,

CARROCCIO-COVILL &
ASSOCIATES, INC.

Richard A. Bunnell, R.L.S.



RAB/ra

DANBURY
BROADCASTING
INC.

WINE/WRKI-FM
P.O. Box 95
Danbury, CT 06813

(203) 775-1212
FAX (203) 775-6452

GARY J. STARR
President

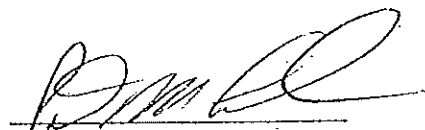
December 15th 1995

Federal Communications Commission
Washington, DC

TO WHOM IT MAY CONCERN

This is to certify that I observed and supervised the assembly and installation of the FM directional antenna system for WRKI Brookfield, Connecticut, and that the system was installed pursuant to the manufacturer's instructions.

I have been practicing engineering continuously since 1971 as the chief operator for WINE/WRKI-FM and hold a "General Radiotelephone Operator License" #PG-1-8580.



Patrick M. Carlone
Chief Operator for WINE/WRKI