TECHNICAL EXHIBIT
APPLICATION FOR LICENSE
AND REQUEST FOR PROGRAM TEST AUTHORITY
RADIO STATION WBUR-FM
BOSTON, MASSACHUSETTS

August 12, 2005

CH 215B 12.0 KW (MAX-DA) 305 M

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Technical Statement

This Technical Exhibit was prepared on behalf of radio station WBUR-FM, channel 215B, Boston, Massachusetts. Station WBUR-FM has completed construction of its modified facility, as authorized in Construction Permit BMPED-20031119AEW. Based on information supplied by the station's Chief Engineer, the facility was built in accordance with the underlying construction permit, including all special operating conditions and restrictions. Technical details are provided on FCC Form 302.

Attached to this Technical Statement are three Exhibits. Exhibit 1 is a Proof of Performance for the directional antenna as supplied by Shively Labs, the antenna manufacturer. Exhibit 2 is an affidavit certifying that a qualified engineer oversaw the installation and that the antenna was mounted in accordance with the instructions of the antenna manufacturer. Exhibit 3 is a surveyor's affidavit that the antenna has been mounted with the proper orientation.

David E. Dickmann

August 12, 2005

Exhibit 1

Directional Antenna Proof of Performance

Shively Labs
a division of Howell Laboratories,Inc.

P. O. Box 389 Harrison Rd.,
Bridgton, Maine 04009 USA

- An Employee-Owned Company -

(207) 647-3327
888-SHIVELY
Fax: (207) 647-8273
E-mail: sales@shively.com
Web site: www.shively.com

S.O. 24068

Report of Test 6810-2R-DA

for

TRUSTEES OF BOSTON UNIVERSITY

WBUR-FM 90.9 MHZ BOSTON, MA

OBJECTIVE:

The objective of this test was to demonstrate the directional characteristics of a 6810-2R-DA to meet the needs of WBUR-FM and to comply with the requirements of the FCC construction permit, file number BMPED-20031119AEW.

RESULTS:

The measured azimuth pattern for the 6810-2R-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 BMPED-20031119AEW indicates that the Horizontal radiation component shall not exceed 12.0 kW at any azimuth and is restricted to the following values at the azimuths specified:

160 - 170 Degrees T: 3.012 kW
270 - 280 Degrees T: 2.398 kW

From Figure 1, the maximum radiation of the Horizontal component occurs at 027 Degrees T to 106 Degrees T. At the restricted azimuth of 160 - 170 Degrees T the Horizontal component is 6.558 dB down from the maximum of 12.0 kW, or 2.651 kW. At the restricted azimuth of 270 - 280 Degrees T the Horizontal component is 7.432 dB down from the maximum of 12.0 kW, or 2.168 kW.

The R.M.S. of the Horizontal component is 0.725. The total Horizontal power gain is 1.970. The R.M.S. of the Vertical component is 0.694. The total Vertical power gain is 1.930. See Figure 4 for calculations. The R.M.S. of the FCC composite pattern is 0.839. The R.M.S. of the measured composite pattern is 0.755. Eighty-five percent (85%) of the original authorized FCC composite pattern is 0.714. Therefore this pattern complies with the FCC requirement of 73.316(c)(2)(ix)(A).

METHOD OF DIRECTIONALIZATION:

One bay of the 6810-2R-DA was mounted on a tower of exact scale to a Dresser-Ideco 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 BMPED-20031119AEW, a single level of the 6810-2R-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.

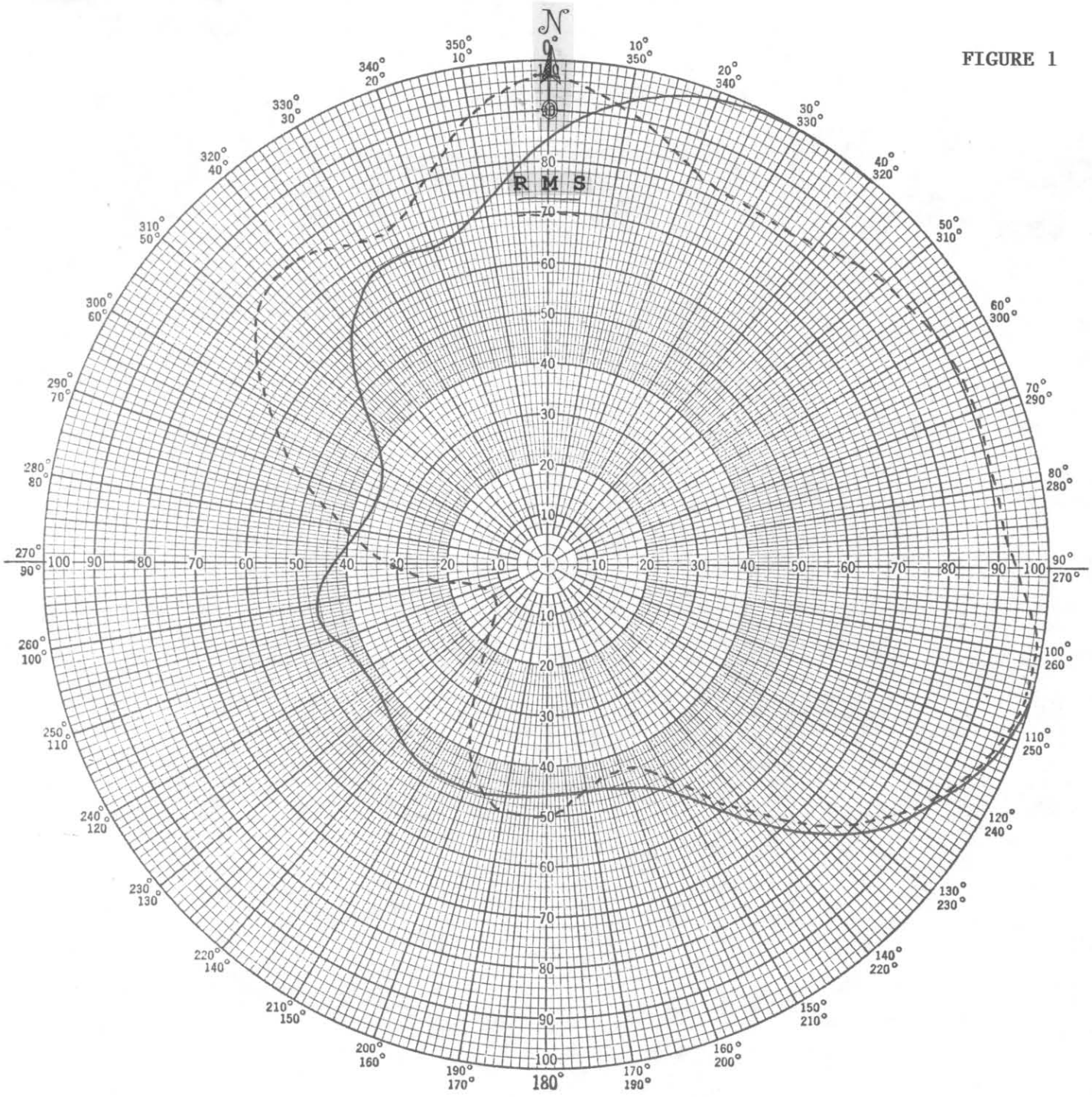
TEST PROCEDURES:

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 409.05 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 24068
July 7, 2005

FIGURE 1



Shively Labs

PROJECT NAME WBUR-FM BOSTON, MA

PROJECT NUMBER 24068 DATE 6/29/05

MODEL (X) FULL SCALE ( ) FREQUENCY 409.05/90.9 MHz

POLARIZATION HORIZ (——); VERT (----)

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

OBSERVER RAS

ANTENNA TYPE 6810-2R-DA

PATTERN TYPE DIRECTIONAL AZIMUTH

REMARKS: SEE FIGURE 2 FOR MECHANICAL DETAILS

Figure 1A

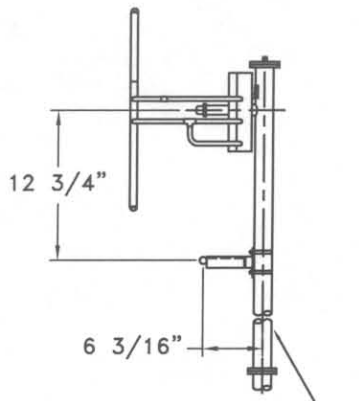
S/O 24068
TABULATION OF HORIZONTAL POLARIZATION
WBUR BOSTON, MA

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.845	180	0.460
10	0.935	190	0.465
20	0.980	200	0.475
30	1.000	210	0.475
40	1.000	220	0.455
45	1.000	225	0.440
50	1.000	230	0.425
60	1.000	240	0.420
70	1.000	250	0.445
80	1.000	260	0.465
90	1.000	270	0.425
100	1.000	280	0.380
110	0.980	290	0.365
120	0.915	300	0.380
130	0.820	310	0.470
135	0.750	315	0.550
140	0.665	320	0.605
150	0.525	330	0.675
160	0.470	340	0.670
170	0.460	350	0.725

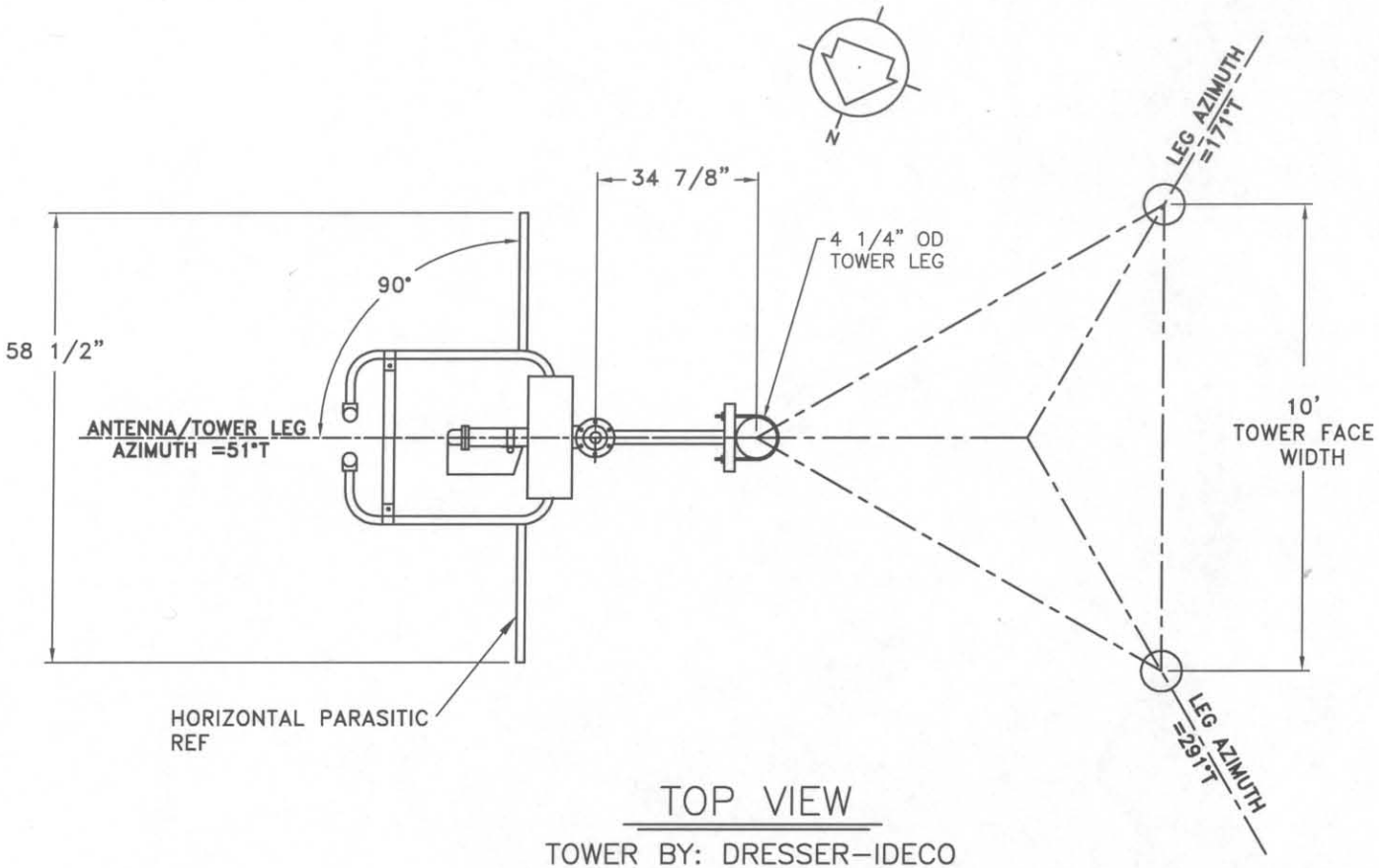
Figure 1B

S/O 24068
TABULATION OF VERTICAL POLARIZATION
WBUR BOSTON, MA

DEGREE	RELATIVE FIELD	DEGREE	RELATIVE FIELD
0	0.970	180	0.500
10	0.915	190	0.500
20	0.840	200	0.435
30	0.815	210	0.285
40	0.830	220	0.180
45	0.860	225	0.150
50	0.875	230	0.130
60	0.900	240	0.130
70	0.905	250	0.135
80	0.905	260	0.210
90	0.935	270	0.320
100	0.990	280	0.410
110	0.975	290	0.530
120	0.905	300	0.645
130	0.800	310	0.755
135	0.720	315	0.780
140	0.635	320	0.780
150	0.495	330	0.740
160	0.435	340	0.770
170	0.460	350	0.900



SIDE VIEW

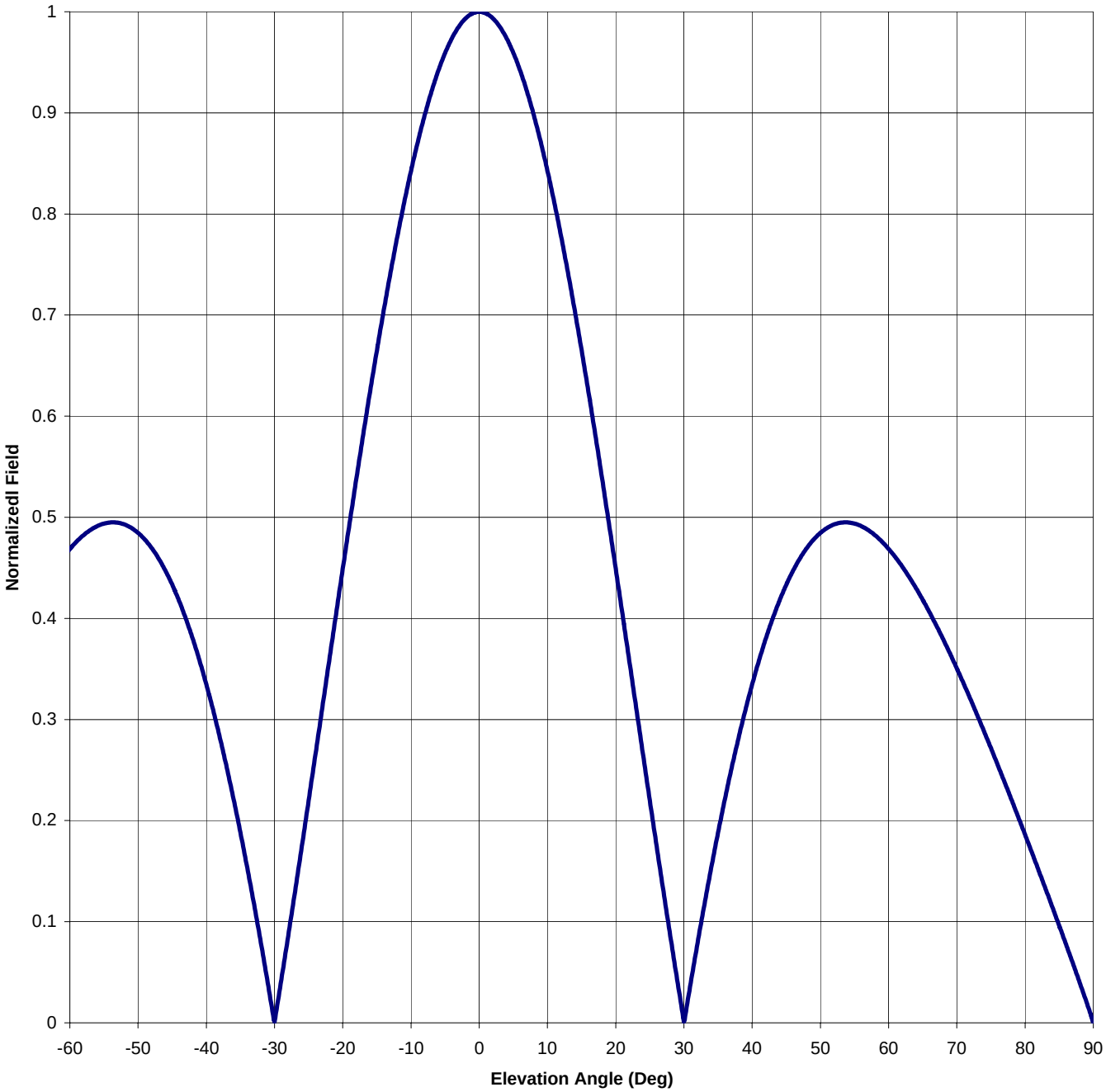


TOP VIEW

TOWER BY: DRESSER–IDECO

SHIVELY LABS A DIVISION OF HOWELL LABORATORIES INC.,BRIDGTON, MAINE			
SHOP ORDER: 24068	FREQUENCY: 90.9 MHz.	SCALE: N.T.S.	DRAWN BY: AMG APPROVED BY:
MODEL: 6810–2R–DIRECTIONAL ANTENNA			
DATE: 7/1/05	FIGURE 2		

Antenna Mfg.:	**Shively Labs**			**Date: 6/29/2005**
Antenna Type:	**6810-2R-DA**			
Station:	**WBUR**	**Beam Tilt**	**0**	
Frequency:	**90.9**	**Gain (Max)**	**1.970**	**2.945 dB**
Channel #:	**215**	**Gain (Horizon)**	**1.970**	**2.945 dB**
Figure:	**3**			



Antenna Mfg.: Shively Labs **Date:** 6/29/2005

Antenna Type: 6810-2R-DA

Station: WBUR **Beam Tilt** 0

Frequency: 90.9 **Gain (Max)** 1.970 2.945 dB

Channel #: 215 **Gain (Horizon)** 1.970 2.945 dB

Figure: 3

Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field	Angle of Depression (Deg)	Relative Field
-90	0.000	-44	0.418	0	1.000	46	0.447
-89	0.021	-43	0.400	1	0.998	47	0.459
-88	0.040	-42	0.380	2	0.993	48	0.470
-87	0.059	-41	0.358	3	0.985	49	0.478
-86	0.078	-40	0.335	4	0.974	50	0.485
-85	0.096	-39	0.309	5	0.959	51	0.490
-84	0.114	-38	0.282	6	0.942	52	0.493
-83	0.133	-37	0.252	7	0.921	53	0.495
-82	0.151	-36	0.221	8	0.898	54	0.495
-81	0.168	-35	0.188	9	0.871	55	0.494
-80	0.186	-34	0.153	10	0.843	56	0.491
-79	0.204	-33	0.117	11	0.811	57	0.487
-78	0.221	-32	0.079	12	0.778	58	0.482
-77	0.238	-31	0.040	13	0.742	59	0.476
-76	0.255	-30	0.001	14	0.705	60	0.469
-75	0.272	-29	0.043	15	0.665	61	0.460
-74	0.288	-28	0.086	16	0.624	62	0.451
-73	0.304	-27	0.130	17	0.582	63	0.441
-72	0.320	-26	0.175	18	0.539	64	0.430
-71	0.335	-25	0.220	19	0.494	65	0.418
-70	0.350	-24	0.266	20	0.449	66	0.406
-69	0.365	-23	0.312	21	0.404	67	0.393
-68	0.379	-22	0.358	22	0.358	68	0.379
-67	0.393	-21	0.404	23	0.312	69	0.365
-66	0.406	-20	0.449	24	0.266	70	0.350
-65	0.418	-19	0.494	25	0.220	71	0.335
-64	0.430	-18	0.539	26	0.175	72	0.320
-63	0.441	-17	0.582	27	0.130	73	0.304
-62	0.451	-16	0.624	28	0.086	74	0.288
-61	0.460	-15	0.665	29	0.043	75	0.272
-60	0.469	-14	0.705	30	0.001	76	0.255
-59	0.476	-13	0.742	31	0.040	77	0.238
-58	0.482	-12	0.778	32	0.079	78	0.221
-57	0.487	-11	0.811	33	0.117	79	0.204
-56	0.491	-10	0.843	34	0.153	80	0.186
-55	0.494	-9	0.871	35	0.188	81	0.168
-54	0.495	-8	0.898	36	0.221	82	0.151
-53	0.495	-7	0.921	37	0.252	83	0.133
-52	0.493	-6	0.942	38	0.282	84	0.114
-51	0.490	-5	0.959	39	0.309	85	0.096
-50	0.485	-4	0.974	40	0.335	86	0.078
-49	0.478	-3	0.985	41	0.358	87	0.059
-48	0.470	-2	0.993	42	0.380	88	0.040
-47	0.459	-1	0.998	43	0.400	89	0.021
-46	0.447	0	1.000	44	0.418	90	0.000
-45	0.433			45	0.433		

S.O. 24068 Figure 4

VALIDATION OF TOTAL POWER GAIN CALCULATION

WBUR BOSTON, MA

6810-2R-DA

Elevation Gain of Antenna 0.991

The RMS values are calculated utilizing the data of a planimeter

Horizontal RMS value divided by the Vertical RMS value equals the Horiz. - Vert. Ratio

H RMS 0.725 V RMS 0.694 H/V Ratio 1.045

Elevation Gain of Horizontal Component 1.035

Elevation Gain of Vertical Component 0.949

Horizontal Azimuth Gain equals 1/(RMS)SQ. 1.902

Vertical Azimuth Gain equals 1/(RMS/Max Vert)SQ. 2.035

Max. Vertical 0.99

***Total Horizontal Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Horizontal Power Gain = **1.970**

***Total Vertical Power Gain is the Elevation Gain Times the Azimuth Gain**

Total Vertical Power Gain = **1.930**

==========

ERP divided by Horizontal Power Gain equals Antenna Input Power

12 KW ERP Equals 6.093 KW Antenna Input Power

Antenna Input Power times Vertical Power Gain equals Vertical ERP

6.093 KW Times 1.930 KW Equals 11.761 KW ERP

Maximum Value of the Vertical Component squared times the Maximum ERP equals the Vertical ERP

0.99 Equals 11.761 KW Vertical ERP

NOTE: Calculating the ERP of the Vertical Component by two methods validates the total power gain calculations

Exhibit 2

Engineer’s Certification

CERTIFICATION
OF INSTALLATION
STATION WBUR-FM
BOSTON UNIVERSITY

I, Michael LeClair, hereby certify that I supervised the assembly and installation of the new directional antenna system for station WBUR-FM pursuant to Construction Permit BMPED-20031119AEW. All specifications from the manufacturer were followed on this installation. The pointing of the antenna was certified as correct by a surveyor at the completion of antenna mounting.

I have been active as a broadcast engineer for more than 25 years and am currently recognized as a Certified Professional Broadcast Engineer by the Society of Broadcast Engineers. I am presently employed as Chief Engineer for the WBUR Group which owns and operates four stations from Boston, Massachusetts, as a part of Boston University.

Date: 12 August 2005

Michael LeClair

Chief Engineer
WBUR Group

Subscribed to and sworn before me
this 12 day of 8, 2005

PAULINE SULPRIZIO, Notary Public
My Commission Expires Apr. 21, 2011

Exhibit 3

Surveyor’s Certification

AFFIDAVIT

I, Jeffrey D. Youngquist, a Professional Land Surveyor, doing business in the State of Massachusetts as Outback Engineering, Inc. at 165 East Grove Street in Middleboro, Massachusetts does hereby certify that the directional antenna for WBUR-FM, Boston, Massachusetts has been oriented at the proper azimuth which conforms with the specifications in FCC Construction Permit BMPED 20031119AEW.

Jeffrey D. Youngquist Date: 8-12-05

P.L.S. # 37742

The Commonwealth of Massachusetts

Norfolk (County), ss.

Date August 12, 2005

Then personally appeared the above named

Jeffrey D. Youngquist

and acknowledged the foregoing instrument to be his/her free act and deed, before me,

Theodora K. Eaton

THEODORA K. EATON, Notary Public

My Commission Expires May 15, 2009