



Technical Exhibit 13
Application for a Construction Permit
For A New Booster Station
Dover, MA

Proposed
Channel 223D
0.099 KW MAX
42° 22' 42.1" N
71° 16' 04.9" W

August 10, 2015

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Technical Exhibit

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For A New Booster Station
Channel 223D
Dover, MA

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**Technical Exhibit
Application for a Construction Permit
For A New Booster Station
Channel 223D
Dover, MA**

Overview

This technical exhibit supports an application for a new booster station for primary station WXRV, Andover, MA (Facility ID 49385, File # BLH-20061121ACI). WXRV is currently licensed to operate on Channel 223B (92.5 MHz) with a maximum effective radiated power of 25 kW.

Proposed Facilities

This application is proposing a new booster station on channel 223 to serve Dover, MA. The location of the transmitter site is at coordinates 42° 22' 42.1" N; 71° 16' 04.9" W. It is proposed to operate the station with an effective radiated power of 0.099 kW (99 w) utilizing a Jampro JAVA 1-1(2) log periodic antenna array that will be mounted on an existing tower having antenna structure registration 1009251. The overall height of the tower is 114.3 meters above ground level. The antenna will be mounted at a height above ground of 97.5 meters and therefore will not be increasing the overall height of the tower. A map showing the proposed antenna location is attached as Exhibit 1.

Proposed Coverage

Exhibit 2 is a computer generated map showing the 54 dBu contours for both the proposed booster and licensed site of WXRV, Andover, MA. As can be seen from this map, the 54 dBu contour of the proposed booster does not exceed the 54 dBu contour of the licensed facilities of WXRV.

Allocation Study

An allocation study was performed according to § 74.1204 of the Commissions Rules. The CDBS was used as the basis for the study. The proposed operation of the booster meets all spacing and overlap requirements except toward first adjacent WPRO-

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FM, Providence, RI (Facility ID #64841). Since the booster is proposed to operate with less than 100 watts this proposal does not need to consider intermediate frequency (IF) allocations.

Contour Overlap with WPRO-FM, Providence, RI

A contour study of the proposed booster as related to first adjacent channel station WPRO-FM was performed. This study showed that the 48 dBu F50/10 interfering contour of the proposed booster would overlap the 54 dBu protected contour of WPRO-FM. A study was performed based on § 74.1204(i) of the rules. This section of the rules is being used since the primary station, WXRV is severely short-spaced to first adjacent station WPRO-FM by 56.7 km based on the separations contained in § 73.207 (see Exhibits 3 & 4). The ratio method was used using a ratio of 6 db to determine the interference area within the 54 dBu F50/50 contour of WPRO-FM. Once the area of interference was defined the interference free area of WPRO-FM with the 54 dBu F50/50 contour was then plotted. Attached as Exhibit 5 is a map showing the interference area (red shading) and the interference free area (green shading) of WPRO-FM. Next the F50/10 contours of the proposed booster were plotted on this map and it was determined that the 50 dBu F50/10 contour was the first contour of the proposed booster in interference free area (see Exhibit 6). This contour overlaps the 64 dBu F50/50 contour resulting in a 14 dB desired to undesired ratio, therefore this application meets the requires of § 74.1204(i) with respect to WPRO-FM.

Environmental Considerations

The antenna system will be mounted on an existing tower having ASR # 1009251. Since the installation of the antenna will not increase the height of the existing tower the proposed facility should be exempt from environmental processing under 47 CFR Section 1.1306.

The proposed facility was evaluated in regards to potential exposure to radio frequency energy exposure at ground level to workers and the general public. The center of radiation of the antenna being proposed is 97.5 meters above ground level. Based on

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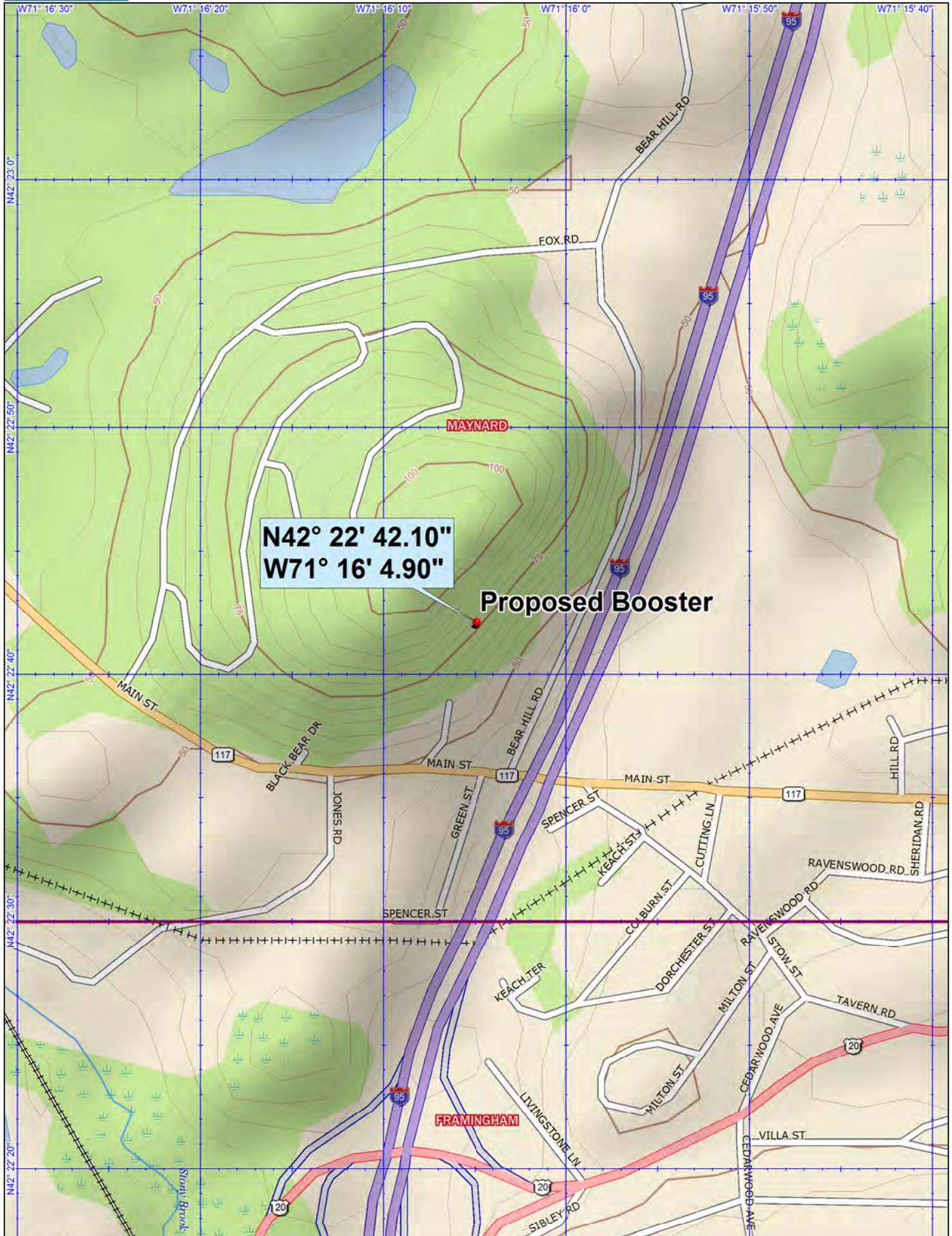
using the FCC FM Model program and using a worst case scenario (Phelps Dodge Ring Type Antenna or dipole) the predicted power density is $0.436 \mu\text{w}/\text{cm}^2$ which is 0.218% of the limit of $200 \mu\text{w}/\text{cm}^2$ for FM broadcast stations in an uncontrolled environment. Since this is less than the 5% threshold this proposal will comply with the RF emission rules.

The licensee agrees to reduce power or cease operations when it becomes necessary for workers to be on the tower in order to ensure that they will not be exposed to levels of radio frequency electromagnetic radiation that exceed FCC guidelines.

The data and information contained herein is accurate and complete to the best of my knowledge and belief.



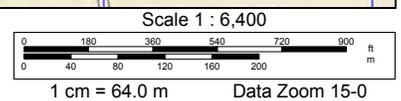
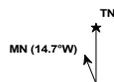
Alan D. Kirschner
Technical Consultant
Kirschner Broadcast Services, LLC
August 10, 2015

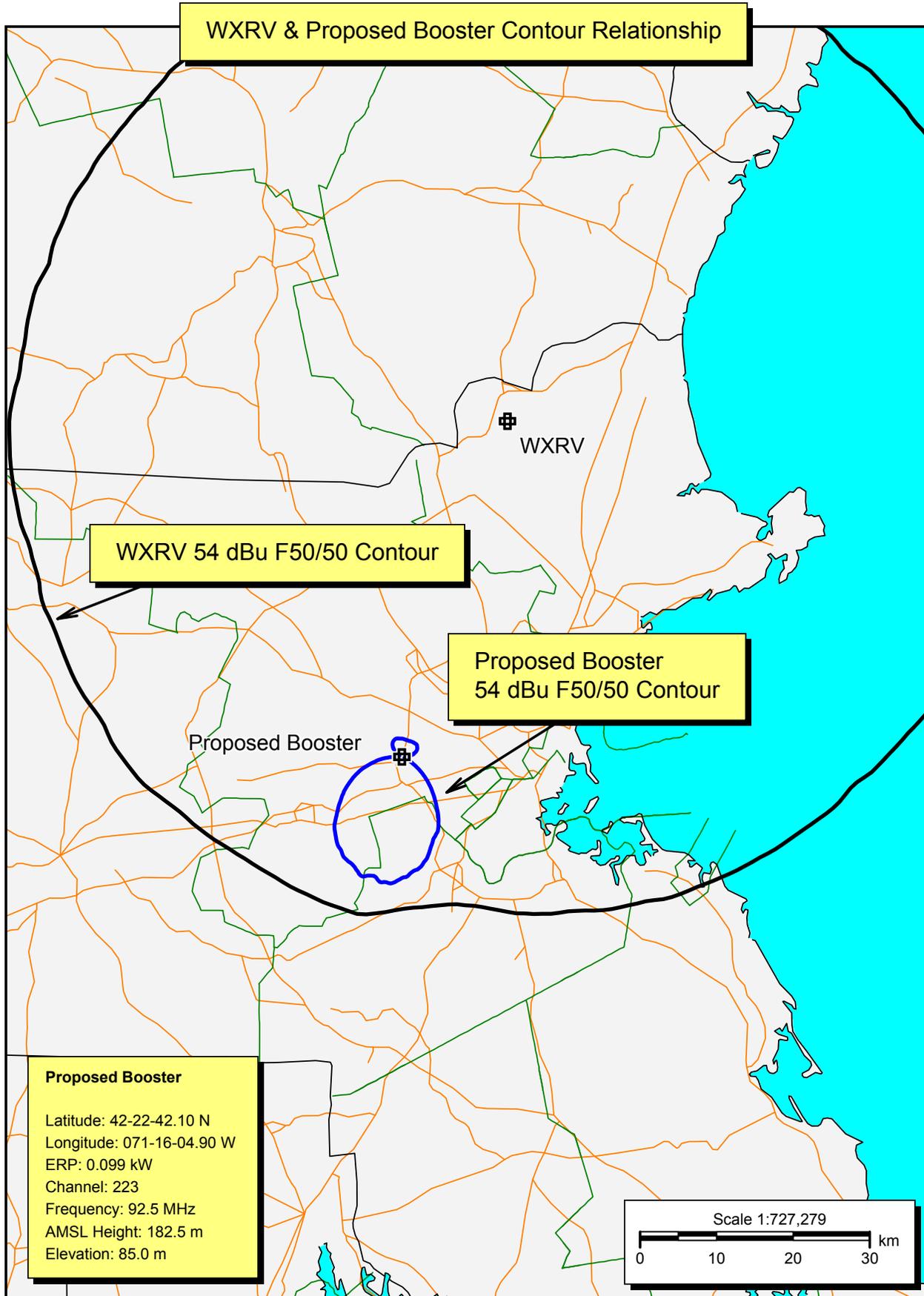


Data use subject to license.

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WXRV, Andover, MA Spacing Study

REFERENCE

42 46 23.0 N.
71 06 01.0 W.

CLASS = B Int = B
Current Spacings to 3rd Adj.
----- Channel 223 - 92.5 MHz -----

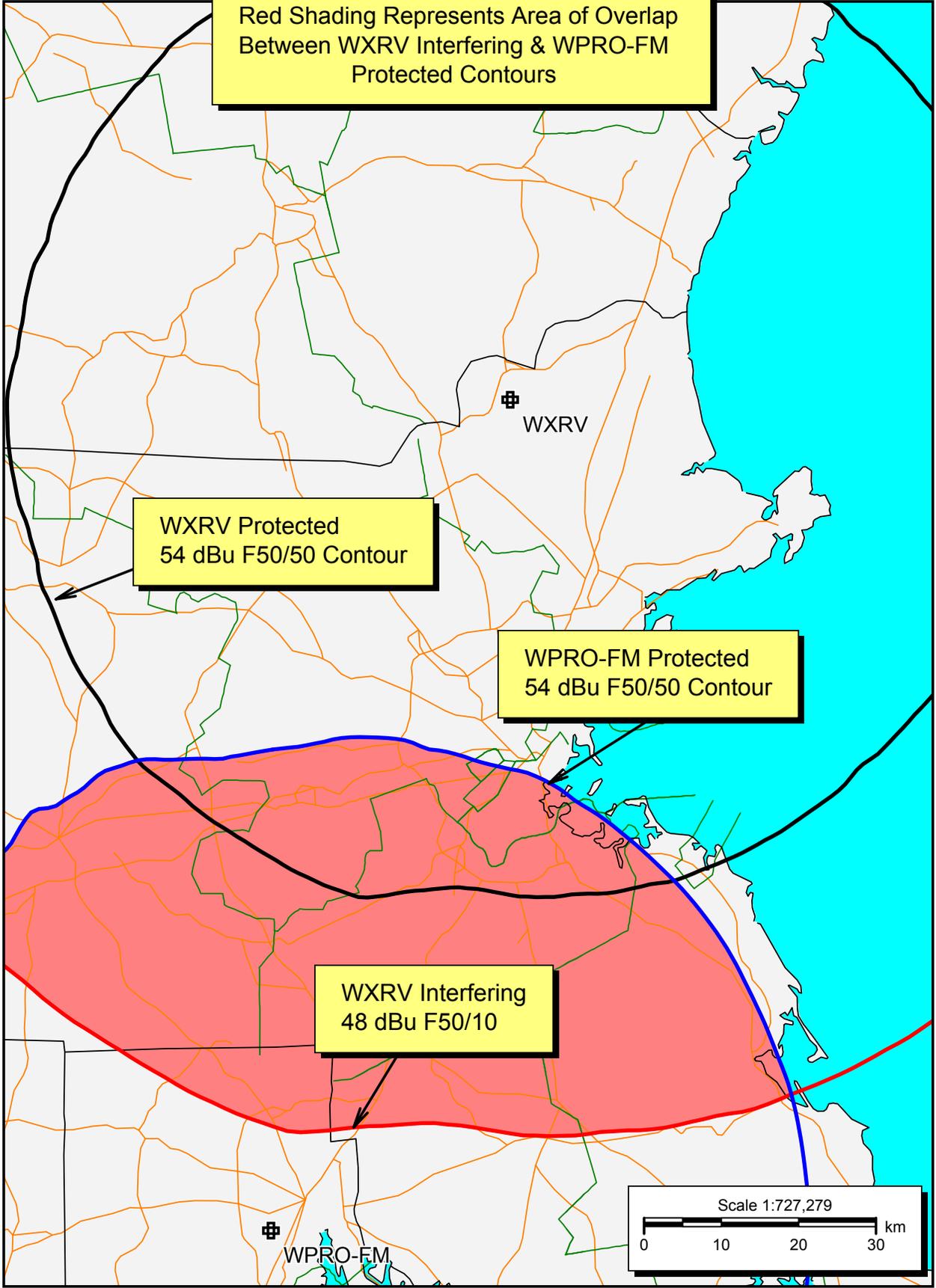
DISPLAY DATES

DATA 08-05-15
SEARCH 08-10-15

Call	Channel	Location	Azi	Dist	FCC	Margin
AL1875	RSV-A 223B	Andover	MA 0.0	0.00	240.5	-240.5
WXRV	LIC 223B	Andover	MA 0.0	0.00	240.5	-240.5
WPRO-FM	LIC 222B	Providence	RI 196.0	111.84	168.5	-56.7
WWYZ	LIC 223B	Waterbury	CT 227.5	197.10	240.5	-43.4
WBOS	LIC-N 225B	Brookline	MA 178.3	47.32	73.5	-26.2
WUMB-FM	LIC 220A	Boston	MA 175.9	58.59	68.5	-9.9
WDER-FM	LIC-N 221A	Peterborough	NH 279.1	64.45	68.5	-4.1
WXEX-FM	LIC-N 221A	Sanford	ME 18.5	75.82	68.5	7.3
NEW	CP -Z 223A	Poultney	VT 299.2	184.84	177.5	7.3
WBPR	LIC-Z 220A	Worcester	MA 231.6	83.77	68.5	15.3
WKVT-FM	LIC 224A	Brattleboro	VT 276.6	128.54	112.5	16.0
WGXL	LIC 222A	Hanover	NH 315.8	137.89	112.5	25.4
WODS	CP 277B	Boston	MA 178.3	47.33	19.5	27.8
WOXO-FM	LIC 224C3	Norway	ME 12.8	173.67	144.5	29.2
WODS	LIC 277B	Boston	MA 191.1	52.69	19.5	33.2
WMME-FM	LIC 222B	Augusta	ME 32.8	207.91	168.5	39.4
WBUA	LIC 224A	Tisbury	MA 164.7	153.66	112.5	41.2
WOMR	LIC-N 221A	Provincetown	MA 135.2	110.42	68.5	41.9
WMGX	LIC-N 226B	Portland	ME 33.6	122.55	73.5	49.1

RSV-R = reserved - needs protection, RSV-A = allocation
All separation margins include rounding

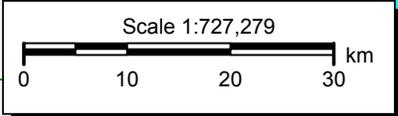
WXRV & WPRO-FM Contour Relationship
Red Shading Represents Area of Overlap
Between WXRV Interfering & WPRO-FM
Protected Contours

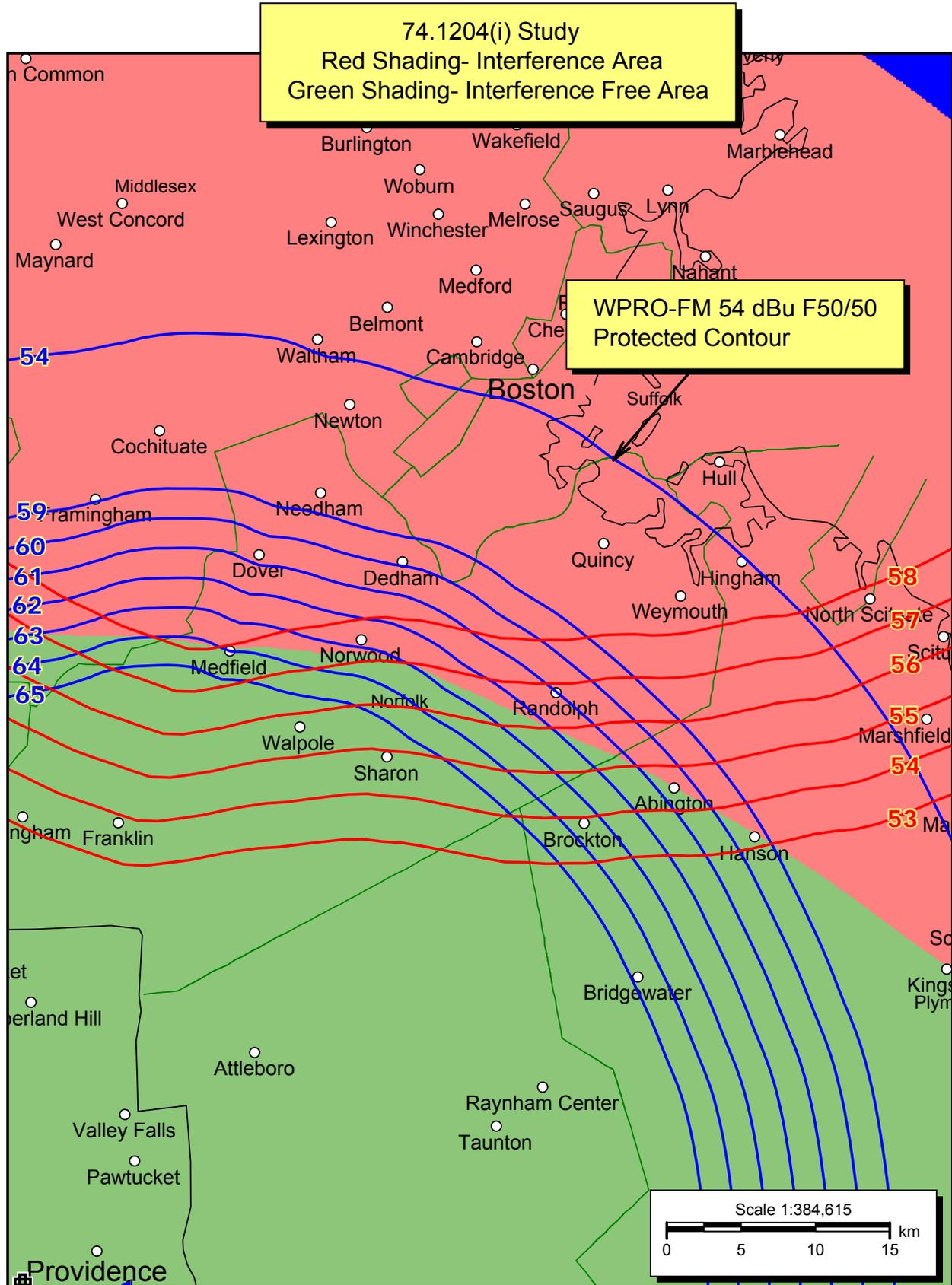


WXRV Protected
54 dBu F50/50 Contour

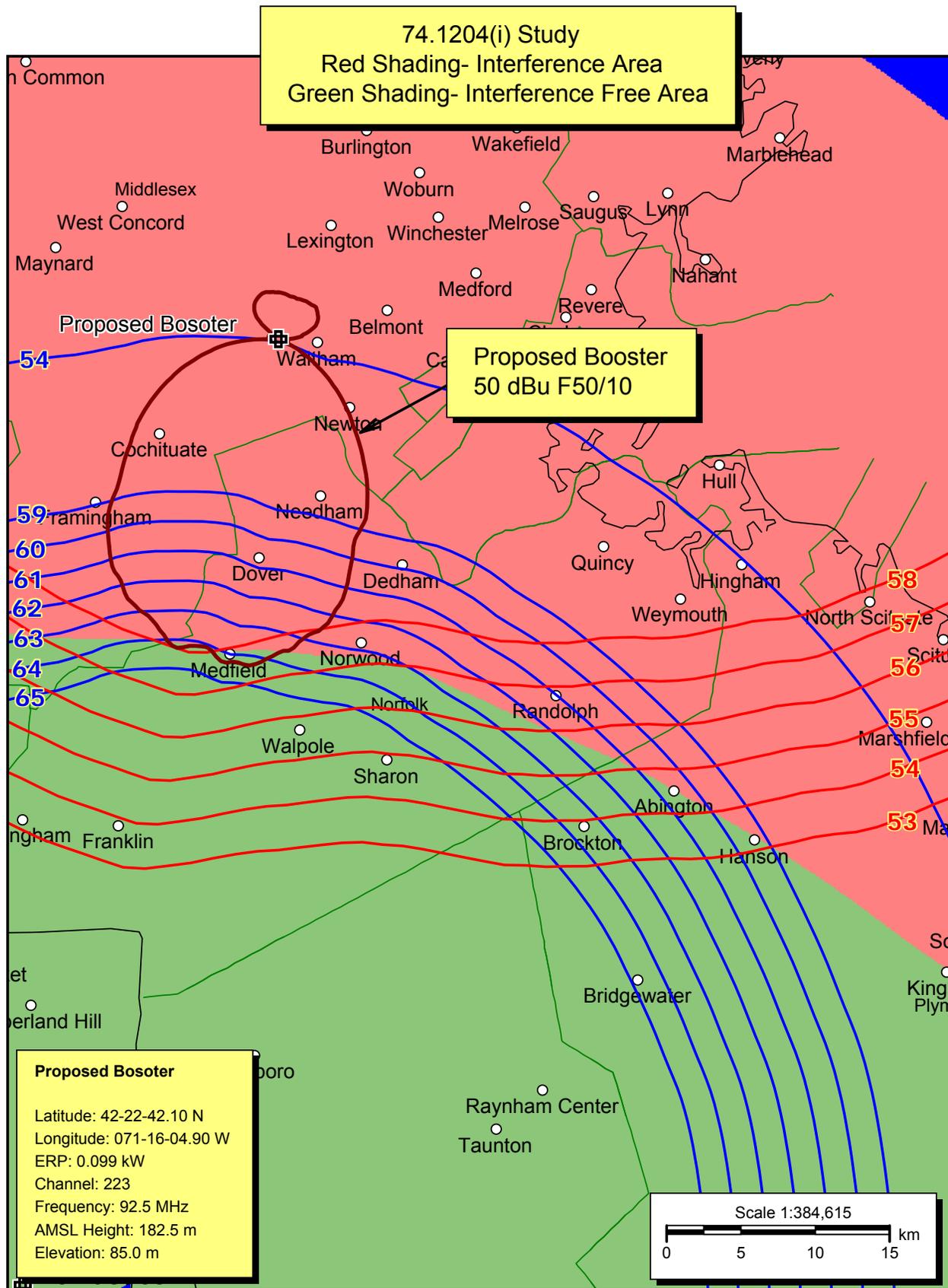
WPRO-FM Protected
54 dBu F50/50 Contour

WXRV Interfering
48 dBu F50/10





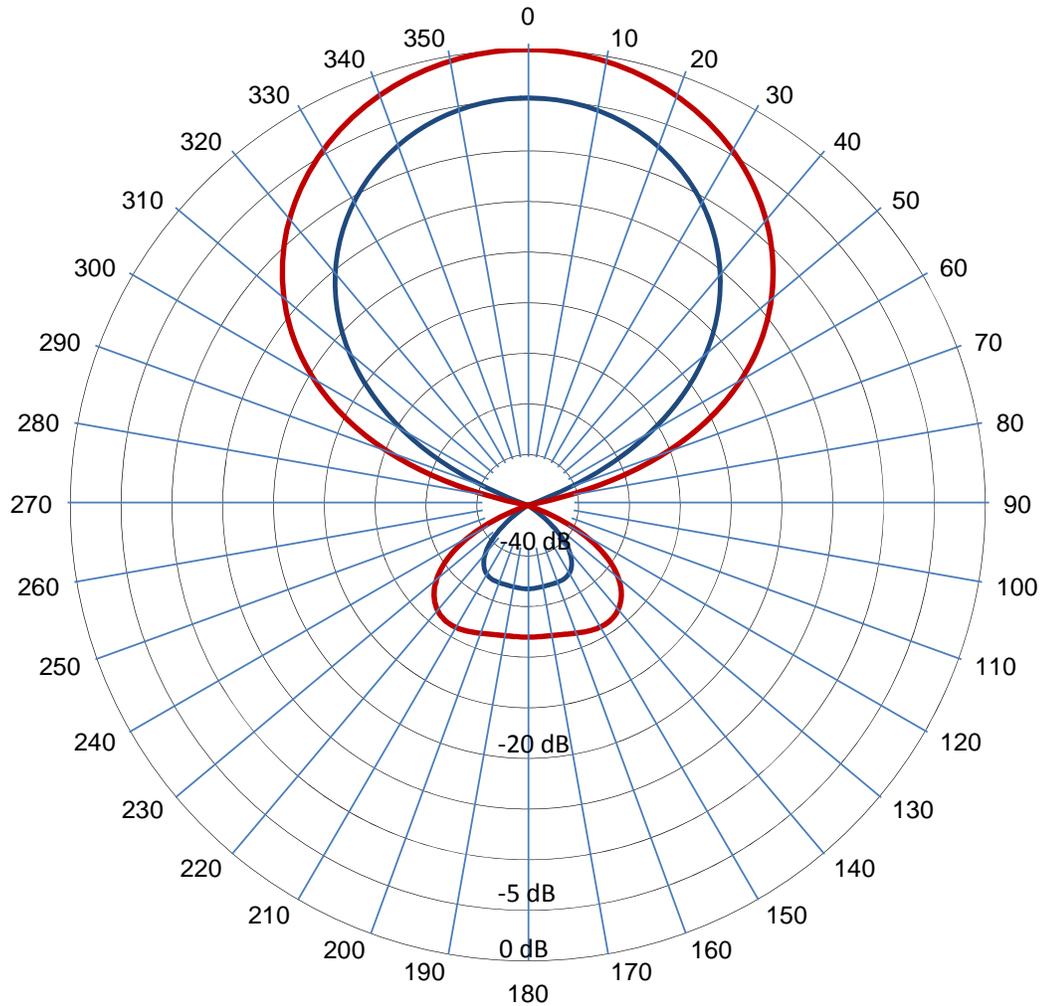
Numbers in Blue (left side) are WPRO-FM F50/50 Contours
Numbers in Red (right side) are WXRV F50/10 Contours



Numbers in Blue (left side) are WPRO-FM F50/50 Contours
Numbers in Red (right side) are WXRV F50/10 Contours



Azimuth Pattern



Blue Trace: Horizontal Polarization Component
Red Trace: Vertical Polarization Component

Customer: WXRV
Channel: 92.5 MHz
Gain: 7.62 dBd (Vpol)

Model: JAVA-1-1(2)
Description: Log Periodic Antenna
30° Roll from Vertical



Azimuth Pattern Tabulation

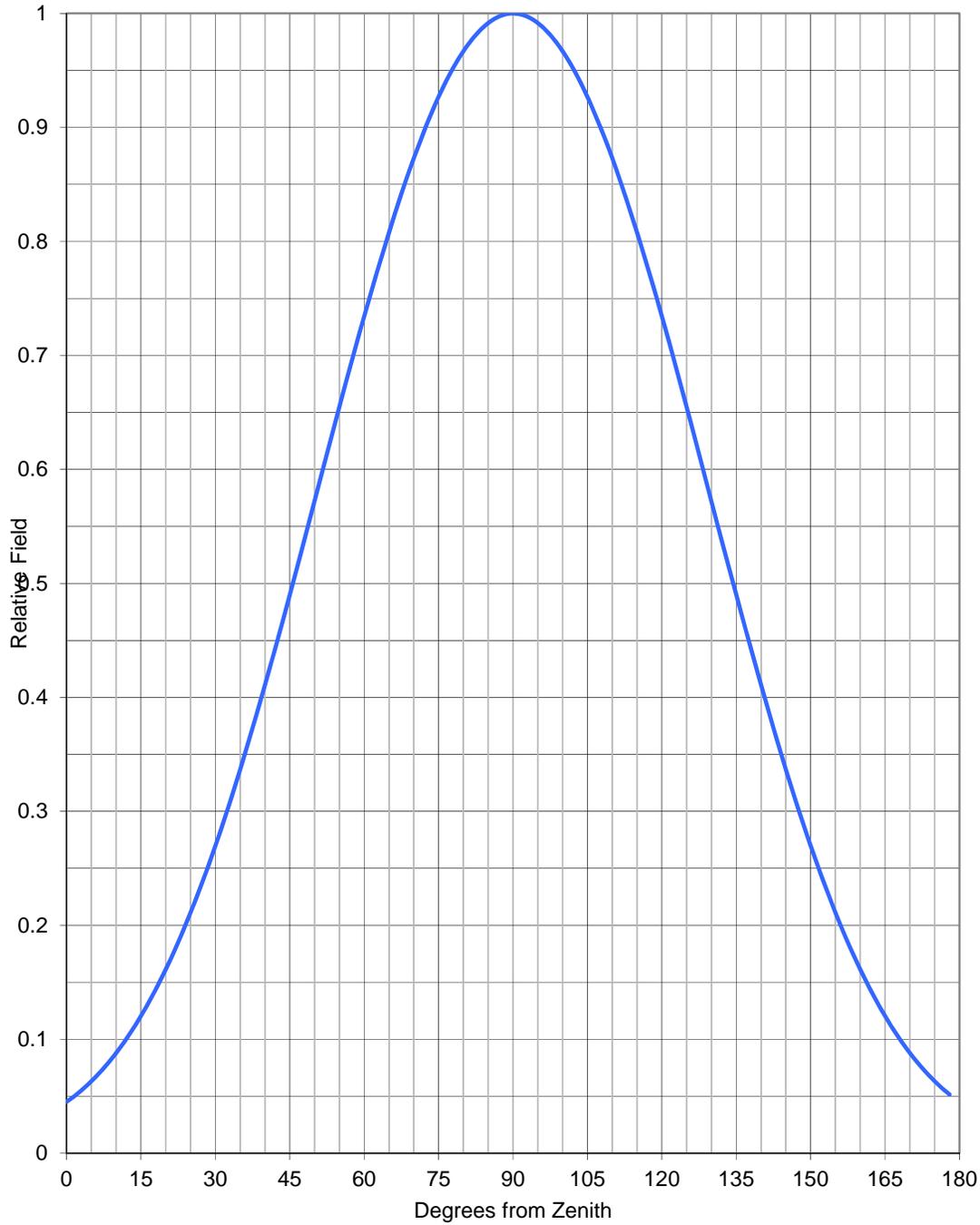
<u>Azimuth Angle</u>	<u>Relative HPOL Field,dB</u>	<u>Relative VPOL Field,dB</u>	<u>Azimuth Angle</u>	<u>Relative HPOL Field,dB</u>	<u>Relative VPOL Field,dB</u>
0	-4.77	0.00	180	-36.75	-31.98
5	-4.93	-0.12	185	-36.78	-31.98
10	-5.40	-0.50	190	-36.83	-31.93
15	-6.20	-1.13	195	-36.86	-31.79
20	-7.33	-2.02	200	-36.86	-31.55
25	-8.80	-3.18	205	-36.88	-31.26
30	-10.64	-4.62	210	-37.06	-31.04
35	-12.88	-6.37	215	-37.52	-31.02
40	-15.54	-8.45	220	-38.39	-31.31
45	-18.68	-10.90	225	-39.79	-32.01
50	-22.38	-13.77	230	-41.81	-33.20
55	-26.73	-17.13	235	-44.58	-34.98
60	-31.89	-21.09	240	-48.25	-37.46
65	-38.08	-25.83	245	-50.00	-40.77
70	-45.74	-31.64	250	-50.00	-44.98
75	-50.00	-50.00	255	-50.00	-50.00
80	-50.00	-50.00	260	-50.00	-50.00
85	-50.00	-50.00	265	-50.00	-50.00
90	-50.00	-50.00	270	-50.00	-50.00
95	-50.00	-50.00	275	-50.00	-50.00
100	-50.00	-50.00	280	-50.00	-50.00
105	-50.00	-50.00	285	-50.00	-39.12
110	-50.00	-50.00	290	-45.74	-31.64
115	-50.00	-50.00	295	-38.08	-25.83
120	-48.25	-37.46	300	-31.89	-21.09
125	-44.58	-34.98	305	-26.73	-17.13
130	-41.81	-33.20	310	-22.38	-13.77
135	-39.79	-32.01	315	-18.68	-10.90
140	-38.39	-31.31	320	-15.54	-8.45
145	-37.52	-31.02	325	-12.88	-6.37
150	-37.06	-31.04	330	-10.64	-4.62
155	-36.88	-31.26	335	-8.80	-3.18
160	-36.86	-31.55	340	-7.33	-2.02
165	-36.86	-31.79	345	-6.20	-1.13
170	-36.83	-31.93	350	-5.40	-0.50
175	-36.78	-31.98	355	-4.93	-0.12

Customer: WXRV
Channel: 92.5 MHz
Gain: 7.62 dBd (Vpol)

Model: JAVA-1-1(2)
Description: Log Periodic Antenna
30° Roll from Vertical



Elevation Pattern



Composite of Horizontal and Vertical Polarizations

Customer: WXRV
Channel: 92.5 MHz

Model: JAVA-1-1(2)
Description: Log Periodic Antenna
30° Roll from Vertical



Elevation Pattern Tabulation

<u>Elevation Angle</u>	<u>Relative Field</u>	<u>Relative Field, dB</u>	<u>Elevation Angle</u>	<u>Relative Field</u>	<u>Relative Field, dB</u>
90	0.045	-26.90	0	1.000	0.00
88	0.052	-25.74	-2	0.999	-0.01
86	0.059	-24.57	-4	0.995	-0.05
84	0.068	-23.40	-6	0.988	-0.11
82	0.077	-22.24	-8	0.979	-0.19
80	0.088	-21.11	-10	0.967	-0.29
78	0.100	-19.99	-12	0.953	-0.42
76	0.113	-18.91	-14	0.936	-0.57
74	0.128	-17.86	-16	0.917	-0.75
72	0.144	-16.84	-18	0.896	-0.95
70	0.161	-15.85	-20	0.873	-1.18
68	0.180	-14.89	-22	0.848	-1.43
66	0.200	-13.96	-24	0.822	-1.70
64	0.222	-13.07	-26	0.794	-2.00
62	0.245	-12.21	-28	0.765	-2.33
60	0.270	-11.38	-30	0.734	-2.68
58	0.296	-10.58	-32	0.703	-3.06
56	0.323	-9.82	-34	0.671	-3.47
54	0.351	-9.09	-36	0.638	-3.90
52	0.381	-8.39	-38	0.605	-4.36
50	0.411	-7.73	-40	0.572	-4.85
48	0.442	-7.09	-42	0.539	-5.36
46	0.474	-6.48	-44	0.506	-5.91
44	0.506	-5.91	-46	0.474	-6.48
42	0.539	-5.36	-48	0.442	-7.09
40	0.572	-4.85	-50	0.411	-7.73
38	0.605	-4.36	-52	0.381	-8.39
36	0.638	-3.90	-54	0.351	-9.09
34	0.671	-3.47	-56	0.323	-9.82
32	0.703	-3.06	-58	0.296	-10.58
30	0.734	-2.68	-60	0.270	-11.38
28	0.765	-2.33	-62	0.245	-12.21
26	0.794	-2.00	-64	0.222	-13.07
24	0.822	-1.70	-66	0.200	-13.96
22	0.848	-1.43	-68	0.180	-14.89
20	0.873	-1.18	-70	0.161	-15.85
18	0.896	-0.95	-72	0.144	-16.84
16	0.917	-0.75	-74	0.128	-17.86
14	0.936	-0.57	-76	0.113	-18.91
12	0.953	-0.42	-78	0.100	-19.99
10	0.967	-0.29	-80	0.088	-21.11
8	0.979	-0.19	-82	0.077	-22.24
6	0.988	-0.11	-84	0.068	-23.40
4	0.995	-0.05	-86	0.059	-24.57
2	0.999	-0.01	-88	0.052	-25.74

Customer: WXRV
Channel: 92.5 MHz

Model: JAVA-1-1(2)
Description: Log Periodic Antenna
30° Roll from Vertical