

TECHNICAL EXHIBIT  
MINOR AMENDMENT TO APPLICATION  
STATION WLVI-DT (FACILITY ID 73238)  
CAMBRIDGE, MASSACHUSETTS

FEBRUARY 26, 2002

CH 41    550 KW (MAX-DA)    345 M

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Technical Narrative

This Technical Exhibit supports a minor amendment to the application for construction permit for digital television station WLVI-DT on channel 41 at Cambridge, Massachusetts. Station WLVI-DT has an application pending to operate with a non-directional effective radiated power (ERP) of 450 kW and an antenna HAAT of 391 meters (employing special electrical and mechanical beam-tilting) (BPCDT-19990909AAH).

This amendment proposes to (1) change to an adjacent transmitting tower (2) increase ERP, (3) increase antenna HAAT, (4) employ a directional antenna and (5) change the electrical and mechanical beam-tilting from the application on file.

Proposed Facilities

The proposed transmitting tower is located at the same coordinates as the currently pending application (coordinates: 42-18-12 N, 71-13-08 W). A directional antenna maximum ERP of 550 kW and antenna HAAT of 345 meters, along with 1.5 degrees of electrical beam tilting and 1.0 degree of mechanical beam tilting at 90° True is hereby proposed (see Figure 2). The antenna structure registration number is 1004233. The proposed facilities (550 kW, 345 m) comply with Section 73.622(f)(8)(i) of the FCC rules concerning maximum allowable ERP and antenna height for DTV stations.

There are two AM stations within 3.2 kilometers of the proposed WLVI-DT site. Stations WUNR, 1600 kHz at Brookline, MA and WRCA, 1330 kHz at Watertown, MA are both located 2.9 kilometers southeast of the WLVI-DT site. WUNR operates with 5 kilowatts directional power during unlimited hours. WRCA is authorized for operation with 17 kilowatts directional power during nighttime hours. The addition of the WLVI-DT antenna to the already constructed tower is not expected to have any adverse impact on either AM station. If necessary, WLVI-DT will take the necessary actions to ensure that there is no adverse effect to either AM station or any other nearby FM or TV station. There are no other AM stations located within 3.2 kilometers of the WLVI-DT transmitter site.

The proposed transmitter site is approximately 303 kilometers from the closest point of the Canadian border. The proposed WLVI-DT operation meets the minimum separation requirements to all Canadian NTSC and DTV stations, as defined in the recently adopted U.S./Canada Letter on Understanding (LOU), except to station CKMI-TV-2 (DTV Ch 41) at Sherbrooke, Quebec. The required minimum separation distance is 371 km. The actual separation distance is 344 kilometers. Therefore, the proposed WLVI-DT operation is “short” by 27 kilometers. Interference calculations using the Longley-Rice propagation model and procedures contained in the LOU indicate that no interference will be caused to any Canadian population within the CKMI-TV-2 39 dBu F(90,90) noise-limited circle (see Figure 4). If coordination with Canada is required, it is respectfully requested, that consideration be given for use of the Longley-Rice propagation model with respect to CKMI-TV-2.

The site is more than 2,700 kilometers from the closest point of the Mexican border. The closest FCC monitoring station is at Belfast, Maine, approximately 294 kilometers to the northeast. The closest point of the National Radio Quiet Zone (VA/WV) is approximately 700 kilometers to the west-southwest. The closest point of the Table Mountain Radio Quiet Zone (CO) is more than 2,800 kilometers to the west. The closest radio astronomy site operating on TV channel 37 is at Hancock, New Hampshire, approximately 94

kilometers to the northwest. These separations are sufficient to not be a concern for coordination purposes.

### Allocation Study

Interference calculations have been made using the procedures outlined in the FCC's OET-69 bulletin. It is noted that the proposed WLVI-DT operation must be evaluated based on use of the vertical pattern and beam tilting specified herein. Otherwise, erroneous interference results may be obtained. The proposed WLVI-DT operation does not cause excessive (greater than 2%, up to 10% total) calculated interference to any analog or DTV assignment. Below is the list of stations considered in the OET-69 analysis.

<b>Stations Potentially Affected by WLVI-DT</b>						
Chan	Call	City/State	Bear (°T)	Dist (km)	Status	App. Ref. No.
26	WHPX	NEW LONDON CT	220	127.5	LIC	BLCT-19860924KI
26	WMEA-TV	BIDDEFORD ME	15	128.3	LIC	BLET-379
27	WUNI	WORCESTER MA	275	41.0	LIC	BLCT-19991214ABC
38	WSBK-TV	BOSTON MA	90	0.0	LIC	BLCT-19910619KG
40	WGGB-TV	SPRINGFIELD MA	267	117.8	LIC	BLCT-19990429KH
40	WDPX	VINEYARD HAVEN MA	133	99.3	APP	BPCDT-19991101AFW
40	WZBU-DT	VINEYARD HAVEN MA	133	99.3	PLN	DTVPLN-DTVP1067
41	WXTV	PATERSON NJ	234	287.9	LIC	BLCT-19920218KE
41	WXTV	PATERSON NJ	234	287.9	CP	BPCT-20000202AAJ
41	WNPE-DT	WATERTOWN NY	297	404.9	PLN	DTVPLN-DTVP1107
41	WVIA-DT	SCRANTON PA	254	405.4	LIC	BLEDT-20010109AAP
41	WVIA-DT	SCRANTON PA	254	405.4	PLN	DTVPLN-DTVP1110
41	WVTA	WINDSOR VT	322	161.2	CP	BPET-19990413KF
42	WSAH-DT	BRIDGEPORT CT	237	188.6	APP	BPCDT-19991101AFE
42	WHAI-DT	BRIDGEPORT CT	237	188.6	PLN	DTVPLN-DTVP1123
42	WHDH-DT	BOSTON MA	12	0.9	PLN	DTVPLN-DTVP1135
44	WGBX-TV	BOSTON MA	297	1.7	LIC	BLET-19820413KF
44	WGBX-TV	BOSTON MA	297	1.7	CP	BPET-19981209KE
48	WYDN	WORCESTER MA	270	55.8	CP	BPET-20000210AAQ
48	WYDN	WORCESTER MA	270	55.8	LIC	BLET-19990507KE

From the above list of stations considered, the table below shows the calculated interference caused to each station. Only stations that are predicted to receive interference from the proposed WLVI-DT operation are shown in the interference table.

Study Station	Baseline	Net Population Change/Interference
40 WGGB-TV SPRINGFIELD MA (LIC)	2,713,820	83 (0.0%) New Interference
40 WDPX VINEYARD HAVEN MA (APP)	527,799	10,072 (1.9%) New Interference
40 WZBU-DT VINEYARD HAVEN MA (PLN)	527,799	1,255 (0.2%) New Interference
41 WXTV PATERSON NJ (LIC)	16,847,374	541 (0.0%) New Interference
41 WXTV PATERSON NJ (CP)	16,847,374	3,040 (0.0%) New Interference
41 WVTM WINDSOR VT (CP)	647,254	7,071 (1.1%) New Interference
42 WHDH-DT BOSTON MA (PLN)	6,651,476	381 (0.0%) New Interference

The proposed WLVI-DT operation does not cause calculated interference to any other analog or DTV station. Therefore, it is believed the proposal complies with the FCC's "de minimis" interference policy.

With respect to Class A TV station protection, the proposal has been evaluated according to the requirements of Section 73.613 of the FCC Rules. The analysis reveals predicted overlap caused to an application for station WVXN-CA on channel 34 at Boston (BMPTTL-19960517QP). Station WVXN-CA is licensed as a Class A facility for operation on channel 24 (BLTTL-19990915AVK). Therefore, it is not expected that the channel 34 facility requested in this superseded application for WVXN-CA requires protection from WLVI-DT. No other Class A stations are potentially affected.

#### Environmental Considerations

The proposed WLVI-DT facilities were evaluated in terms of potential radio frequency (RF) energy exposure at ground level to workers and the general public. The radiation center for the proposed DTV antenna is located 343.5 meters above ground level. The maximum directional ERP is 550 kW. A conservative relative field value of 0.15 was assumed for the calculation (see Figure 2D). Therefore, the "worst-case" calculated power density at a point 2 meters above ground level will be 0.0035 mW/cm<sup>2</sup>. This is less than 1% of the FCC's recommended limit of 0.42 mW/cm<sup>2</sup> for channel 41 for an "uncontrolled" environment.

Access to the transmitting site will be restricted and appropriately marked with warning signs. As this will be a multi-user site, an agreement will control site access. In the event that workers or other authorized personnel enter restricted areas or climb the tower, appropriate measures will be taken to assure worker safety with respect to radio frequency radiation exposure. Such measures include reducing the average exposure by spreading out the work over a longer period of time, wearing "accepted" RFR protective clothing and/or RFR exposure monitors or scheduling work when the stations are at reduced power or shut down. The proposed WLVI-DT operation appears to be otherwise categorically excluded from environmental processing.

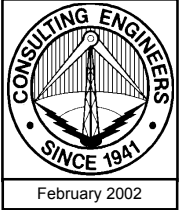


Jonathan N. Edwards

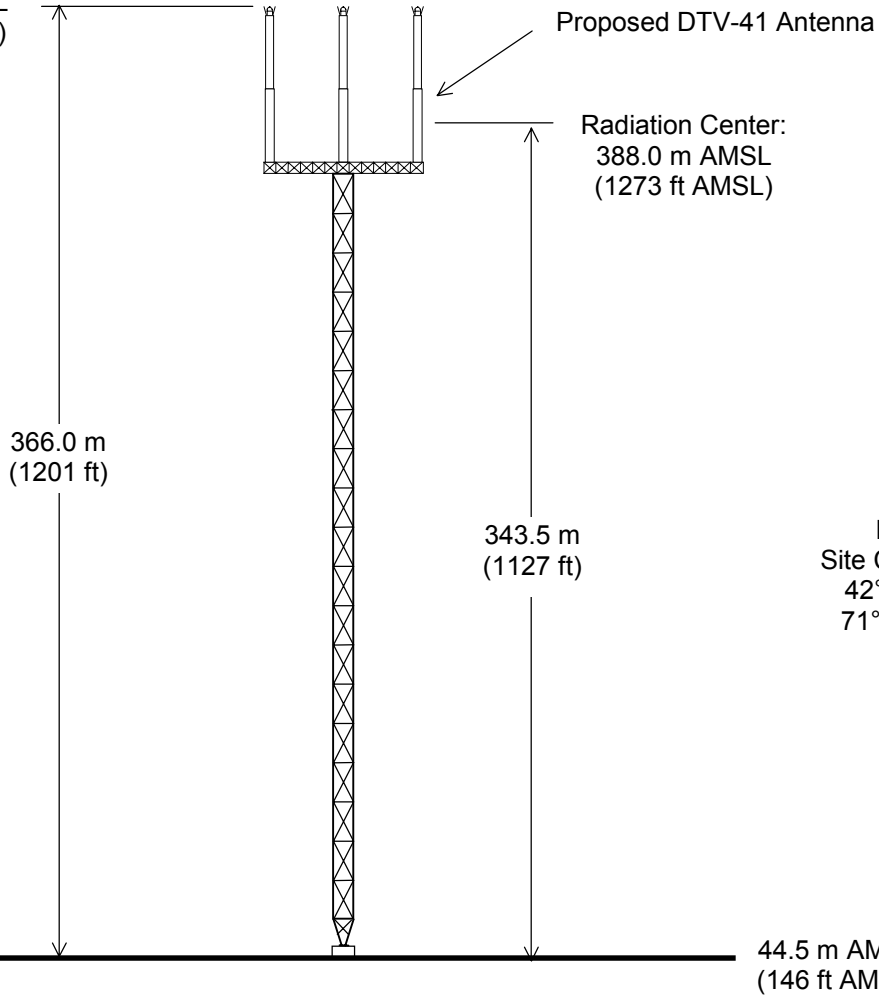
du Treil, Lundin & Rackley, Inc.  
201 Fletcher Avenue  
Sarasota, Florida 34237  
(941) 329-6000

February 26, 2002

Tower Registration No. 1004233



410.5 m AMSL  
(1347 ft AMSL)



NAD 27  
Site Coordinates:  
42° 18' 12" N  
71° 13' 08" W

Not To Scale

## ANTENNA AND SUPPORTING STRUCTURE

STATION WLVI-DT

CAMBRIDGE, MASSACHUSETTS

CH 41 550 KW (MAX-DA) 345 M

du Treil, Lundin & Rackley, Inc. Sarasota, Florida





Date  
Call Letters  
Location  
Customer  
Antenna Type

26 Feb 2002  
WLVI-DT

Channel

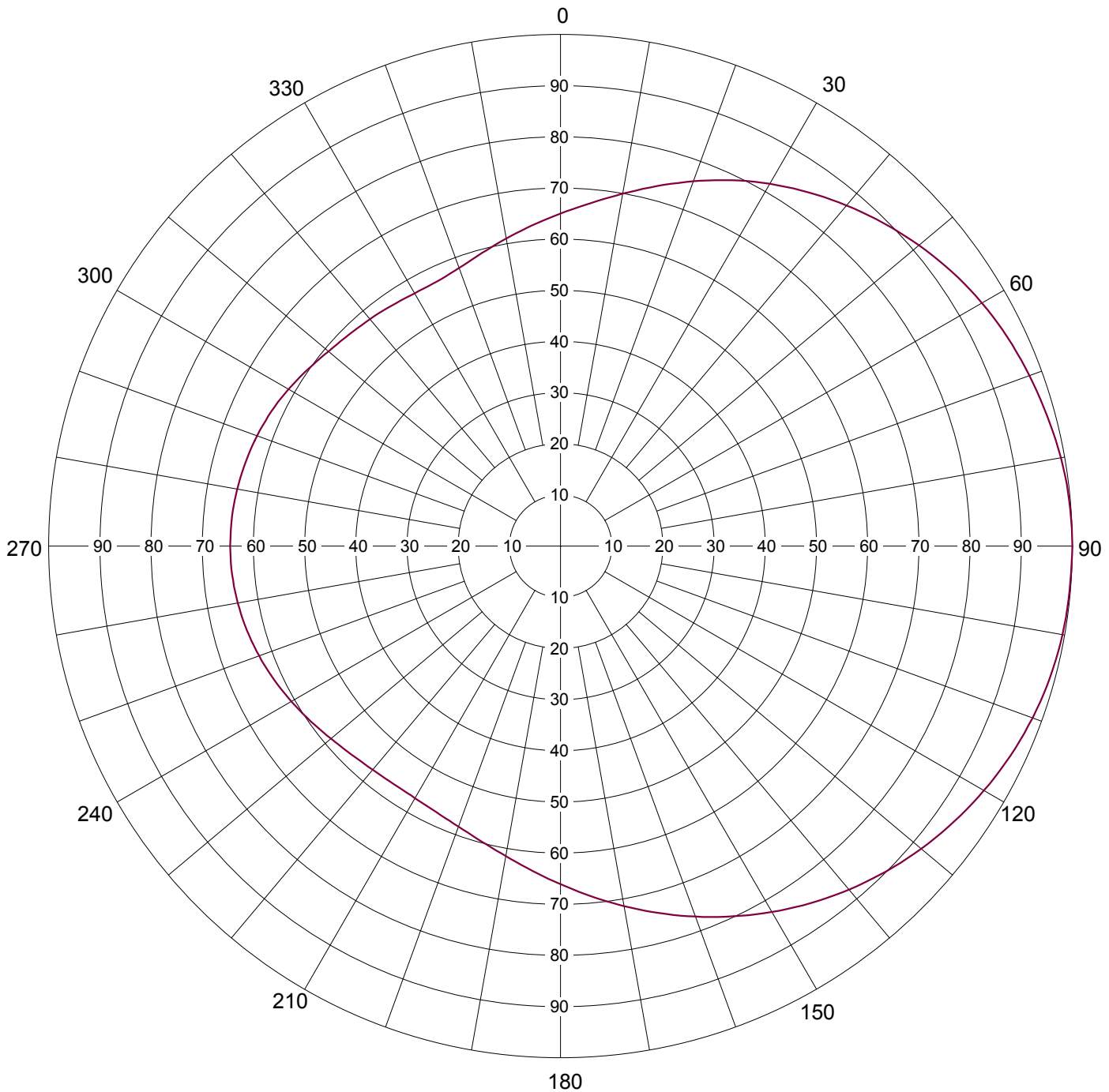
### AZIMUTH PATTERN

RMS Gain at Main Lobe  
Calculated / Measured

1.70 (2.30 dB)  
Calculated

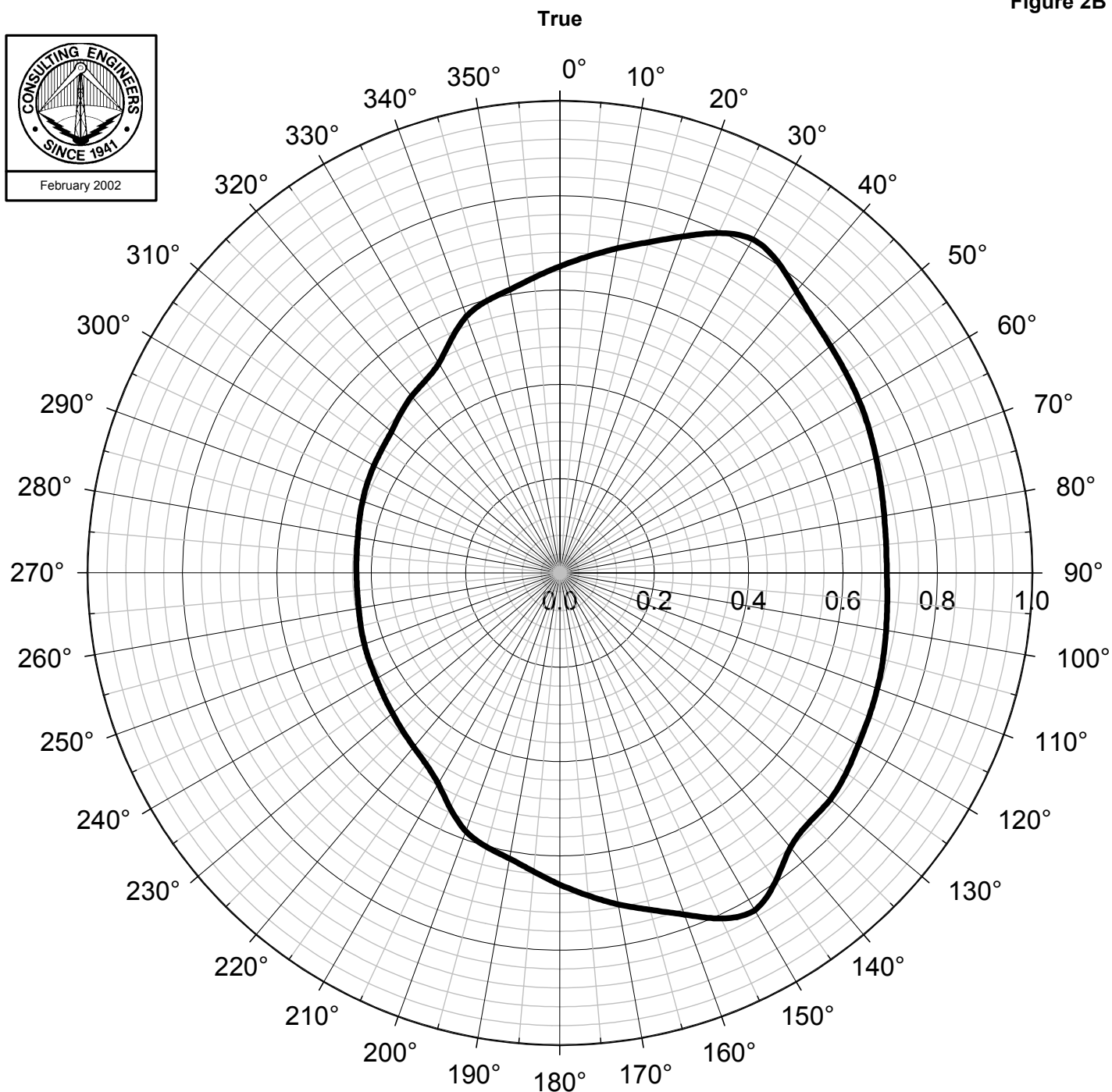
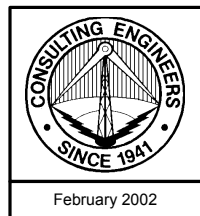
Frequency  
Drawing #

MHz  
DSB-B



Remarks:

Figure 2B



See Tabulation in Figure 2C

**ACTUAL AZIMUTH PATTERN AT RADIO HORIZON CONSIDERING  
ELECTRICAL AND MECHANICAL TILT (RELATIVE FIELD)**

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CAMBRIDGE, MASSACHUSETTS  
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TABULATION OF PATTERN AT RADIO HORIZON  
INCORPORATING ELECTRICAL & MECHANICAL BEAM TILT

<u>Azimuth(° T)</u>	<u>Relative Field</u>	<u>Azimuth (° T)</u>	<u>Relative Field</u>
0	0.650	180	0.661
10	0.699	190	0.615
20	0.759	200	0.583
30	0.817	210	0.516
40	0.780	220	0.482
50	0.749	230	0.463
60	0.732	240	0.449
70	0.713	250	0.441
80	0.698	260	0.433
90	0.693	270	0.431
100	0.702	280	0.435
110	0.716	290	0.445
120	0.730	300	0.455
130	0.748	310	0.466
140	0.760	320	0.489
150	0.826	330	0.513
160	0.771	340	0.579
170	0.714	350	0.610

\* Use of a directional antenna system is proposed. It will incorporate an electrical beam tilt of 1.5 degrees and mechanical beam tilt of 1.0 degree at 90° True. The above tabulation is not for use with OET-69 interference calculations. This tabulation is plotted in Figure 2B.



Date  
Call Letters  
Location  
Customer  
Antenna Type

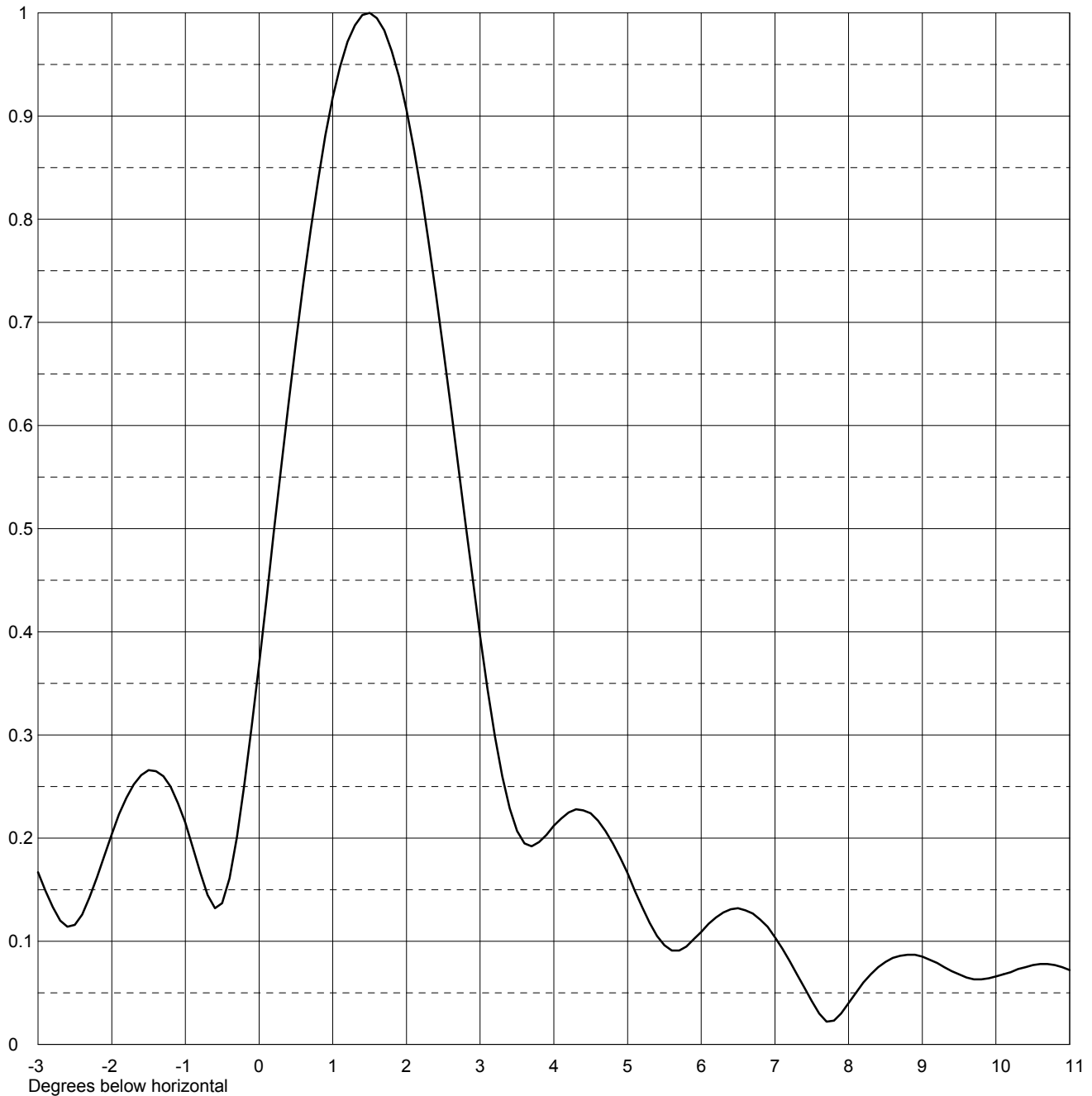
26 Feb 2002  
WLVI-DT

Exhibit No.  
Figure 2D

Channel

### ELEVATION PATTERN

RMS Gain at Main Lobe	<b>23.5 (13.71 dB)</b>	Beam Tilt	<b>1.50 Degrees</b>
RMS Gain at Horizontal	<b>3.2 (5.05 dB)</b>	Frequency	<b>MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>24B235150</b>



Remarks:

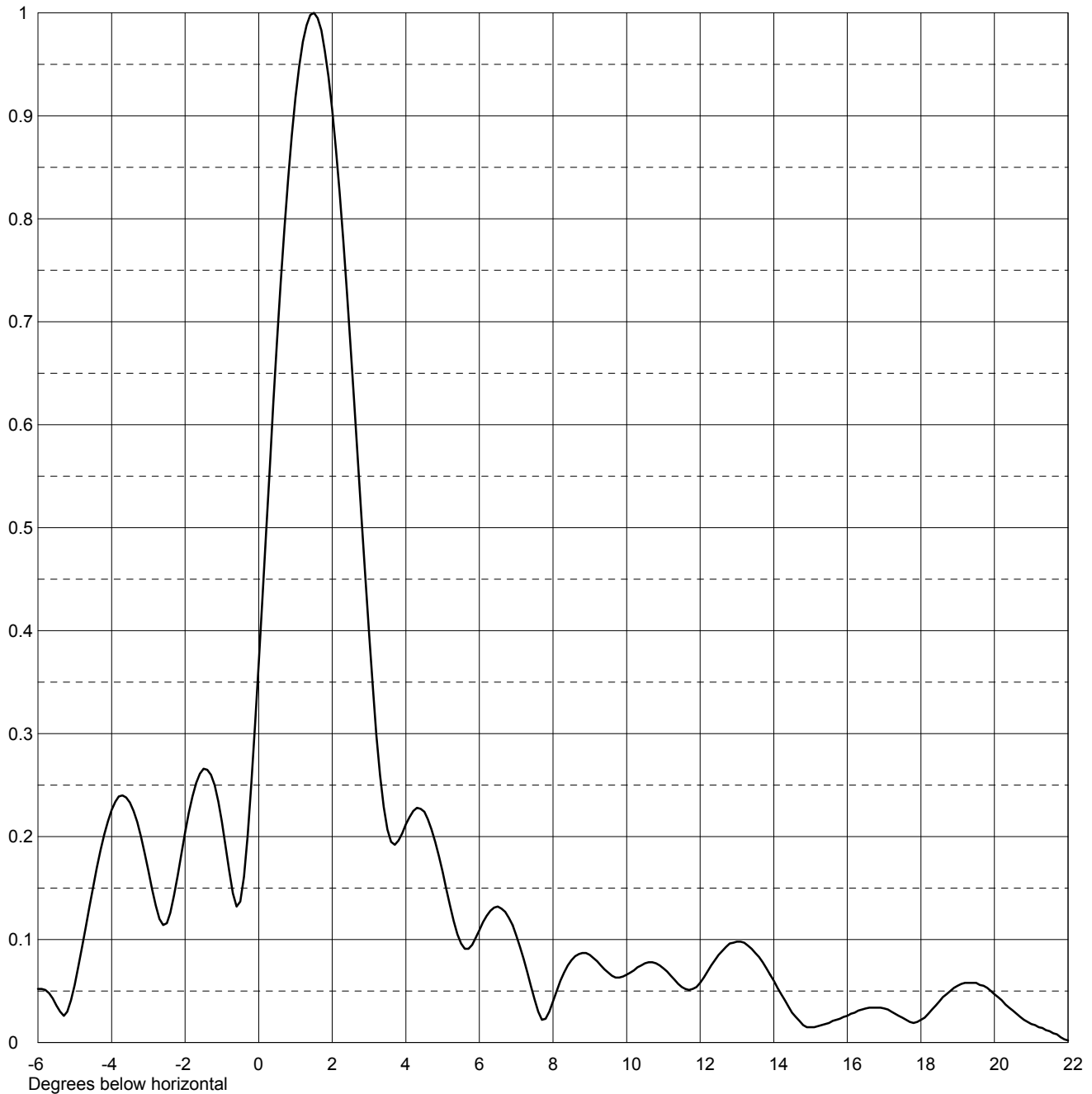


Date  
Call Letters  
Location  
Customer  
Antenna Type

26 Feb 2002  
WLVI-DT  
Channel

### ELEVATION PATTERN

RMS Gain at Main Lobe	23.5 (13.71 dB)	Beam Tilt	1.50 Degrees
RMS Gain at Horizontal	3.2 (5.05 dB)	Frequency	MHz
Calculated / Measured	Calculated	Drawing #	24B235150



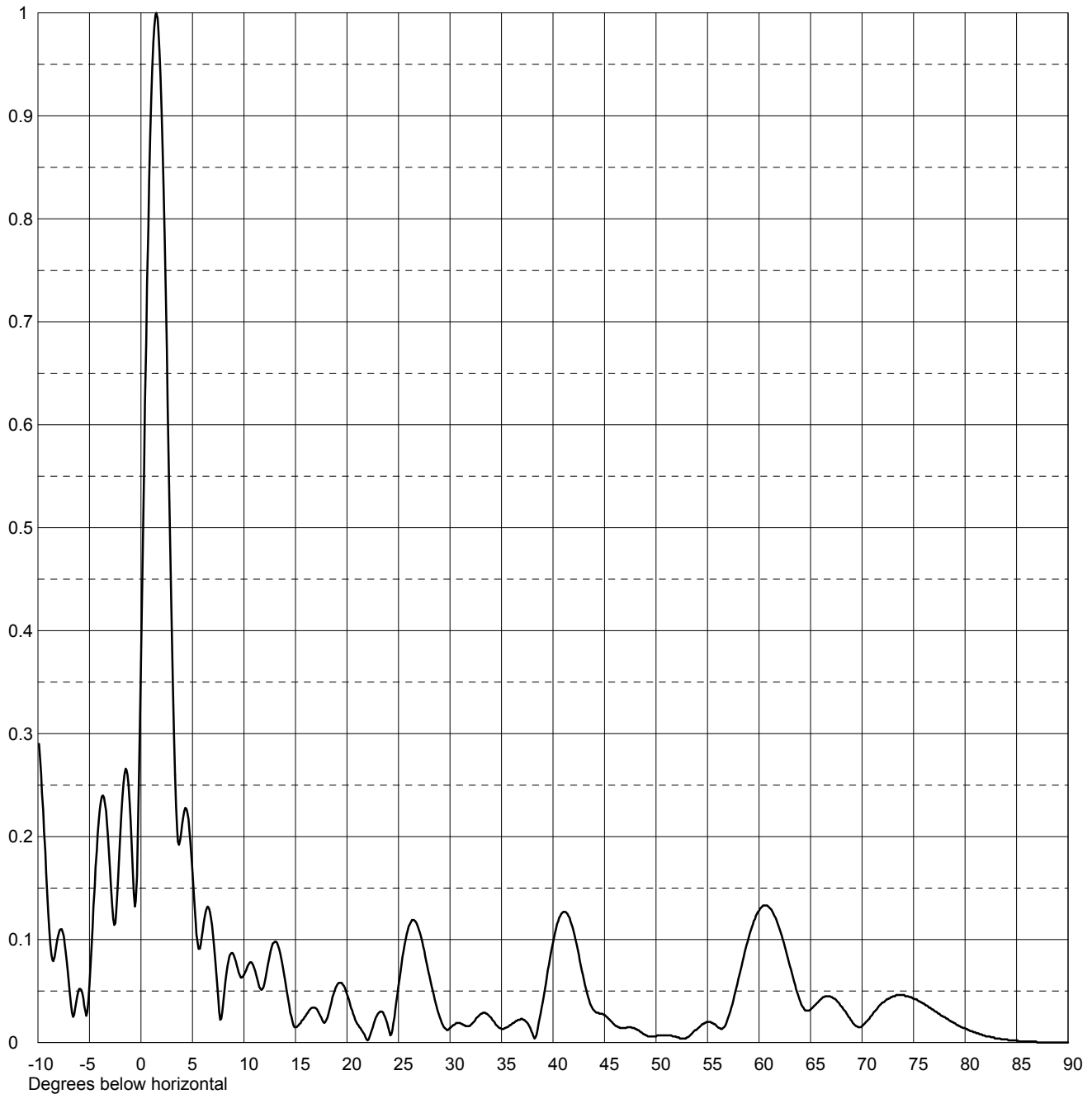
Remarks:



Date	26 Feb 2002	
Call Letters	WLVI-DT	Channel
Location		
Customer		
Antenna Type		

ELEVATION PATTERN

RMS Gain at Main Lobe	23.5 (13.71 dB)	Beam Tilt	1.50 Degrees
RMS Gain at Horizontal	3.2 (5.05 dB)	Frequency	MHz
Calculated / Measured	Calculated	Drawing #	24B235150-90



Remarks:

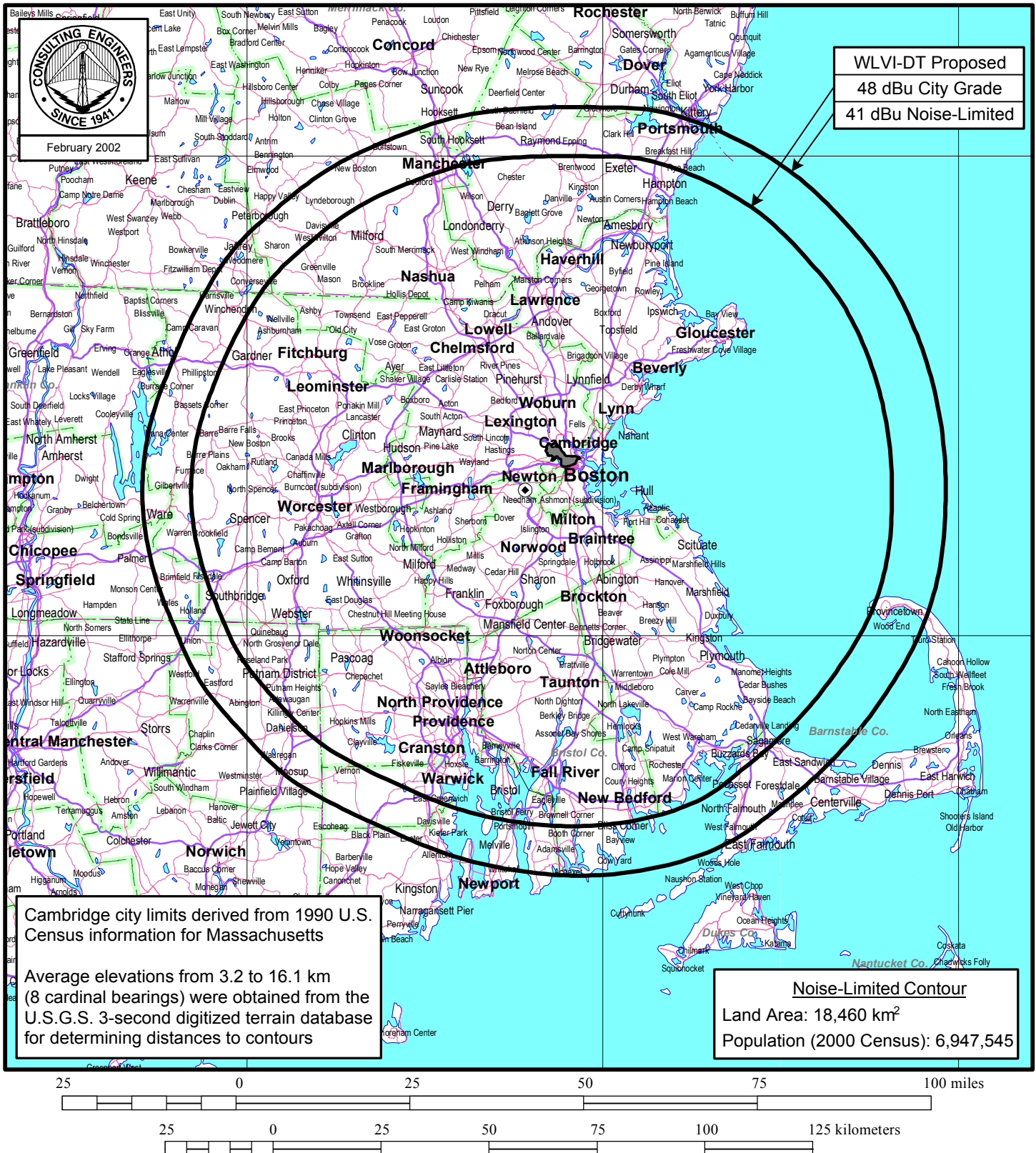
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TABULATION OF VERTICAL ANGLE RELATIVE FIELD VALUES USED IN  
 OET-69 INTERFERENCE CALCULATIONS FOR PROPOSED WLVI-DT OPERATION\*

<u>Vertical Angle</u>	<u>Relative Field</u>	<u>Vertical Angle</u>	<u>Relative Field</u>
-2.0	0.204	3.5	0.212
-1.5	0.263	4.0	0.212
-1.0	0.215	4.5	0.222
-0.5	0.146	5.0	0.166
0.0	0.369	6.0	0.109
0.5	0.680	7.0	0.104
1.0	0.918	8.0	0.040
<b>1.5</b>	<b>1.000</b>	9.0	0.085
2.0	0.906	10.0	0.066
2.5	0.670	11.0	0.072
3.0	0.393	12.0	0.058

\* An additional 1.0 degree of mechanical tilt is employed at 90° True (for a total combined electrical & mechanical tilt of 2.5 degrees at 90° True)

Figure 3



## PREDICTED F(50,90) COVERAGE CONTOURS

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du Treil, Lundin & Rackley, Inc Sarasota, Florida



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INTERFERENCE CAUSED BY WLVI-DT

CELL SIZE : 2.0 km  
 Using DTV->DTV service parameters  
 Using circles for service area

\*\*\*\*\*  
 CKMI-TV 45-18-43 72-14-32 41 550.0 kW 599.0 m AMSL 90.0 % 39.0 dBu  
 SHERBROOKE QU  
 CANTAB CLASS VU  
 Calculated RCAMSL with HAAT of 300  
 %loc = 90.00 %time = 90.00

	Area	Pop
within Noise Limited Contour	21118.76	720585
not affected by terrain losses	18388.71	691537

\*\*\*\*\*

WLVIDP 42-18-12 71-13-08 41 550.000 kW-DA 388 m AMSL 10.0 % 39.0  
 CAMBRIDGE MA 17066 5802 DTVSERVICE: 5802000 NTSCSERVICE: 5805000  
 CLASS EX

0.65	0.70	0.76	0.82	0.87	0.91	0.95	0.98	0.99	1.00	1.00	0.98
0.95	0.92	0.88	0.83	0.77	0.71	0.66	0.62	0.58	0.57	0.57	0.59
0.61	0.63	0.64	0.64	0.64	0.63	0.61	0.59	0.58	0.57	0.58	0.61

Ref Az: 0.0

D/U Baseline: 19.50  
 %loc = 10.00%time = 10

	Area	Pop
<b>Interference</b>	<b>116.26</b>	<b>0 ( 0.0)</b>