

TECHNICAL EXHIBIT  
APPLICATION FOR MODIFICATION  
OF DTV CONSTRUCTION PERMIT  
STATION WCBD-DT (FACILITY ID 10587)  
CHARLESTON, SOUTH CAROLINA

MAY 7, 2002

CH 50    1000 KW (MAX-DA)    561 M

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Technical Narrative

This Technical Exhibit supports a minor change application to modify the construction permit (CP) for digital television (DTV) station WCBD-DT at Charleston, South Carolina. Station WCBD-TV currently operates on analog (NTSC) channel 2 (Facility ID 10587). The WCBD-DT construction permit (BPCDT-19991025ADT) authorizes a DTV operation on channel 59, the original channel allotted by the Federal Communications Commission (FCC) to WCBD. The WCBD-DT CP is based on use of a directional antenna (DA) system and maximum effective radiated power (ERP) of 1000 kilowatts (kW). The antenna height above average terrain (HAAT) is 561 meters. The transmitter site coordinates are 32-56-24, 79-41-45 (NAD-27). The FCC tower registration number for the supporting structure is 1042963.

Proposed DTV Facilities

This application proposes to change the WCBD DTV frequency to channel 50 in accordance with the FCC's Report and Order (R&O) in MM Docket No. 01-335. There is no proposed change in city of assignment (Charleston, SC), ERP (1000 kW-DA), antenna HAAT (561 m), transmitter site (32-56-24, 79-41-45), or supporting tower (1042963).

It is proposed to mount a Dielectric TFU-30DSC-R-S180 directional antenna system at the same elevation as specified in the CP. The antenna pattern is “skull” shaped and the major lobe will be oriented toward 315 degrees True (northwest). The antenna system will incorporate an electrical beam tilt of 1 degree. The maximum DTV ERP will be 1000 kW. The proposed antenna center of radiation will be 560 meters above ground level (AGL), 565 meters above mean sea level (AMSL). The proposed WCBD-DT antenna HAAT remains the same at 561 meters.

The WCBD transmitter site is more than 1000 kilometers from the closest point of the Canadian border. The WCBD site is more than 1400 kilometers from the closest point of the Mexican border. The closest FCC monitoring station is at Powder Springs, Georgia, approximately 478 kilometers to the west. The closest point of the National Radio Quiet Zone (VA/WV) is more than 500 kilometers to the north. The closest point of the Table Mountain Radio Quiet Zone (CO) is more than 2400 kilometers to the west-northwest. The closest radio astronomy site operating on TV channel 37 is at Green Bank, West Virginia, approximately 611 kilometers to the north. These separations are considered sufficient to not be a coordination concern.

### Allocation Study

There is no proposed change in site from that authorized in the WCBD-DT CP. The proposed WCBD-DT operation complies with the channel 50 DTV facilities allocated in the FCC’s R&O in MM Docket No. 01-335 (ie, checklist). Hence, no adverse allocation impact is expected. Interference calculations have been made to analog (NTSC) and DTV stations and allotments using the procedures outlined in the FCC’s OET-69 Bulletin and a 2 kilometer grid spacing. The proposed WCBD-DT operation does not cause excessive calculated interference to any analog or DTV assignment or allotment.

Radiofrequency Electromagnetic Field Exposure

The proposed WCB-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 antenna is located 560 meters above ground level. The maximum DTV ERP is 1000 kW. A relative field value of 0.1 was assumed for the antenna's downward radiation (see Figure 2). The calculated power density at a point 2 meters (6.6 feet) above ground level is  $0.0011 \text{ mW/cm}^2$ . This is less than 1% of the FCC's recommended limit of  $0.46 \text{ mW/cm}^2$  for channel 50 for an "uncontrolled" environment. The calculated power density is less than 0.1% of the FCC's recommended limit for a "controlled" environment.

Access to the transmitting site will be restricted and appropriately marked with warning signs. As this is a multi-user site an agreement will control 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 WCB-DT operation appears to be otherwise categorically excluded from environmental processing.

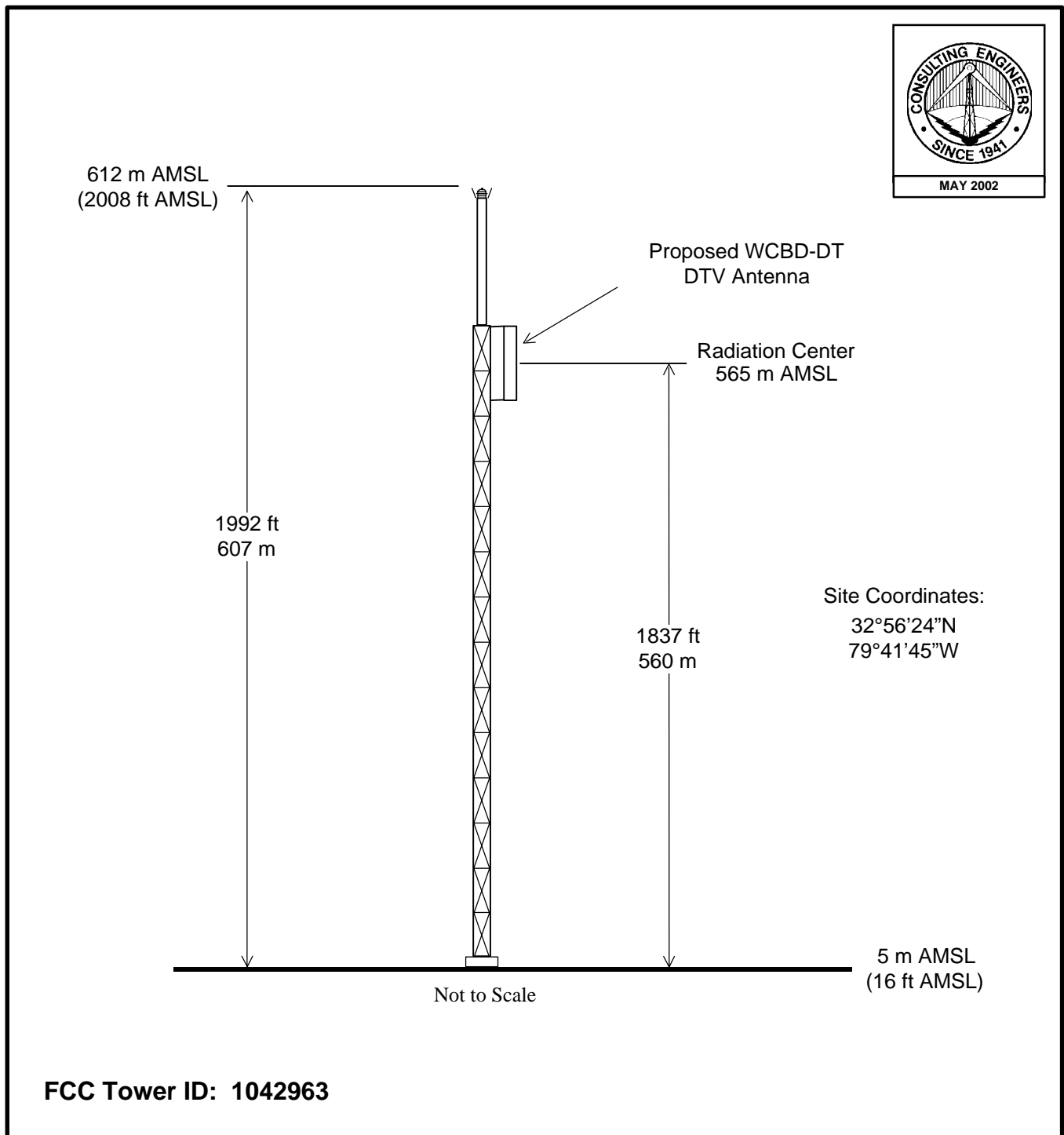
If there are questions concerning the technical portion of this application, please contact the office of the undersigned.

John A. Lundin

du Treil, Lundin & Rackley, Inc.  
201 Fletcher Avenue  
Sarasota, Florida 34237  
(941) 329-6000 voice  
(941) 329-6030 fax  
[john@DLR.com](mailto:john@DLR.com) e-mail

May 7, 2002

Figure 1



## PROPOSED ANTENNA AND SUPPORTING STRUCTURE

STATION WCBD-DT  
CHARLESTON, SOUTH CAROLINA  
CH 50 1000 KW (MAX-DA) 561 M

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

# Dielectric

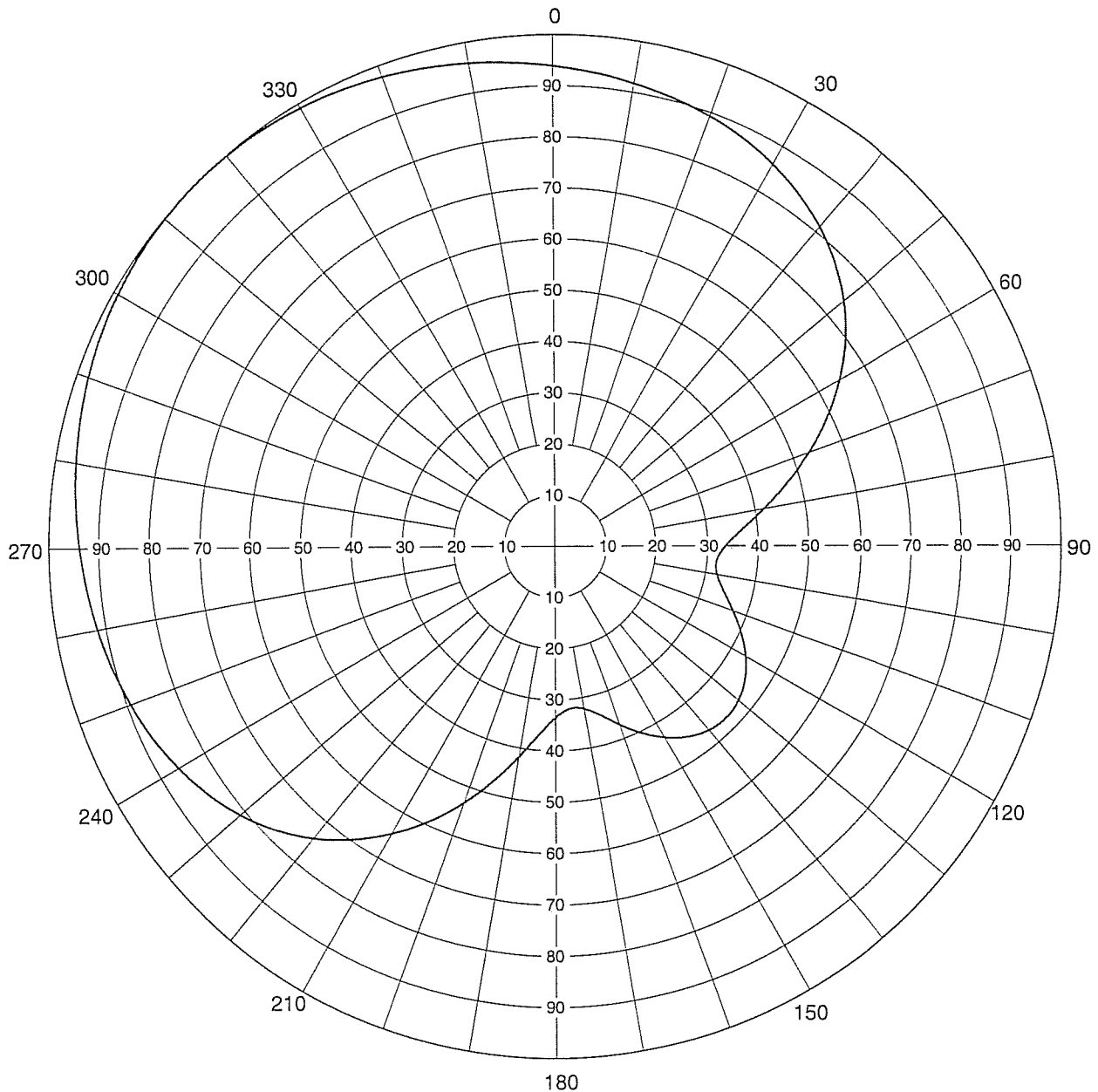
Date	06 May 2002
Call Letters	WCBD-DT Channel 50
Location	Charleston, SC
Customer	Media General
Antenna Type	TFU-30DSC-R S180

## AZIMUTH PATTERN

RMS Gain at Main Lobe  
Calculated / Measured

**1.80 (2.55 dB)**  
**Calculated**

Frequency **689 MHz**  
Drawing # **TFU-S180**



Remarks:



Date 06 May 2002  
Call Letters WCBT-DT Channel 50  
Location Charleston, SC  
Customer Media General  
Antenna Type TFU-30DSC-R S180

### TABULATION OF AZIMUTH PATTERN

Azimuth Pattern Drawing # TFU-S180

Angle	Field	ERP (kW)	ERP (dBk)
0	0.939	881.7	29.45
10	0.917	840.9	29.25
20	0.893	797.4	29.02
30	0.860	739.6	28.69
40	0.812	659.3	28.19
50	0.741	549.1	27.40
60	0.647	418.6	26.22
70	0.533	284.1	24.53
80	0.417	173.9	22.40
90	0.335	112.2	20.50
100	0.323	104.3	20.18
110	0.372	138.4	21.41
120	0.432	186.6	22.71
130	0.470	220.9	23.44
140	0.470	220.9	23.44
150	0.432	186.6	22.71
160	0.372	138.4	21.41
170	0.323	104.3	20.18
180	0.335	112.2	20.50
190	0.417	173.9	22.40
200	0.533	284.1	24.53
210	0.647	418.6	26.22
220	0.741	549.1	27.40
230	0.812	659.3	28.19
240	0.860	739.6	28.69
250	0.893	797.4	29.02
260	0.917	840.9	29.25
270	0.939	881.7	29.45
280	0.959	919.7	29.64
290	0.977	954.5	29.80
300	0.991	982.1	29.92
310	0.999	998.0	29.99
320	0.999	998.0	29.99
330	0.991	982.1	29.92
340	0.977	954.5	29.80
350	0.959	919.7	29.64

#### Maxima

Angle	Field	ERP (kW)	ERP (dBk)
135	0.475	225.6	23.53
315	1.000	1000.0	30.00

#### Minima

Angle	Field	ERP (kW)	ERP (dBk)
96	0.318	101.1	20.05
174	0.318	101.1	20.05

Remarks:

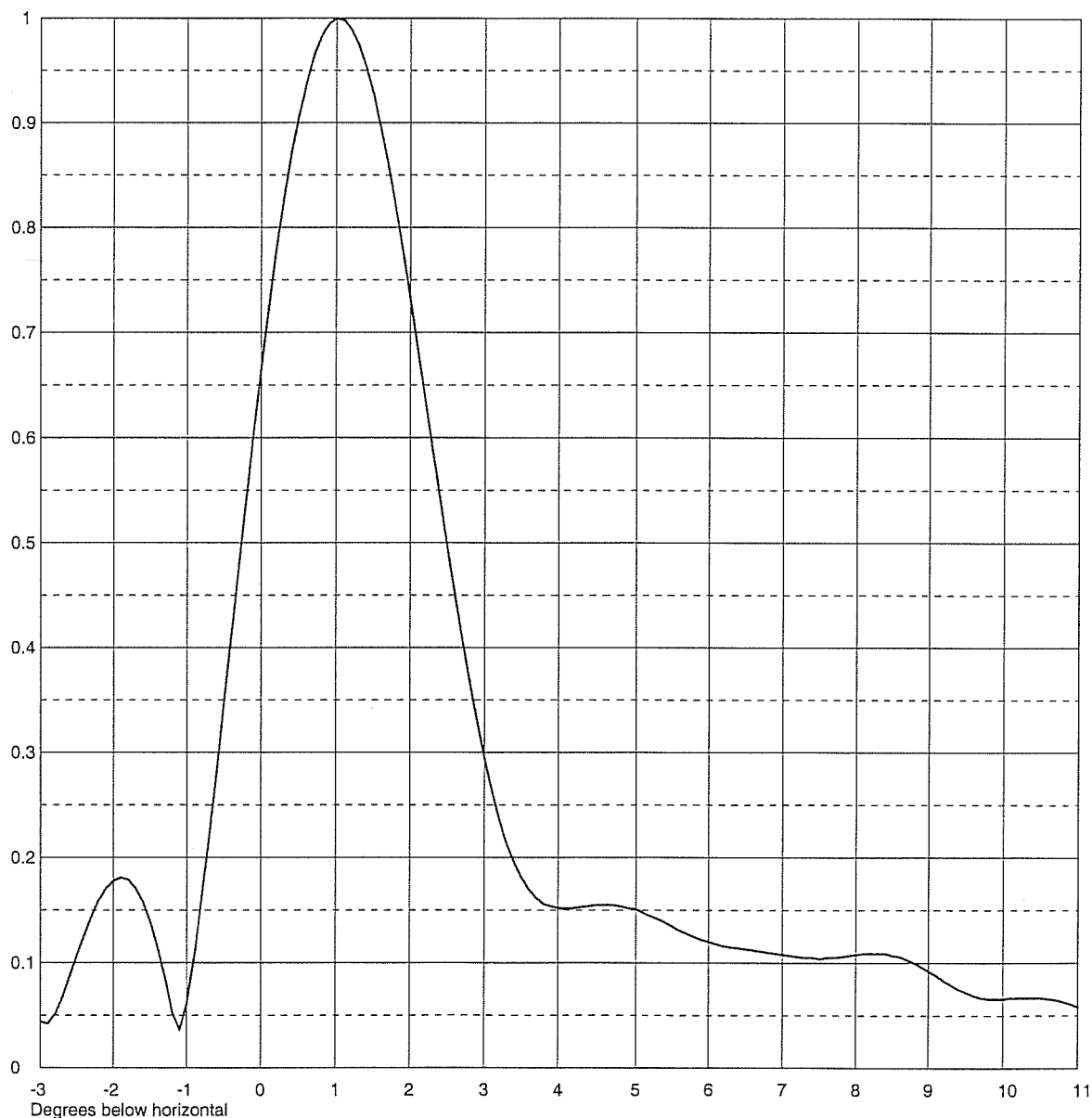




Date	06 May 2002
Call Letters	WCBD-DT Channel 50
Location	Charleston, SC
Customer	Media General
Antenna Type	TFU-30DSC-R S180

### ELEVATION PATTERN

RMS Gain at Main Lobe	25.5 (14.07 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	11.3 (10.53 dB)	Frequency	689.00 MHz
Calculated / Measured	Calculated	Drawing #	30Q255100



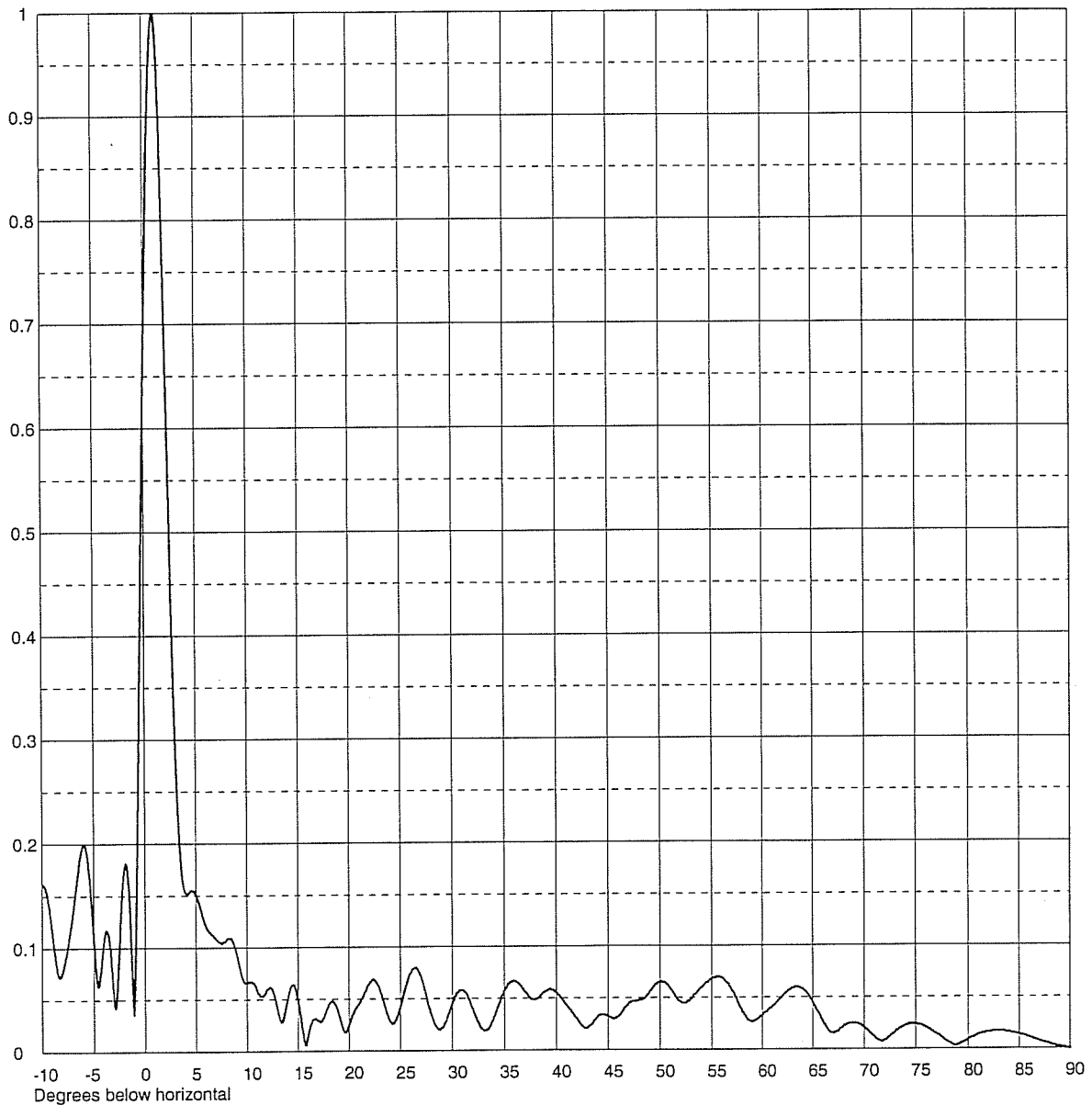
Remarks:



Date	06 May 2002
Call Letters	WCBD-DT Channel 50
Location	Charleston, SC
Customer	Media General
Antenna Type	TFU-30DSC-R S180

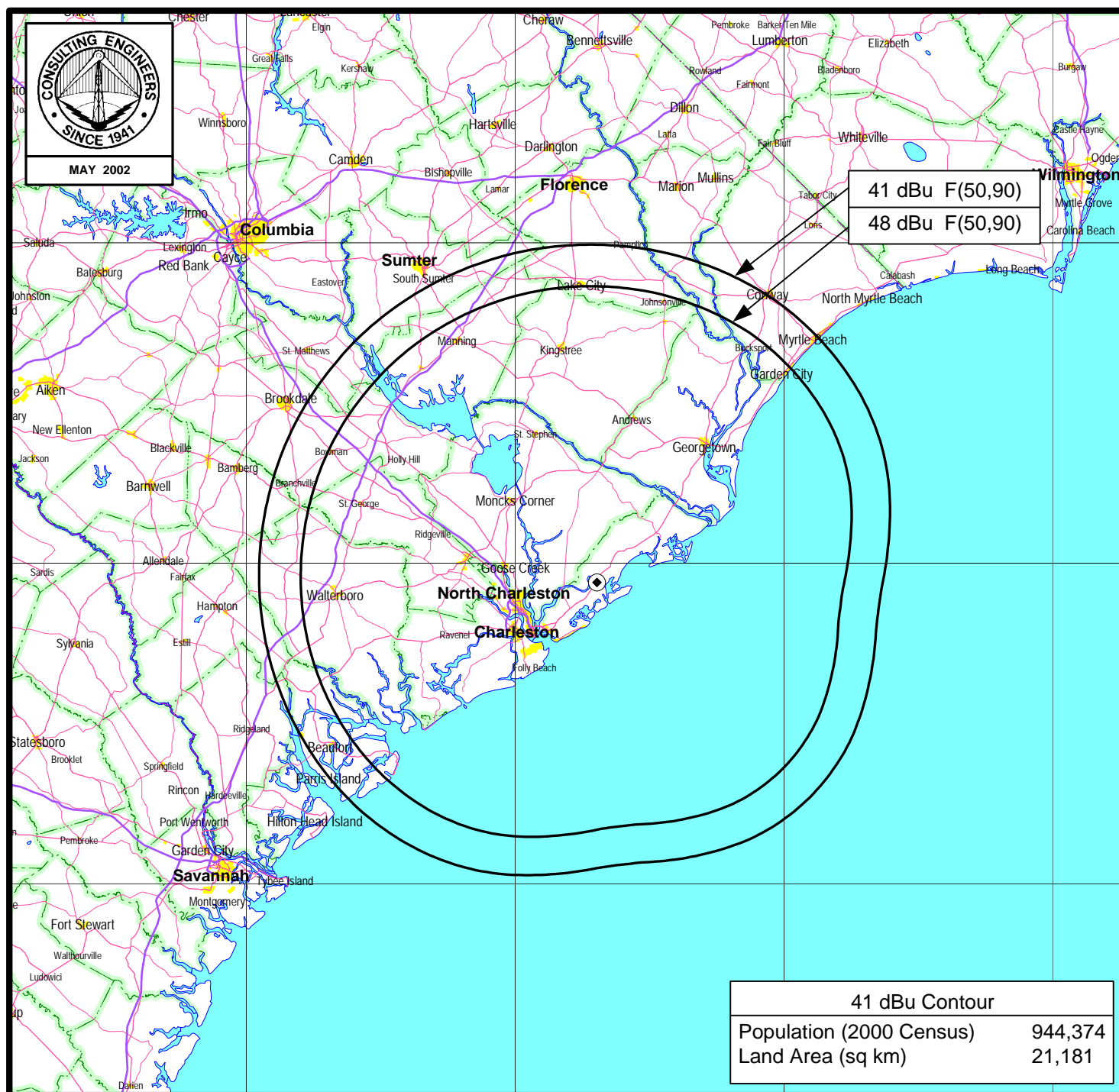
### ELEVATION PATTERN

RMS Gain at Main Lobe	25.5 (14.07 dB)	Beam Tilt	1.00 Degrees
RMS Gain at Horizontal	11.3 (10.53 dB)	Frequency	689.00 MHz
Calculated / Measured	Calculated	Drawing #	30Q255100-90



Remarks:

Figure 3



## PREDICTED COVERAGE CONTOURS

STATION WCBD-DT  
CHARLESTON, SOUTH CAROLINA  
CH 50 1000 KW (MAX-DA) 561 M

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