

TECHNICAL EXHIBIT  
MINOR MODIFICATION OF CONSTRUCTION PERMIT  
STATION WACH-DT (FACILITY ID 19199)  
COLUMBIA, SOUTH CAROLINA

JULY 15, 2002

CH 48    520 KW (MAX-DA)    464 M

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Technical Narrative

This Technical Exhibit supports a minor modification of construction permit for digital television (DTV) station WACH-DT on channel 48 at Columbia, South Carolina. Station WACH-DT is authorized (CP) to operate with a directional antenna maximum effective radiated power (ERP) of 600 kW and an antenna height above average terrain (HAAT) of 464 meters (BMPCDT-20011114ABB).

Proposed Facilities

This minor modification proposes only to change the directional antenna and reduce ERP. The proposed (NAD 27) site coordinates remain: 34-06-58 N, 80-45-51 W). A directional antenna maximum ERP of 520 kW and antenna HAAT of 464 meters is hereby proposed. The FCC antenna structure registration number is 1055358. There is no proposed change in channel, transmitter site, antenna height or city of license (Columbia).

The proposed transmitter site is more than 800 kilometers from the closest point of the Canadian border. The site is more than 1,500 kilometers from the closest point of the Mexican border. The closest FCC monitoring station is at Powder Springs, Georgia, approximately 366 kilometers to the west. The closest point of the National Radio Quiet Zone (VA/WV) is approximately 377 kilometers to the north. The closest point of the Table Mountain Radio Quiet Zone (CO) is more than 2,200 kilometers to the west-northwest. The closest radio astronomy site operating on TV channel 37 is at Green Bank, West Virginia,

approximately 487 kilometers to the north. These separations are sufficient to not be a concern for coordination purposes.

Nearby Broadcast Facilities

There are no known authorized full service AM stations within 10 kilometers of the proposed transmitter site. The following is a list of known authorized full service FM and TV stations within 16 kilometers (10 miles) of the proposed site.

<u>Station</u>	<u>Channel</u>	<u>Bearing(°True)</u>	<u>Distance(km)</u>
WMHK, Columbia, SC	209C	180	2.1
WWDN, Sumter, SC	267C	134	10.5
WNOK, Columbia, SC	284C	286	14.0
WPUB-FM, Camden, SC	274A	33	14.4
WLTR, Columbia, SC	217C1	271	15.9
WOLO-TV(CP), Columbia, SC	25	0	0.0
WQHB(CP), Sumter, SC	63	0	0.0
WIS, Columbia, SC	10	37	1.2
WIS-DT(CP), Columbia, SC	41	37	1.2
WQHB-DT(CP), Sumter, SC	39	112	2.1
WLTX-DT(CP), Columbia, SC	17	180	2.1
WLTX, Columbia, SC	19	180	2.1
WRLK-DT, Columbia, SC	32	271	15.9
WRLK-TV, Columbia, SC	35	271	15.9

Although no adverse electromagnetic impact is expected, the applicant recognizes its responsibility to correct problems that may result from its proposed operation.

Allocation Study

Interference calculations have been made using the procedures outlined in the FCC's OET-69 bulletin, using a 2 kilometer grid spacing. The proposed WACH-DT operation is predicted to cause excessive interference to the two currently pending applications for a new NTSC channel 47 operation at Columbia, SC. However, as stated below, the interference is a reduction from that caused by the current WACH-DT CP operation. Furthermore, the proposed WACH-DT operation does not cause excessive (greater than 2%, up to 10% total) calculated interference to any other (except as aforementioned) analog or DTV station and therefore complies with the FCC's 2%/10% interference standard. Below is the list of stations considered in the OET-69 analysis.

Stations Potentially Affected by proposed WACH-DT						
Chan	Call	City/State	Bear (°T)	Dist (km)	Status	App. Ref. No.
33	WJPM-TV	FLORENCE SC	79	95.6	LIC	BLET-191
44	960628KL	AIKEN SC	246	117.6	APP	BPET-19960628KL
47	WJZY-DT	BELMONT NC	346	143.0	CP	BPCDT-19990927AAK
47	WJZY-DT	BELMONT NC	346	143.0	PLN	DTVPLN-DTVP1299
47	WCSC-DT	CHARLESTON SC	143	165.2	CP	BMPCDT20000501ADT
47	WCSC-DT	CHARLESTON SC	143	165.2	APP	BPRM-20000731AAA
47	NEW	COLUMBIA SC	250	22.9	APP	BNPCT-20020320ACH
47	960722KG	COLUMBIA SC	250	22.9	APP	BPCT-19960722KG
48	WUVG-DT	ATHENS GA	265	331.4	CP MOD	BPCDT-19991027ADN
48	WUVG-DT	ATHENS GA	271	284.7	PLN	DTVPLN-DTVP1321
48	WUPN-TV	GREENSBORO NC	24	212.7	CP	BPCT-20000814ABU
48	WUPN-TV	GREENSBORO NC	23	212.3	LIC	BLCT-19810515KF
48	WCTI-DT	NEW BERN NC	70	332.2	PLN	DTVPLN-DTVP1329
48	960502KH	TAZEWELL TN	313	352.7	CP MOD	BMPCT-20000831AHD
48	WVSX-DT	LEWISBURG WV	1	406.5	CP	BPCDT-19990917AAK
48	WVSX-DT	LEWISBURG WV	1	406.5	PLN	DTVPLN-DTVP1339
49	WITV-DT	CHARLESTON SC	143	165.2	PLN	DTVPLN-DTVP1362
49	WITV-DT	CHARLESTON SC	143	165.2	CP	BPEDT-20000428ACL
49	WRET-TV	SPARTANBURG SC	312	129.2	LIC	BLET-19810706KG

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 WACH-DT operation are shown in the interference table.

OET-69 Interference Analysis		
Study Station	Baseline	Net Population Change/Interference
47 WJZY-DT BELMONT NC (CP)	2,298,101	1,719 (0.1%)
47 WJZY-DT BELMONT NC (PLN)	2,298,101	443 (0.0%)
47 WCSC-DT CHARLESTON SC (BPRM)	859,037	184 (0.0%)
<b>47 NEW COLUMBIA SC (APP)</b>	<b>537,452</b>	<b>-1,055 (0.2%)*</b>
<b>47 960722KG COLUMBIA SC (APP)</b>	<b>626,730</b>	<b>-686 (0.1%)*</b>
48 WUVG-DT ATHENS GA (CP MOD)	3,052,616	343 (0.0%)
48 WUVG-DT ATHENS GA (PLN)	3,052,616	1,440 (0.0%)
48 WUPN-TV GREENSBORO NC (CP)	1,946,601	1,266 (0.1%)
48 WUPN-TV GREENSBORO NC (LIC)	1,625,707	3,373 (0.2%)
49 WITV-DT CHARLESTON SC (PLN)	825,044	18 (0.0%)
49 WITV-DT CHARLESTON SC (CP)	825,044	63 (0.0%)
49 WRET-TV SPARTANBURG SC (LIC)	1,091,226	147 (0.0%)

The herein proposal is predicted to cause less interference to the two NTSC applications than caused by the WACH-DT CP (*see* BMPCDT-20011114ABB) (*see* table below).

Study Station	WACH-DT CP	Proposed WACH-DT	Net Population Change/Interference
47 NEW COLUMBIA SC	3,613 (0.7%)	2,558 (0.5%)	-1,055 (0.2%)
47 960722KG COLUMBIA SC	2,299 (0.4%)	1,613 (0.3%)	-686 (0.1%)

The proposed WACH-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 2%/10% interference standard.

#### Class A Consideration

The FCC's list of low power television (LPTV) assignments eligible for Class A status and the FCC CDBS system have been reviewed for potential Class A impact. The proposed WACH-DT is not predicted to cause any contour overlap to any Class A station .

#### Radiofrequency Electromagnetic Field Exposure

The proposed WACH-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 460.2 meters above ground level. The maximum DTV ERP is 520 kW. A conservative relative field of 0.15 was used for the calculation (*see* Figure 2C). Therefore, the "worst-case" calculated power density at a point 2 meters (6.6 feet) above ground level is 0.0019 mW/cm<sup>2</sup>. This is less than 0.5% of the FCC's recommended limit of 0.45 mW/cm<sup>2</sup> for channel 48 for an "uncontrolled" 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

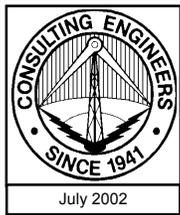
exposure monitors or scheduling work when the stations are at reduced power or shut down. The proposed WACH-DT operation appears to be otherwise categorically excluded from environmental processing.



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July 15, 2002



Tower Reg. No. 1055358

624.6 m AMSL  
(2049 ft AMSL)

538.3 m  
(1766 ft)

Proposed WACH DTV-48 Antenna

Radiation Center  
546.5 m AMSL  
(1793 ft AMSL)

460.2 m  
(1510 ft)

Site Coordinates:  
34° 06' 58" N  
80° 45' 51" W  
(NAD 27)

86.3 m AMSL  
(283 ft AMSL)

Not to Scale

# PROPOSED ANTENNA AND SUPPORTING STRUCTURE

STATION WACH-DT

COLUMBIA, SOUTH CAROLINA

CH 48    520 KW (MAX-DA)    464 M

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



Date **15 Jul 2002**  
Call Letters **WACH-DT** Channel **48**  
Location **Columbia, SC**  
Customer **Raycom**  
Antenna Type **TFU-24DSB-M (C)**

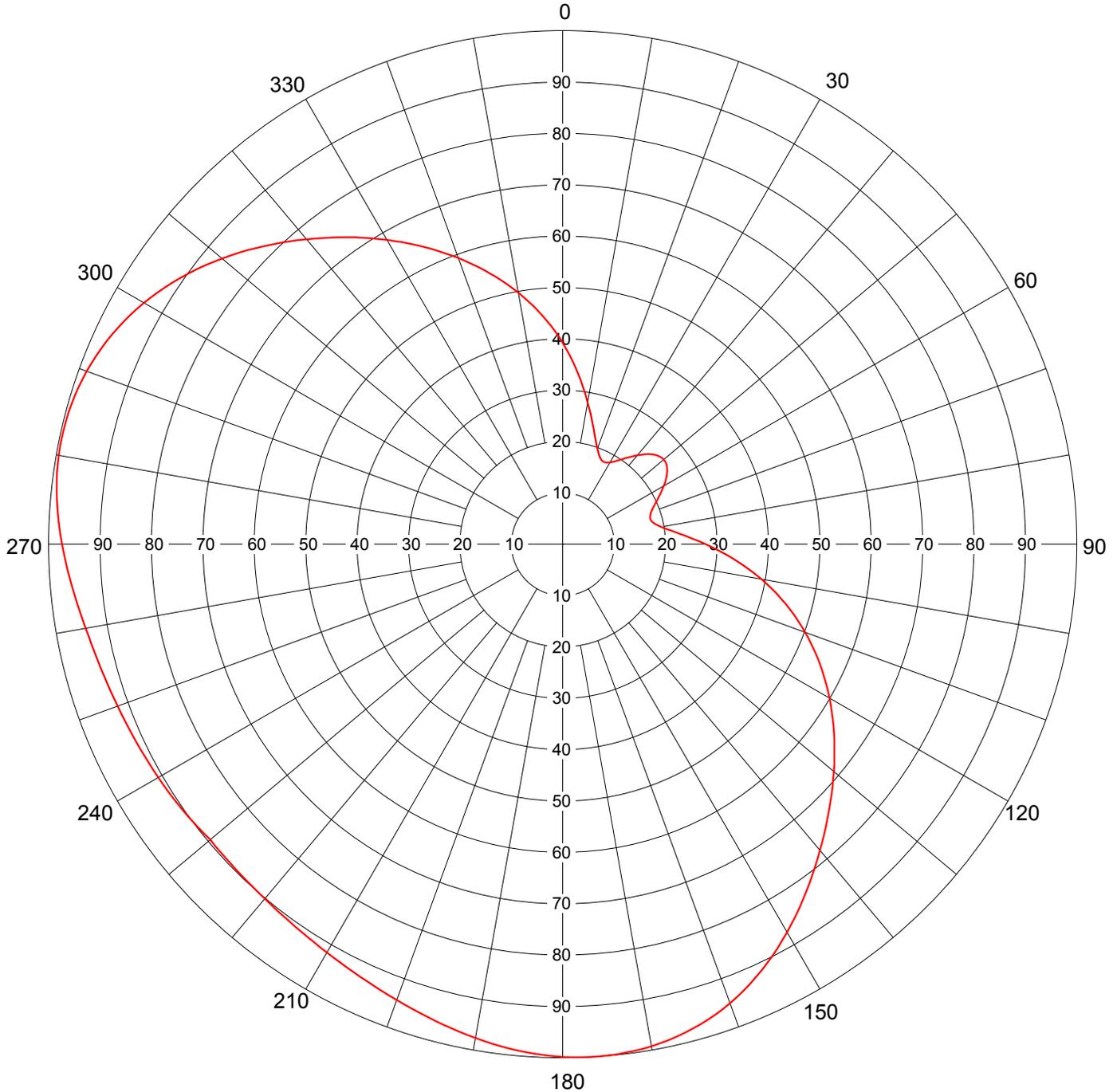
### AZIMUTH PATTERN

RMS Gain at Main Lobe  
Calculated / Measured

**1.90**  
**Calculated**

Frequency  
Drawing #

**677 MHz**  
**DSB-M**



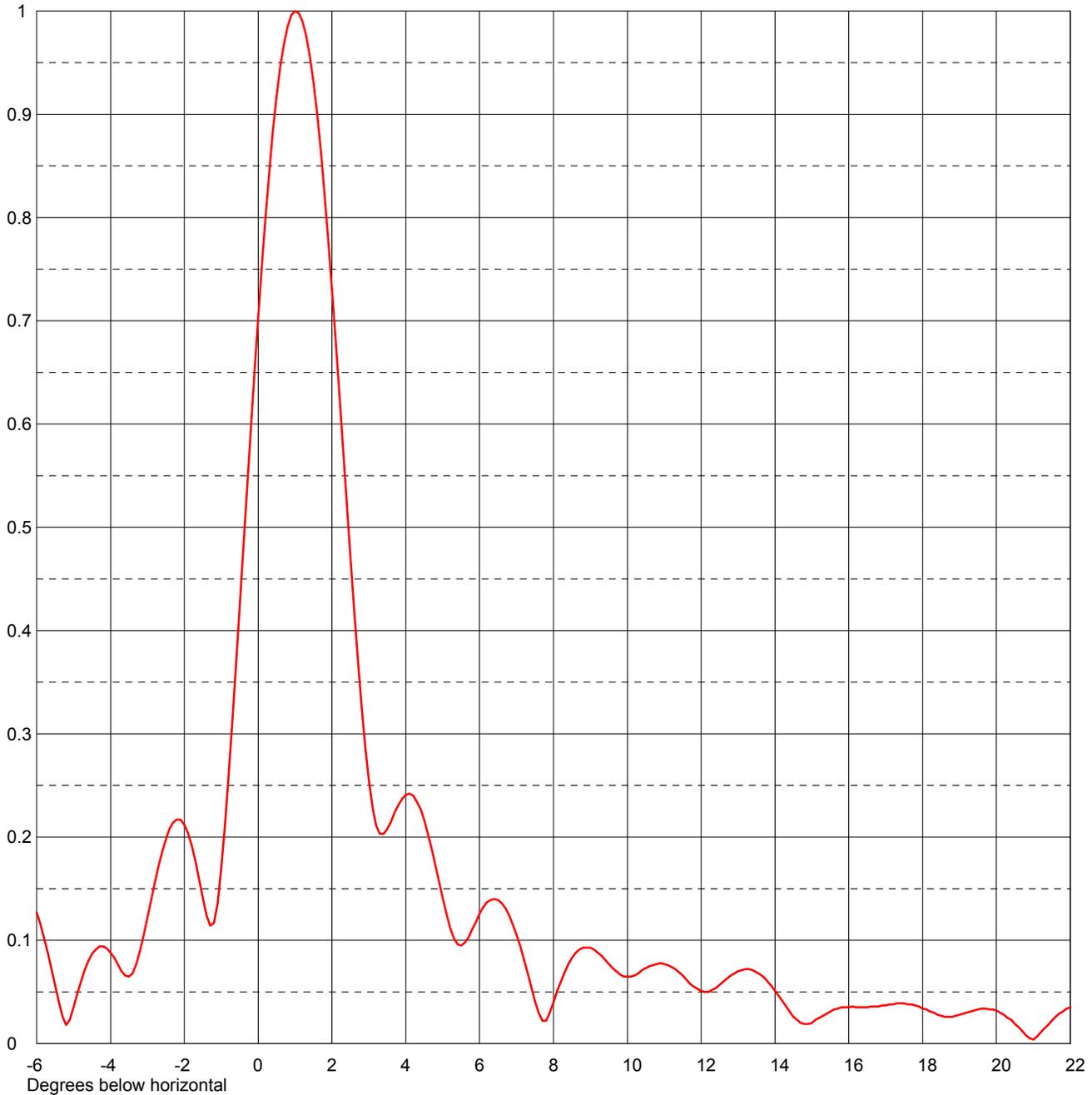
Remarks:



Date	<b>15 Jul 2002</b>	
Call Letters	<b>WACH-DT</b>	Channel <b>48</b>
Location	<b>Columbia, SC</b>	
Customer	<b>Raycom</b>	
Antenna Type	<b>TFU-24DSB-M (C)</b>	

### ELEVATION PATTERN

RMS Gain at Main Lobe	<b>24.0 (13.80 dB)</b>	Beam Tilt	<b>1.00 Degrees</b>
RMS Gain at Horizontal	<b>11.9 (10.76 dB)</b>	Frequency	<b>677.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>24B240100</b>



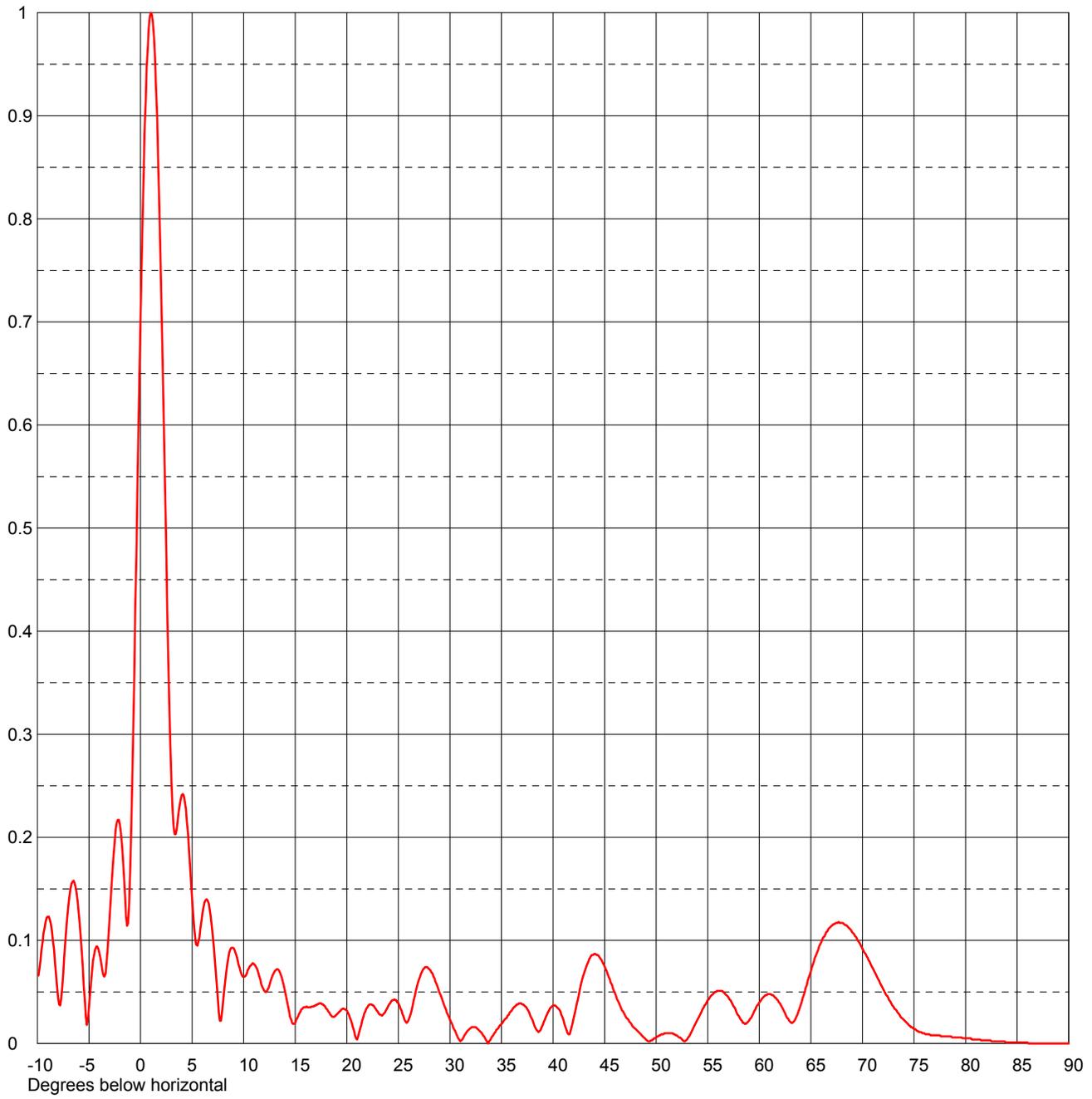
Remarks:



Date **15 Jul 2002**  
Call Letters **WACH-DT** Channel **48**  
Location **Columbia, SC**  
Customer **Raycom**  
Antenna Type **TFU-24DSB-M (C)**

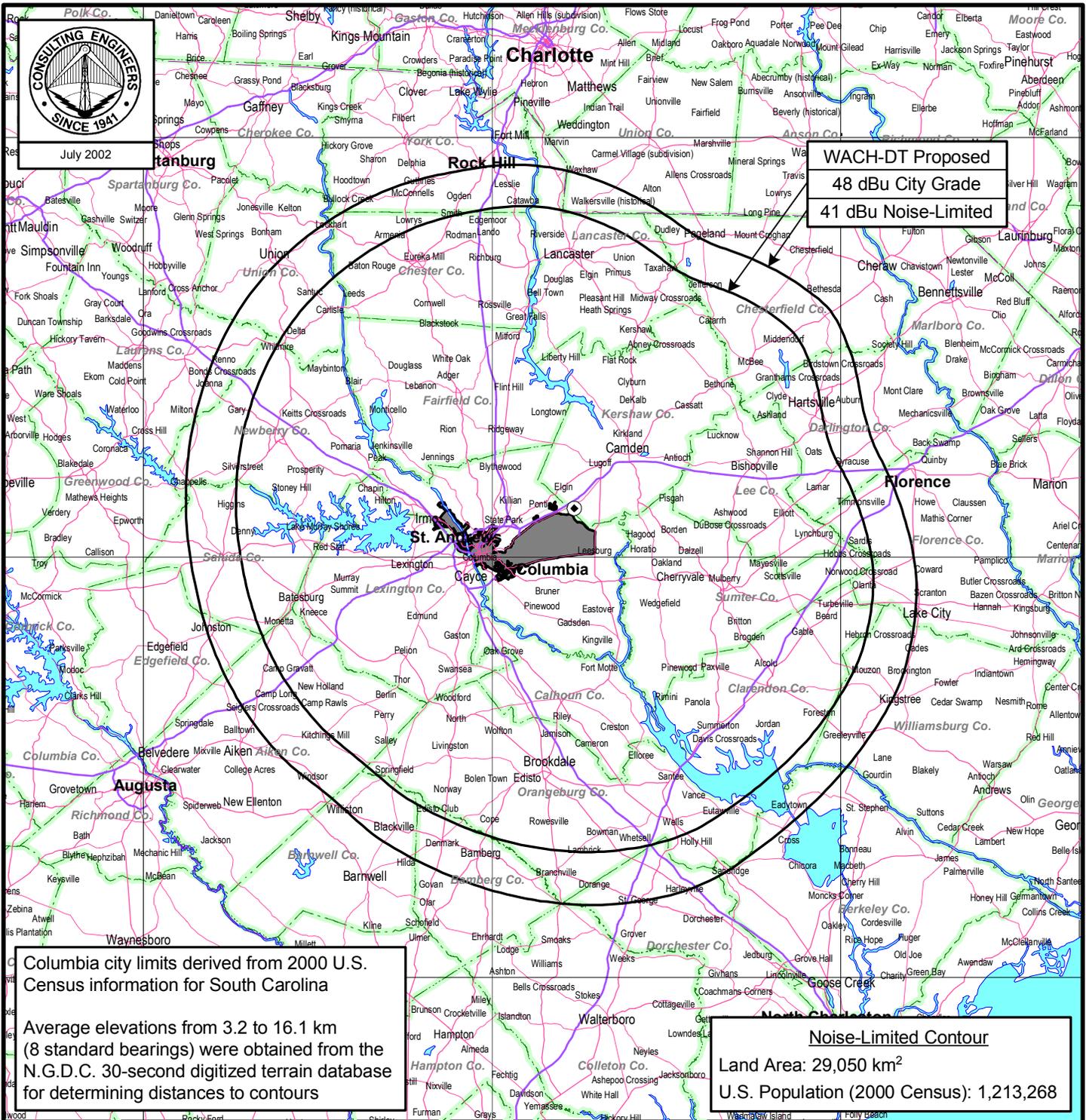
### ELEVATION PATTERN

RMS Gain at Main Lobe	<b>24.0 (13.80 dB)</b>	Beam Tilt	<b>1.00 Degrees</b>
RMS Gain at Horizontal	<b>11.9 (10.76 dB)</b>	Frequency	<b>677.00 MHz</b>
Calculated / Measured	<b>Calculated</b>	Drawing #	<b>24B240100-90</b>



Remarks:

Figure 3



# PREDICTED F(50,90) COVERAGE CONTOURS

STATION WACH-DT

COLUMBIA, SOUTH CAROLINA

CH 48 520 KW (MAX-DA) 464 M

du Treil, Lundin & Rackley, Inc Sarasota, Florida

INTERFERENCE RECEIVED BY W53BX FROM PROPOSED WACH-DT

CELL SIZE : 2.00 km
Using offset in determining thresholds
Per 6th Report & Order and FCC OET-69 Bulletin

\*\*\*\*\*
W53BX 32-09-17 80-45-47 48(+) 0.460 kW 17.7 m AMSL 50.0 % 74.8 dBu
HILTON HEAD ISLAND SC
APP BPTTL20010605ABE
Using DEFAULT vertical antenna pattern

Table with 3 columns: Description, Area, Pop. Rows: within Noise Limited Contour, not affected by terrain losses.

\*\*\*\*\*
WACHDP 34-06-58 80-45-51 48(N) 520.0 kW-DA 546.5 m AMSL 10.0 % 41.8 dBu
COLUMBIA SC 13082 714 DTVSERVICE: 714000 NTSCSERVICE: 714000
0.94 0.87 0.77 0.68 0.59 0.50 0.39 0.28 0.20 0.18 0.23 0.26
0.23 0.18 0.19 0.28 0.39 0.50 0.60 0.69 0.78 0.87 0.95 0.99
1.00 0.98 0.94 0.92 0.90 0.89 0.91 0.92 0.94 0.97 1.00 0.99
(237.0 1.00) (342.0 1.00)
Ref Az: 300.0
Using DEFAULT vertical antenna pattern

D/U Baseline: 34.00
Interference Area Pop
0 0