

WCEU-DT CHANNEL 33 NEW SMYRNA BEACH,
FLORIDA MINOR MODIFICATION OF
CONSTRUCTION PERMIT APPLICATION
(DAYTONA BEACH COMMUNITY COLLEGE)

KESSLER AND GEHMAN ASSOCIATES, INC.
TELECOMMUNICATIONS CONSULTING ENGINEERS

20041210

Prepared by William T. Godfrey, Jr.

KG&A

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ENGINEERING TECHNICAL STATEMENT PREPARED BY WILLIAM T. GODFREY, JR. OF THE FIRM KESSLER AND GEHMAN ASSOCIATES, INC., TELECOMMUNICATIONS CONSULTING ENGINEERS IN CONNECTION WITH A MINOR MODIFICATION OF CONSTRUCTION PERMIT APPLICATION TO MAKE CHANGES TO THE DAYTONA BEACH COMMUNITY COLLEGE DIGITAL BROADCAST FACILITY'S CONSTRUCTION PERMIT (BPEDT-20000412AAQ), WCEU-DT CHANNEL 33, NEW SMYRNA BEACH, FLORIDA.

The firm Kessler and Gehman Associates, Inc., ("KGA") has been retained by Daytona Beach Communication College ("DBCC"), Daytona Beach, Florida in order to prepare engineering studies and the engineering portion of a minor modification of construction permit application for the authorized WCEU-DT Channel 33 digital television broadcast facility in order to operate the digital facility at a reduced Effective Radiated Power ("ERP") on a permanent basis.

Discussion

The DBCC is licensed to operate WCEU-TV on analog Channel 15 with an ERP of 708 kW at an antenna height radiation center of 176 meters Above Average Terrain ("AAT") using a directional antenna (BLCT-19880129KF). The DBCC currently has a construction permit (BPEDT-20000412AAQ) to build and operate WCEU-DT on digital Channel 33 with an ERP of 500 kW at an antenna height radiation center of 491 meters AAT using a TCI model 888-32 directional antenna. The DBCC is currently operating its digital facility under the authorization of a Special Temporary Authority ("STA"). The STA (BDSTA-20030512AFD) authorizes the WCEU-DT Channel 33 facility to operate with an ERP of 308 kW at an antenna height radiation center of 491 meters AAT using a TCI model 888-32 directional antenna.

On November 3, 2004, the DBCC electronically filed an FCC 381 Pre-Election Certification Form (BCERET-20041103AGD) certifying that it would operate its post-transition DTV station pursuant to the aforementioned STA. Accordingly, this minor modification of construction permit application requests authorization to decrease the ERP from the authorized 500 kW to the proposed 308 kW.

Exhibit 12 is an FCC coverage contour map depicting the authorized F(50,90) 40.6 dBuV/m protected noise limited contour (black) and the proposed F(50,90) 40.6 dBuV/m protected noise limited contour (red). It can be seen that the authorized noise limited contour would completely encompass the proposed noise limited contour in all azimuthal directions; therefore, interference studies are not required.

Exhibit 13 is a principal community map demonstrating that the proposed WCEU-DT Channel 33 F(50,90) 48.0 dBuV/m enhanced principal community contour would completely encompass the principal community of New Smyrna Beach, Florida.

Interference Studies

Interference studies are not required since the authorized noise limited contour would completely encompass the proposed noise limited contour in all azimuthal directions (Exhibit 12).

Transmitter Site

The tower is registered with the FCC and the registration number is 1063249. The support structure is located at 4652 Brown Road, Christmas, FL.

Exhibits

Exhibits 1 and 2 represent WCEU's administration data, antenna and antenna structure specifications.

Exhibit 3 depicts the profile view of the proposed facility's antenna on the antenna structure with all appropriate elevations.

Exhibits 4 and 5 display the azimuth pattern and azimuth pattern tabulation respectively using relative field values.

Exhibits 6 and 7 display the elevation pattern and Exhibit 8 displays the elevation pattern tabulation.

Exhibits 9 and 10 display the azimuth pattern and azimuth pattern tabulation respectively using ERP values (dBk).

Exhibit 11 depicts the location of the WCEU-DT site on a 7.5-Minute (Series) Topographic map.

Exhibit 12 depicts the WCEU-DT Channel 33 authorized and proposed noise limited contours and demonstrates that the authorized pattern would exceed the proposed pattern in all azimuthal directions.

Exhibit 13 depicts the proposed WCEU-DT enhanced principal community contour, boundaries of the principal community to be served, and the transmitting location with radials every 45°.

Environmental Impact

The proposed construction would have no significant environmental impact as defined in §1.1307 of the FCC Rules. The DTV transmitter, 6-1/8 inch (75-ohm) DigiTLine and antenna system would produce an ERP of 308 kW. It was determined that the maximum lobe of radiation from the base of the tower out to approximately 1.41 miles would occur at approximately 0.82 miles from the base of the tower. At approximately 0.82 miles from the base of the tower, the depression angle of the main lobe would be 20.0° below the horizontal. At that point, the relative field would be 0.067 and the power density six feet above the ground would be 0.0002 mW/cm². This is only 0.01% of the maximum permissible exposure (“MPE”) limits for Occupational/Controlled Exposure and only 0.05% of the MPE limits for General Population/Uncontrolled Exposure authorized by the American National Standards Institute (“ANSI”). Since the proposed operation of WCEU-DT Channel 33 would not exceed 5.0% of the MPE limit for Occupational/Controlled Exposure or General Population/Uncontrolled Exposure at any point on the ground, WCEU-DT would not be considered a “significant contributor” to the RF exposure environment pursuant to OET Bulletin 65, Edition 97-01.

Therefore, contributions of exposure from other sources were not accounted for in this analysis. It is safe to conclude that the emissions would be insignificant and well within the maximum allowable requirements.

If other antennas are placed on the tower in the future, the applicant will cooperate with those users by reducing or completely terminating the power to the antenna when maintenance workers are in danger from the electromagnetic radiation emanating from the antenna.

Certification

This technical statement was prepared by William T. Godfrey, Jr., Telecommunications Consultant with Kessler and Gehman Associates, Inc. having offices in Gainesville, Florida and has been working in the field of radio and television broadcast consulting since 1998. He graduated from the University of North Florida with a Bachelor of Arts degree in Criminal Justice and a minor in Mathematics in 1993. As a Professional in the field of Telecommunications he states under penalty of perjury that the information contained in this report is true and correct to the best of his knowledge and belief.



KESSLER AND GEHMAN ASSOCIATES, INC.


WILLIAM T. GODFREY, JR.
Telecommunications Technical Consultant

December 10, 2004

**WCEU-DT
NEW SMYRNA BEACH, FL**

ENGINEERING SPECIFICATIONS

A. Transmitter Site:

Geographic coordinates (NAD 27)

North Latitude	28° 36' 35"
West Longitude	81° 03' 35"

Transmitter Site Address: **4652 Brown Road
Christmas, Florida**

**B. Main Studio Site Address: Daytona Beach Community College
1200 West International Speedway Blvd.
Daytona Beach, FL 32114**

C. Proposed Facility:

DTV Channel	Number	33
	Frequency	584-590 MHz

D. Antenna Height:

Height of Site Above Mean Sea Level (AMSL)	16.0 M
Overall Height of Structure Above Ground	516.6 M
(including all appurtenances)	
Overall Height of Structure Above Mean Sea Level	532.6 M
(including all appurtenances)	
Height of Site Above Average Terrain	4.8 M
Antenna Height Radiation Center (R/C) Above Ground	484.3 M
Antenna Height R/C Above Mean Sea Level	500.3 M
Average of All Non-Odd Radials	9.2 M
Antenna Height R/C Above Average Terrain	491.1 M

E. System Parameters – Horizontal Polarization:

Transmitter Power Required	10.3 kW
Maximum Power Input to Antenna	6.2 kW
Transmission Line Loss	2.17 dB
Transmission Line Efficiency	60.7%
Maximum Antenna Gain in Beam Maximum	16.94 dB
Maximum Antenna Gain in Horizontal Plane	15.45 dB
Maximum Effective Radiated Power	24.89 dBk
In Beam Maximum	308.0 kW
Maximum Effective Radiated Power	23.40 dBk
In Horizontal Plane	218.5 kW

WCEU-DT Channel 33
New Smyrna Beach, Florida

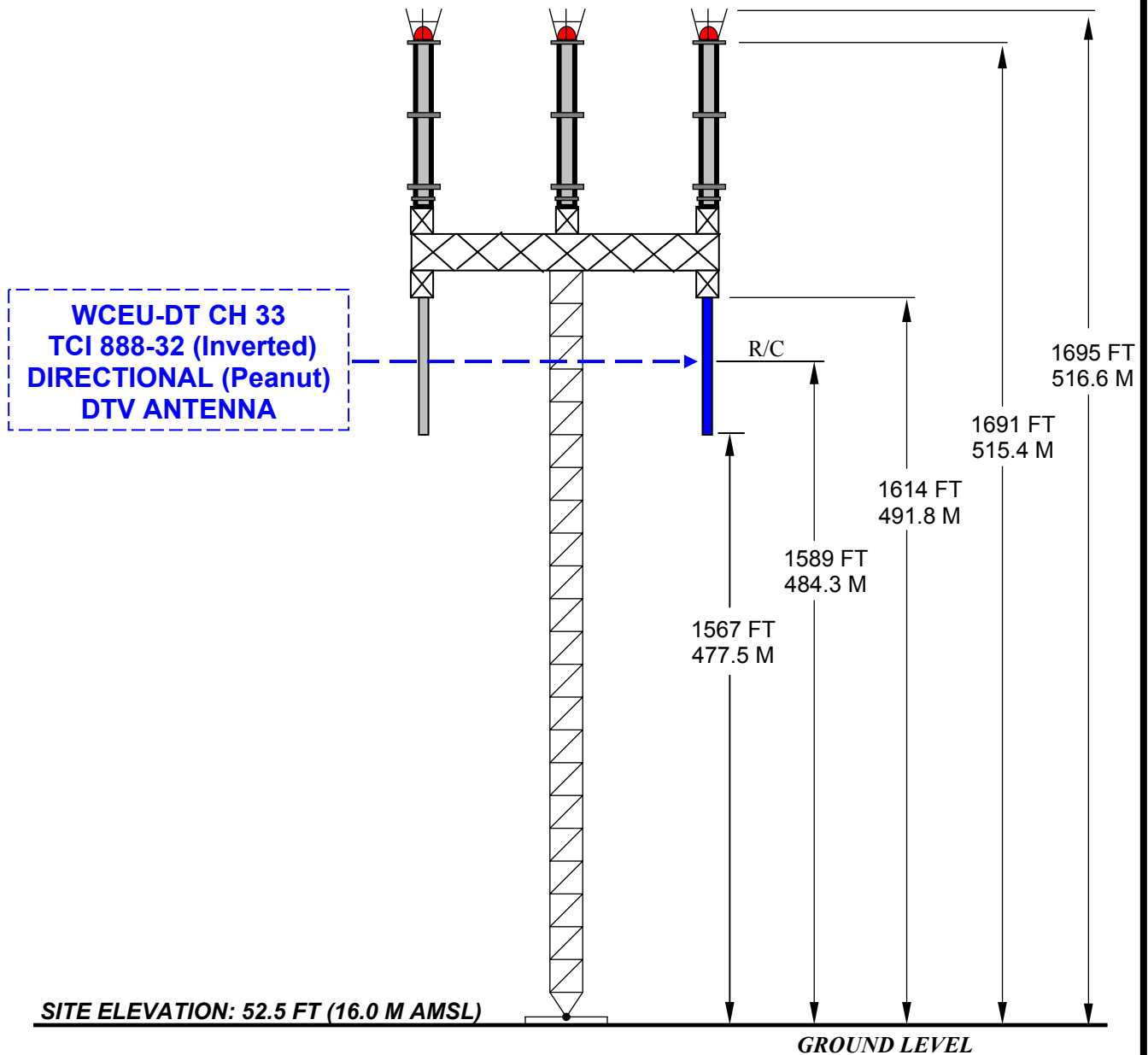
**DATA FOR PROPOSED DTV
DIRECTIONAL TRANSMITTING ANTENNA**

- A. **Antenna:** TCI Model 888-32, Horizontally Polarized, Directional (Peanut Inverted) Antenna.
- B. **Electrical Beam Tilt:** 0.75°
- C. **Mechanical Beam Tilt:** None
- D.

<u>Maximum Power Gain</u>	<u>Horizontal Polarization</u>
Maximum:	49.4 (16.94 dB)
Horizontal:	35.1 (15.45 dB)
- E. **Length:** 46.9 feet (14.3 meters) not including appurtenances.
- F. **Transmitter Power Output:** 10.3 kW
- G. **Null Fill:** 5.0%
- H. **Transmission Line:** 6-1/8" 75-ohm DigiTLine
- I. **Transmission Line Loss:** 0.1185 dB/100-feet
- J. **Total Transmission Line:** 1,666 feet (507.8 meters)
- K. **Transmission Line Attenuation:** 1.97 dB
- L. **Combiner & Splitter Loss:** 0.20 dB
- M. **Total Antenna System Loss:** 2.17 dB

SUPPORT STRUCTURE ELEVATION VIEW

GUYED TOWER



OVERALL HEIGHT AGL: 516.6 M
OVERALL HEIGHT AMSL: 532.6 M
RADIATION CENTER AGL: 484.3 M
RADIATION CENTER AMSL: 500.3 M
AVG OF NON-ODD RADIALS: 9.2 M
RADIATION CENTER HAAT: 491.1 M

COORDINATES: (NAD 27)

N. LATITUDE 28° 36' 35"

W. LONGITUDE 81° 03' 35"

Antenna Structure Registration Number:
1063249

NOTE: NOT TO SCALE

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NEW SMYRNA BEACH, FLORIDA

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EXHIBIT 3

The polar plot displays the magnitude of the transfer function $|G(j\omega)|$ in dB on the vertical axis (ranging from -2 to 2) against the phase angle ϕ in degrees on the horizontal axis (ranging from 0 to 360). The plot includes a grid of concentric circles for magnitude and radial lines for phase. The red curve represents the magnitude response, which is symmetric about the 0 dB line. It starts at 0 dB at 0 degrees, reaches a maximum of approximately 1.8 dB at 135 degrees, and a minimum of approximately -1.8 dB at 45 degrees.

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EXHIBIT 4

WCEU-DT CHANNEL 33

NEW SMYRNA BEACH, FLORIDA

TABULATION OF AZIMUTH PATTERN (RELATIVE FIELD VALUES) FOR PROPOSED ANTENNA

AZIMUTH	RELATIVE FIELD	AZIMUTH	RELATIVE FIELD
N000°E	0.959	N180°E	0.959
N005°E	0.922	N185°E	0.922
N010°E	0.870	N190°E	0.870
N015°E	0.800	N195°E	0.800
N020°E	0.718	N200°E	0.718
N025°E	0.629	N205°E	0.629
N030°E	0.541	N210°E	0.541
N035°E	0.466	N215°E	0.466
N040°E	0.410	N220°E	0.410
N045°E	0.378	N225°E	0.378
N050°E	0.365	N230°E	0.365
N055°E	0.367	N235°E	0.367
N060°E	0.374	N240°E	0.374
N065°E	0.381	N245°E	0.381
N070°E	0.384	N250°E	0.384
N075°E	0.381	N255°E	0.381
N080°E	0.374	N260°E	0.374
N085°E	0.367	N265°E	0.367
N090°E	0.365	N270°E	0.365
N095°E	0.378	N275°E	0.378
N100°E	0.410	N280°E	0.410
N105°E	0.466	N285°E	0.466
N110°E	0.541	N290°E	0.541
N115°E	0.629	N295°E	0.629
N120°E	0.718	N300°E	0.718
N125°E	0.800	N305°E	0.800
N130°E	0.870	N310°E	0.870
N135°E	0.922	N315°E	0.922
N140°E	0.959	N320°E	0.959
N145°E	0.981	N325°E	0.981
N150°E	0.993	N330°E	0.993
N155°E	0.999	N335°E	0.999
N160°E	1.000	N340°E	1.000
N165°E	0.999	N345°E	0.999
N170°E	0.993	N350°E	0.993
N175°E	0.981	N355°E	0.981

MINIMUM OF 0.365 AT N50°E, N90°E, N230°E & N270°E

MAXIMA OF 1.000 AT N160°E & N340°E

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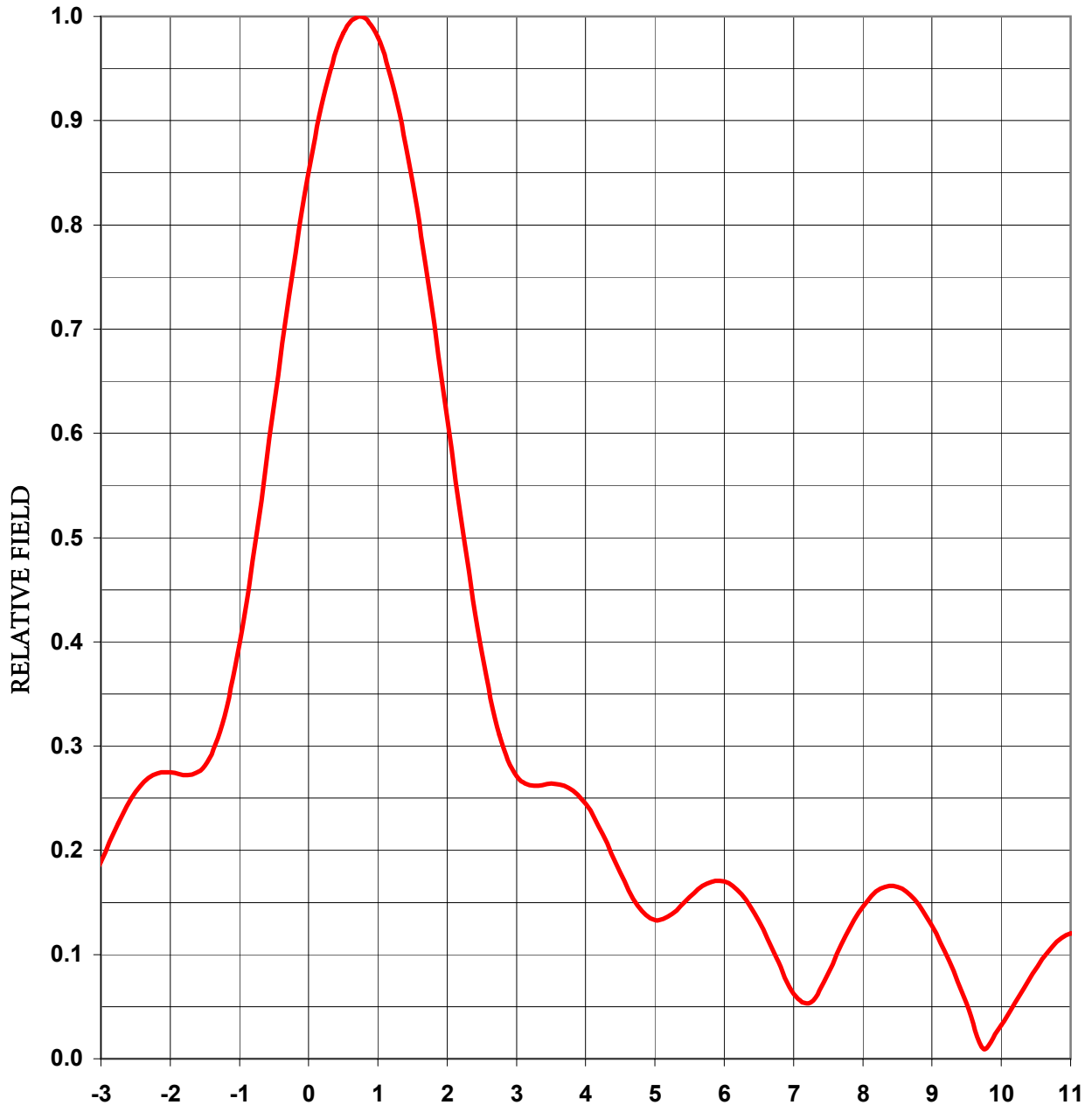
EXHIBIT 5

ELEVATION PATTERN

TCI MODEL 888-32 ANTENNA

RMS Gain at Main Lobe (13.93 dB)
RMS Gain at Horizontal (12.46 dB)

Beam Tilt 0.75 deg
Frequency 584-590 MHz



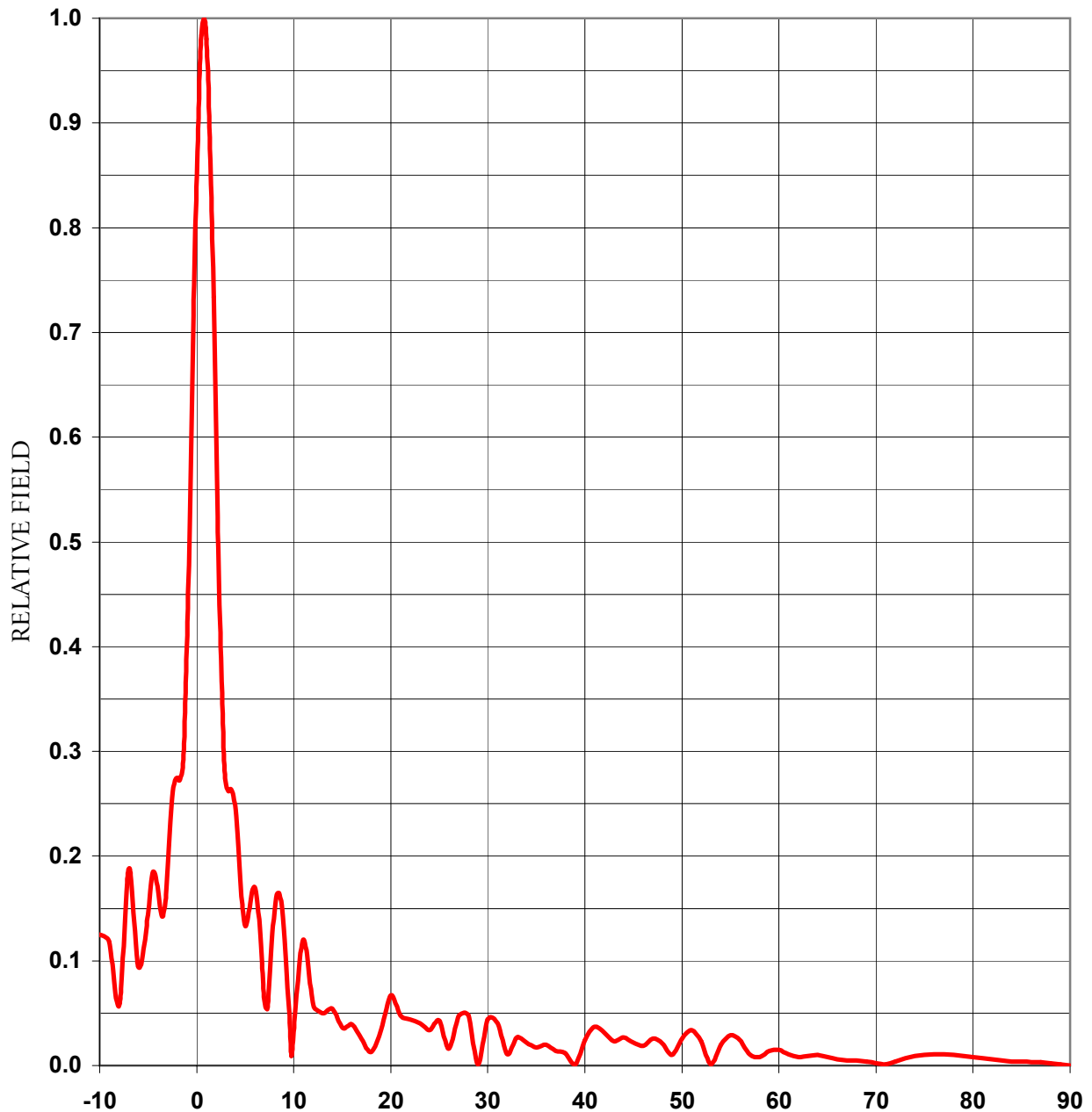
DEGREES BELOW HORIZONTAL DEPICTED WITH POSITIVE VALUES

ELEVATION PATTERN

TCI MODEL 888-32 ANTENNA

RMS Gain at Main Lobe (13.93 dB)
RMS Gain at Horizontal (12.46 dB)

Beam Tilt 0.75 deg
Frequency 584-590 MHz



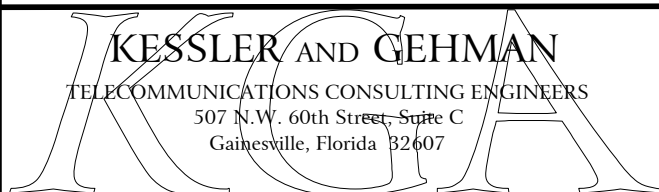
DEGREES BELOW HORIZONTAL DEPICTED WITH POSITIVE VALUES

WCEU-DT CHANNEL 33

NEW SMYRNA BEACH, FLORIDA

ELEVATION PATTERN TABULATION FOR TCI MODEL 888-32 ANTENNA

Angle	Field	Angle	Field	Angle	Field
-10.0	0.125	23.0	0.040	57.0	0.011
-9.0	0.118	24.0	0.034	58.0	0.008
-8.0	0.058	25.0	0.043	59.0	0.014
-7.0	0.188	26.0	0.016	60.0	0.015
-6.0	0.094	27.0	0.048	61.0	0.011
-5.0	0.144	28.0	0.048	62.0	0.008
-4.0	0.167	29.0	0.001	63.0	0.009
-3.0	0.189	30.0	0.044	64.0	0.010
-2.0	0.275	31.0	0.040	65.0	0.008
-1.0	0.399	32.0	0.011	66.0	0.006
0.0	0.850	33.0	0.027	67.0	0.005
0.75	1.000	34.0	0.022	68.0	0.005
1.0	0.980	35.0	0.017	69.0	0.004
2.0	0.614	36.0	0.020	70.0	0.002
3.0	0.271	37.0	0.014	71.0	0.001
4.0	0.244	38.0	0.012	72.0	0.004
5.0	0.133	39.0	0.001	73.0	0.007
6.0	0.170	40.0	0.024	74.0	0.009
7.0	0.062	41.0	0.037	75.0	0.010
8.0	0.146	42.0	0.031	76.0	0.011
9.0	0.128	43.0	0.023	77.0	0.011
10.0	0.032	44.0	0.027	78.0	0.010
11.0	0.120	45.0	0.022	79.0	0.009
12.0	0.058	46.0	0.019	80.0	0.008
13.0	0.050	47.0	0.026	81.0	0.007
14.0	0.054	48.0	0.021	82.0	0.006
15.0	0.036	49.0	0.010	83.0	0.005
16.0	0.039	50.0	0.026	84.0	0.004
17.0	0.025	51.0	0.034	85.0	0.004
18.0	0.013	52.0	0.023	86.0	0.003
19.0	0.035	53.0	0.001	87.0	0.003
20.0	0.067	54.0	0.020	88.0	0.002
21.0	0.048	55.0	0.029	89.0	0.001
22.0	0.044	56.0	0.024	90.0	0.000



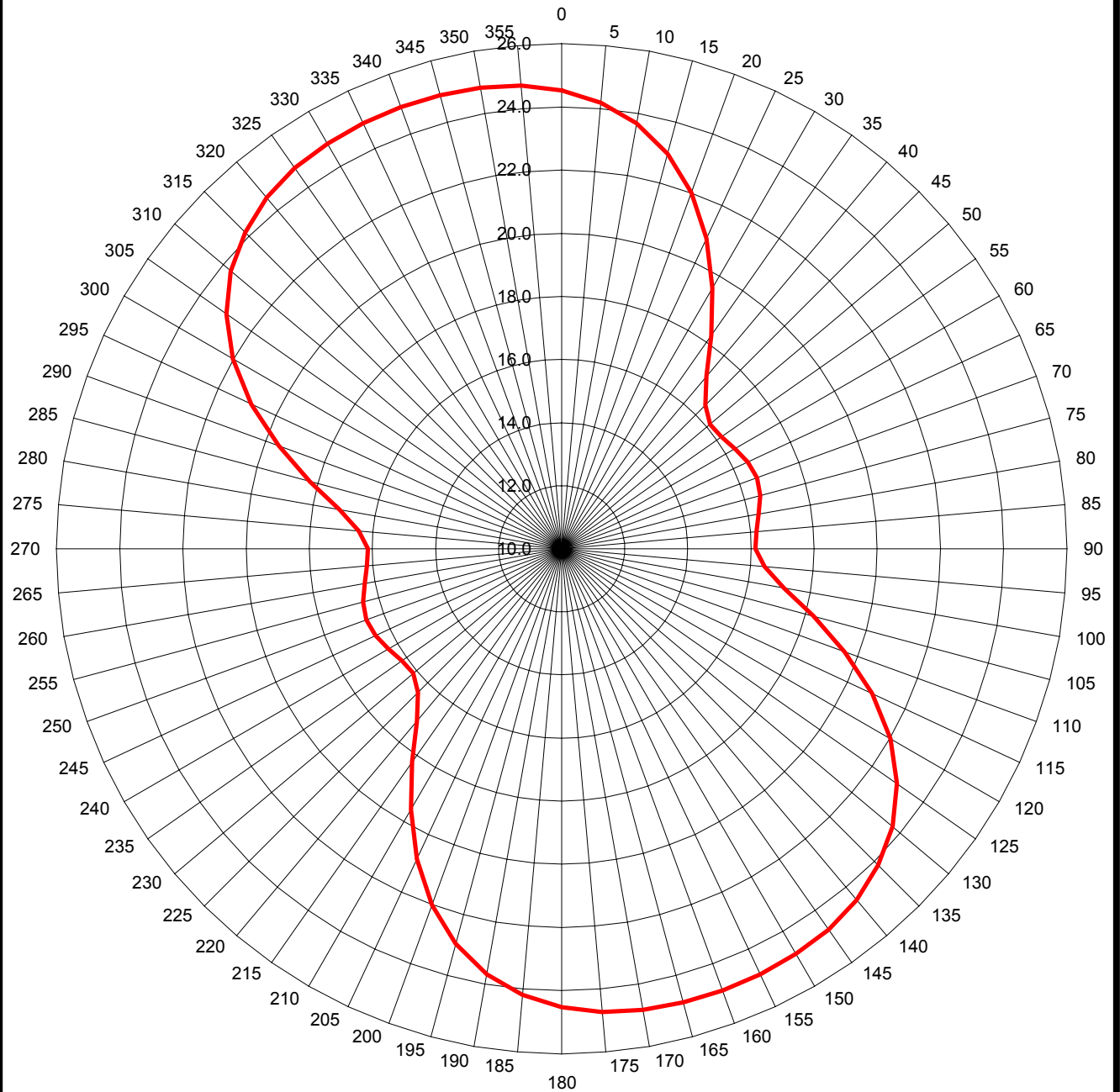
WCEU-DT CH 33

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EXHIBIT 8

AZIMUTH PATTERN (ERP-dBk VALUES)



TCI MODEL 888-32 ANTENNA
ORIENTED WITH BEAM MAXIMA AT N160°E° & N340°E°
MAXIMUM GAIN: 49.4 (16.94 dB)
RMS GAIN: 24.7 (13.93 dB)
DIRECTIONAL (PEANUT INVERTED)

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EXHIBIT 9

WCEU-DT CHANNEL 33

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TABULATION OF AZIMUTH PATTERN (ERP-dBk) FOR PROPOSED ANTENNA

AZIMUTH	dBk	AZIMUTH	dBk
N000°E	24.52	N180°E	24.52
N005°E	24.18	N185°E	24.18
N010°E	23.68	N190°E	23.68
N015°E	22.95	N195°E	22.95
N020°E	22.01	N200°E	22.01
N025°E	20.86	N205°E	20.86
N030°E	19.55	N210°E	19.55
N035°E	18.25	N215°E	18.25
N040°E	17.14	N220°E	17.14
N045°E	16.44	N225°E	16.44
N050°E	16.13	N230°E	16.13
N055°E	16.18	N235°E	16.18
N060°E	16.34	N240°E	16.34
N065°E	16.50	N245°E	16.50
N070°E	16.57	N250°E	16.57
N075°E	16.50	N255°E	16.50
N080°E	16.34	N260°E	16.34
N085°E	16.18	N265°E	16.18
N090°E	16.13	N270°E	16.13
N095°E	16.44	N275°E	16.44
N100°E	17.14	N280°E	17.14
N105°E	18.25	N285°E	18.25
N110°E	19.55	N290°E	19.55
N115°E	20.86	N295°E	20.86
N120°E	22.01	N300°E	22.01
N125°E	22.95	N305°E	22.95
N130°E	23.68	N310°E	23.68
N135°E	24.18	N315°E	24.18
N140°E	24.52	N320°E	24.52
N145°E	24.72	N325°E	24.72
N150°E	24.82	N330°E	24.82
N155°E	24.88	N335°E	24.88
N160°E	24.89	N340°E	24.89
N165°E	24.88	N345°E	24.88
N170°E	24.82	N350°E	24.82
N175°E	24.72	N355°E	24.72

MIMIMUM OF 16.13 dBk AT N50°E, N90°E, N230°E & N270°E

MAXIMA OF 24.89 dBk AT N160°E & N340°E

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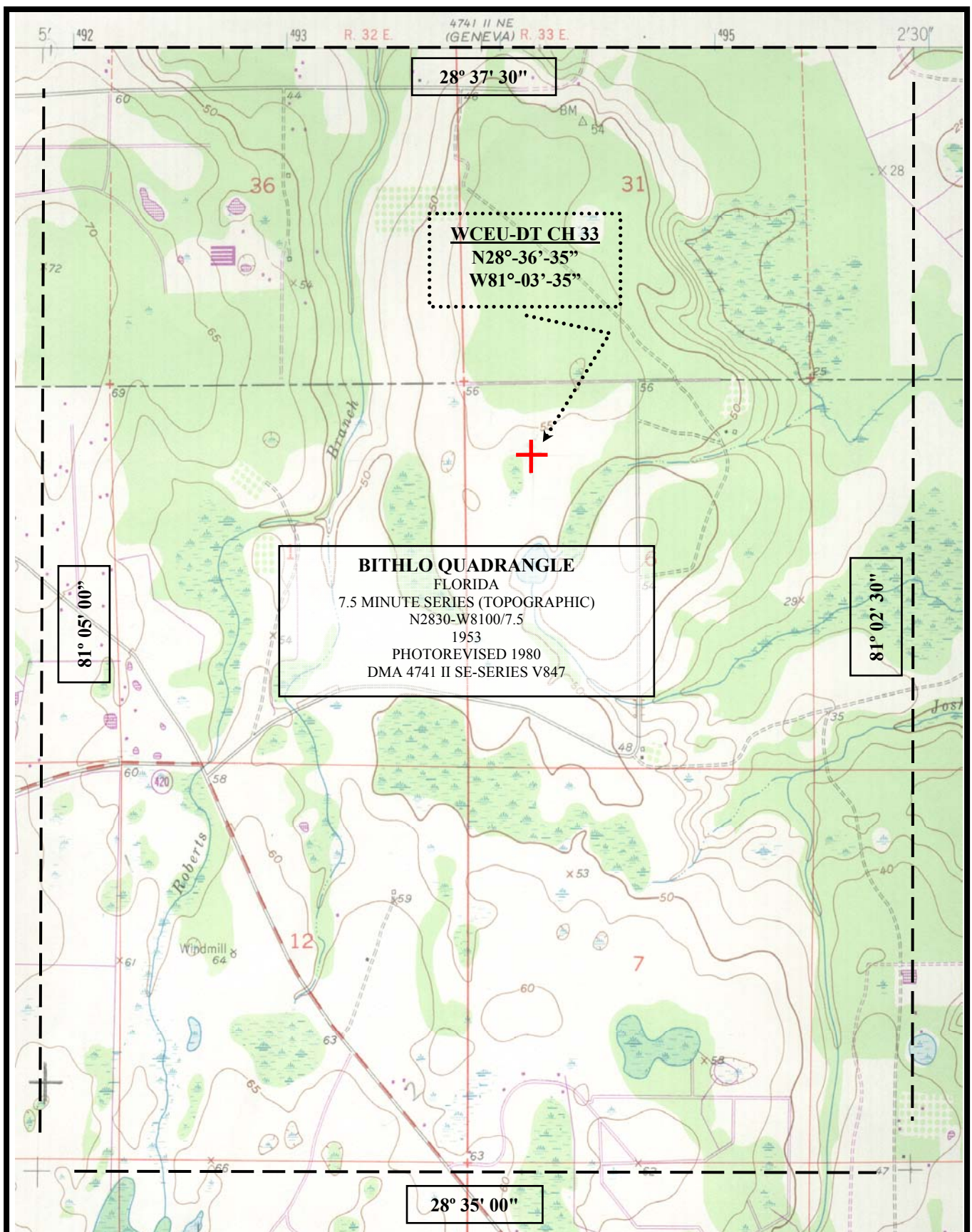
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EXHIBIT 10



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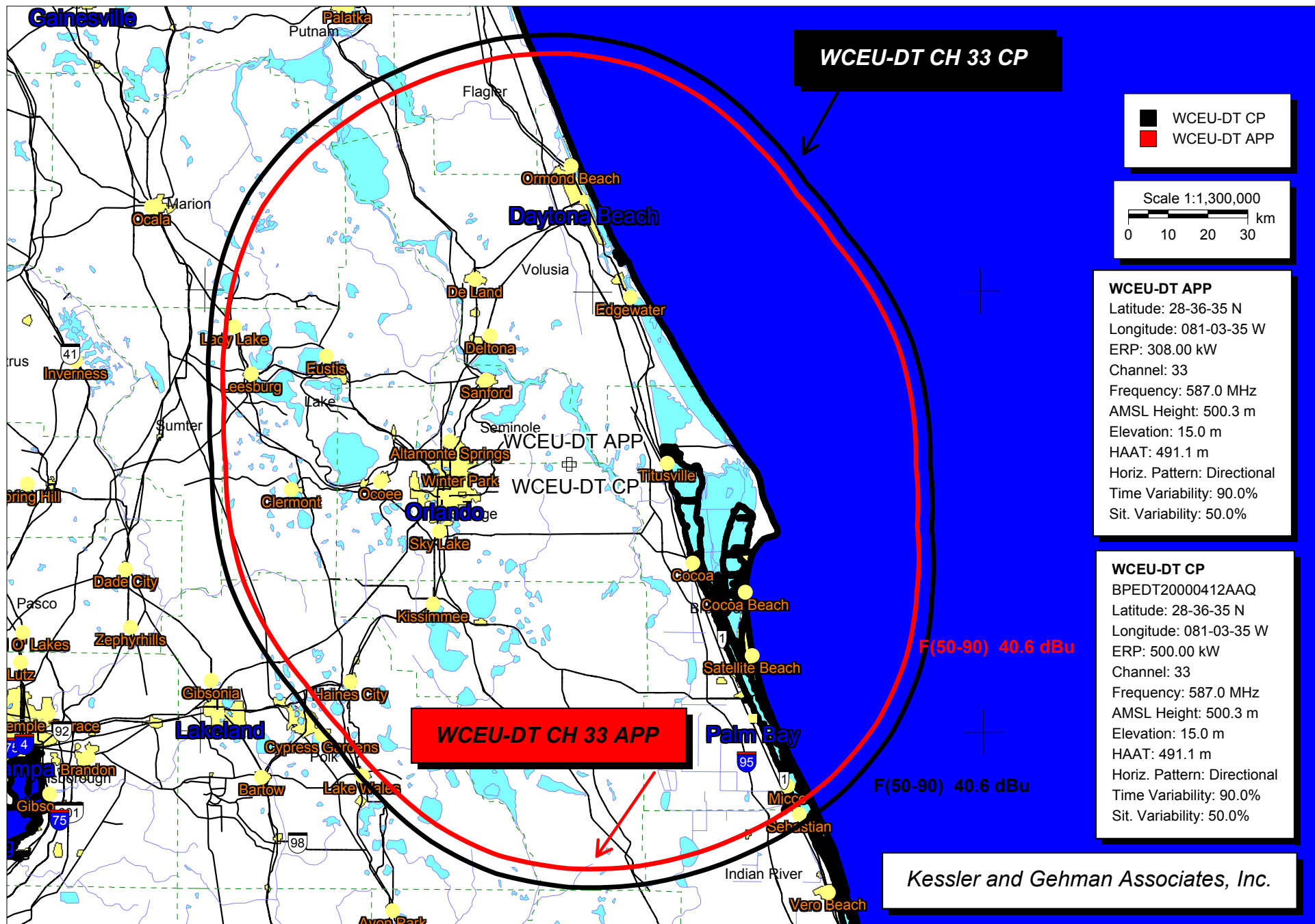
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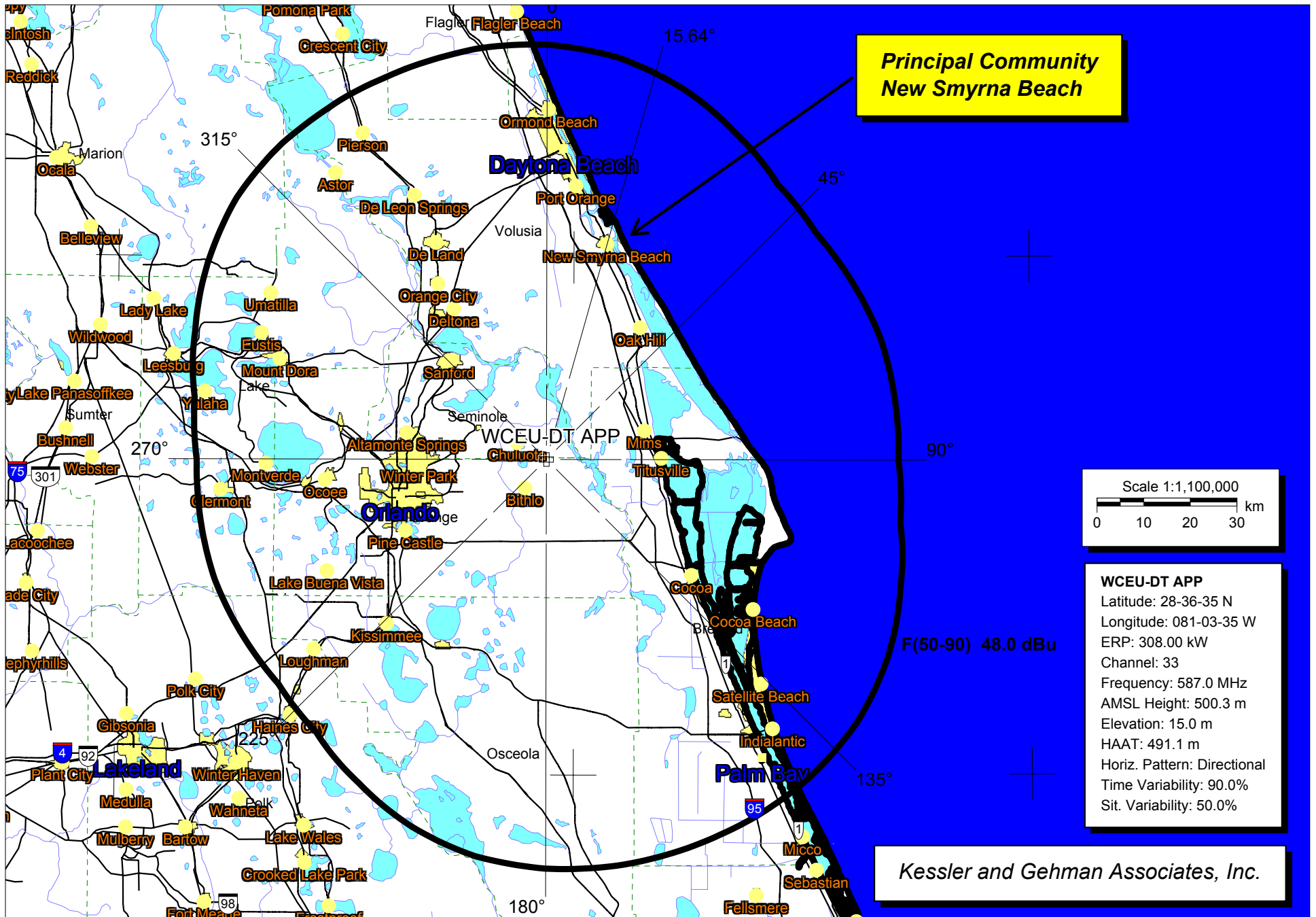
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EXHIBIT 11



WCEU-DT CH 33 CP vs WCEU-DT APP F(50,90) 40.6 dBuV/m NOISE LIMITED CONTOURS



WCEU-DT CH 33 (APP) F(50,90) 48.0 dBuV/m ENHANCED PRINCIPAL COMMUNITY CONTOUR