



SYSTEMS WITH RELIABILITY, LP

Broadcast Antenna & Transmission Systems

SYSTEM DATA SHEET

Call Letters	WMDT(DT)	*Main Top-Mount*
Customer	Warmus and Associates	
Contact	Al Warmus	
Location	Salisbury, MD	
Antenna Model	SWCDT16EC/29-EP	
Channel / Frequency	29 563 MHz	

ELECTRICAL SPECIFICATION

Polarization Type	Elliptical	
Polarization Ratio		
H-Pol. (PRH)	75.000	%
V-Pol. (PRV)	25.000	%
Elevation Directivity (ED)	17.271	
Azimuth Directivity (AD) H-Pol.	1.704	
Azimuth Directivity (AD) V-Pol.	1.704	
Antenna Gain (GH)		
H-Pol. (GH)	22.0707	
V-Pol. (GV)	7.3569	
dB Gain (AG)		
H-Pol. (AGH)	13.4382	dB
V-Pol. (AGV)	8.6669	dB
ERP		
H-Pol. (ERPH)	246.0000	kW
V-Pol. (ERPV)	82.000	kW
Beam Tilt	-0.75	Degrees
Null Fill	15,10,5	
Input Flange	6 1/8"	EIA 50Ω
Line Type	6 1/8" Rigid	50Ω EIA (Myat)
Attenuation per 100 ft.	0.115	dB/100ft
Line Length (LL) AGL+80'	1062.42	ft.
Total Line Attenuation	1.22	dB
Line Efficiency (LE)	75.48	%
Line Loss (LPL)	3.62	kW
Antenna Input Power (AIP)	11.15	kW
Req'd. Transmitter Output Power (TPO)	14.8	kW

MECHANICAL SPECIFICATION

No. Of Bays	16		
Antenna Aperture	26.21	ft.	7.99 m
Antenna Total Length	31.52	ft.	9.61 m
Center of Radiation AGL	997.42	ft.	304.00 m
Antenna Weight (approx.)	2250.00	lbs.	1022.73 kg
Windload (50/33)/ Ft^2 Sectional Area	1638.75	lbs. 50/33PSF	47.50 ft^2

Mechanical Specifications will be certified upon final construction and testing.

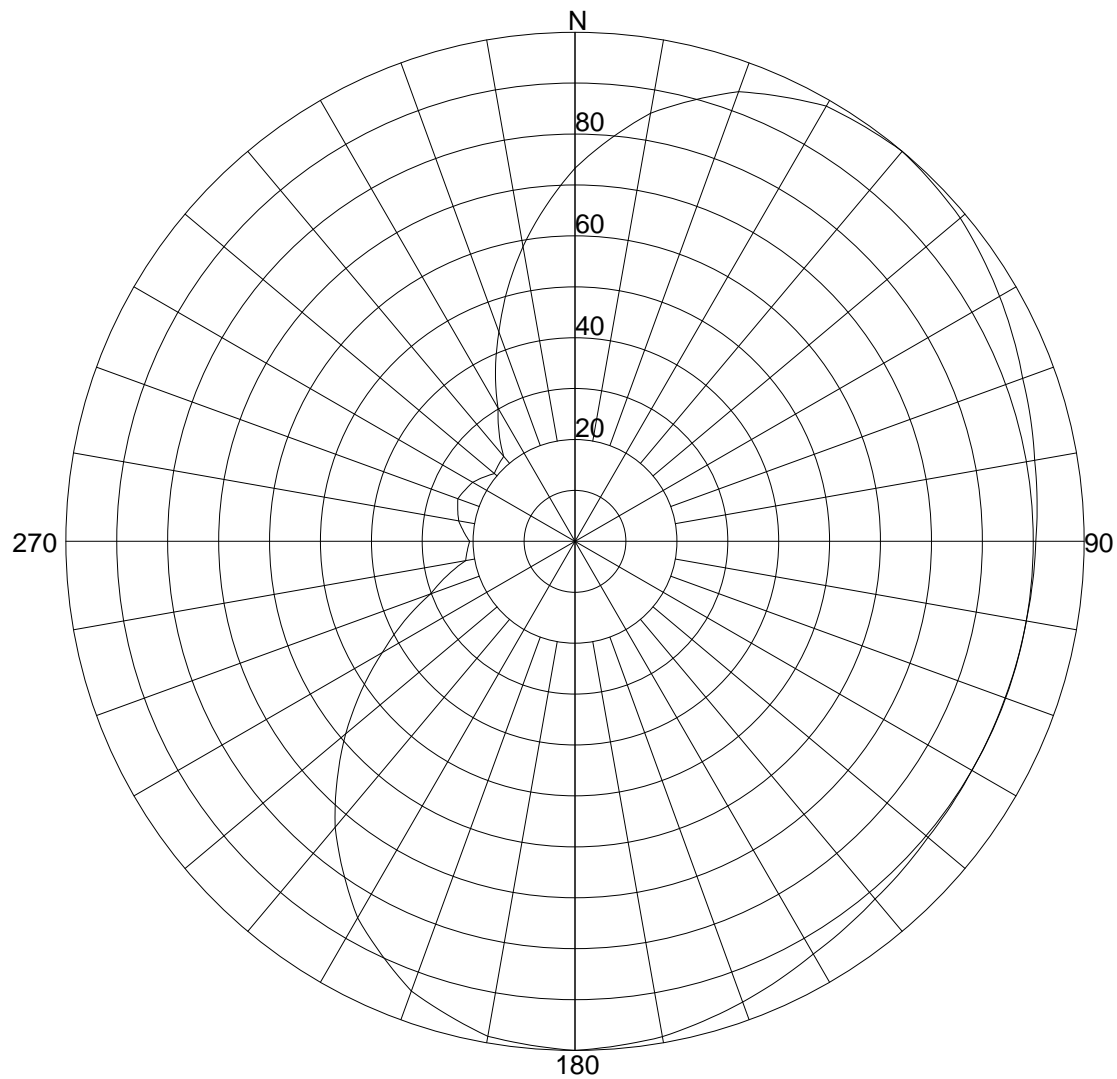
Note: Given values can be used for planning system.

Prepared by:

David K. Edmiston Jr.

David K. Edmiston Jr.
SWR LP Engineering

10/22/2019



Azimuth Pattern

Scale: Linear

Unit: Relative Field

Systems With Reliability

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: SWCDT16EC/29-EP

Main Top-Mount

FREQUENCY: 563 MHz

PATTERN POL.: Elliptical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.70387 / 2.31dB

PATTERN RMS: 0.766

Relative Field Tabulation(Azimuth)

Azimuth Heading	Normalized Field(dB)	Azimuth Heading	Normalized Field(dB)
0	.7330 (-2.7)	180	1.0000 (0)
5	.7935 (-2.01)	185	.9935 (-0.06)
10	.8540 (-1.37)	190	.9870 (-0.11)
15	.8970 (-0.94)	195	.9635 (-0.32)
20	.9400 (-0.54)	200	.9400 (-0.54)
25	.9635 (-0.32)	205	.8970 (-0.94)
30	.9870 (-0.11)	210	.8540 (-1.37)
35	.9935 (-0.06)	215	.7935 (-2.01)
40	1.0000 (0)	220	.7330 (-2.7)
45	.9940 (-0.05)	225	.6605 (-3.6)
50	.9880 (-0.1)	230	.5880 (-4.61)
55	.9755 (-0.22)	235	.5125 (-5.81)
60	.9630 (-0.33)	240	.4370 (-7.19)
65	.9495 (-0.45)	245	.3695 (-8.65)
70	.9360 (-0.57)	250	.3020 (-10.4)
75	.9265 (-0.66)	255	.2600 (-11.7)
80	.9170 (-0.75)	260	.2180 (-13.23)
85	.9110 (-0.81)	265	.2125 (-13.45)
90	.9050 (-0.87)	270	.2070 (-13.68)
95	.9025 (-0.89)	275	.2195 (-13.17)
100	.9000 (-0.92)	280	.2320 (-12.69)
105	.8995 (-0.92)	285	.2385 (-12.45)
110	.8990 (-0.92)	290	.2450 (-12.22)
115	.8995 (-0.92)	295	.2385 (-12.45)
120	.9000 (-0.92)	300	.2320 (-12.69)
125	.9025 (-0.89)	305	.2195 (-13.17)
130	.9050 (-0.87)	310	.2070 (-13.68)
135	.9110 (-0.81)	315	.2125 (-13.45)
140	.9170 (-0.75)	320	.2180 (-13.23)
145	.9265 (-0.66)	325	.2600 (-11.7)
150	.9360 (-0.57)	330	.3020 (-10.4)
155	.9495 (-0.45)	335	.3695 (-8.65)
160	.9630 (-0.33)	340	.4370 (-7.19)
165	.9755 (-0.22)	345	.5125 (-5.81)
170	.9880 (-0.1)	350	.5880 (-4.61)
175	.9940 (-0.05)	355	.6605 (-3.6)

Systems With Reliability

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: SWCDT16EC/29-EP

Main Top-Mount

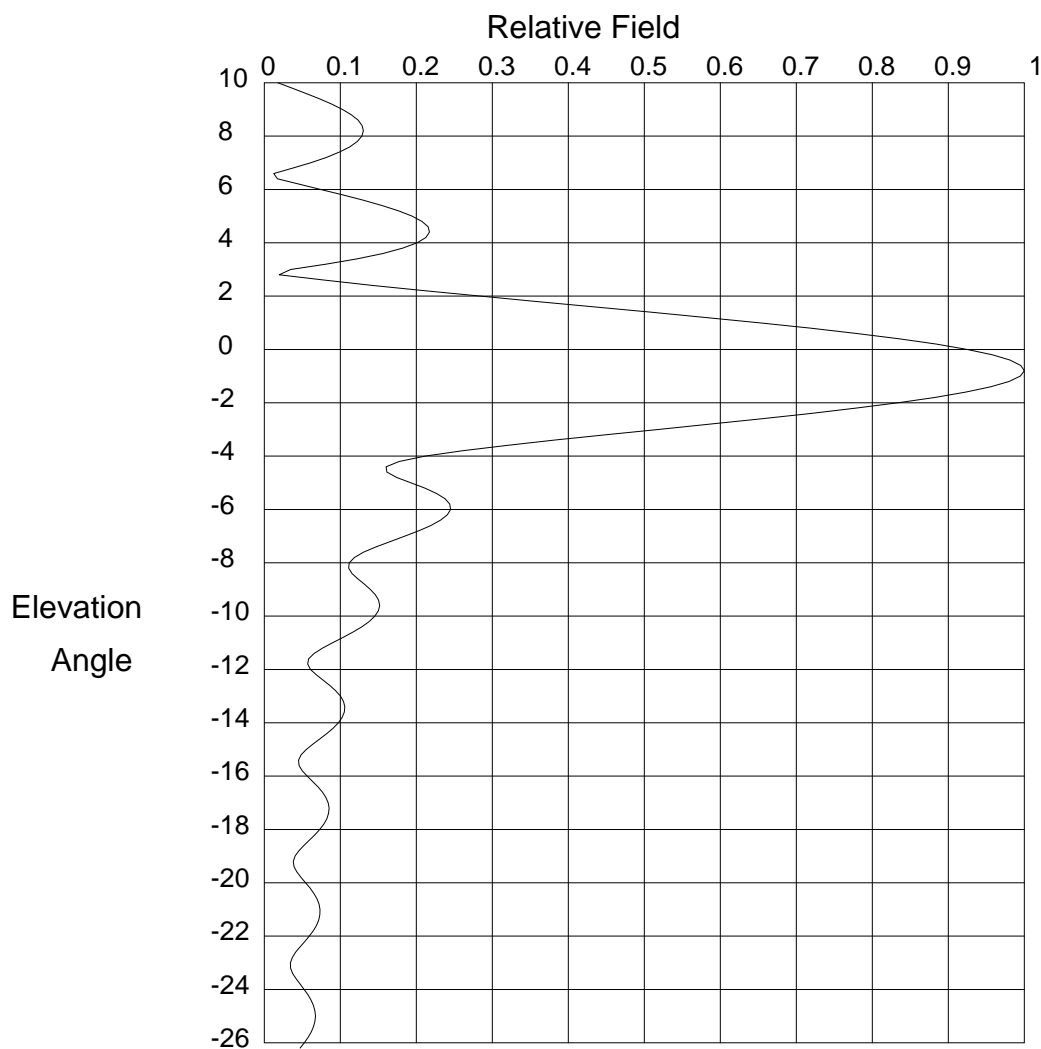
FREQUENCY: 563 MHz

PATTERN POL.: Elliptical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.70387 / 2.31dB

PATTERN RMS: 0.766



Elevation Pattern

Scale: Linear

Units: Field, Relative

Systems With Reliability

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: SWCDT16EC/29-EP

Main Top-Mount

FREQUENCY: 563 MHz

PATTERN POL.: Elliptical

DIRECTIVITY(Peak): 17.271/12.373 dBd

Beam Tilt (Deg.) : - .75

DIRECTIVITY(Horiz): 14.79/11.70 dBd

Null Fill(s)(%) : 15, 10, 5

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
90.0	.101 (-19.907)	52.0	.062 (-24.177)	14.0	.008 (-41.426)
89.0	.117 (-18.64)	51.0	.068 (-23.367)	13.0	.062 (-24.161)
88.0	.133 (-17.536)	50.0	.056 (-25.025)	12.0	.096 (-20.361)
87.0	.149 (-16.562)	49.0	.031 (-30.14)	11.0	.066 (-23.614)
86.0	.164 (-15.696)	48.0	.02 (-33.911)	10.0	.018 (-34.95)
85.0	.179 (-14.928)	47.0	.044 (-27.083)	9.8	.037 (-28.733)
84.0	.194 (-14.253)	46.0	.06 (-24.401)	9.6	.055 (-25.178)
83.0	.207 (-13.671)	45.0	.057 (-24.836)	9.4	.073 (-22.769)
82.0	.219 (-13.188)	44.0	.037 (-28.749)	9.2	.089 (-21.028)
81.0	.229 (-12.811)	43.0	.017 (-35.225)	9.0	.103 (-19.745)
80.0	.236 (-12.556)	42.0	.039 (-28.25)	8.8	.115 (-18.815)
79.0	.239 (-12.439)	41.0	.056 (-25.001)	8.6	.123 (-18.18)
78.0	.238 (-12.485)	40.0	.053 (-25.442)	8.4	.129 (-17.808)
77.0	.231 (-12.724)	39.0	.032 (-29.971)	8.2	.131 (-17.688)
76.0	.219 (-13.2)	38.0	.019 (-34.386)	8.0	.128 (-17.824)
75.0	.20 (-13.971)	37.0	.043 (-27.323)	7.8	.123 (-18.236)
74.0	.175 (-15.124)	36.0	.055 (-25.148)	7.6	.113 (-18.967)
73.0	.145 (-16.795)	35.0	.045 (-26.971)	7.4	.099 (-20.095)
72.0	.109 (-19.22)	34.0	.021 (-33.742)	7.2	.082 (-21.769)
71.0	.072 (-22.814)	33.0	.029 (-30.691)	7.0	.061 (-24.299)
70.0	.041 (-27.751)	32.0	.048 (-26.411)	6.8	.038 (-28.506)
69.0	.039 (-28.07)	31.0	.044 (-27.219)	6.6	.013 (-38.029)
68.0	.065 (-23.773)	30.0	.016 (-35.963)	6.4	.017 (-35.182)
67.0	.09 (-20.933)	29.0	.021 (-33.423)	6.2	.046 (-26.831)
66.0	.106 (-19.478)	28.0	.047 (-26.47)	6.0	.074 (-22.567)
65.0	.111 (-19.116)	27.0	.047 (-26.571)	5.8	.103 (-19.757)
64.0	.102 (-19.796)	26.0	.018 (-34.688)	5.6	.13 (-17.726)
63.0	.082 (-21.683)	25.0	.024 (-32.289)	5.4	.155 (-16.205)
62.0	.055 (-25.199)	24.0	.055 (-25.215)	5.2	.177 (-15.06)
61.0	.033 (-29.732)	23.0	.055 (-25.223)	5.0	.195 (-14.221)
60.0	.041 (-27.681)	22.0	.022 (-33.274)	4.8	.208 (-13.649)
59.0	.064 (-23.892)	21.0	.028 (-31.027)	4.6	.216 (-13.327)
58.0	.079 (-22.094)	20.0	.063 (-24.058)	4.4	.217 (-13.253)
57.0	.079 (-22.056)	19.0	.06 (-24.433)	4.2	.213 (-13.442)
56.0	.064 (-23.878)	18.0	.019 (-34.581)	4.0	.201 (-13.929)
55.0	.038 (-28.433)	17.0	.04 (-28.05)	3.8	.182 (-14.783)
54.0	.019 (-34.205)	16.0	.076 (-22.42)	3.6	.156 (-16.128)
53.0	.041 (-27.819)	15.0	.064 (-23.849)	3.4	.123 (-18.224)

Systems With Reliability

Page 1 of 3

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: *SWCDT16EC/29-EP*

Main Top-Mount

FREQUENCY: *563 MHz*

PATTERN POL.: *Elliptical*

DIRECTIVITY(Peak): *17.271/12.373 dBd*

Beam Tilt (Deg.) : *-.75*

DIRECTIVITY(Horiz): *14.79/11.70 dBd*

Null Fill(s)(%) : *15, 10, 5*

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.082 (-21.717)	-4.4	.16 (-15.893)	-12.0	.061 (-24.305)
3.0	.035 (-29.192)	-4.6	.161 (-15.846)	-12.2	.068 (-23.295)
2.8	.02 (-34.082)	-4.8	.174 (-15.167)	-12.4	.077 (-22.222)
2.6	.079 (-22.04)	-5.0	.193 (-14.298)	-12.6	.086 (-21.277)
2.4	.144 (-16.856)	-5.2	.211 (-13.505)	-12.8	.094 (-20.526)
2.2	.212 (-13.46)	-5.4	.227 (-12.886)	-13.0	.10 (-19.981)
2.0	.284 (-10.929)	-5.6	.238 (-12.467)	-13.2	.104 (-19.641)
1.8	.358 (-8.92)	-5.8	.244 (-12.246)	-13.4	.106 (-19.498)
1.6	.433 (-7.271)	-6.0	.245 (-12.214)	-13.6	.105 (-19.547)
1.4	.508 (-5.89)	-6.2	.241 (-12.363)	-13.8	.103 (-19.785)
1.2	.581 (-4.72)	-6.4	.232 (-12.687)	-14.0	.098 (-20.215)
1.0	.651 (-3.724)	-6.6	.219 (-13.18)	-14.2	.091 (-20.839)
.8	.718 (-2.877)	-6.8	.203 (-13.837)	-14.4	.083 (-21.663)
.6	.78 (-2.161)	-7.0	.185 (-14.649)	-14.6	.073 (-22.683)
.4	.836 (-1.561)	-7.2	.166 (-15.595)	-14.8	.064 (-23.874)
.2	.884 (-1.067)	-7.4	.147 (-16.627)	-15.0	.055 (-25.145)
.0	.925 (-0.673)	-7.6	.131 (-17.653)	-15.2	.049 (-26.279)
-.2	.958 (-0.373)	-7.8	.119 (-18.515)	-15.4	.045 (-26.914)
-.4	.981 (-0.162)	-8.0	.112 (-19.028)	-15.6	.046 (-26.779)
-.6	.996 (-0.039)	-8.2	.111 (-19.086)	-15.8	.05 (-26.003)
-.8	1.00 (0)	-8.4	.115 (-18.752)	-16.0	.057 (-24.956)
-1.0	.995 (-0.046)	-8.6	.123 (-18.204)	-16.2	.064 (-23.921)
-1.2	.98 (-0.176)	-8.8	.132 (-17.614)	-16.4	.071 (-23.03)
-1.4	.956 (-0.392)	-9.0	.14 (-17.092)	-16.6	.076 (-22.327)
-1.6	.923 (-0.696)	-9.2	.146 (-16.697)	-16.8	.081 (-21.821)
-1.8	.882 (-1.091)	-9.4	.15 (-16.454)	-17.0	.084 (-21.509)
-2.0	.834 (-1.581)	-9.6	.152 (-16.375)	-17.2	.085 (-21.384)
-2.2	.779 (-2.171)	-9.8	.15 (-16.467)	-17.4	.085 (-21.443)
-2.4	.719 (-2.869)	-10.0	.146 (-16.733)	-17.6	.082 (-21.684)
-2.6	.654 (-3.685)	-10.2	.138 (-17.181)	-17.8	.078 (-22.109)
-2.8	.587 (-4.628)	-10.4	.129 (-17.817)	-18.0	.073 (-22.721)
-3.0	.518 (-5.712)	-10.6	.117 (-18.651)	-18.2	.067 (-23.522)
-3.2	.449 (-6.952)	-10.8	.104 (-19.689)	-18.4	.06 (-24.506)
-3.4	.382 (-8.363)	-11.0	.09 (-20.922)	-18.6	.052 (-25.638)
-3.6	.318 (-9.95)	-11.2	.077 (-22.298)	-18.8	.046 (-26.817)
-3.8	.26 (-11.689)	-11.4	.066 (-23.655)	-19.0	.041 (-27.82)
-4.0	.212 (-13.473)	-11.6	.059 (-24.65)	-19.2	.038 (-28.316)
-4.2	.177 (-15.023)	-11.8	.057 (-24.881)	-19.4	.039 (-28.098)

Systems With Reliability

Page 2 of 3

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: *SWCDT16EC/29-EP*

Main Top-Mount

FREQUENCY: *563 MHz*

PATTERN POL.: *Elliptical*

DIRECTIVITY(Peak): *17.271/12.373 dBd*

Beam Tilt (Deg.) : *-.75*

DIRECTIVITY(Horiz): *14.79/11.70 dBd*

Null Fill(s)(%) : *15, 10, 5*

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
-19.6	.043 (-27.311)	-27.2	.032 (-29.909)	-54.0	.059 (-24.522)
-19.8	.048 (-26.286)	-27.4	.035 (-29.055)	-55.0	.049 (-26.241)
-20.0	.054 (-25.275)	-27.6	.04 (-27.946)	-56.0	.027 (-31.256)
-20.2	.06 (-24.396)	-27.8	.046 (-26.836)	-57.0	.014 (-37.199)
-20.4	.065 (-23.693)	-28.0	.051 (-25.847)	-58.0	.036 (-28.821)
-20.6	.069 (-23.176)	-28.2	.056 (-25.025)	-59.0	.058 (-24.731)
-20.8	.072 (-22.842)	-28.4	.06 (-24.378)	-60.0	.07 (-23.08)
-21.0	.073 (-22.687)	-28.6	.064 (-23.904)	-61.0	.07 (-23.037)
-21.2	.073 (-22.707)	-28.8	.066 (-23.597)	-62.0	.06 (-24.482)
-21.4	.072 (-22.902)	-29.0	.067 (-23.455)	-63.0	.041 (-27.75)
-21.6	.069 (-23.273)	-29.2	.067 (-23.477)	-64.0	.023 (-32.826)
-21.8	.064 (-23.822)	-29.4	.066 (-23.665)	-65.0	.028 (-30.919)
-22.0	.059 (-24.553)	-29.6	.063 (-24.03)	-66.0	.049 (-26.116)
-22.2	.053 (-25.458)	-29.8	.059 (-24.586)	-67.0	.068 (-23.3)
-22.4	.047 (-26.514)	-30.0	.054 (-25.359)	-68.0	.081 (-21.847)
-22.6	.042 (-27.638)	-31.0	.016 (-35.747)	-69.0	.085 (-21.365)
-22.8	.037 (-28.65)	-32.0	.027 (-31.279)	-70.0	.082 (-21.699)
-23.0	.034 (-29.254)	-33.0	.056 (-25.059)	-71.0	.072 (-22.835)
-23.2	.035 (-29.2)	-34.0	.057 (-24.866)	-72.0	.057 (-24.882)
-23.4	.037 (-28.535)	-35.0	.032 (-29.839)	-73.0	.04 (-28.039)
-23.6	.042 (-27.551)	-36.0	.006 (-43.751)	-74.0	.026 (-31.561)
-23.8	.047 (-26.517)	-37.0	.04 (-28.058)	-75.0	.03 (-30.514)
-24.0	.053 (-25.581)	-38.0	.054 (-25.375)	-76.0	.046 (-26.745)
-24.2	.058 (-24.802)	-39.0	.044 (-27.116)	-77.0	.064 (-23.836)
-24.4	.062 (-24.199)	-40.0	.016 (-35.78)	-78.0	.081 (-21.819)
-24.6	.065 (-23.772)	-41.0	.02 (-34.069)	-79.0	.095 (-20.428)
-24.8	.067 (-23.517)	-42.0	.045 (-26.917)	-80.0	.106 (-19.489)
-25.0	.067 (-23.432)	-43.0	.053 (-25.588)	-81.0	.114 (-18.894)
-25.2	.067 (-23.515)	-44.0	.04 (-27.984)	-82.0	.118 (-18.573)
-25.4	.065 (-23.766)	-45.0	.014 (-37.048)	-83.0	.119 (-18.482)
-25.6	.062 (-24.188)	-46.0	.022 (-33.228)	-84.0	.118 (-18.59)
-25.8	.058 (-24.787)	-47.0	.045 (-26.847)	-85.0	.114 (-18.88)
-26.0	.053 (-25.566)	-48.0	.055 (-25.258)	-86.0	.108 (-19.341)
-26.2	.047 (-26.518)	-49.0	.046 (-26.697)	-87.0	.10 (-19.973)
-26.4	.042 (-27.613)	-50.0	.024 (-32.265)	-88.0	.091 (-20.783)
-26.6	.037 (-28.751)	-51.0	.013 (-37.64)	-89.0	.081 (-21.789)
-26.8	.033 (-29.716)	-52.0	.038 (-28.498)	-90.0	.071 (-23.023)
-27.0	.031 (-30.174)	-53.0	.055 (-25.119)	90.0	.00 (-50)

Systems With Reliability

Page 3 of 3

CLIENT: *WMDT(DT) / Warmus and Associates*

Date: 10/17/2019

ANTENNA TYPE: *SWCDT16EC/29-EP*

Main Top-Mount

FREQUENCY: *563 MHz*

PATTERN POL.: *Elliptical*

DIRECTIVITY(Peak): *17.271/12.373 dBd*

Beam Tilt (Deg.) : *-.75*

DIRECTIVITY(Horiz): *14.79/11.70 dBd*

Null Fill(s)(%) : *15, 10, 5*