

ENGINEERING EXHIBIT
APPLICATION FOR MODIFICATION OF
CONSTRUCTION PERMIT
TELEVISION STATION WLYH-DT
LANCASTER, PENNSYLVANIA

June 21, 2001

CHANNEL 23 500 KW (MAX-DA) 381 M

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Engineering Statement

This Engineering Exhibit was prepared on behalf of digital television broadcast station WLYH-DT, Lancaster, Pennsylvania, in support of an application for modification of its construction permit (See FCC File No. BPCDT-19991027ACS). The purpose of this modification is to correct the effective radiated power (ERP) and antenna height above average terrain (HAAT). The antenna make and model have been revised to reflect a change in the manufacturer. But the antenna azimuthal pattern itself remains unchanged.

The proposed facility will operate with a maximum ERP of 500 kW and an antenna HAAT of 381 m. The previous application for WLYH-DT reflected these facilities in all respects except within the filed FCC Form 301, where the ERP was inadvertently indicated as 325 kW and the HAAT as 386 m. As previously demonstrated, the proposal meets all of the necessary interference protection requirements of the FCC Rules and Regulations.

Proposed Facilities

The proposed transmitting antenna will be side-mounted on the existing WLYH-TV transmission tower with a center of radiation at 280 m above ground level (548 m AMSL). The proposed facility will operate on Channel 23 with a maximum

directional average ERP of 500 kW and an antenna radiation center HAAT of 381 m. The proposal meets the maximum permissible ERP requirements pursuant to Section 73.622(f) of the FCC Rules.

Allocation Considerations

The proposed WLYH-DT Channel 23 facility meets the requirements of Section 73.623 of the FCC Rules concerning predicted interference to other existing NTSC facilities and DTV allotments and assignments. Longley-Rice interference analyses were conducted pursuant to the requirements of the FCC Rules; OET Bulletin No. 69; and published FCC guidelines for preparation of such interference analyses. The Longley-Rice interference analyses were conducted using the software developed by du Treil, Lundin & Rackley, Inc. based on the FCC published software routines.* Stations selected for analysis were determined pursuant to the distance requirements outlined in the FCC DTV Processing Guidelines Public Notice. Accordingly, co-channel DTV and NTSC stations within 429 km and 407 km, respectively, were examined for potential interference; and first-adjacent DTV and NTSC stations within 229 km and 207 km, respectively, were examined for potential interference. Analog taboo-related NTSC stations within 142 km were examined for potential interference. The results of the interference analyses for the proposed WLYH-DT facility are summarized herein at Figure 3. As indicated therein, the proposed facility will meet the 2%/10% criterion

* The duTreil, Lundin & Rackley, Inc. DTV interference analysis program is a precise implementation of the procedures outlined by the FCC in the Sixth Report and Order; subsequent Memorandum Opinion and Order; and FCC OET Bulletin No. 69. A nominal grid size resolution of 2 km was employed.

outlined in the FCC Rules and published guidelines with respect to all considered stations.[†]

There is prohibited contour overlap of the proposed WLYH-DT facility with respect to an application for Class A station WAZF-CA, Front Royal, Virginia (Channel 23, 7.7 kW (max-DA), 306 m AMSL). However, a Longley-Rice interference analysis prepared according to FCC OET Bulletin No. 69 indicates that there will be no interference to WAZF-CA from the proposed WLYH-DT facility. This is detailed in Figure 3. Therefore, the proposed facility complies with Section 73.623(c)(5) of the FCC Rules. A waiver of the contour protection requirements is requested to the extent necessary to provide for use of the Longley-Rice interference analysis methods pursuant to Section 73.623(c)(5)(iii) of the FCC Rules.

Environmental Considerations

With respect to the potential for human exposure to radio frequency (RF) radiation, calculations prepared in accordance with FCC Bulletin OET-65 (Edition 97-01) indicate that the proposal will not result in human exposure to RF radiation at ground level in excess of FCC standards. Power density calculations were conducted at 2-m above ground[‡] based on the following conservative assumptions, with the following results:

[†] Interference analysis results reflect the net change in interference to a given station considering the interference predicted to occur from all other stations (i.e. “masking”) including the allotment facility for WLYH-DT. This properly reflects the net interference change for determining compliance with the FCC DTV2%/10% *de minimis* standard.

[‡] The antenna radiation center height above ground is 280 m for WLYH-DT.

Call Sign	Channel	Peak Visual ERP or Average ERP (kW)	Aural ERP (kW)	Relative Field Factor[§]	FCC Limit^{**} (mW/cm²)	Percentage of Limit
WLYH-DT	23	500	--	0.20	0.351	2.46%

As indicated above, the RF radiation at 2-m above ground level from the proposed WLYH-DT facility will not exceed 2.46% of the FCC limit for general population / uncontrolled exposure. Therefore, the proposal complies with the FCC limits for human exposure to RF radiation and it is categorically excluded from environmental processing. The applicant, in coordination with other users of the transmission facility, shall reduce power or cease operation as necessary to protect persons having access to the WLYH-DT tower or antenna from radio frequency radiation in excess of the FCC guidelines.

Louis Robert du Treil, Jr.

June 21, 2001

§ This is a conservative estimate of the relative field factor in the downward direction.

** for general population/uncontrolled environments

Figure 1

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Tabulation of Average Elevations and
Distances to Predicted Coverage Contours

Azimuth (deg.T)	3-16 km Average Terrain (m)	Antenna HAAT (m)	ERP (kW)	48 dBu f(50,90) Contour (km)	41 dBu f(50,90) Contour (km)
0	157	391	425.0	85.7	97.6
15	162	386	320.8	83.4	95.0
30	163	385	231.2	81.1	92.5
45	164	384	156.8	78.5	89.6
60	175	373	78.8	73.1	83.9
75	184	364	37.0	67.8	78.0
90	237	311	29.0	63.3	72.1
105	217	331	37.0	65.8	75.2
120	176	372	78.8	73.0	83.8
135	152	396	156.8	79.3	90.3
150	147	401	231.2	82.2	93.5
165	156	392	320.8	83.9	95.4
180	157	391	425.0	85.7	97.6
195	145	403	489.1	87.4	99.7
210	154	394	490.0	86.9	99.0
225	176	372	443.7	84.6	96.6
240	152	396	427.8	86.0	98.0
255	177	371	469.5	84.9	97.0
270	171	377	500.0	85.8	98.0
285	143	405	470.5	87.2	99.4
300	146	402	427.8	86.4	98.4
315	133	415	443.7	87.4	99.7
330	142	406	490.0	87.5	99.9
345	150	398	489.1	87.1	99.3

Note: The 3-16-km average terrain is 167 m based on the eight conventional radials (0°, 45°, 90°, etc.). The overall antenna radiation center height above average terrain is 381 m based on the eight conventional radials.

Figure 2



PREDICTED COVERAGE CONTOURS

TELEVISION STATION WLYH-DT
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du Treil, Lundin & Rackley, Inc. Sarasota, Florida

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Summary of Allocation Analysis

Stations Potentially Affected by Proposed Station							
Facility Number	Channel	Call	City State	Distance (km)	Status	Application Prefix	Application Reference Number
1	15	WLYH-TV	LANCASTER PA	0	LIC	BLCT	19791019KK
2	15	WLYH-TV	LEBANON PA	0.1	CP	BPCT	19980611KE
3	16	WNEP-TV	SCRANTON PA	113.8	LIC	BLCT	2623
4	21	WHP-TV	HARRISBURG PA	35.5	LIC	BLCT	2171
5	22	WMPT	ANNAPOLIS MD	139.7	APP	BPET	20000503ABO
6	22	WNJS-DT	CAMDEN NJ	150.2	APP	BPEDT	20000425AAI
7	22	WNJS-DT	CAMDEN NJ	150.2	PLN	DTVPLN	DTVP0468
8	22	WNJS-DT	CAMDEN NJ	150.2	MAX	DTVPLN	DTVP0468
9	22	WYOU	SCRANTON PA	113.7	LIC	BLCT	19861015KF

Stations Potentially Affected by Proposed Station							
Facility Number	Channel	Call	City State	Distance (km)	Status	Application Prefix	Application Reference Number
10	22	WYOU	SCRANTON PA	113.7	CP	BPCT	19960711KE
11	23	WNJS	CAMDEN NJ	150.2	LIC	BLET	19860630KO
12	23	WXXA-TV	ALBANY NY	331.9	LIC	BLCT	19820810KG
13	23	WNEQ-TV	BUFFALO NY	369.1	LIC	BLET	19870520KE
14	23	WHSI-DT	SMITHTOWN NY	304.4	APP	BPCDT	19991028ADR
15	23	WHSI-DT	SMITHTOWN NY	304.4	PLN	DTVPLN	DTVP0507
16	23	WHSI-DT	SMITHTOWN NY	304.4	MAX	DTVPLN	DTVP0507
17	23	WATM-TV	ALTOONA PA	170.9	LIC	BLCT	19990311KG
18	23	WCVE-TV	RICHMOND VA	321.1	LIC	BLET	19940816KE
19	24	WUTB	BALTIMORE MD	111.3	LIC	BLCT	19860103KG
20	24	NEW	VINELAND NJ	150.2	APP	BPRM	20000717AEV
21	24	WNYE-DT	NEW YORK NY	216.3	APP	BPEDT	19991110AAQ
22	24	WNYE-DT	NEW YORK NY	216.3	PLN	DTVPLN	DTVP0545
23	24	WNYE-DT	NEW YORK NY	216.3	MAX	DTVPLN	DTVP0545
24	24	WATM-DT	ALTOONA PA	170.9	APP	BPCDT	19991101AGQ
25	24	WATM-DT	ALTOONA PA	170.9	PLN	DTVPLN	DTVP0548

Stations Potentially Affected by Proposed Station							
Facility Number	Channel	Call	City State	Distance (km)	Status	Application Prefix	Application Reference Number
26	24	WATM-DT	ALTOONA PA	170.9	MAX	DTVPLN	DTVP0548
27	27	WHTM-TV	HARRISBURG PA	41.7	LIC	BLCT	19960626KF
28	23	WAZF-CA	FRONT ROYAL VA	188.1	APP	BMJPTTA	20010507ABJ

Summary of Interference Analysis for Worst-Case Scenarios							
Facility Number	Interference Population Before Analysis	Interference Population After Analysis	Baseline Population	Net Change in Interference	Percent of Baseline	Permissible Percent of Baseline	Result
1	--	--	--	--	0.00	--	pass
2	--	--	--	--	0.00	--	pass
3	--	--	--	--	0.00	--	pass
4	158101	159677	2025679	1,576	0.08	2.0	pass
5	--	--	--	--	0.00	--	pass
6	--	--	--	--	0.00	--	pass
7	--	--	--	--	0.00	--	pass
8	--	--	--	--	0.00	--	pass
9	136322	136631	2355837	309	0.01	2.0	pass
10	174767	175183	2355837	416	0.02	2.0	pass
11	242154	213921	6120065	-28,233	-0.46	--	pass

Summary of Interference Analysis for Worst-Case Scenarios							
Facility Number	Interference Population Before Analysis	Interference Population After Analysis	Baseline Population	Net Change in Interference	Percent of Baseline	Permissible Percent of Baseline	Result
12	--	--	--	--	0.00	--	pass
13	--	--	--	--	0.00	--	pass
14	--	--	--	--	0.00	--	pass
15	--	--	--	--	0.00	--	pass
16	--	--	--	--	0.00	--	pass
17	23231	28698	384720	5,467	1.42	2.0	pass
18	1658	3159	1108667	1,501	0.14	2.0	pass
19	466532	470806	5877388	4,274	0.07	2.0	pass
20	--	--	--	--	0.00	--	pass
21	--	--	--	--	0.00	--	pass
22	--	--	--	--	0.00	--	pass
23	--	--	--	--	0.00	--	pass
24	34932	34945	384720	13	0.00	2.0	pass
25	--	--	--	--	0.00	--	pass
26	--	--	--	--	0.00	--	pass
27	--	--	--	--	0.00	--	pass
28	--	--	--	--	0.00	--	pass

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Transmitting Antenna Manufacturer's
Azimuthal Plane and Vertical Plane Pattern Data

(three pages follow)



Exhibit No.

Date
Call Letters
Location
Customer
Antenna Type

21 Jun 2001

Channel

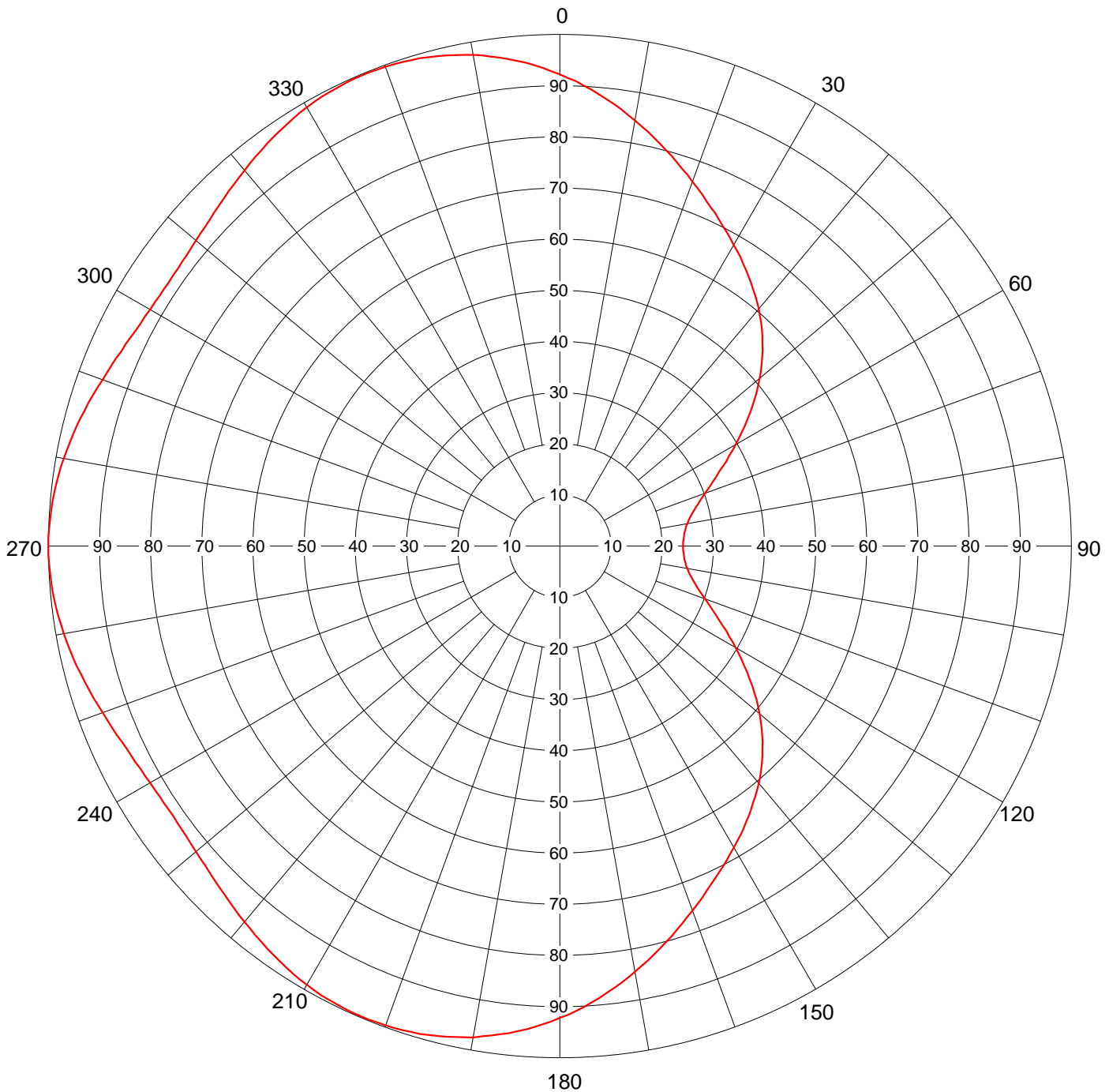
AZIMUTH PATTERN

RMS Gain at Main Lobe
Calculated / Measured

1.56 (1.93 dB)
Calculated

Frequency
Drawing #

MHz
CH23_W



Remarks:

Date **21 Jun 2001**

Call Letters

Channel

Location

Customer

Antenna Type

TABULATION OF AZIMUTH PATTERNAzimuth Pattern Drawing # **CH23_W**

Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
0	0.922	45	0.560	90	0.241	135	0.560	180	0.922	225	0.942	270	1.000	315	0.942
1	0.915	46	0.551	91	0.241	136	0.570	181	0.929	226	0.939	271	1.000	316	0.945
2	0.909	47	0.541	92	0.241	137	0.579	182	0.935	227	0.936	272	0.999	317	0.949
3	0.901	48	0.531	93	0.242	138	0.588	183	0.941	228	0.933	273	0.998	318	0.952
4	0.894	49	0.521	94	0.243	139	0.597	184	0.947	229	0.931	274	0.997	319	0.955
5	0.886	50	0.510	95	0.244	140	0.605	185	0.952	230	0.929	275	0.996	320	0.959
6	0.878	51	0.499	96	0.245	141	0.613	186	0.957	231	0.927	276	0.994	321	0.963
7	0.870	52	0.488	97	0.247	142	0.621	187	0.961	232	0.925	277	0.992	322	0.966
8	0.862	53	0.477	98	0.248	143	0.628	188	0.966	233	0.924	278	0.990	323	0.969
9	0.853	54	0.465	99	0.250	144	0.636	189	0.970	234	0.923	279	0.988	324	0.973
10	0.845	55	0.454	100	0.253	145	0.644	190	0.975	235	0.922	280	0.985	325	0.976
11	0.836	56	0.442	101	0.256	146	0.651	191	0.978	236	0.922	281	0.982	326	0.979
12	0.828	57	0.431	102	0.259	147	0.659	192	0.981	237	0.923	282	0.979	327	0.982
13	0.819	58	0.419	103	0.263	148	0.666	193	0.984	238	0.923	283	0.976	328	0.985
14	0.810	59	0.408	104	0.267	149	0.673	194	0.987	239	0.924	284	0.973	329	0.988
15	0.801	60	0.397	105	0.272	150	0.680	195	0.989	240	0.925	285	0.970	330	0.990
16	0.793	61	0.386	106	0.277	151	0.687	196	0.992	241	0.927	286	0.966	331	0.992
17	0.784	62	0.375	107	0.282	152	0.695	197	0.993	242	0.928	287	0.963	332	0.994
18	0.775	63	0.365	108	0.288	153	0.703	198	0.995	243	0.931	288	0.959	333	0.995
19	0.767	64	0.354	109	0.295	154	0.710	199	0.996	244	0.933	289	0.955	334	0.996
20	0.758	65	0.344	110	0.302	155	0.717	200	0.997	245	0.935	290	0.951	335	0.997
21	0.750	66	0.335	111	0.310	156	0.725	201	0.997	246	0.938	291	0.948	336	0.998
22	0.742	67	0.326	112	0.318	157	0.733	202	0.998	247	0.942	292	0.945	337	0.998
23	0.733	68	0.318	113	0.326	158	0.742	203	0.998	248	0.945	293	0.942	338	0.998
24	0.725	69	0.310	114	0.335	159	0.750	204	0.998	249	0.948	294	0.938	339	0.997
25	0.718	70	0.302	115	0.344	160	0.758	205	0.997	250	0.951	295	0.936	340	0.997
26	0.710	71	0.295	116	0.354	161	0.766	206	0.996	251	0.955	296	0.933	341	0.996
27	0.702	72	0.288	117	0.365	162	0.775	207	0.995	252	0.959	297	0.930	342	0.995
28	0.695	73	0.283	118	0.375	163	0.784	208	0.994	253	0.962	298	0.928	343	0.993
29	0.688	74	0.277	119	0.386	164	0.793	209	0.992	254	0.966	299	0.927	344	0.992
30	0.680	75	0.272	120	0.397	165	0.801	210	0.990	255	0.969	300	0.925	345	0.989
31	0.673	76	0.267	121	0.408	166	0.810	211	0.988	256	0.973	301	0.924	346	0.987
32	0.666	77	0.263	122	0.419	167	0.819	212	0.985	257	0.976	302	0.923	347	0.984
33	0.658	78	0.259	123	0.430	168	0.828	213	0.982	258	0.979	303	0.923	348	0.981
34	0.651	79	0.256	124	0.442	169	0.836	214	0.979	259	0.982	304	0.922	349	0.978
35	0.643	80	0.253	125	0.453	170	0.845	215	0.976	260	0.985	305	0.923	350	0.975
36	0.636	81	0.250	126	0.465	171	0.854	216	0.973	261	0.987	306	0.923	351	0.971
37	0.628	82	0.248	127	0.476	172	0.862	217	0.969	262	0.990	307	0.924	352	0.966
38	0.621	83	0.247	128	0.488	173	0.870	218	0.966	263	0.992	308	0.925	353	0.962
39	0.613	84	0.245	129	0.499	174	0.878	219	0.962	264	0.994	309	0.927	354	0.957
40	0.605	85	0.244	130	0.510	175	0.886	220	0.959	265	0.996	310	0.929	355	0.952
41	0.596	86	0.243	131	0.520	176	0.894	221	0.956	266	0.997	311	0.931	356	0.947
42	0.588	87	0.242	132	0.531	177	0.902	222	0.952	267	0.998	312	0.933	357	0.941
43	0.579	88	0.241	133	0.541	178	0.909	223	0.949	268	0.999	313	0.936	358	0.935
44	0.570	89	0.241	134	0.551	179	0.916	224	0.945	269	1.000	314	0.939	359	0.928

Remarks:



Date
Call Letters
Location
Customer
Antenna Type

21 Jun 2001

Channel

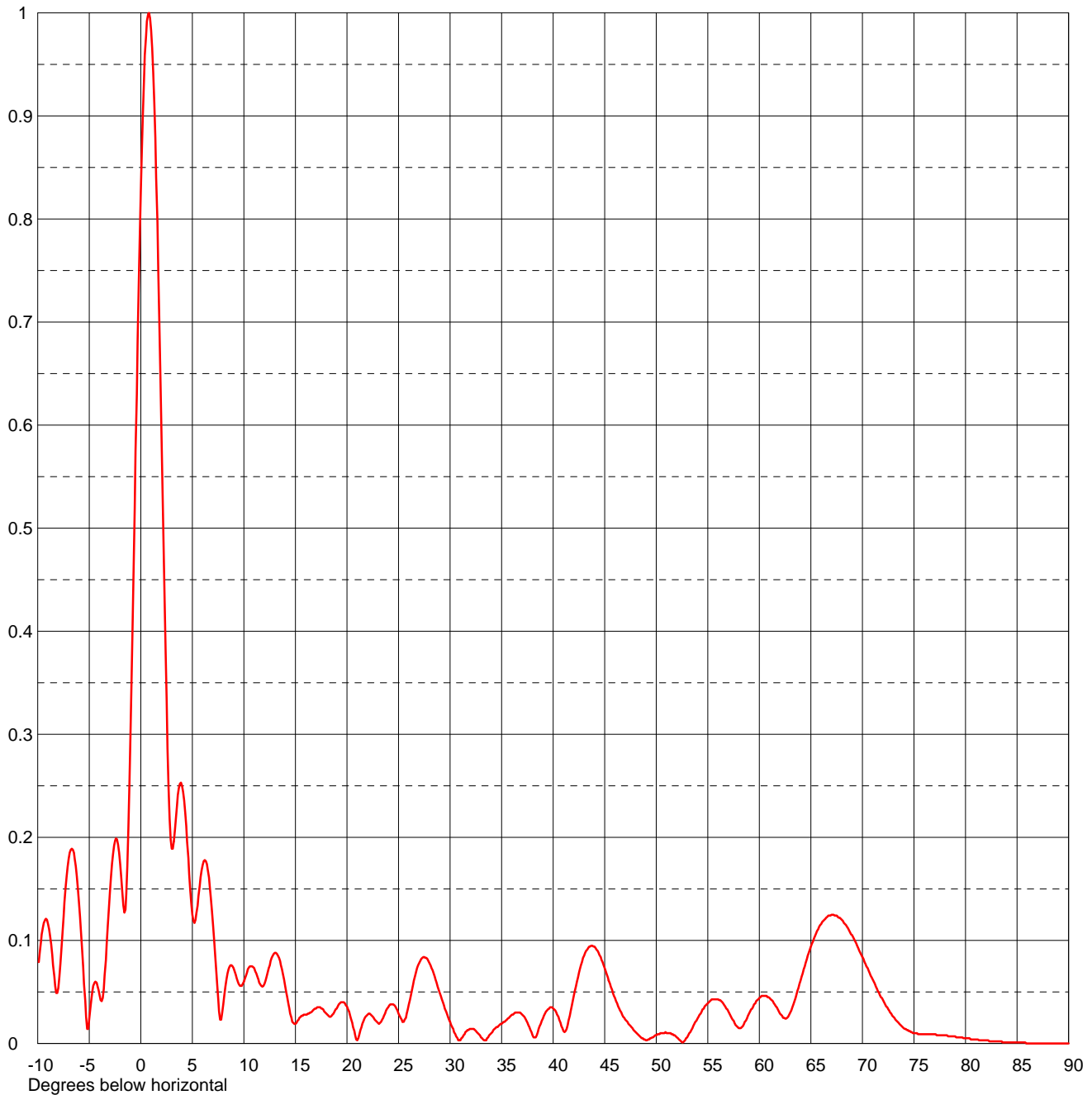
ELEVATION PATTERN

RMS Gain at Main Lobe
RMS Gain at Horizontal
Calculated / Measured

24.0 (13.80 dB)
16.4 (12.15 dB)
Calculated

Beam Tilt
Frequency
Drawing #

0.75 Degrees
MHz
24D240075-90



Remarks: