

ENGINEERING EXHIBIT

Incentive Auction Channel Reassignment

Application for Digital Television Station Auxiliary Antenna Construction Permit

prepared for

WVTM Hearst Television Inc.

WVTM-TV Birmingham, AL

Facility ID 74173

Ch. 7 67 kW 365 m

WVTM Hearst Television Inc. ("Hearst") is the licensee of digital television station WVTM-TV, Facility ID 74173, Birmingham AL. Reassignment of WVTM-TV from Channel 13 to Channel 7 was specified in the *Incentive Auction Closing and Channel Reassignment Public Notice* (DA 17-317, released April 13, 2017). A Construction Permit ("CP", file# 0000034568) authorizes construction of the WVTM-TV post-auction facility on Channel 7. *Hearst* herein seeks authorization for an auxiliary antenna for WVTM-TV on its post-auction Channel 7. The initial operation on reassignment Channel 7 will commence with the auxiliary antenna proposed herein, in order to accommodate tower work including removal of the existing Channel 13 main antenna and installation of the post-auction Channel 7 main antenna.

The reassignment CP authorizes WVTM-TV to operate with a nondirectional antenna at 47.6 kW effective radiated power (ERP) and 400 meters height above average terrain (HAAT). The proposed auxiliary antenna will be installed on the same tower structure as the authorized main antenna and will operate on Channel 7 at 67 kW ERP (directional) and an antenna HAAT of 365 meters.

The WVTM-TV tower structure is associated with FCC Antenna Structure Registration number 1036003. No change to the overall structure height will result from this proposal.

The proposed antenna is a horizontally polarized directional Dielectric model TLS-V8BB. The directional antenna's azimuthal and elevation patterns are depicted in Figures 1 and 2, respectively.

Figure 3 shows that the 36 dBμ noise limited service contour of the proposed auxiliary facility does not extend beyond that of the authorized main facility. Thus, the proposal complies with §73.1675(a).

Human Exposure to Radiofrequency Electromagnetic Field (Environmental)

The proposed operation was evaluated for human exposure to RF energy using the procedures outlined in the FCC's OET Bulletin Number 65. Based on OET-65 equation (10), and considering 20 percent antenna relative field in downward elevations (pattern data shows less than 20 percent relative field at angles 20 to 90 degrees below the antenna), the calculated signal density near the tower at two meters above ground level attributable to the proposed facility is $1.3 \mu\text{W}/\text{cm}^2$, which is 0.6 percent of the general population/uncontrolled maximum permitted exposure limit. This is well below the five percent threshold limit described in §1.1307(b) regarding sites with multiple emitters, categorically excluding the applicant from responsibility for taking any corrective action in the areas where the proposal's contribution is less than five percent.

The general public will not be exposed to RF levels attributable to the proposal in excess of the FCC's guidelines. RF exposure warning signs will continue to be posted. With respect to worker safety, the applicant will coordinate exposure procedures with all pertinent stations and will reduce power or cease operation as necessary to protect persons having access to the site, tower, or antenna from RF electromagnetic field exposure in excess of FCC guidelines. This exhibit is limited to the evaluation of exposure to RF electromagnetic field.

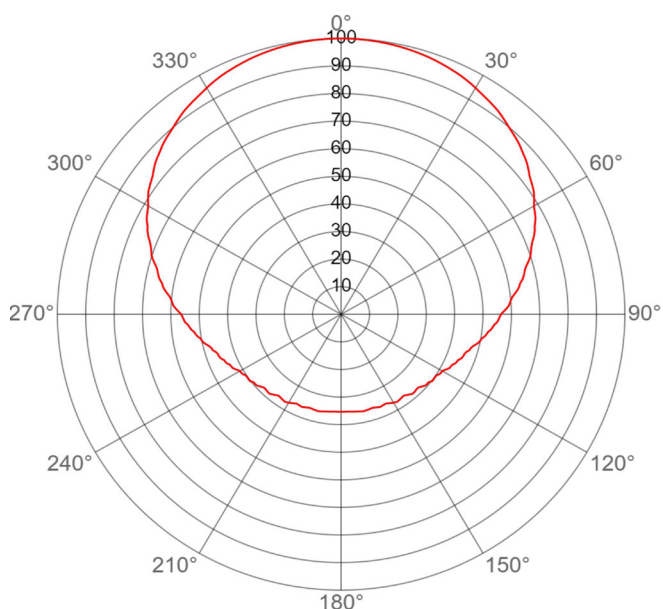
List of Attachments

Figure 1	Antenna Azimuthal Pattern
Figure 2	Antenna Elevation Pattern
Figure 3	Proposed Auxiliary Contours

Chesapeake RF Consultants, LLC

Joseph M. Davis, P.E.	March 26, 2020
207 Old Dominion Road	Yorktown, VA 23692

703-650-9600



Horizontal Polarization AZIMUTH PATTERN

Exhibit No.
Date **26 Feb 2020**
Call Letters **WVTM-TV**
Channel **7**
Antenna Type **TLS-V8BB**
Location **Birmingham AL**
Customer **Hearst TV**

Gain **2.2 (3.42 dB)**
Calculated
Drawing # **TLSV8-H**

Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value	Deg	Value
0	1.000	36	0.925	72	0.703	108	0.459	144	0.369	180	0.353	216	0.369	252	0.459	288	0.703	324	0.925
1	1.000	37	0.921	73	0.696	109	0.457	145	0.370	181	0.353	217	0.369	253	0.463	289	0.708	325	0.929
2	1.000	38	0.916	74	0.686	110	0.456	146	0.371	182	0.353	218	0.372	254	0.471	290	0.714	326	0.932
3	1.000	39	0.911	75	0.676	111	0.451	147	0.373	183	0.354	219	0.375	255	0.473	291	0.721	327	0.936
4	0.999	40	0.906	76	0.668	112	0.444	148	0.374	184	0.354	220	0.379	256	0.479	292	0.730	328	0.939
5	0.999	41	0.900	77	0.663	113	0.443	149	0.372	185	0.354	221	0.382	257	0.487	293	0.740	329	0.943
6	0.998	42	0.896	78	0.657	114	0.439	150	0.370	186	0.355	222	0.383	258	0.495	294	0.747	330	0.948
7	0.997	43	0.891	79	0.650	115	0.433	151	0.367	187	0.355	223	0.382	259	0.500	295	0.753	331	0.952
8	0.997	44	0.887	80	0.640	116	0.431	152	0.365	188	0.356	224	0.381	260	0.504	296	0.761	332	0.956
9	0.996	45	0.882	81	0.635	117	0.429	153	0.362	189	0.357	225	0.380	261	0.512	297	0.769	333	0.959
10	0.995	46	0.877	82	0.627	118	0.423	154	0.360	190	0.358	226	0.381	262	0.518	298	0.774	334	0.962
11	0.993	47	0.871	83	0.617	119	0.417	155	0.360	191	0.359	227	0.385	263	0.522	299	0.780	335	0.965
12	0.992	48	0.865	84	0.607	120	0.411	156	0.361	192	0.360	228	0.389	264	0.531	300	0.785	336	0.968
13	0.991	49	0.861	85	0.601	121	0.411	157	0.362	193	0.360	229	0.393	265	0.536	301	0.794	337	0.970
14	0.989	50	0.855	86	0.596	122	0.409	158	0.363	194	0.359	230	0.395	266	0.541	302	0.802	338	0.973
15	0.988	51	0.847	87	0.592	123	0.404	159	0.361	195	0.359	231	0.394	267	0.551	303	0.810	339	0.975
16	0.986	52	0.840	88	0.583	124	0.402	160	0.359	196	0.358	232	0.397	268	0.555	304	0.816	340	0.978
17	0.984	53	0.832	89	0.573	125	0.402	161	0.358	197	0.357	233	0.402	269	0.559	305	0.822	341	0.980
18	0.982	54	0.827	90	0.563	126	0.402	162	0.356	198	0.356	234	0.402	270	0.563	306	0.827	342	0.982
19	0.980	55	0.822	91	0.559	127	0.402	163	0.357	199	0.358	235	0.402	271	0.573	307	0.832	343	0.984
20	0.978	56	0.816	92	0.555	128	0.397	164	0.358	200	0.359	236	0.402	272	0.583	308	0.840	344	0.986
21	0.975	57	0.810	93	0.551	129	0.394	165	0.359	201	0.361	237	0.404	273	0.592	309	0.847	345	0.988
22	0.973	58	0.802	94	0.541	130	0.395	166	0.359	202	0.363	238	0.409	274	0.596	310	0.855	346	0.989
23	0.970	59	0.794	95	0.536	131	0.393	167	0.360	203	0.362	239	0.411	275	0.601	311	0.861	347	0.991
24	0.968	60	0.785	96	0.531	132	0.389	168	0.360	204	0.361	240	0.411	276	0.607	312	0.865	348	0.992
25	0.965	61	0.780	97	0.522	133	0.385	169	0.359	205	0.360	241	0.417	277	0.617	313	0.871	349	0.993
26	0.962	62	0.774	98	0.518	134	0.381	170	0.358	206	0.360	242	0.423	278	0.627	314	0.877	350	0.995
27	0.959	63	0.769	99	0.512	135	0.380	171	0.357	207	0.362	243	0.429	279	0.635	315	0.882	351	0.996
28	0.956	64	0.761	100	0.504	136	0.381	172	0.356	208	0.365	244	0.431	280	0.640	316	0.887	352	0.997
29	0.952	65	0.753	101	0.500	137	0.382	173	0.355	209	0.367	245	0.433	281	0.650	317	0.891	353	0.997
30	0.948	66	0.747	102	0.495	138	0.383	174	0.355	210	0.370	246	0.439	282	0.657	318	0.896	354	0.998
31	0.943	67	0.740	103	0.487	139	0.382	175	0.354	211	0.372	247	0.443	283	0.663	319	0.900	355	0.999
32	0.939	68	0.730	104	0.479	140	0.379	176	0.354	212	0.374	248	0.444	284	0.668	320	0.906	356	0.999
33	0.936	69	0.721	105	0.473	141	0.375	177	0.354	213	0.373	249	0.451	285	0.676	321	0.911	357	1.000
34	0.932	70	0.714	106	0.471	142	0.372	178	0.353	214	0.371	250	0.456	286	0.686	322	0.916	358	1.000
35	0.929	71	0.708	107	0.463	143	0.369	179	0.353	215	0.370	251	0.457	287	0.696	323	0.921	359	1.000



Figure 1
Auxiliary Antenna Azimuthal Pattern
WVTM-TV Birmingham, AL
Facility ID 74173
Ch. 7 67 kW 365 m

prepared for
WVTM Hearst Television Inc.

March, 2020

ELEVATION PATTERN

Exhibit No.

Date **26 Feb 2020**

Call Letters **WVTM-TV**

Channel **7**

Antenna Type **TLS-V8BB**

Location **Birmingham AL**

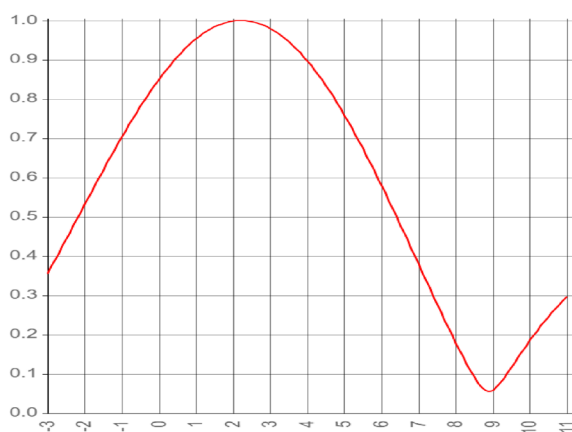
Customer **Hearst TV**

Future fill is available!

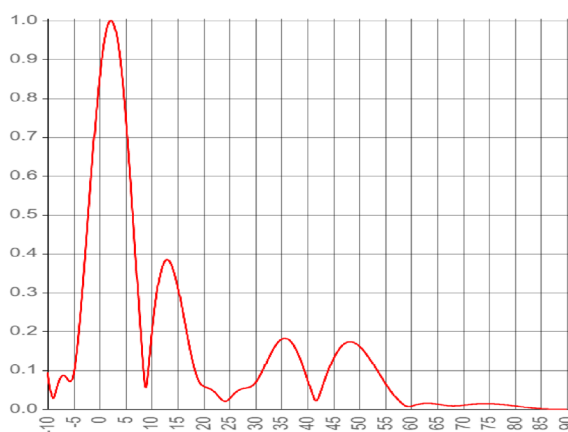
RMS Gain at Main Lobe **7.9 (8.98 dB)**

RMS Gain at Horizontal **5.7 (7.56 dB)**
Calculated

Beam Tilt **2.2 Degrees**

Drawing # **08T079220**


Degrees below horizontal



Degrees below horizontal

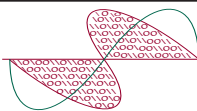
Angle	Field	Angle	Field	Angle	Field	Angle	Field	Angle	Field
-10	0.095	10	0.185	30	0.068	50	0.162	70	0.010
-9	0.028	11	0.297	31	0.089	51	0.148	71	0.012
-8	0.066	12	0.363	32	0.116	52	0.130	72	0.013
-7	0.087	13	0.385	33	0.144	53	0.109	73	0.014
-6	0.075	14	0.366	34	0.166	54	0.088	74	0.014
-5	0.091	15	0.318	35	0.179	55	0.067	75	0.014
-4	0.198	16	0.252	36	0.181	56	0.048	76	0.014
-3	0.355	17	0.182	37	0.171	57	0.031	77	0.013
-2	0.530	18	0.120	38	0.149	58	0.017	78	0.011
-1	0.703	19	0.077	39	0.117	59	0.008	79	0.010
0	0.850	20	0.059	40	0.079	60	0.007	80	0.008
1	0.953	21	0.054	41	0.038	61	0.011	81	0.007
2	0.999	22	0.046	42	0.026	62	0.014	82	0.005
3	0.980	23	0.032	43	0.061	63	0.015	83	0.004
4	0.897	24	0.021	44	0.098	64	0.015	84	0.002
5	0.760	25	0.027	45	0.129	65	0.013	85	0.001
6	0.581	26	0.041	46	0.152	66	0.011	86	0.001
7	0.380	27	0.050	47	0.167	67	0.009	87	0.000
8	0.180	28	0.054	48	0.173	68	0.008	88	0.000
9	0.058	29	0.057	49	0.171	69	0.009	89	0.000



Figure 2
Auxiliary Antenna Elevation Pattern
WVTM-TV Birmingham, AL
Facility ID 74173
Ch. 7 67 kW 365 m

prepared for
WVTM Hearst Television Inc.

March, 2020



Chesapeake RF Consultants, LLC
Radiofrequency Consulting Engineers
Digital Television and Radio

Figure 3
Proposed Auxiliary Contours
WVTM-TV Birmingham, AL
Facility ID 74173
Ch. 7 67 kW 365 m

prepared for
WVTM Hearst Television Inc.

March, 2020

Proposed Auxiliary Ch. 7
67 kW 365 m directional
43 dBu
(Principal Community)
36 dBu
(Noise Limited Service Contour)

Authorized Ch. 7
File# 0000034568
47.6 kW 400 m nondirectional
36 dBu Contour

