

Technical Report W249AH Minor Modification

This technical report is submitted for a minor modification to W249AH at Johnson City, TN, FCC file no. BLFT-20190423AAR. Changes in antenna and tower site coordinate correction are submitted. The facility will continue to serve as a fill-in facility for WKTP(AM) 1590 kHz at Jonesborough, TN, facility I.D. 27498.

W249AH Modification Analysis:

An overlap study in exhibit E-1 shows the W249AH modification is within the W247CH and W251CJ second adjacent protected contours. A tabulation of the +40 146.3 F(50-10) dBu contour within W247CH (exhibit E-2) using the vertical pattern of the Scala CL-FM antenna (exhibit E-3) shows the interfering contour will not reach any buildings, roads or population (exhibit E-4). The +40 F(50-10) dBu contour within the co-located W251CJ second adjacent protected contour = 0. Based on this showing, a waiver of Section 74.1204 is requested, in accordance with *Living Way Ministries, Inc.* (FCC 08-242). The 60 dBu contour overlaps the current W249AH 60 dBu contour and is contained within the 40 kilometer radius of the WKTP(AM) daytime tower site (exhibit E-5).

Antenna System:

The W249AH modification is located on the 68.8 meter tower, ASR 1054538 at corrected coordinates:

36 25 53.0N 082 08 15.0W NAD 83.

A Scala CL-FM single bay, directional antenna rotated at a 270 degree azimuth and 45 degree slant (exhibit E-6) is to be mounted at a COR AGL of 28 meters, 1300 meters

AMSL, 645 meters HAAT (exhibit E-7) and will operate at 0.250 kW ERP.

RF Exposure Calculation:

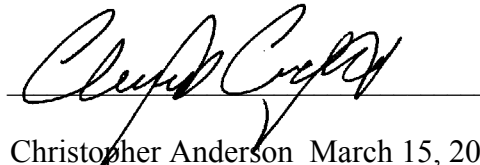
The RF contribution was calculated using the formula from the OET Bulletin 65:

$$S \text{ (RF in microwatts/cm}^2\text{)} = \frac{33.4 \times F^2 \times (H \text{ ERP} + V \text{ ERP in watts})}{R^2 \text{ (height of radiation center in meters}^2\text{)}}$$

Using the vertical (F) factor of 0.360 at 45 degrees, the RF is calculated to be 3.2 $\mu\text{W/cm}^2$ to the ground, which is below 5% of the 200 $\mu\text{W/cm}^2$ maximum permissible for general public exposure allowing exclusion from consideration.

Conclusion:

It is concluded that the W249AH modification complies with all Commission rules and policies.



Christopher Anderson March 15, 2021
andersce@bham.rr.com
© 2021 Anderson Associates

E-1 W249AH Mod. Overlap Study

REFERENCE 36 25 53.00 N. 82 08 15.00 W.		CH# 249D - 97.7 MHz, Pwr= 0.25 kW DA, HAAT= 645.0 M, COR= 1300 M Average Protected F(50-50)= 33.59 km Standard Directional								DISPLAY DATES DATA 03-15-21 SEARCH 03-15-21	
CH CITY	CALL	TYPE STATE	ANT	AZI <--	DIST FILE #	LAT LNG	PWR(kW) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
247D Kingsport	W247CH	CP DCN TN		44.5 224.5	0.44 BPFT20190201ABJ	36 26 03.30 82 08 02.40	0.250	0.9 1328	31.4 Appalachian Educational Co	-3.6*	-31.0*
247D Kingsport	W247CH	LIC DCN TN		44.5 224.5	0.44 BLFT20161114ADP	36 26 03.30 82 08 02.40	0.250	0.9 1328	31.4 Appalachian Educational Co	-3.6*	-31.0*(1)
249D Johnson City	W249AH	LIC DVN TN		0.0 134.8	0.00 BLFT20190423AAR	36 25 53.40 82 08 15.50	0.250	1300	---Reference---		
249C3 Richlands	WRI C-FM	LIC NCN VA		14.8 194.9	82.80 BLH20070509AAM	37 09 04.40 81 53 55.40	3.200 229	91.4 922	35.1 Rr & Wt Broadcasting, Inc.	-22.6*	25.7
251D Bristol	W251CJ	LIC DCN TN		0.0 134.8	0.00 BLFT20190729ABK	36 25 53.40 82 08 15.50	0.250	0.3 1298	16.1 Holston Valley Broadcastin	-3.4*	-16.2*(2)
249D Asheville	W249AR	LIC _CN NC		207.4 27.1	105.26 BLFT20000811AAU	35 35 23.30 82 40 25.40	0.100 358	70.4 1089	22.1 Entercom License, LLC	9.7	11.0
250L1 Greeneville	WOFB-LP	LIC _CN TN		244.3 63.9	67.05 BLL20160616ABU	36 10 03.30 82 48 37.50	0.029 55	493	26.5 Our Father's Business, Inc		11.0
248C Knoxville	WJXB-FM	LIC _CN TN		254.3 73.2	167.66 BLH19890928KC	36 00 36.20 83 55 56.60	100.000 395	118.0 706	79.8 Midwest Communications, In	13.2	33.3
247C North Wilkesboro	WKBC-FM	LIC DEN NC		113.3 293.9	98.71 BLH19970711KA	36 04 34.50 81 07 42.30	100.000 403	11.7 803	81.5 Wilkes Broadcasting Compan	84.0	17.1
250C Concord	WPEG	LIC DEN NC		143.0 323.6	148.17 BMLH20121024AAF	35 21 44.50 81 09 18.30	95.000 491	111.5 727	73.3 Beasley Media Group Licens	29.1	67.9
250C3 Hyden	WZQQ	LIC _CN KY		312.6 132.0	125.93 BLH20111223AAD	37 11 36.30 83 11 03.60	2.000 346	57.4 748	39.3 Leslie County Broadcasting	35.1	38.9
248D Neon	W248DI	LIC DCN KY		324.9 144.5	92.58 BLFT20180709AAB	37 06 39.00 82 44 19.00	0.200	15.6 1031	11.5 Sunshine Media Group, LLC	46.9	36.1
251C Galax	WBRF	LIC DEN VA		82.7 263.5	118.31 BLH19910423KA	36 33 34.40 80 49 24.20	100.000 535	9.2 1149	69.4 Blue Ridge Radio, Inc.	106.2	47.9

Terrain database is GLOBE 30 Sec , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
In & Out distances between contours are shown at closest points. Reference zone= East Zone, Co to 3rd adjacent.
All separation margins (if shown) include rounding.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
***affixed to 'IN' or 'OUT' values = site inside restricted contour.

- (1) The +40 146.3 F(50-10) dBu contour within the W247CH second-adjacent protected contour (exhibit E-2) lowest point = 26.2 meters above the site and does not reach any population, buildings or roads (exhibit E-4).
- (2) The +40 F(50-10) dBu contour within the co-located W251CJ second-adjacent protected contour = 0.

E-2 W249AH Mod. +40 F(50-10) dBu Calculation Within W247CH

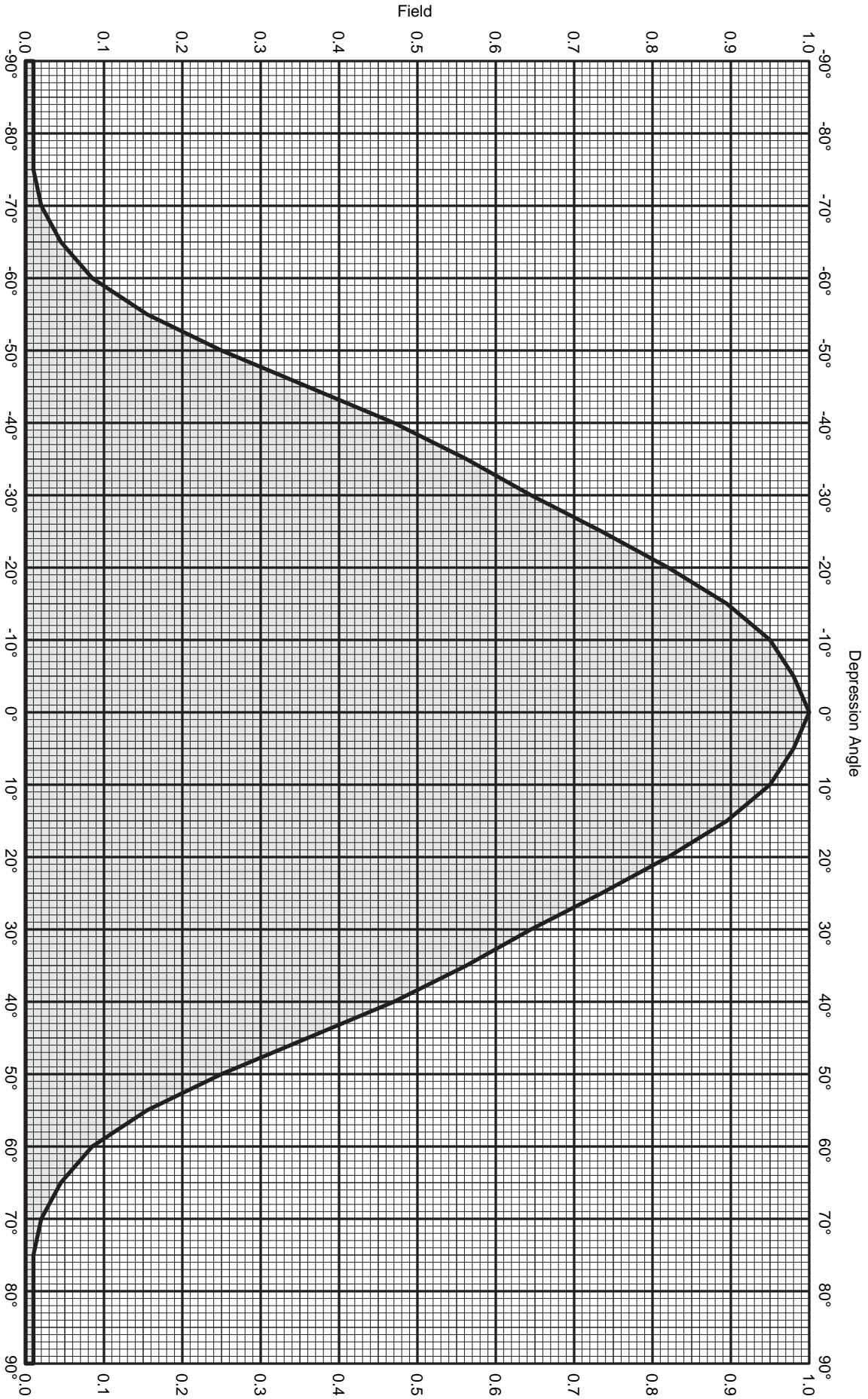
W249AH Johnson City, TN, Showing Protection to W247CH, Channel: 247
Geographic Coordinates: N. 362553.00 W. 820815.00
74.1204(d) Study - Using GLOBE 30 SEC Terrain Database
Translator or LPFM Maximum Licensed ERP = 0.25 kW, Channel: 249
Translator or LPFM Antenna Height AG = 28 meters
W249AH Antenna Model = SCALA CLFMV-1

Protected Station's Contour = 106.2721 dBu
Translator's or LPFM's full Interference contour 146.2721

Review Azimuth = 270 Degrees True
Horizontal Relative Field at Review Azimuth = 1.000
Translator/LPFM ERP on the horizontal at Review Azimuth = 0.25 kW
Distance between stations = 0.4 km
Protected Station= W247CH, .25 kW, 1328 M meters COR AMSL

Depression Angle From Degree(Deg)	Vertical Relative Field	Horizontal Relative Field	ERP (kw)	Dist to IX Contour Along Dep. Angle(m)	Dist to IX Contour From Tower Base(m)	Height IX Above Ground (m)
00.00	1.0	1.0	0.2500	005.3872	005.3872	028.000
05.00	0.98	1.0	0.2401	005.2795	005.2594	027.540
10.00	0.95	1.0	0.2256	005.1179	005.0401	027.111
15.00	0.895	1.0	0.2003	004.8216	004.6573	026.752
20.00	0.82	1.0	0.1681	004.4175	004.1511	026.489
25.00	0.735	1.0	0.1351	003.9596	003.5886	026.327
30.00	0.645	1.0	0.1040	003.4748	003.0092	026.263
35.00	0.562	1.0	0.0790	003.0276	002.4801	026.263
40.00	0.47	1.0	0.0552	002.5320	001.9396	026.372
45.00	0.36	1.0	0.0324	001.9394	001.3714	026.629
50.00	0.25	1.0	0.0156	001.3468	000.8657	026.968
55.00	0.155	1.0	0.0060	000.8350	000.4789	027.316
60.00	0.085	1.0	0.0018	000.4579	000.2290	027.603
65.00	0.045	1.0	0.0005	000.2424	000.1025	027.780
70.00	0.02	1.0	0.0001	000.1077	000.0369	027.899
75.00	0.01	1.0	0.0000	000.0539	000.0139	027.948
80.00	0.01	1.0	0.0000	000.0539	000.0094	027.947
85.00	0.01	1.0	0.0000	000.0539	000.0047	027.946
90.00	0.01	1.0	0.0000	000.0539	000.0000	027.946

E-3 W249AH Mod. Antenna Vertical Elevation Pattern and Tabulation



CL-FM Log-periodic

FM

7.0 dBd (9.15 dBi)

Vertical polarization



KATHREIN
SCALA DIVISION

Post Office Box 4580
Medford, OR 97501 (USA)
Phone: (541) 779-6500
Fax: (541) 779-3991
<http://www.kathrein-scala.com>



CL-FM Log-periodic
FM

7.0 dBd (9.15 dBi)

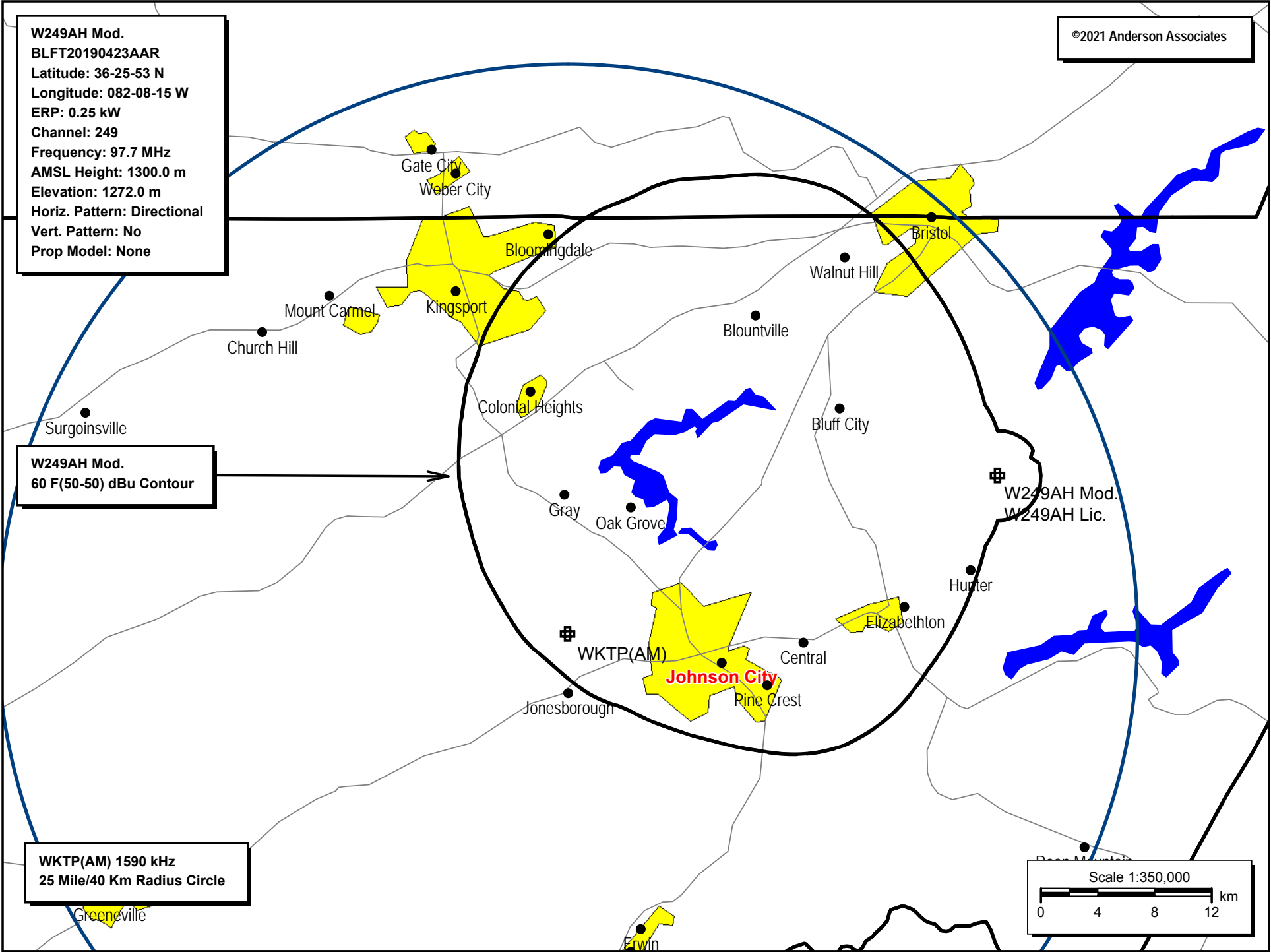
Vertical polarization

Vertical radiation pattern

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
-90	0.010	-40.00	-33.00	0.00	-45	0.360	-8.87	-1.87	0.65
-89	0.010	-40.00	-33.00	0.00	-44	0.382	-8.36	-1.36	0.73
-88	0.010	-40.00	-33.00	0.00	-43	0.404	-7.87	-0.87	0.82
-87	0.010	-40.00	-33.00	0.00	-42	0.426	-7.41	-0.41	0.91
-86	0.010	-40.00	-33.00	0.00	-41	0.448	-6.97	0.03	1.01
-85	0.010	-40.00	-33.00	0.00	-40	0.470	-6.56	0.44	1.11
-84	0.010	-40.00	-33.00	0.00	-39	0.488	-6.22	0.78	1.20
-83	0.010	-40.00	-33.00	0.00	-38	0.507	-5.90	1.10	1.29
-82	0.010	-40.00	-33.00	0.00	-37	0.525	-5.59	1.41	1.38
-81	0.010	-40.00	-33.00	0.00	-36	0.544	-5.29	1.71	1.48
-80	0.010	-40.00	-33.00	0.00	-35	0.562	-5.00	2.00	1.59
-79	0.010	-40.00	-33.00	0.00	-34	0.579	-4.75	2.25	1.68
-78	0.010	-40.00	-33.00	0.00	-33	0.595	-4.50	2.50	1.78
-77	0.010	-40.00	-33.00	0.00	-32	0.612	-4.26	2.74	1.88
-76	0.010	-40.00	-33.00	0.00	-31	0.628	-4.03	2.97	1.98
-75	0.010	-40.00	-33.00	0.00	-30	0.645	-3.81	3.19	2.09
-74	0.012	-38.42	-31.42	0.00	-29	0.663	-3.57	3.43	2.20
-73	0.014	-37.08	-30.08	0.00	-28	0.681	-3.34	3.66	2.32
-72	0.016	-35.92	-28.92	0.00	-27	0.699	-3.11	3.89	2.45
-71	0.018	-34.89	-27.89	0.00	-26	0.717	-2.89	4.11	2.58
-70	0.020	-33.98	-26.98	0.00	-25	0.735	-2.67	4.33	2.71
-69	0.025	-32.04	-25.04	0.00	-24	0.752	-2.48	4.52	2.83
-68	0.030	-30.46	-23.46	0.00	-23	0.769	-2.28	4.72	2.96
-67	0.035	-29.12	-22.12	0.01	-22	0.786	-2.09	4.91	3.10
-66	0.040	-27.96	-20.96	0.01	-21	0.803	-1.91	5.09	3.23
-65	0.045	-26.94	-19.94	0.01	-20	0.820	-1.72	5.28	3.37
-64	0.053	-25.51	-18.51	0.01	-19	0.835	-1.57	5.43	3.49
-63	0.061	-24.29	-17.29	0.02	-18	0.850	-1.41	5.59	3.62
-62	0.069	-23.22	-16.22	0.02	-17	0.865	-1.26	5.74	3.75
-61	0.077	-22.27	-15.27	0.03	-16	0.880	-1.11	5.89	3.88
-60	0.085	-21.41	-14.41	0.04	-15	0.895	-0.96	6.04	4.01
-59	0.099	-20.09	-13.09	0.05	-14	0.906	-0.86	6.14	4.11
-58	0.113	-18.94	-11.94	0.06	-13	0.917	-0.75	6.25	4.21
-57	0.127	-17.92	-10.92	0.08	-12	0.928	-0.65	6.35	4.32
-56	0.141	-17.02	-10.02	0.10	-11	0.939	-0.55	6.45	4.42
-55	0.155	-16.19	-9.19	0.12	-10	0.950	-0.45	6.55	4.52
-54	0.174	-15.19	-8.19	0.15	-9	0.956	-0.39	6.61	4.58
-53	0.193	-14.29	-7.29	0.19	-8	0.962	-0.34	6.66	4.64
-52	0.212	-13.47	-6.47	0.23	-7	0.968	-0.28	6.72	4.70
-51	0.231	-12.73	-5.73	0.27	-6	0.974	-0.23	6.77	4.75
-50	0.250	-12.04	-5.04	0.31	-5	0.980	-0.18	6.82	4.81
-49	0.272	-11.31	-4.31	0.37	-4	0.984	-0.14	6.86	4.85
-48	0.294	-10.63	-3.63	0.43	-3	0.988	-0.10	6.90	4.89
-47	0.316	-10.01	-3.01	0.50	-2	0.992	-0.07	6.93	4.93
-46	0.338	-9.42	-2.42	0.57	-1	0.996	-0.03	6.97	4.97
					0	1.000	0.00	7.00	5.01

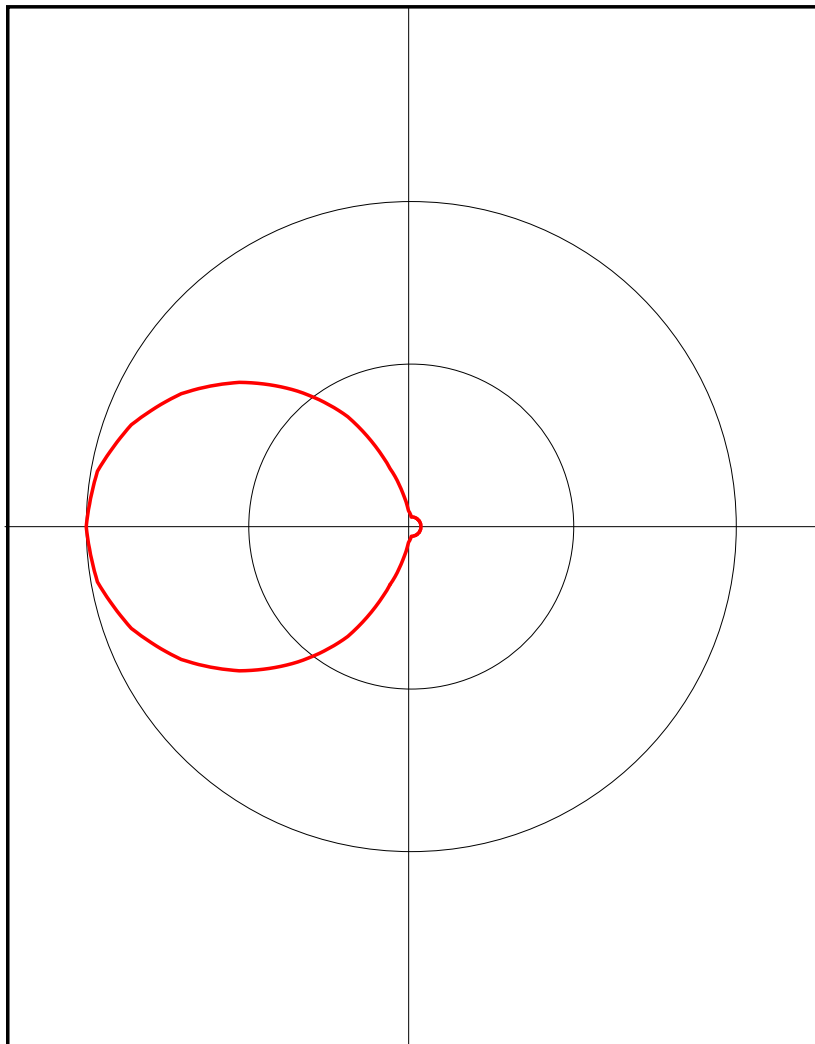


E-5 W249AH Mod. 60 F(50-50) dBu Contour Plot



E-6 W249AH Antenna Pattern

Azimuth (deg)	Relative Field
0.0	0.03
10.0	0.03
20.0	0.03
30.0	0.03
40.0	0.03
50.0	0.03
60.0	0.03
70.0	0.03
80.0	0.03
90.0	0.03
100.0	0.03
110.0	0.03
120.0	0.03
130.0	0.03
140.0	0.03
150.0	0.03
160.0	0.03
170.0	0.03
180.0	0.03
190.0	0.05
200.0	0.19
210.0	0.39
220.0	0.544
230.0	0.69
240.0	0.817
250.0	0.916
260.0	0.98
270.0	1.0
280.0	0.98
290.0	0.916
300.0	0.817
310.0	0.69
320.0	0.544
330.0	0.39
340.0	0.19
350.0	0.05



Antenna Height Above Average Terrain Calculations -- Results

Input Data

Latitude **36° 25' 53"** North
Longitude **82° 8' 15"** West (NAD 83)

Height of antenna radiation center above mean sea level: **1300** meters AMSL

Number of Evenly Spaced Radials = **12** 0° is referenced to True North

Results

Calculated HAAT = **645 meters**

Antenna Height Above Average Terrain calculated
using 1 km [GLOBE terrain data](#)

Individual "Radial HAAT" Values, in meters

0°	773.8 m
30°	727.1 m
60°	218.0 m
90°	421.4 m
120°	542.6 m
150°	609.8 m
180°	664.3 m
210°	687.6 m
240°	696.9 m
270°	790.1 m
300°	813.4 m
330°	790.9 m

ASR Registration 1054538

Registration Detail

Reg Number	1054538	Status	Constructed
File Number	A0064160	Constructed	10/01/1994
EMI	No	Dismantled	
NEPA	No		

Antenna Structure

Structure Type TOWER - Free standing or Guyed Structure used for Commu

Location (in NAD83 Coordinates)

Lat/Long	36-25-53.0 N 082-08-15.0 W	Address	6247 PANHANDLE ROAD
City, State	HUNTER , TN		
Zip	37643	County	CARTER
Center of AM Array		Position of Tower in Array	

Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
1271.9	68.8
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
1340.7	51.6

Painting and Lighting Specifications

FAA Chapters 3, 4, 5, 13

Paint and Light in Accordance with FAA Circular Number 70/7460-1J

FAA Notification

FAA Study	98-ASO-2328-OE	FAA Issue Date	07/14/1998
-----------	----------------	----------------	------------

Owner & Contact Information

FRN	0001770163	Owner Entity Type
-----	------------	----------------------

Owner

HOLSTON VALLEY BROADCASTING CORPORATION Attention To: JOHN O. DAVIS 222 COMMERCE STREET KINGSPORT , TN 37660	P: (423)246-9578 F: E:
--	------------------------------

Contact

P:
F:
E:

Last Action Status

Status	Constructed	Received	07/24/1998
Purpose	New	Entered	07/24/1998