

## **Technical Report W249AH Minor Modification**

This technical report is submitted for a minor modification to W249AH at Johnson City, TN, FCC file no. BLFT-20080422ABD. Changes in antenna and ERP are requested. The translator is to serve as a fill-in to rebroadcast the WTFM(FM) 253C primary signal at Kingsport, TN, FCC facility I.D. 27489.

### **W249AH Modification Analysis:**

An overlap study (exhibit E-1) shows the W249AH modification will not produce any interference overlap to current facilities.

The translator will remain on the current tower, ASR 1043907, at coordinates:

**36 16 07N 82 20 21W NAD 27.**

Two Scala CA2-FM vertically-polarized directional antennas, rotated at 300 and 90 degree azimuths with a 75, 25% power split, respectively (exhibits E-2 and E-3) will be mounted at a COR AGL of 28 meters, 1006 meters AMSL at a HAAT of 388 meters, calculated using the CONTOUR program with the FCC 30 second terrain data with 12 radials, and operate at 0.250 kW ERP. The W249AH modification 60 dBu F(50-50) contour is completely contained within the primary WTFM(FM) 60 dBu contour, and overlaps the current W249AH 60 dBu contour (exhibit E-4).

### **RF Exposure Calculation:**

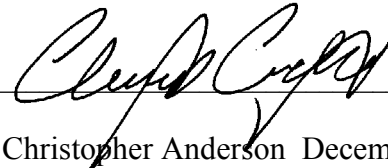
The RF contribution was calculated using the formula from the OET Bulletin 65:

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

Using a vertical (F) factor of 0.595 at a 45 degree depression angle from the antenna elevation pattern, the RF is calculated to be  $4.37 \mu\text{W}/\text{cm}^2$  to the ground, which is well below 5% of the  $200 \mu\text{W}/\text{cm}^2$  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.



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E-1 W249AH Overlap Study

REFERENCE

CH# 249D - 97.7 MHz, Pwr= 0.25 kW DA, HAAT= 388.0 M, COR= 1006 M

DISPLAY DATES

36 16 07.0 N.

Average Protected F(50-50)= 25.5 km

DATA 11-27-13

82 20 21.0 W.

Standard Directional

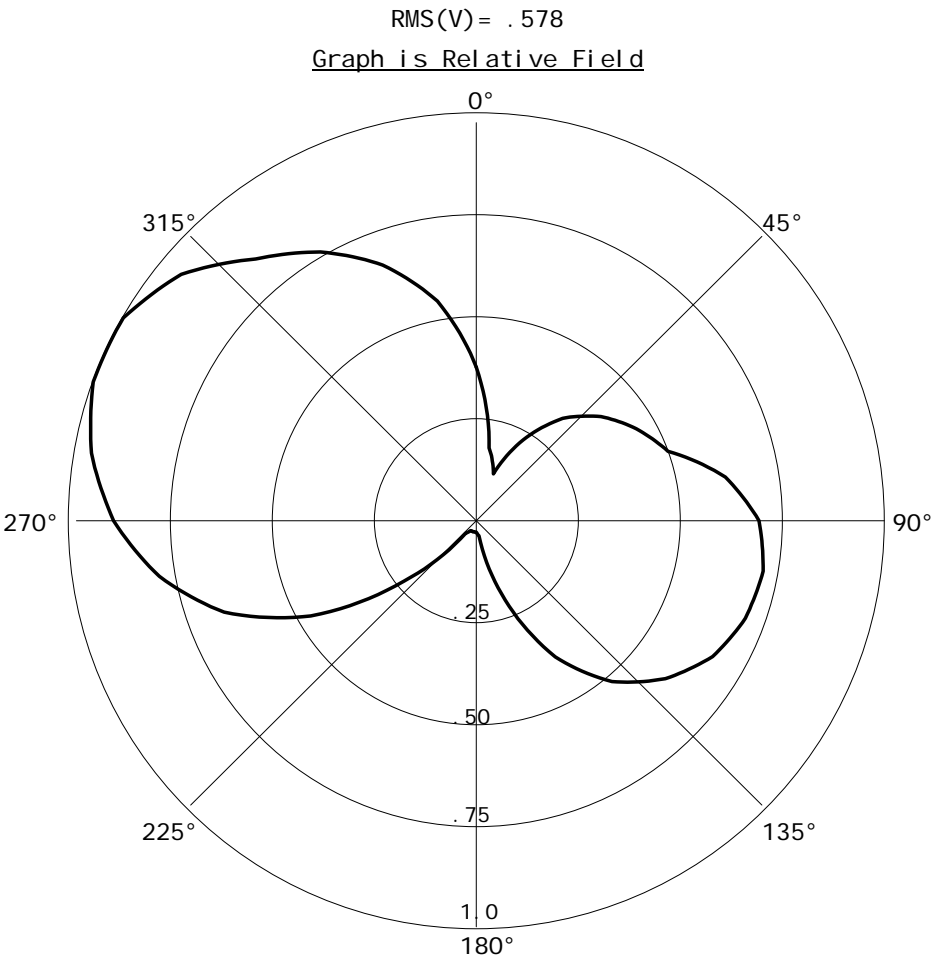
SEARCH 12-01-13

CH	CALL	TYPE	ANT	AZI.	DIST	LAT.	Pwr(kW)	INT(km)	PRO(km)	*IN*	*OUT*
CITY		STATE		<--	FILE #	LNG.	HAAT(M)	COR(M)	LICENSEE	(Overlap in km)	
249D	W249AH	LIC	DC	0.0	0.00	36 16 07.0	0.040	48.5	13.4	-66.8*	-75.2*
Johnson City			TN	0.0	BLFT20080422ABD	82 20 21.0	388	1006	Holston Valley Broadcastin		
249C3	WRIC-FM	LIC	NCX	21.7	105.67	37 09 04.0	3.200	97.5	35.6	-7.9	21.8
Richlands			VA	201.9	BLH20070509AAM	81 53 56.0	229	922	Rr & Wt Broadcasting, Inc.		
249D	W249AR	LIC	C	201.9	81.27	35 35 23.0	0.100	71.3	22.5	-3.2	46.3
Asheville			NC	21.7	BLFT20000811AAU	82 40 26.0	358	1089	Entercom Kansas City Licen		
250D	W250BG	LIC	C	23.5	39.69	36 35 45.0	0.250	25.4	16.2	-1.5	3.0
Bristol			TN	203.6	BLFT20080926ACV	82 09 42.0	77	638	Holston Valley Broadcastin		
248C	WJXB-FM	LIC	CY	259.1	145.92	36 00 36.0	100.000	121.0	81.5	-0.5	25.7
Knoxville			TN	78.2	BLH19890928KC	83 55 57.0	395	706	South Central Communicatio		
250C	WPEG	LIC	DCY	133.0	146.78	35 21 44.0	95.000	112.4	77.4	17.5	48.0
Concord			NC	313.7	BLH19901207KC	81 09 19.0	491	727	Cbs Radio Stations Inc.		
247C	WKBC-FM	LIC	DE	100.8	110.73	36 04 34.0	100.000	11.7	81.4	79.0	28.4
North Wilkesboro			NC	281.5	BLH19970711KA	81 07 43.0	403	803	Wilkes Broadcasting Compan		
250D	W250BR	CP	C	267.3	89.08	36 13 38.0	0.010	12.3	8.6	50.6	39.8
Morristown			TN	86.7	BNPFT20130318ABF	83 19 53.0	255	633	Radio Assist Ministry, Inc		
250C3	WKIC	LIC	CX	324.0	127.44	37 11 36.0	2.000	56.7	37.2	45.4	49.0
Hyden			KY	143.5	BLH20111223AAD	83 11 04.0	346	748	Leslie County Broadcasting		

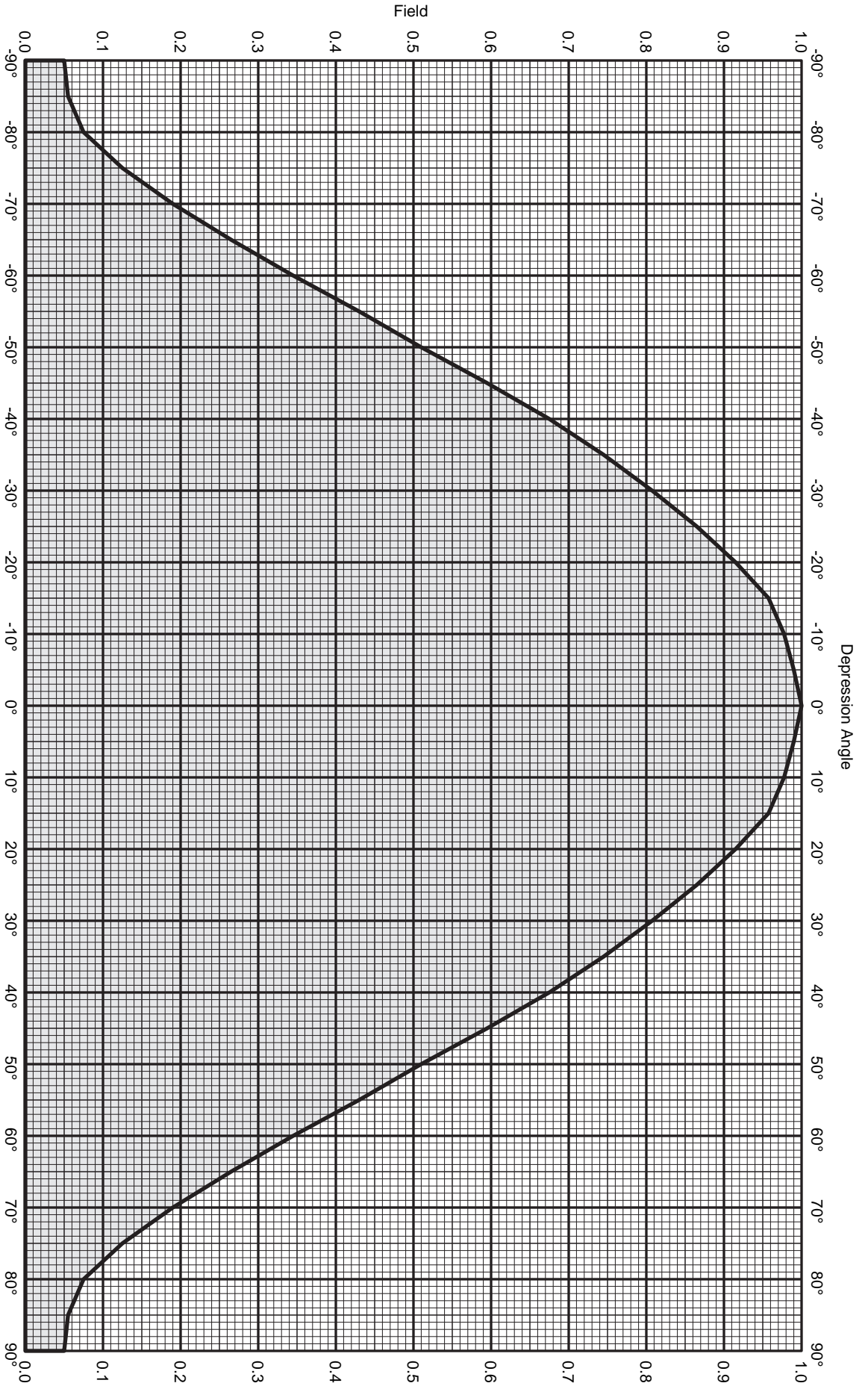
Terrain database is FCC NGDC 30 Sec, R= 73.215 qualifying spacings or FCC minimum spacings in KM, M= Margin in KM  
In & Out distances between contours are shown at closest points. Reference Zone= East Zone, Co to 3rd adjacent.  
All separation margins (if shown) include rounding  
Ant Column: (D= DA 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 protected contour.

E-2 W249AH Composite Antenna Pattern

Azi	Field	dBk	kW
000	0.378	-14.471	0.036
010	0.182	-20.819	0.008
020	0.123	-24.222	0.004
030	0.230	-18.786	0.013
040	0.329	-15.677	0.027
050	0.399	-14.001	0.040
060	0.453	-12.899	0.051
070	0.500	-12.041	0.063
080	0.620	-10.173	0.096
090	0.693	-09.206	0.120
100	0.714	-08.947	0.127
110	0.702	-09.094	0.123
120	0.669	-09.512	0.112
130	0.605	-10.385	0.092
140	0.517	-11.751	0.067
150	0.387	-14.266	0.037
160	0.208	-19.659	0.011
170	0.038	-34.425	0.000
180	0.028	-37.077	0.000
190	0.028	-37.077	0.000
200	0.028	-37.077	0.000
210	0.028	-37.077	0.000
220	0.040	-33.979	0.000
230	0.231	-18.748	0.013
240	0.469	-12.597	0.055
250	0.658	-09.656	0.108
260	0.789	-08.079	0.156
270	0.889	-07.043	0.198
280	0.958	-06.393	0.229
290	0.999	-06.029	0.250
300	0.999	-06.029	0.250
310	0.944	-06.521	0.223
320	0.841	-07.525	0.177
330	0.764	-08.359	0.146
340	0.670	-09.499	0.112
350	0.549	-11.229	0.075



# E-3 Scala CA-2 FM Vertical Elevation Pattern



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

CA2-FM

FM

Maximum gain: 4.0 dBd

Vertical polarization

Vertical radiation pattern  
0 degree electrical downtilt



CA2-FM

FM

Maximum gain: 4.0 dBd

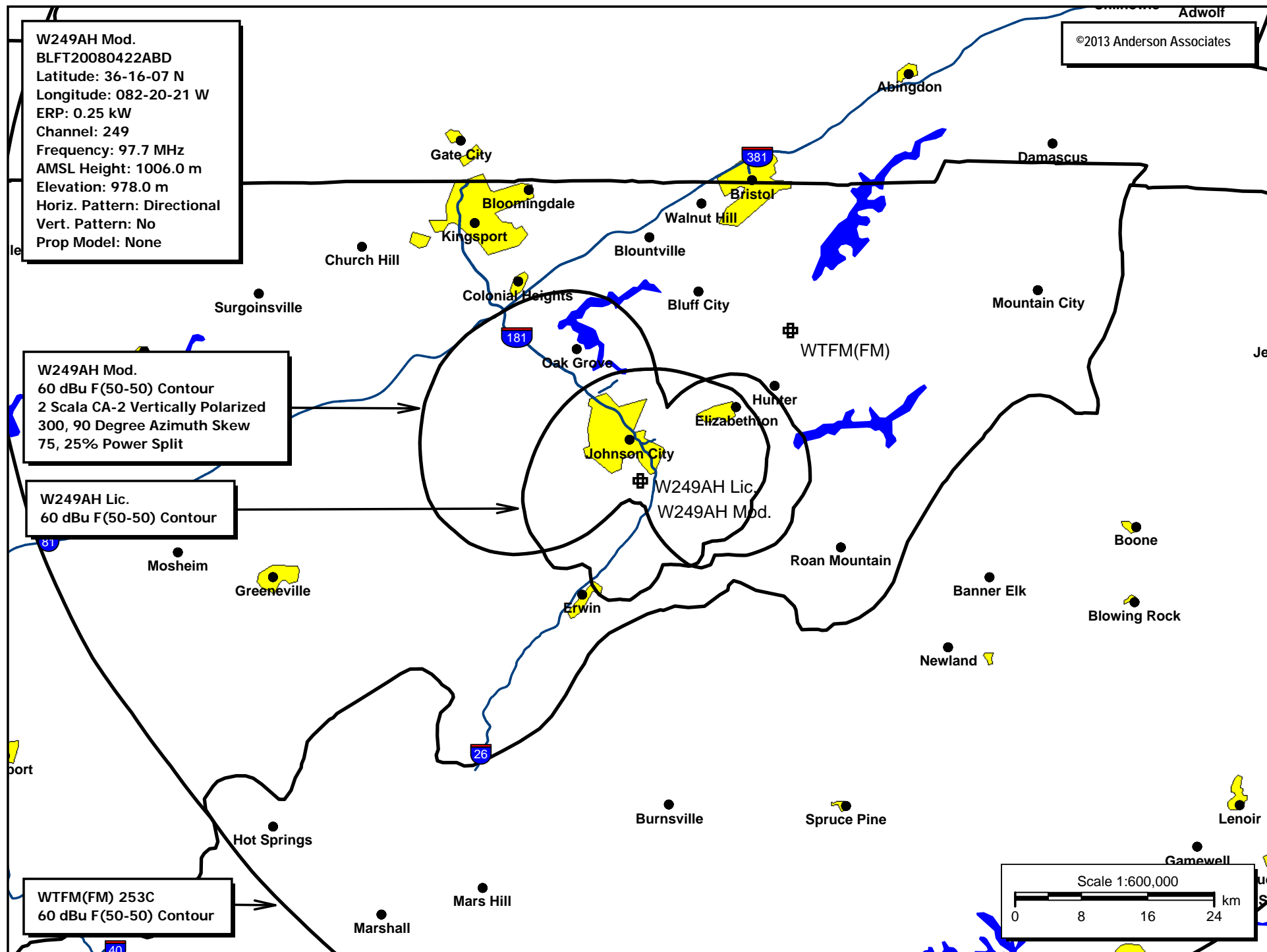
Vertical polarization

Vertical radiation pattern

0 degree electrical downtilt

Angle	Field	Rel.dB	dBd	PwrMult	Angle	Field	Rel.dB	dBd	PwrMult
0	1.000	0.00	4.00	2.51	45	0.595	-4.51	-0.51	0.89
1	0.998	-0.02	3.98	2.50	46	0.578	-4.76	-0.76	0.84
2	0.996	-0.03	3.97	2.49	47	0.561	-5.02	-1.02	0.79
3	0.994	-0.05	3.95	2.48	48	0.544	-5.29	-1.29	0.74
4	0.992	-0.07	3.93	2.47	49	0.527	-5.56	-1.56	0.70
5	0.990	-0.09	3.91	2.46	50	0.510	-5.85	-1.85	0.65
6	0.988	-0.11	3.89	2.45	51	0.494	-6.13	-2.13	0.61
7	0.985	-0.13	3.87	2.44	52	0.478	-6.41	-2.41	0.57
8	0.982	-0.15	3.85	2.42	53	0.462	-6.71	-2.71	0.54
9	0.980	-0.18	3.82	2.41	54	0.446	-7.01	-3.01	0.50
10	0.978	-0.20	3.80	2.40	55	0.430	-7.33	-3.33	0.46
11	0.974	-0.23	3.77	2.38	56	0.413	-7.68	-3.68	0.43
12	0.970	-0.27	3.73	2.36	57	0.396	-8.05	-4.05	0.39
13	0.965	-0.30	3.70	2.34	58	0.379	-8.43	-4.43	0.36
14	0.961	-0.34	3.66	2.32	59	0.362	-8.83	-4.83	0.33
15	0.957	-0.38	3.62	2.30	60	0.345	-9.24	-5.24	0.30
16	0.949	-0.45	3.55	2.26	61	0.329	-9.66	-5.66	0.27
17	0.940	-0.53	3.47	2.22	62	0.313	-10.09	-6.09	0.25
18	0.932	-0.61	3.39	2.18	63	0.297	-10.54	-6.54	0.22
19	0.924	-0.69	3.31	2.14	64	0.281	-11.03	-7.03	0.20
20	0.915	-0.77	3.23	2.10	65	0.265	-11.54	-7.54	0.18
21	0.905	-0.87	3.13	2.06	66	0.250	-12.04	-8.04	0.16
22	0.895	-0.96	3.04	2.01	67	0.235	-12.58	-8.58	0.14
23	0.885	-1.06	2.94	1.97	68	0.220	-13.15	-9.15	0.12
24	0.875	-1.16	2.84	1.92	69	0.205	-13.76	-9.76	0.11
25	0.865	-1.26	2.74	1.88	70	0.190	-14.42	-10.42	0.09
26	0.854	-1.38	2.62	1.83	71	0.177	-15.04	-11.04	0.08
27	0.842	-1.49	2.51	1.78	72	0.164	-15.70	-11.70	0.07
28	0.831	-1.61	2.39	1.73	73	0.151	-16.42	-12.42	0.06
29	0.819	-1.73	2.27	1.68	74	0.138	-17.20	-13.20	0.05
30	0.808	-1.86	2.14	1.64	75	0.125	-18.06	-14.06	0.04
31	0.795	-1.99	2.01	1.59	76	0.115	-18.79	-14.79	0.03
32	0.783	-2.13	1.87	1.54	77	0.105	-19.58	-15.58	0.03
33	0.770	-2.27	1.73	1.49	78	0.095	-20.45	-16.45	0.02
34	0.757	-2.41	1.59	1.44	79	0.085	-21.41	-17.41	0.02
35	0.745	-2.56	1.44	1.39	80	0.075	-22.50	-18.50	0.01
36	0.731	-2.72	1.28	1.34	81	0.071	-22.97	-18.97	0.01
37	0.717	-2.89	1.11	1.29	82	0.067	-23.48	-19.48	0.01
38	0.703	-3.06	0.94	1.24	83	0.063	-24.01	-20.01	0.01
39	0.689	-3.24	0.76	1.19	84	0.059	-24.58	-20.58	0.01
40	0.675	-3.41	0.59	1.14	85	0.055	-25.19	-21.19	0.01
41	0.659	-3.62	0.38	1.09	86	0.054	-25.35	-21.35	0.01
42	0.643	-3.84	0.16	1.04	87	0.053	-25.51	-21.51	0.01
43	0.627	-4.05	-0.05	0.99	88	0.052	-25.68	-21.68	0.01
44	0.611	-4.28	-0.28	0.94	89	0.051	-25.85	-21.85	0.01
					90	0.050	-26.02	-22.02	0.01

# E-4 W249AH Mod. 60 dBu Contour Plot



## E-5 W249AH Tower ASR

### Registration 1043907

#### Registration Detail

Reg Number	1043907	Status	Constructed
File Number	A0786605	Constructed	01/01/1958
EMI	No	Dismantled	
NEPA	No		

#### Antenna Structure

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

#### Location (in NAD83 Coordinates)

Lat/Long	36-16-07.0 N 082-20-20.0 W	Address	BUFFALO MOUNTAIN 3.5 MI SSE
City, State	JOHNSON CITY , TN		
Zip	37604	County	WASHINGTON
Center of AM Array		Position of Tower in Array	

#### Heights (meters)

Elevation of Site Above Mean Sea Level	Overall Height Above Ground (AGL)
977.5	105.8
Overall Height Above Mean Sea Level	Overall Height Above Ground w/o Appurtenances
1083.3	77.4

#### 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	96-ASO-2092-OE	FAA Issue Date	05/13/1996
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#### Owner & Contact Information

FRN	0001595214	Owner Entity Type	Corporation
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#### Owner

Citadel Broadcasting Company  
Attention To: Gary Kline  
3280 Peachtree Road, NW  
Suite 2300  
Atlanta , GA 30305

P: (404)949-0700  
F:  
E: gary.kline@cumulus.com

#### Contact

Graham Brock, Inc. , Marilyn Matheny  
P.O. Box 24466  
St. Simons Island , GA 31522-7466

P: (912)638-8028  
F: (912)638-7722  
E: marilyn@grahambrock.com

#### Last Action Status

Status	Constructed	Received	09/26/2012
Purpose	Admin Update	Entered	09/26/2012