

Engineering Exhibit

**APPLICATION FOR  
CONSTRUCTION PERMIT FOR A  
DIGITAL TELEVISION STATION**

prepared for  
**TV Alabama, Inc.**

WCFT-TV Tuscaloosa, Alabama

Facility ID 21258  
Ch. 33 230 kW (MAX-DA) 657 m

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FCC Form 301 - Section III-D – DTV Engineering

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*This material supplies a "hard copy" of the engineering portions of this application as entered April 7, 2008 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

**SECTION III-D - DTV Engineering**

**Complete Questions 1-5, and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.**

**Pre-Transition Certification Checklist:** An application concerning a pre-transition channel must complete questions 1(a)-(c), and 2-5. A correct answer of "Yes" to all of the questions will ensure an expeditious grant of a construction permit application to change pre-transition facilities. However, if the proposed facility is located within the Canadian or Mexican borders, coordination of the proposal under the appropriate treaties may be required prior to grant of the application. An answer of "No" will require additional evaluation of the applicable information in this form before a construction permit can be granted.

**Post-Transition Expedited Processing.** An application concerning a post-transition channel must complete questions 1(a), (d)-(e), and 2-5. A station applying for a construction permit to build its post-transition channel will receive expedited processing if its application (1) does not seek to expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B"); (2) specifies facilities that match or closely approximate those defined in the new DTV Table Appendix B facilities; and (3) is filed within 45 days of the effective date of Section 73.616 of the rules adopted in the Report and Order in the Third DTV Periodic Review proceeding, MB Docket No. 07-91.

1. The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects:	
(a) It will operate on the DTV channel for this station as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(b) It will operate a pre-transition facility from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input type="radio"/> No
(c) It will operate a pre-transition facility with an effective radiated power (ERP) and antenna height above average terrain (HAAT) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622.	<input type="radio"/> Yes <input type="radio"/> No
(d) It will operate at post-transition facilities that do not expand the noise-limited service contour in any direction beyond that established by Appendix B of the Seventh Report and Order in MB Docket No. 87-268 establishing the new DTV Table of Allotments in 47 C.F.R. § 73.622(i) ("new DTV Table Appendix B").	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> N/A
(e) It will operate at post-transition facilities that match or reduce by no more than five percent with respect to predicted population from those defined in the new DTV Table Appendix B.	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
2. The proposed facility will not have a significant environmental impact, including exposure of workers or the general public to levels of RF radiation exceeding the applicable health and safety guidelines, and therefore will not come within 47 C.F.R. Section 1.1307. Applicant must <b>submit the Exhibit</b> called for in Item 13.	<input checked="" type="radio"/> Yes <input type="radio"/> No
3. Pursuant to 47 C.F.R. Section 73.625, the DTV coverage contour of the proposed facility will encompass the allotted principal community.	<input checked="" type="radio"/> Yes <input type="radio"/> No
4. The requirements of 47 C.F.R. Section 73.1030 regarding notification to radio astronomy installations, radio receiving installations and FCC monitoring stations have either been satisfied or are not applicable.	<input checked="" type="radio"/> Yes <input type="radio"/> No
5. The antenna structure to be used by this facility has been registered by the Commission and will not require registration to support the proposed antenna, OR the FAA has previously determined that the proposed structure will not adversely effect safety in air navigation and this structure qualifies for later registration under the Commission's phased registration plan, OR the proposed installation on this structure does not require notification to the FAA pursuant to 47 C.F.R. Section 17.7.	<input checked="" type="radio"/> Yes <input type="radio"/> No

## TECHNICAL SPECIFICATIONS

## TECH BOX

1.	Channel Number:  DTV    33      Analog TV, if any    33
2.	Zone: <input type="radio"/> I <input checked="" type="radio"/> II <input type="radio"/> III
3.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 33 Minutes 28 Seconds 48 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 87 Minutes 25 Seconds 50 <input checked="" type="radio"/> West <input type="radio"/> East
4.	Antenna Structure Registration Number: 1033524 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
5.	Antenna Location Site Elevation Above Mean Sea Level:                                  195.1   meters
6.	Overall Tower Height Above Ground Level:     603.7   meters
7.	Height of Radiation Center Above Ground Level:     595.3   meters
8.	Height of Radiation Center Above Average Terrain :                                         657   meters
9.	Maximum Effective Radiated Power (average power):                                    230   kW
10.	Antenna Specifications:  a. Manufacturer DIE      Model TFU-26GTH-R CT-150  b. Electrical Beam Tilt: 0.75 degrees <input type="checkbox"/> Not Applicable  c. Mechanical Beam Tilt: degrees toward azimuth degrees True <input checked="" type="checkbox"/> Not Applicable  Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c).  <div style="text-align: right;">[Exhibit 42]</div>  d. Polarization: <input checked="" type="radio"/> Horizontal <input type="radio"/> Circular <input type="radio"/> Elliptical  e. Directional Antenna Relative Field Values: <input type="checkbox"/> Not applicable (Nondirectional)  [For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.] [Relative Field Values]  <div style="text-align: center;"><b>10e. Directional Antenna Relative Field Values</b></div>

[Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]

e. Directional Antenna Relative Field Values:

Rotation (Degrees): ☒ No Rotation

Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value
0	0.214	10	0.384	20	0.465	30	0.384	40	0.214	50	0.289
60	0.542	70	0.744	80	0.863	90	0.921	100	0.957	110	0.986
120	0.997	130	0.973	140	0.919	150	0.864	160	0.845	170	0.875
180	0.932	190	0.981	200	1	210	0.981	220	0.932	230	0.875
240	0.845	250	0.864	260	0.919	270	0.973	280	0.997	290	0.986
300	0.957	310	0.921	320	0.863	330	0.744	340	0.542	350	0.289
Additional Azimuths		44	0.194	158	0.845	356	0.194				

[Relative Field Polar Plot](#)

If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. **Exhibit required.** [Exhibit 43]

11. Does the proposed facility satisfy the pre-transition interference protection provisions of 47 C.F.R. Section 73.623(a) (Applicable only if **Certification Checklist** Items 1(a), (b), or (c) are answered "No.") and/or the post-transition interference protection provisions of 47 C.F.R. Section 73.616? ☒ Yes ☐ No [Exhibit 44]

If "No," attach as an Exhibit justification therefor, including a summary of any related previously granted waivers.

12. If the proposed facility will not satisfy the coverage requirement of 47 C.F.R. Section 73.625, attach as an Exhibit justification therefore. (Applicable only if **Certification Checklist** item 3 is answered "No.") [Exhibit 45]

13. **Environmental Protection Act. Submit in an Exhibit** the following: [Exhibit 46]

If **Certification Checklist** Item 2 is answered "Yes," a brief explanation of why an Environmental Assessment is not required. Also describe in the Exhibit the steps that will be taken to limit RF radiation exposure to the public and to persons authorized access to the tower site.

By checking "Yes" to **Certification Checklist** Item 2, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines.

If **Certification Checklist** Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.

**PREPARERS CERTIFICATION ON SECTION III MUST BE COMPLETED AND SIGNED.**

**SECTION III - PREPARER'S CERTIFICATION**

I certify that I have prepared Section III (Engineering Data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

Name ROBERT J. CLINTON	Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature	Date 4/7/2008	
Mailing Address CAVELL, MERTZ & ASSOCIATES, INC. 7839 ASHTON AVENUE		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20109 -2883
Telephone Number (include area code) 7033929090	E-Mail Address (if available) BCLINTON@CAVELLMERTZ.COM	

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

**Exhibits****Exhibit 43**

**Description:** EXHIBIT 43 - DIRECTIONAL ANTENNA

PLEASE SEE EXHIBIT 44 - STATEMENT A FOR DIRECTIONAL ANTENNA SYSTEM DISCUSSION.

**Attachment 43****Exhibit 44**

**Description:** EXHIBIT 44 - STATEMENT A

EXHIBIT 44 - STATEMENT A - NATURE OF THE PROPOSAL, PROPOSED ANTENNA SYSTEM

**Attachment 44**

Description
<u>EXHIBIT 44 - STATEMENT A</u>

**Exhibit 46**

**Description:** EXHIBIT 46 - STATEMENT B

EXHIBIT 46 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS (WITH TABLE OF CONTENTS AND COPY OF FCC FORM 301 - SECTION III-D)

**Attachment 46**

Description
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EXHIBIT 46 - STATEMENT B

Exhibit 46 - Statement B  
**ENVIRONMENTAL CONSIDERATIONS**  
prepared for  
**TV Alabama, Inc.**  
WCFT-TV Tuscaloosa, Alabama  
Facility ID 21258  
Ch. 33 230 kW (MAX-DA) 657 m

The instant proposal is not believed to have a significant environmental impact as defined under Section 1.1306 of the Commission's Rules. Consequently, preparation of an Environmental Assessment is not required.

### **Nature of The Proposal**

*TV Alabama, Inc.* ("TV Alabama") herein proposes to operate its post-transition Channel 33 digital operation for WCFT-TV from the site currently authorized for its analog facility (See BLCT-19961025KE, ASR 1033524). A new digital Channel 33 antenna will be employed for the post-transition operation from the current analog site. The top mounted antenna will be replaced, lowering the structure's overall height to accomplish WCFT-TV's transition to digital operation.<sup>1</sup> The use of existing transmitting locations has been characterized as being environmentally preferable by the Commission, according to Note 1 of §1.1306 of the FCC Rules. No change in current structure marking and lighting requirements is anticipated.

### **Human Exposure to Radiofrequency Radiation**

The proposed operation was evaluated for human exposure to radiofrequency energy using the procedures outlined in the Commission's OET Bulletin No. 65 ("OET 65"). OET 65 describes a means of determining whether a proposed facility exceeds the radiofrequency exposure guidelines adopted in §1.1310. Under present Commission policy, a facility may be presumed to comply with the limits specified in §1.1310 if it satisfies the exposure criteria set forth in OET 65. Based upon that methodology, and as demonstrated in the following, the proposed transmitting system will comply with the cited adopted guidelines.

The new WCFT-TV antenna that will be employed for the proposed post-transition operation will have a center of radiation 595.3 meters above ground level. An ERP of 230 kilowatts, horizontally polarized, will be employed, utilizing a Dielectric model TFU-26GTH-R CT150 antenna. According to

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<sup>1</sup> The proposed antenna is shorter than the installed WCFT-TV antenna. Consequently, the FAA will be notified of the change and the FCC's Antenna Structure Registration will be modified.

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data provided by the antenna manufacturer, the maximum relative field value in downward directions (between 15 and 90 degrees below the horizontal) is 10 percent on Channel 33. Thus, a value of 10 percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 33 (center frequency 587 MHz) is 391.3  $\mu\text{W}/\text{cm}^2$ .

The proposed WCFT-TV transmitter site is situated atop a mountain range approximately 32 km north of the Tuscaloosa, Alabama city center coordinates. The highest nearby ground elevation within approximately 100 meters of the tower base is 204.2 meters AMSL according to USGS topographic maps. For study purposes, it was assumed that the ground elevation surrounding the site area is flat, and corresponds to the maximum ground elevation of 204.2 meters AMSL. Thus, an antenna radiation center of 586.2 meters above the “flat earth” ground elevation (based on the maximum ground elevation corresponding to topographical map information) is assumed. Also, to simplify calculations, the antenna is assumed to be omni-directional.

OET-65’s formula for television transmitting antennas is based on the NTSC transmission standards, where the average power is normally much less than the peak power. For the DTV facility in the instant proposal, the peak-to-average ratio is different than the NTSC ratio. The DTV ERP figure herein refers to the *average* power level. The formula used for calculating DTV signal density in this analysis is essentially the same as equation (9) in OET-65.

$$S = (33.4098) (F^2) (ERP) / D^2$$

Where:

S	=	power density in microwatts/cm <sup>2</sup>
ERP	=	total (average) ERP in Watts
F	=	relative field factor
D	=	distance in meters

Using this formula, calculations were made to predict power density levels attributable to the WCFT-TV facility at points two meters above ground level near the antenna support structure. Assuming a 10 percent relative field for the WCFT-TV DTV antenna system from the antenna to the “flat earth,” the highest RF electromagnetic field level attributable to WCFT-TV is 0.2  $\mu\text{W}/\text{cm}^2$ , which is 0.05 percent of the uncontrolled / general public MPE limit at any location two meters above the “flat earth” maximum ground level. When the actual terrain elevations are considered (which are below the “flat earth”



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maximum along most azimuths), the calculated RF electromagnetic field will be lower. If the horizontal radiation pattern is considered, the calculated RF electromagnetic field density will be even lower.

§1.1307(b)(3) states that facilities at locations with multiple transmitters (such as the case at hand) are categorically excluded from responsibility for taking any corrective action in the areas where their contribution is less than five percent. Since the instant situation meets the five percent exclusion test at all ground level areas, the impact of any other facilities using this site may be considered independently from this proposal. Accordingly, it is believed that the impact of the proposed operation should not be considered to be a factor at or near ground level as defined under §1.1307(b).

**Safety of Tower Workers and the General Public**

As demonstrated herein, excessive levels of RF energy attributable to the proposal will not be caused at publicly accessible areas at ground level near the antenna supporting structure. Consequently, members of the general public will not be exposed to RF levels in excess of the Commission's guidelines. Nevertheless, tower access will continue to be restricted and controlled through the use of a locked fence. Additionally, appropriate RF exposure warning signs will continue to be posted.

With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure attributable to WCFT-TV would not occur in areas at ground level. A site exposure policy will continue to be employed protecting maintenance workers from excessive exposure when work must be performed on the tower or in areas where high RF levels may be present. Such protective measures may include, but will not be limited to, restriction of access to areas where levels in excess of the guidelines may be expected, power reduction, or the complete shutdown of facilities when work or inspections must be performed in areas where the exposure guidelines will be exceeded. On-site RF exposure measurements may also be undertaken to establish the bounds of safe working areas. The applicant will coordinate exposure procedures with all pertinent stations.

**Conclusion**

Based on the preceding, it is believed that the instant proposal may be categorically excluded from environmental processing under Section 1.1306 of the Rules, hence preparation of an Environmental Assessment is not required.