

Engineering Exhibit

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

prepared for  
**Hawaii Public Television Foundation**

KHET(TV) Honolulu, Hawaii

Facility ID 26431  
Ch. 11 3.2 kW 625 m

**Table of Contents**

FCC Form 340 - Section VII – DTV Engineering

Exhibit 35

Statement A	Nature Of The Proposal, Proposed Antenna System
Figure 1	Coverage Contour Comparison
Table I	Interference Study Results

Exhibit 37

Statement B	Environmental Considerations
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*This material supplies a “hard copy” of the engineering portions of this application as entered April 16, 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 VII Preparer's Certification**

I certify that I have prepared Section VII (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 4/16/2008	
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).

**SECTION VII - 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 checked="" type="radio"/> No |
| (c) It will operate a pre-transition facility with an effective radiated power (ERP) and antenna   | <input type="radio"/> Yes <input type="radio"/> No            |

	neight above average terrain (HAA1) that do not exceed the DTV reference ERP and HAAT for this station as established in 47 C.F.R. Section 73.622.	
	(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="checkbox"/> 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="checkbox"/> 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="checkbox"/> 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="checkbox"/> No

## SECTION VII - DTV Engineering

### TECHNICAL SPECIFICATIONS

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

<b>TECH BOX</b>	
1.	Channel Number:  DTV 11    Analog TV, if any 11
2.	Zone: <input type="radio"/> I <input checked="" type="radio"/> II <input type="radio"/> III
3.	Antenna Location Coordinates: (NAD 27)  Latitude: Degrees 21 Minutes 24 Seconds 3 <input checked="" type="radio"/> North <input type="radio"/> South  Longitude: Degrees 158 Minutes 6 Seconds 10 <input checked="" type="radio"/> West <input type="radio"/> East
4.	Antenna Structure Registration Number: 1007114 <input type="checkbox"/> Not Applicable <input type="checkbox"/> Notification filed with FAA
5.	Antenna Location Site Elevation Above Mean Sea Level: 755.9 meters
6.	Overall Tower Height Above Ground Level: 60.9 meters
7.	Height of Antenna Above Ground Level: 45.7 meters

7.	Height of Radiation Center Above Ground Level:	45.7 meters																																																																																																
8	Height of Radiation Center Above Average Terrain (HAAT):	625 meters																																																																																																
9.	Maximum Effective Radiated Power (average power):	3.2 kW																																																																																																
10.	<p>Antenna Specifications:</p> <p>a. Manufacturer DIE    Model THA-BP3SP-1H/3HD-1</p> <p>b. Electrical Beam Tilt: degrees    <input checked="" type="checkbox"/> Not Applicable</p> <p>c. Mechanical Beam Tilt: degrees toward azimuth degrees True    <input checked="" type="checkbox"/> Not Applicable</p> <p>Attach as an Exhibit all data specified in 47 C.F.R. Section 73.625(c). [Exhibit 33]</p> <p>d. Polarization: <input checked="" type="radio"/> Horizontal    <input type="radio"/> Circular    <input type="radio"/> Elliptical</p> <p>e. Directional Antenna Relative Field Values:    <input type="checkbox"/> Not applicable (Nondirectional)</p> <p>[For a composite directional (not off-the-shelf) antenna, press the following button to fill in the relative field values subform.]</p> <p>[Relative Field Values]</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><b>10e. Directional Antenna Relative Field Values</b></p> <p style="text-align: center;">[Fill in this subform for a composite directional (not off-the-shelf) antenna, only.]</p> </div> <p>e. Directional Antenna Relative Field Values:</p> <p>Rotation (Degrees): 0 <input checked="" type="checkbox"/> No Rotation</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th><th>Degrees</th><th>Value</th></tr> </thead> <tbody> <tr> <td>0</td><td>0.511</td><td>10</td><td>0.591</td><td>20</td><td>0.706</td><td>30</td><td>0.667</td><td>40</td><td>0.53</td><td>50</td><td>0.591</td></tr> <tr> <td>60</td><td>0.868</td><td>70</td><td>0.875</td><td>80</td><td>0.718</td><td>90</td><td>0.798</td><td>100</td><td>0.946</td><td>110</td><td>1</td></tr> <tr> <td>120</td><td>0.959</td><td>130</td><td>0.869</td><td>140</td><td>0.705</td><td>150</td><td>0.491</td><td>160</td><td>0.369</td><td>170</td><td>0.277</td></tr> <tr> <td>180</td><td>0.098</td><td>190</td><td>0.022</td><td>200</td><td>0.03</td><td>210</td><td>0.037</td><td>220</td><td>0.018</td><td>230</td><td>0.169</td></tr> <tr> <td>240</td><td>0.327</td><td>250</td><td>0.398</td><td>260</td><td>0.577</td><td>270</td><td>0.78</td><td>280</td><td>0.913</td><td>290</td><td>0.982</td></tr> <tr> <td>300</td><td>0.989</td><td>310</td><td>0.898</td><td>320</td><td>0.737</td><td>330</td><td>0.769</td><td>340</td><td>0.912</td><td>350</td><td>0.773</td></tr> <tr> <td>Additional Azimuths</td><td></td><td>2</td><td>0.5</td><td>23</td><td>0.721</td><td>44</td><td>0.5</td><td>65</td><td>0.913</td><td>295</td><td>1</td></tr> </tbody> </table> <p style="text-align: center;"><a href="#">Relative Field Polar Plot</a></p>		Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0	0.511	10	0.591	20	0.706	30	0.667	40	0.53	50	0.591	60	0.868	70	0.875	80	0.718	90	0.798	100	0.946	110	1	120	0.959	130	0.869	140	0.705	150	0.491	160	0.369	170	0.277	180	0.098	190	0.022	200	0.03	210	0.037	220	0.018	230	0.169	240	0.327	250	0.398	260	0.577	270	0.78	280	0.913	290	0.982	300	0.989	310	0.898	320	0.737	330	0.769	340	0.912	350	0.773	Additional Azimuths		2	0.5	23	0.721	44	0.5	65	0.913	295	1
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If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be satisfied. **Exhibit required.** [Exhibit 34]

| 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 35] | |

	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 therefor. (Applicable only if <b>Certification Checklist</b> item 3 is answered "No.")	[Exhibit 36]
13.	<b>Environmental Protection Act. Submit in an Exhibit</b> the following: a. If <b>Certification Checklist</b> 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 <b>Certification Checklist</b> 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 <b>Certification Checklist</b> Item 2 is answered "No," an Environmental Assessment as required by 47 C.F.R Section 1.1311.	[Exhibit 37]
<b>PREPARERS CERTIFICATION ON PAGE 8 MUST BE COMPLETED AND SIGNED.</b>		

## Exhibits

### Exhibit 34

**Description:** EXHIBIT 34 - DIRECTIONAL ANTENNA

PLEASE SEE EXHIBIT 35 - STATEMENT A FOR DIRECTIONAL ANTENNA DISCUSSION

### Attachment 34

### Exhibit 35

**Description:** EXHIBIT 35 - STATEMENT A

EXHIBIT 35

STATEMENT A - NATURE OF THE PROPOSAL, ALLOCATION CONSIDERATIONS

DTV CONTOUR EXTENSION - FREEZE WAIVER REQUEST

### Attachment 35

Description
<a href="#"><u>EXHIBIT 35 - STATEMENT A</u></a>

### Exhibit 37

**Description:** EXHIBIT 37 - STATEMENT B

EXHIBIT 37 - STATEMENT B - ENVIRONMENTAL CONSIDERATIONS (WITH TABLE OF CONTENTS AND COPY OF SECTION VII - DTV ENGINEERING)

### Attachment 37

Description
<a href="#"><u>EXHIBIT 37 - STATEMENT B</u></a>

Exhibit 37 - Statement B - Amended  
**ENVIRONMENTAL CONSIDERATIONS**  
prepared for  
**Hawaii Public Television Foundation**  
KHET(TV) Honolulu, Hawaii  
Facility ID 26431  
Ch. 11 3.2 kW 625 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**

*Hawaii Public Television Foundation* ("HPTF") herein proposes to operate its post-transition Channel 11 digital operation for KHET(TV) from the site currently authorized for its digital facility (See BLEDT-20060516ACN, ASR 1007114). A new digital Channel 11 antenna will be side mounted on the existing structure for the post-transition operation. 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. Since no change in overall structure height is proposed, 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 proposed KHET(TV) antenna that will be employed for the proposed post-transition operation will have a center of radiation 45.7 meters above ground level. An ERP of 3.2 kilowatts, horizontally polarized, will be employed. According to information provided by the manufacturer, the Dielectric model THA-BP3SP-1H/3HD-1 antenna has a maximum relative field of less than

Exhibit 37 - Statement B - Amended  
**ENVIRONMENTAL CONSIDERATIONS**  
(Page 2 of 3)

30 percent from 25 to 90 degrees below the horizontal plane (*i.e.*, below the antenna). Thus, a value of 30 percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 11 (center frequency 201 MHz) is 200  $\mu\text{W}/\text{cm}^2$ .

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, the proposed facility would contribute a power density of 5.0  $\mu\text{W}/\text{cm}^2$  at two meters above ground level near antenna support structure, or 2.5 percent of the general population/uncontrolled limit. At ground level locations away from the base of the tower, the calculated RF power density is even lower, due to the increasing distance from the transmitting antenna.

§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 the 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).

Exhibit 37 - Statement B - Amended  
**ENVIRONMENTAL CONSIDERATIONS**  
(Page 3 of 3)

**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 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.