

ENGINEERING EXHIBIT

Application for Modification of Digital Television Station Construction Permit

prepared for

Bend Licenses, Limited Partnership KTVZ-DT Bend, Oregon

Facility ID 55907
Ch. 18 50 kW 188 m

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This material supplies a "hard copy" of the engineering portions of this application as entered February 26, 2002 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 DATA	
<p>Complete Questions 1-5 of the Certification Checklist and provide all data and information for the proposed facility, as requested in Technical Specifications, Items 1-13.</p>	
<p>Certification Checklist: A correct answer of "Yes" to all of the questions below will ensure an expeditious grant of a construction permit. 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.</p>	
<p>1. The proposed DTV facility complies with 47 C.F.R. Section 73.622 in the following respects:</p>	
(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 from a transmitting antenna located within 5.0 km (3.1 miles) of the DTV reference site for this location as established in 47 C.F.R. Section 73.622.	<input checked="" type="radio"/> Yes <input type="radio"/> No
(c) It will operate 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 checked="" type="radio"/> No
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 submit the Exhibit 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

SECTION III-D - DTV Engineering	
<p>TECHNICAL SPECIFICATIONS</p> <p>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.</p>	
<p>TECH BOX</p>	
1.	<p>Channel Number:</p> <p>DTV 18 Analog TV, if any 21</p>
2.	<p>Zone:</p> <p>I <input type="radio"/> II <input checked="" type="radio"/> III <input type="radio"/></p>
3.	<p>Antenna Location Coordinates: (NAD 27)</p> <p>Latitude:</p> <p>Degrees 44 Minutes 4 Seconds 40 <input checked="" type="radio"/> North <input type="radio"/> South</p> <p>Longitude:</p> <p>Degrees 121 Minutes 19 Seconds 49 <input checked="" type="radio"/> West <input type="radio"/> East</p>
4.	<p>Antenna Structure Registration Number:</p>

Not Applicable Notification filed with FAA

5. Antenna Location Site Elevation Above Mean Sea Level: 1285 meters

6. Overall Tower Height Above Ground Level: 58 meters

7. Height of Radiation Center Above Ground Level: 43 meters

8. Height of Radiation Center Above Average Terrain : 188 meters

9. Maximum Effective Radiated Power : 50 kW

10. Antenna Specifications:

a. Manufacturer DIE Model TFU-12DSB-I(C)

b. Electrical Beam Tilt:
1 degrees Not Applicable

c. Mechanical Beam Tilt:
degrees toward azimuth
degrees True Not Applicable
Attach as an Exhibit all data specified in 47 C.F.R. Section 73.685. [Exhibit 39]

d. Polarization:
 Horizontal Circular Elliptical

e. Directional Antenna Relative Field Values: 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]

10e. Directional Antenna Relative Field Values

[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	0.808	10	0.92	20	0.989	30	0.993	40	0.942	50	0.878
60	0.819	70	0.776	80	0.757	90	0.769	100	0.781	110	0.779
120	0.77	130	0.754	140	0.77	150	0.823	160	0.888	170	0.946
180	0.991	190	0.99	200	0.927	210	0.828	220	0.704	230	0.572
240	0.446	250	0.372	260	0.363	270	0.403	280	0.437	290	0.439
300	0.411	310	0.37	320	0.368	330	0.429	340	0.539	350	0.675
Additional Azimuths		25	1	185	1	256	0.358	285	0.441	315	0.362

If a directional antenna is proposed, the requirements of 47 C.F.R. Sections 73.625(c) must be [Exhibit 40]

	satisfied. Exhibit required.	
11.	Does the proposed facility satisfy the 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".) If No, attach as an Exhibit justification therefore, including a summary of any previously granted waivers.	<input checked="" type="radio"/> Yes <input type="radio"/> No [Exhibit 41]
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 42]
13.	Environmental Protection Act. Submit in an Exhibit the following: 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.	[Exhibit 43]
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 JOSEPH M. DAVIS, P.E.		Relationship to Applicant (e.g., Consulting Engineer) CONSULTING ENGINEER	
Signature		Date 2/26/2002	
Mailing Address CAVELL, MERTZ & DAVIS, INC. 7839 ASHTON AVENUE			
City MANASSAS		State or Country (if foreign address) VA	Zip Code 20109 -
Telephone Number (include area code) 7033929090		E-Mail Address (if available) JDAVIS@CMDCONSULTING.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 40

Description: EXHIBIT 40 - STATEMENT A

EXHIBIT 40 - STATEMENT A - ATTACHED AS A PDF FILE

Attachment 40

Description	Type	Conversion	
		Status	File
<u>Exhibit 40 - Statement A</u>	Adobe Acrobat File	not needed	PDF

Exhibit 41

Description: EXHIBIT 41 - STATEMENT B

EXHIBIT 41 - STATEMENT B - ATTACHED AS A PDF FILE

Attachment 41

Description	Type	Conversion	
		Status	File
<u>Exhibit 41 - Statement B</u>	Adobe Acrobat File	not needed	PDF

Exhibit 43

Description: EXHIBIT 43 - STATEMENT C

EXHIBIT 43 - STATEMENT C - ATTACHED AS A PDF FILE (WITH APPLICATION ITEMIZED SUMMARY)

Attachment 43

Description	Type	Conversion	
		Status	File
<u>Exhibit 43 - Statement C</u>	Adobe Acrobat File	not needed	PDF

Exhibit 43 - Statement C
ENVIRONMENTAL CONSIDERATIONS
prepared for
Bend Licenses, Limited Partnership
KTVZ-DT Bend, Oregon
Facility ID 55907
Ch. 18 50 kW 188 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

Bend Licenses, Limited Partnership ("*Bend*") herein proposes to modify the Construction Permit for KTVZ-DT, a new digital television ("DTV") station on Channel 18, paired with KTVZ analog Channel 21, Bend, Oregon. *Bend* proposes to side-mount the DTV Channel 18 facility on the existing antenna supporting structure currently employed by the licensed KTVZ analog facility.

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 structure height is proposed, thus no change in current structure marking and lighting requirements is anticipated. Therefore, it is believed that this application may be categorically excluded from environmental processing pursuant to §1.1306 of the Commission's rules.

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.

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The KTVZ-DT antenna will be installed such that its center of radiation is 43 meters above ground level. An effective radiated power (“ERP”) of 50 kilowatts, horizontally polarized, will be employed. According to elevation pattern data provided by the antenna manufacturer, the proposed KTVZ-DT antenna will have a relative field of 10 percent or less from 20 to 90 degrees below the horizontal plane (i.e.: below the antenna). Thus, a value of 10 percent relative field is used for this calculation. The “uncontrolled/general population” limit specified in §1.1310 for Channel 18 (center frequency 497 MHz) is 331.3 $\mu\text{W}/\text{cm}^2$.

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 ²
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 9.9 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near antenna support structure, or 3.0 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.

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§1.1307(b)(3) states that facilities contributing less than five percent of the exposure limit at locations with multiple transmitters are categorically excluded from responsibility for taking any corrective action in the areas where its 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 near 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 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 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.

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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.