

ENGINEERING EXHIBIT

Application for Digital Low Power Television “Flash-Cut” Construction Permit

prepared for

Colins Broadcasting Corporation

K18CD Lincoln, Nebraska

Facility ID 21165

Ch. 18 (Digital) 15 kW (MAX-DA)

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FCC Form 346, Section III (Digital)

Exhibit 11

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Attachment I	Antenna Relative Field Pattern
Table I	Interference Study Results

Exhibit 12

Statement B	Environmental Considerations
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This material supplies a “hard copy” of the engineering portions of this application as entered December 16, 2010 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 - ENGINEERING DATA (Digital)**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.

TECH BOX

1.	Channel Number: 18																																																																																																
2.	Translator Input Channel No. :																																																																																																
3.	Primary station proposed to be rebroadcast: <table border="1"><tr><td>Facility Identifier</td><td>Call Sign</td><td>City</td><td>State</td><td>Channel</td></tr></table>	Facility Identifier	Call Sign	City	State	Channel																																																																																											
Facility Identifier	Call Sign	City	State	Channel																																																																																													
4.	Antenna Location Coordinates: (NAD 27) Latitude: Degrees 40 Minutes 51 Seconds 10 <input checked="" type="radio"/> North <input type="radio"/> South Longitude: Degrees 96 Minutes 40 Seconds 36 <input checked="" type="radio"/> West <input type="radio"/> East																																																																																																
5.	Antenna Structure Registration Number: 1022906 <input type="checkbox"/> Not Applicable [Exhibit 10] <input type="checkbox"/> Notification filed with FAA																																																																																																
6.	Antenna Location Site Elevation Above Mean Sea Level: 349.6 meters																																																																																																
7.	Overall Tower Height Above Ground Level: 152.4 meters																																																																																																
8.	Height of Radiation Center Above Ground Level: 124 meters																																																																																																
9.	Maximum Effective Radiated Power (ERP): 15 kW																																																																																																
10.	Transmitter Output Power: 0.725 kW																																																																																																
11.	a. Transmitting Antenna: Before selecting Directional "Off-the-Shelf", refer to "Search for Antenna Information" under CDBS Public Access (http://licensing.fcc.gov/prod/cdbs/pubacc/prod/cdbs_pa.htm). Make sure that the Standard Pattern is marked Yes and that the relative field values shown match your values. Enter the Manufacturer (Make) and Model exactly as displayed in the Antenna Search. <input type="radio"/> Nondirectional <input type="radio"/> Directional "Off-the-shelf" <input checked="" type="radio"/> Directional composite Manufacturer PSI Model PSILP8DF-18 b. Electrical Beam Tilt: 1.0 degrees <input type="checkbox"/> Not Applicable c. Directional Antenna Relative Field Values: <input type="checkbox"/> N/A (Nondirectional or Directional "Off-the-shelf") Rotation (Degrees): 205 <input type="checkbox"/> No Rotation <table border="1"><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>1.000</td><td>10</td><td>0.983</td><td>20</td><td>0.939</td><td>30</td><td>0.850</td><td>40</td><td>0.745</td><td>50</td><td>0.634</td></tr><tr><td>60</td><td>0.521</td><td>70</td><td>0.405</td><td>80</td><td>0.296</td><td>90</td><td>0.223</td><td>100</td><td>0.165</td><td>110</td><td>0.101</td></tr><tr><td>120</td><td>0.049</td><td>130</td><td>0.023</td><td>140</td><td>0.019</td><td>150</td><td>0.028</td><td>160</td><td>0.045</td><td>170</td><td>0.064</td></tr><tr><td>180</td><td>0.077</td><td>190</td><td>0.071</td><td>200</td><td>0.051</td><td>210</td><td>0.028</td><td>220</td><td>0.017</td><td>230</td><td>0.035</td></tr><tr><td>240</td><td>0.080</td><td>250</td><td>0.125</td><td>260</td><td>0.168</td><td>270</td><td>0.224</td><td>280</td><td>0.304</td><td>290</td><td>0.409</td></tr><tr><td>300</td><td>0.525</td><td>310</td><td>0.640</td><td>320</td><td>0.750</td><td>330</td><td>0.849</td><td>340</td><td>0.932</td><td>350</td><td>0.987</td></tr><tr><td>Additional Azimuths</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></tbody></table>	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	Degrees	Value	0	1.000	10	0.983	20	0.939	30	0.850	40	0.745	50	0.634	60	0.521	70	0.405	80	0.296	90	0.223	100	0.165	110	0.101	120	0.049	130	0.023	140	0.019	150	0.028	160	0.045	170	0.064	180	0.077	190	0.071	200	0.051	210	0.028	220	0.017	230	0.035	240	0.080	250	0.125	260	0.168	270	0.224	280	0.304	290	0.409	300	0.525	310	0.640	320	0.750	330	0.849	340	0.932	350	0.987	Additional Azimuths											
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[Relative Field Polar Plot](#)

NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.	
12.	Out-of-channel Emission Mask: <input type="radio"/> Simple <input checked="" type="radio"/> Stringent
CERTIFICATION	
13.	Interference : The proposed facility complies with all of the following applicable rule sections. 47.C.F.R Sections 74.709, 74.793(e), 74.793(f), 74.793(g), 74.793(h), 74.794(b) and 73.1030. <input checked="" type="radio"/> Yes <input type="radio"/> No <div style="text-align: right;">See Explanation in [Exhibit 11]</div>
14.	Environmental Protection Act. The proposed facility is excluded from environmental processing under 47. C.F.R. Section 1.1306 (i.e., The facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments). Unless the applicant can determine RF compliance, an Exhibit is required. <input checked="" type="radio"/> Yes <input type="radio"/> No <div style="text-align: right;">See Explanation in [Exhibit 12]</div> <p>By checking "Yes" above, 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.</p>
15.	Channels 52-59. If the proposed channel is within channels 52-59, the applicant certifies compliance with the following requirements, as applicable: <input type="checkbox"/> The applicant is applying for a digital companion channel for which no suitable channel from channel 2-51 is available. <input type="checkbox"/> Pursuant to Section 74.786(d), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.
16.	Channels 60-69. If the proposed channel is within channels 60-69, the applicant certifies compliance with the following requirements, as applicable: <input type="checkbox"/> Pursuant to Section 74.786(e), the applicant has notified, within 30 days of filing this application, all commercial wireless licenses of the spectrum comprising the proposed TV channel and the first adjacent channels thereto, for which the proposed digital LPTV or TV translator antenna site lies inside the licensed geographic boundaries of the wireless licensees or within 75 miles and 50 miles, respectively, of the geographic boundaries of co-channel and adjacent-channel wireless licensees.

- ☐ Pursuant to Section 74.786(e), the applicant proposing operation on channel 63, 64, 68 and 69 ("public safety channels") has secured a coordinated spectrum use agreements(s) with 700 MHz public safety regional planning committee(s) and state administrator(s) of the region(s) and state(s) within which the antenna site of the digital LPTV or TV translator station is proposed to locate, and those adjoining regions and states with boundaries within 75 miles of the proposed station location.
- ☐ Pursuant to Section 74.786(e), the applicant for a channel adjacent to channel 63, 64, 68 or 69 has notified, within 30 days of filing this application, the 700 MHz public safety regional planning committee(s) and state administrator(s) of the region and state containing the proposed digital LPTV or TV translator antenna site and regions and states whose geographic boundaries lie within 50 miles of the proposed LPTV or TV translator antenna site.

PREPARERS CERTIFICATION ON PAGE 3 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 RICHARD H. MERTZ	Relationship to Applicant (e.g., Consulting Engineer) CONSULTANT	
Signature	Date 12/16/2010	
Mailing Address CAVELL, MERTZ & ASSOCIATES, INC. 7732 DONEGAN DRIVE		
City MANASSAS	State or Country (if foreign address) VA	Zip Code 20109 -
Telephone Number (include area code) 7033929090	E-Mail Address (if available) RMERTZ@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 11

Description: K18CD EXHIBIT 11

EXHIBIT 11 CONTAINS STATEMENT A, NATURE OF THE PROPOSAL, ALLOCATIONS CONSIDERATIONS; FIGURE 1; ATTACHMENT I; AND TABLE I.

Attachment 11

Description
K18CD Exhibit 11

Exhibit 12

Description: K18CD EXHIBIT 12

EXHIBIT 12 CONTAINS STATEMENT B, ENVIRONMENTAL CONSIDERATIONS, TABLE OF CONTENTS, AND A COPY OF THE ENGINEERING PORTIONS OF THE FCC FORM.

Attachment 12

Description
K18CD Exhibit 12

Exhibit 12-Statement B
ENVIRONMENTAL CONSIDERATIONS
prepared for
Colins Broadcasting Corporation
K18CD Lincoln, Nebraska
Facility ID 21165
Ch. 18 (Digital) 15 kW (MAX-DA)

Introduction

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.

The *Colins Broadcasting Corporation* ("Colins") herein proposes to "flash-cut" to digital operation low power television station K18CD. The proposed digital facility will operate on Channel 18 at the same site as the current K18CD analog operation (Facility ID 21165; see BLTTL-19990809JM).

A new directional transmitting antenna will be utilized at the same antenna height as the authorized analog directional antenna on an existing antenna support structure. No tower modifications or change in overall structure height is necessary to carry out this proposal. The tower has been registered with the Commission and assigned Antenna Structure Registration Number 1022906.

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 Electromagnetic Field

The proposed operation was evaluated for human exposure to radiofrequency electromagnetic field 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

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ENVIRONMENTAL CONSIDERATIONS
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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 K18CD digital Channel 18 antenna center of radiation will be 124 meters above ground level. An effective radiated power of 15 kilowatts, horizontally polarized, is proposed. Based on information provided by the antenna manufacturer, the antenna vertical plane pattern will have a maximum value of 22.6 percent (from 10° to 90° below the horizontal). Thus, 22.6 percent is employed 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 (10) 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 1.72 $\mu\text{W}/\text{cm}^2$ at two meters above ground level near the antenna support structure, or 0.52 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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ENVIRONMENTAL CONSIDERATIONS
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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. 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 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 nearby towers 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.