

# ENGINEERING EXHIBIT

Application for License to Cover  
Construction Permit  
prepared for  
**Palm Television, L.P.**  
WATM-DT Altoona, Pennsylvania  
Facility ID 20287  
Ch. 24 1,000 kW 311 m

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FCC Form 302-DTV, Section III

### Exhibit 7

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| Figure 1    | Vertical (Elevation) Plane Relative Field Pattern     |

*This material supplies a "hard copy" of the engineering portions of this application as entered May 19, 2005 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**

**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: 24   |                            |                                  |
| 2. | Operating Constants   |                            |                                  |
|    | Transmitter power output (average power at input to transmission line, after any filter attached to the transmitter, if used) |                            | Transmission line power loss     |
|    | 12.14 dBk   | 16.37 kW                   | 0.98 dB                          |
|    | Antenna Input power   | Maximum antenna power gain | Maximum effective radiated power |
|    | 11.161 dBk  | 18.839 dB                  | 30.00 dBk 1,000 kW               |
| 3. | Antenna Data  |                            |                                  |
|    | Manufacturer<br>SWR   | Model<br>SWEDMP24NC/24 CF  |                                  |

**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.**

**CERTIFICATION**

|    |   |   |
|----|---|---|
| 4. | <b>Main Studio Location.</b> The main studio location complies with 47 C.F.R. Section 73.1125.  | <input checked="" type="radio"/> Yes <input type="radio"/> No<br><br>See Explanation in [Exhibit 6] |
| 5. | <b>Constructed Facility</b> The facility was constructed as authorized in the underlying construction permit or complies with 47 C.F.R. Section 73.1690.  | <input type="radio"/> Yes <input checked="" type="radio"/> No<br><br>See Explanation in [Exhibit 7] |
| 6. | <b>Special Operating Conditions.</b> The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit.<br><br><b>An exhibit may be required.</b> Review the underlying construction permit | <input checked="" type="radio"/> Yes <input type="radio"/> No<br><br>See Explanation in [Exhibit 8] |
| 7. | <b>Transmitter.</b> The transmitter complies with 47 C.F.R. Section 73.1660.  | <input checked="" type="radio"/> Yes <input type="radio"/> No<br><br>See Explanation in [Exhibit 9] |

**APPLICATION FILED PURSUANT TO 47 C.F.R. SECTIONS 73.1675(c) OR 73.1690(c).**

Only applicants filing this application pursuant to 47 C.F.R. Sections 73.1675(c) or 73.1690(c) must complete the following section.

|    |  |  |
|----|--|--|
| 8. | <b>Changing transmitter power output.</b> Is this application being filed to authorize a change in transmitter power output caused by the replacement of an omnidirectional antenna with another omnidirectional antenna or an alteration of the transmission line system? See 47 C.F.R. Sections 73.1600(e)(1) and (e)(10). | <input type="radio"/> Yes <input type="radio"/> No |
|----|--|--|

|                                     |  |  |
|-------------------------------------|--|--|
| SECTIONS 73.1690(c)(1) and (c)(10). |  |  |
| 9.                                  | <p><b>Replacing a directional antenna.</b> Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(3) to replace a directional antenna with another directional antenna?</p> <p>If "Yes" to the above, the applicant certifies the following:</p>   | <p><input type="radio"/> Yes <input type="radio"/> No</p>  |
|                                     | <p>a. <b>Pattern of Directional Antenna.</b> The proposed theoretical antenna pattern complies with 47 C.F.R. Section 73.1690(c)(3). <b>Exhibit is required.</b></p>   | <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>See Explanation in [Exhibit 10]</p> |
| 10                                  | <p><b>Use a formerly licensed main facility as an auxiliary facility.</b> Is this application being filed pursuant to 47 C.F.R. Section 73.1675(c)(1) to request authorization to use a formerly licensed main facility as an auxiliary facility and/or change the ERP of the proposed auxiliary facility?</p> <p>If "Yes" to the above, the applicant certifies the following:</p>  | <p><input type="radio"/> Yes <input type="radio"/> No</p>  |
|                                     | <p>a. <b>Auxiliary antenna service area.</b> The proposed auxiliary facility complies with 47 C.F.R. Section 73.1675(a). <b>Exhibit is required.</b></p>   | <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>See Explanation in [Exhibit 11]</p> |
|                                     | <p>b. <b>Environmental Protection Act.</b> The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (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).</p> <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> | <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>See Explanation in [Exhibit 12]</p> |
| 11.                                 | <p><b>Change the license status.</b> Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(9) to change the license status from commercial to noncommercial or from noncommercial to commercial?</p> <p>If "Yes" to above, submit an exhibit providing full particulars. For applications changing license status from commercial to noncommercial, include Section II of FCC Form 340 as an exhibit to this application.</p>   | <p><input type="radio"/> Yes <input type="radio"/> No</p> <p>[Exhibit 13]</p>                    |

**PREPARER'S CERTIFICATION ON PAGE 6 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<br>JONATHAN A. SCHULTZ | Relationship to Applicant (e.g., Consulting Engineer)<br>CONSULTANT |
| Signature                   | Date<br>5/19/2005   |
| Mailing Address             |   |

CAVELL, MERTZ & DAVIS, INC.  
7839 ASHTON AVENUE

|  |   |                     |
|--|---|---------------------|
| City<br>MANASSAS                                   | State or Country (if foreign address)<br>VA                         | Zip Code<br>20109 - |
| Telephone Number (include area code)<br>7033929090 | E-Mail Address (if available)<br>JONATHAN.SCHULTZ@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 7

**Description:** EXHIBIT 7 - NATURE OF THE PROPOSAL - ENVIRONMENTAL CONSIDERATIONS

THE WATM-DT FACILITY AS INSTALLED DIFFERS FROM THE FACILITIES AUTHORIZED IN THE UNDERLYING CONSTRUCTION PERMIT ONLY IN THE FOLLOWING RESPECT: A SWR SWEDMP24NC/24 CF DIRECTIONAL ANTENNA HAS BEEN INSTALLED IN LIEU OF THE DIE TFU-24DSC-R S300 DIRECTIONAL ANTENNA NAMED IN THE CONSTRUCTION PERMIT. THE HORIZONTAL PLANE RELATIVE FIELD PATTERN AND ALL OTHER OPERATING CONSTANTS REMAIN UNCHANGED. SEE EXHIBIT 7 - NATURE OF THE PROPOSAL - ENVIRONMENTAL CONSIDERATIONS - ATTACHED AS PDF DOCUMENT

### Attachment 7

#### Description

EXHIBIT 7

Exhibit 7 - Statement A  
**NATURE OF THE PROPOSAL**  
**ENVIRONMENTAL CONSIDERATIONS**  
prepared for  
**Palm Television, L.P.**  
WATM-DT Altoona, Pennsylvania  
Facility ID 20287  
Ch. 24 1,000 kW 311 m

**Nature of The Proposal**

*Palm Television, L.P.* (“*Palm*”) is the licensee of television station WATM-TV, Ch. 23, Altoona, Pennsylvania, and holds a Construction Permit (“CP,” FCC File Number BPCDT-19991101AGQ) for the paired digital television (“DTV”) station WATM-DT, Ch. 24. *Palm* has completed construction and commenced operation of WATM-DT pursuant to Section 73.1620(a)(1) of the FCC Rules, and herein applies for license to cover the aforementioned CP. WATM-DT was constructed as authorized in the underlying CP, except that the CP authorizes a Dielectric model TFU-24DSC-R S300 directional antenna, and the antenna installed is a Systems With Reliability (“SWR”) model SWEDMP24NC/24 CF DT directional antenna with 0.75° of electrical beam tilt. However, this is an immaterial change in the authorized facility, as the horizontal plane relative field pattern of the installed SWR antenna is identical to the authorized Dielectric pattern. The installed antenna is oriented such that the main lobe is located at 63° True as authorized. No other changes to the authorized operating constants are proposed, and there will be no change in the resulting WATM-DT service area.

**Human Exposure to Radiofrequency Electromagnetic Field**

The vertical (elevation) plane radiation pattern of the installed SWR antenna, shown in **Exhibit 7 - Figure 1**, differs slightly from the vertical (elevation) plane pattern of the authorized Dielectric antenna. Accordingly, the WATM-DT operation was evaluated for human exposure to radiofrequency (“RF”) electromagnetic field based on the vertical plane pattern of the installed SWR antenna, using the procedures outlined in the Commission’s OET Bulletin No. 65 (“OET-65”). OET-65 describes a means of determining whether a proposed or authorized 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 installed transmitting system will comply with the cited adopted guidelines.

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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 DTV facilities, 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   | = | RF power density in microwatts/cm <sup>2</sup> |
| ERP | = | total average ERP in Watts                     |
| F   | = | relative field factor                          |
| D   | = | distance in meters                             |

*Palm* has installed a SWR model SWEDMP24NC/24 CF DT, such that its center of radiation is 64.6 meters above ground level. An effective radiated power of 1,000 kilowatts, horizontally polarized, is employed. The "uncontrolled/general population" limit specified in §1.1310 for Channel 24 (center frequency 533 MHz) is 355.3  $\mu$ W/cm<sup>2</sup>.

Calculations<sup>1</sup> were made based on the actual vertical plane pattern of the SWR antenna (see **Exhibit 7 - Figure 1**). These calculations, which assumed a uniform ground elevation above mean sea level, were made at one-foot intervals outwards from the base of the WATM-DT tower to a distance of 91 meters (300 feet), then at two-foot intervals to a distance of 183 meters (600 feet), then at ten-foot intervals to a distance of 914 meters (3,000 feet). The results of these calculations showed that WATM-DT's contribution to power density at two meters above ground level is *less than five percent of the general population/uncontrolled limit at all points more than 38 meters (125 feet) distant from the WATM-DT tower*. Within 38 meters of the WATM-DT tower, the maximum contribution to power density found at any location attributable to WATM-DT was 201.6  $\mu$ W/cm<sup>2</sup>, or 56.7 percent of the general population/uncontrolled limit.

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<sup>1</sup>Available upon request.

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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 (such as the case at hand) are categorically excluded from taking any corrective action in the areas where its contribution is less than five percent. Since WATM-DT meets the five percent exclusion test *at all ground level areas more than 38 meters from the WATM-DT tower*, the impact of other facilities near this site may be considered independently from WATM-DT, beyond the aforementioned distance. Within 38 meters of the WATM-DT site, the contributions to RF power density of the co-located WATM-TV analog facility and other nearby facilities were also evaluated. Calculations for each facility were based on that facility's ERP and antenna height above mean sea level as reported in the Commission's engineering databases and its respective distance from WATM-DT. For each facility considered, the *maximum contribution to power density at any location within 38 meters of WATM-DT* was calculated. Using the appropriate formulae from OET-65, the co-located WATM-TV and other nearby facilities, excluding WATM-DT, would contribute a total RF power density of 31.1% of the general population/uncontrolled limit. With the additional 56.7% contribution attributable to WATM-DT, the total contributions of all facilities involved becomes 87.8% of the general population/uncontrolled limit. A list of all stations considered is provided on the following page.<sup>2</sup>

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<sup>2</sup>The Commission's FM engineering database shows a Construction Permit for a booster facility for WFGI-FM, Channel 238B, Johnstown, Pennsylvania, located at the WATM-DT site. However, information provided by representatives of *Palm* reports that this booster facility has been removed from the tower and is no longer functioning. Therefore, this booster facility has not been considered for the purposes of the instant calculation.

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Stations Considered in Radiofrequency Radiation Calculation

| <u>Call Sign / File Number</u> | <u>Channel</u> | <u>City, State</u>          |
|--------------------------------|----------------|-----------------------------|
| WATM-DT                        | 24             | Altoona, Pennsylvania       |
| WATM-TV                        | 23             | Altoona, Pennsylvania       |
| WTAJ-TV                        | 10             | Altoona, Pennsylvania       |
| WKBS-DT                        | 46             | Altoona, Pennsylvania       |
| WKBS-TV                        | 47             | Altoona, Pennsylvania       |
| W41CF                          | 41             | Altoona, Pennsylvania       |
| W57BM (STA)                    | 57             | Somerset, Pennsylvania      |
| WFGY(FM)                       | 251B           | Altoona, Pennsylvania       |
| BNPED-20000405ABS (APP)        | 212A           | Bellwood, Pennsylvania      |
| WBRX-FM1 (Booster) (APP)       | 232D           | Altoona, Pennsylvania       |
| WWOT(FM)                       | 261B1          | Altoona, Pennsylvania       |
| W272AD                         | 272D           | Altoona, etc., Pennsylvania |
| WALY(FM)                       | 280A           | Bellwood, Pennsylvania      |
| WRKY-FM                        | 285A           | Hollidaysburg, Pennsylvania |

**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 locked fences. Additionally, appropriate RF exposure warning signs will continue to be posted.

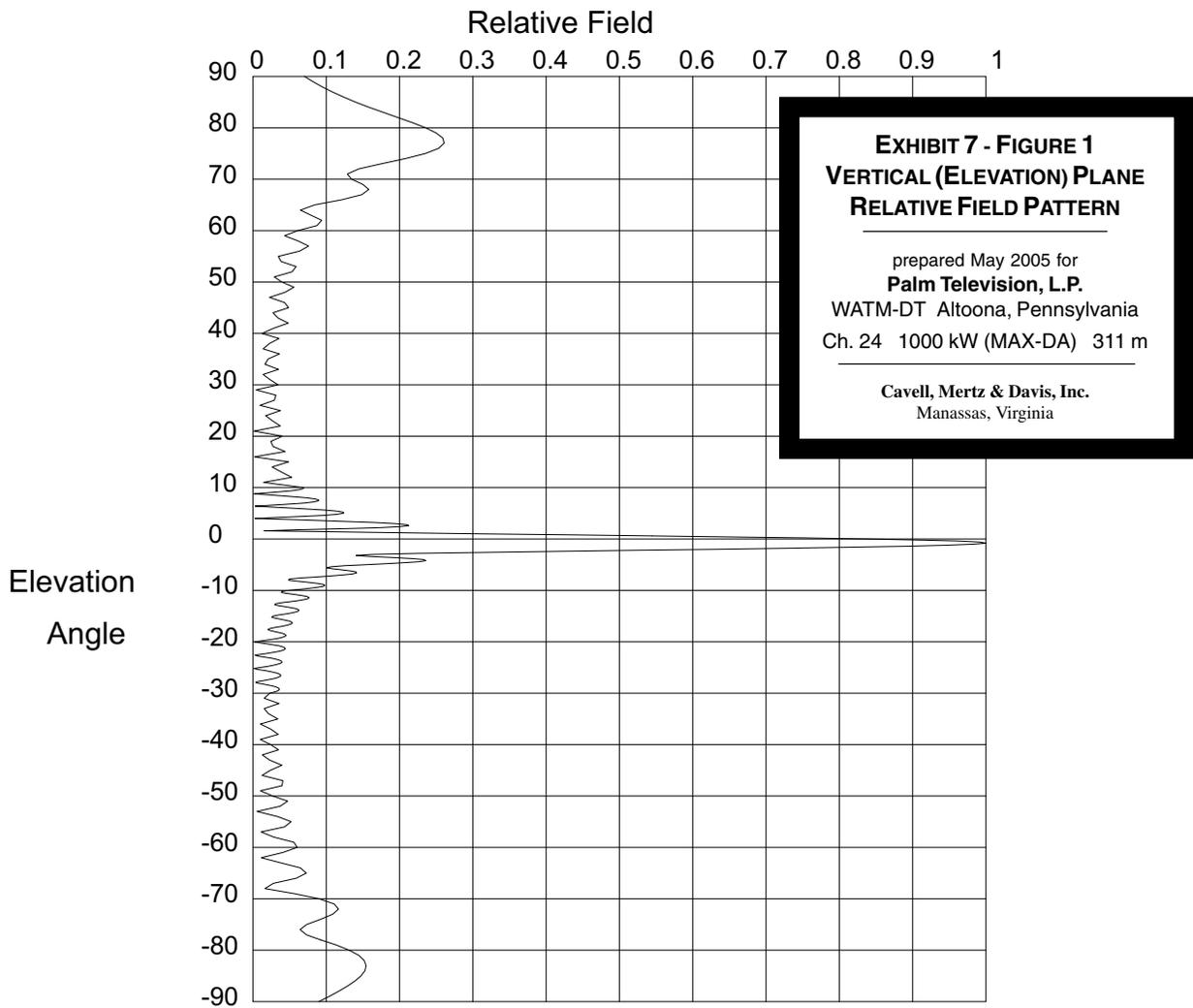
With respect to worker safety, it is believed that based on the preceding analysis, excessive exposure would not occur in areas at ground level. A site exposure policy will be employed protecting maintenance workers from excessive exposure when work must be performed on the tower in areas where high 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

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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 is in compliance with 1.1307(b) of the Rules. Hence preparation of an Environmental Assessment is not required.



## Elevation Pattern

Scale: Linear

Units: Field, Relative

## Systems With Reliability

CLIENT: *WATM-TV*

Date: 10/28/2004

ANTENNA TYPE: SWEDMP24NC/24 CF

FREQUENCY: 533

PATTERN POL.: Horizontal

DIRECTIVITY(Peak): 25.422/14.052 dBd

Beam Tilt (Deg.) : -75

DIRECTIVITY(Horiz): 17.934/12.537 dBd

Null Fill(s)(%) : 15, 10, 5