

## **PUBLIC NOTICE DA 00-1407**

**Released: June 26, 2000**

## PART 15 UNLICENSED MODULAR TRANSMITTER APPROVAL

Product Name: AutoRADIO

Brand Name: Thermo

FCC ID: MCO-AR900

Canada: 2246A-AR900

Applicant: Thermo Electron

To whom it may concern,

This letter states the device in the subject comply with PART 15 UNLICENSED MODULAR TRANSMITTER APPROVAL 8 requirements of DA 00-1407 as follow:

1. The modular transmitter must have its own RF shielding. This is intended to ensure that the module does not have to rely upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with Part 15 limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-compliant operation. Figure 1 shows a photo of the EUT in which the modular transmitter has its own RF shielding.



Figure 1. A Photograph of the modular transceiver

2. The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with Part 15 requirements under conditions of excessive data rates or over-modulation. Please see the block diagram in Figure 2, which shows a block diagram of the modular transmitter. The applicant use an ARM-7 micro processor as buffered modulation/data inputs for complying with Part 15 requirements

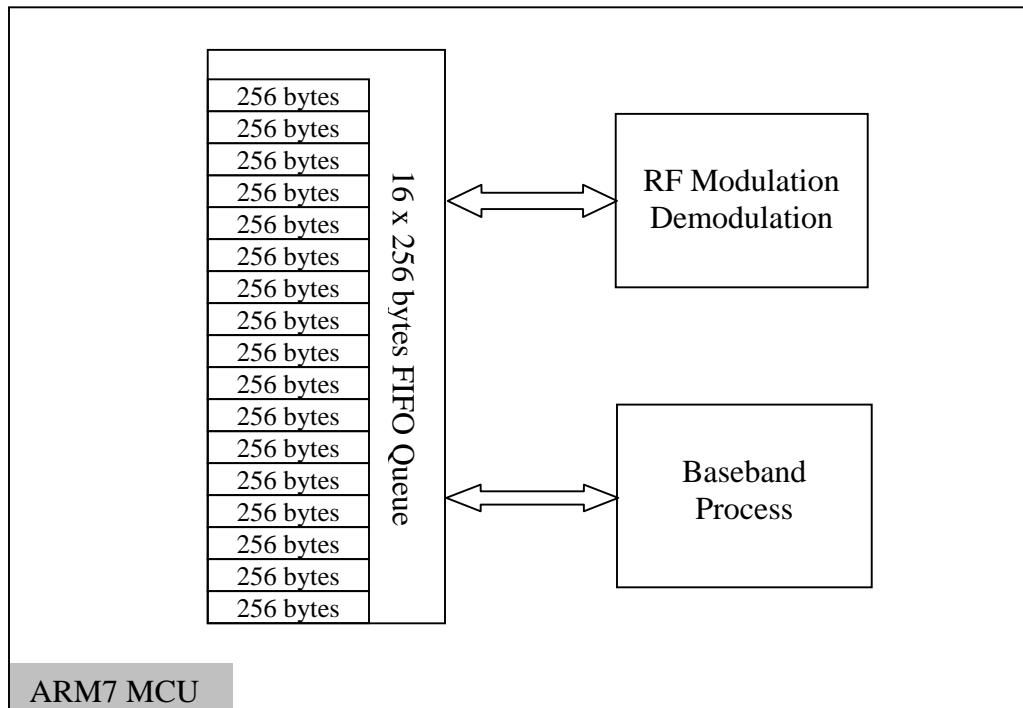


Figure 2. A block diagram of the baseband system showing the data buffer

3. The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 requirements regardless of the design of the power supplying circuitry in the device into which the module is installed. Figure 3 is the circuitry block diagram of the applicant-designed power supply regulation in the device.

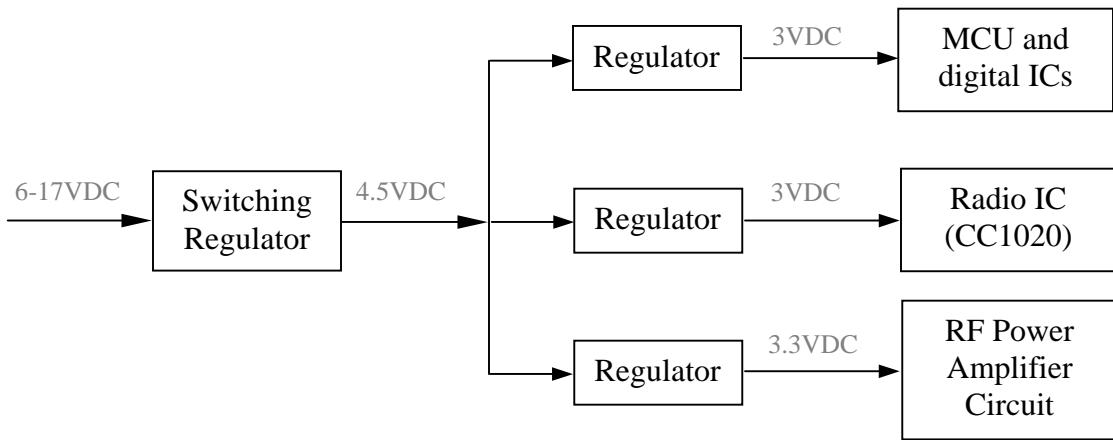


Figure 3. The regulated power supply block diagram of the modular transceiver

4. The modular transmitter must comply with the antenna requirements of Section 15.203 and 15.204(c). The antenna must either be permanently attached or employ a “unique” antenna coupler (at all connections between the module and the antenna, including the cable). Any antenna used with the module must be approved with the module, either at the time of initial authorization or through a Class II permissive change. The “professional installation” provision of Section 15.203 may not be applied to modules. Please see Figure 4 showing the external photo of EUT and Antenna Spec. The antenna employs a “unique” antenna coupler (at all connections between the module and the antenna, including the cable).

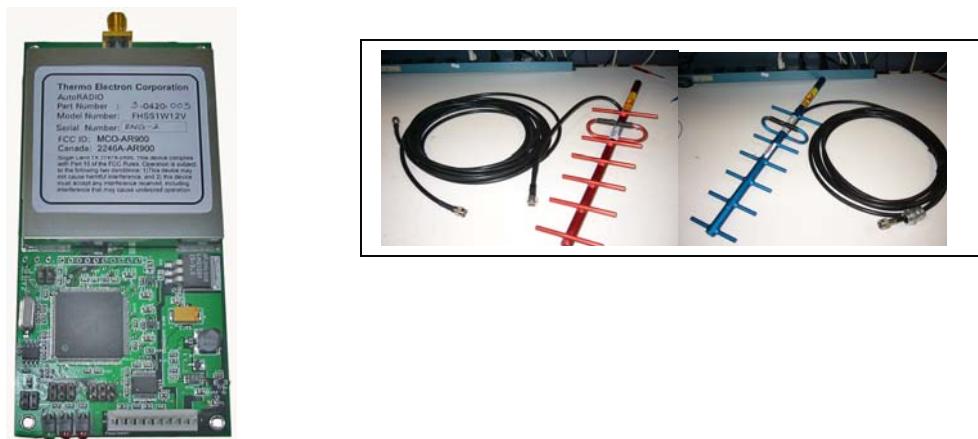


Figure 4. External photo to the EUT, and connectors to the antenna

The radio antenna connector is of SMA type. Designated as J182 (see Figure 4 and schematic). Maximum radiated power of the antenna is 7 dB making the total ERP of the transmitted power output of 36dB.

5. The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing. This is intended to demonstrate that the module is capable of complying with Part 15 emission limits regardless of the device into which it is eventually installed. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in Section 15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will be marketed with the module (see Section 15.27(a)). The length of these lines shall be length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified or commercially available (see Section 15.31(i)). Please see Figure 5 showing the testing photo and external photo of EUT. The applicant has supplied a stand-alone configuration to the module transmitter during the test. And DC power lines connected to the module absolutely have no ferrites and the length is fixed.



Figure 5. The stand-alone test setup to the transmitter with the radio mounted inside RTU with wires and power line length fixed.

6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID is not visible when the module is installed inside another device, then the

outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: XYZMODEL1" or "Contains FCC ID: XYZMODEL1." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization. Please see the FCC Statement in user manual attached.

7. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements. A copy of these instructions must be included in the application for equipment authorization. For example, there are very strict operational and timing requirements that must be met before a transmitter is authorized for operation under Section 15.231. For instance, data transmission is prohibited, except for operation under Section 15.231(e), in which case there are separate field strength level and timing requirements. Compliance with these requirements must be assured. Please see the user manual for more details user and installer learn how to use the radio as attached.

8. The modular transmitter must comply with any applicable RF exposure requirements. For example, FCC Rules in Sections 2.1091, 2.1093 and specific Sections of Part 15, including 15.319(i), 15.407(f), 15.253(f) and 15.255(g), require that Unlicensed PCS, UNII and millimeter wave devices perform routine environmental evaluation for RF Exposure to demonstrate compliance. In addition, spread spectrum transmitters operating under Section 15.247 are required to address RF Exposure compliance in accordance with Section 15.247(b)(4). Modular transmitters approved under other Sections of Part 15, when necessary, may also need to address certain RF Exposure concerns, typically by providing specific installation and operating instructions for users, installers and other interested parties to ensure compliance. Please see attached user manual for the FCC Statement in which more details are provided such as specific installation and

operated instructions for users, installers and other interested parties ensuring the compliance.