

## Exhibit 12. Transmitter Description -----47 CFR. 2.1033 (c) 4,5,6,7,8

### 12.1. Transmitter Technical Characteristics

This trunked radio transceiver is of the receive first type, meaning it must first find, acquire and lock onto a control channel from a predefined set of control frequencies assigned to a compatible base station. Transmission is not possible until acquisition and lock has been achieved, then it is limited to transmission of service request bursts on the digitally modulated reverse control channel. Upon recognition of a proper request, the control channel base station transmitter will then assign the transceiver a traffic channel for transmission of digital circuit switched or packet switched data from the set of frequencies for which the trunking system is licensed.

In addition to controlling the assigned frequency to which the transceiver will be slaved, the base station frequency serves as an accurate, stable reference for the transceiver local reference oscillator by virtue of an AFC function inherent in the acquisition and lock process.

The base station allocates the number of 15ms time division multiplex (TDM) time slots in which the transceiver transmits, depending on the user requested transmission mode. The trunking system protocol for data transmission uses a 90ms frame divided into six 15 ms time slots. These slot allocations are summarized in Table 12.1 below.

Transmission Mode	Time Slots Allocated Per Frame	Duty Cycle
1:6 Circuit Switched Data Mode	1	16.67%
1:3 Circuit Switched Data Mode	2	33.33%
Packet Data Mode	up to 81 of 120 slots	up to 67.5%

Table 12.1: Time Slot Allocation Table

### RF Power Output

Transmitter output power may be automatically attenuated by up to 24 dB below the maximum transmitter output power setting upon receipt of a command signal from the base station to prevent base station receiver overload. The user has no control over this setting.

The nominal mean average power available at the antenna connector for the various transmission modes and for the minimum and maximum power settings are summarized in the Table 12.2 below:

Transmission Mode	Pulse Average Power at Minimum Power Setting (W)	Pulse Average Power at Maximum Power Setting	Frame Average Power at Minimum Power Setting (W)	Frame Average Power at Maximum Power Setting (W)
1:6 Circuit Switched Data Mode	0.0024	0.7	0.0004	0.1167
1:3 Circuit Switched Data Mode	0.0024	0.7	0.0008	0.2333
Packet Data Mode	0.0024	0.7	0.00162 (over 20 frames)	0.4725 (over 20 frames)

Table 12.2: RF Power Output

- A. Pulse Average Output Power 0.0024 W--0.7 W Maximum
- B. Frequency Range 806-821 MHz
- C. Frequency Stability 1.9 PPM \*
- D. Emission Designator 18K3D7W (See Ex. 6-2)
- E. Spurious Emissions < -16 dBm
- F. DC Voltage and Current into the final RF amplifier stage/stages 
3.6 Volts DC nominal  
240 mA mean current at 1:6 Mode  
480 mA mean current at 1:3 Mode  
972 mA mean current at Packet Mode

\* See exhibit 6.6

12.2. Transmitter Application

The radio is characterized by the following features, options, and accessories.

**A. DC Power Cables Available:**

- Power cable for connection to vehicular supply voltage
- Ignition sense cable for on/off control

**B. Antennas Available:**

- Magnetic base
- Window mount
- Roof mount

**C. Maximum Transmit Channel Capability**

All channels in the 806-821 MHz band that are a multiple of 12.5 kHz. This includes EA based SMR service channels.

**D. Housing**

The transmitter will be housed in the housing shown in the accompanying photographs.

**E. Other Accessories/Options**

Data cable

**12.3. Transmitter Programmability**

The subject transmitter complies with 47 CFR 90.203 in that it is not front panel programmable by the operator. The transmitter internal control computer automatically selects one of the preprogrammed frequency channels in coordination with the trunking systems control channel. The transceivers authorized transmit frequency list is preprogrammed at the factory and can not be changed by the operator.

The programming of available transmitter frequency channels by an authorized service person is accomplished by the use of a personal computer using MS-DOS, a Level Shifter card, and licensed "Radio Service Software" (RSS).

No operation, receive or transmit is permitted during programming of the portable radio. The transceiver can transmit only after it's receiver has acquired and locked onto the base station. The maximum frequency error of the transceiver is 1.9 PPM based on the base station meeting the FCC requirement of 1.5 PPM. This locking ensures an accurate transmission frequency. For further description please refer to exhibit 6.6.