

Confidentiality Requested

Exhibit 12. Transmitter Description -- Pursuant 47 CFR 2.1033(c)

12.1 Transmitter Technical Characteristics --2.1033(c) 4, 5, 6, 7, 8

This handheld trunked TDM 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 channel frequencies assigned to a compatible base station. Transmission is inhibited until control channel 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 voice, circuit-switched data, or packet-switched data from the set of frequencies for which the trunking system is licensed.

The technical capability of the transceiver exceeds FCC emissions requirements for the 806 – 821 and 896 – 901 MHz range for which companion base stations are authorized in the United States. It is expected that this handheld transceiver marketed in the United States will also be used for itinerant roaming operation outside the United States with companion base stations that may operate anywhere within the broader frequency range the 806 – 825 and 896 – 901 MHz. It is also expected that this transceiver type will be marketed outside the United States and brought into the United States for itinerant “roaming” operation on compatible the 806 – 821 and 896 – 901 MHz base stations located in the United States. Thus performance data is provided to substantiate FCC compliant operation with a companion base station over the broader international the 806 – 825 and 896 – 901 MHz band expected in use of this handheld transceiver outside the United States.

When the transceiver is operating in the 896-901 MHz frequencies, the transceiver will be operated on frequencies midway between those of the channels given in table 4B of 47CFR90.617(d).

The trunking system basic protocol uses a 90ms frame divided into six 15 ms time slots. The base station allocates the number of 15 ms time division multiplex (TDM) time slots in which the transceiver transmits that depend on the user requested transmission mode. Packet data transmission uses 15ms time slots in a 1.8 second frame. These slot allocations are summarized in Table 12-1.

In addition to controlling the assigned frequency to which the transceiver will be slaved, the compatible base station frequency serves as an accurate, stable reference for the transceiver local reference oscillator by virtue of a transceiver AFC function inherent in the acquisition and lock process. The RF output power of the transceiver also is dynamically controlled by the radio, which senses the received signal strength and adjusts transmitter output power in approximately 1dB steps over the range from rated power to 39 dB cutback.

Transmission Service Mode	Time Slots Allocated	Modulation
1.) Dispatch (push-to-talk)	One 15 ms slot	Quad-16MQAM
2.) Telephone Interconnect	One or two 15 ms slots, (or 2 half 15 ms slots) ^{##} (Service provider selectable)	Quad-16MQAM
3.) Circuit-Switched Data*	Two 15 ms slots	Quad-4MQAM, Quad-16MQAM, Quad-64MQAM
4.) Packet-Switched Data ^{*#}	One to six 15 ms slots in any particular frame (up to a maximum of 81 slots in 20 contiguous frames)	Quad-4MQAM, Quad-16MQAM, Quad-64MQAM

Table 12-1: TDM Time Slot Allocation

* via a buffered serial port at an input rate of 115.2 Kbps maximum for RS-232 cable or a maximum of 12,000 Kbps for USB cable.

^{*#} via an internal world wide Web browser.

^{##} Split 3:1 TDM interleaving format

12.1.1 800 MHz Band Operation:

- A. Output Power 0.135 to 640 milliWatts (Pulse average)
- B. Maximum Antenna Gain -1.5 dBd
- C. Maximum ERP 454.5 milliWatts (Pulse average)
- D. Frequency Range 806-825 MHz**
- E. Frequency Stability ≤ 0.4PM *
- F. Emission Designator 18K3D7W
- G. Spurious Emissions < -15 dBm
- H. Maximum DC Voltage and Current during a transmit slot 4.0V in transmit slot[#]
<1.214 A in transmit slot[#]
(at nominal battery voltage)

12.1.2 900 MHz Band Operation:

- A. Output Power 0.142 to 640 milliWatts (Pulse average)
- B. Maximum Antenna Gain 0.4 dBd
- C. Maximum ERP 695.2 milliWatts (Pulse average)
- D. Frequency Range 896 – 901 MHz**
- E. Frequency Stability ≤ 0.4 PPM *
- F. Emission Designator 18K3D7W
- G. Spurious Emissions < -15 dBm
- H. Maximum DC Voltage and Current into the final RF Amplifier stage (at nominal Battery voltage) 4.0 V in transmit slot[#]
<1.118 A in transmit slot[#]

** See Exhibit 12.1

* See Exhibit 6e

See Exhibit 6.1.3

12.2 Bluetooth Application

The i605 is a monolith product based on the i860 and is the first iDEN Bluetooth enabled handset. Bluetooth is used for short range wireless communications that do not require high data rates. The pico-net is the term used for a connection between a “master” and one or more “slaves”. The “master” sets up and maintains the pico-net that the “slaves” are part of. A pico-net has a maximum of 7 “slaves” and only one “master”. Members of a pico-net typically are not shared between pico-nets. The sharing of members can be done (called “scatter-net”) but will not be supported by our implementation. At this time, the i605 project will only support a “point to point” connection (only one slave at a time). There are two different types of links: Asynchronous Connection-Less (ACL) and Synchronous Connection Oriented (SCO). The ACL is used for maintenance of the link and for data applications. This type of link uses different packet sizes to improve data rate and error correction mechanisms. The SCO link is mainly used for real-time voice applications, where more data is necessary, sacrificing error correction mechanisms. For battery life improvements, when there is no BT activity the BT protocol has a “sniff” mode of operation. Once the Master and the Slave have established the BT link, both the Master and Slave go to “sleep” and communicate with each other in an established time interval to maintain the BT link. This time interval is called “sniff duty cycle”.

12.3 Bluetooth Technical characteristics:

Modulation = GFSK

Band of Operation = 2.4 - 2.4835 GHz (1MHz channel bandwidth)

Frequency Hopping: 1600 hops per second (translates to 625uS transmission)

BT Maximum Data Rate = 1Mb/s

Data rate will be limited by the UART speed.

It is classified as a CLASS 2 BT device.

Rated power is from +4 to -6 dBm, with a typical of 0dBm.

12.4 Transmitter Application

The following features, options, and accessories characterize the radio product:

Power Supplies:

6 mm High Performance Battery (**SNN5705**)

10 mm Maximum Capacity Battery (**NNTN4655**)

This radio product contains a built in battery charger which charges the attached battery from an external DC power supply. Additional DC power supplies are available with which the radio may be operated:

Rapid Travel Charger (NNTN4680, NNTN4963, with international variations –NNTN4842, NNTN4843, NNTN4844, NNTN4958, NNTN4959)

Switching Mid Rate Travel Charger (NNTN4841 with international variations – NNTN4947, NNTN4948, NNTN4949, NNTN4950)

Body-worn Accessories:

Holster (NNTN5913)

Car Accessories Available:

Easy install hands free car kit (NNTN4744)

Vehicle Power Adapters (NNTN4679, NNTN5165)

Universal dash mount holder (NNTN5113)

Hard Install Car Kit Base (NNTN4846)

Pro Install Car Kit Cradle (NNTN5879)

Data Cables / Adapters Available:

RS-232 Data Cable (NKN6560, NNTN5406)

USB Cable (NKN6559, NNTN5405)

Audio Accessories:

Light Duty Remote Speaker Mic (NSN6066)

Stereo/Phone audio mix headset, PTT (NNTN5751)

Stereo/Phone audio mix headset, Standard (NNTN5752)

Surveillance Ear Piece (NNTN5211)

PTT headset (NNTN5004, NNTN5005, NNTN5006, NNTN5330)

Housing:

The transmitter will be housed in a housing as shown in the accompanying photographs (Exhibit 3 and 9). There will also be several variations of bezel color, housing shape, and keypad color and shape. All transceivers will be identical from a standpoint of hardware operation and internal circuitry.

12.5 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 cannot be changed by the operator.