Monday, August 20, 2001

To: Joe Dichoso
jdichoso@fcc.gov
FCC Application Processing Branch

From: Gregory Snyder, Washington Laboratories, Ltd.

Re: FCC ID PB8P4432-150
Applicant: Dassault Automatismes & Telecommunications
Correspondence Reference Number: 19470
731 Confirmation Number: EA100704

Following are the questions raised by the FCC review of the above referenced application. Each question has been answered (see italicized text) and, where appropriate, new exhibits have been uploaded.

1) Block diagram showing all frequencies and oscillators.

A new block diagram of the Stamptronics FHSS radio block has been uploaded.
File: "Stamptronics Block Diagram.pdf"

2) Provide the technical description for the base unit. The technical description supplied is for the portable unit.
The pseudorandom sequence appeared to not comply. It did not meet the definition in Section 2.1 for FHSS systems. You may want to go ahead and also indicate how the device complies with the non-coordination requirement requested in the previous application.

A new "Description of Transmission" document ("Artema FHSS Description.pdf") has been uploaded which includes both the hand-held and base units.
The pseudorandom sequences are described on page 6 of the new "Description of Transmission" (see Channel Table). What is called "Table 0" is actually a feature used only for test purposes. The operational tables (Table 1, 2 & 3) are pseudorandom.

3) Indicate the antenna and antenna gain, and antenna location to justify the 1.5 cm distance RF separation distance.

The antenna is a unipole, quarter wave type and the gain is lower than 0dBi. A drawing of the antenna, Model 4432-601A502, has been uploaded as "Artema FHSS Antenna.pdf". Also, the distance from the antenna to the outside of the case is approximately 0.5cm. Since this distance does not provide the necessary calculated minimum distance, Power spectral density measurements were performed around the unit near the antenna and in all directions and the highest recorded levels for each 3 channels tested were:

Channel	*Measured Level*	*Limit*
Channel 0, 903.8MHz:	*0.186mW/cm^2*	*0.61mW/cm^2*
Channel 24, 907.4MHz:	*0.173mW/cm^2*	*0.61mW/cm^2*
Channel 49, 911.15MHz:	*0.164mW/cm^2*	*0.61mW/cm^2*

All measured levels are well within the Power Spectral Density limits for exposure.

4) Each frequency must be used equally on the average by each transmitter. Except for voice systems, each new transmission must start at a different point in the sequence so that on average the full sequence is used. Therefore, Describe where the next transmission starts when all frequencies are not used

for a previous message. This is required because some transmissions may need only a few frequency hops to be completed. i.e. If the transmission started on the same frequency each time, this frequency would be used more than the others if many short transmissions were sent.

The next transmission starts with the next channel in the hopping table sequence. For example, if a short transmission starts with the first channel in the hopping table and needs only 8 hops to complete the transmission, the next transmission will start with the ninth channel in the hopping table sequence.

5) Section 15.247(a)1 indicates that the system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. Please explain how the device complies with this rule when a packet is repeated or when multiple packets are sent. What is the receiver input bandwidth? How does the receiver shift frequencies and determine which frequency to shift to in order to synchronize with this transmitter?

The receiver uses a VCO to rapidly shift frequencies in synchronization with the transmitted signals, based on the hopping table that was chosen during the acquisition procedure.

When a packet is repeated , it is transmitted on the next hopping channel, which is a different frequency.

The receiver input bandwidth is limited by the filters on the receiver, which have a passband of +/- 50kHz at 3 dB.
The adjacent channel rejection is 20dB

The receiver shifts frequencies with the following procedure:
After changing to a new hopping frequency, the microcontroller sends a command to the VCO to shift frequencies. It waits until the VCO has stabilized, then activates the receiver chip, and starts to process the data from the received signals.

6) External photo's

External photo exhibit (“External Photos.pdf”) has been uploaded.