Date: Tue, 7 Jul 1998 13:54:53 -0400
From: oetech@fccsun07w.fcc.gov (OET)
To: trephonc@macconnect.com
Subject: ADDITIONAL INFORMATION ON FCC ID: KINAIRPRO-SE
[Correspondance ID: 1735]

ONLY RESPOND ELECTRONICALLY TO ANSWER ALL OF THE FOLLOWING ITEMS. DO NOT SUBMIT A PARTIAL RESPONSE ELECTRONICALLY. PARTIAL RESPONSES MUST BE SEND VIA STANDARD METHODS LIKE FAX, EMAIL OR MESSENGER SERVICE. YOUR COOPERATION IS APPRECIATED.

1. This application is for 4 different transmitters. They operate with two different modulation schemes, different maximum output powers and over slightly different operating frequency ranges. In my opinion, two separate applications should have been filed for these transmitters, one for the Airpro models 19.2 and 64 and one for the Airpro models 128 and 256. Nevertheless, I will authorize them under the same FCC ID number (THIS TIME ONLY) but I need to see test data for all models in all modes of operation.

The following were not provided:
(a) Minimum bandwidth plots for the Airpro models 19.2, 64, and 128 (Only plots for the 256 were provided. Be sure these plots show compliance with the requirement to be 20 dB down at the bandedge),

SEE PLOTS LABELED 6dB SUBMITTED 22 JULY

(b) Antenna conducted plots for the Airpro models 64, and 128 (Only plots for the 19.2 and 256 were provided),

SEE PLOTS LABELED ANT SUBMITTED 22 JULY

(c) Power spectral density measurements for the Airpro models 19.2, 64, and 128, (Only plots for the 256 were provided)

SEE PLOTS LABELED PSD SUBMITTED 22 JULY

(d) Processing gain measurements for one of the modulation schemes (BPSK and MSK modulation is used but only one set of processing gain results were provided and they were not identified),

The Processing Gain document which accompanied the AIRPRO-SE document included measurements for a BPSK radio.
However, there is no difference between MSK vs BPSK in the final analysis, since the processing gain baseline performance for both is 10^{-4}. The result of 12.8 dB for the processing gain is based on a <u>non-coherent</u> receiver.

(e) AC line conducted test results for the Airpro models 19.2, 64, 128 and 256 (None were provided).

SEE PLOTS LABELED AC SUBMITTED 22 JULY

2. For the processing gain test results provided, the S/N value of 12.8 dB seems too high for BPSK modulation @ a BER of 10 to the -4 power. Please justify it. My standard curves for BPSK and MSK modulation show a S/N value of 8.8 dB.
Please refer to documents process1.jpg through process3.jpg submitted on 11 July 1998. The charts are for both coherent and noncoherent receivers. The figure of 8.8 dB with a given S/N of 10¯4, is for a coherent receiver. The chart clearly demonstrates and supports our measurements that a <u>noncoherent receiver</u> is capable of a S/N of 12.3. (I believe the 12.8 dB figure quoted in your question is the processing gain.)

3. Please justify your duty cycle correction factor of -8 dB used on the radiated emissions test results. This transmitter operates in full duplex mode, i.e., a duty cycle correction of -6 dB. Where's the extra 2 dB?

THE TRANSMITTER TIMING IS NOT QUITE SYMMETRICAL, TO ALLOW FOR PATH DELAY AND RX/TX DELAY IN REMOTE UNIT. ON TIME = 3.4 MS, PULSE TRAIN = 8.5 MS, DF = -8dB. SEE CHARTS LABELED DUTYON.JPG AND PLSTRAIN.JPG SUBMITTED 22 JULY

4. Provide a copy of the installation instructions that will be provided to the professional installer that notifies him when the output power of this transmitter must be reduced below the maximum output power level. I see no idication in the theory of operation that this is automatically performed by software in the transmitter.

SEE WORD DOCUMENT CALLED AIRAMMEND.DOC SUBMITTED 22 JULY

5. Please address Section 15.247(b)(4) and the operation of this transmitter in a manner that ensures the Commission's RF safety guidelines will be met. Specific installation instructions for each type of antenna may be provided as indicated in Section 3 of Supplement C to OET Bulletin 65. Supplement C may be obtained from our website at www.fcc.gov/oet/info/documents.

SEE WORD DOCUMENT CALLED AIRAMMEND.DOC SUBMITTED 22 JULY