



Date: 1st March 2002

Mr. Martin Perrine  
Authorization & Evaluation Division  
Federal Communications Commission Laboratory  
7435 Oakland Mills Road  
Columbia, MD 21046

Re: Form 731 Confirmation Number: EA823993 with FCC ID: AZ489FT5818.

Dear Mr. Perrine;

Motorola Inc., 8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322, herein submits its response to the 27 February 2002 request for information in Correspondence Number 22103.

- 1) The transmitter is capable of being tuned to operate over the frequency range from 806 to 825 MHz to support both domestic and foreign operation. Operating frequency within that range is controlled by signaling from the licensed base station. This equipment is precluded from operation in the USA up to 825 MHz since no companion base stations have or can be licensed there under part 90.

We rate this equipment by RF output power, not ERP. Output power is tuned at the factory, as noted in Exhibit 4.4, using special software not available to operators. Output power is tuned, in discrete steps via a step attenuator in integrated circuit U506 (see Figures 4.3 and 4.4), to the rated value of 0.60 watts. Considering manufacturing variations we rate output power as 0.70 watts maximum. Because of the resolution of the step attenuators it is not likely that any particular radio can be set exactly to the maximum limit.

- 2) The requested block diagram is provided in attached new Exhibit 4.6.
- 3) An attenuator of 10 dB was inserted between the spectrum analyzer and the test radio that was functioning at the normal operating power level circa 27.8 dBm. This reduces the signal into the analyzer to a level of 17.8 dBm. This is the level that might have been displayed except for the fact that the occupied bandwidth measurement utilized the peak hold feature of the spectrum analyzer, and the signal has a peak to average ratio on the order of 5.7 dB. This brings the expected display value to 23.5 dBm. We attribute the difference between this expectation and the actual displayed levels to attenuator and spectrum analyzer accuracy uncertainties.

- 4) CW is used for ERP measurements for best results with the antenna measurement system utilized. Special test software is loaded to generate this single carrier signal compared to the normal four subcarrier signal produced by digitally modulating the in-phase (I) and quadrature (Q) component signals shown in Figure 4-3. CW modulation is produced using special test software by disabling the modulation inputs to U801, and setting the attenuator for the Q channel to a maximum so only a single I-channel signal emanates from U506. Prior to ERP testing the radio output power is measured using a power meter while the I-channel attenuator setting is specially adjusted to a level closest to that produced by the radio when it is digitally modulated in normal operation. Due to attenuator resolution the output power so set will be close to, but not exactly equal to, that measured with normal digital modulation operational software or the maximum power rating.

Because the output power so set is not exactly equal to the maximum output power rating then the ERP measured with the test radio needs to be scaled to the rated value by the ratio of rated digitally modulated output power to measured CW output power. For this reason Exhibits 6.8.1 and 6.8.2 contain the calculation process by which this is done for ERP measurement using the substitution antenna method.

- 5) All radiated spurious emissions were measured employing a peak detector while utilizing the Max Hold function on the Rohde & Schwarz ESI 26 EMI Test Receiver/Spectrum Analyzer stated in Exhibit 7.6.1. The Max Hold function saves for each sweep the largest of the previously stored/currently measured values in the trace memory. Using Max Hold, the detector is automatically set to Max Peak. The maximum spurious power level at each frequency is captured by virtue of the fact that the transmission pulses are peak detected at the analyzer at a rate faster than the rate at which the transmitter angular and search antenna vertical positioning vary.

Further, the following information is provided regarding your inquiry on the SAR Report in Exhibit 11.

- 1) When a wrist strap is used, the intended position of the DUT is to be hanging below the user's wrist towards the user's hand. The wrist and hand have a SAR limit of 4.0 W/kg averaged over any 10g of tissue. During the FCC - TCB training workshop held during August 25-27, 2001, it was indicated that, because there has not been any issues with demonstrating SAR compliance in the hand, this would not be requested for future submissions. Also, there are no measurement procedure guidelines for measuring SAR in the hand or wrist stated in OET Bulletin 65 Supplement C.
- 2) The term Conducted Output Power level used on pages 4 through 8 corresponds to the output power of the unit assessed when measured on a conducted basis in the manner stated in Exhibit 7.1. The attenuator for that radio was set to provide

the highest attainable output power below the rated 700 milliWatt (28.45 dBm) rating. All power levels reported at the stated test frequencies were within the 5% power setting allowance stated in Supplement C Edition 01-01.

- 3) We confirm that faceplates other than the silver faceplates have a non-metallic finish.
- 4) Retractable half-wave antenna number 8504163G02 is an integral antenna supplied with the radio. No external antenna is offered. Information requested on our only hands free accessory (for in-vehicle use) is provided in attached new Exhibit 12.4. The need for audio impedance information is not clear, but per your request be advised that it is 32 ohms, except the neckloop is 1000 ohms.
- 5) There is a section in the user manual near the verbiage cited that is entitled Approved Accessories. That section was provided to assure that, consistent with your concern, information obtained by an interested party is product specific. This is evident by accessing the Motorola web site stated in that section ([www.mot.com/iDEN](http://www.mot.com/iDEN)) then selecting an accessory type (e.g. – carry cases). An example of that Motorola Performance Matched™ information was captured using a Web browser program and is attached as new Exhibit 8.1. Information specific to this radio product has not yet been released so the example information provided is for our similar i80s product. We trust this clarification obviates the need to change the manual information submitted.
- 6) The unit does not allow data mode in the 900MHz band, only Phone Mode is allowed. As per the table in section 2, on page 3, Phone Mode has a duty cycle of 1:3. For this duty cycle the proper crest factor is 3. This was the crest factor used."
- 7) Attached is the probe calibration certificate requested. The DASYS v3.1 system, SAR scanning procedures and algorithms used were those set forth in the SPEAG™ DASYS manual. Please see the attached calibration sheet for the probe used.
- 8) The requested photo is supplied portraying the 15 cm depth in attached Exhibit Addendum
- 9) Additional photos are supplied as requested in the attached Exhibit 11 Addendum showing the setup for evaluation in phone mode with the radio in the tilt position, and in push-to-talk mode in front of the face.

Contact me at (954) 723-5793 if you require any additional information.

Sincerely,

/s/ Mike Ramnath

FCC Liaison

Email: [mike.ramnath@motorola.com](mailto:mike.ramnath@motorola.com)

Attachments:

Exhibit 4.6, Transmitter Block Diagram

Exhibit 8.1, Example List of Approved Accessories

Exhibit 11 Addendum, SAR Report

Exhibit 12.4, Hands Free Accessory Information