MOTOROLA

13th January 2005

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

Re: Form 731 Confirmation Number: EA472812 with FCC ID: AZ492FT4870

Dear Mr. Lyles,

Motorola Inc., 8000 West Sunrise Boulevard, Fort Lauderdale, Florida, herein submits its response to the 3rdJanuary 2005 for information in Correspondence Number 28283 and 28284.

1) Please justify use under Part 74.

R1) Upon further review of the requirements of FCC Rule Part 74, Motorola has decided not to pursue Rule Part 74 for this application.

2) Please detail the locations of the band edge MPE evaluation performed and reported in tables 41-54.

A2) The data presented in Table A for By-stander position indicates that the 45 degree assessment was the highest position. Therefore the band edges, tables 41-54, were tested at the 45 degree radial with 99.5cm distance. Appendix A details this position and distance. The data presented in tables 33-54 does define 45 or 90 degree assessments however the distances noted did not reflect the distances provided in section 6.1.1 or Appendix A. Tables 33-54 have been revised to reflect the precise distances, as stated in section 6.1.1 and Appendix A.

3) Please confirm and/or revise that avg. power density in MPE Tables 1-54 are correct, e.g., by in format af Table A. Some of these seem to have used percentage-of-uncontrolled limit to get average, or some other method. Alternatively please provide the power density values that were used to calculated the average power density value at the top of each table.

A3) The MPE tables 1-54 were confirmed to be correct. In addition further details and formulas are now provided for further clarification

External to vehicle - 10 measurements are averaged over the body (*Body_Ave*).
Internal to vehicle - 3 measurements are averaged over the body (*Body_Ave*).
Narda Probe measures in percent of the controlled limit.

Therefore;
$$Average\_over\_Body = Body\_Ave * Controlled\_Limit$$

$$Pwr\_Density\_Calc = Average\_over\_Body * 50\%\_Duty\_Cycle$$

$$Pwr\_Density\_Max\_Calc = Pwr\_Density\_Calc * \frac{Max\_Output\_Power}{Initial\_Output\_Power}$$

Note; For *Initial Output Power* > *Max_Output_Power*, *Max_Output_Power* / *Initial Output Power* = 1

4) Please clarify or provide the related MPE measurements (table number) associated with the SAR results given in App. D Tables I and II.

A4) Appendix D, tables I and II have been revised to include the applicable MPE table numbers. Each table number is also highlighted in section 11.0 Test Results Summary Table A.

5) User/installer instructions mention 100 W radios in the RF exposure instructions. This radio is 120 W which may be confusing for the user/installer. Please address. As usual note that general practice is to list 100 W on FCC Form 731 line item, then include grant notes related to maximum output power per 90.205(r) and appropriate power used for RF exposure evaluations.

A5) This radio is capable of transmitting from 25-120 Watt (Variable Power) as evident in the MPE Report and the Test Report (Ex 6A). However, Motorola chose to market this device with a 'guaranteed' power of 100 Watt but the radio may be over 100 Watt and will never exceed 120 Watt which is the Factory Final Test Upper Limit. Hence the installation manual calls out this radio as a 100 Watt radio. This was the accepted practice in several prior applications including the more recent, FCC ID: AZ492FT3808.
Motorola would like to have the FCC grant reflect a variable power of 25 to 120 Watt and this would give us the flexibility to market the device anywhere between 25 to 120 Watt.

6) This filing requires roof top installation for the 1/4 wave length antenna, i.e., install manual pp. 2-2, 2-22. Please explain how the present instructions sufficiently address different requirements for other antennas and will be implemented by the installer, or revise. Having the same installation requirements for all antennas may be preferable in this case, e.g., rooftop.

A6) Section 2.5.1 of the installation manual provides the antenna mounting site/location with both roof top and trunk lid for all antennas while noting that some restrictions may apply. In this case the ¼ wave antenna is noted as a restriction to roof top only. Mandating roof top installation for all antennas would present unwarranted installation flexibility constraints.

7) As indicated by the MPE and SAR evaluations performed, trunk mount operations at this frequency band and power level require careful consideration. Please address the following

7a) It appears that two antenna examples were used for two model "validation" schemes in App. D pp. 18-23. Provide validations for each antenna used for SAR evaluations similar to that discussed on page 20-23. Use of either a vehicle mount or simple ground plane mount is acceptable.

A7a) As agreed during the various conference calls between the FCC and Motorola technical staffs in 2003, at the time the computational compliance assessment method was jointly developed, validations would be provided for one inside (passenger) and outside (bystander) exposure scenarios. This was agreed so as to endorse the philosophy adopted by the IEEE Standards Coordinating Committee 34 in developing the SAR measurement standard IEEE Std 1528, which defines a single validation setup involving a dipole antenna next to a flat phantom, and does not require separate validations for each wireless communications device model and form factor.

7b) Regarding the validation results reported on App. D page 21 and following (antenna HAE6013A 425 MHz) please provide details of both the modeled and measured data. How were the values from the table on page 20 used? How was H field measured/addressed? Please further explain the large difference in the SE (FDTD) and SE (meas) in the figure on page 23.

A7b) The measured data for the passenger exposure comprised three data points, which are reported in tabular format in the revised report. The bar chart, which was incorrect (belonged to an earlier filing of a VHF mobile radio) was removed. The measured data for the bystander exposure is reported in the chart at p. 23. The difference between measured and simulated MPE values is due to the idealistic assumptions used in the model to produce a conservative exposure estimate, as explained in the text at p. 20: "The simulations tend to overestimate the average power density levels, which is understandable since there are no ohmic losses and perfect impedance matching is enforced in the computational models."

7c) Regarding the dipole validation of App. D pg. 12 please provide corresponding near field and far field, and impedance comparison measurements with an actual dipole, if possible.

A7c) This data is not available at this time. The conservative nature of the computational assessment is indeed demonstrated by the validations carried out for both bystander and passenger exposure conditions.

7d) To confirm that unexpected field distributions do not exist, please provide modeled results for rear of trunk configurations at a distance of +/- 5 cm toward and away from car (approx. tenth-wavelength) for each location used for SAR evaluation. Worst case configuration from previous evaluation is sufficient.

A7d) The field plots shown in fig. 1, 5, and 6 are very smooth within a significant volume around the bystander, thereby confirming that no unexpected field distribution exists in the mentioned distance range.

7e) Please validate assumptions made about the antenna feed modeling technique used (App. D pg. 17). One possibility may be MPE modeling and testing over a simple finite ground plane for one antenna feed. Please also address antennas with loads in the middle of the whip if applicable.

A7e) In the mentioned paragraph it is stated: "In this way, we neglect mismatch losses and artificially produce an overestimation of the SAR, thereby introducing a conservative bias in the model." The results presented regarding the validations show the conservative nature of the computational SAR assessments carried out.

----------Correspondence Reference Number 28284-----------------------

7f) Based on actual field usage whether it is reasonable for installation and operational instructions to be implemented across all customers. Please provide additional details how the grantee will ensure RF exposure compliance for this device.

A7f) Each radio is supplied with the Product Safety and RF Energy Exposure Booklet which was submitted as Exhibit 8. This booklet provides all necessary information to ensure RF exposure compliance and provides antenna installation guidelines.
In addition, the MPE report states the following in section 1.0; "This device will be marketed to and used by employees solely for work-related operations, such as public safety agencies, e.g. police, fire and emergency medical. User training is the responsibility of these agencies which can be expected to employ the usage instructions, safety information and operational cautions set forth in the user's manual, instructional sessions or other means. Motorola also makes available to its customers training classes on the proper use of two-way radios and wireless data devices."

7g) Please provide details of how the human model is "adjusted" for the seating position.

A7g) The visible human model is a standing subject. By taking advantage of the XFDTD built-in ability to segment and rotate bodies, we cut the model at the hip and the knees, then translated and rotated the various body parts in order to arrange them in a way so as to represent a passenger, as shown in figs. 2,7,8,9, and 10.

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

Sincerely,
/s/ Mike Ramnath (signed)
Manager, Regulatory Compliance
Email: Mike.Ramnath@motorola.com