

9th May 2006.

To: Tri Luu, Ultratech Engineering Labs Inc.
tri@ultratech-labs.com
From: Steven Dayhoff
Steven.Dayhoff@fcc.gov

FCC Equipment Authorization Branch
Applicant: Futurecom Systems Group Inc
FCC ID: LO6-DVRSVHF

Correspondence Reference Number: 30607
731 Confirmation Number: EA384518
Date of Original E-Mail: 3/28/2006
Subject: Info Request

This correspondence amends and replaces the preceding version which had only 2.1033 review questions.

FYI grant parameters for companion/collocated mobile radios are:

	freq	Pmax per 90.205(r)
AZ492FT3806	136-174	57
AZ492FT3808	136-174	120

Q1) User manual describes how label notifying about FCC occupational RF exposure requirements is to be installed "beside the mobile radio control head" - please describe how grantee will ensure label will be installed at locations other than transmitter enclosure

A1) Please note that there are two RF Exposure Labels. Since the DVRS is configured to be used with the XTL5000 Mobile Radio, the factory attached RF Safety Label, as described on the FCC Grant Conditions and User Manual, is displayed on the microphone cord and visible to the user.

The other RF Safety Label is placed on the dash beside the Mobile Radio control head.

Q2) User manual mentions radio is restricted to occupational use, but does not explain related criteria for occup., i.e., work-related, control of exposures - please revise

A2) The RF Safety information has been added to Product Safety and RF Energy Exposure Booklet and the Draft Users Manual, Rev 2.2.

This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

Q3) User manual has 82 cm antenna-bystander separation distance instruction, but MPE evaluation was done at 90 cm from edge of vehicle - please explain discrepancy

9th May 2006.

and how RF exposure compliance will be ensured, and/or revise filing where appropriate.

A3) Please refer to Table 2 in the Product Safety and RF Energy Exposure Booklet. Product Safety and RF Energy Exposure Booklet shows the 90 cm distance.

Q4) User manual mentions half-wavelength antenna, but RFx evaluation used only quarterwavelength antennas, please explain and/or revise filing where appropriate.

A4) The Product Safety and RF Energy Exposure Booklet covers multiple bands of DVR and companion mobile radios. Table 4 shows approved configurations.

Q5) Filing should include a letter stating that SAR computational modeling data to demonstrate RF exposure compliance is submitted in lieu of actual MPE field-strength/power-density measurements based on the Commission's earlier acceptance of this process under FCC ID number(s) _____. FCC is continuing to consider applications of this type on a case-by-case basis, and future filings may request info other than as herein to confirm compliance with FCC RF exposure rules.

A5) An email from Rich Fabina of the FCC, dated 27th October 2004 for application EA732233, FCC ID: AZ492FT4867, stated the following: " A request for waiver of the Commission's rules is not necessary for this application. We have routinely granted this same request for a number of prior authorizations involving Motorola products. We believe providing SAR computational modeling data in lieu of MPE measurements is a reasonable approach to determine RF exposure compliance. Since we have accepted this procedure in a number of already granted Certifications, we included this as a proposed rule change in our RF safety rulemaking procedure that is currently in progress".

The above email from the FCC should satisfy your request.

Q6) This filing mentions 6W max at antenna input, due to "duplexer" loss. Neither original nor this C2pc (Class II permissive change) filing appear to describe transmit-path duplexer - please give info about duplexer and its function, for example including system block diagrams, photos, spec sheets.

A6) A duplexer was not part of the DVRS system during MPE testing. The power is restricted to 6W at the DVRS antenna port (conducted into antenna) to ensure MPE/SAR requirements. MPE/SAR report has been revised to delete reference to a duplexer.

Q7) Please describe test set-ups and procedures used to obtain antenna-terminal power for all transmitters.

A7) See attached document "Power Measurements".

Q8) Please explain how 20W 100% duty factor from original filing TC336539 LO6-DVRSVHF leads to 6W 100% duty factor herein.

A8) Power reduction, frequency, antenna selection and antenna placements were optimized to satisfy customer requirements for co-located DVR and Mobile while maintaining MPE/SAR requirements.

9th May 2006.

9) FYI original filing TC336539 LO6-DVRSVHF considered MPE evaluation for 20W and 50% usage duty factor (=> antenna-bystander separation distance of 82 cm from MPE estimation); RFX exhibit in this C2pc filing has 100% duty factor for veh. repeater - why the difference?

A9) Power reduction, frequency, antenna selection and antenna placements were optimized to satisfy customer requirements for co-located DVR and Mobile while maintaining MPE/SAR requirements.

Q10) If not in this filing already, please explain why companion radios are tested at 147-174 MHz rather than 136-174 MHz.

A10) Companion mobile with 1/4 wave antenna was limited to 147 MHz to assure MPE/SAR compliance.

Q11) We note that RFX report front page shows for AZ492FT3808 power that is different from grant certificate, and not consistent with expected power for 50% duty factor - please revise if appropriate, or explain.

A11) Transmit power figures on the front page of the MPE/SAR report are the actual maximum conducted power levels; duty cycle is factored into the calculation of the final MPE results

Q12) RFX exhibit seems a little unclear or inconsistent in actual powers and duty factors applied for companion radios - table in clause 9 has ~ 56 W, whereas 50% usage duty factor "effective" powers are expected to be

AZ492FT3806	136-174	25
AZ492FT3808	136-174	50 (max 60)

Please explain, and/or revise.

A12) The table in section 9 of the MPE/SAR report lists the conducted measured output powers for each tested frequency in CW mode. MPE measurements were conducted with the radios transmitting in CW. The 50% duty cycle which is applied for Push-To-Talk operation was then applied to the calculated MPE result. This is explained in detail in section 11.0.

Q13) SAR report appendix is based on code version v5.3, whereas specific calculations for this filing used code version v6.1 - please revise appendix where appropriate.

A13) The new faster XFDTD v 6.3 is now available and all the SAR results and validation projects for this report have been recomputed with the newer version. Validation of previous version of XFDTD (v.5.3) has been repeated with the newer version of the software using a number of test cases which produced similar results for both versions of the code.

In addition, the information below is extract from communication with Dr. Ray Lubbers, Remcom, Inc. where he indicates:

"We have made extensive validations comparing different XFDTD versions for consistency.

9th May 2006.

We believe that the results from different versions should be negligably different. These small differences are due to changes between processors, compilers, and optimizations."

The one exception is average SAR. Due to changes in standards and calculation methods you might see some changes average SAR results. These should not be significant but could be more than negligible."

The contributing factor to the differences in average SAR values is that the new XFDTD version has incorporated the latest IEEE SAR averaging algorithm. At the same time computation of the point SAR and field values has not been impacted by those changes.

Q14) It is unclear whether or not high SAR locations at bends in legs are physically real or artifacts or some type of discontinuities from geometry adjustments. To support compliance demonstration, please submit corresponding steady-state E & H field plots for SAR figs 3, 4.

A14) Pictures showing E and H field distributions corresponding to the condition represented in Fig 3 and 4 have been added to the report. The location of peak 1-g average SAR at bends in legs is related to artifact, which can be attributed to the tissue discontinuities of the passenger model. As can be seen from SAR and field distributions this artifact tends to overestimates peak SAR value in the body.

Q15) If not in report already, for highest exposure configuration in this filing, please submit table showing comparison between calculated field-strengths and measured data for one-to-one locations, where measured data is in form shown in RF exhibit appendix F.

A15) The requested data is in the attached document "Validation_for_FCC"

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal and forfeiture of the filing fee pursuant to Section 1.1108

DO NOT Reply to this email by using the Reply button. In order for your response to be

processed expeditiously, you must upload your response via the Internet at www.fcc.gov, E-Filing,

OET Equipment Authorization Electronic Filing, Submit Correspondence, Select Correspondence

pertaining to EAS (Equipment Authorization System). Also, please note that partial responses

increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the e-mail address

listed below the name of the sender.