

April 12, 2003

RE: ATCB

FCC ID: H25VMS2000

1.) The "Data Package" exhibit from Retlif Laboratories is difficult to read – especially the scanned test setup photographs. It would be helpful to include a direct electronic version and not simply a scanned test report. Can this be done?

The test report was not scanned by DTC, it is as it was received, a PDF file. The four photographs that were included in the test report have been uploaded to ATCB website on March 18, 2003 as JPGs. DTC deems the balance of the report legible. 2 new portions of Retlif(dBd) test data are being sent with this response letter.

2.) In general, measurements for all Part 90 transmitter spurious emissions using the substitution method should be expressed in terms of dBd, and not dBi. Was the transmitter modulated or not during radiated testing? If modulated, please identify the modulation used. In addition, please specify the measurement bandwidth settings. Please identify the antennas used for each measurement at each frequency.

DTC has had RETLIF Labs modify the test report to be expressed in terms of dBd. The carrier was modulated using a Tektronics TSG130A Video pattern generator set to the 75% color bar pattern. Antennas used are listed in the RETLIF test report.

3.) Power rating is shown to be 2 Watts, but maximum conducted power shown in the Test Report is 2.884 Watts. Please explain. FCC policy is to show maximum measured power and not rated power on the Grant of Equipment Authorization.

Since maximum output power under 90.205(I) is limited to 5 Watts, can we please revise our grant request to be for 2.884 Watts. Our design goal was 2 watts minimum. We are submitting a new FORM 731 to show the higher output power.

4.) We fully understand that a 1Vp-p is used for video signals. However no curves or series of curves are presented to show compliance with 2.1047(d). Ideally, a measurement using a Bessel function analysis could be presented.

Per our phone conversation on March 25th at 5:00pm the purpose of this question was a concern that higher frequencies would over deviate the carrier.

The signal modulating the main carrier consists of a standard NTSC video signal as well as up to two audio subcarriers in the range of 6.0 – 7.5 MHz.

The NTSC video signal has a 1 Vpp maximum level and a bandwidth of 4.25 MHz maximum. The video processing circuit of the transmitter consists of a pre-emphasis network that conforms to the CCIR 405 525 line curve which is the NTSC standard. It is the content of the video signal in conjunction with the pre-emphasis network that insures that the occupied bandwidth will never exceed the limit as defined by the calculated necessary bandwidth and §90.210(b). The test signal used when measuring occupied bandwidth (75% color bars from a video pattern generator) contains high frequency content at amplitudes that far exceed that which would be received from a video camera. Even under conditions of extreme brightness, a video camera is virtually incapable of generating a signal that would cause the transmitter's occupied bandwidth to exceed that measured using the 75% color bar signal. Therefore, the 75% color bar signal represents a worse case modulation condition.

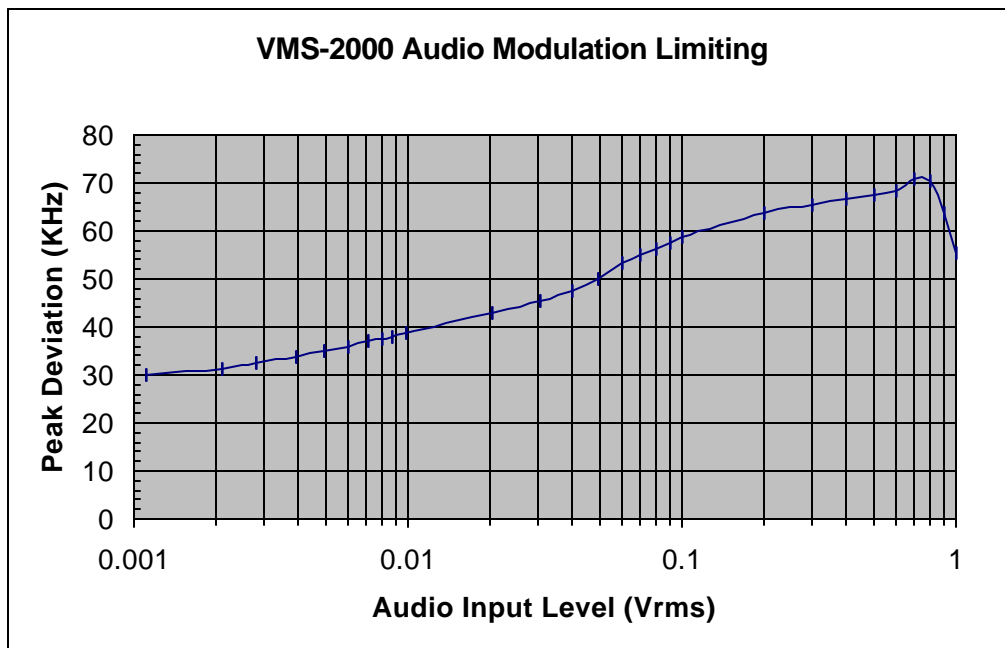
4.)continued

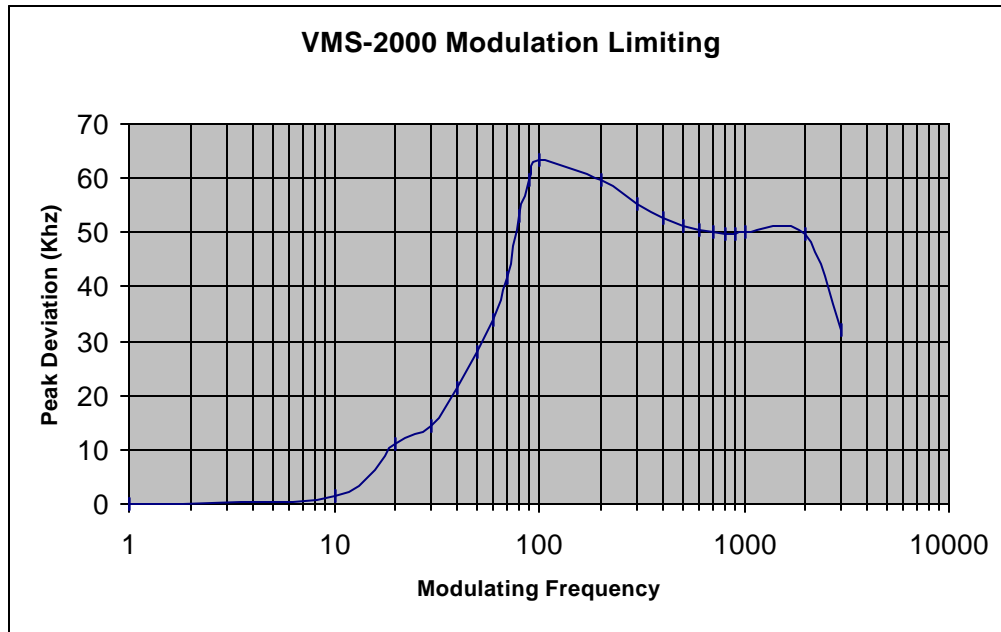
By definition, the first pair of modulation sidebands due to the audio subcarriers always occur at a frequency that is offset from the main carrier less than 50% of the authorized bandwidth. The highest modulation index achieved due to the subcarriers is $M=0.1$ (for the 6.0 MHz subcarrier). This modulation index results in a maximum level for the first pair of sidebands that is nominally 26 dB below the main carrier. The level of the second pair of sidebands is nominally 58 dB below the main carrier.

The response of the video modulator signal is limited by the roll-off of the video amplifier above 5 MHz.

5.) It is not clear if this device employs modulation limiting. If so, kindly show compliance with 2.1047(b).

The audio circuitry of the VMS-2000 does employ modulation limiting. The 2 graphs that follow show the modulation limiting properties of the circuitry. The data was taken using a WaveTek Model 90 Function Generator and a HP 8901B Modulation analyzer. Also, please note that by design the mean radiated power due to each of the subcarriers is less than 0.5 percent of the total mean radiated power.





6.) Please review 2.1051. Conducted spurious signals within 20db of the limit must be shown.

BMP files showing spurs within the limits have been attached to the response e-mail.

7.) Please provide a statement within the report showing why the subcarriers are excluded from any necessary bandwidth calculation.

The modulating signal consists of a video component and two audio subcarriers. Since, by design, the mean radiated power due to each of the subcarriers is less than 0.5 percent of the total mean radiated power, only the characteristics video component of the modulating signal are considered when calculating the necessary bandwidth.

Necessary bandwidth is calculated according to Title 47 CFR paragraph 2.202(g). The formula $B_n = 2M + 2DK$ was used where:

B_n = Necessary Bandwidth
 D = Peak frequency deviation
 M = Maximum modulating frequency
 $K = 1$

$M = 4.25$ MHz (highest video frequency)
 $D = 4.0$ MHz (Peak frequency deviation caused by the video signal)

$B_n = 2M + 2D$
 $B_n = 16.5$ MHz

Therefore, the necessary bandwidth is 16.5 MHz.

8.) The definition of any RF category “Mobile” includes a distance limit of 20cm, and not the 40cm as specified in your RF Exposure exhibit. Please review and correct.

The operator’s manual has been corrected. The safe distance was recalculated using the max power out.

9.) The RF Exposure exhibit should also be based upon your maximum measured power and not rated power. Please show MPE estimation for all anticipated antennas.

OET Bulletin 65, Appendix A lists the MPE for our frequency band as $5\text{mW}/\text{cm}^2$. MPE(Maximum Possible exposure) will not change with different antennas, only safe distance to the transmitter will. DTC has calculated safe distance(50cm) using the maximum possible gain antenna(17dbi). DTC recommends that a safe distance of 50cm be maintained at all times.

10.) Under what circumstances will the 10 D-cell alkaline battery pack be used?

Per our phone conversation on 4/2/03 this device is not to be considered a portable device. The operator's manual has been updated to state that at no times should this device be worn on the body.

11.) The Manual seems to indicate this device can be used in RF category "Fixed", "Mobile", and "Portable" situations. The "Portable" configuration is of great concern if this can be body worn and may require a SAR report. Please explain the body worn conditions further.

This device is in the "Mobile" category. The operator's manual has been corrected and states that under no circumstance is this device to be worn on the body.

12.) Please elaborate on instructions for "Mobile" and "Fixed" installations.

Appendix A of the operator manual has been updated. The words "Mobile" and "Fixed" have been removed from the paragraph explaining suitable antennas. The calculation of safe distance was redone with max. power out.

13.) No information sheet is presented on the 17dBi antenna called out in the RF Exposure Exhibit.

Information on the 17 dBi antenna was added to the operator's manual.

14.) Please be aware that the final language necessary for RF Exposure compliance may change depending upon the satisfactory resolution of all RF Exposure questions.

Please review the updated manual(attached with this e-mail) to see if it is to your satisfaction.

15.) It is noted an "Ovation Micro ViewLock II" is used for encryption. Please identify the method utilized and note if this will effect the modulation requirements. The description of your methodology can be held Confidential if uploaded to the Operational Description section of the Application and noted in a Confidentiality Request letter.

The "Ovation Micro ViewLock II" employs an active line cut and rotate method of scrambling. This method of encryption does not effect the mask. Plots of the unscrambled and scrambled video modulation masks were uploaded to ATCB website on March 18, 2003. The "Ovation Micro ViewLock II" is not DTC proprietary equipment, therefore we do not seek confidentiality for this option.

16.) Although schematics are marked as Confidential, no Confidentiality Request letter has been received. In addition, Block Diagram, Operational Description and Parts list are not marked Confidential either. Do you really want these Exhibits available for public disclosure?

A "Request for Confidentiality" letter was uploaded to the ATCB website on March 13, 2003.

17.) Should the document titled TP1910340 be considered a “Tune Up” procedure? If so, this should also be listed as Confidential.

A “Request for Confidentiality” letter was uploaded to the ATCB website on March 13, 2003.

18.) Please note a Cover Letter should specify the reason for the Application, and not simply be a reprint of the Test Report cover page. The responsible party or parties for this equipment should be properly identified.

A cover letter has been generated and included with this e-mail.

19.) The Block Diagram seems to indicate that a switched low power setting is included with this equipment, but no low power data is included anywhere. Kindly show low power data for RF Pout, Occupied Bandwidth, and Transmitter Spurious Emissions.

Additional data was taken by RETLIF Labs to meet this request. The reports are attached.