

Response to TCB questions

----- Original Message -----

From: [Certification Manager](#)

To: [Acme Testing](#)

Sent: Thursday, February 15, 2001 2:01 PM

Subject: FCC ID: OOX-WRM2000

We have completed our review and the following issues were identified:

1. Please confirm that the unit uses a single chip/symbol rate of 8:1 and that the chip/symbol rate of 11:1 available in the chip set is unused.

At this time, the WRM 2000 supports only 5.5 Mbts/sec and 11 Mbts/sec CCK which uses a chip/symbol rate of 8:1. It does not support 1 Mbts/sec or 2 Mbts/sec modulation schemes which have a chip/symbol rate of 11:1.

2. Please provide bandedge plots documenting that the unit complies with the 15.205 limit at 2483.5MHz with the transmitter operating at channel 11. Use the highest gain antenna.

Plots are provided for both band edges for channels 1 & 11 with the highest gain antenna

3. Please provide data responsive to the 15.31(e) requirement for input voltage variation.

The transmitter was tested at 85% and 115% input voltage with no measurable change in power output.

4. The LISN was out of calibration on the date of testing. Please respond. Was it calibrated subsequently? Did the calibration return indicate that it was in calibration as received?

The calibration information provided in the test report had a typographical error please see the attached revised page 12 of the test report for correct information.

5. Please explain why 24,000 MHz was selected as the upper end of the explored range when 15.33 requires exploration to the tenth harmonic or 24,620 MHz for this device.

I apologize for this error and omission. The actual upper frequency range measured was 22 GHz. 22 GHz is the upper range of the HP 8566B spectrum analyzer. Previous discussions with the Engineers at the OET branch of the FCC indicated that it is an acceptable procedure to state "that by good engineering

judgment and practice that if there are no detectable emissions over the range of 7.4 GHz to 22 GHz then there can be no emissions over 22 GHz”.

TCB note: See FCC email exhibit

6. Please specify the label material.

The material used for the Regulatory label is Mylar. Its adhesive is manufactured by 3M, part # 467MP.

7. The report specifies that testing was conducted with a shielded RS-232 cable. The users manual does not specify a shielded cable should be used when connecting to the RS-232 port. Please supply a corrected users manual.

Modifications to the manual concerning the RS-232 cable. During normal operation the RS-232 cable is not attached to any of the units. It is only used for diagnostics or troubleshooting. Make modifications to the manual in the General Advisory section, under "Warnings and Advisories" , as give below:

Change

WARNING!

Connect only shielded twisted pair (STP) Ethernet cable to the NCL1170 10Base Tx Ethernet (RJ-45) port. It is the responsibility of the installer to supply and use the correct type of Ethernet cable.

To

WARNING!

Connect only shielded Serial and twisted pair Ethernet cables to the NCL1170 RS-232 Serial (DB-9) and 10Base Tx Ethernet (RJ-45) ports. It is the responsibility of the installer to supply and use the correct type of Serial and Ethernet cables.

8. We have some concerns regarding the use of different antennas. We have noted the use of a unique connector but appendix D of the manual does not make it clear that the device can only be used with the tested antennas. Also for the dish antenna the gain is different from the report and on page 10 of the manual. From the test report the antenna gain results were calculated with 10m of cable and a filter. Appendix D discusses the use of different lengths. We need to be satisfied that only the tested antennas/cable/filter will be used with the device.

1)Antennas tested for use with the unit.

For each type of antenna, the one with the maximum effective gain was used during test. For example the Omni antenna, with an effective gain of 9.0 dBi, was tested because it had the maximum gain that would be use with in the system. During install it could be possible to use an Omni with an effective gain of 5.0 dBi.

2) Dish Antenna Gain

The report is correct, were it states the Dish Antenna gain is 24 dBi.

The value stated on page 10 of the manual, referred to as the Maximum Antenna System Gain or maximum effective gain, is slightly different than antenna gain. It refers to the gain of the Antenna System which includes the antenna gain (24dBi) that is modified by losses due to cabling, filters and other passive components (3.5 dB). The maximum antenna system gain is then equal to $24-3.5=20.5$ dBi.

3) Only tested antennas/cable/filter will be used with the device.

a) This system is designed for commercial installations with outdoor antennas and is to be professionally installed.

b) Only the antenna types tested will be used with this device.

c) Only the filter tested will be used with this device. If other filters are to be second sourced they will have equivalent or superior performance and will be covered under a class I permissive change.

d) Only LMR-400 or equivalent cable will be used. If other cable types are to be used they will be covered under a class I permissive change. The cable length could vary between different installations depending on the location of the antenna. But in any case, the antenna system gain will never exceed the value that unit was tested with. Thus, the radiated output RF power and spurs will be will either be equal to or less than those measured on the unit tested for FCC compliance.

Best regards

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