American Telecommunications Certification Body Inc.
6731 Whittier Ave, McLean, VA 22101

July 12, 2003

RE: Zeus Technology Systems, Inc.

FCC ID: Q5L-ZRC-20

After a review of the submitted information, I have a few comments on the above referenced Application.

1) The device appears to be a TX module and not an end use device and from the users manual appears to be desiring a modular approval. However a modular request letter has not been submitted. Please explain and if applicable provide a modular request letter that addresses the issues given in the FCC docket provided in the attachment.   Note that due to the power levels of this device, it may only be approved for use as a module in RF categories considered as mobile or fixed. Portable conditions would not be allowed.
2) Please provide photographs of each of the proposed antenna(s) as part of your external photograph exhibit. Note that the user manual mentions 5 different antennas (page 3).
3) Please provide further information regarding the 5 proposed antennas for use with this device (types, gain, etc.). Note that the FCC requires that the highest gain of each type (monopole, dipole, yagi, dish, patch, etc.) be tested and that all available antennas be listed in the filing.
4) Device authorized under 15.247 are required to submit information in regards to RF exposure (ref. 15.247(b)(4)). This information has not been provided. Please provide.
5) The block diagram appears to show an RF switch at the output to the antenna, however the schematic does not appear to show a switch. Please confirm that the block diagram and schematic are correct for this device and correct if necessary.
6) The test report only lists one measurement antenna, yet testing is required up to approximately 25 GHz. Please update the test equipment list for all antenna used.
7) The test report section 4 takes advantage of a duty cycle correction for the TX dwell time. However, it is uncertain if this dwell time is set or if it may be variable. Please provide further information from the manufacturer regarding possible dwell times and if necessary adjust the test report.
8) System receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals (2.1033(b)(10)/15.247(a)(1)). Please provide information that shows this device complies with this.
9) The duty cycle shown in section 4 of the report show a 3.67 ms dwell time. However if the device uses each frequency equally on the average, it is uncertain how it can dwell on 1 frequency twice in 100 msec if the device is using 75 channels
10) Measurements of low, middle, and high channels should be made to show that each channel is used equally on the average, and that this time is less than 400 msec per 30 seconds.
11) From the plots showing the number of channels, only 74 channels can be counted (vs. 75). Note that since the 20 dB bandwidth is < 1 MHz, 75 channels is the minimum allowed per 15.247(a)(1)(ii). Please explain.
12) The users manual mentions 5 different antennas, although the test configuration photographs only appear to show one antenna as being tested.
13) Please explain why the Cable, Antenna and Amplifier are consistent for all frequencies between peak and average except for 12.009 GHz.
14) Please explain the RBW and VBW setting used for all radiated emissions tests.

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15) Please explain the use of the AVG detector. Frequency hopping systems must be measured using a hop-stopped carrier (frequency stopped, plus with a non pulsing carrier) when possible. The difference between peak and average readings suggests that the carrier may not have been in continuous TX. Frequency hopping systems are measured hop stopped for PEAK and AVG emissions, but if they normally would TX < 100 msec per channel they may be additionally corrected for time of occupancy per channel as shown in section 4 of your report. If the device was not appropriately hop stopped, then the use of the AVG detector using standard RBW = 1 MHz and VBW = 10 Hz may not be allowed. Note that if the device has a duty cycle as given in this report, then further average measurements are not necessarily needed since the correction factor exceeds 20 dB. Additionally note, that as long as peak emissions were taken properly with a RBW and VBW of 1 MHz, you may correct for averaging by the actual duty cycle even if greater than 20 dB. This is a common misconception regarding this issue. Please call to discuss if you have any questions regarding this issue.

16) This device shall use a pseudorandomly ordered list of hopping frequencies. Please explain how this device accomplishes this and also provide sample hopping tables (minimum of 2 if the device is capable of having multiple hopping tables.

17) Please provide information showing compliance with 15.247(g)/(h).

18) If this device is being approved in a modular fashion, then the manual should provide further information to the user regarding labeling, RF exposure conditions, EMC responsibility, etc. The manual does not appear to provide enough information to the manufacturer and additionally the labeling should suggest "contains TX module". I have enclosed sample text suggested for some types of devices that can be used and/or reworded as necessary.

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Examining Engineer

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The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information may result in application termination. Correspondence should be considered part of the permanent submission and may be viewed from the Internet after a Grant of Equipment Authorization is issued.

Please do not respond to this correspondence using the email reply button. In order for your response to be processed expeditiously, you must submit your documents through the AmericanTCB.com website. 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 sender.