



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

October 19, 2004

RE: Cirronet

FCC ID: HSW-2450

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

Administrative Issues:

- 1) Please confirm that confidentiality is not requested on the block diagram. If it is, please adjust the confidentiality letter.
- 2) It appears that a modular approval is desired for this device. When modular approval is requested, a cover letter addressing each of the modular issues in the FCC guidance document must be provided. Please provide a cover letter addressing each of the modular requirements.
- 3) In the RF exposure exhibit, please:
 - a) denote and group all mobile antennas together and all fixed antennas together. The exhibit should clearly denote which antennas are for which.
 - b) Please denote which antennas were tested in this application.
- 4) The RF exposure exhibit lists frequencies from 2400.9 – 2476.2. However the 731 form lists 2401.69 – 2469.89, the test report lists 2400.9 – 2476.85, and the theory of operation cites 2401.6896 – 2469.888. What are the lowest and highest channels? All exhibits should be consistent. Please correct as necessary.
- 5) The RF exposure exhibit mentions 2.0 cm for mobile applications. Note that distance should not be calculated for mobile applications as this is assumed to be 20 cm by definition. Please correct.
- 6) All point to point antennas should be listed in the users manual to the installer in connection with the first paragraph shown regarding point to point applications. This should likely include the 15 dBi Yagi, 18 dBi parabolic dish antennas, and the 14 dBi corner reflector (which may not apply – see below) as well.
- 7) Any EIRP that exceeds 36 dBi (maximum conducted power + dBi of antenna) may only be used for point to point applications. Please explain the use of the corner reflector. The EIRP with the corner reflector is 36.5 dBi, which is not allowed if it may be used for applications other than point to point without further power reduction for installation of this antennas (i.e. maximum power of 150 mW for point to multipoint installations). If power is reduced by the installer for these configurations, the device must be professionally installed, the users manual clearly explain what is to be done and how is it done, and any ability to increase/decrease the output power via software must meet with the requirements of 15.15(b) Please explain.
- 8) The users manual should clearly list all approved antennas and RF exposure conditions for all antennas (i.e. 20 cm, 52 cm, etc). This information should be simple and easy to understand (i.e. a table grouping by fixed/mobile and listing appropriate distances).
- 9) The manual appears to be missing information of 15.21. Please update
- 10) The fixed antenna statement appears to be missing the 18 and 24 dBi Andrews parabolic dish antennas (and possibly others). Please update
- 11) The fixed and mobile statements should also include information to inform the installer or user “and must not be co-located or operating in conjunction with any other antenna or transmitter.” Please update
- 12) There are several other antennas which are given, which do not appear in the manual, but should likely be listed under the mobile antennas shown. Please update.
- 13) Please explain why the users manual cites 2 meters, while the RF exposure is only around 52 cm for fixed antennas.

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- 14) Test configuration photographs show some antennas placed directly on the table top. Antennas such as the yagi and corner reflector should not be placed directly on the table top. They should be insulated by foam or cardboard so that they are at least 1 to 2" above the table top. Please review and correct as necessary.
- 15) The users manual should provide more guidance and instruction to the installers/OEM integrators to instruct the integrator how to properly label the device and specific information to include in the users manual. Example information for other filings may be found on the following page. Please add additional information which covers this information to the users manual.
- 16) The information regarding antenna connections states "reverse-sex TNC or N connector". Please clarify if this is in reference to a reverse N or standard N connector. Standard connectors are only allowed if professional installation is justified in the application.
- 17) FYI...For future power measurements of this type, please ensure that the signal is adequately below the top reference line.
- 18) Antenna conducted measurements for spurious should be measured using RBW = 100kHz, VBW > RBW per FCC guidelines. Please correct.
- 19) Please explain why conducted spurs only appears in antenna conducted plot 4g, and not on the other channels.
- 20) In table 4a and 4e, did 7203 MHz use the high pass filter or measured at 1 meter? Please review/correct as necessary.
- 21) 7428 MHz in Table 4d does not appear to be denoted properly.
- 22) Please comment on the RBW and VBW settings used to take average radiated measurements.
- 23) The peak plots appear to show that the signal was pulsed during test. Additionally, there appears to be a large difference between peak and average measurements suggesting that inappropriate average settings were used. Note that If the TX was pulsed during testing, then average measurements of RBW=1 MHz, VBW = 10 Hz will likely not be applicable. Please provide a plot of a single frequency with a 0 Hz span to show the duty cycle relationship that the TX had during testing. Please provide cursor measurements to show TXon time, TXoff time, and TXperiod. Note for average measurements to be valid, the VBW must be > 1/Ton time, but preferably > 4* (1/Ton) time. Call to discuss if necessary. Note that the RF exposure information also suggests that maybe a 3 dB average factor may be applied (20 log 0.7).
- 24) Please confirm the Results of the fundamental in table 4e. The comma appears to suggest 480k uV/m. Is this 4808k or 480k uV/m?
- 25) The number of hopping channels can not adequately be determined from the plot provided. If necessary, please use different RBW and divide the band into 3 traces (i.e. 2.400-2428, 2428-2456, 2456-2484). Given the 20 dB bandwidth of 528 kHz, a RBW of 100 kHz may work better.
- 26) Test report states 87 hopping channels, while the theory of operation cites 75. This is not consistent.
- 27) The theory of operation states the output power is 18 dBm maximum, while the test report shows much higher than this (22.5 dBm). All information is expected to be consistent. Please explain and correct as necessary.
- 28) The theory of operation states the 20 dB bandwidth is about 880 kHz, while the test report shows 538 kHz. All information is expected to be consistent. Please explain and correct as necessary.
- 29) The test data does not show the carrier separation as given in 15.247(a)(1). Please measure and provide.
- 30) It does not appear that the remainder of the report was provided. The last page is the paragraph of 2.16. Please correct.
- 31) Please provide test data to support that each frequency is used equally on the average.
- 32) Please provide a sample hop table showing that the device complies with the pseudo-random hopping requirement.

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33) Please explain if the TX is always hopping regardless of data or not. How does the device handle short intermittent bursts of data.

34) Information regarding 2.1033(b)(10) has not been provided. Please provide.



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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.

The manual should provide further information and better detail as to how the OEM must use the module in order to maintain RF exposure compliance and that its approval is limited only to devices that can maintain the 20 cm distance between the antenna and body. In order to make sure that the integrators are given enough information, please add the following information or similar to the users manual:

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users for mobile antennas installations as defined in this manual, or the antenna is installed such that ____ cm is maintained between the antenna and users for fixed antennas installations as defined in this manual, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.
- 3) The Module is approved using the FCC 'unlicensed modular transmitter approval' method. Therefore the module has only been approved with certain types of antennas not exceeding certain antenna gains. This device must only be used with the list of antennas approved for use.

As long as the 3 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations, co-location with another transmitter, or use with a different type of antenna not previously approved), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling – Mobile Antenna Use

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example access points, routers, wireless ASDL modems, and similar equipment). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: **INSERT FCC ID HERE**".

End Product Labeling – Fixed Antenna Use

This transmitter module is authorized only for use in devices where the antenna may be installed such that ____ cm may be maintained between the antenna and users (for example access points, routers, wireless ASDL modems, and similar equipment). The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: **INSERT FCC ID HERE**".

RF Exposure Statements That Must be Included in the End Users Manual – Mobile Antenna Use

The users manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

RF Exposure Statements That Must be Included in the End Users Manual – Fixed Antenna Use

The users manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

Additional Information That Must be Provided to OEM Integrators

The end user should NOT be provided any instructions on how to remove or install the device.