WESTERN Multiplex

1196 Borregas Ave., Sunnyvale, CA 94089-1302, USA
Tel: +1 (408) 542-5200, Fax: +1 (408) 542-5300

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

November 29, 1999

RE: Response to FCC Requests
Correspondence Reference Numbers: 10651
FCC IDs: HZB-U58-45
Form 731 Confirmation Numbers: EA94823

Dear Mr. Czumak:

This is in response to your emailed requests regarding the RF exposure issues of our U-NII radios in application.

Both HZB-U58-45 and HZB-U5358-45 U-NII radios are full duty-cycle products exclusively designed for fixed-mount point-to-point applications (Please refer to Page 1-1 of the *Installation and Maintenance Manual*). Each radio's inputs are connected to external equipment through their 100BaseT interface. The RF output port is connected to a RF cable or a waveguide, which connects on the other side to an antenna usually installed on top of a building or a tower. It is impossible to use the radio in any mobile application.

The radios need to be professionally installed outdoor either on top of a tower or on a tall building. The installation sites are inaccessible to the general public. Only installation engineers may get close to the radio antenna during system installation. For the safety concern of the professional installers, we put a warning message on Page 3-18 of the product manual recommending installers stay at least 5 feet away from the antenna during system operation. (We updated the manual and changed the distance from 2 feet to 5 feet. Please refer to page 3-18 of the updated manual).

The EIRP limits for our radios are +30dBm at 5.25-5.35 GHz and +53dBm at 5.725-5.825 GHz. For the worst case of EIRP of 53dBm, the power density at 5 feet from an antenna is:

$$S = EIRP/4\pi R^2 = 6.9 W/m^2 = 0.69\ mW/cm^2 < 1\ mW/cm^2$$

Where: S = Power density
R = distance to the center of radiation of the antenna

In the cases of using 2', 4', and 6' parabolic antennas,

The near field power density is : $S_{nf} = 16\eta P/\pi D^2$. The worst case of near-field power density is when the radio output at the certified power, η=1, and the antenna diameter D=2ft.

$$S_{nf}\,max = 16x0.295/\pi\,(2x0.3048)^2 = = 4.1\ W/m^2 = 0.41\ mW/cm^2 < 1\ mW/cm^2$$

Where: S_{nf} = maximum near –field power density
P = power fed to the antenna
η = aperture efficiency
D = antenna diameter

The far field power density is: $S_{ff} = PG/4\pi R^2$. A worst estimate is when the output power is at the highest of 302 mW, the antenna gain is the highest of 38dB, and the distance to antenna is at the closest of 5 feet.

$S_{ff} = PG/4\pi R^2 = 0.295x38/4\pi(5x0.3048)^2 = 0.38W/m^2 = 0.038\ mW/cm^2 < 1\ mW/cm^2$

Where: S_{ff} = power density (on axis)
P = Power fed to the antenna
R = distance to the point of interest

In all the above-mentioned cases, the power density is compliant with the limit for General Population/ Uncontrolled Exposure as specified in rule 1.1310.

We have removed the paragraph regarding " mounting indoors in front of the windows" from the product manual (Please refer to page 3-18 of the updated manual). This information was incorrectly copied from another manual. Like all our other spread spectrum radio products, the above-mentioned U-NII product is strictly for outdoor, point-to-point directional applications.

I hope I have addressed all the requests you raised in your email and with these explanations, we will be able to receive the grants for the applied product soon. Please let me know if you should have any further questions and please address all correspondence to the undersigned.

Sincerely yours

Caroline Yu

International Product Manager
Western Multiplex Corp.

Enclosure: Updated Tsunami *Installation and Maintenance Manual*