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Federal Communications Commission  
Authorization and Evaluation Division  
7435 Oakland Mills Road  
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**RE: Response to FCC Requests**  
**Correspondence Reference Numbers: 11532**  
**FCC IDs: HZB-S58-12**  
**Form 731 Confirmation Numbers: EA95627**  
**Attn: Greg Czumak**

1. Please find in the attached form a list of different types of antennas may be used with the HZB-S58-12 radios. For your reference, we have also included some typical antenna models made by different manufacturers.

| Antenna Type      | Manufacturer | Model Number | Mid-band Gain (dBi) |
|-------------------|--------------|--------------|---------------------|
| 1 Foot Flat Panel | Gabriel      | DFPD1-52     | 23.5                |
| 2 Foot Flat Panel | Gabriel      | DFPD2-52     | 28                  |
|                   | RSI          | A57A24-U     | 26.5                |
| 2 Foot Parabolic  | Gabriel      | SSP2-52B     | 28.5                |
|                   | RSI          | P-57C24      | 29                  |
|                   | Radio Waves  | SP2-5.2      | 28.3                |
| 3 Foot Parabolic  | Radio Waves  | SP3-5.2      | 31.4                |
| 4 Foot Parabolic  | Gabriel      | SSP4-52A     | 34.2                |
|                   | RSI          | P-57B48      | 34.7                |
|                   | Radio Waves  | SP4-5.2      | 34.6                |
| 6 Foot Parabolic  | Gabriel      | SSP6-52A     | 37.5                |
|                   | RSI          | P-57A72      | 38.2                |
|                   | Radio Waves  | SP6-5.2      | 37.7                |
| 8 Foot Parabolic  | Gabriel      | DRFB8-55ASE  | 40.7                |
|                   | RSI          | P-57A96      | 40.8                |

2.
  - As I have indicated in my previous response, our radios are fixed-mount equipment that are designed for point-to-point outdoor communications. The antennas must be highly directional, and the transmission path must have line-of-sight clearance. The radio antennas must be installed either on top of a tower or a very high building so that the line-of-sight condition can be met. Therefore, the antenna sites are not accessible to the general public. Installation of the radios and antennas must be performed by professional installation engineers. The transmission paths of the radios are well above ground level radiating in a beam point to point rather than omnidirectional to the general public like a paging transmitter. Given all the conditions mentioned above, the radiation of our radios should be considered in the Occupational/Controlled exposure category, rather than of General Population/Uncontrolled Exposure category. However, we still comply with the limit set for General Population/uncontrolled exposure as specified in 1.1310. My last response shows the compliance with calculation for anywhere over 5 meters away from the antenna. We have included a warning message in our manual informing installers to keep at least five meters away from the antenna while the equipment is in operation.

- Due to the fact that the HZB-S58-12 radio is used for fix-mount point-to-point communication that requires line-of-sight clearance in the path and that the radio is single-unit in-door equipment, the antenna sites are always far away from the radio equipment room. The typical length of RF cable that runs from the output of the radio to the antenna input is over 100 feet. In situations where an antenna site is extremely far from the equipment room, waveguide may be used as a means to reduce the loss from RF transmission. A typical distance between antenna and radio when waveguide is used is over 200 feet. To give a worst example, let's assume 100 feet Andrew 5/8" foam coax cable or 200 feet Andrew waveguide is used. Given 0.5dB loss for the connectors on each end, the loss introduced by RF cabling is at least 3.5-5.5 dB (please refer to the table below for Loss/100' data). As for the majority of cases, the transmission line loss is usually in the range of over 10dB.

When this loss is taken into consideration, the maximum possible EIRP will be:  
 Maximum Output power + Maximum Antenna Gain – Minimum Implementation Loss = 23.4 + 41 – 3.5 = 60.9 dBm, which is equivalent to 1230W.

Many transmitters and facilities subject to EA listed in Table 1 of 1.1307 are of a broadcasting nature that radiate into the general public, while our radio radiates with a very narrow beam high above the general population. Even though, when taken the transmission line loss into consideration, we are still below the limit of 1640 EIRP set for the broadcasting stations.

In summary, our radio will not introduce RF radiation exceeding any FCC limits when using with antennas of up to 41dB, even when more stringent standards for other types of transmitters are applied. We are open to limiting antenna gain to 41dBi if FCC deems it necessary.

| <b>Feeder Loss Type</b> | <b>Manufacturer</b> | <b>Model Number</b> | <b>Loss/100'</b> |
|-------------------------|---------------------|---------------------|------------------|
| 1/2" foam coax          | Andrew              | LDF 4-50            | 6.6 dB           |
| 5/8" foam coax          | Andrew              | LDF 4.5-50          | 4.7 dB           |
| Waveguide               | Andrew              | EW-52               | 1.2 dB           |

Yours truly

Caroline Yu  
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 Western Multiplex Corporation