



American Telecommunications Certification Body Inc.

6731 Whittier Ave, McLean, VA 22101

March 14, 2006

RE: Honeywell International Inc.

FCC ID: CFS7720PLUS

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

- 1) Limits for $43 + 10 \log$ typically equate to an absolute substitution level of -13 dBm. The substitution method gives you a power level conducted assuming radiation from a $\frac{1}{2}$ wave dipole. However by providing the limit of -10.85 you are providing a radiated ERP limit. Normally following the substitution method provides corrected to conducted readings assuming radiation from $\frac{1}{2}$ wave dipole (see below). Most labs typically use $43 + 10 \log$ (Power – conducted) which will equate to -13 dBm. This is even referenced in TIA 603 – 3.2.12.2. Please review.
- 2) The substitution table appears to be adjust the RX readings for the gain of the TX antenna. This is confusing the way it is presented and after careful analysis suggests that the compensation direction was incorrect. Normally the compensation is adjusted to the signal generator level used. For instance, if a signal generator level (SGL) was applied to a Horn, then a lower SGL level was necessary to recreate the reading. Therefore the SGL into a dipole would have been higher to achieve the same RX field strength. Therefore if a SGL into a HORN was used, the RX recreated field strength would need to be higher and appears the results are off by twice your transmit gain relative to a dipole. Still adjusting the RX readings is misleading and this adjustment should be done to the signal generator levels and the same RX strength used. Note that adjusting the table will give numbers close to 14-16 dB margin – similar to the original results. Additionally, the limit typically should be -13 dBm (as shown above). Please correct. The following is provided to clarify the concepts and provide and if your original data was understood, an example of expected levels. Note that once all readings are adjusted, they are similar to the original readings in margin. Please review/correct.

1	2	3	4	5	6	7	8	9	10	11	12
Freq	Pol	Orient.	Maximum RX Reading From Original Equipment (unit A)	Recreated Reading During Substitution (Using Same Unit A)	Diff. between orig. reading and substitution level	TX Gain (dBi)	TX Gain Ref to Dipole	RF Power into TX antenna	RF Power into TX antenna, corrected by TX Gain Relative to Dipole	Limit	Margin
			This is the original measurement and the ideal level recreated when using substitution method. The idea is to recreate the same reading with the substitution conditions	Substitution Level	Column 5 – Column 4	10.61 (example)	Previous Column (5) – 2.15 10.61 – 2.15 = 8.46	This should be the measured SGL level at the TX antenna feed point. I.E. adjusted by any cable loss, attenuators, etc. I.E. 13 dBm SGL – 1.0 db CL – 10 dB pad = 2.0 dBm into antenna feed point See step m) TIA 603, 2.2.12. Note this assumes same level was recreated, or 0 for Column 6.	Column 9 + Column 8 + Column 6. This gives the Substitution level Note care must be taken as values in columns 6 and 8 could actually be negative See step m) TIA 603, 2.2.12. Note this assumes same level was recreated, or 0 for Column 6.	-13 dBm	Column 11 – Column 10
6.4976625	V	Y	60.22	51.76	8.46	10.61	8.46	-45.2	-28.3	-13 dBm	15.3
6.4976625	V	Y	60.22	60.22	0	10.61	8.46	-36.74 Note: Estimated level had the RX level not been adjusted	-28.3 Note: Dipole level is higher than Column 9 since more power would be necessary into Dipole	-13 dBm	15.3

- 3) The Maximum RF Exposure Calculation Exhibit referenced for previous comment 4 does not appear to have been received and could not be reviewed. This information should be provided for the worse case configuration. Additionally RF exposure requirements also require properly informing the users/owners of the system regarding RF Exposure requirements. Therefore required statements in the manual (similar to previously mentioned) must be added and also requires providing an updated manual. Please provide.
- 4) Please note that it appears the EIRP limitation used was +17 dBW EIRP (see original report on FCC site). It appears that with 5 Watt output and a possible 13 dBi Yagi antenna listed in the original manual, that this will exceed the +17 dBW EIRP allowed by 3 dB. This information must be properly understood to evaluate the RF exposure above. Please explain.



Timothy R. Johnson
Examining Engineer

[mailto: tjohnson@AmericanTCB.com](mailto:tjohnson@AmericanTCB.com)

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.