Engineering and Testing for EMC and Safety Compliance

Field Strength Engineering Evaluation

MODEL: i-PORT 3

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1 GENERAL INFORMATION

This report documents an engineering evaluation of Identec Solutions, Inc. i-PORT 3. Average and peak field strength measurements of the fundamental radiating frequency were taken on 3 channels per FCC 15.245. The test results reported in this document relate only to the item that was tested.

All measurements contained in this application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions, 1992. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier, and cables.

All radiated emissions measurements were performed manually at Rhein Tech Laboratories. The radiated emissions measurements required by the rules were performed on the three meter, open-field test range maintained by Rhein Tech Laboratories, 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. A complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission. The power line conducted emissions measurements were performed in a shielded enclosure also located at the Herndon, Virginia facility. The FCC accepts Rhein Tech Laboratories, Inc. as a facility available to do measurement work for others on a contractual basis.

1.1 TEST METHODOLOGY

Radiated testing was performed according to the procedures in ANSI C63.4 1992. Radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.2 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report, submitted to and approved by the Federal Communications Commission, to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

2 SYSTEM TEST CONFIGURATION

2.1 JUSTIFICATION

This is an engineering evaluation report documenting average and peak field strength measurements of the fundamental radiating frequency of the i-PORT 3 on 3 channels per FCC 15.245. The following frequencies were tested: 905 MHz, 910 MHz and 914.8 MHz.

2.2 EXERCISING THE EUT

The manufacturer provided test software to select the transmitting channel, put the EUT into constant transmit mode and disable hoping.

2.3 TEST SYSTEM DETAILS

The FCC identifiers for all equipment, plus descriptions of all cables used in the tested system are:

TABLE 1: EQUIPMENT UNDER TEST (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
COLLECTOR TERMINAL	Identec Solutions	i-PORT 3	03364P0353	O2E-ILR-IPORT3	Unshielded I/O	15518
ANTENNA	Identec Solutions	HEMI ANTENNA	743115	N/A	3 m Shielded Cable	15519
AC Power Adapter (12VDC)	IPS	HUP24-12B2	N/A	N/A	1.8 m Shielded and unshielded	15520

2.4 CONFIGURATION OF TESTED SYSTEM

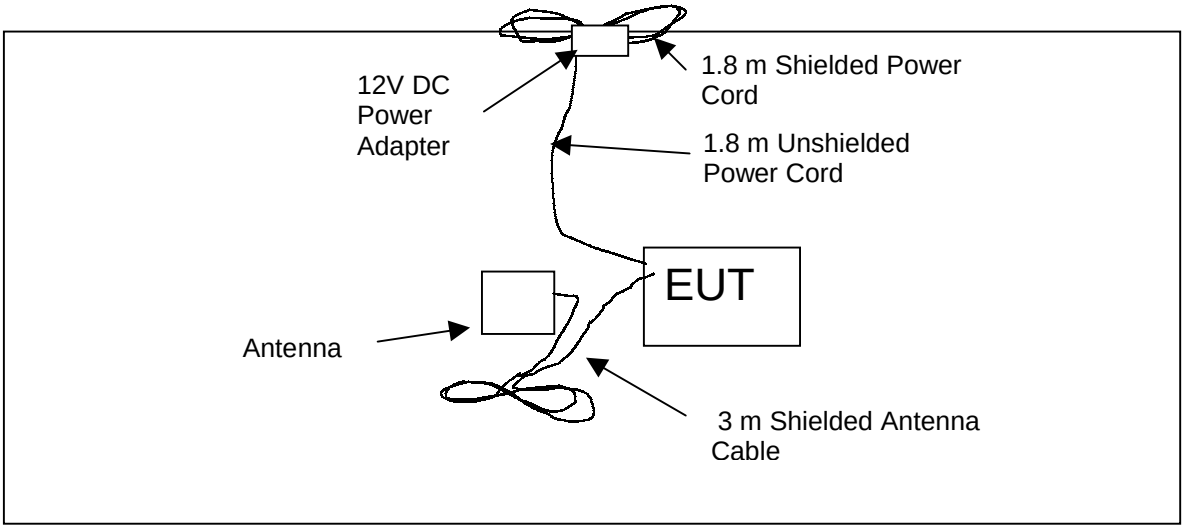


FIGURE 1: TEST SYSTEM CONFIGURATION

3 FIELD STRENGTH MEASUREMENTS PER FCC 15.245

3.1 TEST DESCRIPTION

Per FCC 15.245, the field strength of the fundamental from an intentional radiator operating between 902 and 928 MHz must not exceed 500 mV/m. This limit is specified at a test distance of 3 meters and is based on measurement instrumentation employing an average detector. The provisions in FCC Section 15.35 for limiting peak emissions also apply. Per 15.35, there is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

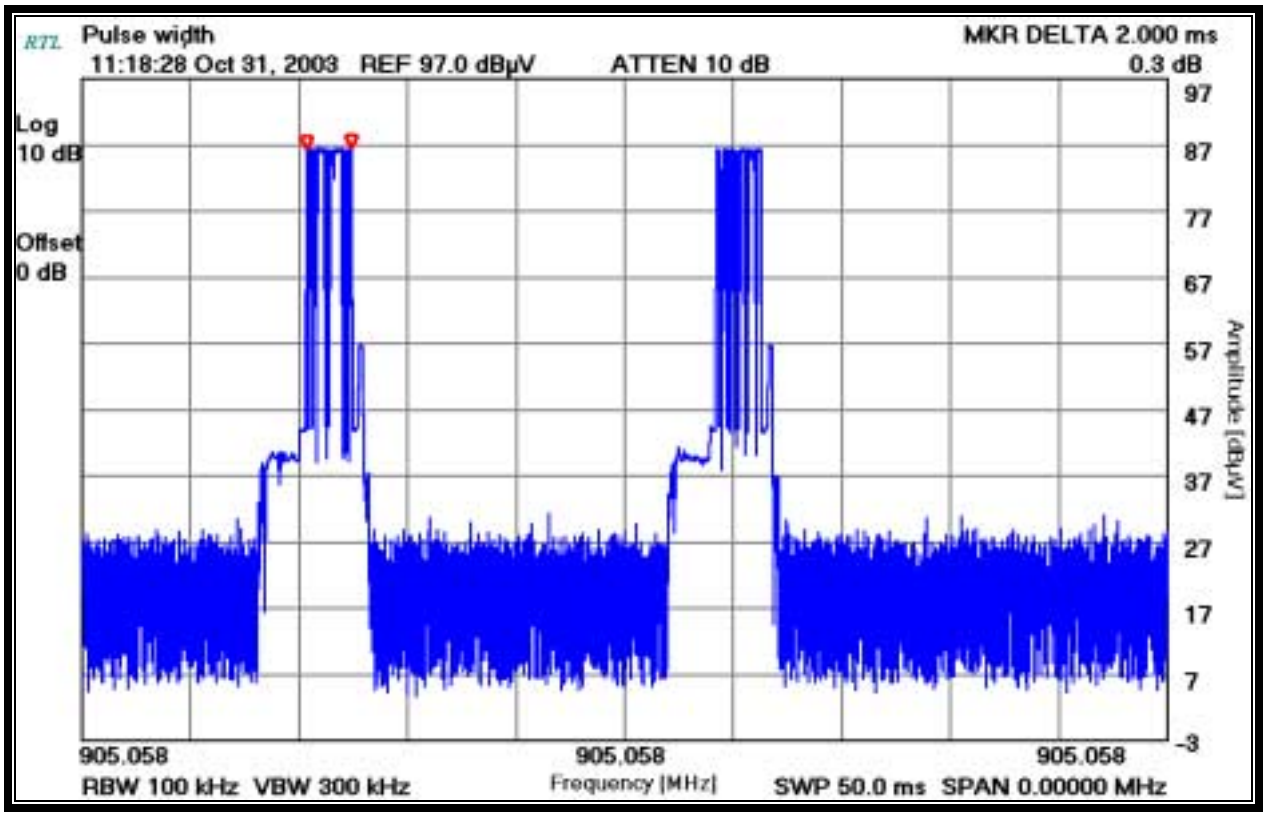
3.2 RADIATED EMISSION DATA

TABLE 2: FUNDAMENTAL RADIATED EMISSIONS: FCC PART 15.245

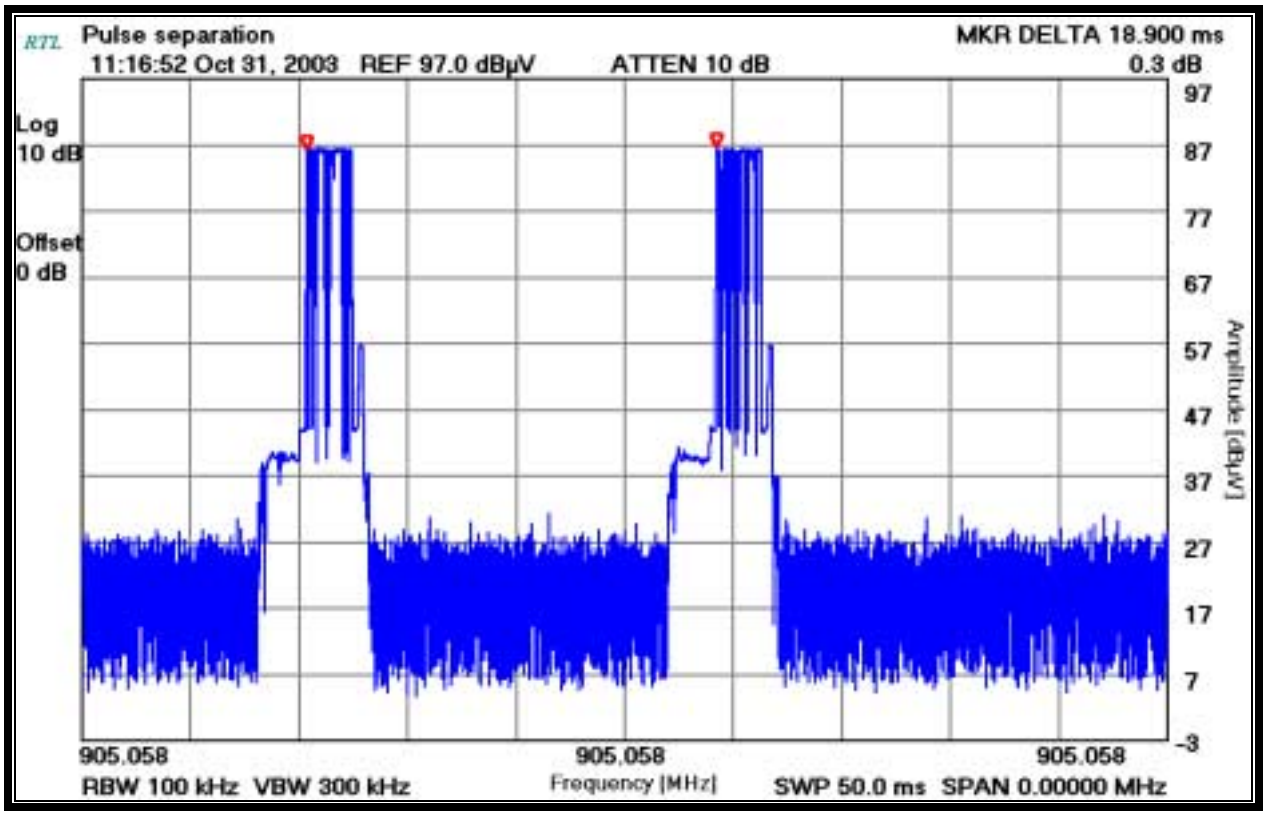
Temperature: 55°F Humidity: 72%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB/m)**	**Dwell Time Correction Factor (-19.5 dB)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**
905.054	Pk	V	240	1.0	90.0	35.4		125.4	134.0	-8.6
905.054	Av	V	240	1.0	90.0	35.4	-19.5	105.9	114.0	-8.1
910.051	Pk	H	275	1.0	91.8	36.1		127.9	134.0	-6.1
910.051	Av	H	275	1.0	91.8	36.1	-19.5	108.4	114.0	-5.6
914.611	Pk	V	350	1.2	93.0	35.4		128.4	134.0	-5.6
914.611	Av	V	350	1.2	93.0	35.4	-19.5	108.9	114.0	-5.1

* Note: The preamplifier's gain is included in the site correction factor.

4 DUTY CYCLE CALCULATION



PLOT 4-1: PULSE WIDTH MEASUREMENT FOR DUTY CYCLE



PLOT 4-2: PULSE SEPARATION MEASUREMENT FOR DUTY CYCLE

Duty cycle calculation from above plots:

2 ms / 18.9 ms = 0.1058 or 10.58 %

20 LOG (0.1058) = -19.5 dB correction.

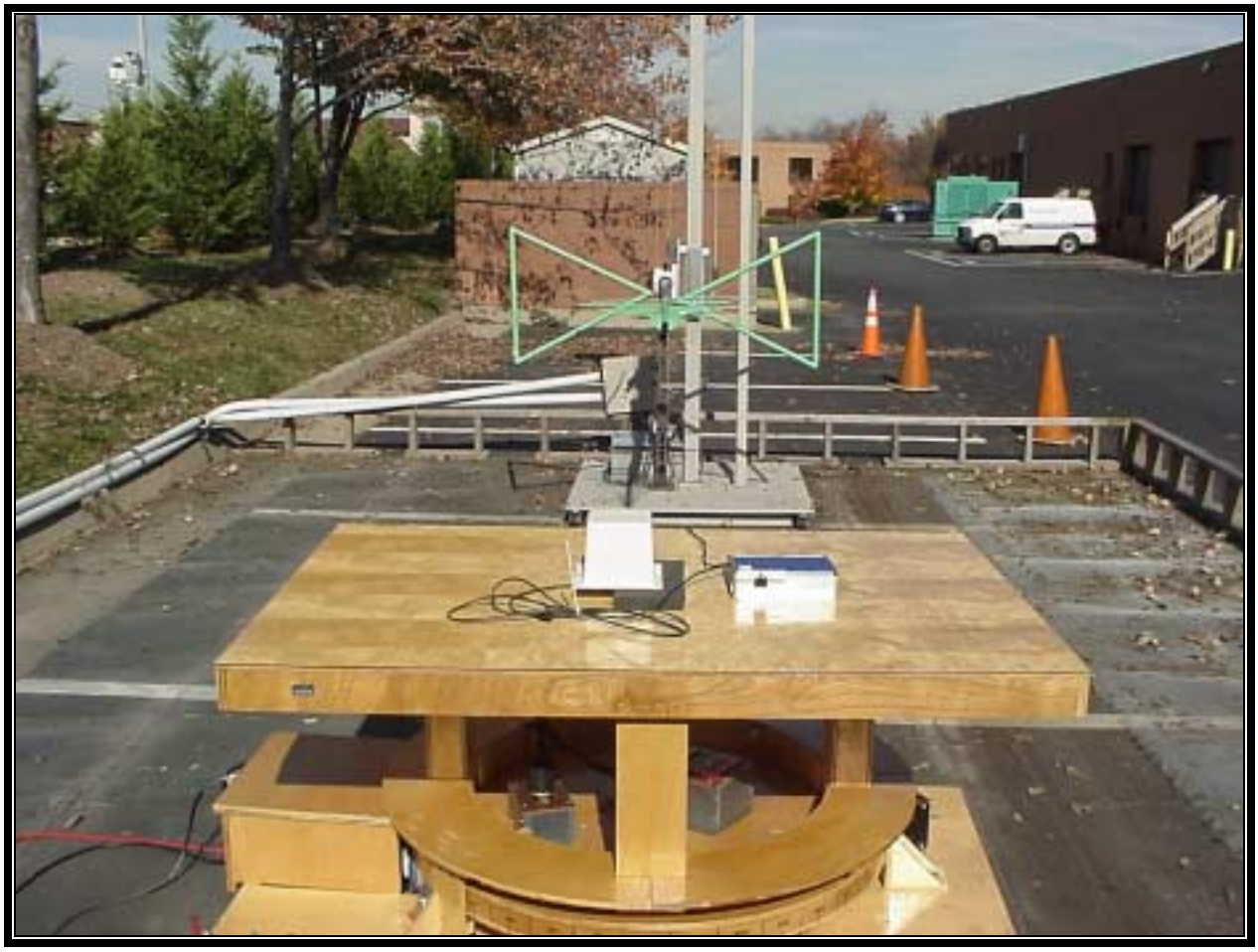
TABLE 3: EQUIPMENT USED FOR TESTING

Radiated Emissions					
RTL Asset	**Manufacturer**	**Model**	**Part Type**	**Serial Number**	**Calibration Date**
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	5/12/04
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	5/12/04
901053	Schaffner &Chase	CBL6112B	Bilog antenna (20 MHz - 2 GHz)	2648	7/03/04
900905	Rhein Tech Laboratories, Inc.	PR-1040	Pre Amplifier 40dB (10 MHz – 2 GHz)	1006	9/10/03
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	5/12/04
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	7/03/04

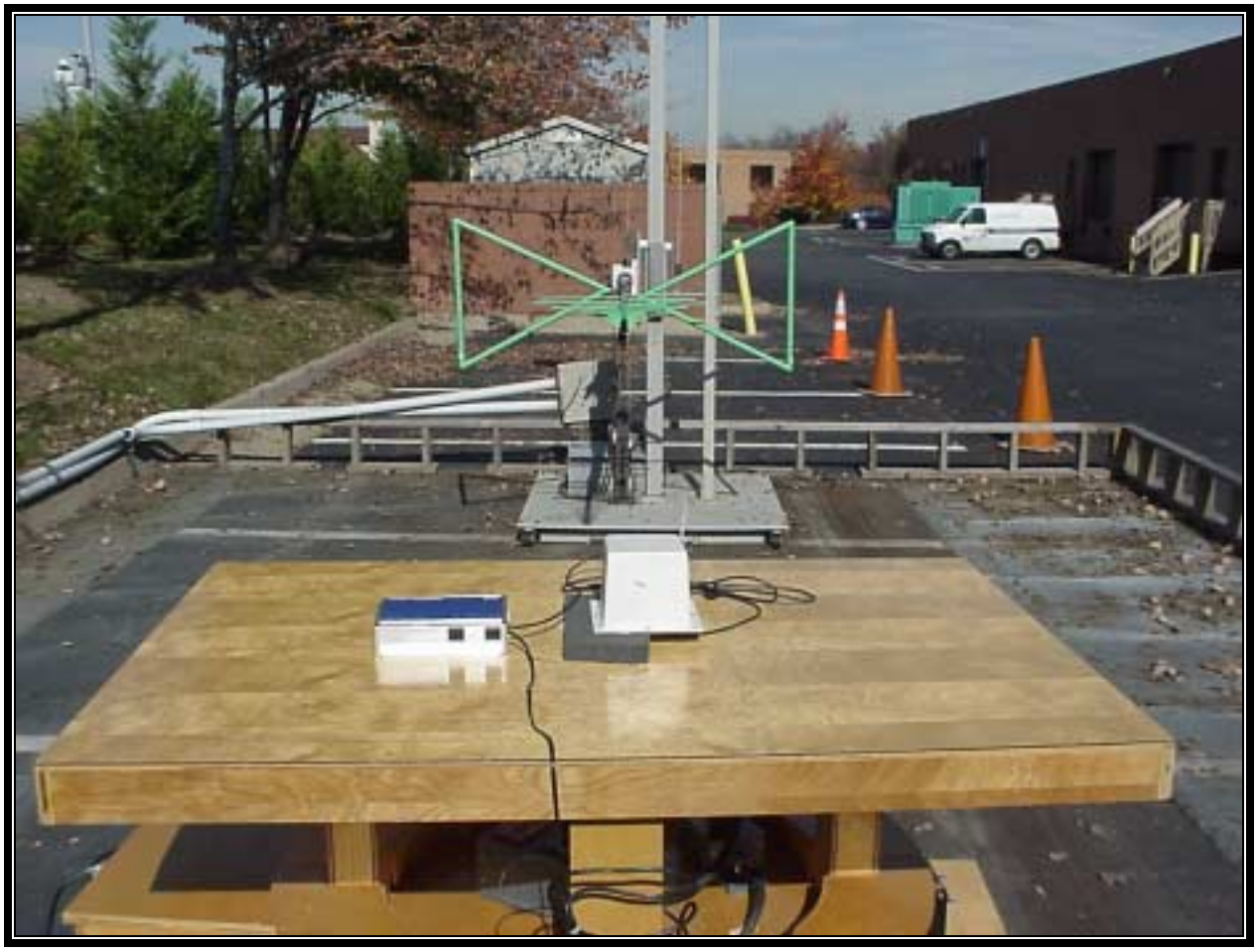
5 CONCLUSION

The data in this measurement report shows that the EUT as tested, i-Port 3, when used with the Identec Hemi antenna, complies with the applicable requirements of radiated power as outlined in 15.245 (b) of the FCC Rules and Regulations.

APPENDIX A: TEST CONFIGURATION PICTURES



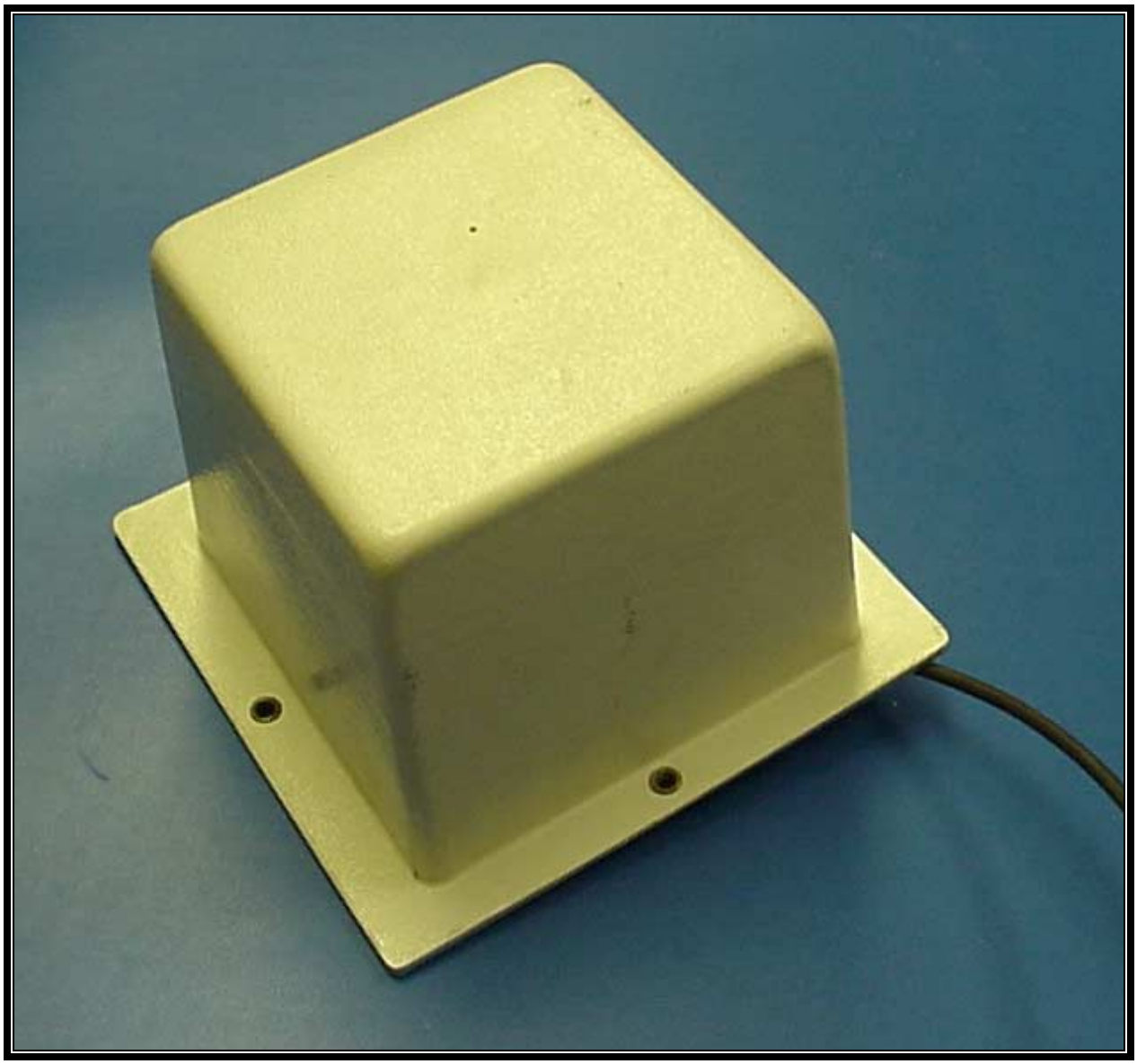
PHOTOGRAPH 1: RADIATED TEST CONFIGURATION (FRONT VIEW)



PHOTOGRAPH 2: RADIATED TEST CONFIGURATION (REAR VIEW)

APPENDIX B: EXTERNAL PHOTOGRAPHS

PHOTOGRAPH 3: i-PORT 3



PHOTOGRAPH 4: ANTENNA