Nemko-CCL, Inc.

1940 West Alexander Street
Salt Lake City, UT 84119
801-972-6146

Test Report

Certification

Test Of:

2GIG-GCX

FCC ID: WDQ-ZW01

Test Specification:

FCC PART 15, Subpart C

Test Report Serial No: 223853-11.2

Applicant:
2GIG Technologies
2961 W. Maple Loop Drive
Lehi, UT 84043

Date of Test: October 30, 2012

Issue Date: December 18, 2012

Accredited Testing Laboratory By:

NVLAP

NVLAP Lab Code 100272-0

CERTIFICATION OF ENGINEERING REPORT

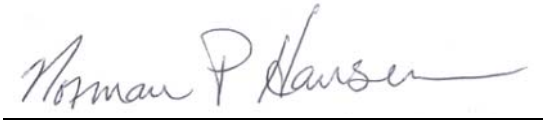
This report has been prepared by Nemko-CCL, Inc. to document compliance of the device described below with the requirements of Federal Communications Commission (FCC) Part 15, Subpart C. This report may be reproduced in full, partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

- Applicant: 2GIG Technologies
- Manufacturer: Flextronics and Hourui Linear Electronics Manufactory
- Brand Name: Go!Control
- Model Number: 2GIG-GCX
- FCC ID Number: WDQ-ZW01

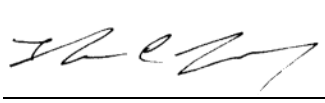
On this 18th day of December 2012, I, individually, and for Nemko-CCL, Inc., certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

Although NVLAP has recognized that the Nemko-CCL, Inc. EMC testing facilities are in good standing, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Nemko-CCL, Inc.



Tested by: Norman P. Hansen
EMC Technician



Reviewed by: Thomas C. Jackson
General Manager

TABLE OF CONTENTS

PAGE

SECTION 1.0 CLIENT INFORMATION

1.1 Applicant:

Company Name: 2GIG Technologies
2961 W. Maple Loop Drive
Lehi, UT 84043

Contact Name: Greg Hansen
Title: Regulatory Compliance Manager

1.2 Manufacturer:

Company Name: Flextronics
89 Yong Fu Road
Tong Fu Industrial Park
Bao An District
Shenzhen, 518103 P.R. China

Contact Name: Feng Zhou
Title: QA Engineer

1.3 Manufacturer:

Company Name: Hourui Linear Electronics Manufactory
Hourui Second Industrial Zone
Hourui Village
Bao An District
Shenzhen, P.R. China

Contact Name: Henry Luk
Title: Senior Electronic Engineering Supervisor

SECTION 2.0 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of EUT:

Brand Name:	Go!Control
Model Number:	2GIG-GCX
Serial Number:	Engineering Unit
Dimensions:	8.5” x 6” x 1.25”

2.2 Description of EUT:

The 2GIG-GCX is a control panel for use in home automation and security systems. The 2GIG-GCX is powered by a ZB Power ZB-A140017 power supply. A Ni-mh 7.2 V, 2000 mA battery power pack provides back up power during power outages. The 2GIG-GCX, fully configured, has a POTS line interface, contact interface ports, a Z-Wave 908.42 MHz transceiver, a 910 – 920 MHz FHSS transceiver, and a Telit HE910 2G/3G cell modem. A 3.75” x 2.25” touchscreen is provided for direct user interface.

This report covers the 908.42 MHz Z-Wave tranmsitter. The 910 – 920 MHz FHSS transmitter was tested and is covered in Nemko-CCL report #223853-3. The circuitry of the device subject to FCC Part 15, Subpart B is covered in Nemko-CCL report #223853-2. The Telit HE910 carries modular certification under FCC ID #RI7HE910.

2.3 EUT and Support Equipment:

The FCC ID numbers for the EUT and support equipment used during the test are listed below:

Brand Name Model Number Serial No.	FCC ID Number	Description	Name of Interface Ports / Interface Cables
BN: Go!Control MN: 2GIG-GCX (Note 1) SN: Engineering Unit	WDQ-ZW01	Control Panel	See Section 2.4
BN: Toshiba MN: 2020 SN: None	None	PBX	Line/Modular cord (Note 2)

Note: (1) EUT
(2) Interface port connected to EUT (See Section 2.4)

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.4 Interface Ports on EUT:

Name of Ports	No. of Ports Fitted to EUT	Cable Descriptions/Length
Telephone	1	Modular cord with RJ45 and RJ10 connectors/10 meters
Power/Contact	1	8 conductors/1 meter

2.5 Modification Incorporated/Special Accessories on EUT:

There were no modifications or special accessories required to comply with the specification.

SECTION 3.0 TEST SPECIFICATION, METHODS & PROCEDURES

3.1 Test Specification:

Title:	FCC PART 15, Subpart C (47 CFR 15) 15.203, 15.207, and 15.249 Limits and methods of measurement of radio interference characteristics of radio frequency devices
Purpose of Test:	The tests were performed to demonstrate initial compliance

3.2 Methods & Procedures:

3.2.1 §15.203 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

3.2.2 §15.207 Conducted Limits

(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHZ to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5*	66 to 56*	56 to 46*
0.5 – 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency.

3.2.3 §15.249 Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, and 5725 – 5850 MHz

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05-24.25 GHz band subject to the following conditions:

(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.

(2) The frequency tolerance of the carrier signal shall be maintained within ±0.001% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Antenna gain must be at least 33 dBi. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

(c) Field strength limits are specified at a distance of 3 meters.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

(e) As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

3.3 Test Procedure

The conducted disturbance at mains ports and radiated disturbance testing was performed according to the procedures in ANSI C63.4: 2003 and using the guidance, DA 00-705, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems, dated March 30, 2000. Testing was performed at Nemko-CCL, Inc. Wanship open area test site #2, located at 29145 Old Lincoln Highway, Wanship, UT. This site has been registered with the FCC, and was renewed February 15, 2012 (90504). This registration is valid for three years.

Nemko-CCL, Inc. is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Lab: 100272-0, which is effective until September 30, 2013.

SECTION 4.0 OPERATION OF EUT DURING TESTING

4.1 Operating Environment:

Power Supply: 120 VAC
AC Mains Frequency: 60 Hz

4.2 Operating Modes:

The transmitter was tested while in a constant transmit mode at full power. The AC mains voltage to the AC adapter was varied as required by §15.31(e) with no change seen in the voltage supplied to the transmitter or in transmitter characteristics.

4.3 EUT Exercise Software:

2GIG Technologies software was used to exercise the transmitter.

SECTION 5.0 SUMMARY OF TEST RESULTS

5.1 FCC Part 15, Subpart C

5.1.1 Summary of Tests:

Section	Environmental Phenomena	Frequency Range (MHz)	Result
15.203	Antenna Requirements	Structural requirement	Complied
15.207	Conducted Disturbance at Mains Ports	0.15 to 30	Complied
15.249(a)	Field Strength of the Fundamental Frequency	902 – 928	Complied
15.249(a)	Field Strength of the Harmonics	902 – 9280	Complied
15.249(d)	Field Strength of Spurious Emissions	0.05 – 9280	Complied
Note 1: Compliance with these requirements is shown in documents filed with the FCC at the time of Certification.			

5.2 Result

In the configuration tested, the EUT complied with the requirements of the specification.

SECTION 6.0 MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

6.1 General Comments:

This section contains the test results only. Details of the test methods used and a list of the test equipment used during the measurements can be found in Appendix 1 of this report.

6.2 Test Results:

6.2.1 §15.203 Antenna Requirements

The EUT uses a monopole wire antenna that is soldered to the PCB.

6.2.2 §15.207 Conducted Disturbance at the AC Mains Ports

Frequency (MHz)	AC Mains Lead	Detector	Measured Level (dBµV)	Limit (dBµV)	Margin (dB)
0.15	Hot Lead	Peak (Note 1)	49.3	56.0	-6.7
0.42	Hot Lead	Peak (Note 1)	41.0	47.5	-6.5
0.89	Hot Lead	Peak (Note 1)	42.5	46.0	-3.5
3.64	Hot Lead	Peak (Note 1)	38.9	46.0	-7.1
4.56	Hot Lead	Peak (Note 1)	39.4	46.0	-6.6
24.05	Hot Lead	Peak (Note 1)	43.1	50.0	-6.9
25.40	Hot Lead	Peak (Note 1)	44.4	50.0	-5.6
26.13	Hot Lead	Peak (Note 1)	43.3	50.0	-6.7
27.05	Hot Lead	Peak (Note 1)	44.2	50.0	-5.8
0.18	Neutral Lead	Peak (Note 1)	44.6	54.3	-9.7
0.90	Neutral Lead	Quasi-Peak (Note 2)	43.8	56.0	-12.2
0.90	Neutral Lead	Average (Note 2)	40.3	46.0	-5.7
4.55	Neutral Lead	Peak (Note 1)	36.8	46.0	-9.2
12.40	Neutral Lead	Peak (Note 1)	42.6	50.0	-7.4
26.55	Neutral Lead	Peak (Note 1)	44.8	50.0	-5.2
27.05	Neutral Lead	Peak (Note 1)	44.8	50.0	-5.2
27.48	Neutral Lead	Peak (Note 1)	45.2	50.0	-4.8

Frequency (MHz)	AC Mains Lead	Detector	Measured Level (dBµV)	Limit (dBµV)	Margin (dB)
28.45	Neutral Lead	Peak (Note 1)	43.4	50.0	-6.6
28.90	Neutral Lead	Peak (Note 1)	43.1	50.0	-6.9

Note 1: The reference detector used for the measurements was Quasi-Peak or Peak and the data was compared to the average limit; therefore, the EUT was deemed to meet both the average and quasi-peak limits.

Note 2: The reference detector used for the measurements was quasi-peak and average and the data was compared to the respective limits.

RESULT

The EUT complied with the specification by 3.5 dB.

6.2.3 §15.249(a) Fundamental Field Strength

The table below shows the fundamental emission, measured at 3 meters using peak detection.

Frequency (MHz)	Detector	Receiver Reading (dBµV)	Correction Factor (dB/m)	Field Strength (dBµV/m)	3 m Limit (dBµV/m)	Margin (dB)	Polarity
908.42	Peak	60.5	30.5	91.0	94.0	-3.0	Vertical
908.42	Peak	62.7	30.5	93.2	94.0	-0.8	Horizontal

RESULT

The EUT complied with the specification by 0.8 dB.

6.2.4 §15.249(a) and §12.249(d) Field Strength of Harmonics and Spurious Emissions

The spurious emissions and harmonic emissions were measured from 0.05 MHz to 9084.2 MHz. The table below shows the emissions from the transmitter. Emissions from the digital circuitry and receivers of the EUT are shown in Nemko-CCL report 223853-2 and 225853-3.

Frequency (MHz)	Detection Mode	Antenna Polarity	Receiver Reading (dBµV)	Correction Factor (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1816.8	Peak	Vertical	22.8	29.3	52.1	74.0	-21.9
1816.8	Average	Vertical	17.5	29.3	46.8	54.0	-7.2
1816.8	Peak	Horizontal	25.3	29.3	54.6	74.0	-19.4
1816.8	Average	Horizontal	19.9	29.3	49.2	54.0	-4.8
2725.3	Peak	Vertical	9.5	32.6	42.1	74.0	-31.9
2725.3	Average	Vertical	5.1	32.6	37.7	54.0	-16.3
2725.3	Peak	Horizontal	9.4	32.6	42.0	74.0	-32.0
2725.3	Average	Horizontal	5.2	32.6	37.8	54.0	-16.2
3633.7	Peak	Vertical	1.7	35.8	37.5	74.0	-36.5
3633.7	Average	Vertical	-7.1	35.8	28.7	54.0	-25.3
3633.7	Peak	Horizontal	1.7	35.8	37.5	74.0	-36.5
3633.7	Average	Horizontal	-7.0	35.8	28.8	54.0	-25.2
4542.1	Peak	Vertical	2.4	37.1	39.5	74.0	-34.5
4542.1	Average	Vertical	-8.1	37.1	29.0	54.0	-25.0
4542.1	Peak	Horizontal	2.5	37.1	39.6	74.0	-34.4
4542.1	Average	Horizontal	-7.8	37.1	29.3	54.0	-24.7
5450.5	Peak	Vertical	0.7	39.3	40.0	74.0	-34.0
5450.5	Average	Vertical	-9.6	39.3	29.7	54.0	-24.3
5450.5	Peak	Horizontal	0.6	39.3	39.9	74.0	-34.1
5450.5	Average	Horizontal	-9.4	39.3	29.9	54.0	-24.1
6358.9	Peak	Vertical	-0.2	40.0	39.8	74.0	-34.2
6358.9	Average	Vertical	-10.3	40.0	29.7	54.0	-24.3
6358.9	Peak	Horizontal	0.5	40.0	40.5	74.0	-33.5
6358.9	Average	Horizontal	-10.0	40.0	30.0	54.0	-24.0
7267.4	Peak	Vertical	0.7	42.2	42.9	74.0	-31.1
7267.4	Average	Vertical	-9.3	42.2	32.9	54.0	-21.1
7267.4	Peak	Horizontal	0.0	42.2	42.2	74.0	-31.8
7267.4	Average	Horizontal	-9.5	42.2	32.7	54.0	-21.3
8175.8	Peak	Vertical	0.5	43.5	44.0	74.0	-30.0
8175.8	Average	Vertical	-10.1	43.5	33.4	54.0	-20.6
8175.8	Peak	Horizontal	0.4	43.5	43.9	74.0	-30.1
8175.8	Average	Horizontal	-10.2	43.5	33.3	74.0	-40.7

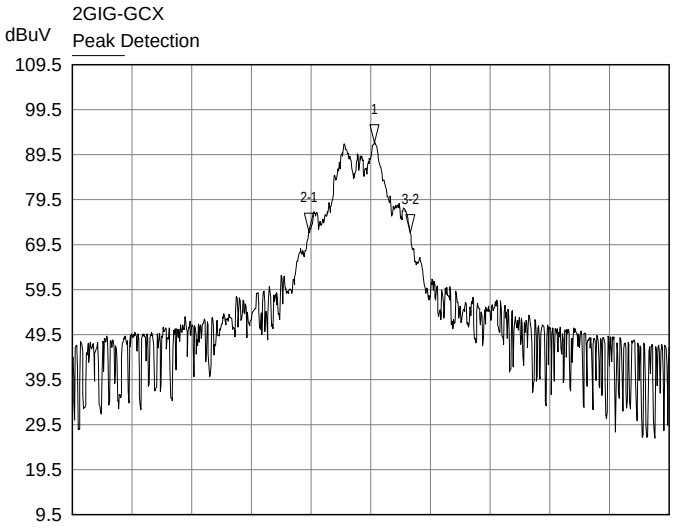
Frequency (MHz)	Detection Mode	Antenna Polarity	Receiver Reading (dBµV)	Correction Factor (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
9084.2	Peak	Vertical	-0.8	44.5	43.7	54.0	-10.3
9084.2	Average	Vertical	-10.9	44.5	33.6	74.0	-40.4
9084.2	Peak	Horizontal	-0.9	44.5	43.6	54.0	-10.4
9084.2	Average	Horizontal	-11.4	44.5	33.1	74.0	-40.9

RESULT

The EUT complied with the specification by 4.8 dB.

6.2.4 Channel Bandwidth

The 20 dB bandwidth of the hopping channel is shown in the plot below. This plot shows the fundamental emission has a 20 dB band width of 170 kHz is contained totally within the 902 – 928 MHz frequency band.



Mkr	X-Axis	Value	Notes
1 ▽	908.426000 MHz	92.1000 dBuV	
2-1 ▽	-110.000000 kHz	-19.6000 dB	
3-2 ▽	170.000000 kHz	-0.4000 dB	

Peak Detection Band width

APPENDIX 1 TEST PROCEDURES AND TEST EQUIPMENT

A1.1 §15.207 Conducted Disturbance at the AC Mains

The conducted disturbance at mains ports from the EUT was measured using a spectrum analyzer with a quasi-peak adapter for peak, quasi-peak and average readings. The quasi-peak adapter uses a bandwidth of 9 kHz, with the spectrum analyzer's resolution bandwidth set at 100 kHz, for readings in the 150 kHz to 30 MHz frequency ranges.

The conducted disturbance at mains ports measurements are performed in a screen room using a (50 Ω/50 µH) Line Impedance Stabilization Network (LISN).

Where mains flexible power cords are longer than 1 m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4 m in length.

Where the EUT is a collection of devices with each device having its own power cord, the point of connection for the LISN is determined from the following rules:

(a) Each power cord, which is terminated in a mains supply plug, shall be tested separately.
(b) Power cords, which are not specified by the manufacturer to be connected via a host unit, shall be tested separately.
(c) Power cords which are specified by the manufacturer to be connected via a host unit or other power supplying equipment shall be connected to that host unit and the power cords of that host unit connected to the LISN and tested.
(d) Where a special connection is specified, the necessary hardware to effect the connection is supplied by the manufacturer for the testing purpose.
(e) When testing equipment with multiple mains cords, those cords not under test are connected to an artificial mains network (AMN) different than the AMN used for the mains cord under test.

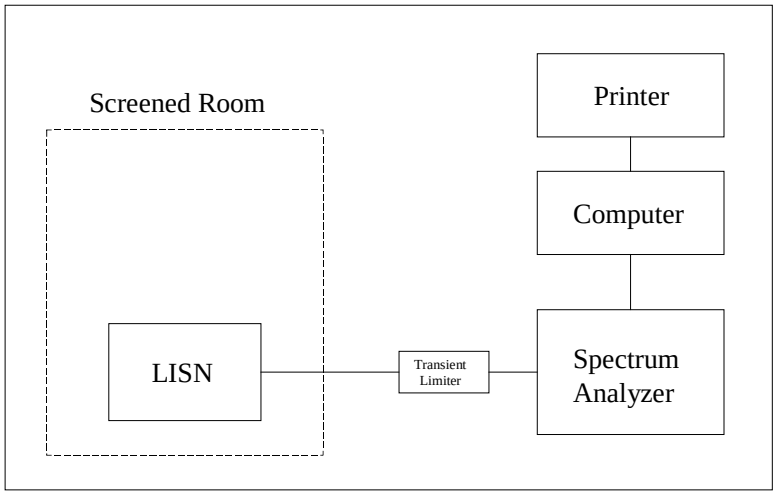
For AC mains port testing, desktop EUT are placed on a non-conducting table at least 0.8 meters from the metallic floor and placed 40 cm from the vertical coupling plane (copper plating in the wall behind EUT table). Floor standing equipment is placed directly on the earth grounded floor.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Due Date of Calibration
Wanship Open Area Test Site #2	Nemko-CCL, Inc.	N/A	N/A	11/16/2011	11/16/2012
Test Software	Nemko-CCL, Inc.	Conducted Emissions	Revision 1.2	N/A	N/A
Spectrum Analyzer	Hewlett Packard	8566B	2230A01711	01/17/2012	01/17/2013

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Due Date of Calibration
Quasi-Peak Detector	Hewlett Packard	85650A	2043A00137	01/18/2012	01/18/2013
LISN	EMCO	3825/2	9305-2099	03/12/2012	03/12/2013
Conductance Cable Wanship Site #2	Nemko-CCL, Inc.	Cable J	N/A	12/14/2011	12/14/2012
Transient Limiter	Hewlett Packard	11947A	3107A02266	12/14/2011	12/14/2012

An independent calibration laboratory or Nemko-CCL Inc. personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Conducted Emissions Test Setup



A1.2 §15.247 Radiated Measurements

The radiated emissions from the intentional radiator were measured using a spectrum analyzer with a quasi-peak adapter for peak and quasi-peak readings.

A loop antenna was used to measure emissions below 30 MHz. Emission readings more than 20 dB below the limit at any frequency may not be listed in the reported data. For frequencies between 9 kHz and 30 MHz, or the lowest frequency generated or used in the device greater than 9 kHz, and less than 30 MHz, the spectrum analyzer resolution bandwidth was set to 9 kHz and the video bandwidth was set to 30 kHz. For average measurements, the spectrum analyzer average detector was used.

For frequencies above 30 MHz, an amplifier and preamplifier were used to increase the sensitivity of the measuring instrumentation. The quasi-peak adapter uses a bandwidth of 120 kHz, with the spectrum analyzer's resolution bandwidth set at 1 MHz, for readings in the 30 to 1000 MHz frequency ranges. For peak emissions above 1000 MHz the spectrum analyzer's resolution bandwidth was set to 1 MHz and the video bandwidth was set to 3 MHz. For average measurements above 1000 MHz the spectrum analyzer's resolution bandwidth was set to 1 MHz and the average detector of the analyzer was used.

A biconilog antenna was used to measure the frequency range of 30 to 1000 MHz and a Double Ridge Guide Horn antenna was used to measure the frequency range of 1 GHz to 18 GHz at a distance of 3 meters and/or 1 meter from the EUT. The readings obtained by the antenna are correlated to the levels obtained with a tuned dipole antenna by adding antenna factors.

The configuration of the EUT was varied to find the maximum radiated emission. The EUT was connected to the peripherals listed in Section 2.3 via the interconnecting cables listed in Section 2.4. A technician manually manipulated these interconnecting cables to obtain worst-case radiated disturbance. The EUT was rotated 360 degrees, and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission. Where there were multiple interface ports all of the same type, cables are either placed on all of the ports or cables added to these ports until the emissions do not increase by more than 2 dB.

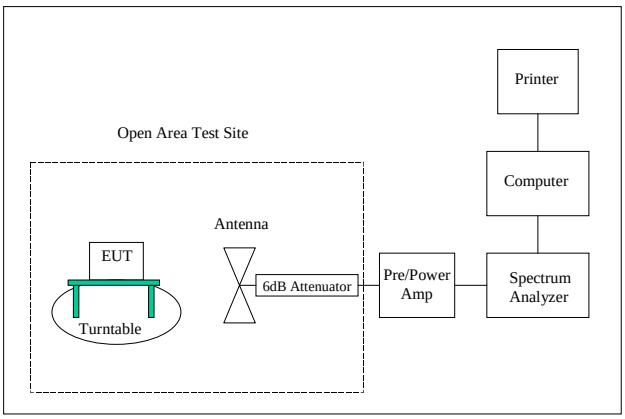
Desktop EUT are measured on a non-conducting table 0.8 meters above the ground plane. The table is placed on a turntable, which is level with the ground plane. For equipment normally placed on floors, the equipment shall be placed directly on the turntable.

For radiated emission testing at 30 MHz or above that is performed at distances closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

Type of Equipment	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Due Date of Calibration
Wanship Open Area Test Site #2	Nemko-CCL, Inc.	N/A	N/A	11/16/2011	11/16/2012
Test Software	Nemko-CCL, Inc.	Radiated Emissions	Revision 1.3	N/A	N/A
Spectrum Analyzer/Receiver	Rhode & Schwarz	ESU40	100064	07/28/2012	07/28/2013
Spectrum Analyzer	Hewlett Packard	8566B	2230A01711	01/17/2012	01/17/2013
Quasi-Peak Detector	Hewlett Packard	85650A	2043A00137	01/18/2012	01/18/2013
Loop Antenna	EMCO	6502	2011	03/11/2011	03/11/2013
Biconilog Antenna	EMCO	3142	9601-1009	04/21/2011	04/21/2013
Double Ridged Guide Antenna	EMCO	3115	9604-4779	03/10/2011	03/10/2013
High Frequency Amplifier	Miteq	AFS4-01001800-43-10P-4	1096455	06/26/2012	06/26/2013
6’ High Frequency Cable	Microcoax	UFB197C-0-0720-000000	1296	05/14/2012	05/14/2013
20’ High Frequency Cable	Microcoax	UFB197C-1-3120-000000	1297	05/14/2012	05/14/2013
3 Meter Radiated Emissions Cable Wanship Site #2	Microcoax	UFB205A-0-4700-000000	1295	05/10/2011	05/10/2013
Pre/Power-Amplifier	Hewlett Packard	8447F	3113A05161	08/27/2012	08/27/2013
6 dB Attenuator	Hewlett Packard	8491A	32835	12/14/2011	12/14/2012

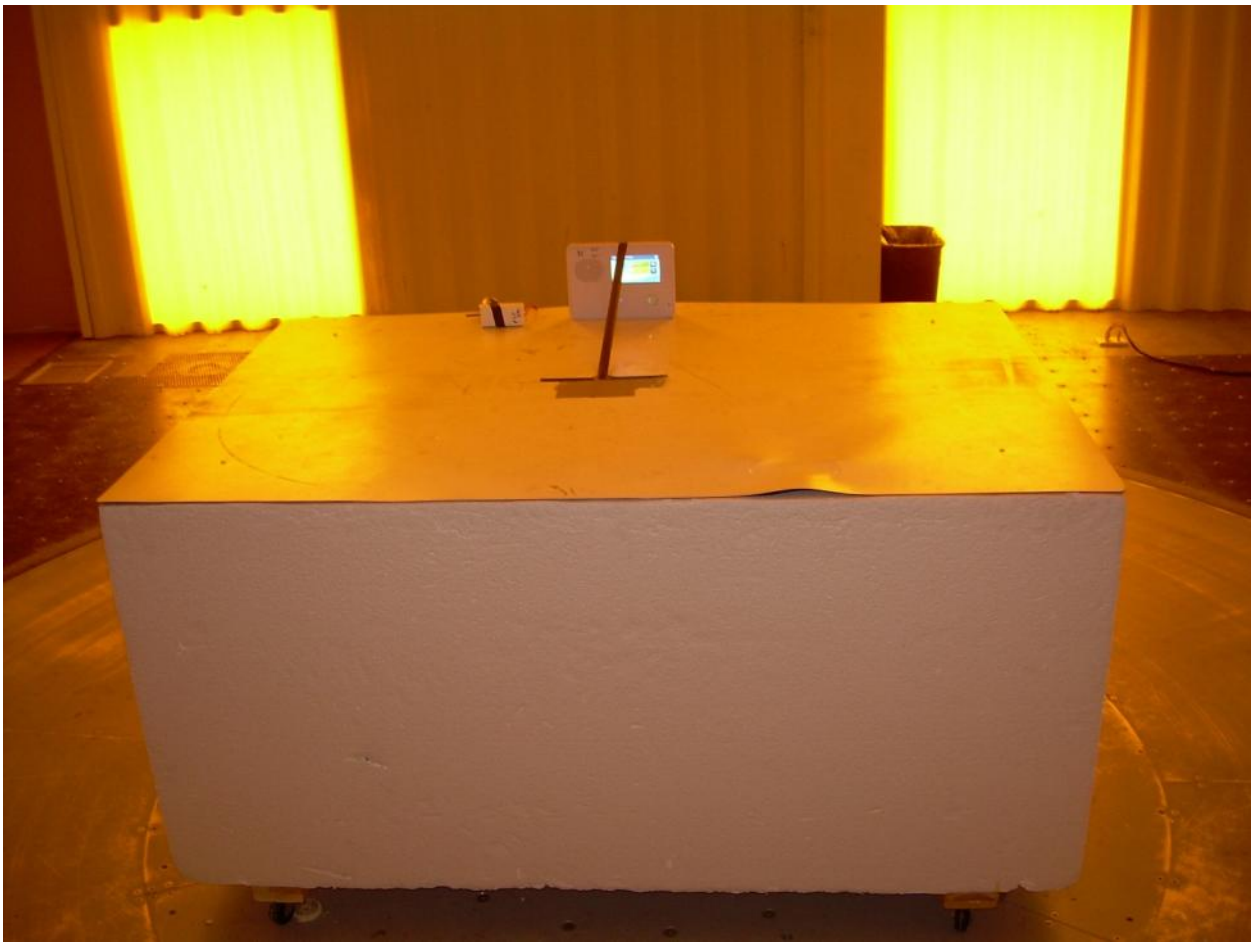
An independent calibration laboratory or Nemko-CCL, Inc. personnel calibrates all the equipment listed above at intervals defined in ANSI C63.4:2003 Section 4.4 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to tractability is on file and is available for examination upon request.

Radiated Emissions Test Setup

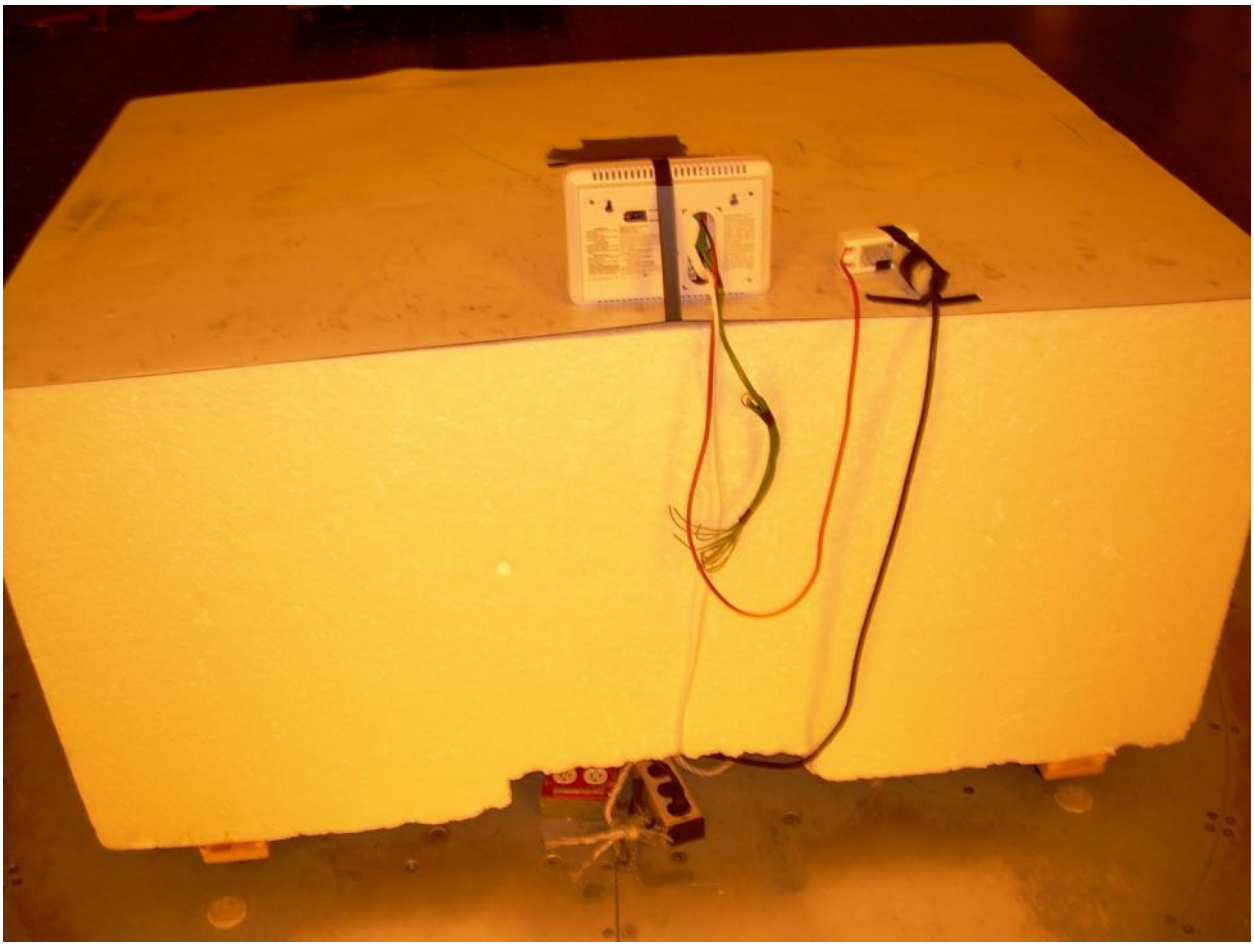


APPENDIX 2 PHOTOGRAPHS

Photograph 1 – Front View Radiated Disturbance Worst Case Configuration



Photograph 2 – Back View Radiated Disturbance Worst Case Configuration



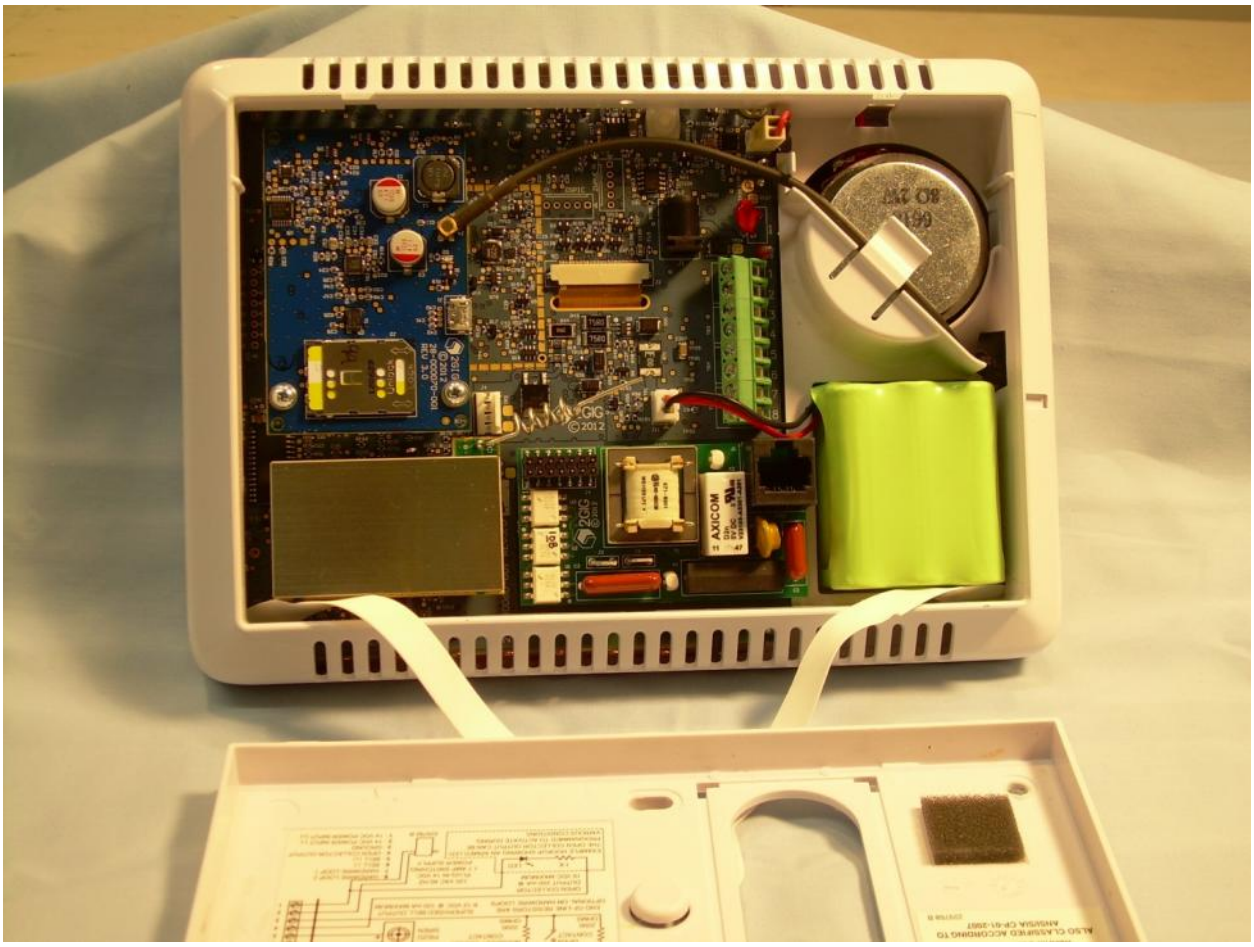
Photograph 3 – Front View Conducted Disturbance Worst Case Configuration

Photograph 4 – Back View Conducted Disturbance Worst Case Configuration

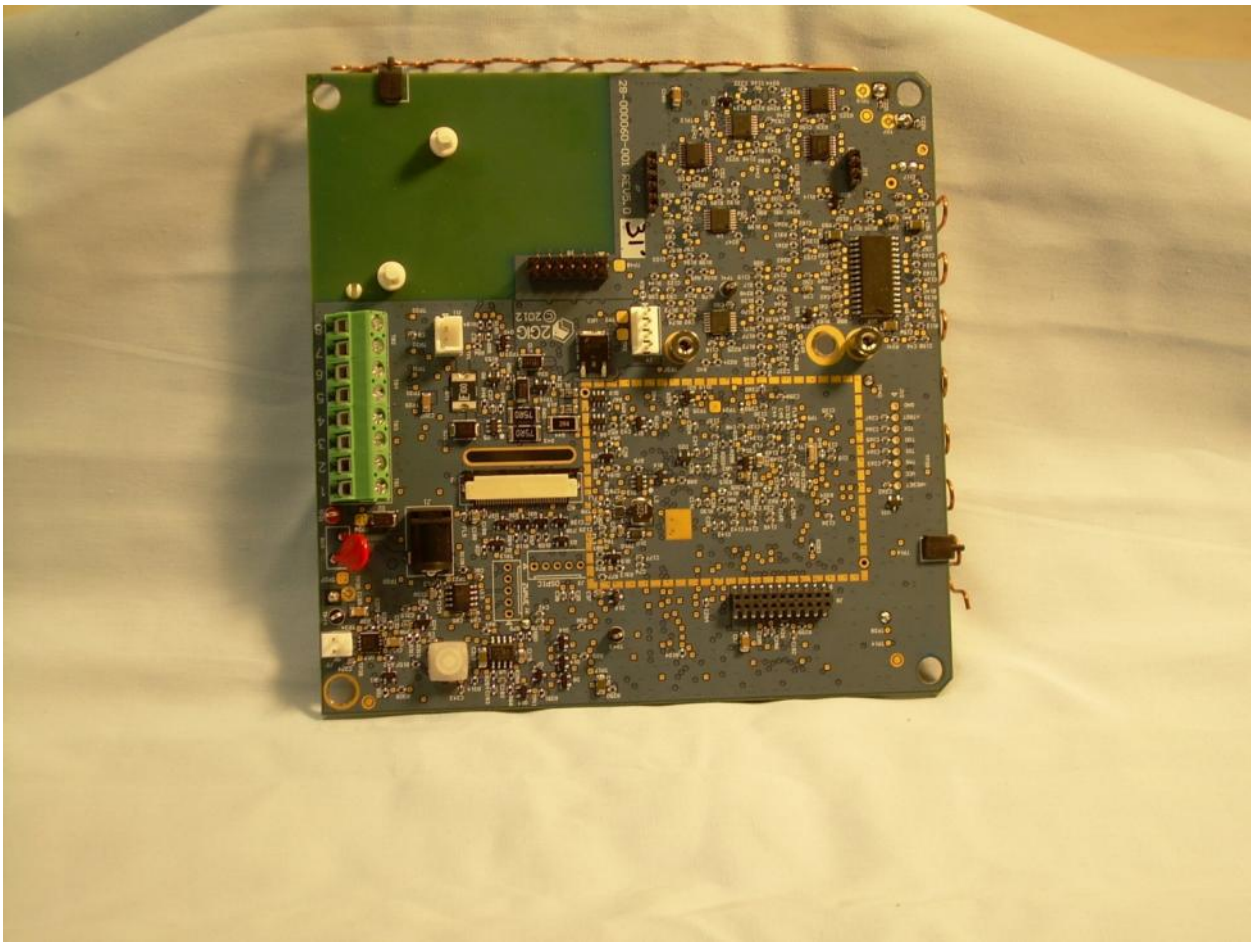
Photograph 5 – Front View of the EUT

Photograph 6 – Back View of the EUT

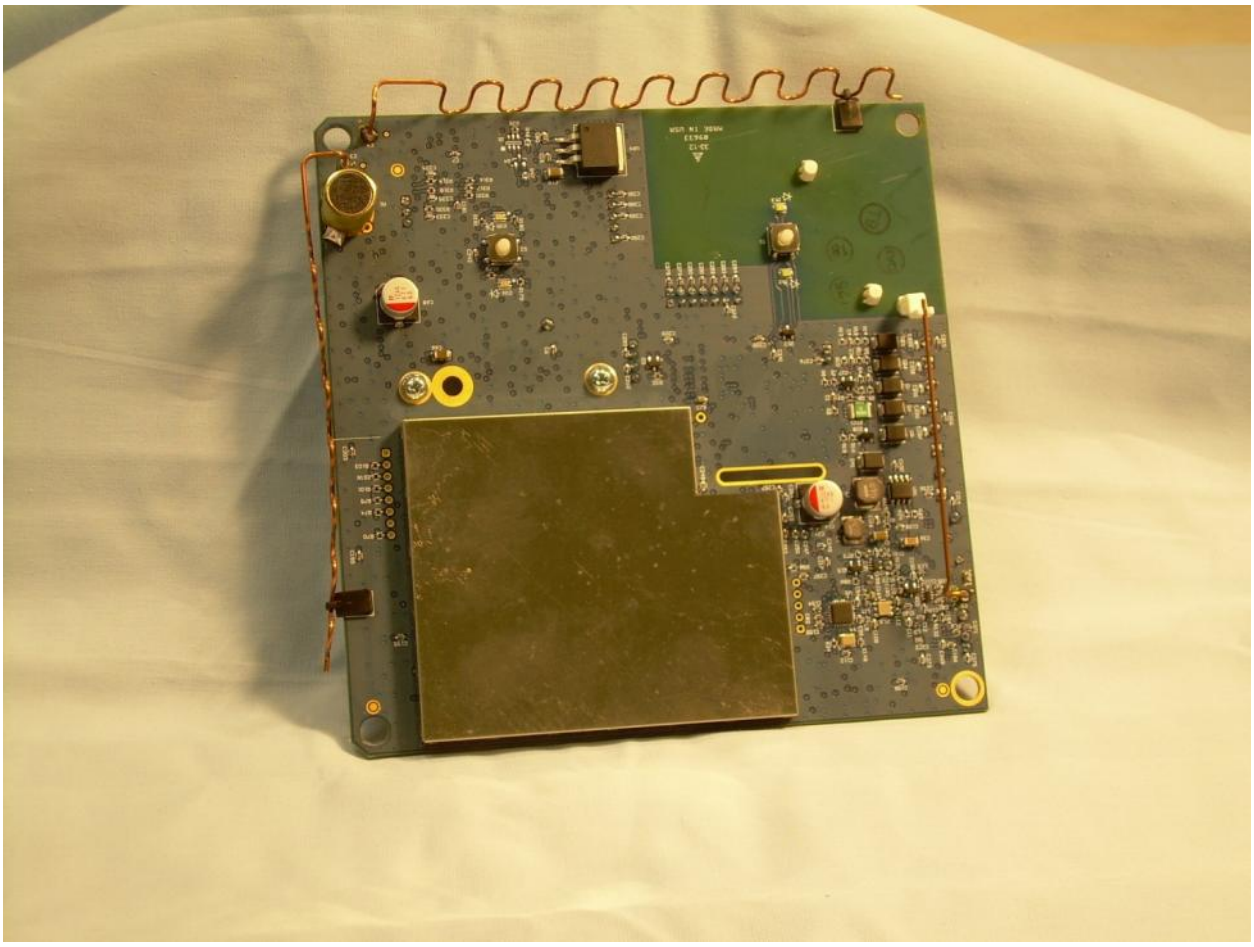
Photograph 7 – Internal View of the EUT



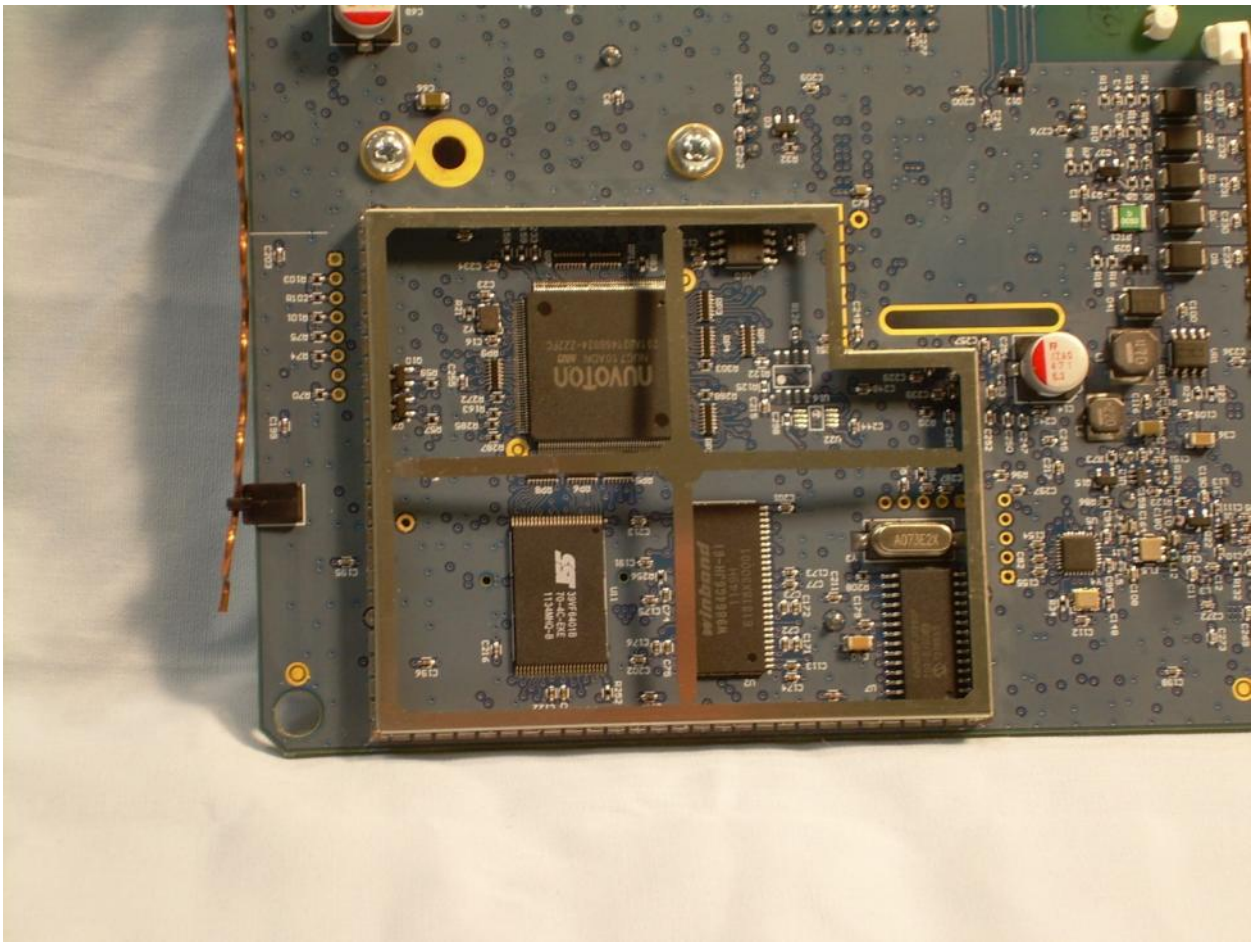
Photograph 8 – View of the Back Side of the Main PCB



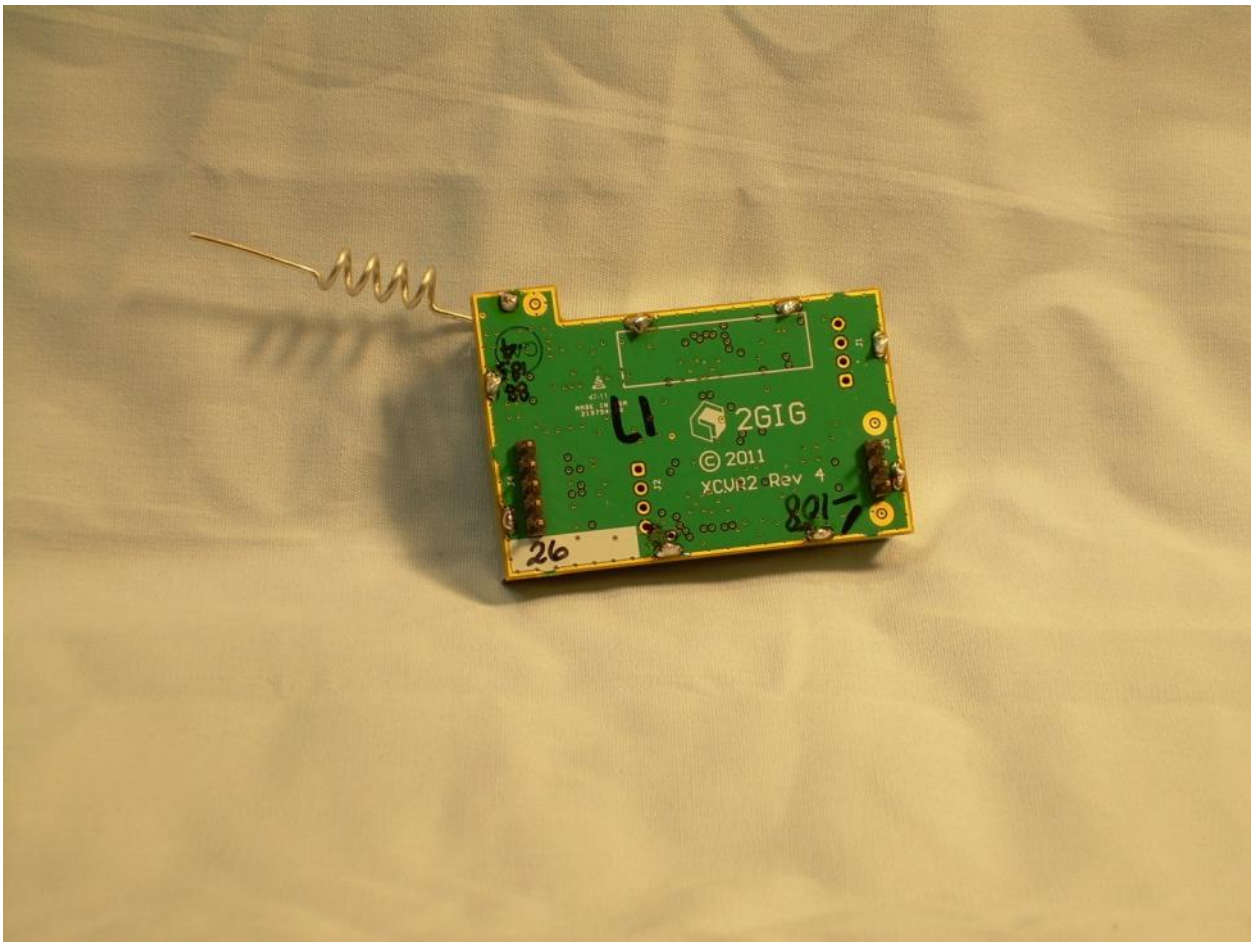
Photograph 9 – Front View of the Main PCB



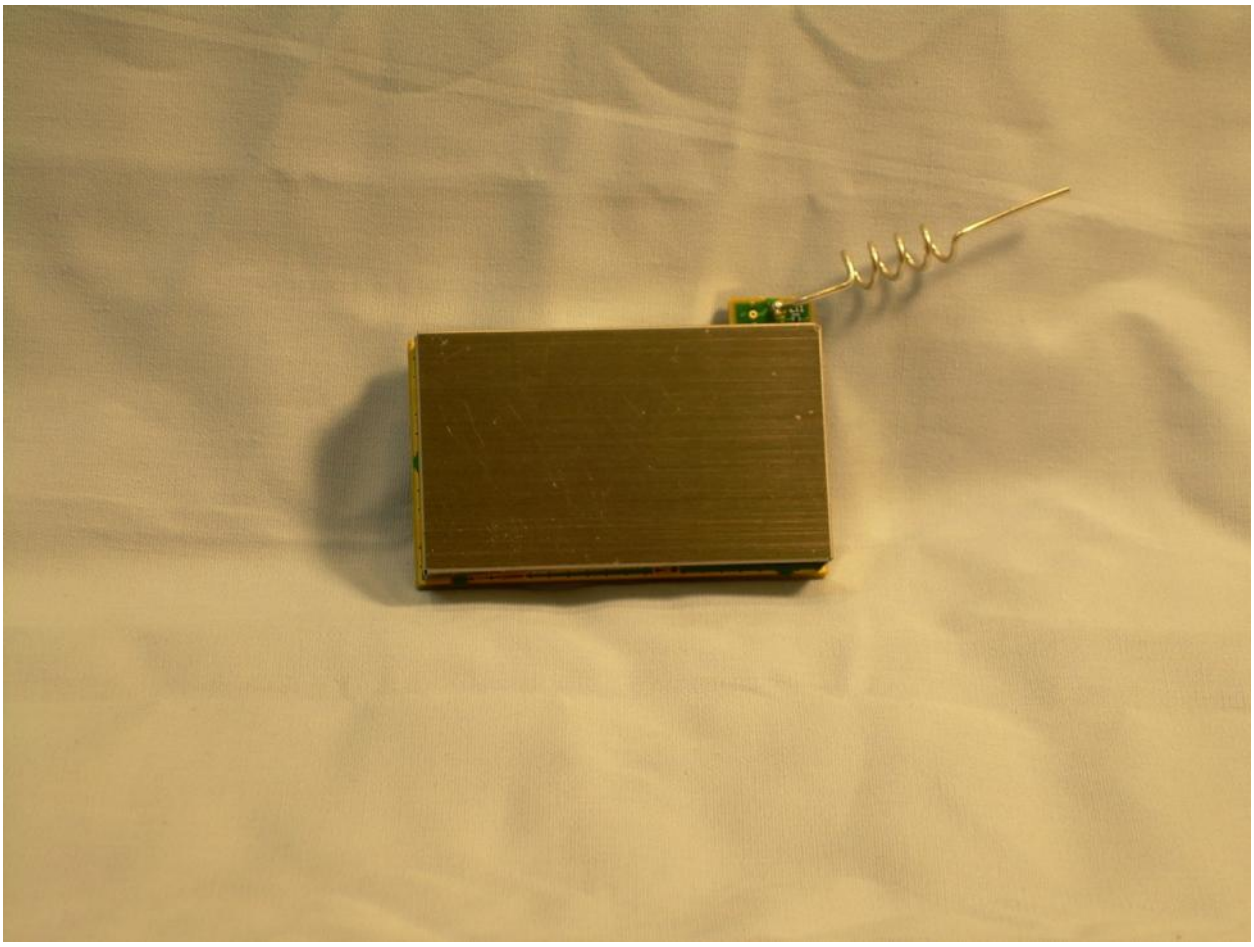
Photograph 10 – View of the Circuitry Under the RF Shield on the Main PCB



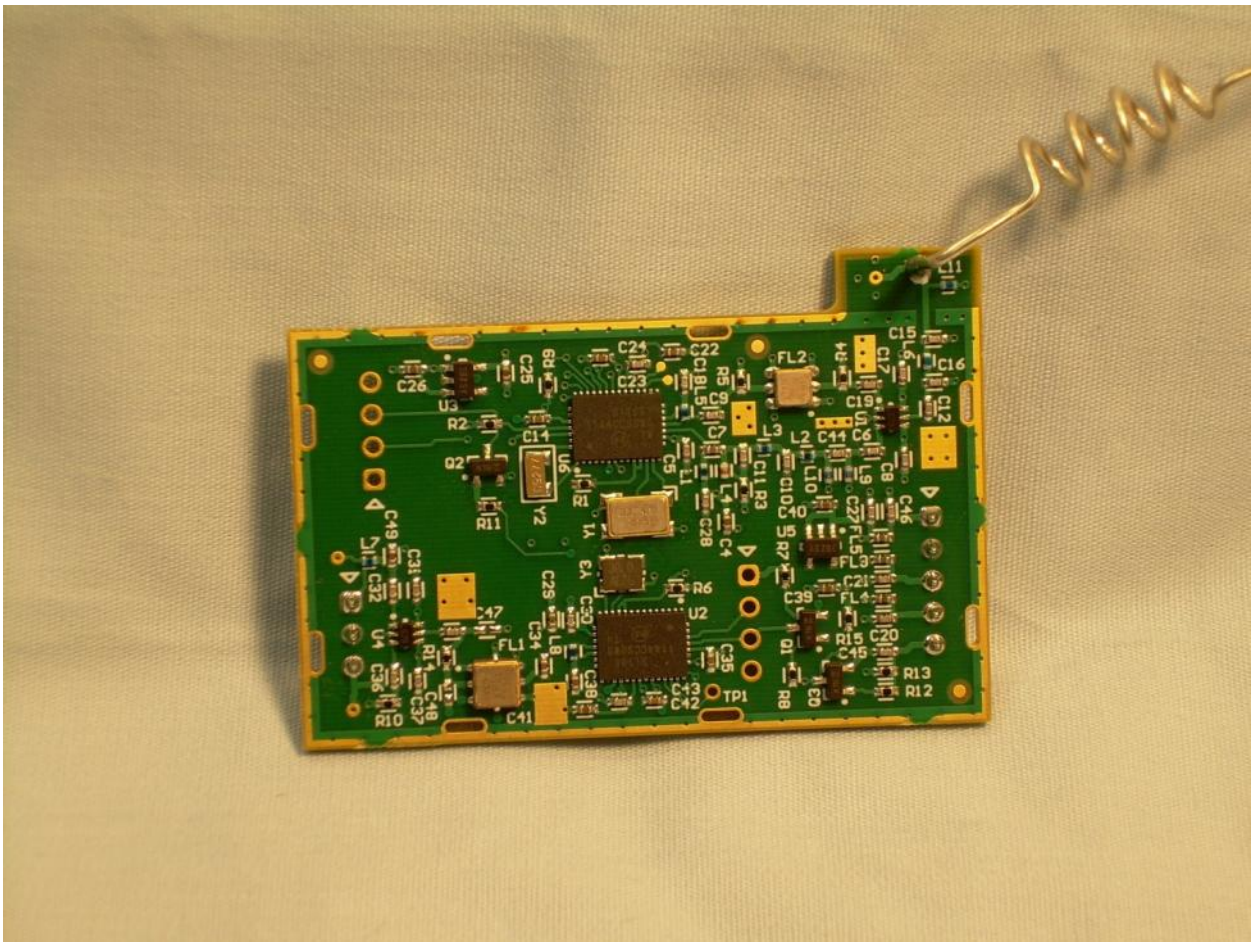
Photograph 11 – Back View of the FHSS Transceiver Module



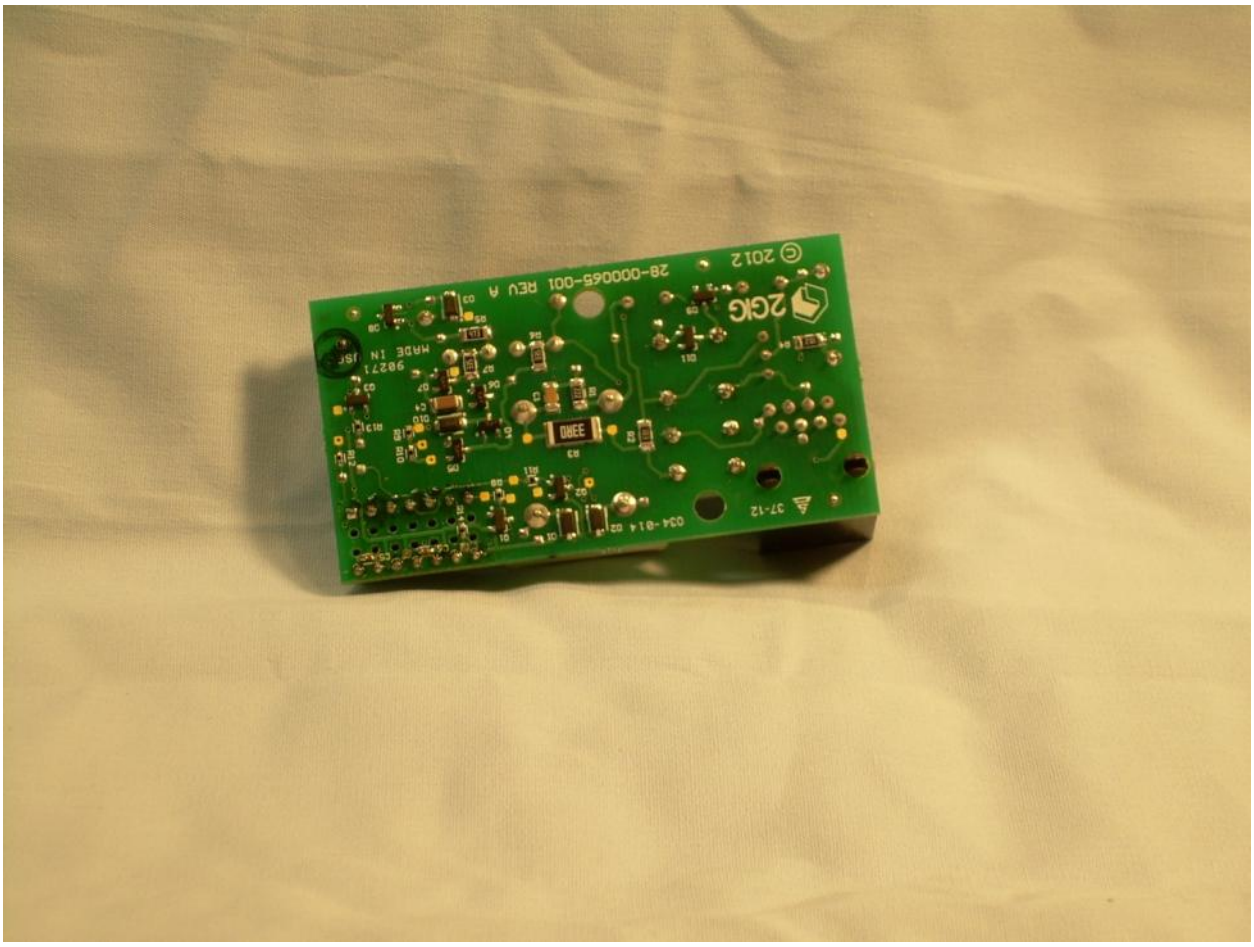
Photograph 12 – Front View of the FHSS Transceiver



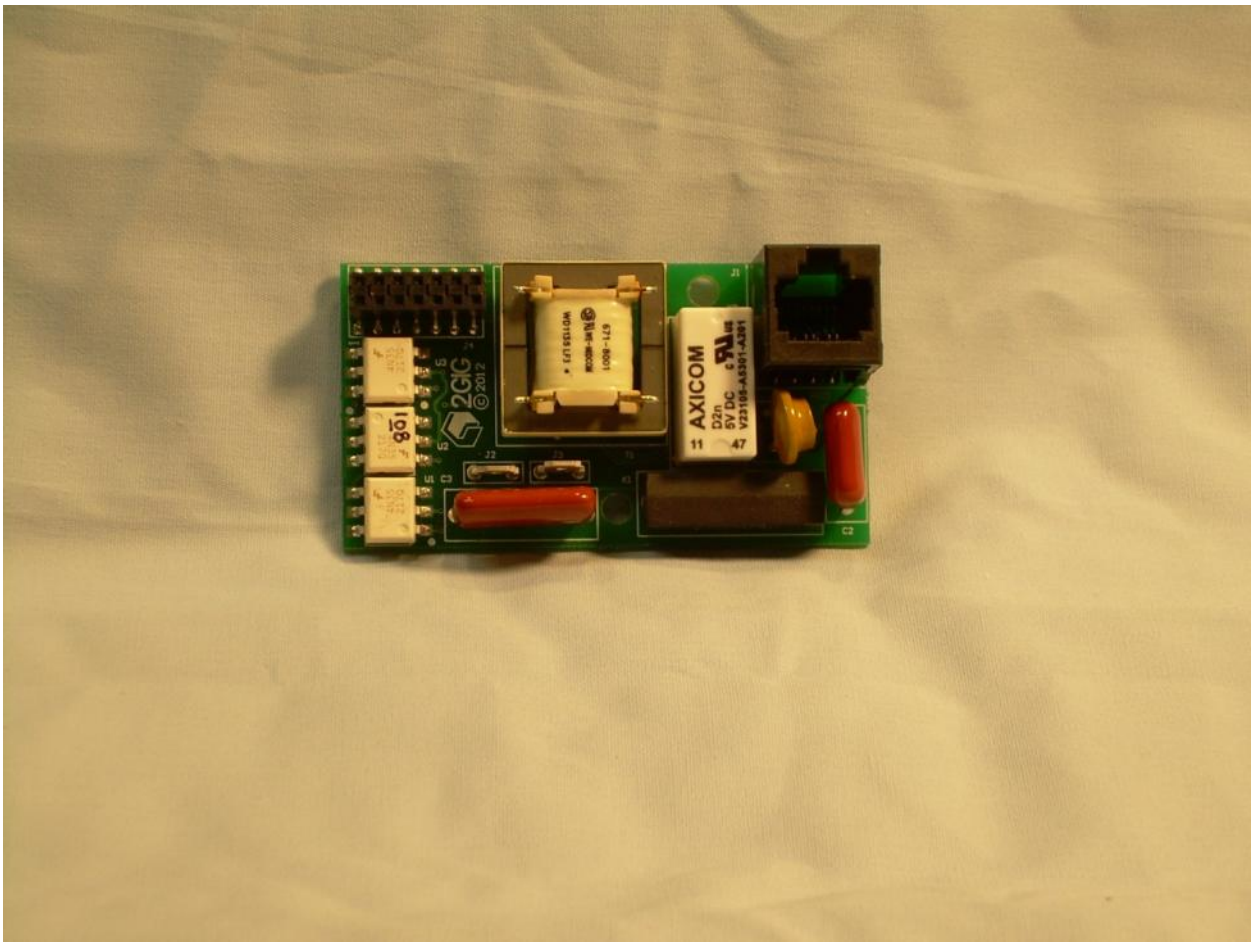
Photograph 13 – View of the Circuitry Under the RF Shield of the FHSS Transceiver



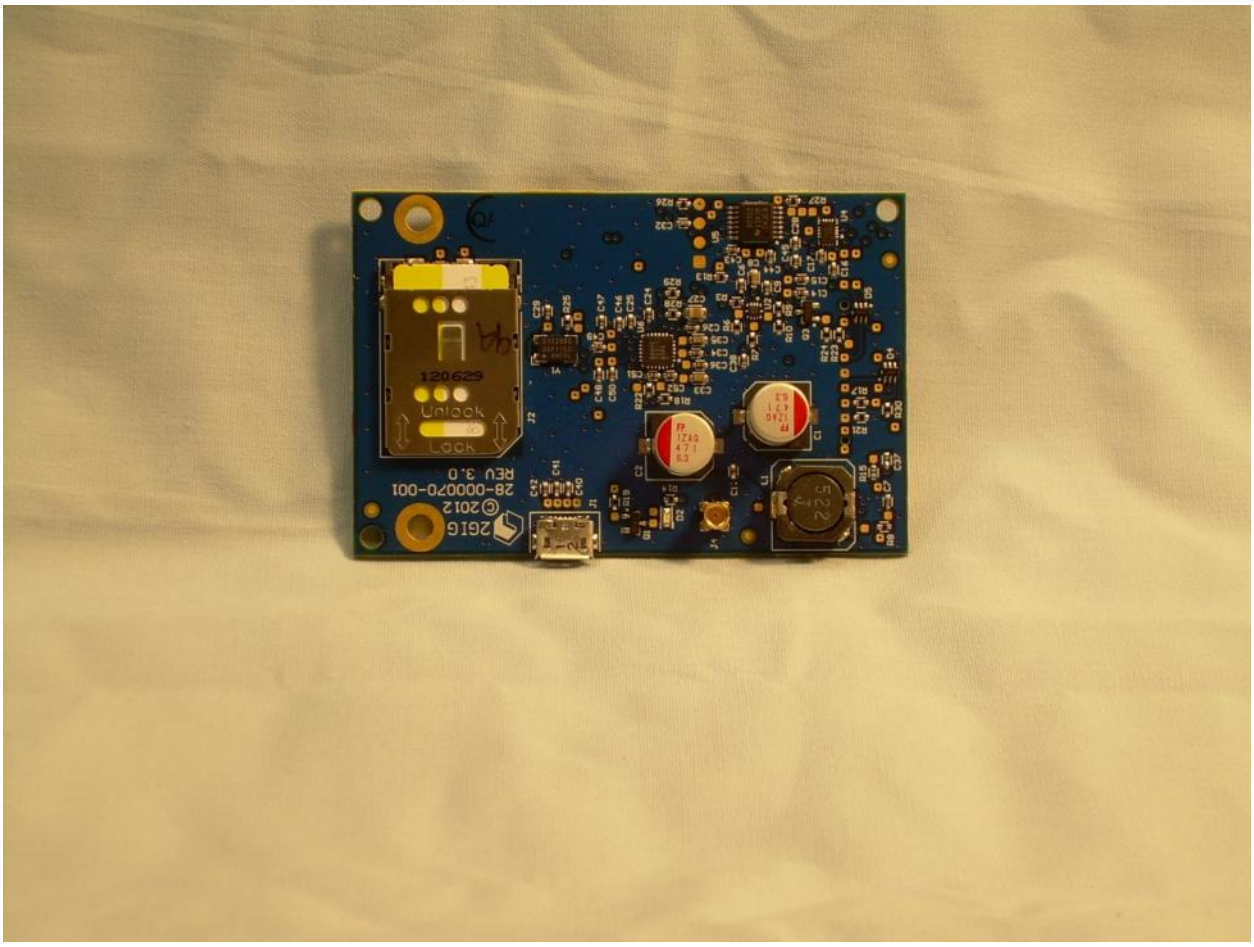
Photograph 14 – Front View of the POTS PCB



Photograph 15 – Back View of the POTS PCB



Photograph 16 – Front View of the 2G/3G Cell Modem



Photograph 17 – Back View of the 2G/3G Cell Modem