

# Certification Test Report

## For a Scale Carriage

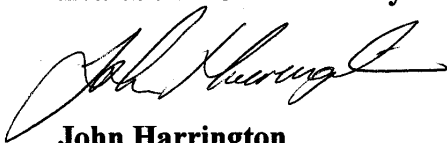
**Manufacturer:**

Mettler Toledo  
6600 Huntley Road  
Columbus, OH 43229  
United States of America

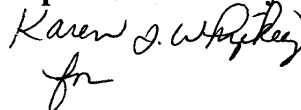
**Laboratory:**

F-Squared Laboratories  
16740 Peters Road  
Middlefield, Ohio 44062  
United States of America

The Scale Carriage, model MCSB, has been tested and found to comply with the requirements of the Federal Communications Commission outlined in the Federal Register CFR 47, Part 15, subpart C. The product was received on September 12, 2003 and the testing was completed on January 28, 2004.

**Evaluation Conducted By:**

**John Harrington**  
**EMC Technical Manager**

**Report Reviewed By:**

**Wendy Fuster**  
**President**



*success thru compliance*

**F-Squared Laboratories**

14333 Kinsman Road  
Burton, OH 44021  
(440) 834-8926  
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This report shall not be duplicated except in full without the written approval of F-Squared Laboratories.

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## **Exhibit I**

### **Engineering Statement**

This report has been prepared on behalf of Mettler Toledo to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15, subpart C of the FCC Rules and under the regulation section 15.249 and section 15.209 procedures, using ANSI C63.4 1992 standards. The test results found in this report relate only to the items tested.

**EQUIPMENT UNDER TEST:**

Scale Carriage  
Trade Name: Mettler Toledo  
FCC ID: RITTE0001  
Model No.: MCSB  
Power Supply: 12 VDC Battery

**APPLICABLE RULES:**

CFR 47, Part 15, subpart C

**EQUIPMENT CATEGORY:**

Intentional Radiator

**MEASUREMENT LOCATION:**

F-Squared Laboratories in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

**MEASUREMENT PROCEDURE:**

All measurements were performed according to the 1992 version of ANSI C63.4. A list of the measurement equipment can be found in Exhibit II.

**UNCERTAINTY BUDGET:**

- Radiated Emission  
Combined Uncertainty (+ or -) 2.24 dB  
Expanded Uncertainty (+ or -) 4.48 dB
- Conducted Emission  
Combined Uncertainty (+ or -) 1.13 dB  
Expanded Uncertainty (+ or -) 2.26 dB

**ENGINEERING STATEMENT:**

I hereby state that: The measurements shown in this application were made in accordance with the procedures indicated and the energy emitted by this equipment was found to be within the limits. I assume full responsibility for the accuracy and completeness of these measurements.

I further state that: On the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

Certified by: \_\_\_\_\_  
John Harrington, EMC Technical Manager

## **Exhibit II**

### **List of Measurement Instrumentation**

<b>Equipment Type</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Due Date</b>
OATS	Compliance Labs	N/A	001	Oct. 8, 2004
Receiver	Dynamic Sciences	DSI-2020	604/002	Sept. 4, 2004
Chamber Antenna 1	EMC Test Systems	3143 Biconilog	9603-1229	June 12, 2004
OATS Antenna 2	EMC Test Systems	3143 Biconilog	9609-1306	July 25, 2004
Pre Amp	Hewlett Packard	83006A	3104A00500	Sept. 9, 2004
Spectrum Analyzer	Hewlett Packard	8566B	2311A02270	Nov. 4, 2004
Active Loop Antenna	AH Systems	SAS-562B	232	Nov. 14, 2004
Horn Antenna	EMCO	3115	9809-5580	Feb. 6, 2005

## **Exhibit III**

### **EUT Information**

**TEST ITEM CONDITION:**

The equipment to be tested was received in good condition.

**TESTING ALGORITHM:**

The EUT was powered on using a fully charged battery and was operated using software in a test mode that made it transmit with a constant carrier. The fundamental emissions, harmonic emissions up to the 10<sup>th</sup> harmonic and the other spurious emissions are recorded in the data tables.

**RADIATED EMISSION TESTING:**

The emissions were maximized by rotating the table and raising/lowering the antenna mounted on a 4.0 meter mast. Cable and peripheral positions were also varied to produce maximum emissions. Both horizontal and vertical field components were measured. The output of the antenna was connected to the input of the receiver and emissions were measured in the range 9kHz to 10GHz. The measurement detector, bandwidth and distance are detailed in the table below. The raw measurements were corrected to allow for antenna factor and cable loss. All data for radiated emissions can be found in Exhibit V.

Frequency Range	Detector	Resolution Bandwidth	Distance
9kHz to 150kHz	Quasi-Peak	200Hz	3.0m
150kHz to 30MHz	Quasi-Peak	10kHz	3.0m
30MHz to 1GHz	Quasi-Peak	120kHz	3.0m
1GHz to 10GHz	Peak	1MHz	3.0m

**Exhibit IV**  
**EUT Configuration and Cables**

**Equipment Under Test (EUT):**

Device	Manufacturer	Model Number	Serial Number
Scale Carriage	Mettler Toledo	MCSB	None

**Accessories (Support Equipment):**

Device	Manufacturer	Model Number	Serial Number
12 VDC Battery	Mettler Toledo	None	None
Test Load	Mettler Toledo	082451020	None

**Cables:**

Cable Function	Length	Shielded (Yes/No)
DC Power	1 meter	No
Scale sensors	1 meter	No

## Exhibit V

### Radiated Data

<b>Test Date:</b>	Jan. 28, 2004	<b>Test Engineer:</b>	J. Harrington
<b>Standard:</b>	FCC 47 CFR 15, subpart C, clause 15.249	<b>Air Temperature:</b>	21° C
<b>Limit:</b>	Class A	<b>Relative Humidity:</b>	45%
<b>Distance:</b>	3.0 Meters		

#### Carrier Frequency: 914.997MHz

Frequency (MHz)	Polarity (V/H)	Measurement (dBuV)	Antenna Factor (dB/m)	Cable loss (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
914.997	H	57.1	23.8	8.0	88.9	94.0	5.1
914.997	V	59.5	23.8	8.0	91.3	94.0	2.7
1829.994	V	13.4	28.3	8.5	50.2	54.0	3.8
1829.994	H	13.7	28.3	8.5	50.5	54.0	3.5
112.71	H	19.35	12.95	1.05	33.35	43.50	10.15
112.71	V	16.27	12.95	1.05	30.27	43.50	13.23
162.83	H	18.00	12.48	1.20	31.68	43.50	11.82
162.83	V	15.49	12.48	1.20	29.17	43.50	14.33
564.27	H	15.43	19.05	2.63	37.11	46.00	8.89
564.27	V	19.71	19.05	2.63	41.39	46.00	4.61
663.30	H	19.90	20.30	2.80	43.00	46.00	3.00
663.30	V	20.36	20.30	2.80	43.46	46.00	2.54
701.56	H	15.10	20.70	2.90	38.70	46.00	7.30
701.56	V	14.48	20.70	2.90	38.08	46.00	7.92



**Carrier Frequency: 902.09MHz**

Frequency (MHz)	Polarity (V/H)	Measurement (dBuV)	Antenna Factor (dB/m)	Cable loss (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
902.09	V	60.1	24.0	8.0	92.1	94.0	1.9
902.09	H	54.1	24.0	8.0	86.1	94.0	7.9
1804.18	V	15.3	28.3	8.5	52.1	54.0	1.9
1804.18	H	15.3	28.3	8.5	52.1	54.0	1.9
112.71	H	18.65	12.95	1.05	32.65	43.5	10.85
112.71	V	16.17	12.95	1.05	30.17	43.5	13.33
162.83	H	18.52	12.48	1.2	32.2	43.5	11.3
162.83	V	16.49	12.48	1.2	30.17	43.5	13.33
564.27	H	15.43	19.05	2.63	37.11	46	8.89
564.27	V	20.15	19.05	2.63	41.83	46	4.17
663.3	H	19.45	20.3	2.8	42.55	46	3.45
663.3	V	19.57	20.3	2.8	42.67	46	3.33
701.56	H	14.9	20.7	2.9	38.5	46	7.5
701.56	V	14.35	20.7	2.9	37.95	46	8.05

**Carrier Frequency: 927.98MHz**

Frequency (MHz)	Polarity (V/H)	Measurement (dBuV)	Antenna Factor (dB/m)	Cable loss (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
927.98	V	60.4	23.8	8.0	93.2	94.0	1.8
927.98	H	56.1	23.8	8.0	87.9	94.0	6.1
1855.96	H	15	28.3	8.5	51.8	54.0	2.2
1855.96	V	15	28.3	8.5	51.8	54.0	2.2
112.71	H	19.35	12.95	1.05	33.35	43.50	10.15
112.71	V	16.27	12.95	1.05	30.27	43.50	13.23
162.83	H	18.00	12.48	1.20	31.68	43.50	11.82
162.83	V	15.49	12.48	1.20	29.17	43.50	14.33
564.27	H	15.43	19.05	2.63	37.11	46.00	8.89
564.27	V	19.71	19.05	2.63	41.39	46.00	4.61
663.30	H	19.90	20.30	2.80	43.00	46.00	3.00
663.30	V	20.36	20.30	2.80	43.46	46.00	2.54
701.56	H	15.10	20.70	2.90	38.70	46.00	7.30
701.56	V	14.48	20.70	2.90	38.08	46.00	7.92



**PASS**

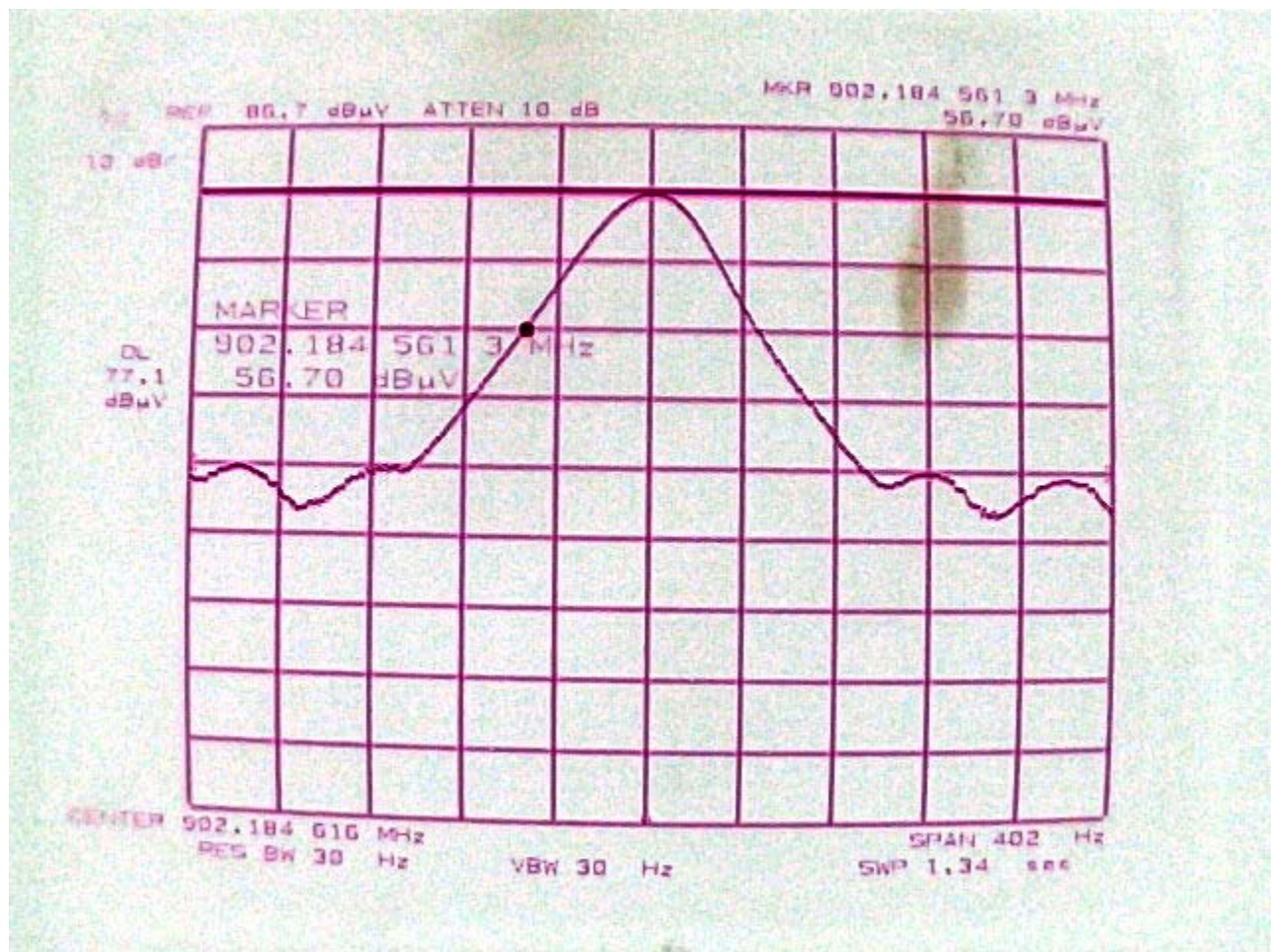


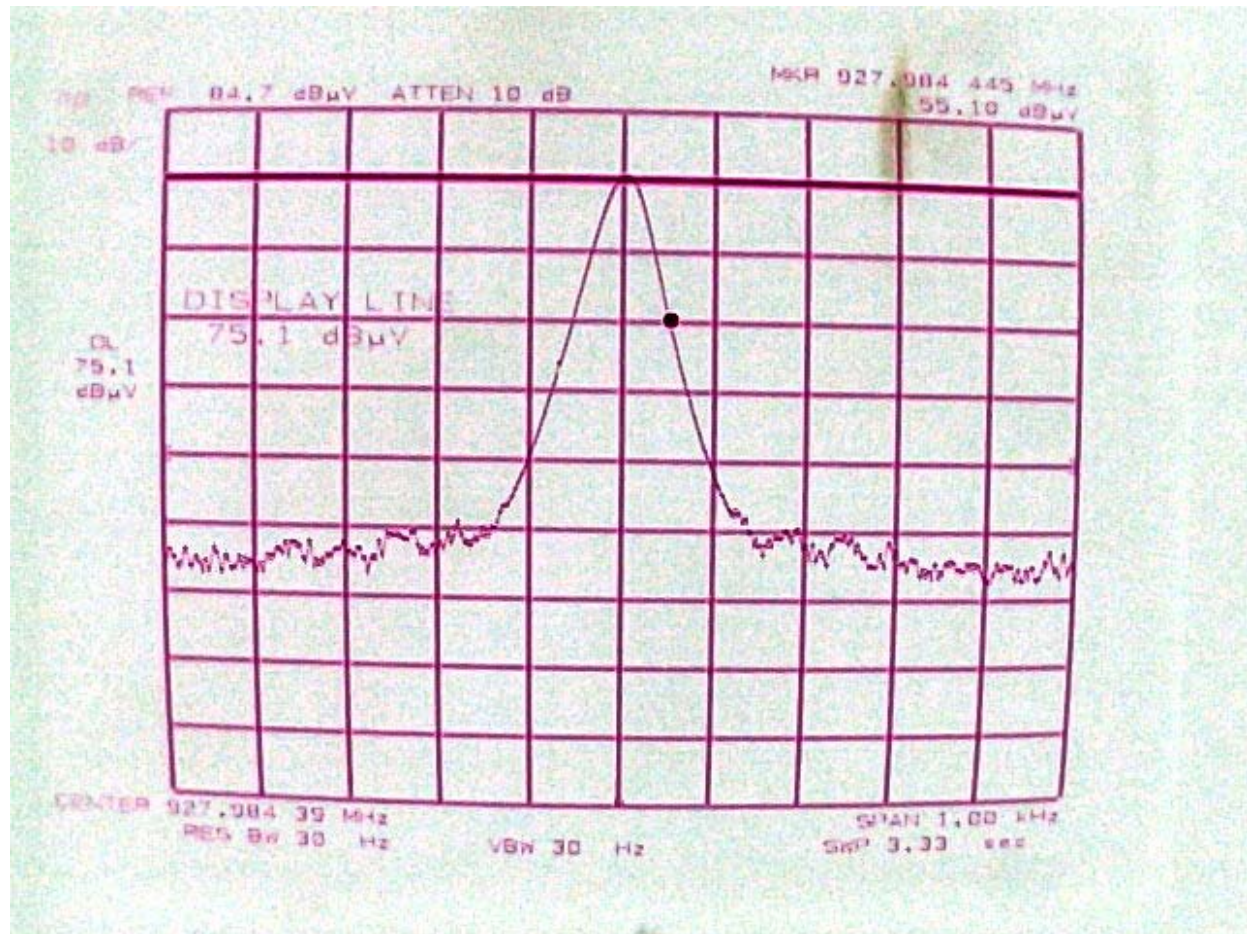
**FAIL**

## Exhibit VI

### Band Occupancy

Test Date:	Dec. 16, 2003	Test Engineer:	F. Gonzales
Relative Humidity:	46%	Air Temperature:	21° C





## **Exhibit VII**



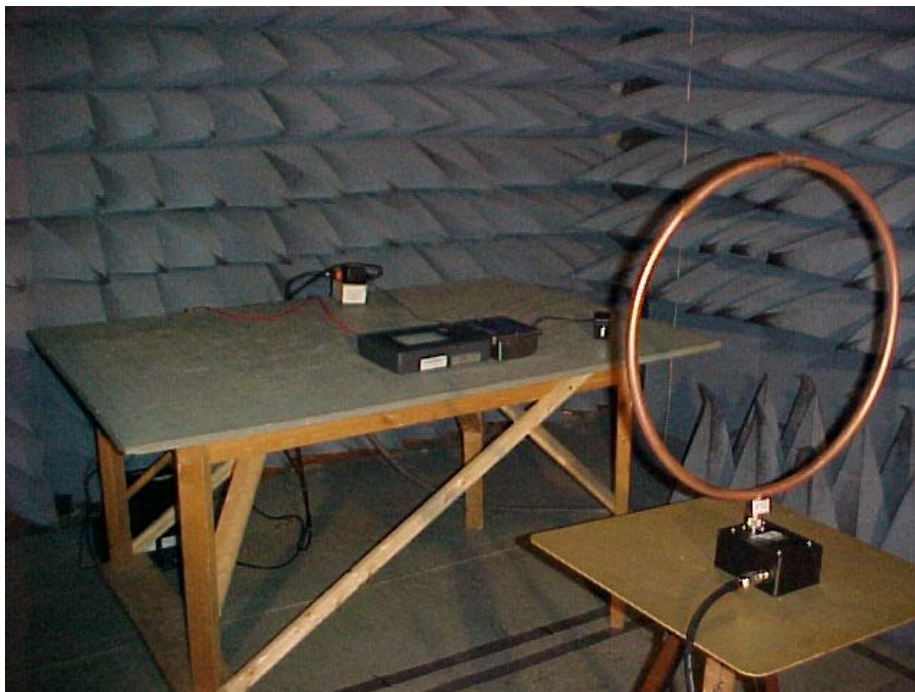
# **TEST SET-UP & EUT PHOTOGRAPHS**



## **RADIATED TEST**



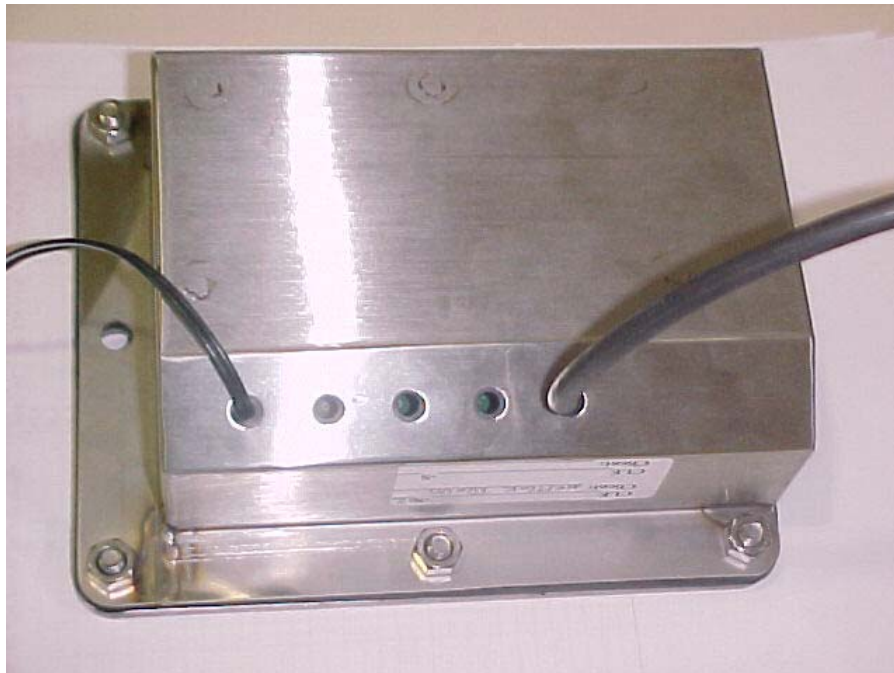
## **RADIATED TEST**



**PHOTOGRAPH OF EUT – *Front View***

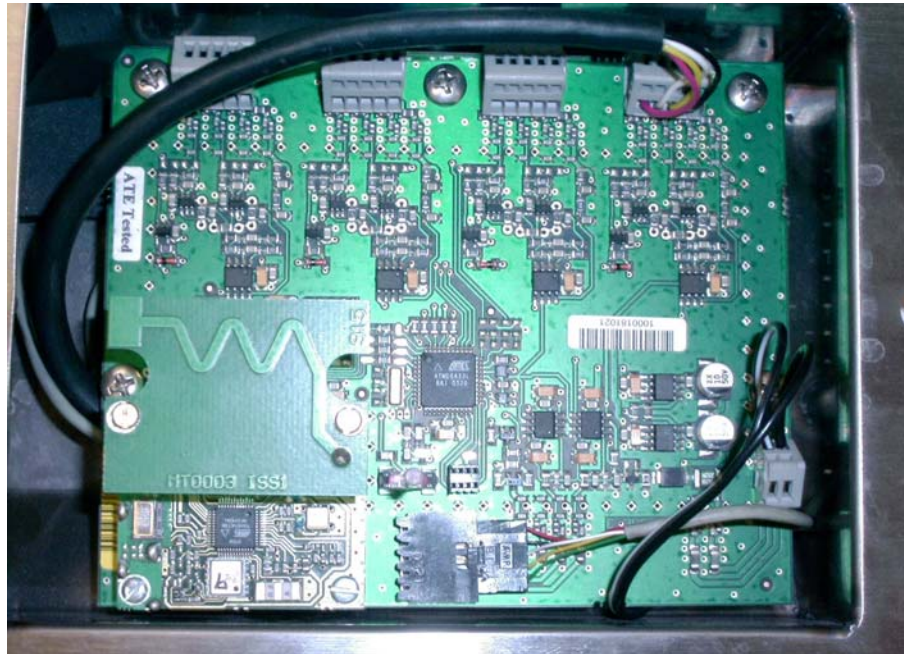


**PHOTOGRAPH OF EUT – *Back View***

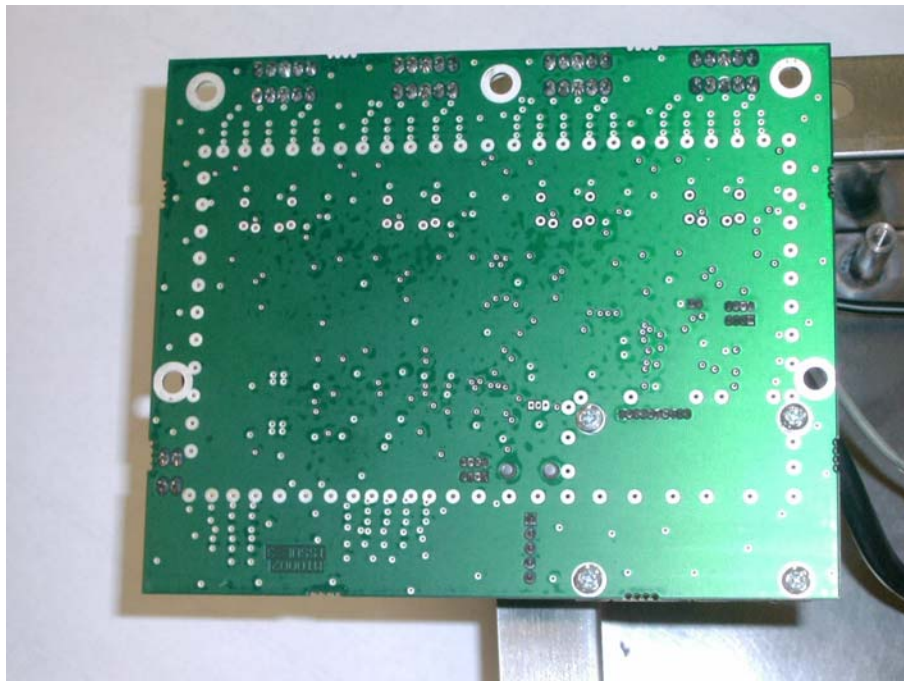




**PHOTOGRAPH OF EUT – *Main Board (Component Side View)***



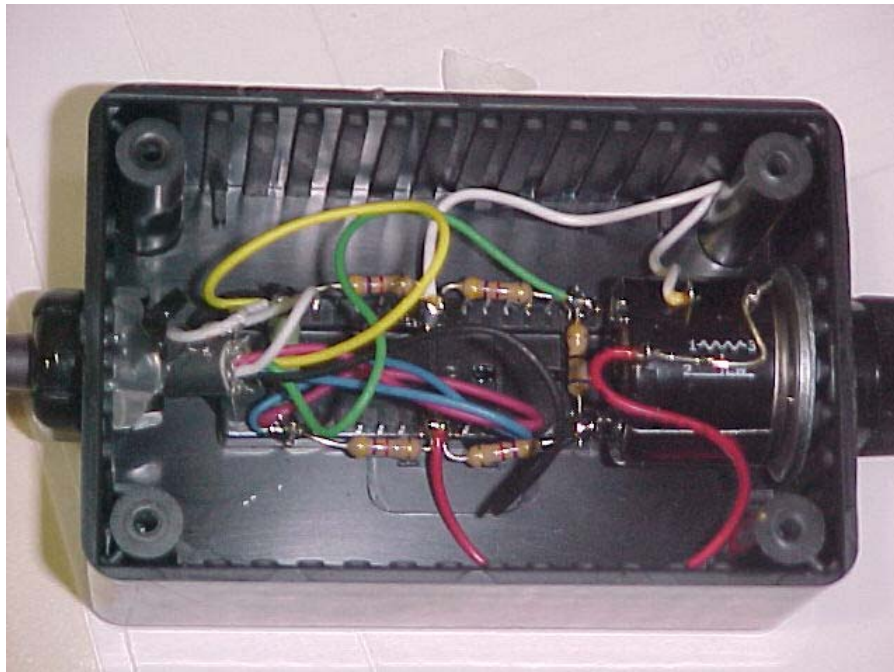
**PHOTOGRAPH OF EUT – *Main Board (Solder Side View)***



**PHOTOGRAPH OF EUT – *Test Load***

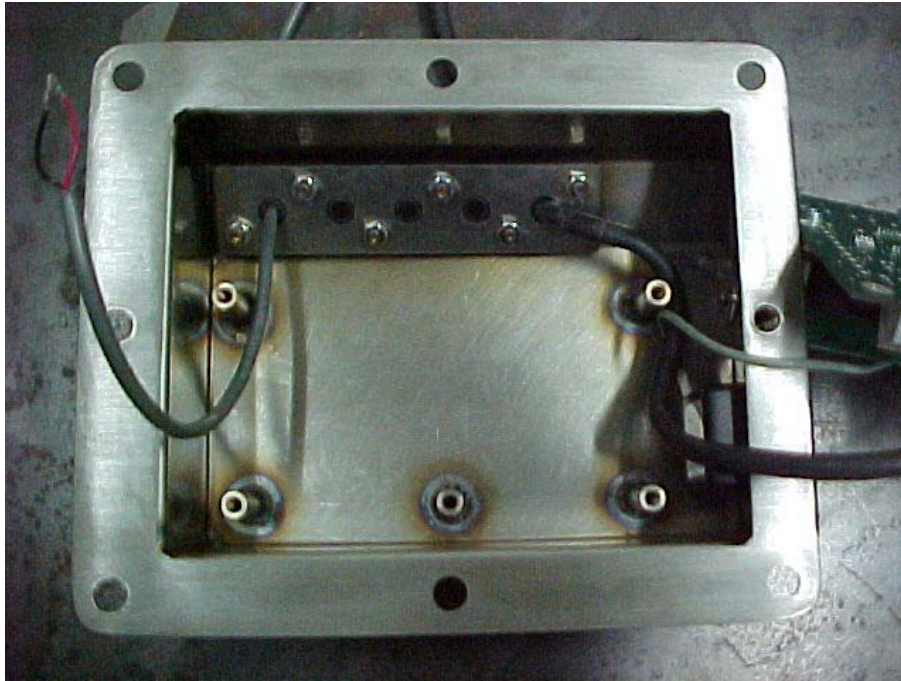


**PHOTOGRAPH OF EUT – *Test Load***

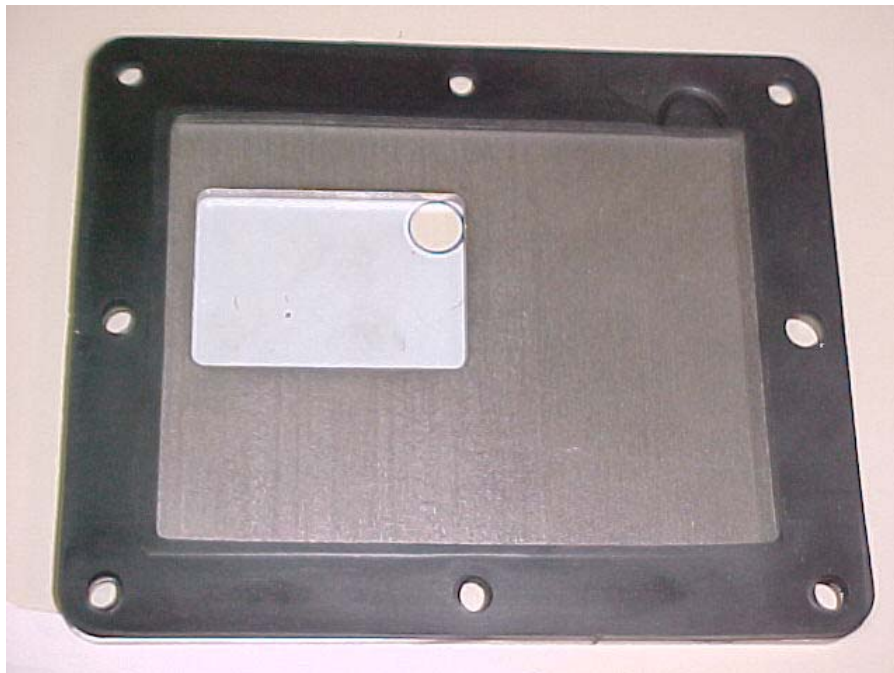




**PHOTOGRAPH OF EUT – Chassis (Inside View)**



**PHOTOGRAPH OF EUT – Chassis Cover (Inside View)**



**Photograph of EUT – *Radio Module Detail***

