



# Emissions Test Report

**EUT Name:** TranspondIT Electric

**EUT Model:** MS8EM915V10

FCC Title 47, Part 15, Subpart B and EMC Directive 89/336/EEC

*Prepared for:*

Don Watts  
Advanced Technology RAMAR, Ltd.  
P.O. Box 110127  
Research Triangle Park, NC 27709  
Tel: 919-991-9924  
Fax: 919-991-9946

*Prepared by:*

Flextronics Compliance Laboratories  
762 Park Avenue  
Youngsville, NC 27596  
Tel: (919) 554-0901  
Fax: (919) 556-2043  
<http://www.flextronics.com/>

*Report/Issue Date:* 10 October 2002

*Report Number:* 5032ADV

# Statement of Compliance

*Manufacturer:* Advanced Technology RAMAR, Ltd.  
P.O. Box 110127  
Research Triangle Park, NC 27709  
919-991-9924  
*Requester / Applicant:* Don Watts  
*Name of Equipment:* TranspondIT Electric  
Model No. MS8EM915V100  
*Type of Equipment:* RF Transmitter for Household Electric Meter  
*Class of Equipment:* Class B  
*Application of Regulations:* FCC Title 47, Part 15, Subpart B and EMC Directive 89/336/EEC  
*Test Dates:* 12 September 2002 to 17 September 2002

## *Guidance Documents:*

Emissions: FCC 47 CFR Part 15, EN55022: 1998

## *Test Methods:*

Emissions: EN55022:1998, ANSI C63.4:1992

The electromagnetic compatibility test and documented data described in this report has been performed and recorded by Flextronics Compliance Laboratories, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that a sample of one, of the equipment described above, has been shown to be compliant with the EMC requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in the Executive Summary of this report.



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Steve O'Steen  
Operations Manager  
NVLAP Signatory

10 October 2002

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Date

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## 1 Executive Summary

### 1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Title 47, Part 15, Subpart B and EMC Directive 89/336/EEC based on the results of testing performed on 12 September 2002 through 17 September 2002 on the *TranspondIT Electric* Model No. *MS8EM915V100* manufactured by Advanced Technology RAMAR, Ltd.. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

### 1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

### 1.3 Summary of Test Results

Table 1 - Summary of Test Results

| Emission            | Test Method(s)                                 | Test Parameters             | Result    |
|---------------------|------------------------------------------------|-----------------------------|-----------|
| Radiated Emissions  | 47 CFR 15,<br>EN55022:1998,<br>ANSI C63.4:1992 | 9 KHz to 10000 MHz, Class B | compliant |
| Conducted Emissions | 47 CFR 15,<br>EN55022:1998,<br>ANSI C63.4:1992 | 150 kHz to 30 MHz, Class B  | compliant |

### 1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

### 1.5 Equipment Modifications

No modifications were found to be necessary in order to achieve compliance.

## 2 Emissions

### 2.1 Radiated Emissions

Testing was performed in accordance with 47 CFR 15, EN55022:1998, ANSI C63.4:1992. These test methods are listed under the laboratory's NVLAP Scope of Accreditation. This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

## **2.1.1 Test Methodology**

### ***2.1.1.1 Preliminary Test***

### ***2.1.1.2 Final Test***

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

### ***2.1.1.3 Deviations***

There were no deviations from this test methodology.

## **2.1.2 Test Results**

Section 2.1.2.1 lists the final measurement data under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and 1.5.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

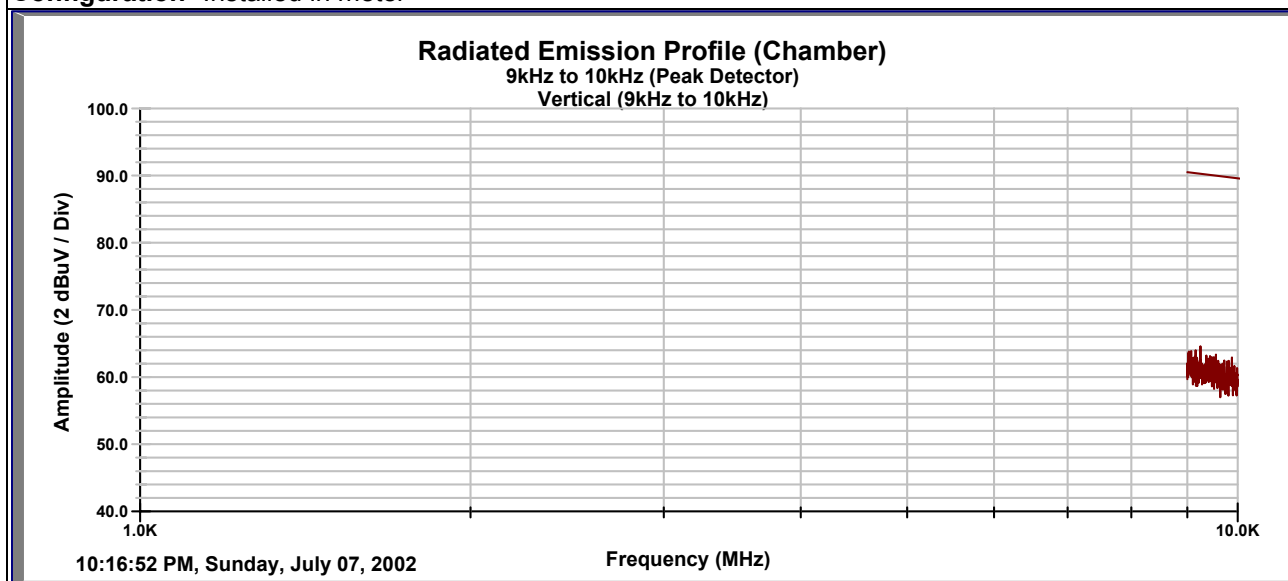
### ***2.1.2.1 Final Data***

The data recorded in this section contains the final results under the worst-case conditions and with any modifications or special accessories implemented as the manufacturer intends.

## SOP 1 Radiated Emissions

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|                      |                      |                       |                    |
|----------------------|----------------------|-----------------------|--------------------|
| <b>EUT Name</b>      | TranspondIT Electric | <b>Date</b>           | 7 July 2002        |
| <b>EUT Model</b>     | MS8EM915V10          | <b>Temp / Hum in</b>  | 70 Deg. F / 35% RH |
| <b>EUT Serial</b>    | TXA                  | <b>Temp / Hum out</b> | N/A                |
| <b>Standard</b>      | FCC 47 CFR Part 15   | <b>Line AC / Freq</b> | 120 VAC / 60 Hz    |
| <b>Dist/Ant Used</b> | 3M/6511              | <b>Performed by</b>   | Eugene Moses       |
| <b>Configuration</b> | Installed in meter   |                       |                    |



| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|---------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = ku_c(y)$   $k = 2$  for 95% confidence

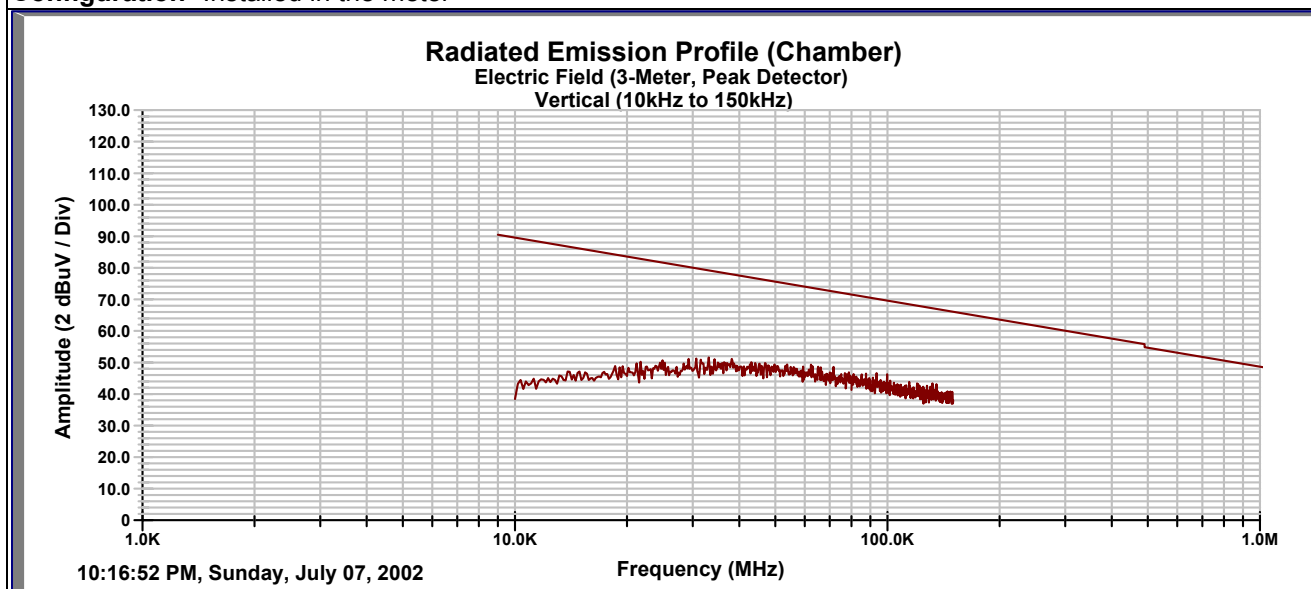
Notes:

# SOP 1 Radiated Emissions

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EUT Name TranspondIT Electric  
EUT Model MS8EM915V10  
EUT Serial TXA  
Standard FCC 47 CFR Part 15  
Dist/Ant Used 3M/6511  
Configuration Installed in the meter

Date 7 July 2002  
Temp / Hum in 70 Deg. F / 35% RH  
Temp / Hum out N/A  
Line AC / Freq 120 VAC / 60 Hz  
Performed by Eugene Moses



| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|---------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
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|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = k u_c(y)$   $k = 2$  for 95% confidence

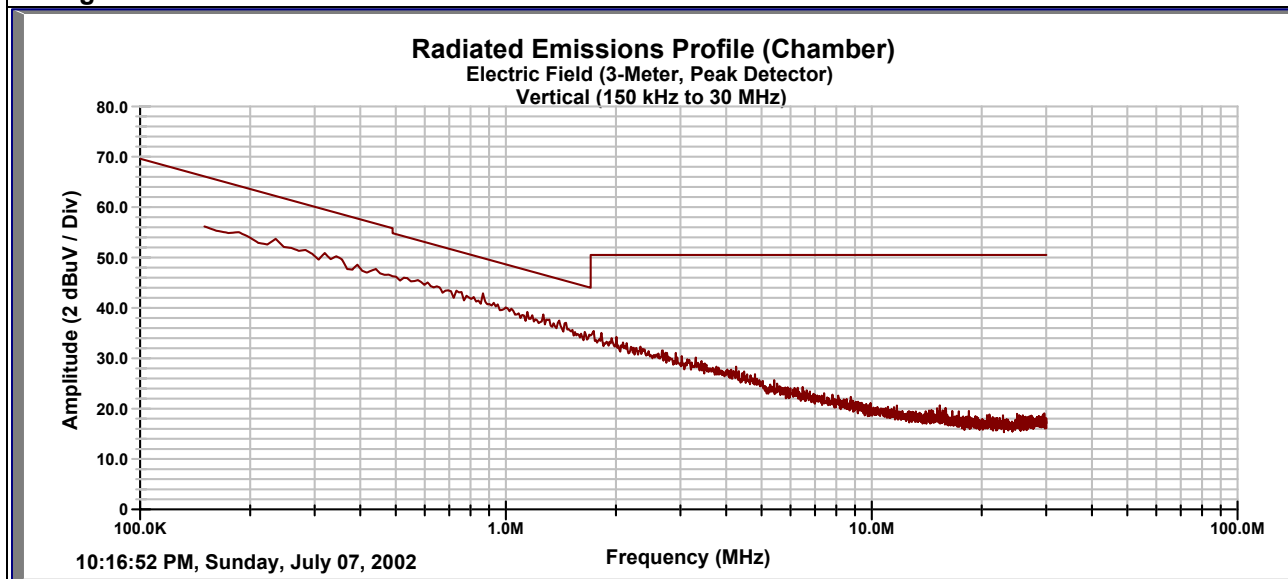
Notes:

# SOP 1 Radiated Emissions

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**EUT Name** TranspondIT Electric  
**EUT Model** MS8EM915V10  
**EUT Serial** TXA  
**Standard** FCC 47 CFR Part 15  
**Dist/Ant Used** 3M/6502  
**Configuration** Installed in the meter

**Date** 7 July 2002  
**Temp / Hum in** 70 Deg. F / 35% RH  
**Temp / Hum out** N/A  
**Line AC / Freq** 120 VAC / 60 Hz  
**Performed by** Eugene Moses



| Emission Freq (MHz) | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|---------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                     |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

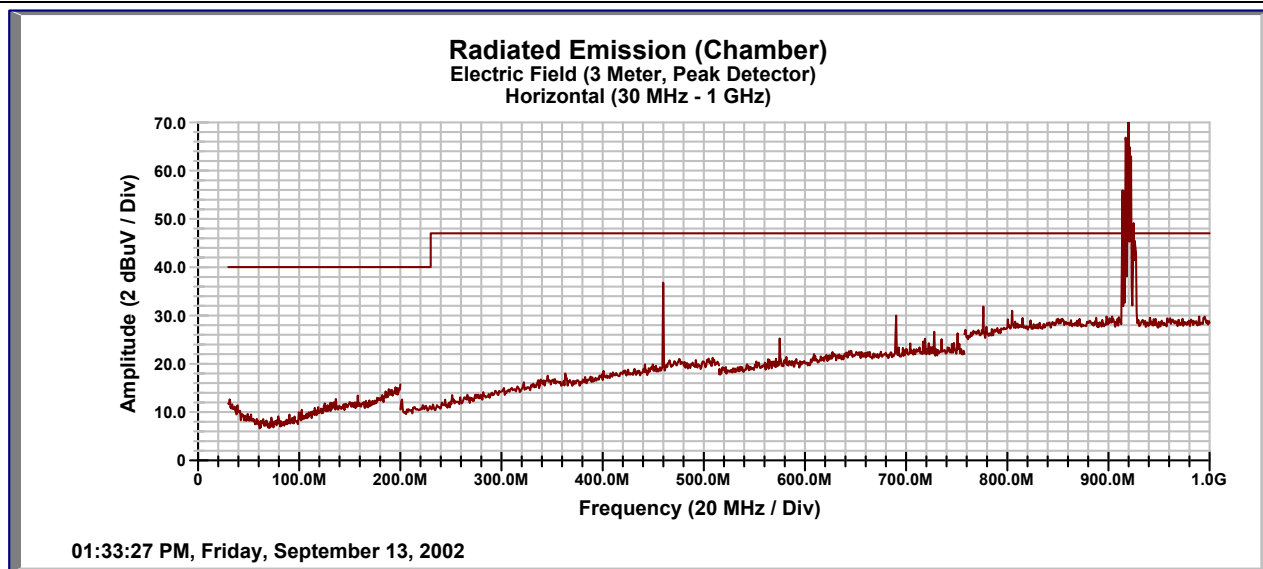
Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = ku_c(y)$   $k = 2$  for 95% confidence

Notes:

# SOP 1 Radiated Emissions

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|               |                                  |                |                    |
|---------------|----------------------------------|----------------|--------------------|
| EUT Name      | TranspondIT Electric             | Date           | 13 September 2002  |
| EUT Model     | MS8EM915V10                      | Temp / Hum in  | 73 Deg. F / 35% RH |
| EUT Serial    | TXA                              | Temp / Hum out | N/A                |
| Standard      | FCC 47 CFR Part 15               | Line AC / Freq | 230 VAC / 60 Hz    |
| Dist/Ant Used | 3M/3110B, SAS-516, TDS-200/535-4 | Performed by   | Eugene Moses       |
| Configuration | Installed in the meter           |                |                    |



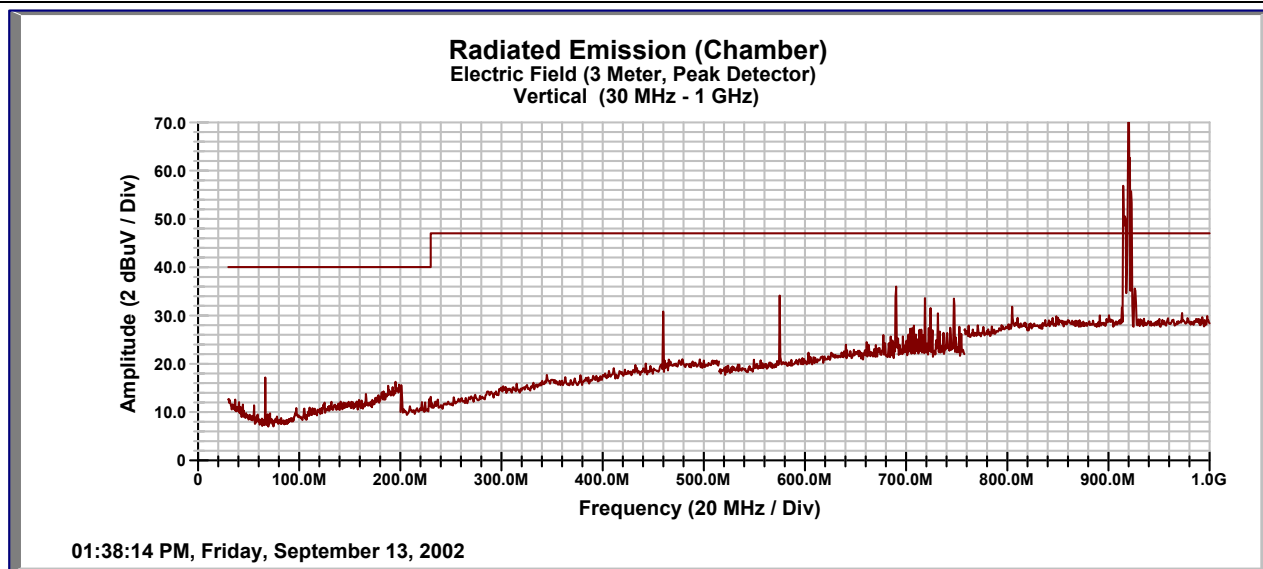
| Emission Freq (MHz)                                                                                                     | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|-------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
| Measurement made with SAS-516 antenna. Peak value.                                                                      |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 919.90                                                                                                                  | H               | 1           | 26              | 60.80            | 0.00          | 4.27            | 23.60             | 88.67                  | 94.00               | -5.33            |
| Measurement made with TDS-200/535-4 dipole. Peak value.                                                                 |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 919.90                                                                                                                  | H               | 1           | 26              | 60.80            | 0.00          | 4.27            | 23.60             | 88.67                  | 94.00               | -5.33            |
| Measurement made with SAS-516. Quasi-Peak Value.                                                                        |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 460.00                                                                                                                  | H               | 1.98        | 350             | 19.00            | 0.00          | 3.01            | 17.90             | 39.91                  | 47.00               | -7.09            |
| 689.90                                                                                                                  | H               | 1           | 270             | 7.87             | 0.00          | 3.68            | 21.10             | 32.66                  | 47.00               | -14.34           |
| 776.10                                                                                                                  | H               | 1           | 213             | 3.55             | 0.00          | 3.91            | 21.36             | 28.81                  | 47.00               | -18.19           |
| Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty       |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| Combined Standard Uncertainty $u_c(y) = \pm 1.6\text{dB}$ Expanded Uncertainty $U = ku_c(y)$ $k = 2$ for 95% confidence |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Notes:

# SOP 1 Radiated Emissions

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|                      |                                  |                       |                    |
|----------------------|----------------------------------|-----------------------|--------------------|
| <b>EUT Name</b>      | TranspondIT Electric             | <b>Date</b>           | 13 September 2002  |
| <b>EUT Model</b>     | MS8EM915V10                      | <b>Temp / Hum in</b>  | 73 Deg. F / 35% RH |
| <b>EUT Serial</b>    | TXA                              | <b>Temp / Hum out</b> | N/A                |
| <b>Standard</b>      | FCC 47 CFR Part 15               | <b>Line AC / Freq</b> | 230 VAC / 60 Hz    |
| <b>Dist/Ant Used</b> | 3M/3110B, SAS-516, TDS-200/535-4 | <b>Performed by</b>   | Eugene Moses       |
| <b>Configuration</b> | Installed in the meter           |                       |                    |

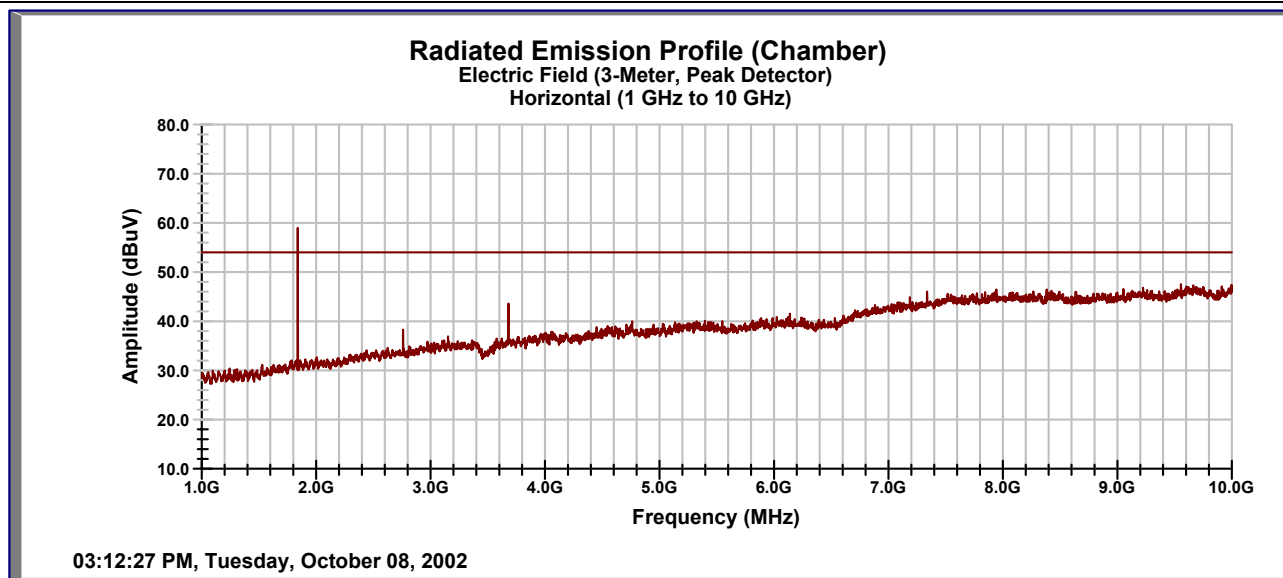


| Emission Freq (MHz)                                                                                                     | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|-------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
| Measurement made with SAS-516 antenna. Peak Value.                                                                      |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 920.00                                                                                                                  | V               | 1.2         | 339             | 62.98            | 0.00          | 4.27            | 22.80             | 90.05                  | 94.00               | -3.95            |
| Measurement made with TDS-200/535-4 dipole. Peak value.                                                                 |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 920.00                                                                                                                  | V               | 1.3         | 343             | 56.69            | 0.00          | 4.27            | 28.00             | 88.96                  | 94.00               | -5.04            |
| Measurement made with SAS-516. Quasi-peak Value.                                                                        |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 460.00                                                                                                                  | V               | 1           | 50              | 13.60            | 0.00          | 3.01            | 17.30             | 33.91                  | 47.00               | -13.09           |
| 574.90                                                                                                                  | V               | 1           | 69              | 11.38            | 0.00          | 3.37            | 18.20             | 32.95                  | 47.00               | -14.05           |
| 690.00                                                                                                                  | V               | 1           | 345             | 19.84            | 0.00          | 3.68            | 19.60             | 43.12                  | 47.00               | -3.88            |
| 718.70                                                                                                                  | V               | 1           | 156             | 12.50            | 0.00          | 3.77            | 20.73             | 37.00                  | 47.00               | -10.00           |
| 747.40                                                                                                                  | V               | 1           | 218             | 7.72             | 0.00          | 3.83            | 20.00             | 31.55                  | 47.00               | -15.45           |
|                                                                                                                         |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty       |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| Combined Standard Uncertainty $u_c(y) = \pm 1.6\text{dB}$ Expanded Uncertainty $U = ku_c(y)$ $k = 2$ for 95% confidence |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

# SOP 1 Radiated Emissions

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|               |                        |                |                    |
|---------------|------------------------|----------------|--------------------|
| EUT Name      | TranspondIT Electric   | Date           | 8 October 2002     |
| EUT Model     | MS8EM915V10            | Temp / Hum in  | 73 Deg. F / 35% RH |
| EUT Serial    | TXA                    | Temp / Hum out | N/A                |
| Standard      | FCC 47 CFR Part 15     | Line AC / Freq | 230 VAC / 60 Hz    |
| Dist/Ant Used | 3M/3115-5770           | Performed by   | Eugene Moses       |
| Configuration | Installed in the meter |                |                    |



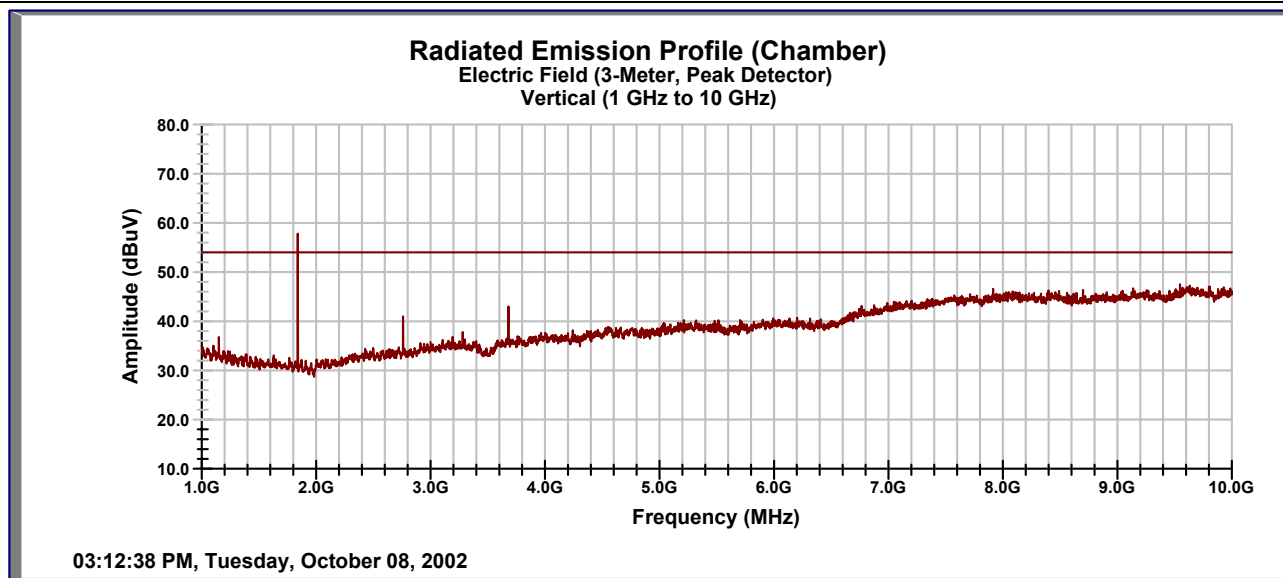
| Emission Freq (MHz)                                                                                                     | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|-------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
| FIM Value is average. 0.3 DB has been added to E-Field value for HPF loss.                                              |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 1840.00                                                                                                                 | H               | 1.09        | 59              | 42.00            | 36.43         | 6.50            | 28.40             | 40.77                  | 54.00               | -13.23           |
| Add 1.1DB to E-Field Value for insertion loss of HPF. Average value.                                                    |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 7250.00                                                                                                                 | H               | 1.09        | 350             | 21.00            | 36.11         | 14.09           | 37.50             | 37.58                  | 54.00               | -16.42           |
|                                                                                                                         |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                                                                                                                         |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
|                                                                                                                         |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty       |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| Combined Standard Uncertainty $u_c(y) = \pm 1.6\text{dB}$ Expanded Uncertainty $U = ku_c(y)$ $k = 2$ for 95% confidence |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Notes:

# SOP 1 Radiated Emissions

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|               |                        |                |                    |
|---------------|------------------------|----------------|--------------------|
| EUT Name      | TranspondIT Electric   | Date           | 8 October 2002     |
| EUT Model     | MS8EM915V10            | Temp / Hum in  | 73 Deg. F / 35% RH |
| EUT Serial    | TXA                    | Temp / Hum out | N/A                |
| Standard      | FCC 47 CFR Part 15     | Line AC / Freq | 230 VAC / 60 Hz    |
| Dist/Ant Used | 3M/3115-5770           | Performed by   | Eugene Moses       |
| Configuration | Installed in the meter |                |                    |



| Emission Freq (MHz)                                   | ANT Polar (H/V) | ANT Pos (m) | Table Pos (deg) | FIM Value (dBuV) | Amp Gain (dB) | Cable Loss (dB) | ANT Factor (dB/m) | E-Field Value (dBuV/m) | Spec Limit (dBuV/m) | Spec Margin (dB) |
|-------------------------------------------------------|-----------------|-------------|-----------------|------------------|---------------|-----------------|-------------------|------------------------|---------------------|------------------|
| Add 0.3 to E-Field Value for HPF loss. Average value. |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 1840.00                                               | V               | 1           | 11              | 44.15            | 36.43         | 6.50            | 28.30             | 42.82                  | 54.00               | -11.18           |
| Add 0.3 to E-Field Value for HPF loss. Average value  |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 3680.00                                               | V               | 1.13        | 218             | 33.51            | 35.79         | 9.10            | 33.48             | 40.60                  | 54.00               | -13.40           |
| Add 0.6 to E-Field Value for HPF loss. Average value. |                 |             |                 |                  |               |                 |                   |                        |                     |                  |
| 9700.00                                               | V               | 1           | 350             | 30.39            | 36.65         | 16.54           | 38.98             | 49.86                  | 54.00               | -4.14            |
|                                                       |                 |             |                 |                  |               |                 |                   |                        |                     |                  |

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.6\text{dB}$  Expanded Uncertainty  $U = k u_c(y)$   $k = 2$  for 95% confidence

Notes:

## **2.2 Conducted Emissions**

Testing was performed in accordance with 47 CFR 15, EN55022:1998, ANSI C63.4:1992. These test methods are listed under the laboratory's NVLAP Scope of Accreditation.

### **2.2.1.1 Deviations.**

There were no deviations from this test methodology.

### **2.2.2 Test Results**

Section 2.2.2.1 lists the final measurement data under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and 1.5.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

#### **2.2.2.1 Final Data**

The data recorded in this section contains the final results under the worst-case conditions and with any modifications or special accessories implemented as the manufacturer intends.

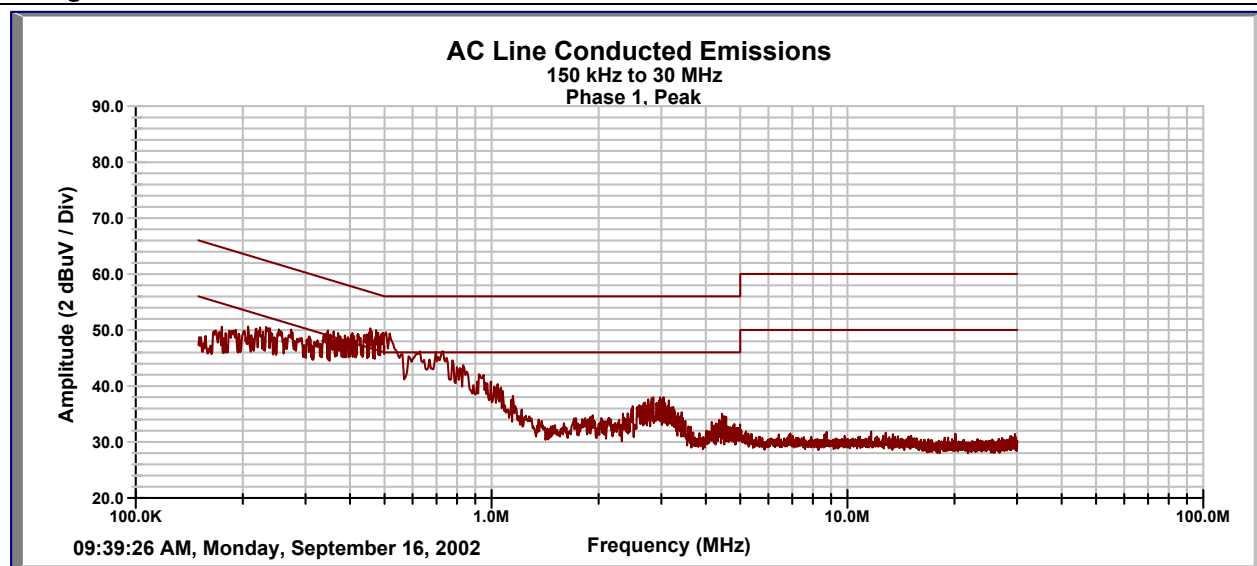
## SOP 2 Conducted Emissions

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**EUT Name** TranspondIT Electric  
**EUT Model** MS8EM915V10  
**EUT Serial** TXA  
**Standard** FCC 47 CFR Part 15  
**LISNs Used** 5, 6

**Date** 16 September 2002  
**Temperature** 69 Deg. F  
**Humidity** 69% RH  
**Line AC /Freq** 230 VAC / 60 Hz  
**Performed by** Eugene Moses

**Configuration** Installed in the meter



| Emission Freq (MHz) | Line ID (1,2,3,N) | FIM Quasi (dBuV) | FIM Ave (dBuV) | Cable Loss (dB) | LISN CF (dB) | Quasi Limit (dBuV) | Ave Limit (dBuV) | Quasi Spec Margin (dB) | Ave Spec Margin (dB) |
|---------------------|-------------------|------------------|----------------|-----------------|--------------|--------------------|------------------|------------------------|----------------------|
| 0.236               | 1                 | 32.50            | 13.88          | 0               | 9.90         | 62.24              | 52.24            | -15.86                 | -28.46               |
| 0.358               | 1                 | 31.09            | 12.97          | 0               | 9.90         | 58.77              | 48.77            | -17.78                 | -25.90               |
| 0.517               | 1                 | 31.20            | 14.03          | 0               | 9.90         | 56.00              | 46.00            | -14.90                 | -22.07               |
| 0.695               | 1                 | 28.79            | 12.05          | 0               | 9.90         | 56.00              | 46.00            | -17.31                 | -21.90               |
| 3.08                | 1                 | 18.42            | 3.86           | 0               | 10.00        | 60.00              | 50.00            | -31.58                 | -36.14               |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |

Quasi Spec Margin = Quasi FIM + Cable Loss + LISN CF - Quasi Limit  $\pm$  Uncertainty

Ave Spec Margin = Ave FIM + Cable Loss + LISN CF - Ave Limit  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.2\text{dB}$  Expanded Uncertainty  $U = k u_c(y)$   $k = 2$  for 95% confidence

Notes:

## SOP 2 Conducted Emissions

Tracking # 5032ADV Page 2 of 2

EUT Name TranspondIT Electric

Date 16 September 2002

EUT Model MS8EM915V10

Temperature 69 Deg. F

EUT Serial TXA

Humidity 69% RH

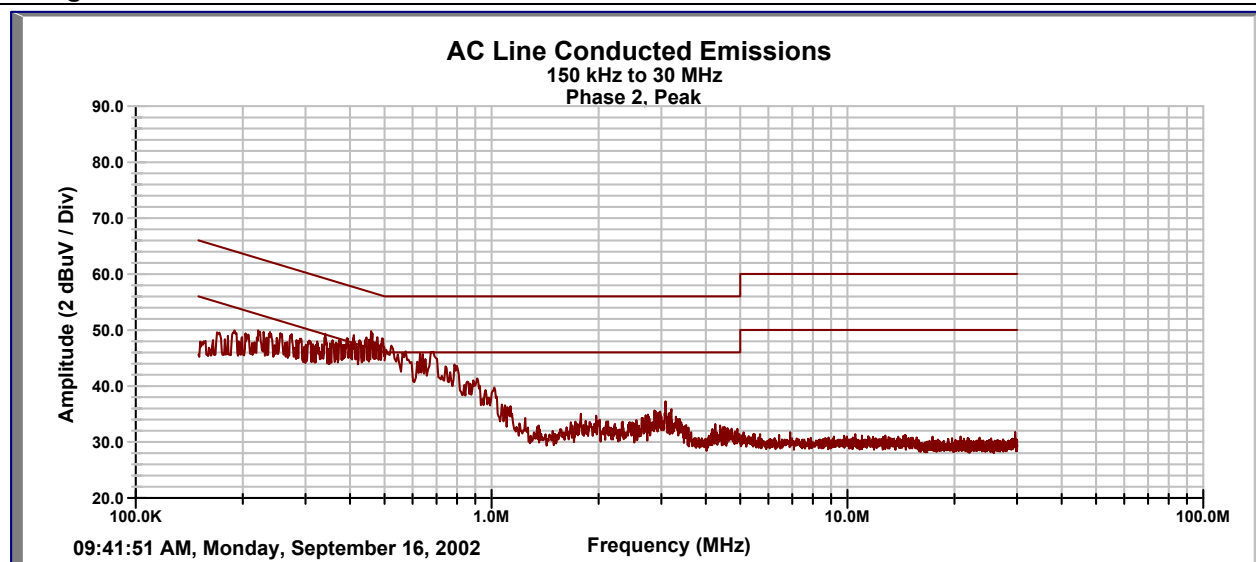
Standard FCC 47 CFR Part 15

Line AC /Freq 230 VAC / 60 Hz

LISNs Used 5, 6

Performed by Eugene Moses

Configuration Installed in the meter



| Emission Freq (MHz) | Line ID (1,2,3,N) | FIM Quasi (dBuV) | FIM Ave (dBuV) | Cable Loss (dB) | LISN CF (dB) | Quasi Limit (dBuV) | Ave Limit (dBuV) | Quasi Spec Margin (dB) | Ave Spec Margin (dB) |
|---------------------|-------------------|------------------|----------------|-----------------|--------------|--------------------|------------------|------------------------|----------------------|
| 0.193               | 2                 | 32.91            | 14.10          | 0               | 9.90         | 63.91              | 53.91            | -21.10                 | -29.91               |
| 0.461               | 2                 | 32.19            | 14.00          | 0               | 9.90         | 56.67              | 46.67            | -14.58                 | -22.77               |
| 0.655               | 2                 | 29.33            | 11.64          | 0               | 9.90         | 56.00              | 46.00            | -16.77                 | -24.46               |
| 3.05                | 2                 | 16.57            | 2.95           | 0               | 10.00        | 60.00              | 50.00            | -33.43                 | -37.05               |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |
|                     |                   |                  |                |                 |              |                    |                  |                        |                      |

Quasi Spec Margin = Quasi FIM + Cable Loss + LISN CF - Quasi Limit  $\pm$  Uncertainty

Ave Spec Margin = Ave FIM + Cable Loss + LISN CF - Ave Limit  $\pm$  Uncertainty

Combined Standard Uncertainty  $u_c(y) = \pm 1.2\text{dB}$     Expanded Uncertainty  $U = k u_c(y)$      $k = 2$  for 95% confidence

Notes:

### 3 Test Equipment Use List

| Equipment                                    | Manufacturer         | Model #    | Serial/Inst # | Last Cal<br>dd/mm/yy | Next Cal<br>dd/mm/yy |
|----------------------------------------------|----------------------|------------|---------------|----------------------|----------------------|
| SOP 1 - Radiated Emissions (5 Meter Chamber) |                      |            |               |                      |                      |
| Amplifier, preamp                            | Agilent Technologies | 8449B      | 3008A01480    | 7-Feb-02             | 7-Feb-03             |
| Ant. Biconical                               | EMCO                 | 3110B      | 3367          | 28-Nov-01            | 28-Nov-02            |
| Ant. Log Periodic                            | AH Systems           | SAS-516    | 133           | 26-Nov-01            | 26-Nov-02            |
| Antenna Horn                                 | EMCO                 | 3115       | 5770          | 18-Nov-01            | 18-Nov-02            |
| Cable, Coax                                  | Andrew               | FSJ1-50A   | 031           | 28-Jan-02            | 28-Jan-03            |
| Cable, Coax                                  | Andrew               | FSJ1-50A   | 034           | 6-Feb-02             | 6-Feb-03             |
| Cable, Coax                                  | Andrew               | FSJ1-50A   | 045           | 29-Jan-02            | 29-Jan-03            |
| Chamber, Semi-Anechoic                       | Braden Shielding     | 5 meter    | A67631        | 26-Mar-02            | 26-Mar-03            |
| Data Table, EMCWin                           | Flextronics EMC      | EMCWin.dll | 002           | 6-Jan-02             | 6-Jan-03             |
| Spectrum Analyzer                            | Agilent Tec.         | E7405A     | US39440161    | 5-Aug-02             | 5-Aug-03             |

|                                                    |                   |               |            |           |           |
|----------------------------------------------------|-------------------|---------------|------------|-----------|-----------|
| SOP 2 - Conducted Emissions (AC/DC and Signal I/O) |                   |               |            |           |           |
| Cable, Coax                                        | Belden            | RG-213        | 004        | 28-Jan-02 | 28-Jan-03 |
| LISN (5) 50mH/50Ω                                  | Solar Electronics | 8028-50-TS-24 | 990441     | 8-Aug-02  | 8-Aug-03  |
| LISN (6) 50mH/50Ω                                  | Solar Electronics | 8028-50-TS-24 | 990442     | 8-Aug-02  | 8-Aug-03  |
| LISN Selection Box                                 | Flextronics EMC   | CFL-9206      | 1650       | 23-Aug-02 | 23-Aug-03 |
| Spectrum Analyzer                                  | Agilent Tec.      | E7405A        | US39440157 | 5-Aug-02  | 5-Aug-03  |

|                              |        |        |          |           |           |
|------------------------------|--------|--------|----------|-----------|-----------|
| General Laboratory Equipment |        |        |          |           |           |
| Meter, Multi                 | Fluke  | 79-3   | 69200606 | 5-Aug-02  | 5-Aug-03  |
| Meter, Temp/Humid/Barom      | Fisher | 02-400 | 01       | 21-Aug-02 | 21-Aug-03 |

\* Calibration of equipment past due for re-calibration will be performed expeditiously. If any equipment is found to be out of tolerance at that time, affected customers will be notified accordingly.