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## REPORT ON

Limited FCC CFR 47: Part 15 C and IC RSS-210 Testing in support of an  
Application for Grant of Equipment Authorisation  
of a Blue Tower Communications TransPondIT Electric Centron

### COMMERCIAL-IN-CONFIDENCE

**FCC ID: MS8EM915CV1-120**  
**IC Number: 4202A-EM915C**

Report No OR200223/01 Issue 3

June 2006

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FCC ID: MS8EM915CV1-120  
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**DATED**

2<sup>nd</sup> June 2006

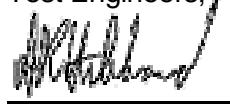
**This report has been Up-issued to Issue 3 to correct an error in the IC Number**

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**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15 C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;



A Hubbard



0141  
Group

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## **SECTION 1**

### **REPORT SUMMARY**

Limited FCC CFR 47: Part 15 C and IC RSS-210 Testing in support of an  
Application for Grant of Equipment Authorisation  
of a Blue Tower Communications TransPondIT Electric Centron

## 1.1 STATUS

<b>Equipment Under Test</b>	TransPondIT Electric Centron
<b>Objective</b>	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
<b>Name and Address of Client</b>	Blue Tower Communications Ltd. Suite 1, Basepoint Business Park Aviation Park West Christchurch Dorset BH23 6NW
<b>Model Number</b>	EM915CV1-120 (Catalogue Number 915-120)
<b>Part Number</b>	95005511
<b>Serial Number</b>	04002903
<b>Drawing Number</b>	90005510 CD 0M
<b>Build Status</b>	M
<b>Software Issue</b>	94008000 RC 01
<b>Declared Variants</b>	None
<b>Test Specification/Issue/Date</b>	FCC CFR 47: Part 15, Subpart C, August 2002 RSS-210: 2005
<b>Number of Items Tested</b>	One
<b>Security Classification of EUT</b>	Commercial-In-Confidence
<b>Incoming Release Date</b>	Declaration of Build Status 29 <sup>th</sup> March 2006
<b>Disposal</b>	Packing Note
<b>Reference Number</b>	OR200223
<b>Date</b>	29 <sup>th</sup> March 2006
<b>Order Number</b>	7176
<b>Date</b>	5 <sup>th</sup> March 2006
<b>Start of Test</b>	28 <sup>th</sup> March 2006
<b>Finish of Test</b>	29 <sup>th</sup> March 2006
<b>Related Documents</b>	ANSI C63.4: 2001 FCC: DA 00-705

## 1.2 INTRODUCTION

The information contained within this report is intended to show limited verification of compliance of the Blue Tower Communications TransPondIT Electric Centron to the requirements of FCC Specification Part 15 C and Industry Canada RSS-210 and RSS-Gen.

Testing was carried out in support of an application for Grant of Equipment Authorisation in the name of Blue Tower Communications.

## 1.2 INTRODUCTION

### 1.2.1 Declaration of Build Status

**Manufacturer** BLUE TOWER COMMUNICATIONS.

**Country of origin** U.K.

**UK Agent** Blue Tower Communications.

**Description** 120V Automatic Meter Reading (AMR) Module for CENTRON ELECTRICITY METER

**Model No** EM915CV1-120 - CATALOGUE NUMBER is 915-120

**Part No** 95005511

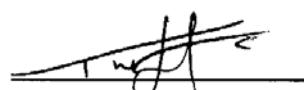
**Serial No** 04002903

**Drawing Number** 90005510 CD 0M

**Build Status** M

**Software Issue** 94008000 RC 01

**Signature**



**Date**

29<sup>th</sup> MARCH 2006.

**D of B S Serial No** OR200223

TUV Product Service Limited formally certifies that the manufacturer's declaration as reproduced in this report, is a true and accurate record of the original received from the applicant.

### 1.3 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out is shown below.

Test	Spec Clause		Test Description	Result	Levels/ Comments
	FCC	Industry Canada			
2.1	15.207	RSS-Gen, 7.2.2	Conducted Emissions (Transmit Mode)	Pass	
2.2	15.209 15.249(d)	RSS-210, 2.6 Table 2 RSS-210, A2.9(2)	Spurious Radiated Emissions (Transmit Mode)	Pass	
2.3	15.249(a)(c)	RSS-210, A2.9(1)	Maximum Peak Output Power Fundamental (Transmit Mode)	Pass	
2.4	15.249(a)(c)	RSS-Gen, 7.2.2	Field Strength, Harmonics (Transmit Mode)	Pass	

## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The TransPondIT for CENTRON is a personality module that has been designed for the CENTRON solid-state electric meter. The TranspondIT sends meter data via radio frequency (RF) signal to a receiving unit: HandTrackIT, FastTrackIT or CellTrackIT.

### 1.4.2 Modes of Operation

Modes of operation of the EUT during testing were as follows:

The unit is activated (i.e. will transmit data packets) only when it has been installed in a meter and configured in the meter house. Once installed within a meter box it will start to read the meter and transmit according to its configuration.

The transmit intervals (time between transmissions) and the duration of the transmissions, are under the control of the PIC. This is programmed in the meter house. It can be configured in the field and can transmit at intervals of between 5 seconds and 10 hours. The transmit time is typically 2.56 milliseconds.

The transmission is a data frame of 128 bits comprising 32 bits of preamble and 96 bits of data that includes a 24 bit cyclic redundancy (CRC) check. The packet is used to modulate the carrier as binary data at a rate of 50kbps using differential Manchester encoding.

The EUT was transmitting at a reparation rate of 20.833Hz for testing purposes only.

### 1.4.3 Test Configuration

Units for FCC testing have a link field added to the PCB that permits 4 modes of operating to be selected. Under normal operation the unit is transmitting one 2.56ms pulse every 5.0 seconds. Such signals take a long time to produce a useful trace on a spectrum analyser. Consequently, to find the position of a maximum transmitted field, the EUT was operated in CW mode.

The normal Pulse repetition Rate of 0.5Hz is below the minimum rate of 20Hz permitted by the FCC for use of quasi peak detectors. Therefore, the maximum transmitted field strength was measured by setting the unit to a 20.833Hz PRF and using a quasi peak detector.

## 1.5 TEST CONDITIONS

The EUT was set-up simulating a typical user installation on the Alternative Open Field Test Site under FCC Registration Number: 90987 and Industry Canada Registration Number: 4270, and tested in accordance with the applicable specification.

For all tests, the Blue Tower Communications TransPondIT Electric Centron was powered by 120V 60Hz supply.



#### **1.6 DEVIATIONS FROM THE STANDARD**

No deviations from the applicable test standards were made.

#### **1.7 MODIFICATION RECORD**

No modifications were made to the EUT during testing.

## SECTION 2

### TEST DETAILS

Limited FCC CFR 47: Part 15 C and IC RSS-210 Testing in support of an  
Application for Grant of Equipment Authorisation  
of a Blue Tower Communications TransPondIT Electric Centron

## 2.1 CONDUCTED EMISSIONS ON POWER PORTS

### 2.1.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.207 and Industry Canada RSS-Gen, 7.2.2

### 2.1.2 Equipment Under Test

TransPondIT Electric Centron

### 2.1.3 Date of Test

29<sup>th</sup> March 2006

### 2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.1.5 Test Procedure

Test performed in accordance with ANSI C63.4.

Conducted Emission Measurements were undertaken within the semi-anechoic chamber.  
Emissions were measured on the Live and Neutral Lines in turn.

Emissions were formally measured using a Quasi-Peak and Average Detectors, which meet the CISPR requirements. The details of the worst-case emissions for the Live and Neutral Lines are presented in the Tables following.

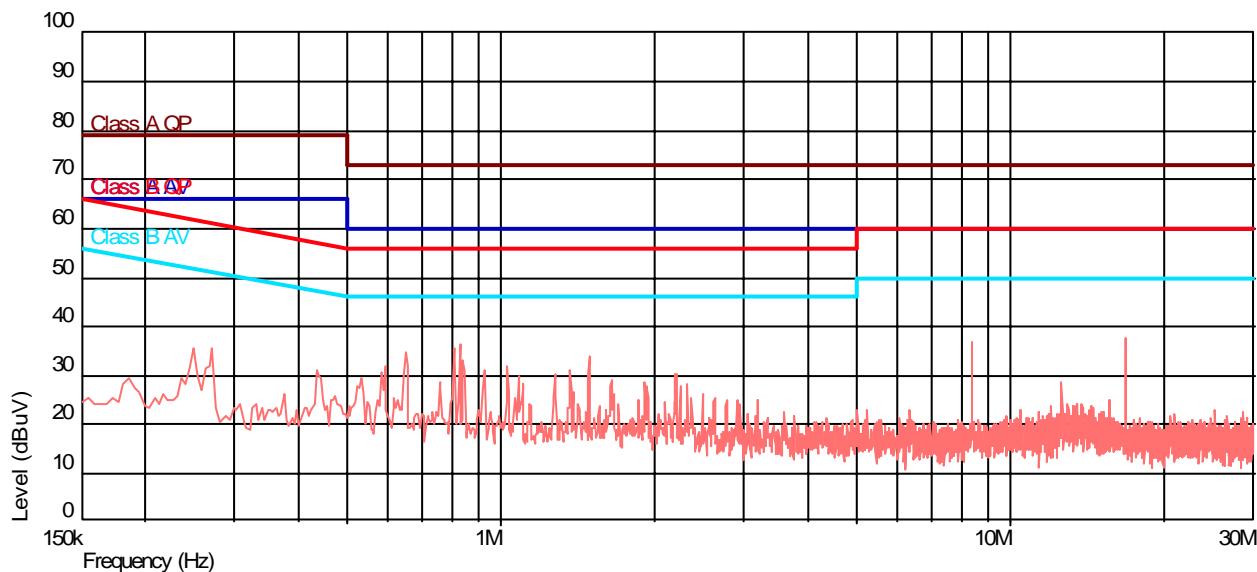
The EUT was supplied from a 120V, 60Hz supply.

## 2.3 CONDUCTED EMISSIONS ON POWER PORTS

### 2.3.6 Test Results

The EUT met the Class B requirements of FCC CFR 47: Part 15 Subpart C, Section 15.207 and Industry Canada RSS-Gen, 7.2.2 for Conducted Emissions on the Live and Neutral Lines.

#### Live Line



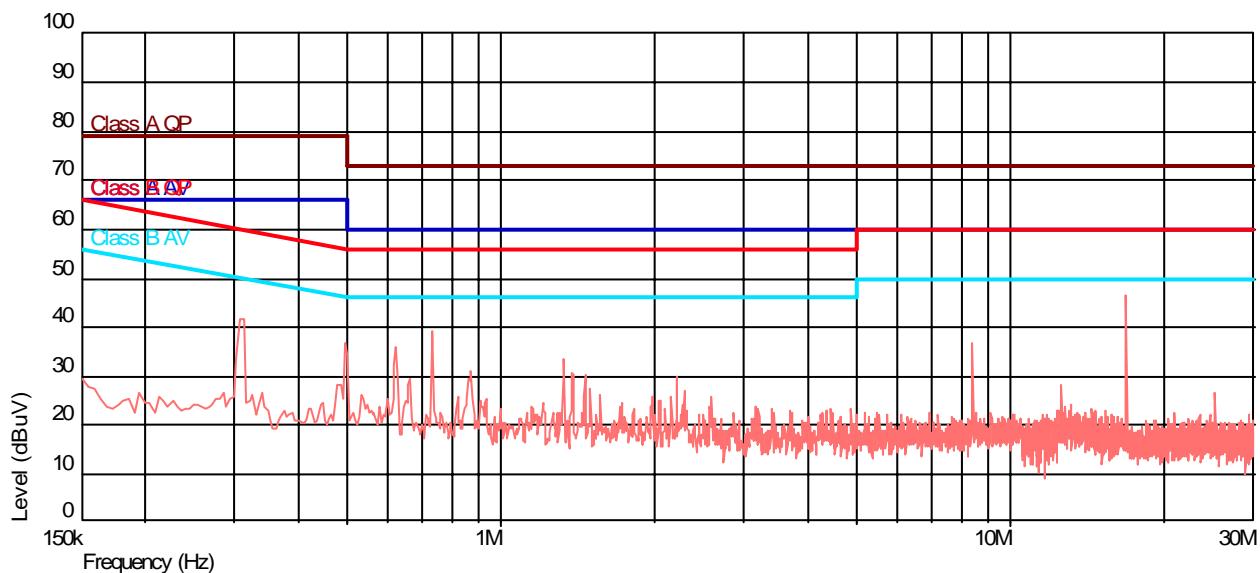
Frequency(Hz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
249.09481 k	25.81	61.79	-35.98	-	-	-
271.429269 k	26.18	61.07	-34.89	-	-	-
434.290551 k	26.06	57.17	-31.11	-	-	-
583.317956 k	25.70	56.00	-30.30	-	-	-
595.228196 k	24.65	56.00	-31.35	-	-	-
650.996844 k	25.08	56.00	-30.92	-	-	-
802.681984 k	24.58	56.00	-31.42	-	-	-
826.956643 k	24.05	56.00	-31.95	-	-	-
844.064309 k	23.67	56.00	-32.33	-	-	-
926.129459 k	23.28	56.00	-32.72	-	-	-
1.026162 M	23.30	56.00	-32.70	-	-	-
1.36738 M	21.10	56.00	-34.90	-	-	-
1.483551 M	20.97	56.00	-35.03	-	-	-
2.197896 M	17.96	56.00	-38.04	-	-	-
8.389668 M	36.19	60.00	-23.81	35.38	50.00	-14.62
16.779854 M	45.38	60.00	-14.62	37.23	50.00	-12.77

The margin between the specification requirements and all other emissions were 38.04dB or more below the specified Quasi-Peak limit and 14.62dB or more below the Average limit.

## 2.3 CONDUCTED EMISSIONS ON POWER PORTS

### 2.3.6 Test Results

#### Neutral Line

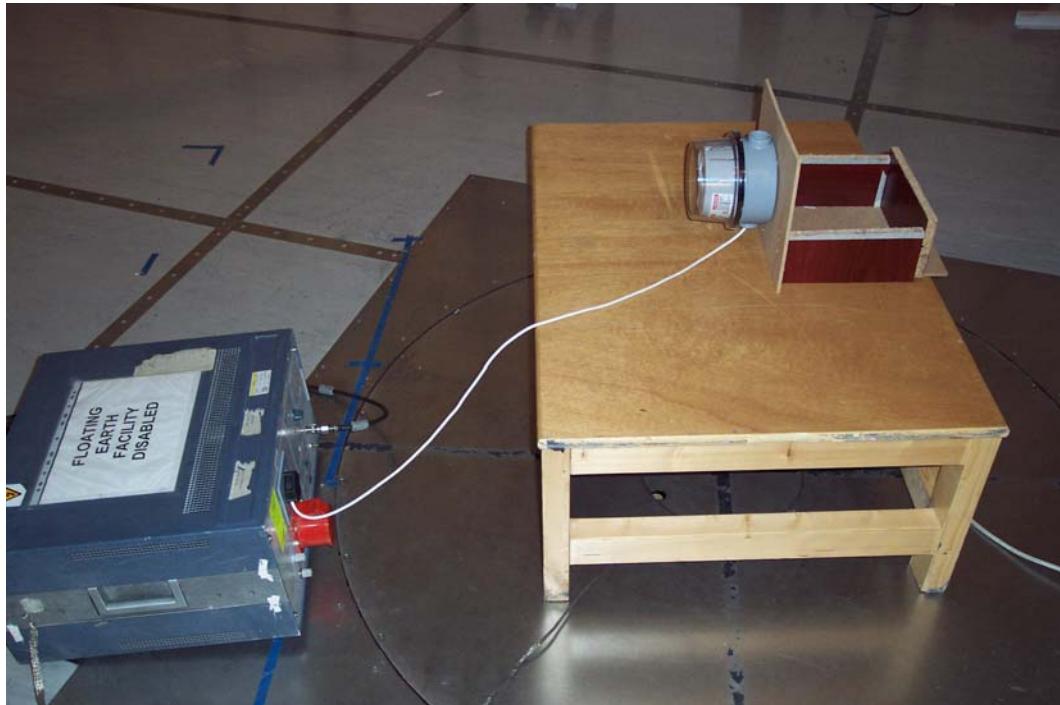


Frequency(Hz)	QP Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Level (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
307.691032 k	25.89	60.03	-34.14	-	-	-
491.023888 k	25.54	56.15	-30.61	-	-	-
622.961573 k	25.08	56.00	-30.92	-	-	-
737.400902 k	25.25	56.00	-30.75	-	-	-
1.322191 M	21.61	56.00	-34.39	-	-	-
8.389668 M	36.07	60.00	-23.93	35.58	50.00	-14.42
16.778509 M	46.60	60.00	-13.40	38.55	50.00	-11.45

The margin between the specification requirements and all other emissions were 34.39dB or more below the specified Quasi-Peak limit and 14.45dB or more below the Average limit.

## 2.3 CONDUCTED EMISSIONS ON POWER PORTS

### 2.3.7 Set up Photographs



Set Up Photograph

## 2.2 SPURIOUS RADIATED EMISSIONS (TRANSMIT MODE)

### 2.2.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.209 and Industry Canada RSS-210, 2.6 Table 2, RSS-2.10, A2.9(2)

### 2.2.2 Equipment Under Test

TransPondIT Electric Centron

### 2.2.3 Date of Test

29<sup>th</sup> March 2006

### 2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.2.5 Test Procedure

Test Performed in accordance with ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT. The list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

Emissions identified within the range 30MHz – 1GHz were then formally measured using a CISPR Quasi-Peak detector.

Emissions identified within the range 1GHz – 10GHz were then formally measured using Peak and Average Detectors, as appropriate.

The measurements were performed at a 3m distance unless otherwise stated.



## 2.2 SPURIOUS RADIATED EMISSIONS (TRANSMIT MODE)

### 2.2.6 Test Results

Equipment Designation: Unintentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.209 and Industry Canada RSS-210, 2.6 Table 2 , RSS-2.10, A2.9(2)for Spurious Radiated Emissions (30MHz – 1GHz).

Emission Frequency	Polarisation	Height	Azimuth	Field Strength		Limit	
MHz		cm	degree	dB $\mu$ V/m	$\mu$ V/m	dB $\mu$ V/m	$\mu$ V/m
689.9	Horizontal	100	000	37.50	75.00	46.00	200.00

No other emissions were detected within 20dB of the specification limit..

## 2.3 MAXIMUM PEAK OUTPUT POWER FUNDAMENTAL (TRANSMIT MODE)

### 2.3.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.249(a)(c) and Industry Canada RSS-210, A2.9(1)

### 2.3.2 Equipment Under Test

TransPondIT Electric Centron

### 2.3.3 Date of Test

29<sup>th</sup> March 2006

### 2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.3.5 Test Procedure

Test Performed in accordance with ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT. The list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The measurements were performed at a 3m distance unless otherwise stated.

## 2.3 MAXIMUM PEAK OUTPUT POWER FUNDAMENTAL (TRANSMIT MODE)

### 2.3.6 Test Results

Equipment Designation: Unintentional Radiator.

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.49(a)(c) and Industry Canada RSS-210, A12.9(1) for Maximum Peak Output Power Fundamental (Transmit Mode).

Emission Frequency	Polarisation	Height	Azimuth	Field Strength		Limit	
MHz		cm	degree	dB $\mu$ V/m	mV/m	dB $\mu$ V/m	mV/m
919.9	Horizontal	138	000	93.4	47.7	93.98	50.0

## 2.4 FIELD STRENGTH, HARMONICS (Transmit Mode)

### 2.4.1 Specification Reference

FCC CFR 47: Part 15 Subpart C, Section 15.249(a)(c) and Industry Canada RSS-Gen, 7.2.2

### 2.4.2 Equipment Under Test

TransPondIT Electric Centron

### 2.4.3 Date of Test

29<sup>th</sup> March 2006

### 2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.4.5 Test Procedure

Test Performed in accordance with FCC CFR 47: Part 15.249(a)(c).

Measurements of the 2<sup>nd</sup> to 10<sup>th</sup> harmonic emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations with the antenna height, antenna polarisation and turntable azimuth obtained from Section 2.3.

An Average detector function was used to measure the emission levels.

### 2.4.6 Test Results

The EUT met the requirements of FCC CFR 47: Part 15 Subpart C, Section 15.249(a)(c) and Industry Canada RSS-Gen, 7.2.2.

Emission Frequency	Polarisation	Height	Azimuth	Field Strength		Limit	
MHz		cm	degree	dB $\mu$ V/m	$\mu$ V/m	dB $\mu$ V/m	$\mu$ V/m
1839.82	Horizontal	100	000	26.34	20.75	53.98	500.00
1839.76	Vertical	160	315	27.04	22.49	53.98	500.00



## **SECTION 3**

### **TEST EQUIPMENT**

### 3.1 TEST EQUIPMENT

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No	TE Number	Calibration Due
<b>Section 2.1 EMC - Conducted Emissions</b>				
LISN	Rohde & Schwarz	ESH2-Z5	16	17/08/2006
Transient Limiter	Hewlett Packard	11947A	1032	06/06/2006
Screened Room (5)	Rainford	Rainford	1545	01/03/2008
Test Receiver	Rohde & Schwarz	ESIB26	2085	26/09/2006
<b>Sections 2.2, 2.3 and 2.4 EMC - Radiated Emissions</b>				
LISN	Rohde & Schwarz	ESH2-Z5	16	17/08/2006
Spectrum Analyser	Hewlett Packard	8542E	18	09/02/2007
Signal Generator	Marconi	2031	53	20/12/2006
Amplifier	Miteq Corp	AMF-3d-001080-18-13P	231	O/P MON
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	01/07/2006
Transient Limiter	Hewlett Packard	11947A	1032	06/06/2006
Screened Room (5)	Rainford	Rainford	1545	01/03/2008
Mast Controller	Inn-Co GmbH	CO 1000	1606	O/P MON
Turntable/Mast Controller	EMCO	2090	1607	O/P MON
Test Receiver	Rohde & Schwarz	ESIB26	2085	26/09/2006
Amplifier (8GHz-18GHz)	Avantec	AWT-18036	2821	O/P MON
Bilog Antenna	Chase	CBL6143	2904	10/11/2007

### 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*

Worst case error for both Time and Frequency measurement 12 parts in  $10^6$ .

\* In accordance with CISPR 16-4



## **SECTION 4**

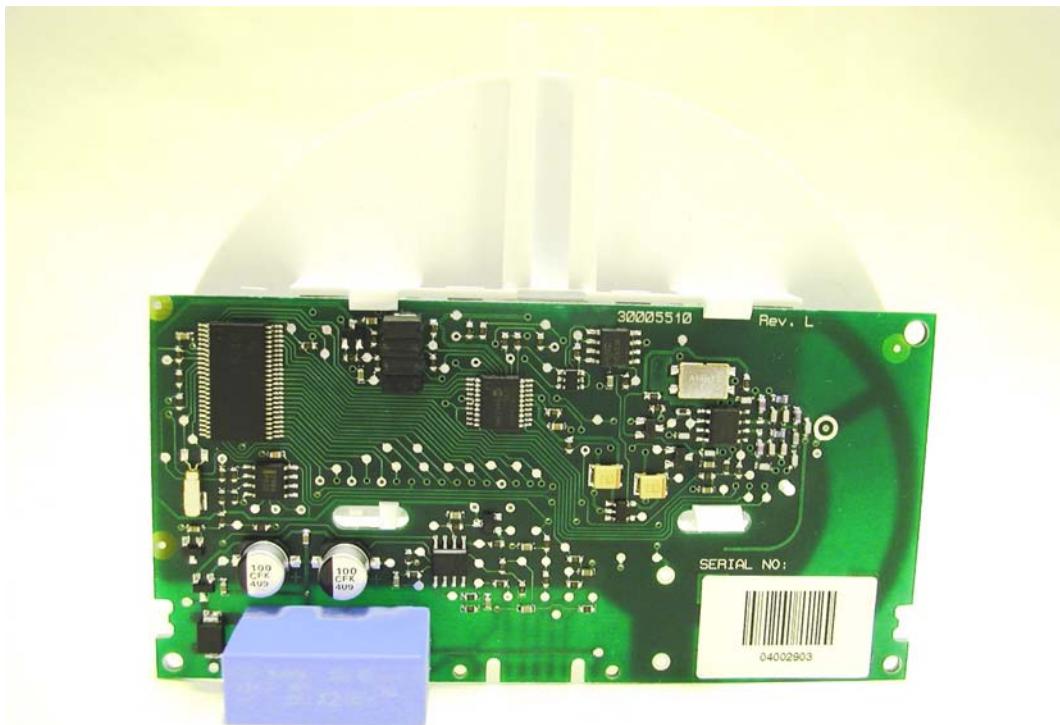
### **PHOTOGRAPHS**

#### 4.1 PHOTOGRAHPS OF EQUIPMENT UNDER TEST (EUT)



TransPondIT Centron 120V module (removed from meter): LCD front view

#### 4.1 PHOTOGRAHPS OF EQUIPMENT UNDER TEST (EUT)



Rear view of TransPondIT Centron 120V module - showing PCB antenna position

#### 4.1 PHOTOGRAHPS OF EQUIPMENT UNDER TEST (EUT)



TransPondIT Centron 120V module - installed into a 120V 1S Meter



Product Service

## **SECTION 5**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**

## 5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
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