

MEASUREMENT AND TECHNICAL REPORT

HM ELECTRONICS  
 6675 Mesa Ridge Road  
 San Diego, CA 92121-2937

DATE: 4 June 2001

<b>This Report Concerns:</b>	Original Grant: <input checked="" type="checkbox"/>	Class II Change: <input type="checkbox"/>
<b>Equipment Type:</b>	AMS AM1011 Base Transceiver Board, Model 180094	
<b>Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?</b>	Yes: <input type="checkbox"/> <b>Defer until:</b>	No: <input checked="" type="checkbox"/>
<b>Company Name agrees to notify the Commission by:</b>	N/A	
<b>of the intended date of announcement of the product so that the grant can be issued on that date.</b>		
<b>Transition Rules Request per 15.37?</b>	Yes: <input type="checkbox"/>	*No: <input checked="" type="checkbox"/>
<i>(*) FCC Part 15, Paragraphs 15.109(a), 15.209 and 15.223</i>		
<p><b>Report Prepared by:</b></p> <p><b>TÜV PRODUCT SERVICE</b>                  10040 Mesa Rim Road                  San Diego, CA 92121-2912                  Phone: 858 546 3999                  Fax: 858 546 0364</p>		

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**1 GENERAL INFORMATION**

**1.1 Product Description**

NAME, MODEL, SERIAL # OF EUT:	AMS AM1011 Base Transceiver Board, Model 180094
DESCRIPTION OF EUT:	AM Transceiver Board for use in COM430 and COM930
OPERATING MODE(S):	<b>Normal</b>
<b>POWER INTERFACE</b>	
FREQUENCY/AC/DC VOLTAGE:	Battery power DC
PHASES:	1
OSCILLATOR FREQUENCIES:	32.768 kHz on Y1; Crystal reference
<b>POWER SUPPLY</b>	

**1.2 Related Submittal/Grant**

None

**1.3 Tested System Details**

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

None

**1.4 Test Methodology**

Purpose of Test: To demonstrate compliance with the ANSI C63.4 setup.

Test Performed:

1. Conducted Emissions, FCC Part 15.207
2. Radiated Emissions, EN55022: 1992 Class B limit, 30 - 1,000 MHz, 10 meters
- X 3. Radiated Emission per FCC Part 15.109(a), 15.209 and 15.223
4. Engineering evaluations

**1.5 Test Facility**

The open area test site and conducted measurement data were tested by:

TÜV PRODUCT SERVICE  
10040 Mesa Rim Road  
San Diego, CA 92121-2912  
Phone: 858 546 3999  
Fax: 858 546 0364

The Test Site Data and performance comply with ANSI 63.4 and are registered with the FCC, 7435 Oakland Mills Rd, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

## **2. SYSTEM TEST CONFIGURATION**

### 2.1 Justification

The was initially tested for FCC emission in the following configuration:

See Block Diagram.

### 2.2 EUT Exercise Software

None

### 2.3 Special Accessories

None

### 2.4 Modification

None

### 2.5 Configuration of Tested System

See Block Diagram.

**3 CONDUCTED EMISSION DATA**  
**EUT is battery powered.**

**HME ELECTRONICS**

See following page(s).

**4 RADIATED MEASUREMENT EQUIPMENT LIST**

**Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)**

The *EQUIVALENT RADIATED EMISSIONS* measurements were performed at the following test location :

- Test not applicable

**Test Site:**

Canyon Site Parking Lot, Carroll Canyon, San Diego

**Test Equipment Used :**

<b>Model No.</b>	<b>Property No.</b>	<b>Description</b>	<b>Manufacturer</b>	<b>Serial Number</b>	<b>Cal Date</b>
HP8568B	430	Spectrum Analyzer	Hewlett Packard	3303A00365	
HFH2-Z2	208	Loop Antenna	Rohde & Schwarz	880	*

Remarks: (\*) Verified prior to use.

## 6 RADIATED EMISSION DATA

The following data lists the significant emission frequencies, measured levels, correction factor (which includes cable and antenna corrections), the corrected reading, and the limit.

See following page(s).



4 May 01  
EUT: AMS AM1011 Base Xcvr Board  
Sire SR4

Freq. MHz	3 m Meas. Peak dB $\mu$ V	Corr. Factor	30 29.5 dB $\mu$ V	Limit	Margin	
				3 meters		
				40		
Part 15, Para. 15.223						
1.8062	33.1	20	29.5	60	-6.9	Noise floor
3.6124	17.9	20	29.5	60	-22.7	Noise floor
5.4186	16.6	20	29.5	60	-23.4	Noise floor
7.2248	17.7	20	29.5	60	-22.6	Noise floor
9.031	16.5	20	29.5	60	-23.5	Noise floor

4 May 01  
EUT: AMS AM1011 Base Xcvr Board  
Canyon 1

Part 15, Para. 15.209						
10.8372	16.9	20	29.5	69.5	32.6	Noise floor
12.6434	17.5	20	29.5	69.5	32.0	Noise floor
14.4496	16.0	20	29.5	69.5	33.5	Noise floor
16.2558	16.2	20	29.5	69.5	33.3	Noise floor
18.062	16.7	20	29.5	69.5	32.8	Noise floor

Temp: 23C  
Humidity: 35  
Atm. Press: 101.8 kPa

Equipment: Spectrum analyzer, #74 HP 8568B s/n 2304A04531  
Antenna: Rohde & Schwarz 9 kHz - 30 MHz Loop #208 S/N 88.458/25

REPORT NOSC103937

SPEC: FCC Part 15 para 15.109(a)

COMPANY:HME

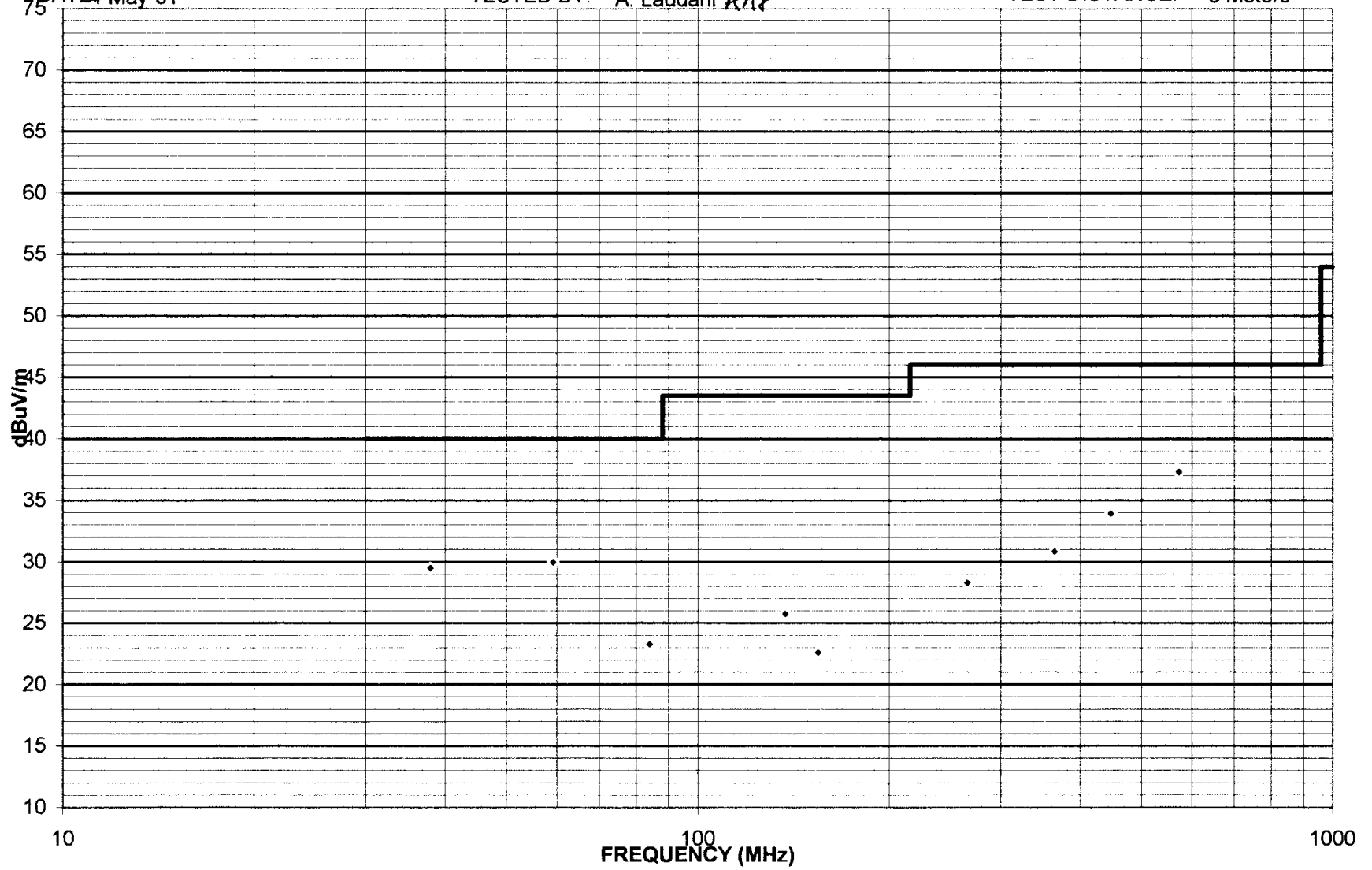
EUTAMS AM1011 Base Xcvr Board (Com 430 & 930)

EUT MODE Normal Operating Configuration

DATE 4-May-01

TESTED BY: A. Laudani *AAE*

TEST DISTANCE: 3 Meters





## 6.1 Field Strength Calculation

If a preamplifier was used during the Radiated Emission Testing, it is required that the amplifier gain must be subtracted from the Spectrum Analyzer (Meter) Reading. In addition, a correction factor for the antenna, cable used and a distance factor, if any, must be applied to the Meter Reading before a true field strength reading can be obtained. In the automatic measurement, these considerations are automatically presented as a part of the print out. In the case of manual measurements and for greater efficiency and convenience, instead of using these correlation factors for each meter reading, the specification limit was modified to reflect these correlation factors at each frequency value so that the meter readings can be compared directly to the modified specification limit. This modified specification limit is referred to as the "Corrected Meter Reading Limit" or simply the CMRL, which is the actual field strength present at the antenna. The quantity can be derived in the following manner:

$$\text{Corrected Meter Reading Limit (CMRL)} = \text{SAR} + \text{AF} + \text{CL} - \text{AG} - \text{DC}$$

Where, SAR = Spectrum Analyzer Reading  
 AF = Antenna Factor  
 CL = Cable Loss  
 AG = Amplifier Gain (if any)  
 DC = Distance Correction (if any)

Assume the following situation: A meter reading of 29.4 dBuV was obtained from a Class A computing device measured at 83 MHz. Assume an antenna factor of 9.2 dB, a cable loss of 1.4 dB and amplifier gain of 20.0 dB at 83 MHz. The final field strength would be determined as follows:

$$\text{CMRL} = 29.4 \text{ dBuV} + 9.2 \text{ dB} - 1.4 \text{ dB} - 20 \text{ dB/M} - 0.0 \text{ dB}$$

$$\text{CMRL} = 20.0 \text{ dBuV/M}$$

This result is well below the FCC and CSA Class A limit of 29.5 dbuV/m at 83 MHz.

For the manual mode of measurement, a table of corrected meter reading limit was used to permit immediate comparison of the meter reading to determine if the measure emission amplitude exceeded the specification limit at that specific frequency.

**7 ATTESTAION STATEMENT:**

All tests according to *CFR 47, Part 15, Paragraphs 15.207 and 15.209* were

■ - Performed

The Equipment Under Test

■ - **Fulfills** the general requirements of *CFR 47, Part 15, Paragraphs 15.207 and 15.209*.

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- TÜV PRODUCT SERVICE, INC. -

Responsible Engineer:



Jim Owen  
(EMC Engineer)