

**Appendix J**

**RADIATED EMISSIONS, FCC PART 2, PARAGRAPH 2.993  
CONDUCTED EMISSIONS:  
PART 2, PARAGRAPHS 2.985, 2.989, 2.991 AND  
PART 90, PARAGRAPH 90.217(b)**

**Emissions Test Conditions: RADIATED EMISSIONS FCC Part 2, Paragraph 2.993**

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

- Test not applicable

- Roof (Small Open Area Test Site)
- Canyon #1 (10- and 30-Meter Open Area Test Site), Carroll Canyon, San Diego
- Canyon #2 (3- and 10-Meter Open Area Test Site), Carroll Canyon, San Diego

**Testing was performed at a test distance of:**

- 1 meters
- 3 meters
- 10 meters

**Test Equipment Used :**

Model No.	Manufacturer	Description	Serial No.	Prop. No.	Cal Date
■ - 8566B	Hewlett Packard	Spectrum Analyzer	2115A00842	407	02/18/99
■ - 85662B	Hewlett Packard	Spectrum Analyzer Display	2112A02185	406	02/18/99
■ - 3115	EMCO	Antenna, Double Ridge Guide	9412-4363	453	09/01/99
■ - AFD3-0208-40-ST	Miteq, Inc.	Pre-Amplifier (30 dB gain), 2 to 8 GHz	155382	367	01/21/99
■ - 3146	EMCO	Log Periodic Antenna	9402-3775	418	06/25/99

Remarks: Equipment for Part 2, Paragraph 2.993 and Part 90, Paragraph 90.217(b)



## 8.2 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.

**Emissions Test Conditions: CONDUCTED EMISSIONS**

**The EQUIVALENT CONDUCTED EMISSIONS measurements were performed in the following test location :**

- Test not applicable

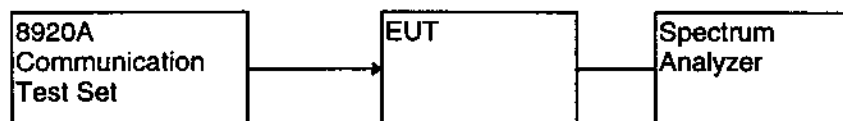
- SR-2, Shielded Room, 12' x 24' x 10', Metal Chamber
- SR-3, Shielded Room, 12' x 20' x 8', Metal Chamber
- SR-4, Shielded Room, 10' x 17' x 8', Copper Screen Chamber
- SR-5, Shielded Room, 16' x 28' x 15', Metal, Semi-Anechoic Chamber
- TR-1, Shielded Room, 16.5' x 10' x 7.5', Copper Screen Chamber

**Test Equipment Used :**

Model No.	Manufacturer	Description	Serial No.	Prop. No.	Cal Date
■ - 85660B	Hewlett Packard	Spectrum Analyzer	2311A02209	407	10/01/99
■ - 85662A	Hewlett Packard	Spectrum Analyzer Display	2309A04682	406	10/01/99

Remarks: \_\_\_\_\_  
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## CONDUCTED MEASUREMENT SETUP



CUSTOMER: HM ELECTORNICS, INC.  
SPECIFICATION: FCC Part 2, Paragraph 2.985  
REPORT NO. S8473  
NOTE: Output power = 0.162

TEST: Output Power

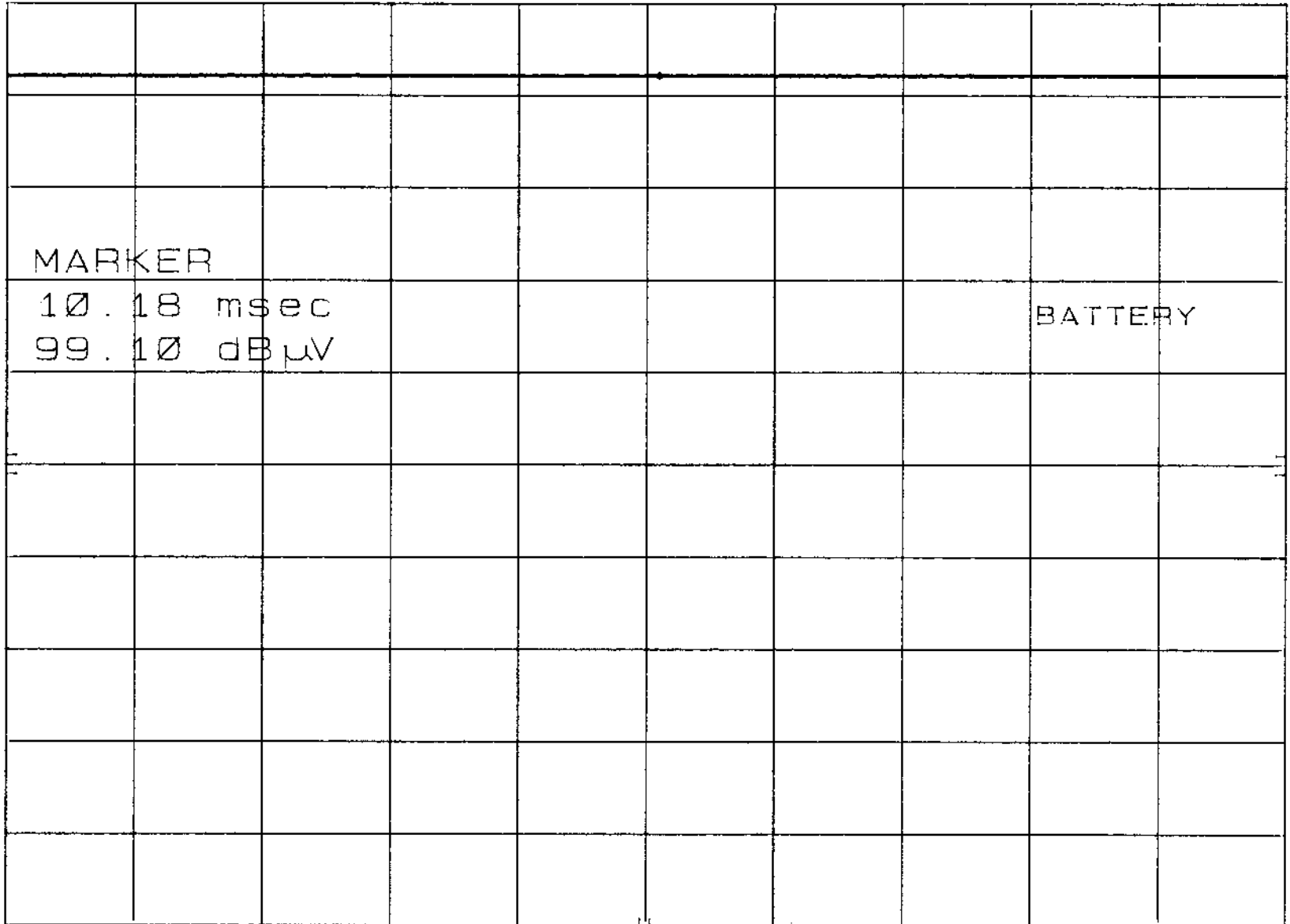
DATE: 17 September 1998

MKR 10.18 msec  
99.10 dB $\mu$ V

hp REF 107.0 dB $\mu$ V ATTEN 10 dB

10 dB/

POS PK



CENTER 457.513 MHz

RES BW 300 kHz

VBW 1 MHz

SPAN 0 Hz  
SWP 20 msec

CUSTOMER: HM ELECTORNICS, INC.

TEST: Occupied Bandwidth

SPECIFICATION: FCC Part 2, Paragraph 2.989 and Part 90, Paragraph 90.217(b)

DATE: 17 September 1998

REPORT NO. S8473

MKR  $\Delta$  11.4 kHz

- .80 dB

hp

REF 99.1 dB $\mu$ V

ATTEN 10 dB

10 dB/

POS PK

MARKER  $\Delta$

11.4 kHz

- .80 dB

BATTERY

Limit  
30 dB

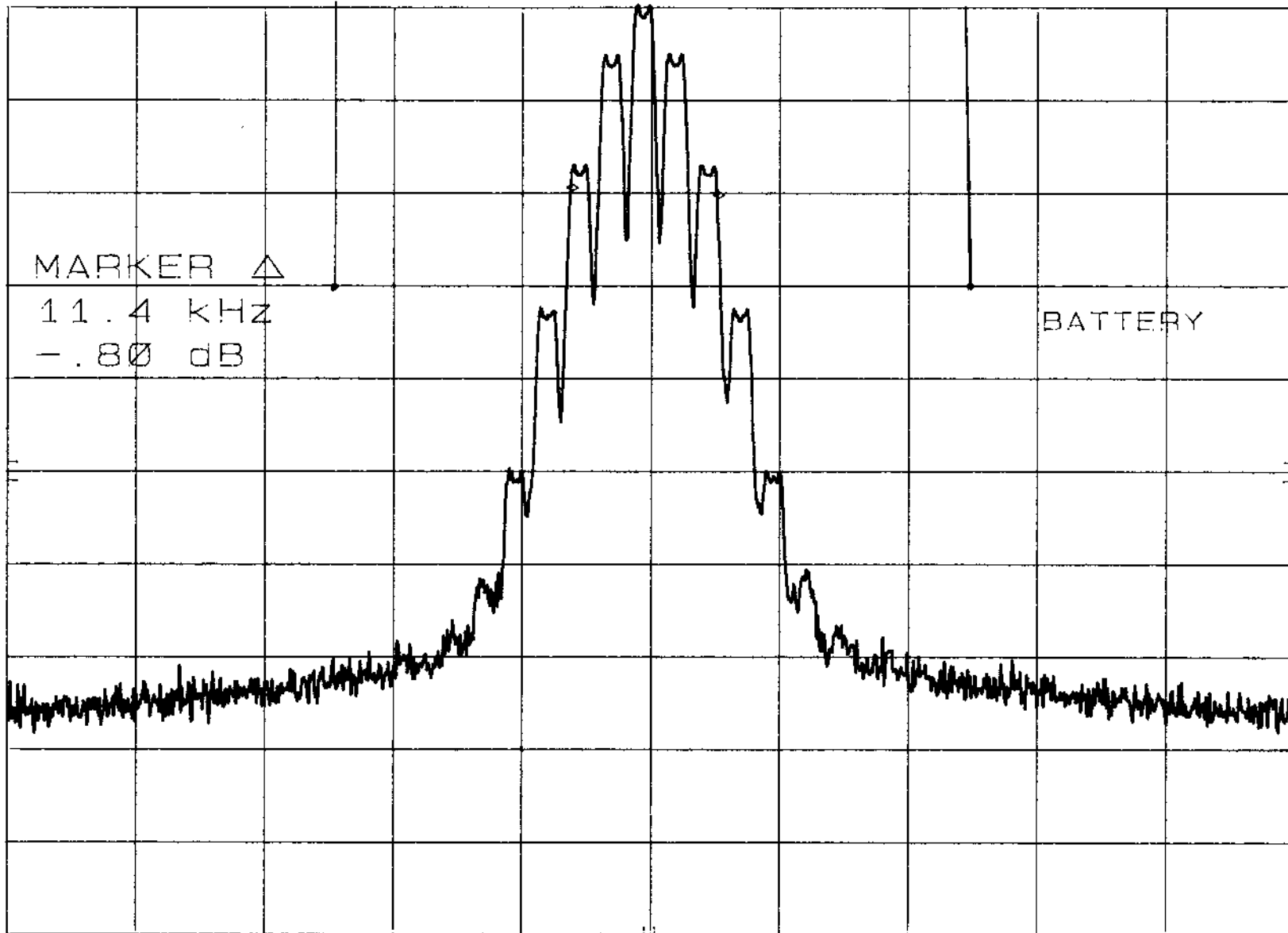
CENTER 457.5125 MHz

RES BW 300 Hz

VBW 3 kHz

SPAN 100.0 kHz

SWP 100 sec





CUSTOMER: HM ELECTORNICS, INC.  
SPECIFICATION: FCC Part 2, Paragraph 2.991  
REPORT NO. S8473

TEST: Spurious Emissions at Antenna Terminals

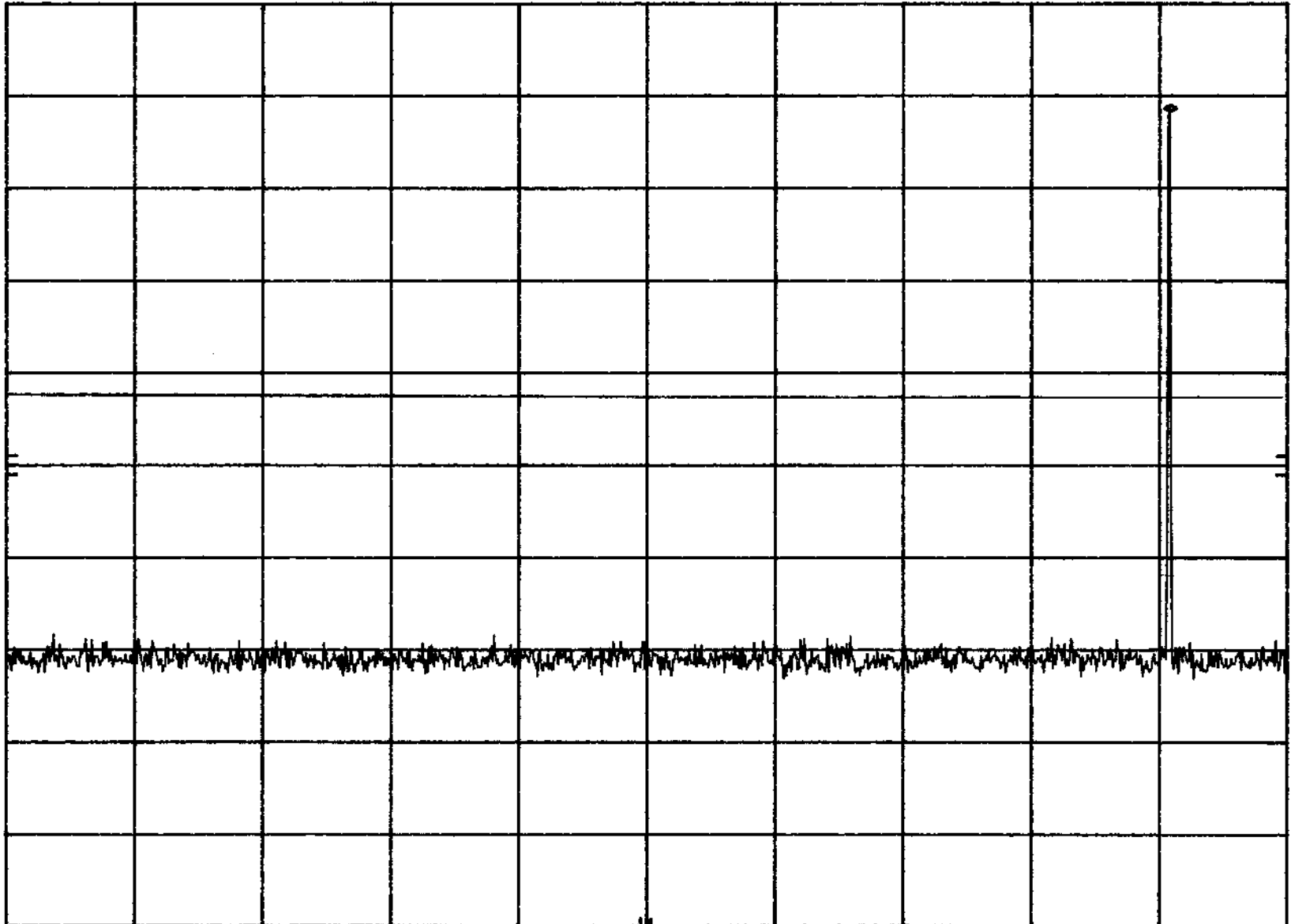
DATE: 17 September 1998

*HP*  
MKR 454.3 MHz  
125.60 dB $\mu$ V

*hp* REF 137.0 dB $\mu$ V ATTEN 50 dB

10 dB/

POS PK



START 3 MHz

RES BW 100 kHz

VBW 300 kHz

STOP 500 MHz

SWP 149 msec

CUSTOMER: HM ELECTORNICS, INC.  
SPECIFICATION: FCC Part 2, Paragraph 2.991  
REPORT NO. S8473

TEST: Spurious Emissions at Antenna Terminals

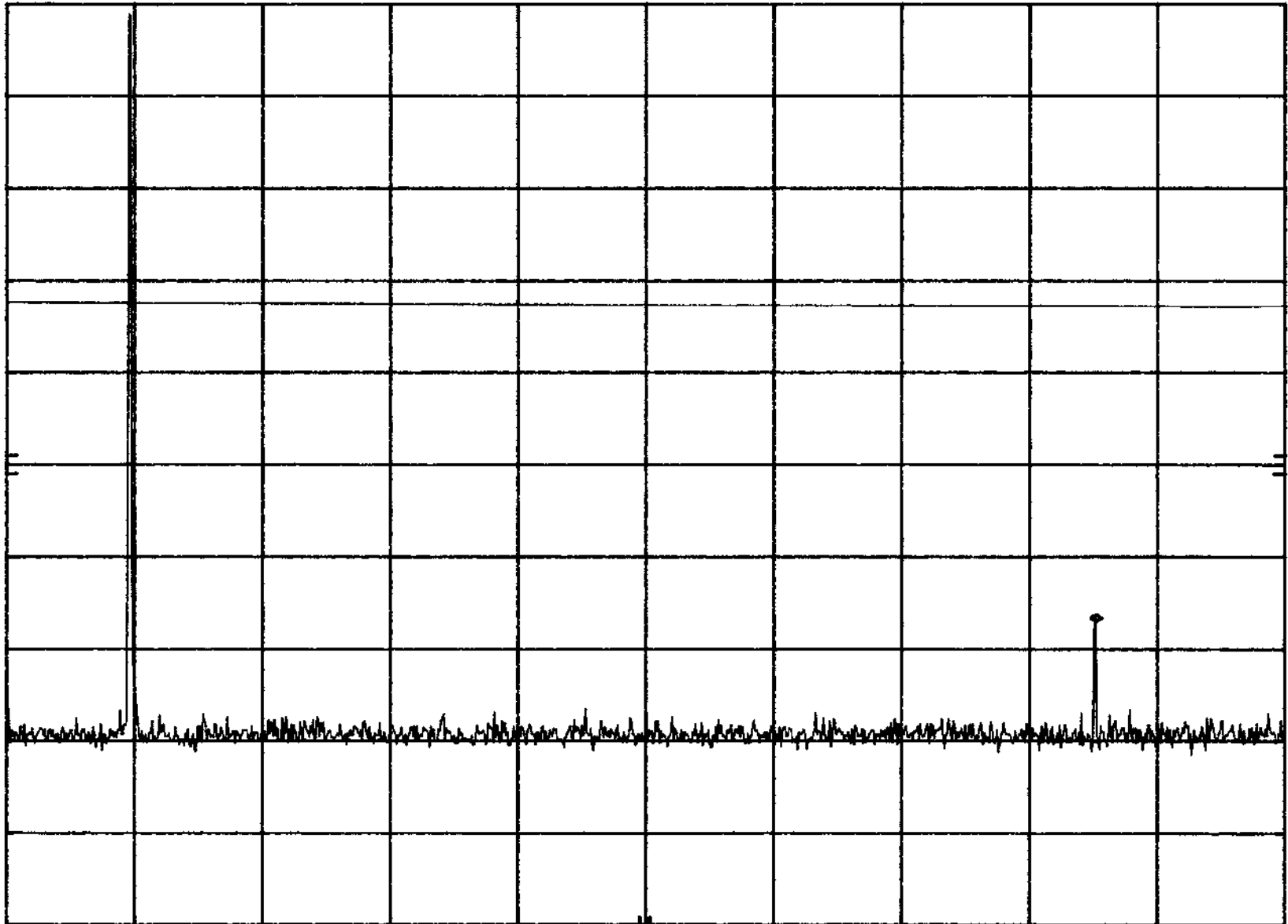
DATE: 17 September 1998

MKR 911.2 MHz  
60.40 dB $\mu$ V

hp REF 127.0 dB $\mu$ V ATTEN 30 dB

10 dB/

POS PK



START 400 MHz

RES BW 100 kHz

VBW 300 kHz

STOP 1.000 GHz

SWP 180 msec

CUSTOMER: HM ELECTORNICS, INC.  
SPECIFICATION: FCC Part 2, Paragraph 2.991  
REPORT NO. S8473

TEST: Spurious Emissions at Antenna Terminals

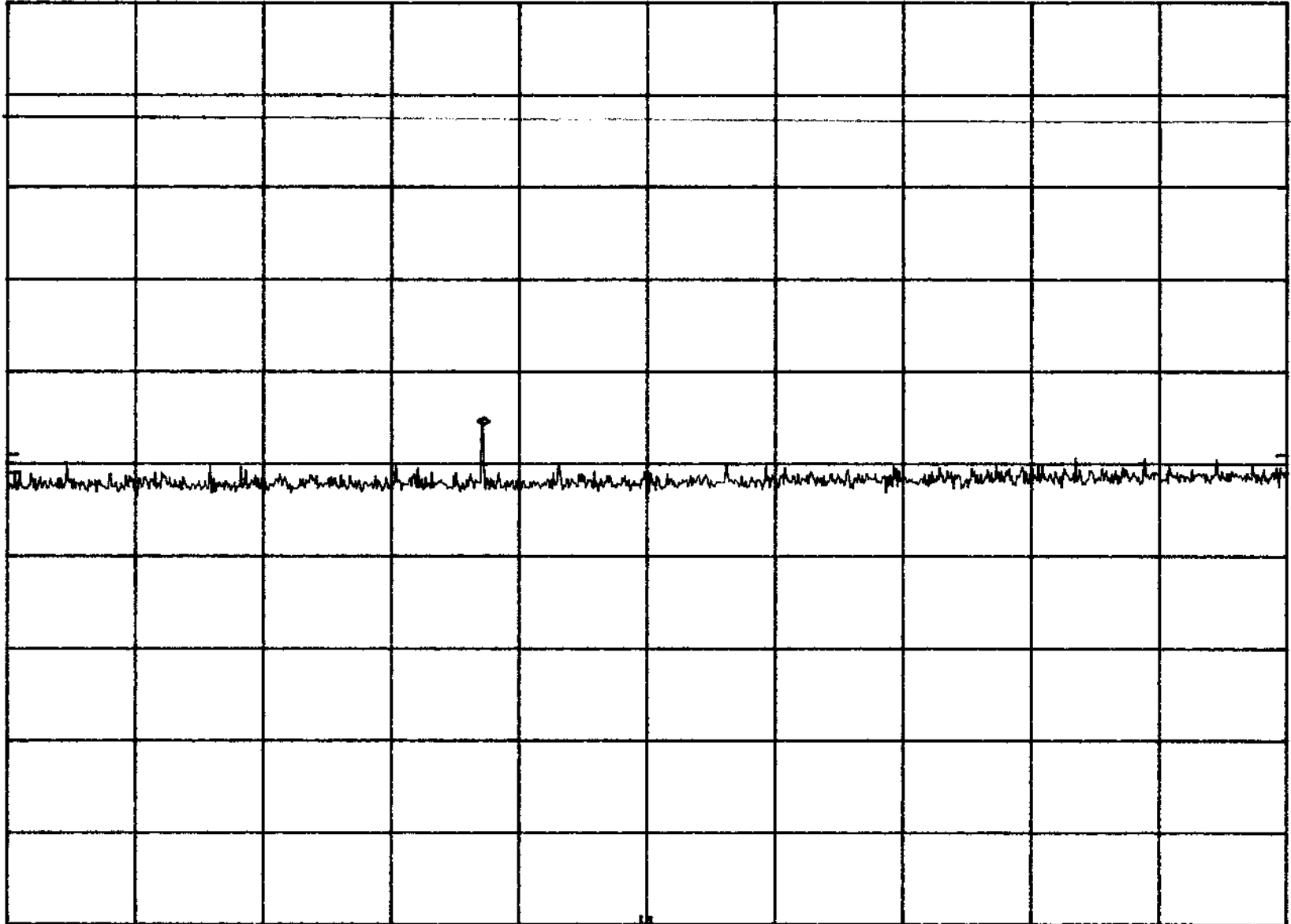
DATE: 17 September 1998

*AP*  
MKR 1.372 GHz  
61.60 dB $\mu$ V

*hp* REF 107.0 dB $\mu$ V ATTEN 30 dB

10 dB/

POS PK



Limit

START 1.00 GHz

RES BW 1 MHz

VBW 1 MHz

STOP 2.00 GHz

SWP 25.0 msec

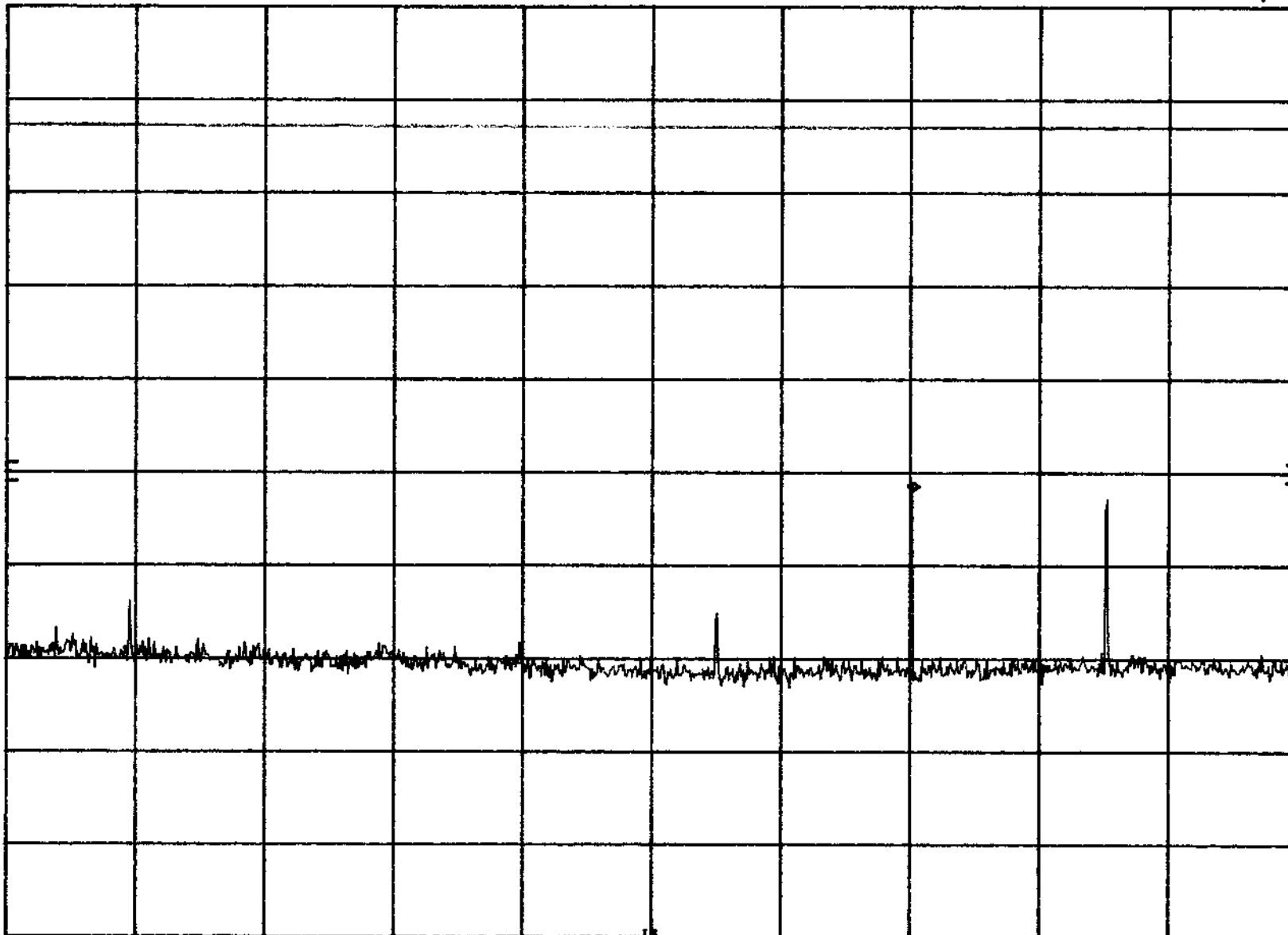
MKR 4.106 GHz  
55.50 dB $\mu$ V

*HP*

*hp* REF 107.0 dB $\mu$ V ATTEN 10 dB

10 dB/

POS PK



Limit

START 2.00 GHz

RES BW 1 MHz

VBW 1 MHz

STOP 5.00 GHz  
SWP 75.0 msec