



## FCC Part 15

*Subpart C (Intentional Radiators)*

### CLASS B MEASUREMENT / TECHNICAL REPORT

*Fujitsu Personal Systems, Inc.*

**Model: FMW2700S**

**FCC ID: HV6-9801**

*Date: 8/20/98*

This report concerns:    Original Grant    ☒    Class II change

**Equipment type: Spread Spectrum Radio**

Deferred Grant requested per CFR 47.0.457(d)(1)(ii)?    Yes    No    ☒

If yes, defer until:

(Applicant) agrees to notify the Commission by: \_\_\_\_\_ of the intended  
announcement of the product so that the Grant can be issued on that date.

Transition Rules Request per 15.37?    Yes    No    ☒

If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR  
[10-1-91 Edition] provision.

**Report Prepared by:**

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Universal Compliance Laboratories  
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San Jose, CA 95133  
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## **Section 1.0**

# ***GENERAL INFORMATION***

### **1.1     *Canadian EMI Compliance Statement***

“This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

“Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.”

### **1.2     *Product Description***

EUT is a wireless pen computer with an integral Proxim RangeLan2, FCC ID: IMKRL21PC spread spectrum radio.

### **1.3     *Related Submittal(s) / Grant(s)***

An application covering the FMW2700S FCC ID: HV6-9801 FCC Class B Subpart B has also been submitted.

**1.4    *Tested System Details***

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (including granted add-on cards) are as follows:

| <b>Mfr.</b>                     | <b>Model</b>         | <b>Desc.</b>                 | <b>S/N</b> | <b>FCC ID:</b>   | <b>Cables</b>       |
|---------------------------------|----------------------|------------------------------|------------|------------------|---------------------|
| <b>Fujitsu Personal Systems</b> | <b>FMW2700S</b>      | <b>Wireless Pen Computer</b> | <b>N/A</b> | <b>HV6-9801</b>  |                     |
| <b>Proxim</b>                   | <b>N/A</b>           | <b>Spread Spectrum Radio</b> | <b>N/A</b> | <b>IMKRL21PC</b> | <b>N/A</b>          |
| <b>Fujitsu Personal Systems</b> | <b>N/A</b>           | <b>Keyboard</b>              | <b>N/A</b> | <b>HV6-0550</b>  | <b>Non-Shielded</b> |
| <b>Sanken</b>                   | <b>CA 01007-0060</b> | <b>AC Adapter</b>            | <b>N/A</b> | <b>N/A</b>       | <b>Non-Shielded</b> |

## 1.5 *Test Methodology*

### ***UCL Radiated Emissions Test Procedure:***

1. **SETUP EUT ON TURNTABLE PER ANSI 63.4 FIGURE 11:** Be careful to maintain proper spacing between peripheral devices. Bundle excessive lengths of I/O cable to achieve 1 meter cable length, make sure I/O cables are at least 40 cm from ground plane. Power up the system and initialize any software necessary to exercise the EUT.
2. Place the biconical antenna in vertical polarization on antenna mast.
3. **INITIAL SCAN:** Record signals from 30 - 300 MHz. vary the size of the frequency span (and corresponding Center Frequency Step Size) displayed on the analyzer depending on the number of signals present. Decrease the span to 5 MHz or 1 MHz to clearly identify signals in crowded areas of the spectrum.
4. **IDENTIFICATION OF AMBIENT SIGNALS:** In order to identify ambient signals, turn off power to the turntable and recheck the spectrum from 30 - 300 MHz. Any signals still present are ambient signals. Remove these datapoints from the measurement spreadsheet.
5. **MAXIMIZATION OF SIGNAL STRENGTH:** With the ambient signals eliminated from consideration, it is time to maximize the emissions from the EUT to record the final measurements. Apply power to the EUT.
  - a) **Identify worst case angle:** Center the spectrum analyzer display on the first recorded frequency. Set the frequency span to 1 MHz. With Trace A in **MAX HOLD**, rotate the turntable 360 degrees. Observe the display during turntable rotation. Trace A will record the maximum field strength, while Trace B (still in **Clear/Write** mode) will vary during the rotation. Return the turntable to the location where Trace B is at the same amplitude as Trace A. This is the worst case angle for this frequency.
  - b) **Identify worst case antenna height:** Now vary the antenna height from 1 to 4 meters, again with Trace A on MAX HOLD and Trace B on Clear/Write. Return the antenna to the height where Trace B is the same amplitude as Trace A. This is the worst case height for this frequency.

### ***UCL Radiated Emissions Test Procedure: (cont...)***

- a) **Cable Manipulation:** It is essential to vary I/O cable and power cord positions to identify the maximum emission level from the EUT. With the turntable and mast still at the worst case positions, leave Trace A in MAX HOLD and vary the cable locations as much as they could reasonably be expected to vary in normal use of the EUT. For example, it is not necessary to lift any I/O cable or power cord to a position above the turntable height. Be careful to explore any possibilities for cable interactions which might increase emissions.
  
- b) **Quasi-Peak Measurements:** Certain signals will exhibit a lower amplitude when measured in quasi-peak mode. When the amplitude is lower in quasi-peak mode than in peak detection mode the quasi-peak measurement shall be recorded as the final measurement (note: quasi-peak detection is valid from 9 kHz to 1 GHz, above 1GHz average mode is required). Quasi-peak measurement procedure is as follows:
  - 1) Center the signal being measured on the analyzer display.
  - 2) Narrow the span to 100 Hz and re-center the signal.
  - 3) Narrow the span to 10 Hz and re-center the signal.
  - 4) Set the Frequency Span to 0 Hz.
  - 5) Adjust the Reference Level until the trace is near the top of the display.
  - 6) Put the analyzer in Linear Mode <LIN>
  - 7) Re-adjust the Reference Level until the signal is near the top of the display.
  - 8) Set the analyzer to single sweep mode <Single>
  - 9) Set the sweep time to 5 seconds <Sweep Time> <5> <Sec>
  - 10) Turn Trace B off <Off>
  - 11) Set Trace A to max hold <Max Hold>
  - 12) Turn the quasi-peak adapter on <On>
  - 13) Hit <Single> to start measurement
  - 14) Use marker <Normal> to find highest reading
  - 15) Convert measurement to dB  $\mu$ V/m using the equation  $20 \text{ Log ( amplitude in microvolts)}$
  - 16) Record measurement if lower than peak measurement.

## ***UCL Line Conducted Emissions Test Procedure:***

1. **Set Up Eut On Turntable Per Ansi 63.4 Figure 11:** Be careful to maintain proper spacing between peripheral devices. Bundle excessive lengths of I/O cable to achieve 1 meter cable length, make sure I/O cables are at least 40 cm from ground plane. Power up the system and initialize any software necessary to exercise the EUT.
2. **Set Up Spectrum Analyzer:** Per instrument settings in Appendix A of this document.
3. **Begin Measurement Sequence:**
  - a) **<Start Freq> <450> <kHz>, <Stop Freq> <5> <MHz>;** Start Sweep #1 as defined in Appendix A by starting a single sweep **<Single>** from 450 kHz to 5 MHz.
  - b) **<Start Freq> <5> <MHz>, <Stop Freq> <15> <MHz>;** Start Sweep #2 as defined in Appendix A by starting a single sweep **<Single>** from 5 MHz to 15 MHz.
  - c) **<Start Freq> <15> <MHz>, <Stop Freq> <30> <MHz>;** Start Sweep #3 as defined in Appendix A by starting a single sweep **<Single>** from 15 MHz to 30 MHz.
  - d) For any emissions within 10 dB of the limit, reduce Frequency Span to 1 MHz **<Frequency Span> <1> <MHz>**, set sweep time to 200 seconds **<Sweep Time> <200> <Sec>**, a perform a single sweep **<Single>** to attain a final measurement. Record this measurement on the measurement spreadsheet.
4. **Cable Manipulation To Maximize Emissions:** The effect of cable position on the line conducted emissions must be fully investigated. Experiment with various positions of the I/O cables and power cords to determine if there is any interaction between cables. Repeat step 3 to re-measure emissions after each cable manipulation.

## **1.6    *Test Facility***

The open area test site and conducted measurement facility used to collect the Forbidden Band test data and intentional radiator data is located at:

Electronic Compliance Laboratories  
1249 Birchwood Drive  
Sunnyvale, CA 94089

***Test site conforms with ANSI 63.4 site attenuation requirements and is listed by the FCC.***

## **Section 2.0**

# **Product Labeling**

Label artwork

Fujitsu Personal Systems Inc.

44-0792-00A

150%

**POINT 1600**

Fujitsu Personal Systems, Inc. • Santa Clara, CA 95054  
Made in Japan



Model No: FMW2700S



Serial No:

INPUT 15V DC MAX 2.8A



FCC ID: HV6-9801

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet Appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**SERIAL NUMBER**

BAR CODE

Bar code of S/N

BAR CODE

Bar code of P/N

**FMW2700S**

Fujitsu Personal Systems, Inc. • Santa Clara, CA 95054  
Made in Japan

Model No: FMW2700S

Serial No:

FCC ID: HV6-9801

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## **Section 3.0**

# **System Test Configuration**

### **3.1     *Justification***

The system was configured for testing in a typical fashion (as an end-user would set it up) per ANSI 63.4.

### **3.2     *EUT Exercise Software***

The EUT exercise program used during radiated and conducted testing functions as follows:

Fujitsu uses Proxim-provided intentional test program called RL2DIAG.EXE to send and receive packets during this testing. This is a fully duplex mode.

#### **Mode 2: Transit Mode**

1) EUT continuously transmitting and receiving data.

### **3.3    *Special Accessories***

**None**

### **3.4    *Equipment Modifications***

To achieve compliance to Class B levels, the following changes were made by Electronic Compliance Laboratories during compliance testing.

**None**

**APPENDIX A**

**COMPLETE**

**INTENTIONAL RADIATOR**

**TEST DATA FOR PROXIM**



**Electronic Compliance  
Laboratories, Inc.**  
1249 Birchwood Drive  
Sunnyvale, CA 94089  
(800)707-LABS  
(408)747-1495 fax  
(408)747-1490

**15.247 Certification**

**FCC ID: IMKRL21PC**

**EMI TEST REPORT**

**Proxim RangeLAN2 Model 7250-05  
FHSS 2.4 GHz PC Card Wireless Lan Adapter  
with Proxim P/N 1900.0020 Clip on Antenna,  
and Proxim P/N 1900.0021 Stub Antenna**

**Prepared for  
Proxim Inc.  
295 N. Bernardo Ave.  
Mountain View, CA 94043**

**Tel: (415) 960-1630  
Fax: (415) 960-0332**

**Prepared by  
  
Electronic Compliance Laboratories Inc.  
1249 Birchwood Dr.  
Sunnyvale, CA 94089  
Tel: (408) 747-1490  
Fax: (408) 747-1495**

**Test Report Number: A606004**

**Date of Test: May 6 - 14, 1996**

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## 1.0 TEST FACILITY

Name: Electronic Compliance Laboratories

Location: 1249 Birchwood Dr.  
Sunnyvale, CA 94089

Site Filing: A site description is on file at the Federal Communications Commission  
P.O. Box 429  
Columbia, MD 21045

Types of Sites: Open Field Radiated and Indoor Screen Room (Line Conducted).  
All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements.

## 2.0 TEST EQUIPMENT

| Description          | Manufacturer | Model    | SN         |
|----------------------|--------------|----------|------------|
| EMI Receiver         | HP           | 8546A    | 3325A00137 |
| Spectrum Analyzer    | HP           | 8563A    | 3137A01183 |
| Preamp               | HP           | 8347A    | ECL 1001   |
| Preamp               | HP           | 8449B    | 3008A00527 |
| LISN                 | EM           | ANS-25/2 | 2532       |
| Biconical Antenna    | EM           | EM 6912  | 414        |
| Log Periodic Ant     | EM           | EM 6950  | 311        |
| Double Ridge Horn    | EM           | EM 6961  | 6231       |
| Filter BP 4-8 GHz    | Narda        | NBP1011  | 102        |
| Filter BP 8-12.5 GHz | Melabs       | F-4496   | 405        |

### **3.0 EUT**

Proxim RangeLAN2 model 7250-05 PC Card adapter,  
node address 0020a630d741 / SN 102

with one each Proxim P/N 1900.0020 Clip on Antenna,  
and Proxim P/N 1900.0021 Stub Antenna (antennas not serialized)

### **4.0 SUPPORT EQUIPMENT**

Equipment Type: laptop PC with PC Card slot and built in mouse, display,  
keyboard  
Model Number: 4/25 SL  
Serial Number: USZ6006492  
FCC ID: DJKPWRE486-25SL  
Manufacturer: AST

Equipment Type: laptop PC charger  
Model Number: ADP-51BB  
Serial Number: BJ305022414  
FCC ID: none  
Manufacturer: Delta Electronics, Inc.

Equipment Type: US IEC cordset, 6 ft.  
Model Number: none  
Serial Number: none  
FCC ID: none  
Manufacturer: generic

## 5.0 EQUIPMENT CONFIGURATION

All of the equipment and cables were placed in worst case positions to maximize emissions.

Interconnecting cables were of the type and length specified in the individual equipment requirements.

Grounding was in accordance with the manufacturers requirements and conditions for intended use.

Proxim rl2diag.exe software was used during the tests.

| <b>EUT<br/>PORT</b>  | <b>CONNECTED TO</b>      | <b>CABLE TYPE</b>                                         |
|----------------------|--------------------------|-----------------------------------------------------------|
| antenna              | antenna                  | 1900.0020 integral to antenna<br>1900.0021 not applicable |
| PC Card              | host PC Card slot        | not applicable                                            |
| <b>HOST<br/>PORT</b> | <b>CONNECTED TO</b>      | <b>CABLE TYPE</b>                                         |
| external DC          | charger                  | integral to charger                                       |
| charger IEC          | three wire mains or LISN | 6 ft US IEC cordset                                       |
| monitor              | not applicable           | integrated in laptop host                                 |
| keyboard             | not applicable           | integrated in laptop host                                 |
| serial               | not applicable           | integrated mouse in host                                  |

## 6.0 SUMMARY OF TESTS

The Proxim Inc. model 7250-05 is a low power frequency hopping spread spectrum (FHSS) radio system operating in the 2400-2483.5 MHz band. It plugs into a type 2 PC Card slot. Tests were performed with both antenna options. Test software "rl2diag.exe" was run on the host computer.

6.1 **15.247(a)(1) FREQUENCY HOPPING SYSTEMS**

The Proxim 7250-05 uses 79 channels, each 1 MHz wide. The system hops over one of 15 pseudorandom sequences. On average, each channel is used equally. Please refer to "RangeLAN2 Frequency Hopping Theory of Operation" in the confidentiality package attached to this submission for more details.

6.1.1 **15.247(a)(1)(ii) CHANNEL UTILIZATION**

Three spectrum analyzer plots labeled "7250 CHANNEL UTILIZATION". The total number of channels is 79. The channels used have nominal center frequencies of 2402 through 2480 MHz.

Three spectrum analyzer MAX HOLD plots labeled "7250 BANDWIDTH" show the 20 dB bandwidth of the hopping channel to be < 1 MHz (0.983/0.983/0.950 MHz) at the low/midband/high frequencies of 2.402/2.44/2.48 GHz.

Zero span spectrum analyzer plot labeled "7250 CHANNEL DWELL TIME" shows

Worst case transmission time in a given slot: 400 msec elapsed time, <100 % duty

Maximum allowed: 400 msec.

6.1.2 **15.247(b) MAXIMUM PEAK OUTPUT POWER**

The three spectrum analyzer plots labeled "7250 POWER OUT" show the maximum power of the hopping channel to be +20.7 dBm or 117 mW.

The EUT was made to transmit uninterrupted random data on each of the low/mid/high channels.

The output was fed directly via an SMA adapter, 3 foot RG 142 cable and SMA to N adapter to the spectrum analyzer on MAX HOLD with no additional attenuation.

Power = +20.0 dBm (peak reading) +0.6 dB cable loss +0.1 dB adapter loss = +20.7 dBm

Limit: +30 dBm / 1 W maximum power  
with 1900.0020 antenna,

EIRP = +20.7 (peak power) +1 (peak gain, dBi) = +21.7 dBm / 148 mW  
EIRP

with 1900.0021 antenna,

EIRP = +20.7 (peak power) +0 (peak gain, dBi) = +20.7 dBm / 117 mW  
EIRP

Limit: +36 dBm / 4 W maximum EIRP

### 6.1.3 **15.247(c) OUT OF BAND EMISSIONS**

The spectrum analyzer plot titled "7250 OUT OF BAND BAND EDGES" shows the output spectrum of the EUT while hopping one of the pseudorandom sequences and continuously transmitting packetized data. The analyzer was placed in MAX HOLD mode, and individual sweeps of 50 msec duration were recorded continually for 10 minutes with the same spectrum analyzer connection as was used for peak output power. The resultant plot shows that the EUT emissions remain inside the 2400 - 2483.5 MHz band when measured in  $\geq 100$  kHz bandwidth during operation.

The spectrum analyzer plots labeled "7250 OUT OF BAND  $<1$  GHz", "7250 OUT OF BAND 1 - 2.75 GHz", and "7250 OUT OF BAND 2.75 - 26 GHz" show that emissions measured in  $\geq 100$  kHz bandwidth are more than 20 dB below the highest level of the desired power outside of the 2400 - 2483.5 MHz band.

### 6.1.4 **15.203 ANTENNA REQUIREMENT**

This product uses a unique coupling to the intentional radiator. The coupling is by means of a subminiature coaxial connector which is not generally available. The manufacturer's control drawing labeled "15.203 ANTENNA CONNECTOR" is attached.

### 6.1.5 **15.205 RESTRICTED BAND RADIATION LIMITS**

The EUT and host laptop under charge were placed on a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antenna was moved in to 1 meter for the  $>1$  GHz measurements to improve the noise floor, and the appropriate range factor was applied. While the EUT was transmitting uninterrupted random data on each of the low/mid/high channels and with the spectrum analyzer on MAX HOLD, the turntable was rotated, and the search antenna raised and lowered in an attempt to maximize the received radiated emission level. Test results are attached for each of the two EUT antennas in tabular form show that no spurious signals were detected above the 74 dBuV/m peak/54dBuV/m average limits.

#### 6.1.6 15.207 AC LINE CONDUCTED EMISSIONS

The RF line conducted levels for emissions in the 0.45 - 30 MHz band must not exceed 250  $\mu$ V when measured with a LISN. Attached graphs and tabular data show that emissions are below the 250  $\mu$ V (48 dB $\mu$ V) maximum allowed level.

#### 7.0 FCC CLASS B RADIATED EMISSIONS

The attached tables for each of the two antenna options show that the Class B radiated limits from 30 - 1000 MHz are not exceeded by the combination of the EUT and host with either antenna option. The EUT was operating normally with a combination of transmission and reception and hopping one of the fifteen pseudorandom sequences during this test. The EUT and host laptop under charge were placed near one edge of a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antennas were located at 3 meters. Measurements were made in accordance with ANSI C63.4-1994.

Electronic Compliance Laboratories

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Chris Blyleckie  
Technical Director

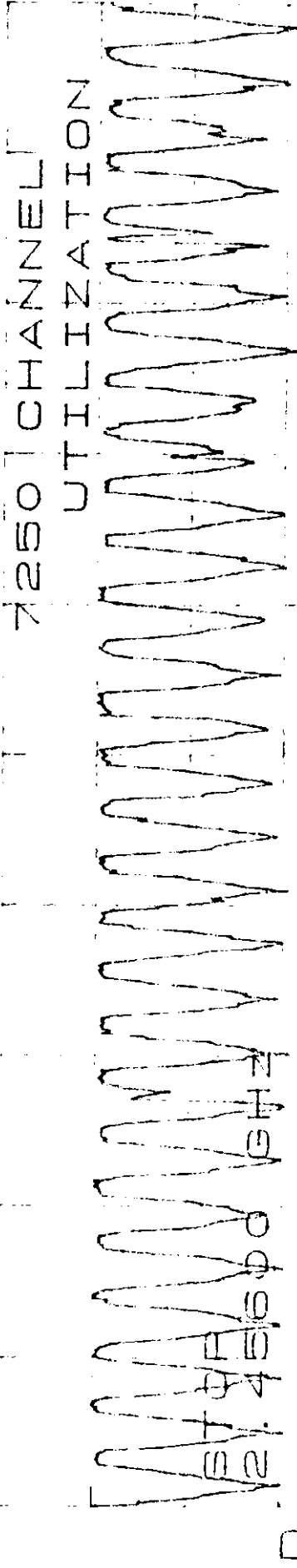
---

Date

**APPENDIX A**  
**SPREAD SPECTRUM PLOTS**

ATTEN 40dB  
FL 30.0dB

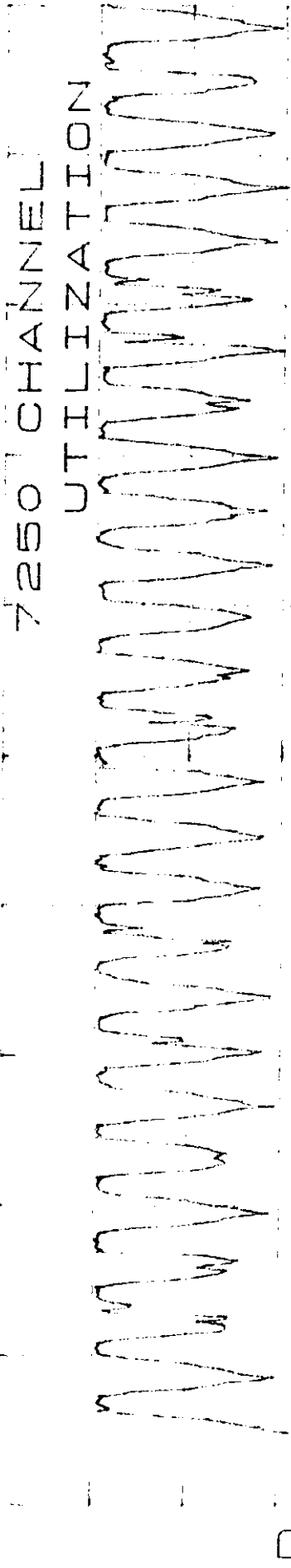
10dB/



START 2.42800GHZ STOP 2.45600GHZ  
\*RBW 100KHZ VBW 100KHZ SWP10 50ms

ATTEN 40dB  
RL 30.0dBm

10dB/



START 2.40000GHZ  
VBW 100KHZ

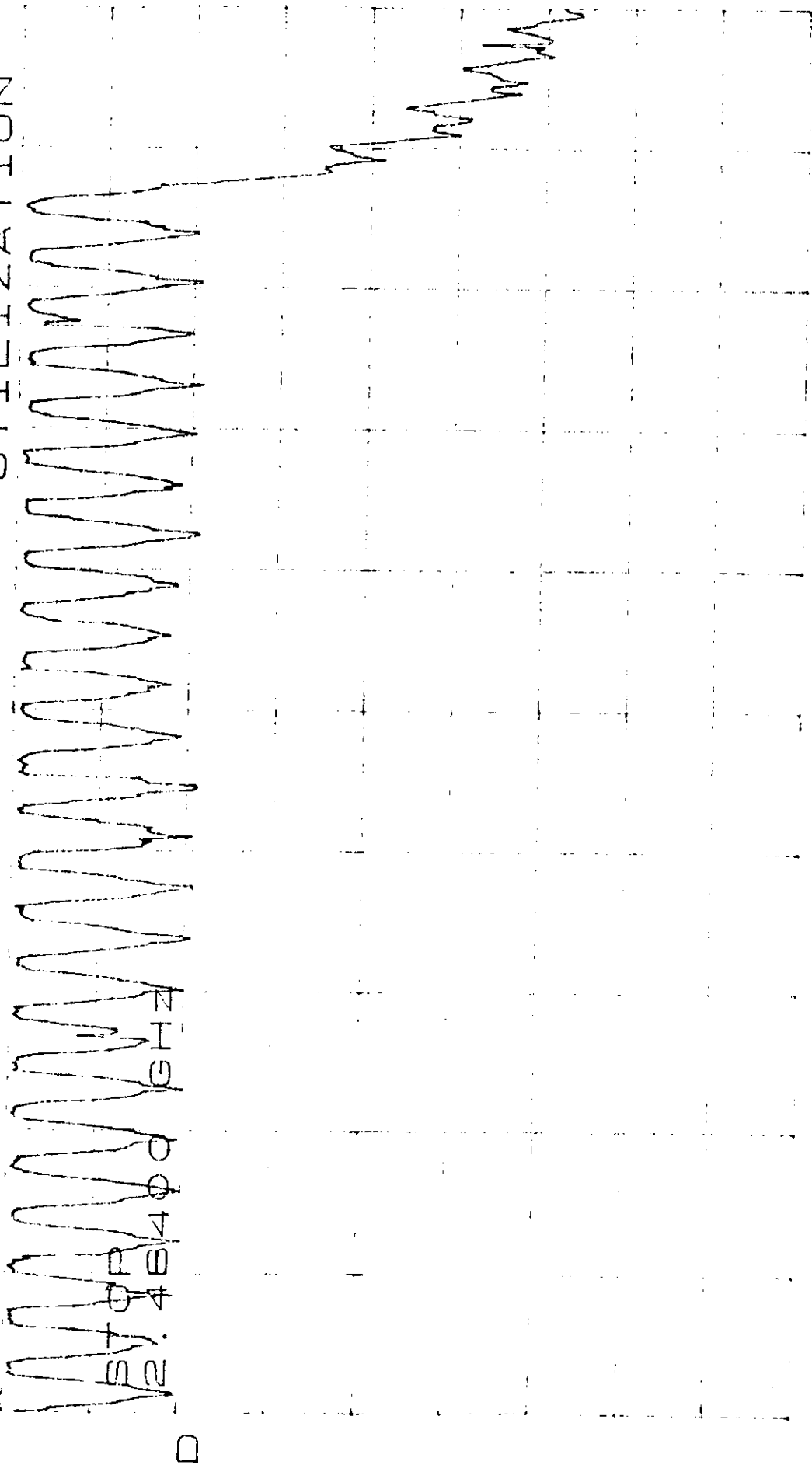
STOP 2.42800GHZ  
SWP 50ms

\*AG061110C  
6/6/96

ATTEN 40dB  
PL 30.0dBm

10dB/

7250 CHANNEL  
UTILIZATION



START 2.45600 GHz STOP 2.48400 GHz<sup>12</sup>  
\* RBW 100 kHz VBW 100 kHz SWP 50 ms

ATTEN 30dB  
FL 20.00dB

ΔMKR - .34dB  
983KHZ

7250 BANDWIDTH

10dB/

ΔMKR  
983 KHZ  
D - .34 DB



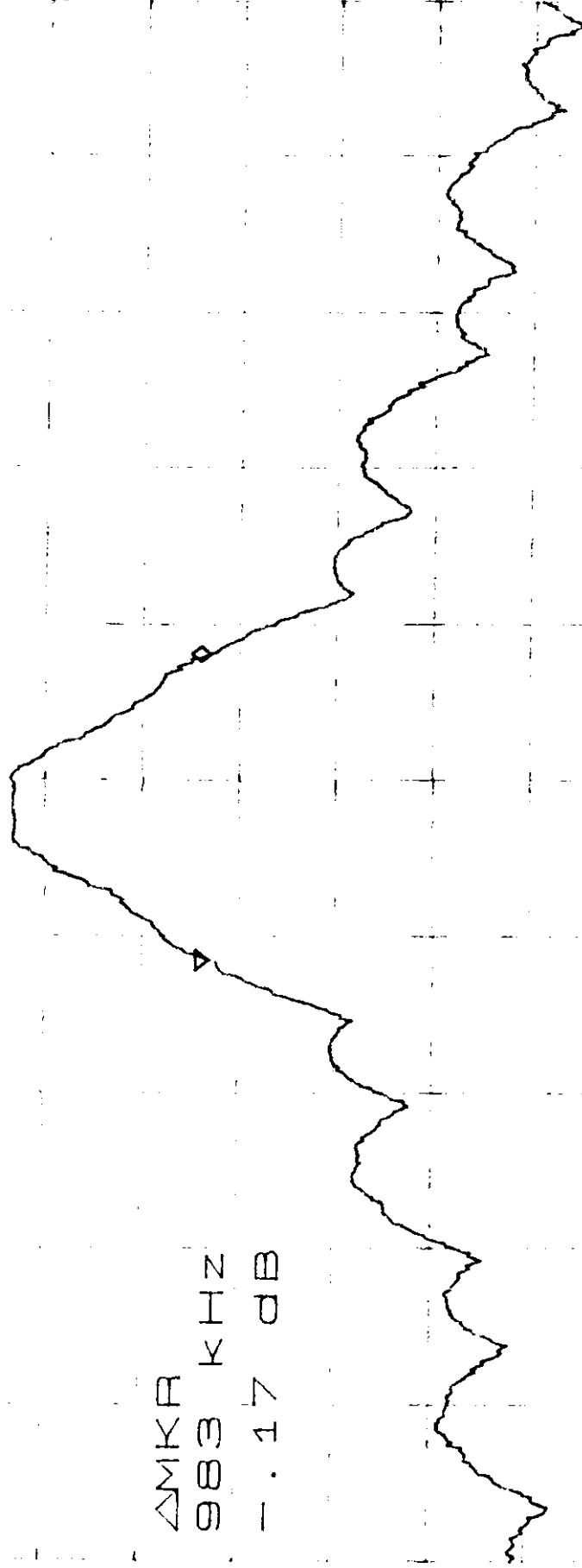
CENTER 2.402000GHZ  
SPAN 5.000MHz  
SWP 50ms

ATTEN 30dB  
RL 20.0dBm

ΔMKR - .17dB  
983kHz  
7250 BANDWIDTH

ΔMKR  
983 kHz  
- .17 dB

D



CENTER 2.440000GHZ  
SPAN 5.000MHZ  
SWP 50ms

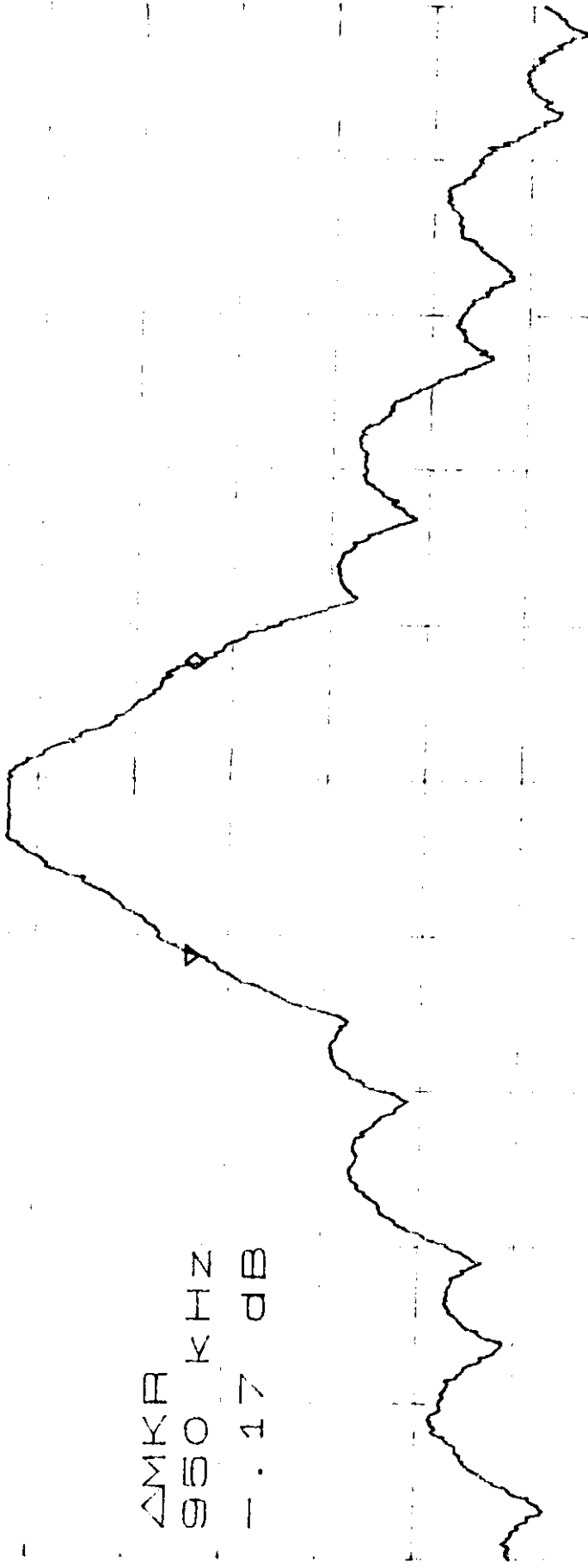
ATTEN 30dB  
PL 20.0dBm

ΔMKR - .17dB  
950KHz

10dB/

7250 BANDWIDTH

ΔMKR  
950 KHz  
D - .17 dB



CENTER 2.480000GHZ

SPAN 5.000MHZ  
SWP 50ms<sup>15</sup>

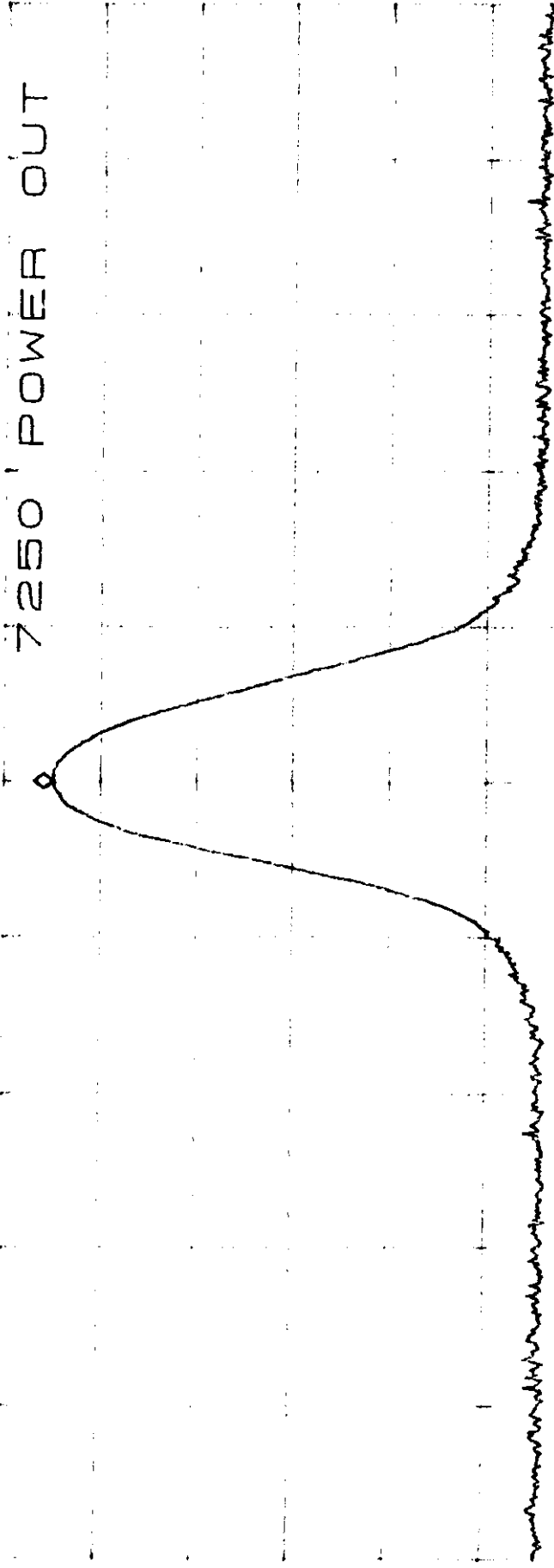
\*RBW 100KHz \*VBW 30KHz



ATTEN 40dB  
RL 25.0dBm

MKR 19.83dBm  
2.40200GHz  
7250' POWER OUT

10dB/



D

CENTER 2.40200GHz

SPAN 50.00MHz

\*RBW 2.0MHz

VBW 3.0MHz

SWP 50ms

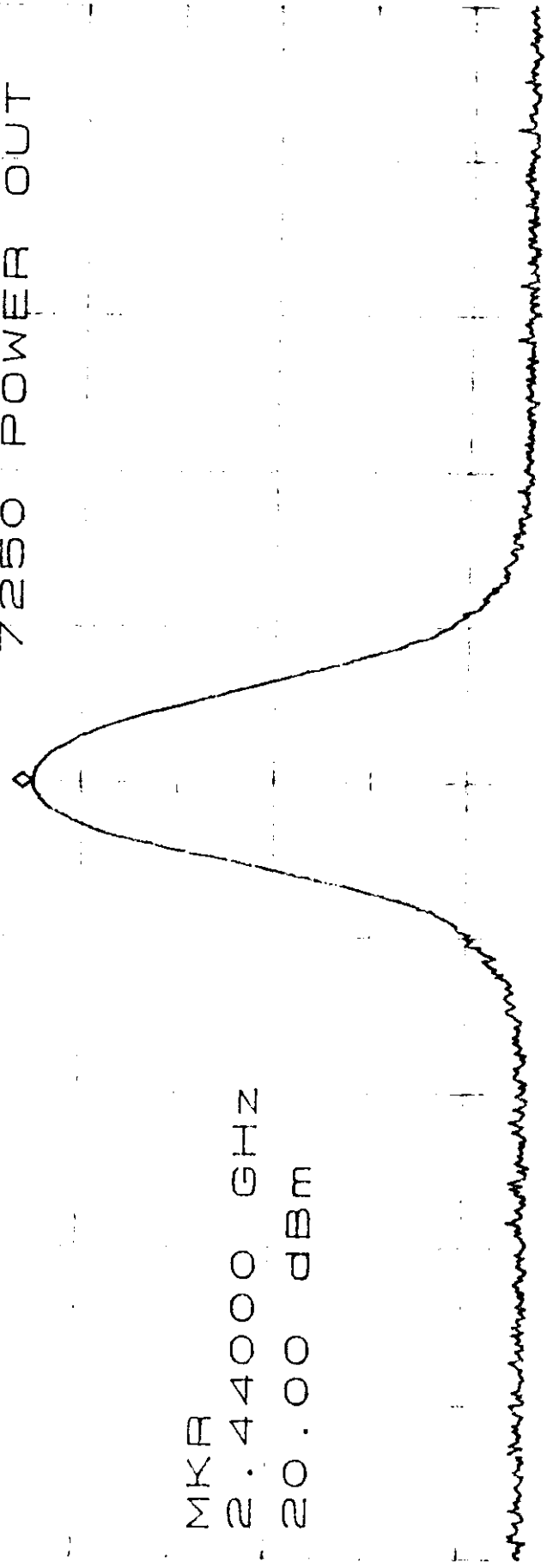
6/6/96

ATTEN 40dB  
PL 25.0dBm

MKR 20.00dBm  
2.44000GHZ  
7250 POWER OUT

10dB/

MKR  
2.44000 GHZ  
20.00 dBm



CENTER 2.44000GHZ  
RBW 2.0MHZ  
\*A60601.DDC

SPAN 50.00MHZ  
SWP 50ms 18

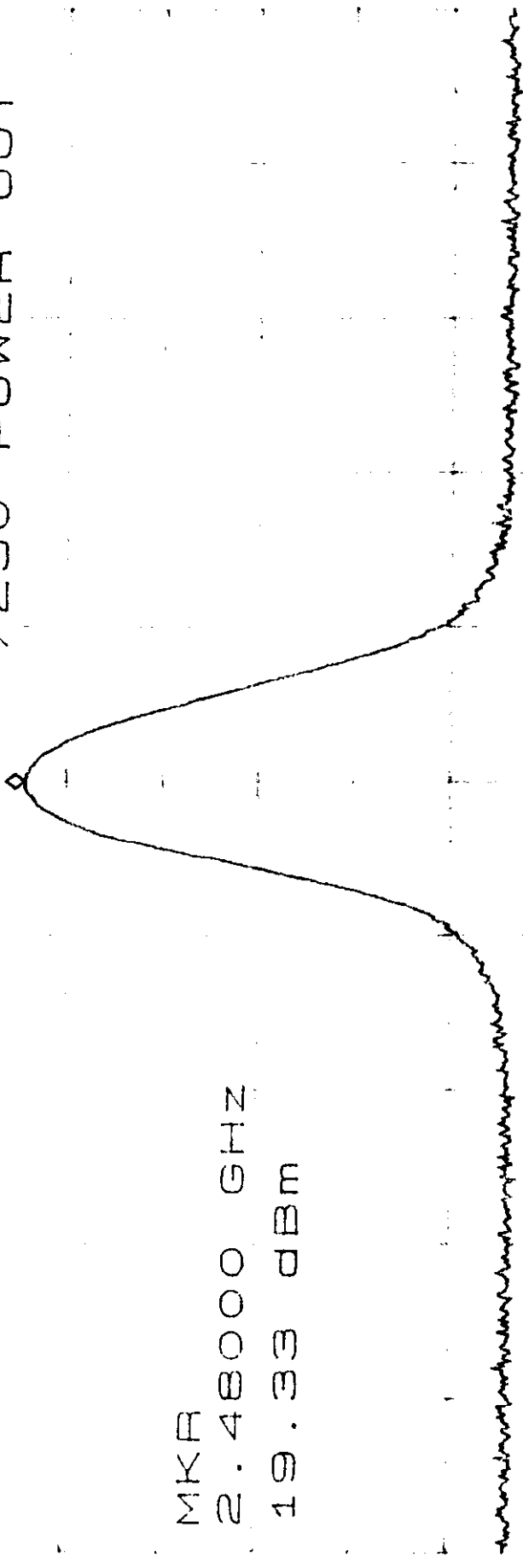
ATTEN 40dB  
F1 25.0dBm

MKR 19.33dBm  
2.48000GHz

10dB/

7250 POWER OUT

D MKR  
2.48000 GHz  
19.33 dBm



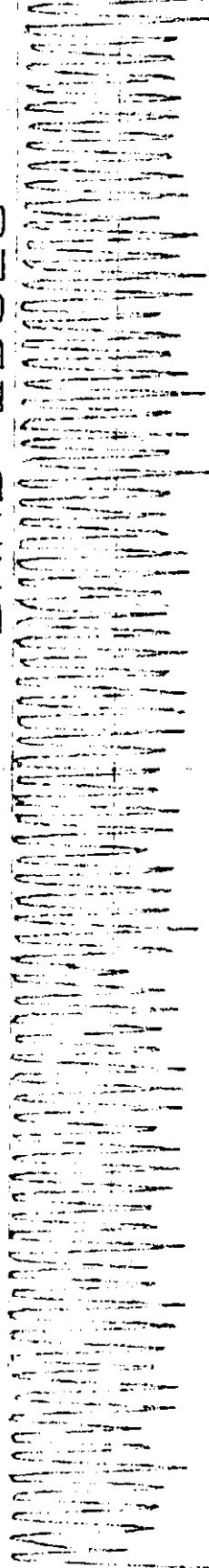
CENTER 2.48000GHz  
\*FREQ 2.0MHz VBW 3.0MHz

SPAN 50.00MHz  
SWP 50ms 19

ATTEN 40dB  
RL 30.0dBm

10dB/

7250 OUT OF BAND  
BAND EDGES



START 2.400000GHZ STOP 2.483500GHZ  
\*BW 100KHZ \*VBW 300KHZ SWP 50ms

A606001.DOC

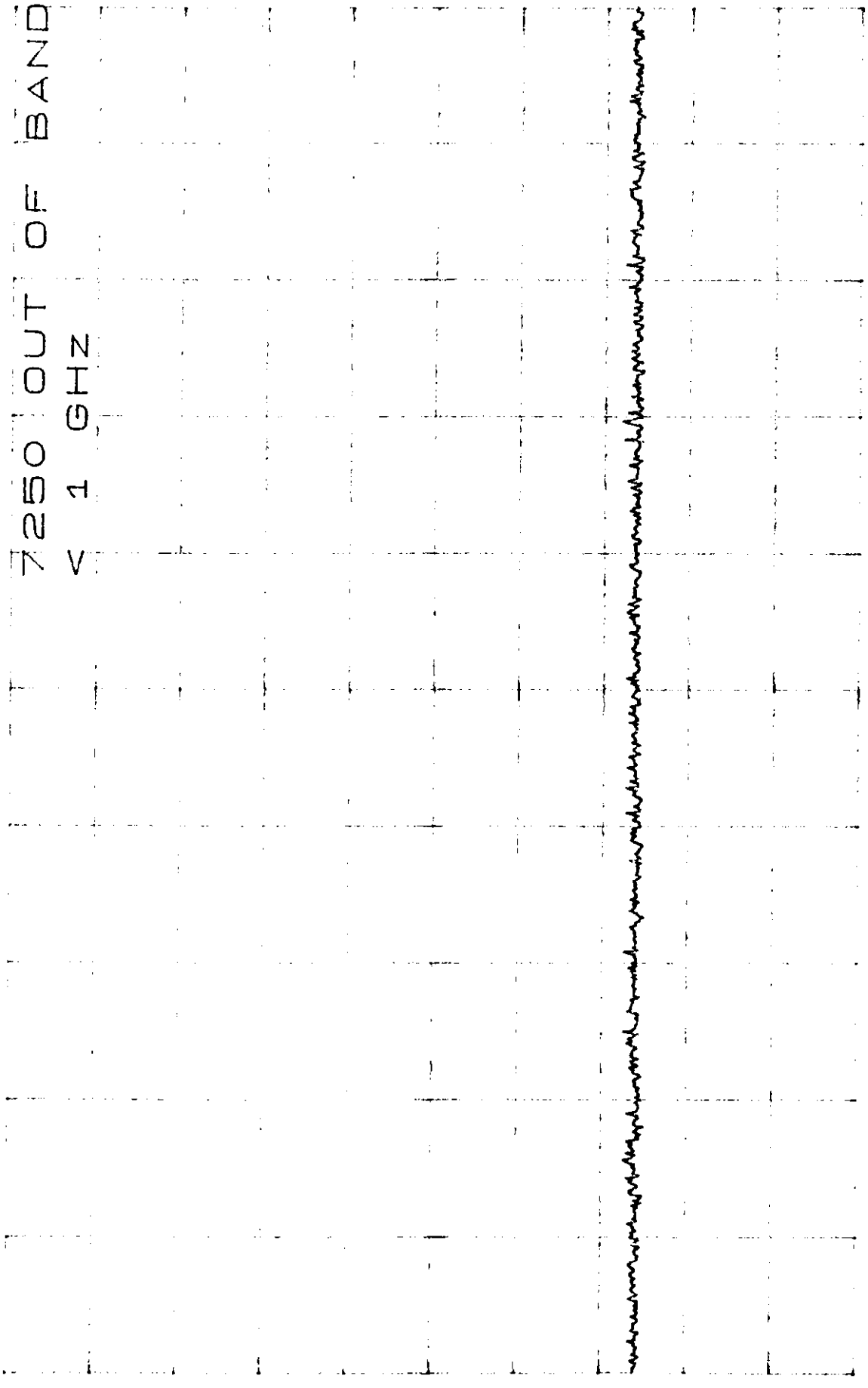
6/6/96

ATTEN 40dB  
PL 30.0dBm

10dB/

7250 OUT OF BAND  
V 1 GHZ

D



START 0HZ STOP 1.000GHZ  
\*RBW 100KHZ \*VBW 300KHZ SWP 300ms  
A606001.DOC  
6/6/96

ATTEN 40dB

RL 30.0dBm

10dB/

7250 OUT OF BAND

1-2.75 GHz

D

START 1.000GHZ

STOP 2.750GHZ

RBW 1.0MHZ

\*VBW 3.0MHZ

SWP 50ms

A606001DOC

6/6/96

ATTEN 40dB

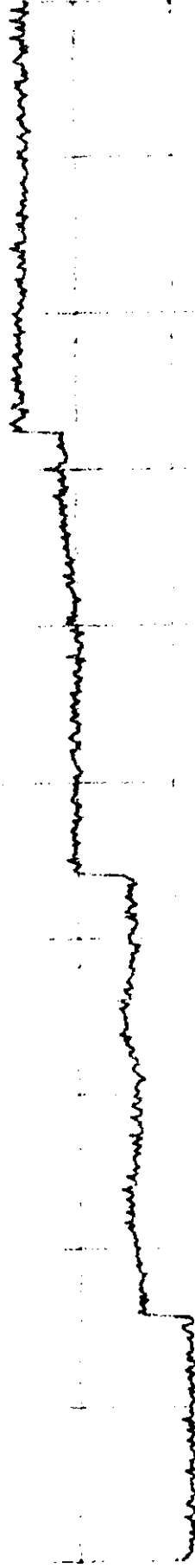
PL 30.0dBm

10dB/

7250 OUT OF BAND

2.75-26 GHz

D



START 2.75GHz

STOP 26.00GHz

RBW 1.0MHz

\*VBW 3.0MHz

SWP 500ms

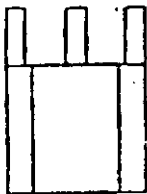
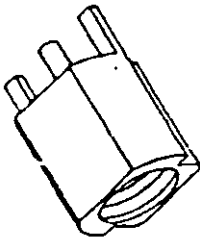
6/6/96

**APPENDIX B**

**ANTENNA CONNECTOR**

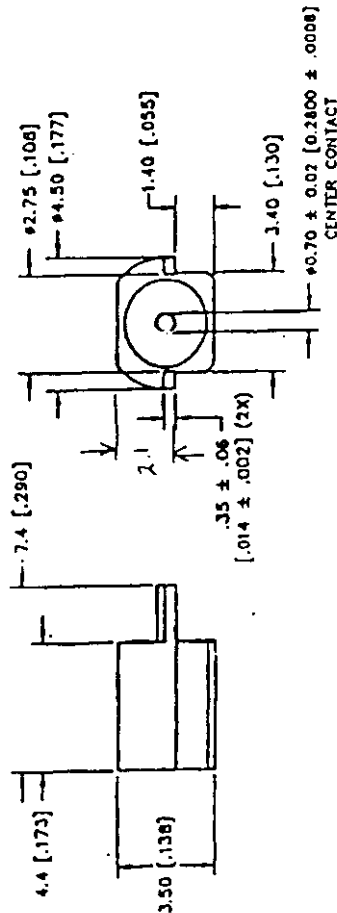
| DATE | STATION NAME                 | DATE    | ANALYST     |
|------|------------------------------|---------|-------------|
| F    | LEWIS AND CLARK FOR ECO 116A | 8/14/76 | B.A.        |
| G    | REV FOR ECO 1301             | 8/17/76 | W.L.B./B.A. |

| DATE | STATION NAME                 | DATE    | ANALYST     |
|------|------------------------------|---------|-------------|
| F    | LEWIS AND CLARK FOR ECO 116A | 8/14/76 | B.A.        |
| G    | REV FOR ECO 1301             | 8/17/76 | W.L.B./B.A. |

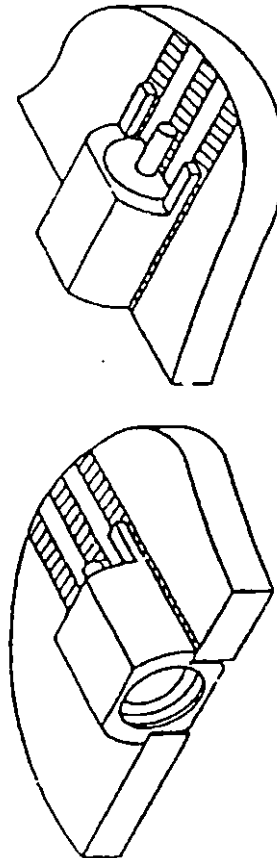


**2 4 0 3 0 1 0 6**

PNR DATA SHEET  
Part # \_\_\_\_\_  
Sheet 2 of \_\_\_\_\_



CENTER CONTACT COPLANARITY



3D VIEW  
PCE MOUNT DETAIL

[illegible]

25

# **APPENDIX D**

## **FORBIDDEN BAND TEST DATA**

## Forbidden Band (1/2)

## FCC RADIATED DATA SHEET

EUT: FMW 2700S  
S/N: FCC#HV6-9801  
RULE PART: 15.247

DATE: Aug. 13, 1998  
CUSTOMER NAME: Fujitsu  
WORK ORDER: 8081302  
FILE: 8081302a

ANTENNA: Horn OTHER CAL FACTOR: ATTN dB: 0  
MODULATION TYPE: DUTY dB: 0  
TESTED BY: Shawn HP IL dB: 0  
COMMENTS: Unit horizontally oriented DIST dB: 10

| FREQ                            | READING | Pk, QP, | A.F. | Cable loss | AMP  | O.C.F. | TOTAL    | LIMIT    | DELTA |
|---------------------------------|---------|---------|------|------------|------|--------|----------|----------|-------|
| MHz                             | dB(uV)  | or Av   | dB   | dB         | dB   | dB     | dB(uV/m) | dB(uV/m) | dB    |
| Fund = 2402 (Low (horizontal))  |         |         |      |            |      |        |          |          |       |
| 4804                            | 51.8    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 46.6     | 74.0     | -27.4 |
| 4804                            | 41.8    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 36.6     | 54.0     | -17.4 |
| 7206                            | 56.3    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 57.9     | 74.0     | -16.1 |
| 7206                            | 37.5    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 39.1     | 54.0     | -14.9 |
| 9608                            | 48.0    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 54.3     | 74.0     | -19.7 |
| 9608                            | 37.2    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 43.5     | 54.0     | -10.5 |
| 12010                           | 47.6    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 55.5     | 74.0     | -18.6 |
| 12010                           | 37.6    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 45.5     | 54.0     | -8.6  |
| 14412                           | 47.3    | Pk      | 40.8 | 14.5       | 35.0 | 10.0   | 57.6     | 74.0     | -16.4 |
| 14412                           | 33.6    | Avg     | 40.8 | 14.5       | 35.0 | 10.0   | 43.9     | 54.0     | -10.1 |
| Fund = 2440 (Mid (horizontal))  |         |         |      |            |      |        |          |          |       |
| 4880                            | 53.3    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 48.1     | 74.0     | -25.9 |
| 4880                            | 41.3    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 36.1     | 54.0     | -17.9 |
| 7320                            | 56.6    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 58.2     | 74.0     | -15.8 |
| 7320                            | 36.9    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 38.5     | 54.0     | -15.5 |
| 9760                            | 45.7    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 52.0     | 74.0     | -22.0 |
| 9760                            | 37.3    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 43.6     | 54.0     | -10.4 |
| 12200                           | 48.3    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 56.2     | 74.0     | -17.9 |
| 12200                           | 36.9    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 44.8     | 54.0     | -9.3  |
| 14640                           | 45.8    | Pk      | 40.7 | 15.5       | 35.0 | 10.0   | 57.0     | 74.0     | -17.0 |
| 14640                           | 34.6    | Avg     | 40.7 | 15.5       | 35.0 | 10.0   | 45.8     | 54.0     | -8.2  |
| Fund = 2480 (High (horizontal)) |         |         |      |            |      |        |          |          |       |
| 4960                            | 51.3    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 46.1     | 74.0     | -27.9 |
| 4960                            | 42.0    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 36.8     | 54.0     | -17.2 |
| 7440                            | 57.2    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 58.8     | 74.0     | -15.2 |
| 7440                            | 37.4    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 39.0     | 54.0     | -15.0 |
| 9920                            | 48.1    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 54.4     | 74.0     | -19.6 |
| 9920                            | 37.1    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 43.4     | 54.0     | -10.6 |
| 12400                           | 47.0    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 54.9     | 74.0     | -19.2 |
| 12400                           | 37.1    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 45.0     | 54.0     | -9.1  |
| 14880                           | 42.3    | Pk      | 40.7 | 15.5       | 35.0 | 10.0   | 53.5     | 74.0     | -20.5 |
| 14880                           | 32.7    | Avg     | 40.7 | 15.5       | 35.0 | 10.0   | 43.9     | 54.0     | -10.1 |

## FCC RADIATED DATA SHEET

EUT: FMW 2700S  
 S/N: FCC#HV6-9801  
 RULE PART: 15.247

DATE: Aug. 13, 1998  
 CUSTOMER NAME: Fujitsu  
 WORK ORDER: 8081302  
 FILE: 8081302b

ANTENNA: Horn  
 MODULATION TYPE:  
 TESTED B Shawn  
 COMMENTS: Unit Vertically Oriented

OTHER CAL FACTOR: ATTN dB: 0  
 DUTY dB: 0  
 HP IL dB: 0  
 DIST dB: 10

| FREQ.                      | READING | Pk, QP, | A.F. | Cable loss | AMP  | O.C.F. | TOTAL,   | LIMIT    | DELTA |
|----------------------------|---------|---------|------|------------|------|--------|----------|----------|-------|
| MHz                        | dB(uV)  | or Av   | dB   | dB         | dB   | dB     | dB(uV/m) | dB(uV/m) | dB    |
| Fund = 2402 (Low channel)  |         |         |      |            |      |        |          |          |       |
| 4804                       | 41.5    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 36.3     | 74.0     | -37.7 |
| 4804                       | 30.2    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 25.0     | 54.0     | -29.0 |
| 7206                       | 41.5    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 43.1     | 74.0     | -30.9 |
| 7206                       | 21.7    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 23.3     | 54.0     | -30.7 |
| 9608                       | 30.7    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 36.9     | 74.0     | -37.1 |
| 9608                       | 19.3    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 25.6     | 54.0     | -28.4 |
| 12010                      | 29.7    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 37.5     | 74.0     | -36.5 |
| 12010                      | 17.8    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 25.7     | 54.0     | -28.3 |
| 14412                      | 27.3    | Pk      | 40.8 | 14.5       | 35.0 | 10.0   | 37.6     | 74.0     | -36.4 |
| 14412                      | 17.2    | Avg     | 40.8 | 14.5       | 35.0 | 10.0   | 27.4     | 54.0     | -26.6 |
| Fund = 2440 (Mid channel)  |         |         |      |            |      |        |          |          |       |
| 4880                       | 42.2    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 37.0     | 74.0     | -37.0 |
| 4880                       | 32.0    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 26.8     | 54.0     | -27.2 |
| 7320                       | 33.2    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 34.8     | 74.0     | -39.2 |
| 7320                       | 23.3    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 24.9     | 54.0     | -29.1 |
| 9760                       | 31.3    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 37.6     | 74.0     | -36.4 |
| 9760                       | 20.0    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 26.3     | 54.0     | -27.7 |
| 12200                      | 28.3    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 36.2     | 74.0     | -37.8 |
| 12200                      | 17.5    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 25.4     | 54.0     | -28.7 |
| 14640                      | 21.8    | Pk      | 40.7 | 15.5       | 35.0 | 10.0   | 33.0     | 74.0     | -41.0 |
| 14640                      | 13.0    | Avg     | 40.7 | 15.5       | 35.0 | 10.0   | 24.2     | 54.0     | -29.8 |
| Fund = 2480 (High channel) |         |         |      |            |      |        |          |          |       |
| 4960                       | 41.7    | Pk      | 32.8 | 7.0        | 35.0 | 10.0   | 36.5     | 74.0     | -37.5 |
| 4960                       | 31.3    | Avg     | 32.8 | 7.0        | 35.0 | 10.0   | 26.1     | 54.0     | -27.9 |
| 7440                       | 44.7    | Pk      | 36.0 | 10.6       | 35.0 | 10.0   | 46.3     | 74.0     | -27.8 |
| 7440                       | 25.5    | Avg     | 36.0 | 10.6       | 35.0 | 10.0   | 27.1     | 54.0     | -26.9 |
| 9920                       | 30.0    | Pk      | 38.3 | 13.0       | 35.0 | 10.0   | 36.3     | 74.0     | -37.7 |
| 9920                       | 19.5    | Avg     | 38.3 | 13.0       | 35.0 | 10.0   | 25.8     | 54.0     | -28.2 |
| 12400                      | 27.7    | Pk      | 39.3 | 13.6       | 35.0 | 10.0   | 35.5     | 74.0     | -38.5 |
| 12400                      | 17.7    | Avg     | 39.3 | 13.6       | 35.0 | 10.0   | 25.5     | 54.0     | -28.5 |
| 14880                      | 28.7    | Pk      | 40.7 | 15.5       | 35.0 | 10.0   | 39.9     | 74.0     | -34.1 |
| 14880                      | 19.2    | Avg     | 40.7 | 15.5       | 35.0 | 10.0   | 30.4     | 54.0     | -23.6 |

# **APPENDIX H**

## **TEST EQUIPMENT LIST / CALIBRATION SCHEDULE**

**Electronic Compliance Laboratories  
EMC Lab Equipment List**

**For FCC Part 15.247**

| No. | Description                          | Model # | Manufacturer    | Serial No. | Last Cal. | Next Cal. |
|-----|--------------------------------------|---------|-----------------|------------|-----------|-----------|
| 1   | Spectrum Analyzer (9 kHz - 26.5 GHz) | 8563A   | Hewlett Packard | N/A        | 7/1/98    | 7/1/99    |
| 2   | Antenna                              | RGA-60  | EMCO            | N/A        | 6/12/98   | 6/12/99   |

**For Conducted Emissions**

| No. | Description                         | Model # | Manufacturer    | Serial No. | Last Cal. | Next Cal. |
|-----|-------------------------------------|---------|-----------------|------------|-----------|-----------|
| 1   | Spectrum Analyzer (9 kHz - 6.5 GHz) | 8546A   | Hewlett Packard | N/A        | 6/8/98    | 6/8/99    |
| 2   | LISN                                | N/A     | Electro-Metrics | N/A        | 7/5/98    | 7/5/99    |