



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 XX Class II change

Equipment type: Spread Spectrum Radio

Deferred Grant requested per CFR 47 0.457(d)(1)(ii)? Yes No XX

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 XX

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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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 numrique de la classe B respecte toutes les exigences du Rglement sur le matriel 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.

FCC ID: HV6-9801

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:

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

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 μ V/m using the equation $20 \log (\text{amplitude in microvolts})$
 - 16) Record measurement if lower than previous 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.

FCC ID: HV6-9801

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

CE



Model No: FMW2700S



Serial No:

INPUT 18V 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 numerique de la classe B respecte toutes les exigences du Reglement sur la materiel 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

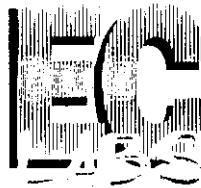
3.4 *Equipment Modifications*

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.

| EUT PORT | CONNECTED TO | CABLE TYPE |
|----------------------|--------------------------|---|
| antenna | antenna | 1900.0020 integral to antenna 1900.0021 not applicable |
| PC Card | host PC Card slot | not applicable |
| HOST PORT | CONNECTED TO | CABLE TYPE |
| 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(e) 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 ≥ 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 ≥ 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 μ V when measured with a LISN. Attached graphs and tabular data show that emissions are below the 250 μ V (48 dB μ V) maximum allowed level.

7.0 FCC CLASS B RADIATED EMISSIONS

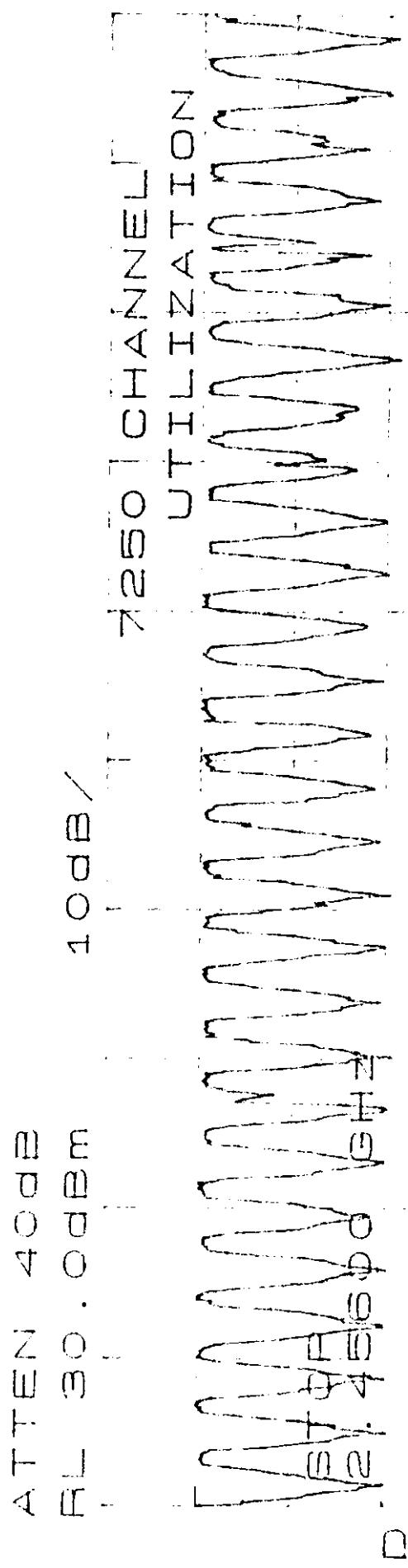
The attached tables for each of the two antenna options show that the Class B radiated limits from 30 - 1000 MHz are not exceeded by the combination of the EUT and host with either antenna option. The EUT was operating normally with a combination of transmission and reception and hopping one of the fifteen 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

Chris Blyeckie
Technical Director

Date

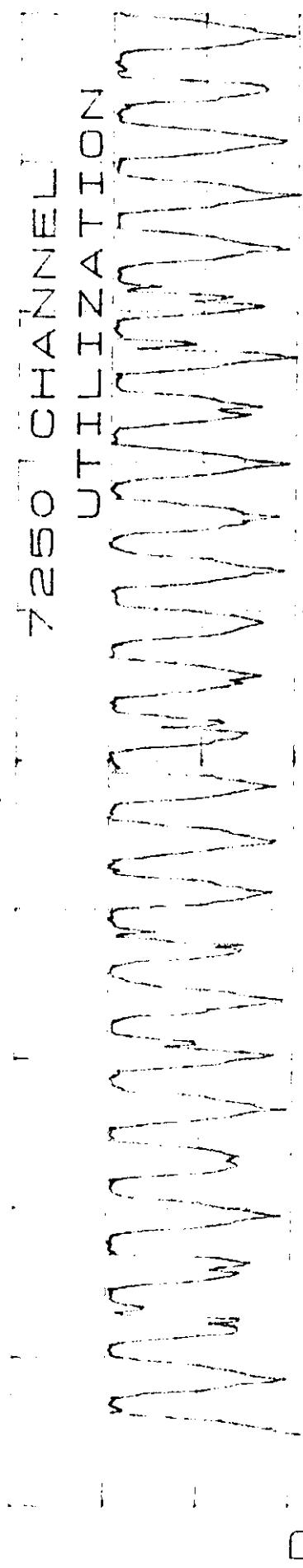
APPENDIX A
SPREAD SPECTRUM PLOTS



STOP 2.45600GHz
START 2.42800GHz
VIEW 100KHz SWP₁₀ 50ms
*Agilent 1000
6/6/96

ATTEN 40dB
RL 30.0dBm

10dB/

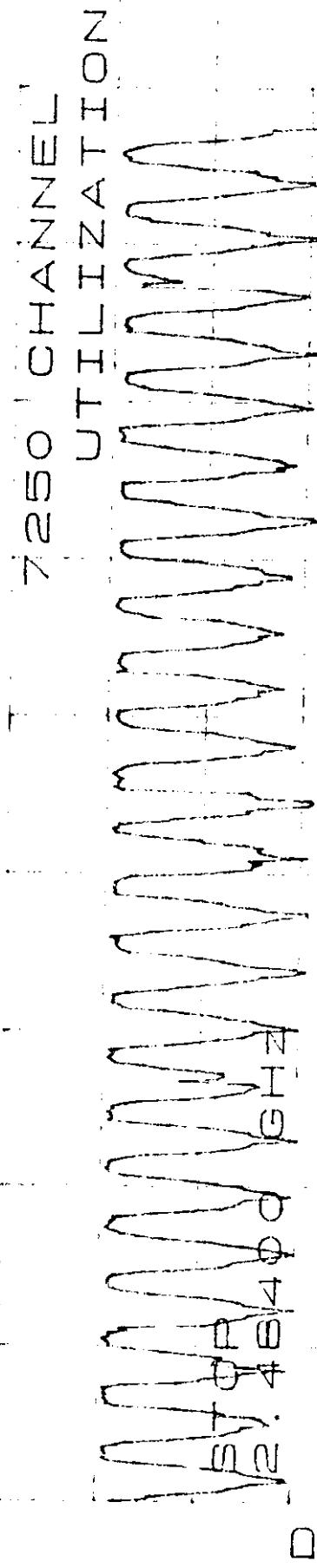


START 2.4000GHz
STOP 2.42800GHz
VBW 100kHz
SWP 50ms

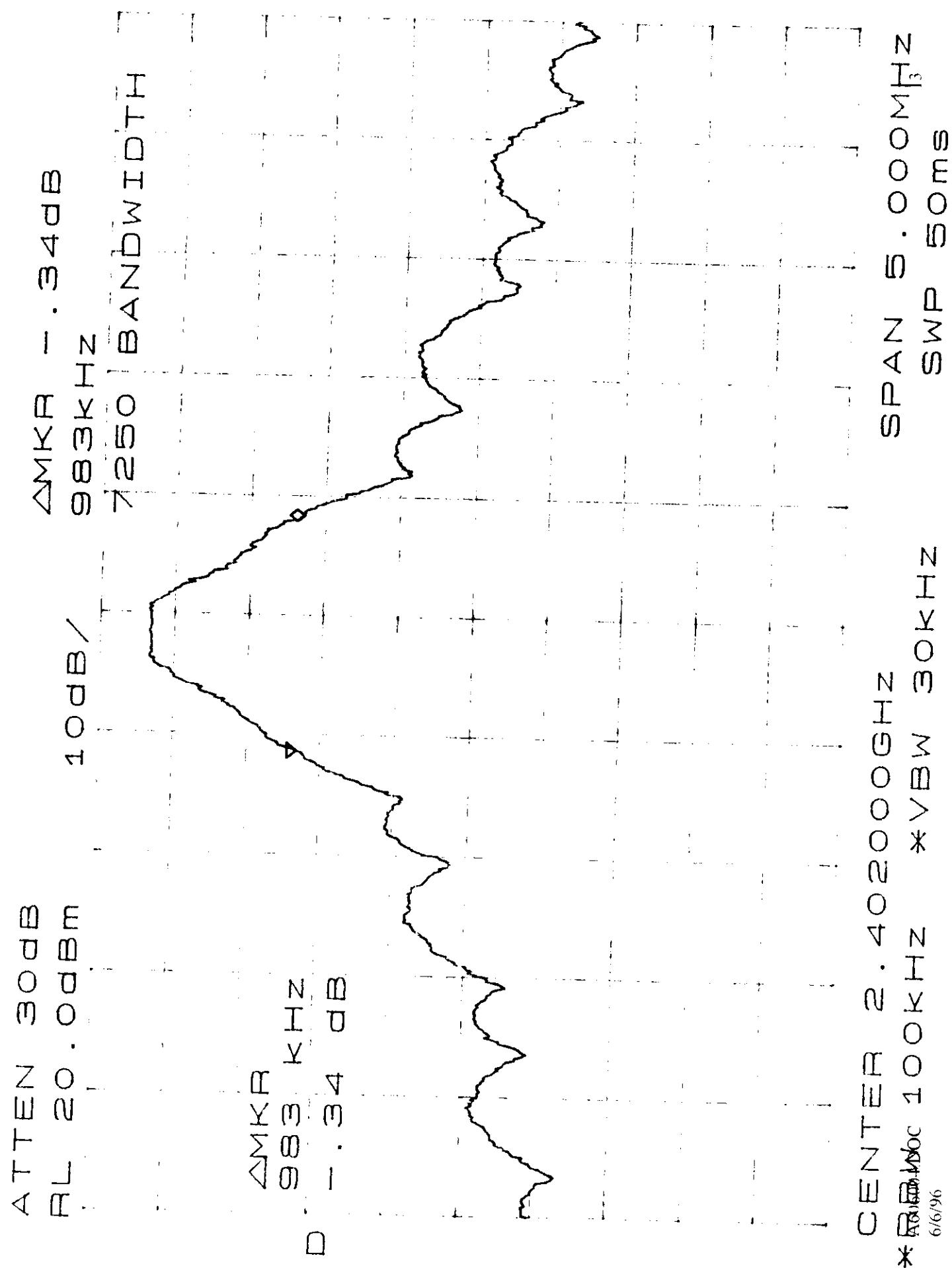
6/6/96

ATTEN 40dB
RL 30.0dBm

10dB/



START 2.45600GHz VBW 100KHz SWP 50ms
STOP 2.48400GHz 6/6/96
* ~~6/6/96~~ doc 100KHz



ATTEN 30dB
RL 20.0dBm

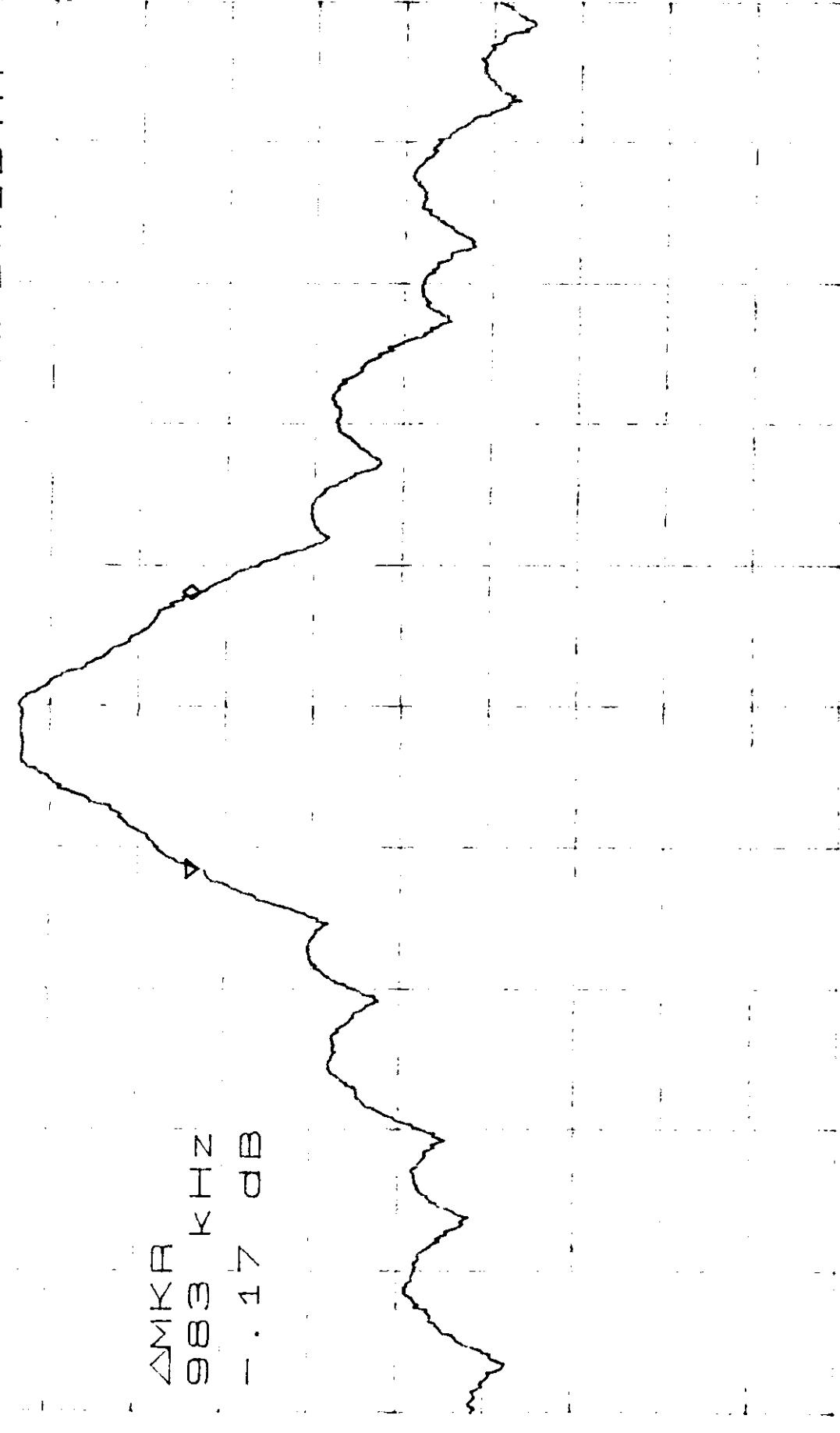
$\Delta MKR = .17$ dB

983 kHz

7250 BANDWIDTH

10dB/

ΔMKR
983 kHz
- .17 dB
□



CENTER 2.440000GHz
*FBW 100kHz *VFBW 30kHz
6/6/96

SPAN 5.000MHz
SWP 50ms 14

ATTEN 30dB
FL 20.0dBm

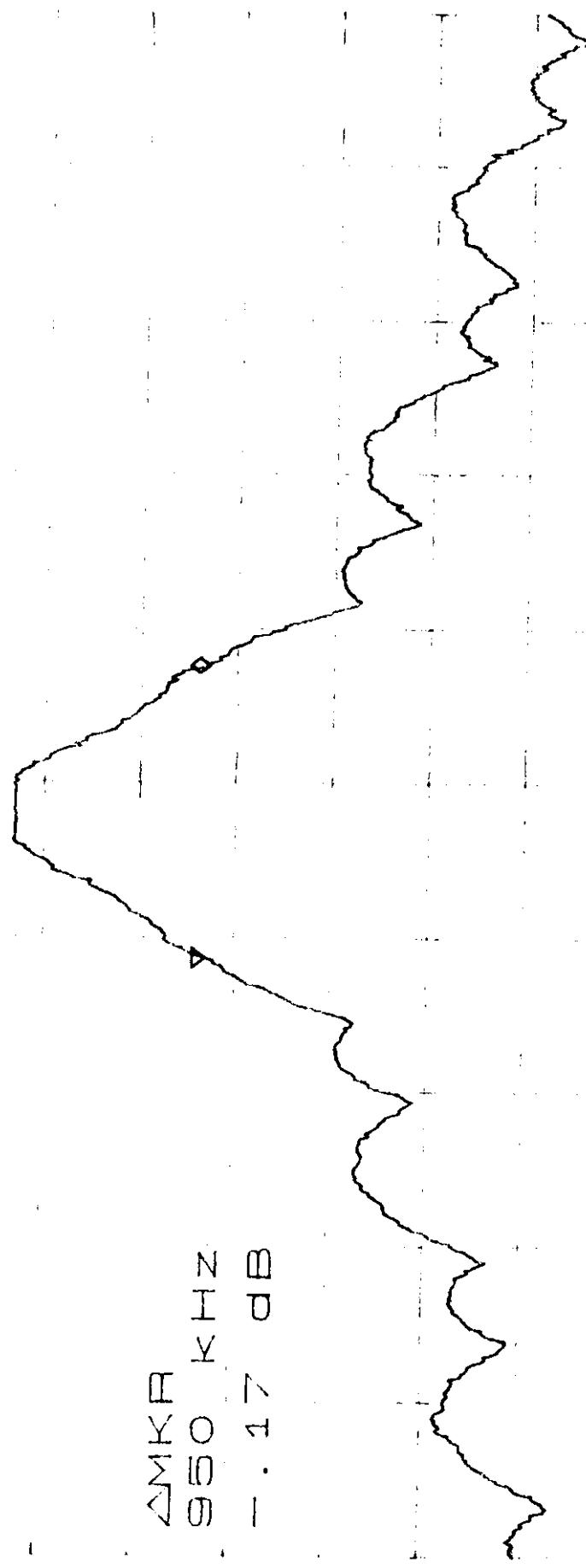
$\Delta MKR = .17$ dB

950 kHz

250' BANDWIDTH

10dB /

ΔMKR
950 kHz
D - .17 dB



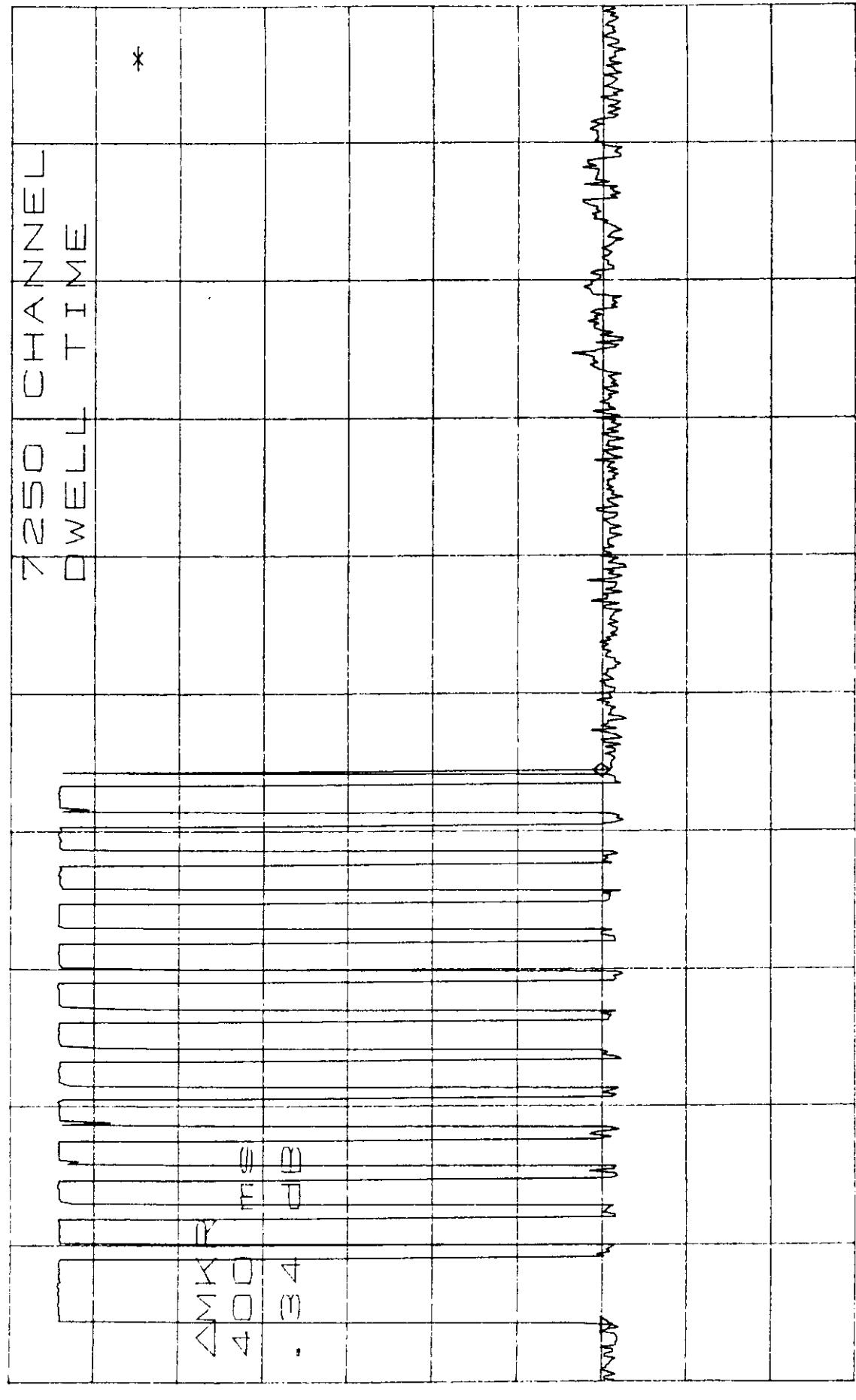
CENTER 2.480000GHz *VBW 30kHz
6/6/96

SPAN 5.000MHz
SWP 50ms

ATTEN 400B

△MKR . 34dB

卷之三



SPAN OHZ
SWR 1 0 0 0

6/6/96

ATTEN 40dB
RL 25.0dBm

MKR 19.83dBm
2.40200GHz
7250, POWER OUT

10dB/

D

CENTER 2.40200GHz
*REFDG 2.0MHz VBW 3.0MHz
SPAN 50.00MHz SWP 50ms 17
6/6/96

ATTEN 40dB
RL 25.0dBm

MKR 20.00dBm
2.44000GHz
7250! POWER OUT
10dB/

MKR
2.44000 GHz
□ 20.00 dBm

7250! POWER OUT
10dB/

SPAN 50.00MHz
SWP 50ms 18
CENTER 2.44000GHz
*RBdc 2.0MHz VBW 3.0MHz
6/6/96

ATTEN 40dB
RL 25.0dB

MKR 19.33dBm
2.48000GHz
250' POWER OUT

10dB/

MKR
2.48000 GHz
19.33 dBm

100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

CENTER 2.48000GHz
2.0MHz VBW 3.0MHz
SPAN 50.00MHz
SWP 50ms 19
6/6/96

ATTEN 40dB
RL 30.0dB

10dB/

7250 OUT OF BAND
BAND EDGES

□

START 2.40000GHz STOP 2.48350GHz
*RBW 100KHz *VBW 300KHz SWP 50ms 20

A60604.DOC
6/6/96

ATTEN 40dB
RL 30 . 0dB

10dB/
7250 OUT OF BAND
< 4 GHz

D

STOP 1 . 000GHz
*VSW 300kHz SWP 300msec

START 0Hz
*VSW 100kHz SWP 300msec

A60604.DOC
6/6/96

ATTEN 40dB

RL 30.0dBm

10dB/

7250 ! OUT OF BAND
4-2.75 GHz

D

START 1.000GHz STOP 2.750GHz
RBW 1.0MHz *VBW 3.0MHz SWP 50ms

6/6/96

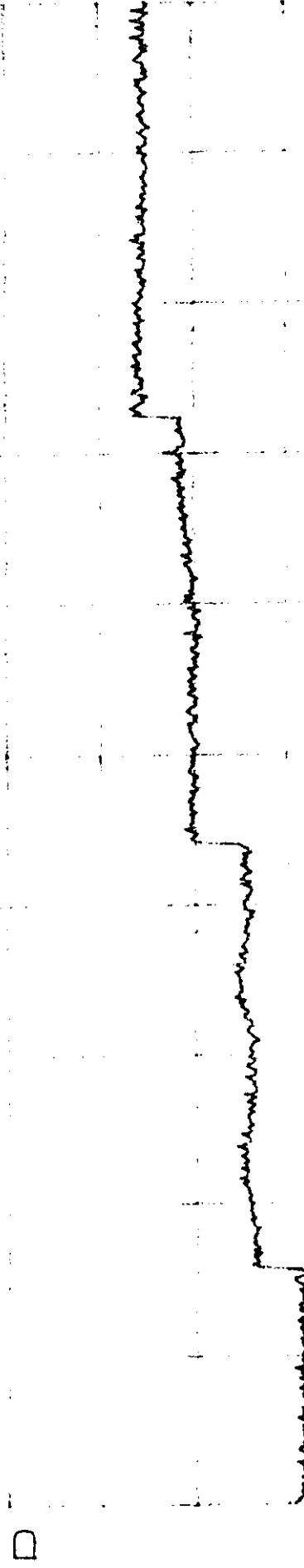
22

ATTEN 40dB
RL 30.0dBm

10dB/

7250 OUT OF BAND

2.75-26 GHz

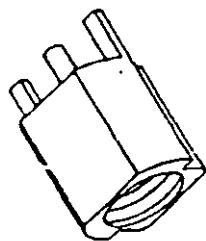


START 2.75GHz
STOP 26.00GHz
SWP 500mS

6/6/96

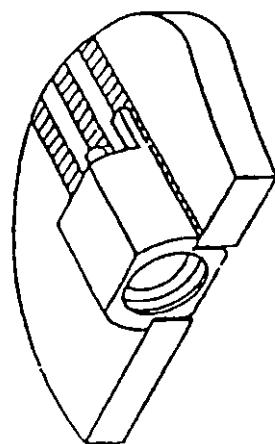
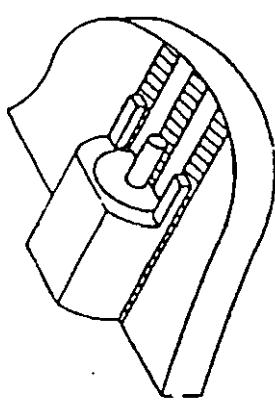
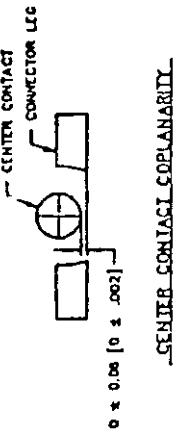
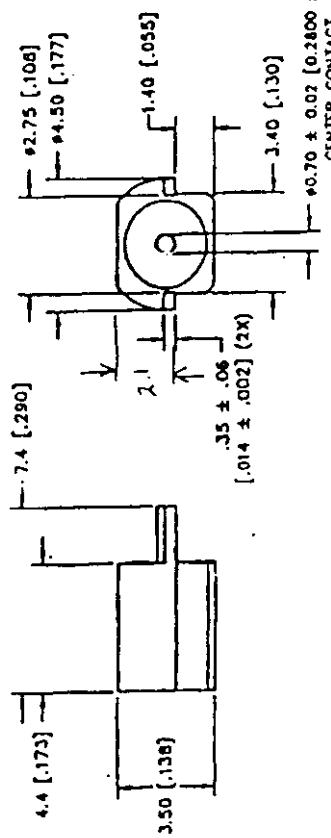
APPENDIX B
ANTENNA CONNECTOR

15.203 ANTENNA CONNECTOR



21030106

| | |
|----------------|----------------|
| PNR DATA SHEET | |
| Part # | _____ |
| Sheet | _____ of _____ |



3D VIEW
PCT MOUNT DETAIL

| Ref | Qty | Ref | Qty | Ref | Qty | Ref | Qty | Ref | Qty |
|------------------------------|-----|---------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|
| PARTS LIST | | | | | | | | | |
| 1 | 1 | 2 | 1 | 3 | 1 | 4 | 1 | 5 | 1 |
| CONN, MMCX, EDGE MOUNT, JACK | | HUBER + SUHNER INC. | | MMCX, EDGE MOUNT, JACK | | MMCX, EDGE MOUNT, JACK | | MMCX, EDGE MOUNT, JACK | |
| 64878922 | 1 | 64878922 | 1 | 64878922 | 1 | 64878922 | 1 | 64878922 | 1 |
| C | 1 | C | 1 | C | 1 | C | 1 | C | 1 |
| Do not scale | | Do not scale | | Do not scale | | Do not scale | | Do not scale | |
| APPENDIX | | APPENDIX | | APPENDIX | | APPENDIX | | APPENDIX | |

FCC ID: HV6-9801

APPENDIX D

FORBIDDEN BAND TEST

DATA

Forbidden Band (1/2)

| FCC RADIATED DATA SHEET | | | | | | | | | | | | | | | |
|-----------------------------------|----------------------------|------------------------------|------|------------------------|------|--------|--------------------|-------------------|-------------|--|--|--|--|--|--|
| EUT: FMW 2700S | | | | DATE: Aug. 13, 1998 | | | | | | | | | | | |
| S/N: FCC#HV6-9801 | | | | CUSTOMER NAME: Fujitsu | | | | | | | | | | | |
| RULE PART: 15.247 | | | | WORK ORDER: 8081302 | | | | | | | | | | | |
| | | | | FILE: 8081302a | | | | | | | | | | | |
| ANTENNA: | Horn | OTHER CAL FACTORS ATTN dB: 0 | | | | | | | | | | | | | |
| MODULATION TYPE: | | DUTY dB: 0 | | | | | | | | | | | | | |
| TESTED B | Shawn | HP IL dB: 0 | | | | | | | | | | | | | |
| COMMENTS: | Unit horizontally oriented | DIST dB: 10 | | | | | | | | | | | | | |
| FREQ. | READING | Pk, QP, or Av | A.F. | Cable loss | AMP | O.C.F. | TOTAL, dB(uV/m) | LIMIT dB(uV/m) | DELTA dB | | | | | | |
| MHz | dB(uV) | | dB | dB | dB | dB | dB(uV/m) | dB(uV/m) | dB | | | | | | |
| Fund = 2402 (Low Channel) | | | | | | | | | | | | | | | |
| 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 Channel) | | | | | | | | | | | | | | | |
| 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 Channel) | | | | | | | | | | | | | | | |
| 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 | | | | | DATE: | Aug. 13, 1998 | | | |
| S/N: FCC#HV6-9801 | | | | | CUSTOMER NAME: | Fujitsu | | | |
| RULE PART: 15.247 | | | | | WORK ORDER: | 8081302 | | | |
| | | | | | FILE: | 8081302b | | | |
| ANTENNA: | Horn | | | | OTHER CAL FACTOR: | ATTN dB: 0 | | | |
| MODULATION TYPE: | | | | | DUTY dB: | 0 | | | |
| TESTED BY: | Shawn | | | | HP IL dB: | 0 | | | |
| COMMENTS: | Unit Vertically Oriented | | | | DIST dB: | 10 | | | |
| FREQ. | READING | Pk, QP, or Av | A.F. | Cable loss | AMP | O.C.F. | TOTAL, | LIMIT | DELTA |
| MHz | dB(uV) | | 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 |