FCC Parts 22 Test Report
for
Wireless Link
on the
Fixed Wireless Cellular Desktop Phone
Model: FWT-8000
FCC ID: NJIFW8000

Report #: 20369331
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Accredited for testing to FCC

Tested by:	Engineer Suresh Kondapalli	
Reviewer:	EMC Manager David Chernomordik	

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1.1 Test Summary

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Tested By: _____ _____
Suresh Kondapalli Date

Approved By: _____ _____
David Chernomordik, Ph.D., Review Date:
EMC Site Manager

1.2 Product Description

The Wireless Link FWP-800D is a Fixed Wireless Cellular Desktop Phone is a stand-alone telephone with digital TDMA and analog AMPS cellular transceiver radio system built-in. It provides extended telephone service bringing subscriber wireless access to a cellular network.

For more information, please refer to the attached product description.

Use of Product	Cellular Desktop Phone
Whether quantity (>1) production is planned	[X] Yes, [ ] No
Cellular Phone standards	[X] AMPS [X] TDMA
Type(s) of Emission	40K0F8W, 40K0F1D, 30K0G7D
Allowed Deviation	12± 10% (AMPS mode)
Range of RF Output	27.8 dBm
Frequency Range	824 - 849 MHz (AMPS & TDMA)
Antenna(e) & Gain	0 dBi
Detachable antenna ?	[ ]Yes [X] No
Receiver L.O. frequency	988.38, 1001.19, 1013.61 MHz
External input	[X] Audio [ ] Digital Data

1.3 Related Submittal(s) Grants

[X] None

[ ] DOC for computer section, a separate DOC is prepared.

2.0 RF Power Output

FCC 2.1046

2.1 Test Procedure

The transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. Transmitter output was read off the spectrum analyzer in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the spectrum analyzer reading. A HP power meter was also used to measure the RF power.

Tests were performed at three frequencies (low, middle, and high channels) and on all power levels which can be setup on the transmitters.

2.2 Test Equipment

Hewlett Packard 8481A Power Sensor, 435B Power Meter
Hewlett Packard HP8566B Spectrum Analyzer, 100 Hz - 22 GHz
Tektronix 2784 Spectrum Analyzer, 100 Hz – 40 GHz

2.3 Test Results

Frequency (MHz)	**Measured Power (dBm)**
824	27.1
836.5	26.8
849	25.8

For more details, refer to the attached plots:

AMPS Mode	
Plot Number	Description
2.3.a	Low Channel
2.3.b	Middle Channel
2.3.c	High Channel
TDMA Mode	
Plot Number	Description
2.3.d	Low Channel
2.3.e	Middle Channel
2.3.f	High Channel

3.0 Radiated Power

FCC 22.913

The Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

3.1 Test Procedure

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane on an open test site. The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. During the measurement, the resolution and video bandwidths of the spectrum analyzer were set to 100 kHz (for frequencies below 1 GHz) and 1 MHz (for frequencies above 1 GHz).

Worst case emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. The spectrum analyzer reading was recorded and the field strength (E_1 in dBuV/m) was calculated.

ERP was measured using a substitution method. The EUT was replaced by half-wave dipole connected to a signal generator. The spectrum analyzer reading was recorded and the field strength (E_2 in dBuV/m) was calculated.

ERP was calculated as follows:

$$ERP = E_1 - E_2 + P_g,$$

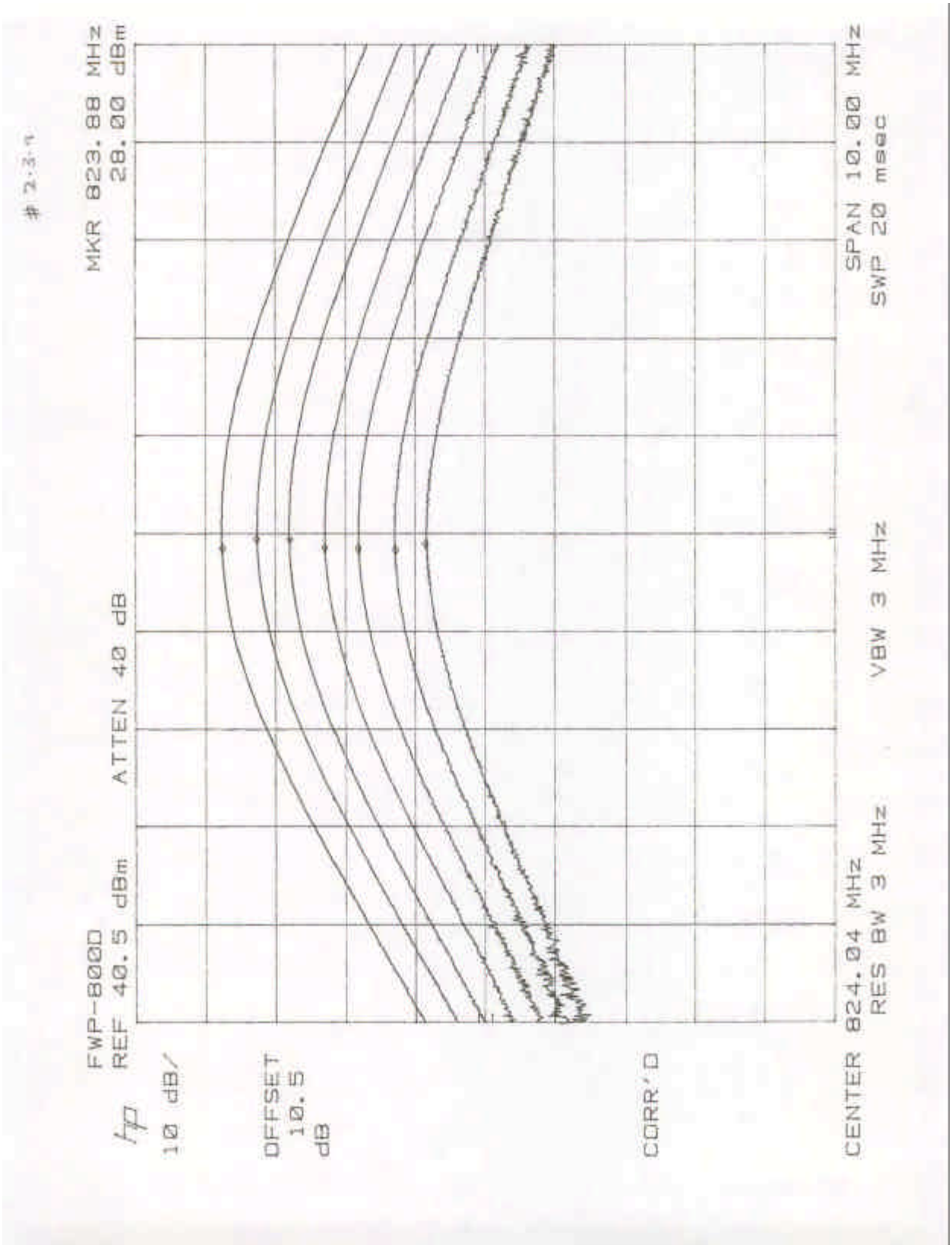
where E_1 & E_2 are field strength in dBuV/m when measured from EUT & generator accordingly; P_g is the generator output in dBm

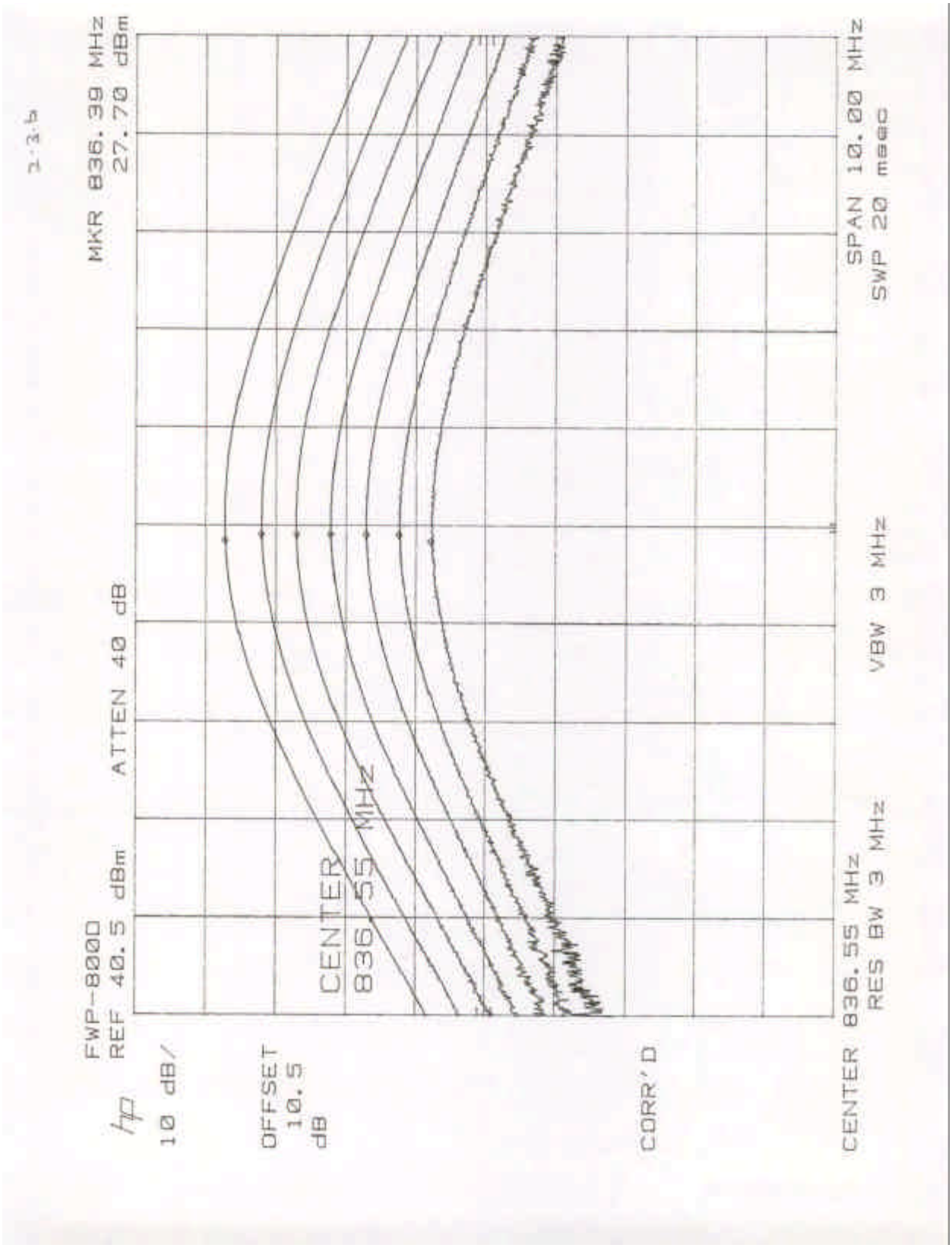
3.2 Test Equipment

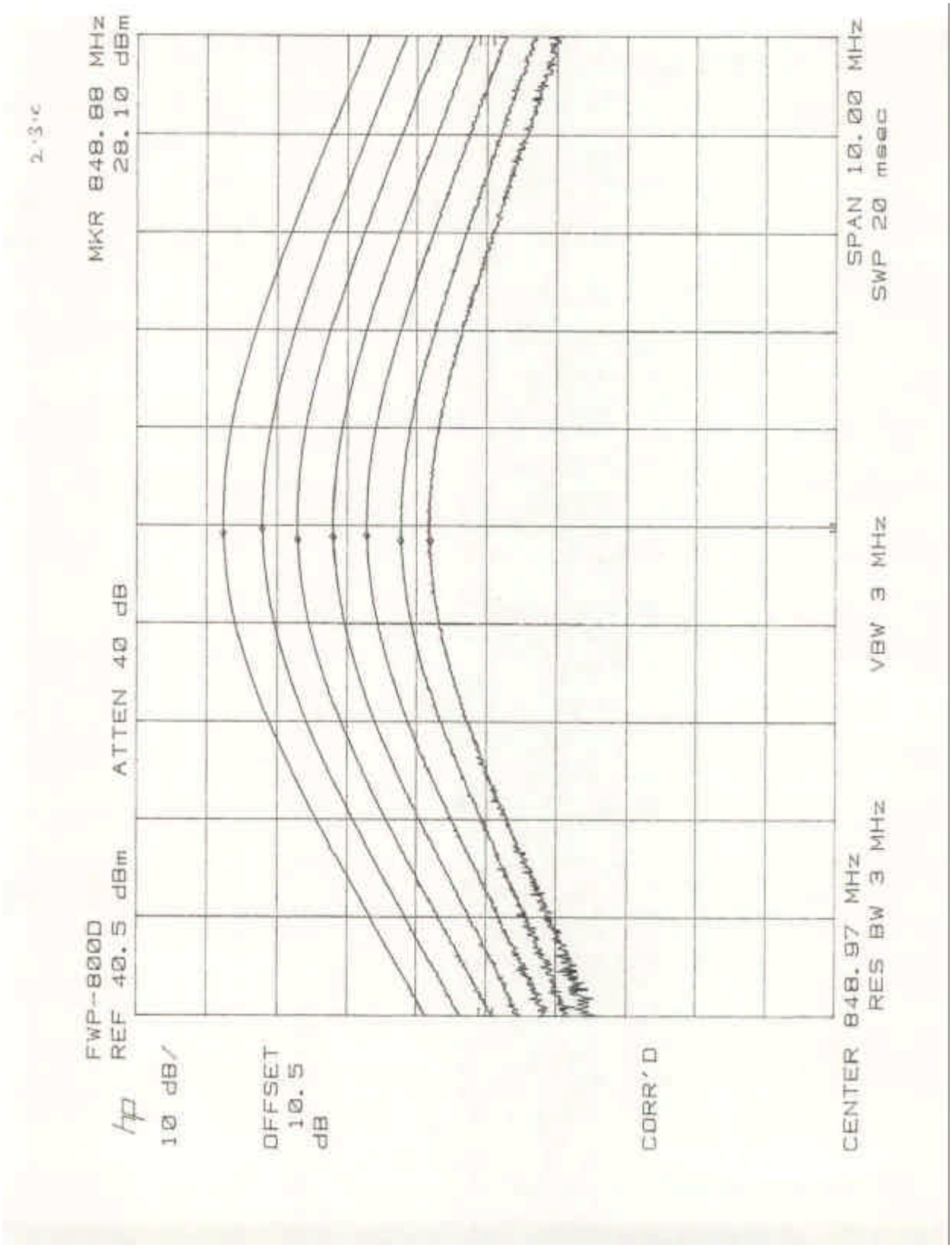
Hewlett Packard HP8566B Spectrum Analyzer
EMCO 3148 Log Periodic Antenna
CDI Robert's Antenna
Rohde & Schwarz SMH 44 signal generator

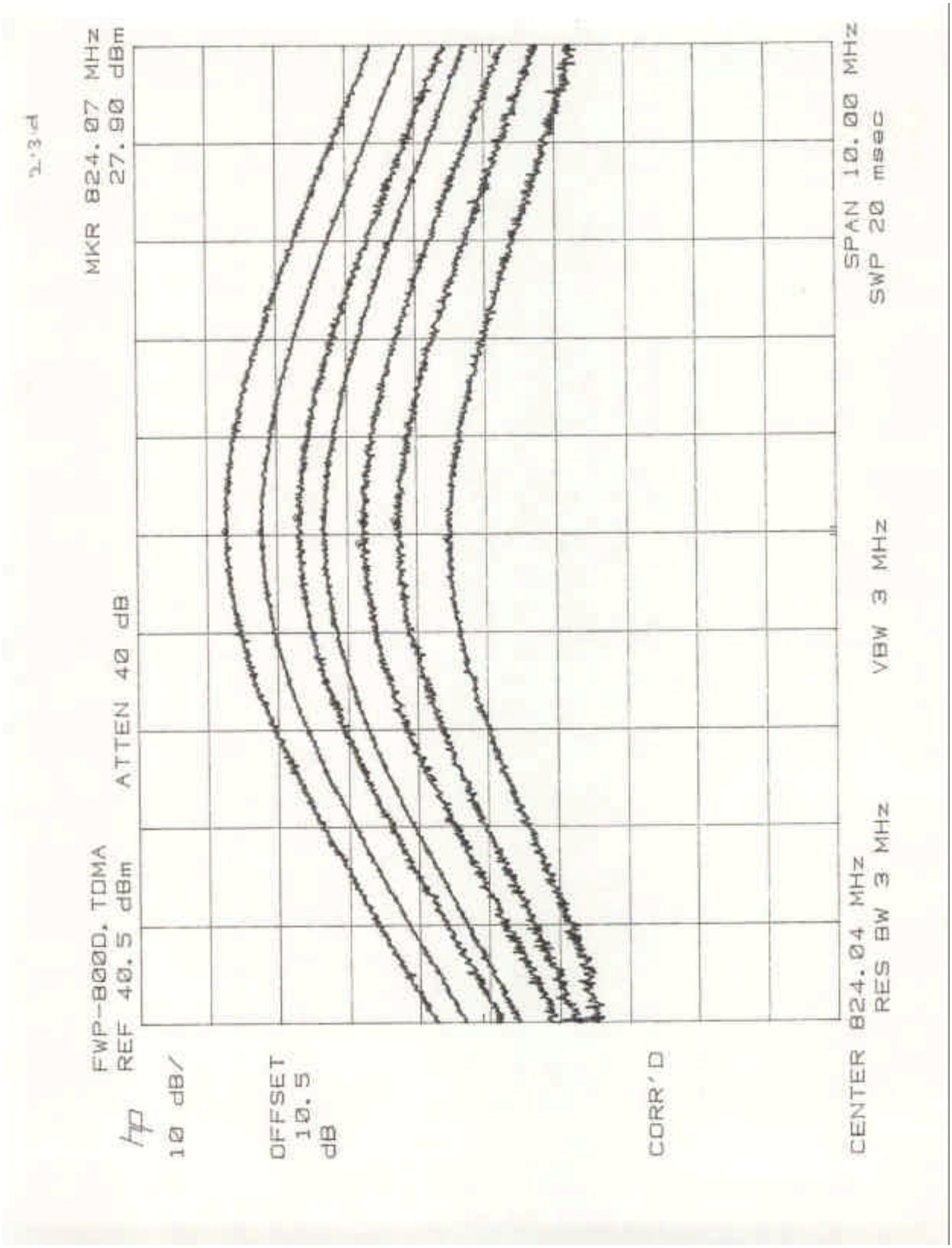
3.3 Test Results

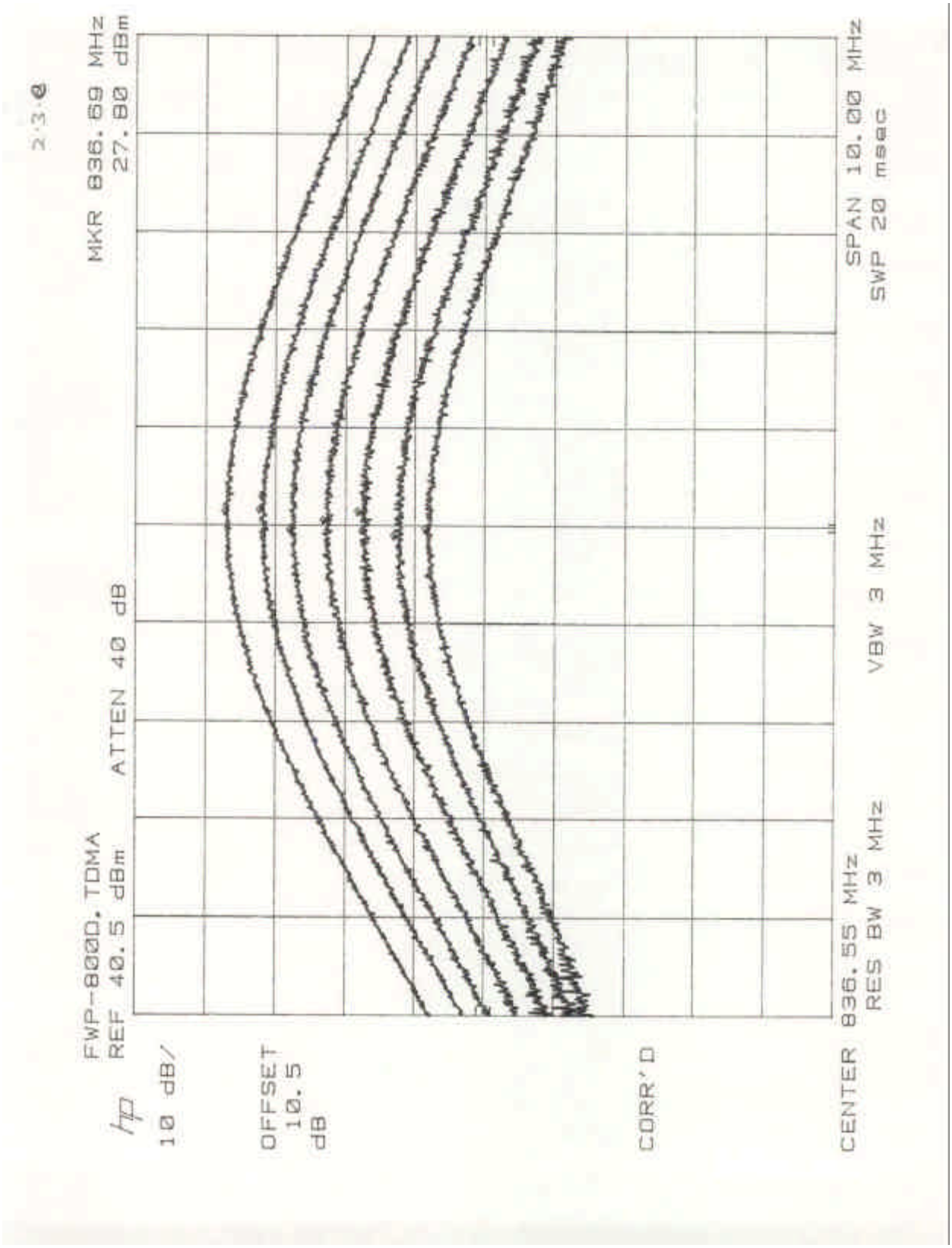
Passes	Refer to the attached data sheets.

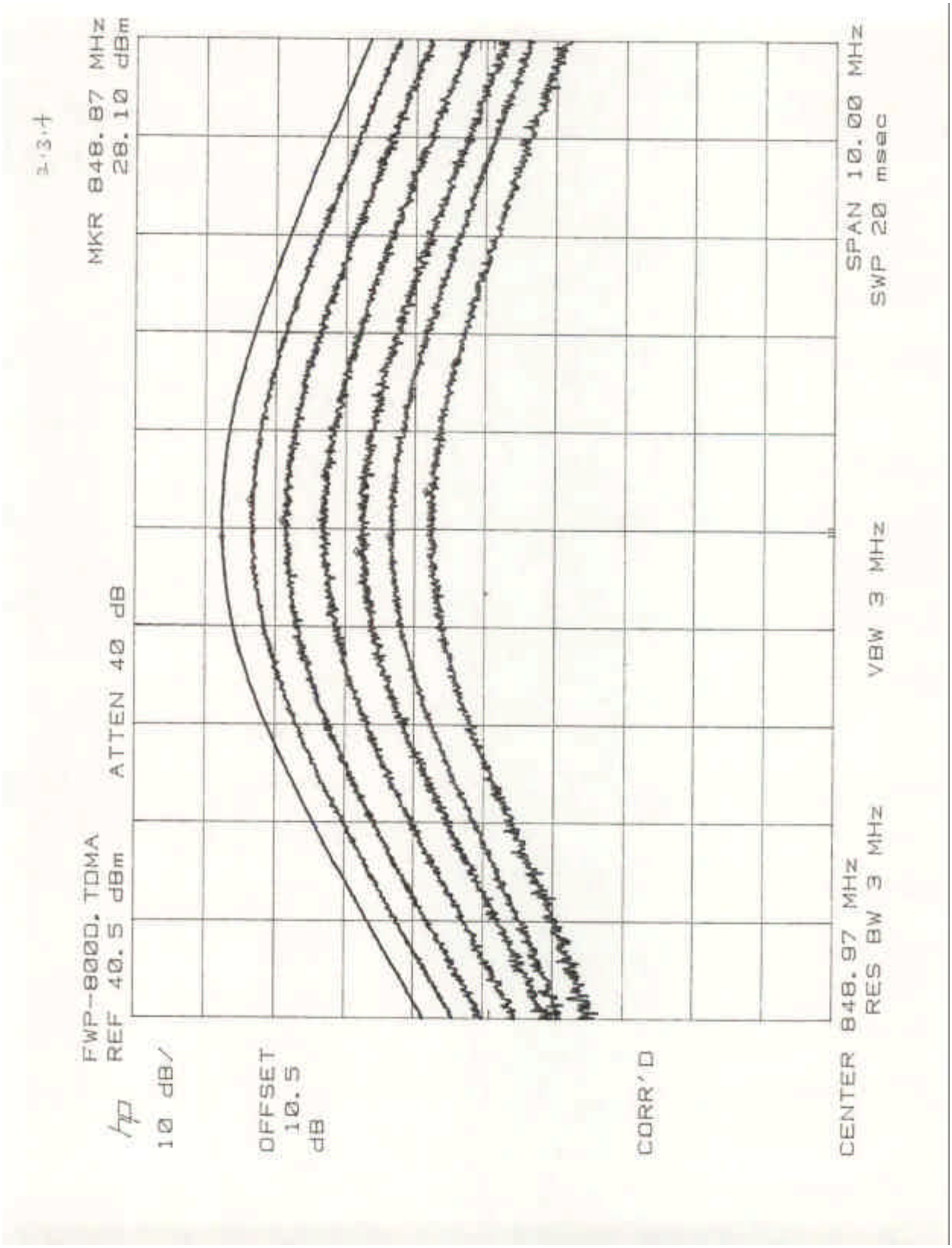

#2.3-7
MKR 823.88 MHz
28.00 dBm
SPAN 10.00 MHz
SWP 20 msec
FWP-800D
REF 40.5 dBm
ATTEN 40 dB
VBW 3 MHz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 824.04 MHz
RES BW 3 MHz


2.3.b
MKR 836.39 MHz
27.70 dBm
SPAN 10.00 MHz
SWP 20 msec
FWP-8000
REF 40.5 dBm
ATTEN 40 dB
VBW 3 MHz
CENTER
836.55 MHz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.55 MHz
RES BW 3 MHz


2.3.c
MKR 848.88 MHz
28.10 dBm
SPAN 10.00 MHz
SWP 20 msec
FWP-800D
REF 40.5 dBm
ATTEN 40 dB
VBW 3 MHz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 848.97 MHz
RES BW 3 MHz


MKR 824.07 MHz
27.90 dBm
SPAN 10.00 MHz
SWP 20 msec
FWP-800D, TDMA
REF 40.5 dBm
ATTEN 40 dB
VBW 3 MHz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 824.04 MHz
RES BW 3 MHz


2·3·e
MKR 836.69 MHz
27.80 dBm
SPAN 10.00 MHz
SWP 20 msec
FWP-800D, TDMA
REF 40.5 dBm
ATTEN 40 dB
VBW 3 MHz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.55 MHz
RES BW 3 MHz


FWP-800D, TDMA
REF 40.5 dBm
ATTEN 40 dB
MKR 848.87 MHz
28.10 dBm
SPAN 10.00 MHz
SWP 20 msec
VBW 3 MHz
RES BW 3 MHz
CENTER 848.97 MHz
10 dB/
OFFSET
10.5
dB
CORR'D

Field Strength of fundamental

Frequency MHz	Antenna Polarity	Detector	SA Reading dB(µV)	Antenna Factor dB(1/m)	Cable Loss dB	Field Strength dB(µV/m)
AMPS Mode						
824.04	V	Peak	107.4	21.9	2.0	131.3
836.55	V	Peak	103.3	22.4	2.0	128.6
848.97	V	Peak	103.0	23.3	2.0	128.9
TDMA Mode						
824.04	V	Peak	105.6	21.9	2.0	129.5
836.55	V	Peak	106.1	22.2	2.0	130.3
848.97	V	Peak	105.0	22.0	2.0	129.0

Radiated Power (Substitution Method)

Frequency MHz	Antenna Polariz.	Field Strength (EUT) dBµV/m	Field Strength (Sig. Gen. +Tuned Dipole) dBµV/m	Signal Generator Output dBm	ERP dBm
AMPS Mode					
824.04	V	131.3	113.5	10.0	27.8
836.55	V	128.6	113.4	10.0	25.2
848.97	V	128.9	113.3	10.0	25.6
TDMA Mode					
824.04	V	129.5	113.5	10.0	26.0
836.55	V	130.3	113.4	10.0	26.9
848.97	V	129.0	113.3	10.0	25.7

4.0 Modulation Deviation Limiting

FCC 2.1047**,** 22.915(b)(c)

4.1 Test Procedure

The RF output of the transceiver was connected to the input of a FM deviation meter through sufficient attenuation so as not to overload the meter or distort the readings. An audio signal generator with a variable attenuator on the output was coupled into the external microphone jack of the transceiver, or alternatively, the microphone element was removed and the generator output was connected to the microphone wires by clip leads.

At three different modulating frequencies, the output level of the audio generator was varied and the FM deviation level was recorded (Table 4.1a).

In addition, the audio signal was adjusted to obtain 8 kHz deviation at 1 kHz modulation frequency. Then the input signal was increased in 1 step by 20 dB and the peak deviation and steady state deviation were recorded. This test was performed at modulation frequencies from 300 Hz to 3 kHz.

4.2 Test Equipment

Marconi 2955A Radio Communication Test Set
Leader LFG-1300S Function Generator
LMV-182 AC Millivoltmeter

4.3 Test Results

The deviation is not to exceed 12 kHz. The EUT passed the test. See test data in table 4.1a.

Table 4.1a

Modulation Deviation Limiting			
Output Level (mV)	FM Deviation in kHz at Indicated Modulating Frequency		
	3000 Hz	1000 Hz	300 Hz
10.0	3.18	3.9	0.79
15.0	4.5	5.68	1.02
20.0	5.8	7.3	1.22
30.0	7.0	9.5	1.70
40.0	7.4	10.4	2.6
60.0	7.6	11.1	3.7
70.0	7.7	00.3	4.3
80.0	7.8	11.4	4.8
90.0	7.9	11.4	5.4
100.0	7.9	11.5	5.8
110.0	7.3	11.5	6.2
150.0	7.3	11.5	7.2
160.0	7.3	11.5	7.3
170.0	7.3	11.5	7.5
180.0	7.3	11.5	7.6
190.0	7.3	11.5	7.7
200	7.3	11.4	7.8
250	7.3	10.8	7.8
300	7.4	10.2	10.9
400	8.19	9.5	9.8
450	7.7	9.5	10.8
500	7.8	9.5	10.6
600	7.6	9.4	10.6

Middle Channel: 836.52 MHz

Table 4.1b

Frequency Deviation			
Frequency kHz	Initial Deviation	Peak Deviation	Steady State Deviation
0.3	1.3	10.5	10.2
0.5	2.1	11.1	10.1
0.7	4.2	9.3	9.1
0.9	7.4	10.9	10.6
1.0	8.0	11.3	8.0
1.2	9.5	13.0	12.7
1.4	9.7	12.3	12.1
1.6	9.3	11.7	11.0
1.8	8.8	10.9	10.7
2.0	8.4	10.4	10.1
2.4	6.3	8.0	7.9
2.8	6.2	7.8	7.7
3.0	6.0	7.3	7.2

Test Conditions:

V_{inp} = 9.6 mV
Deviation = 8 kHz at 1 kHz modulation frequency
Middle Channel = 836.52 MHz

5.0 Audio Filter Characteristics
FCC 22.915(d)

For mobile stations, these signals must be attenuated, relative to the level at 1 kHz, as follows:

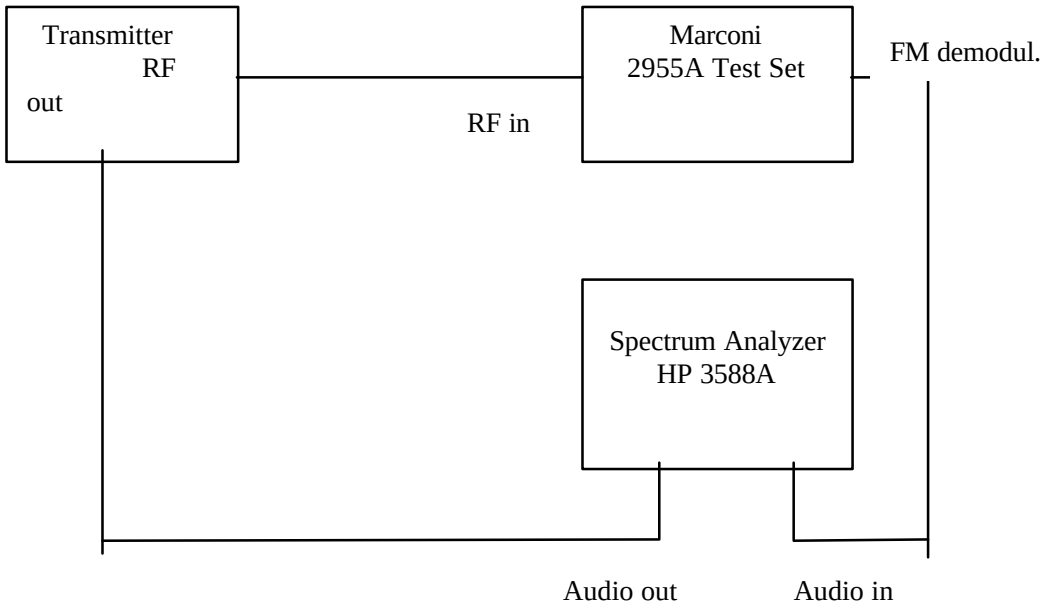
(i) In the frequency ranges of 3.0 to 5.9 kHz and 6.1 to 15.0 kHz, signals must be attenuated by at least 40 log (f/3) dB, where f is the frequency of the signal in kHz.

(ii) In the frequency range of 5.9 to 6.1 kHz, signals must be attenuated at least 35 dB.

(iii) In the frequency range above 15 kHz, signals must be attenuated at least 28 dB.

5.1 Test Procedure

The test was performed according to the block diagram shown below.



On that block diagram, the HP 3885A spectrum analyzer having the tracing generator, and the Marconi 2955A Radio Communication Test Set having an output of a FM demodulator, are used. After the calibration was made (the -20 dBm reading of the spectrum analyzer corresponds to the 9 kHz deviation) the spectrum analyzer was set to scan the frequency from 300 Hz to 30 kHz, with the same audio input level as described above, and with compressor OFF and expander OFF.

The audio filter response was plotted directly from the spectrum analyzer (Refer to Plots # 5.1.a, 5.1.b).

Using the level measured at 1 kHz as a reference (0 dB), the audio filter response was calculated (See Table 5.1).

Table 5.1

Audio Filter Characteristics		
Modulation Frequency kHz	Relative Level dBm	Attenuation
0.3	-38.95	17.8
0.4	-36.12	14.9
0.5	-32.47	11.2
0.6	-30.27	6.2
0.7	-27.4	5.2
0.8	-24.94	3.7
0.9	-23.53	2.3
1.0	-21.21	0
1.2	-19.59	-1.7
1.4	-19.26	-2.0
1.6	-19.45	-1.8
1.8	-20.08	-1.2
2.0	-20.68	-0.6
2.2	-21.15	-0.1
2.5	-21.89	0.6
3.0	-23.34	1.1
3.5	-28.51	7.3
4.0	-59.23	38.5
4.5	-59.98	38.7
5.0	-60.31	39.4
5.5	-60.77	39.5
5.9	-61.60	40.4
6.0	-61.20	40.2
6.1	-60.79	40.5
8.0	-63.50	42.3
10.0	-64.22	43.0
15.0	-69.98	48.7
20.0	-85.38	63.1
30.0	-94.98	72.7

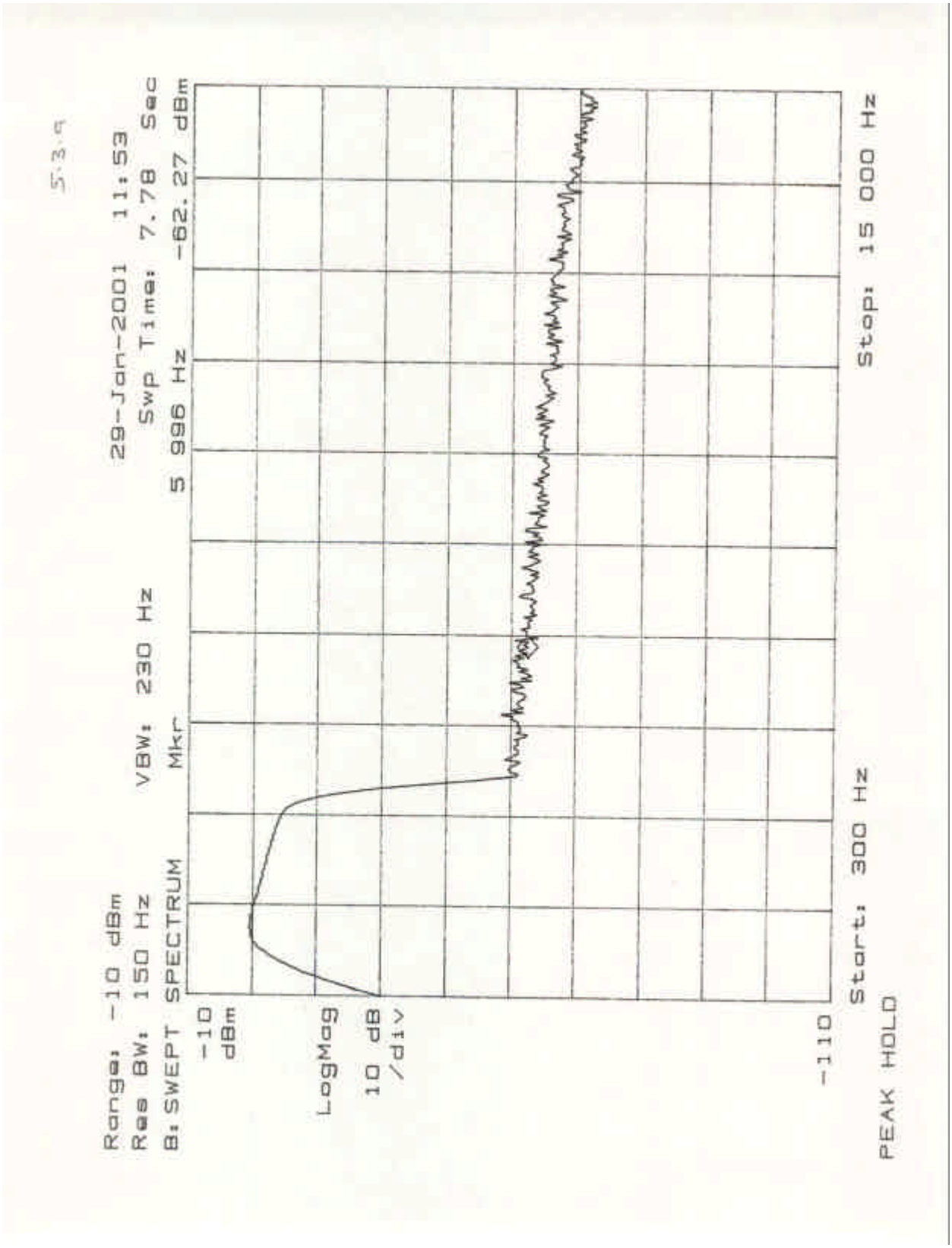
5.2 Test Equipment

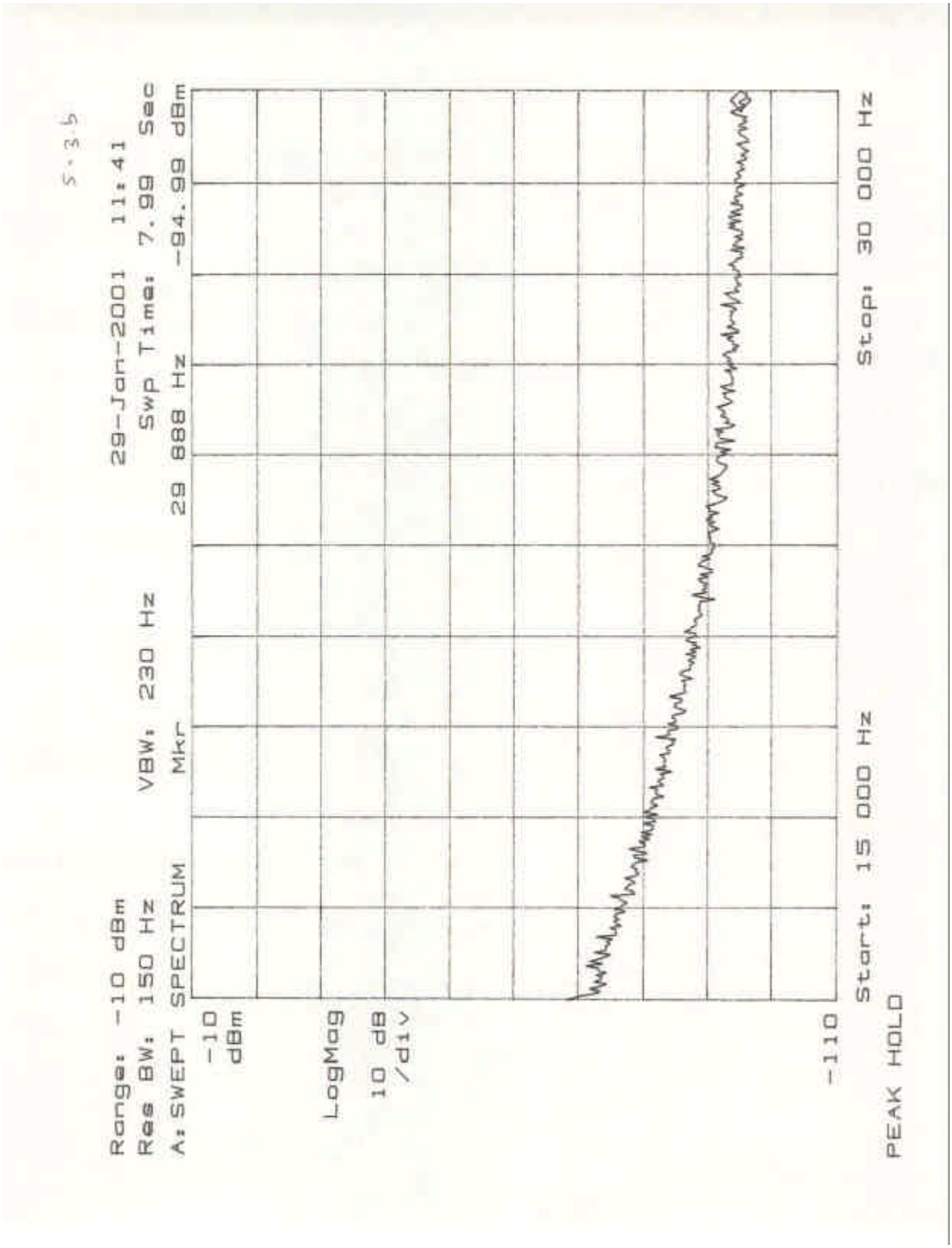
Marconi Instruments 2955A Radio Communications Test Set
HP 3588A Spectrum Analyzer
HP 7470A Plotter

5.3 Test Results

Passed, refer to the attached plots.

Audio Filter Characteristics	
Plot Number	Description
5.3.a	300Hz to 15KHz
5.3.b	15KHz to 30KHz


5.3.9
29-Jan-2001 11:53
Swp Time: 7.78 Sec
-62.27 dBm
5 996 Hz
Range: -10 dBm
Res BW: 150 Hz
VBW: 230 Hz
B: SWEPT SPECTRUM
Mkr
-10 dBm
LogMag
10 dB /div
-110
Start: 300 Hz
Stop: 15 000 Hz
PEAK HOLD


5.3.6
29-Jan-2001 11:41
Swp Time: 7.99 Sec
-94.99 dBm
29 888 Hz
Range: -10 dBm
Res BW: 150 Hz
VBW: 230 Hz
A: SWEPT SPECTRUM
Mkr
-10 dBm
LogMag
10 dB /div
-110
Start: 15 000 Hz
Stop: 30 000 Hz
PEAK HOLD

6.0 Emission Limitations, Occupied Bandwidth
FCC 2.1049, 22.917(b)(d)

For F3E/F3D emission mask uses with audio filter, the mean power of emissions must be attenuated below the mean power of the unmodulated carrier wave (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB;

(2) On any frequency removed from the carrier frequency by more than 45 kHz, up to the first multiple of the carrier frequency: at least 60 dB or (43 + 10 log P) dB, whichever is the lesser attenuation.

For F1D emission mask, the mean power of emissions must be attenuated below the mean power of the unmodualted carrier (P) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but no more than 45 kHz: at least 26 dB;

(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz: at least 45 dB;

(2) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency: at least 60 dB or (43 +10 log P) dB, whichever is the lesser attenuation.

6.1 Test Procedure

The RF output of the transceiver was connected to the input of the spectrum analyzer through sufficient attenuation. The audio generator was connected to the audio input of the transceiver.

The spectrum with no modulation was recorded. The audio input signal was adjusted to obtain the frequenciy deviation equal 6 kHz at the audio frequency of maximum response which was determined measuring deviation versus frequency from 300 Hz to 3.5 kHz and was found 2.8 kHz. The audio input level was increased by 16 dB. The audio frequency was set to the frequency 2.5 kHz.

The resolution bandwidth of the spectrum analyzer was set at 300 Hz and the spectrum was recorded in the frequency band ±50 kHz and ±100 kHz from the carrier frequency. The same plots has been done for wideband emissions, SAT, ST, DTMF9, Voice, some of the combinations of these modulating signals and in TDMA mode.

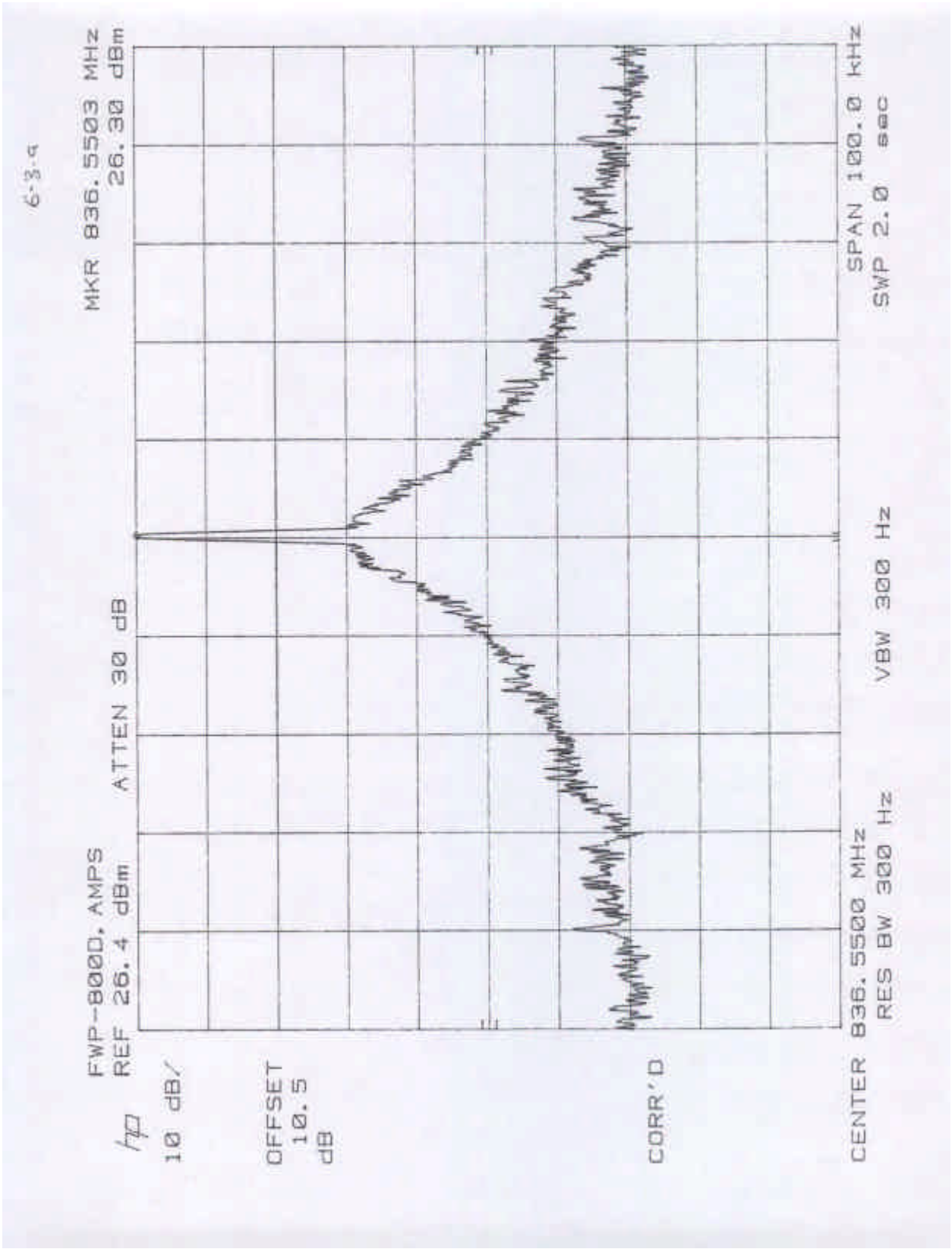
6.2 Test Equipment

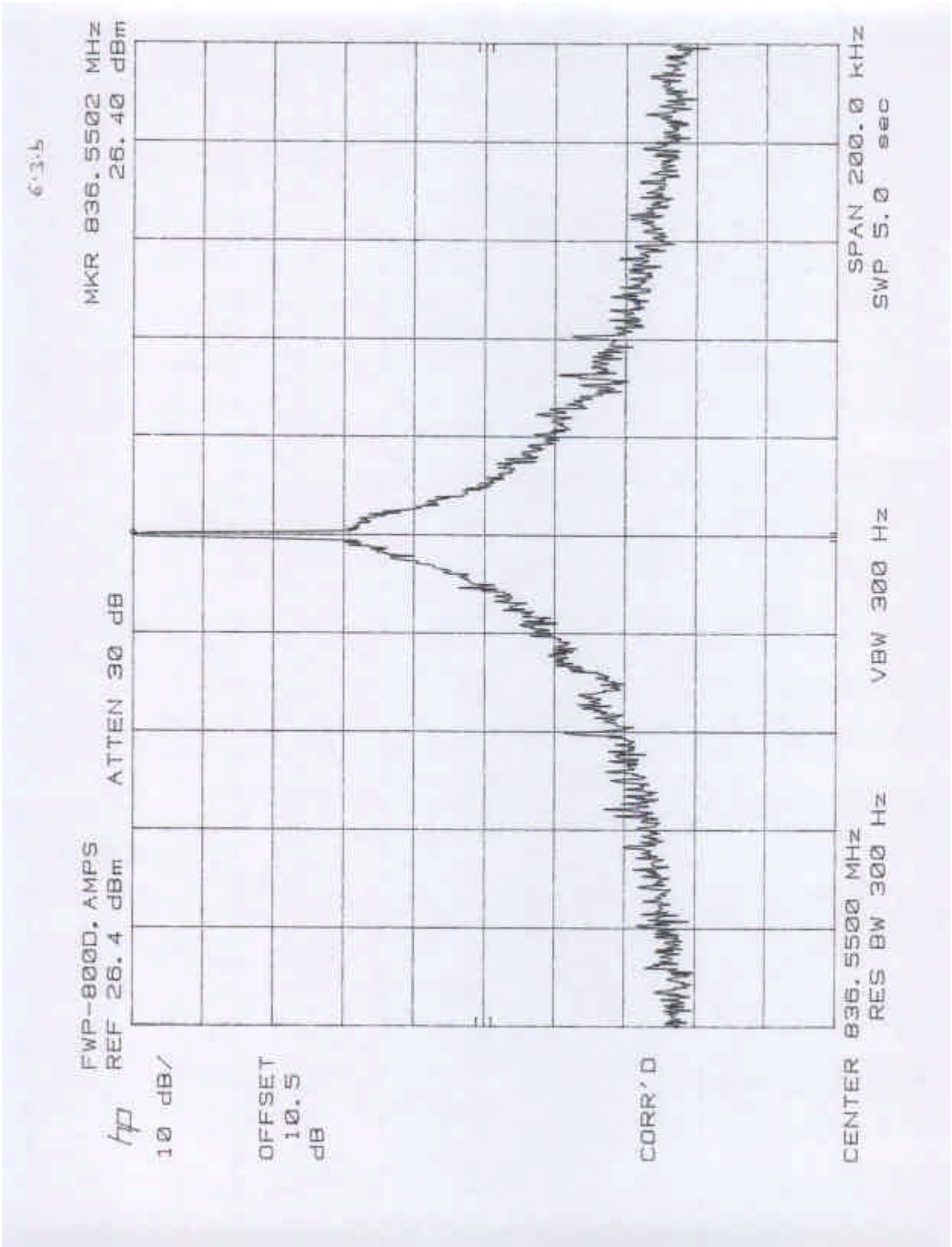
HP 8566B Spectrum Analyzer
Leader LFG-1300S Function Generator
Leader LMV-182 AC Millivoltmeter
Marconi 2955A Radio Communication Test Set
HP 7470A Plotter

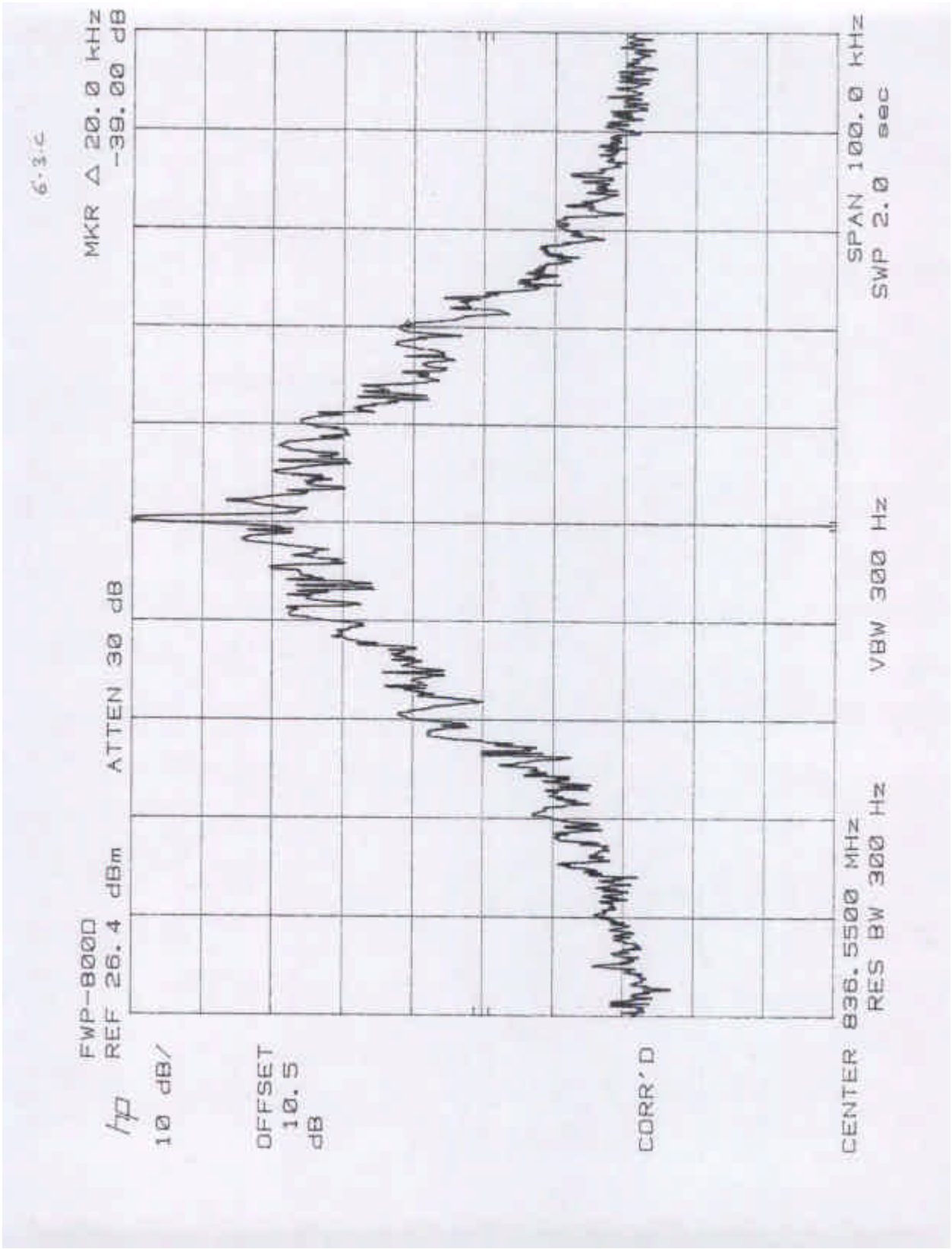
6.3 Test Results

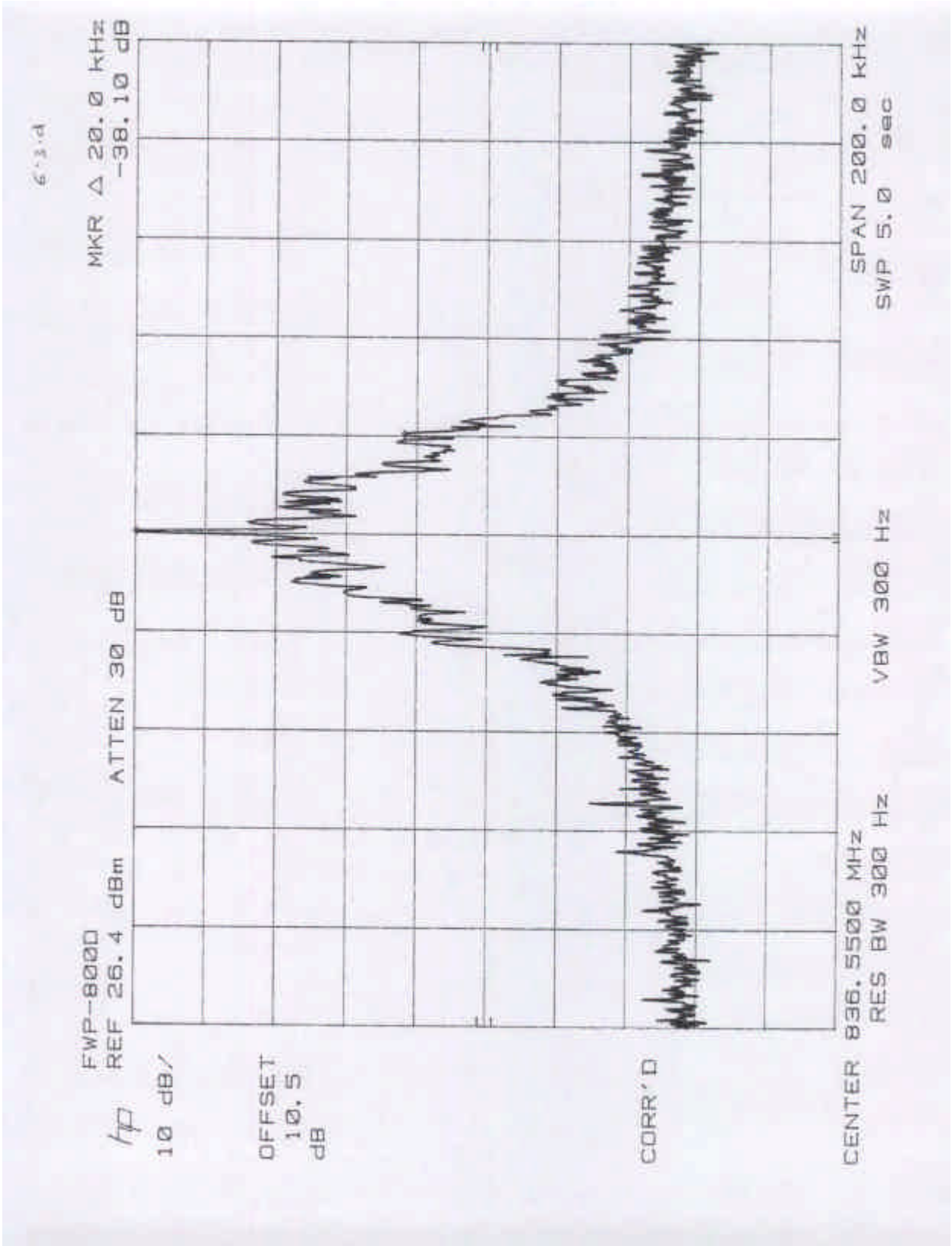
Passes	Refer to the attached plots.

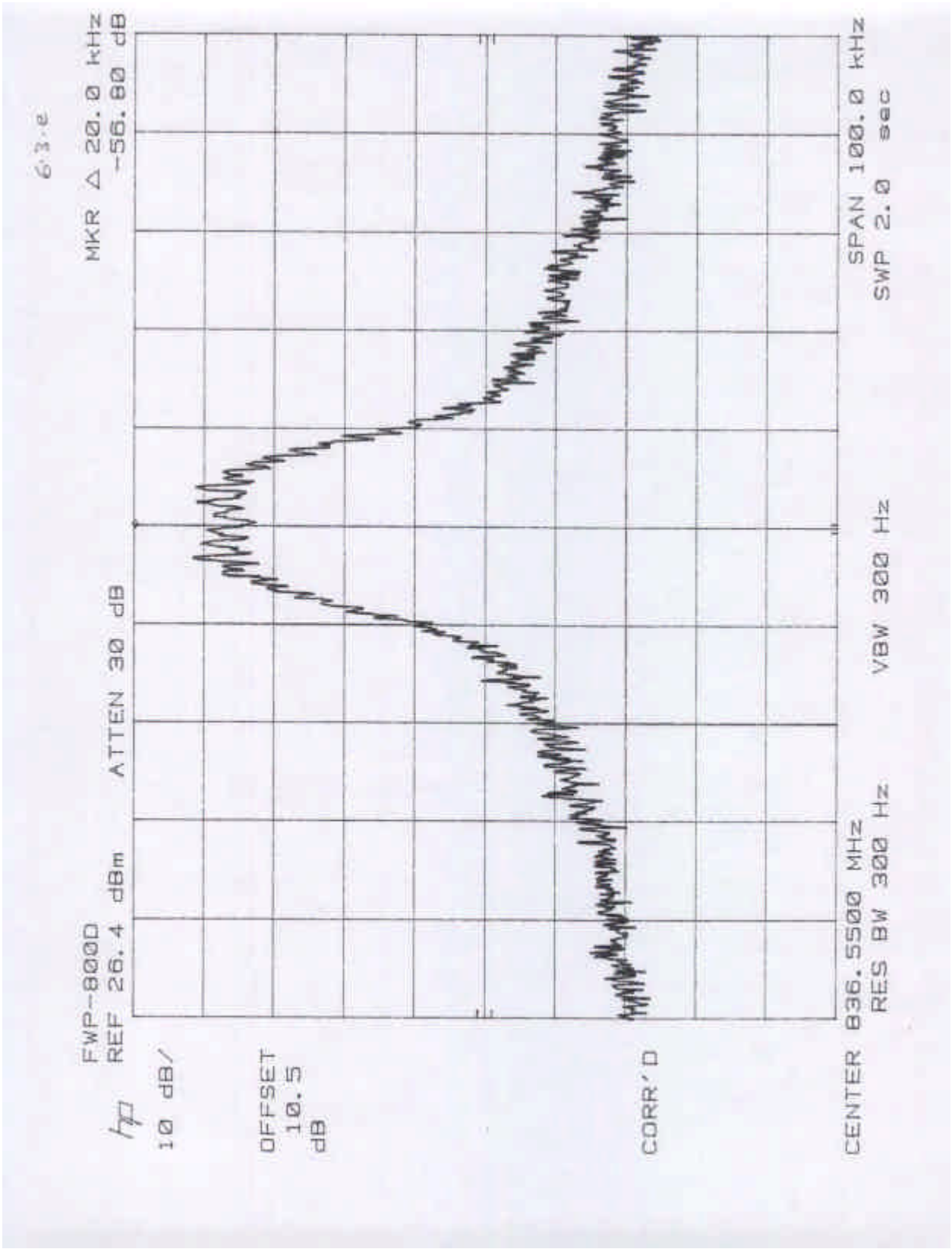
Plot Number	Description
6.3.a	Carrier frequency, no modulation, scan 100 kHz
6.3.b	Carrier frequency, no modulation, scan 200 kHz
6.3.c	Wideband emissions (0, 1, 0, 1), scan 100 kHz
6.3.d	Wideband emissions (0, 1, 0, 1), scan 200 kHz
6.3.e	DTMF "9"
6.3.f	SAT (6 kHz, 2 kHz deviation)
6.3.g	ST (10 kHz, 8 kHz deviation), scan 50 kHz
6.3.h	ST (10 kHz, 8 kHz deviation), scan 100 kHz
6.3.i	ST & SAT (6 kHz & 10 kHz), scan 100 kHz
6.3.j	DTMF & SAT, scan 100 kHz
6.3.k	Voice (2.5 kHz), scan 100 kHz
6.3.l	Voice (2.5 kHz) & SAT (6 kHz), scan 100 kHz
6.3.m	Voice (2.5 kHz) & SAT (6 kHz), low power
6.3.n	TDMA mode, scan 100 kHz
6.3.p	TDMA mode, scan 200 kHz

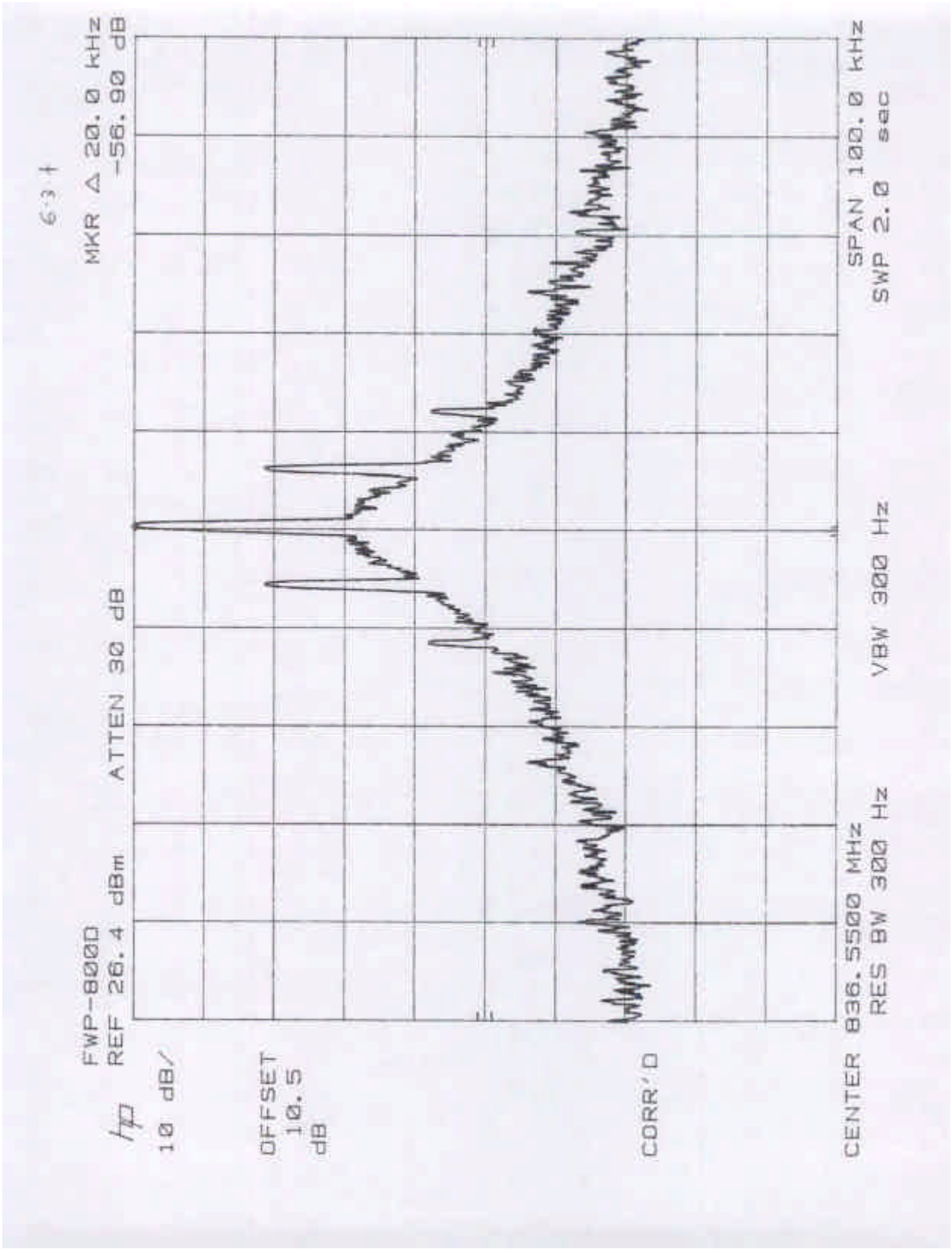

6-3-a
MKR 836.5503 MHz
26.30 dBm
SPAN 100.0 kHz
SWP 2.0 sec
FWP-800, AMPS
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

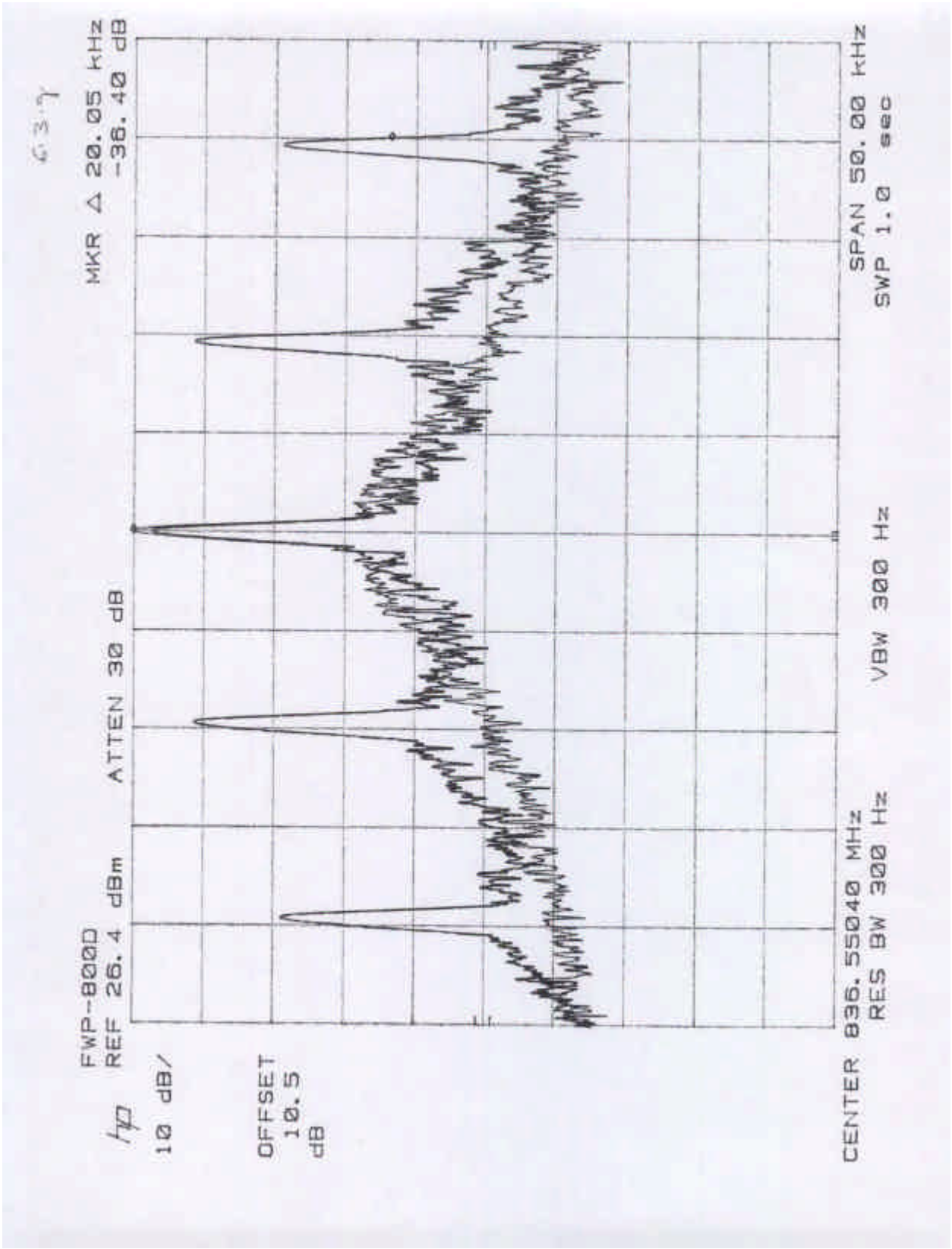

6'3.5
MKR 836.5502 MHz
26.40 dBm
SPAN 200.0 kHz
SWP 5.0 sec
FWP-800D.AMPS
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

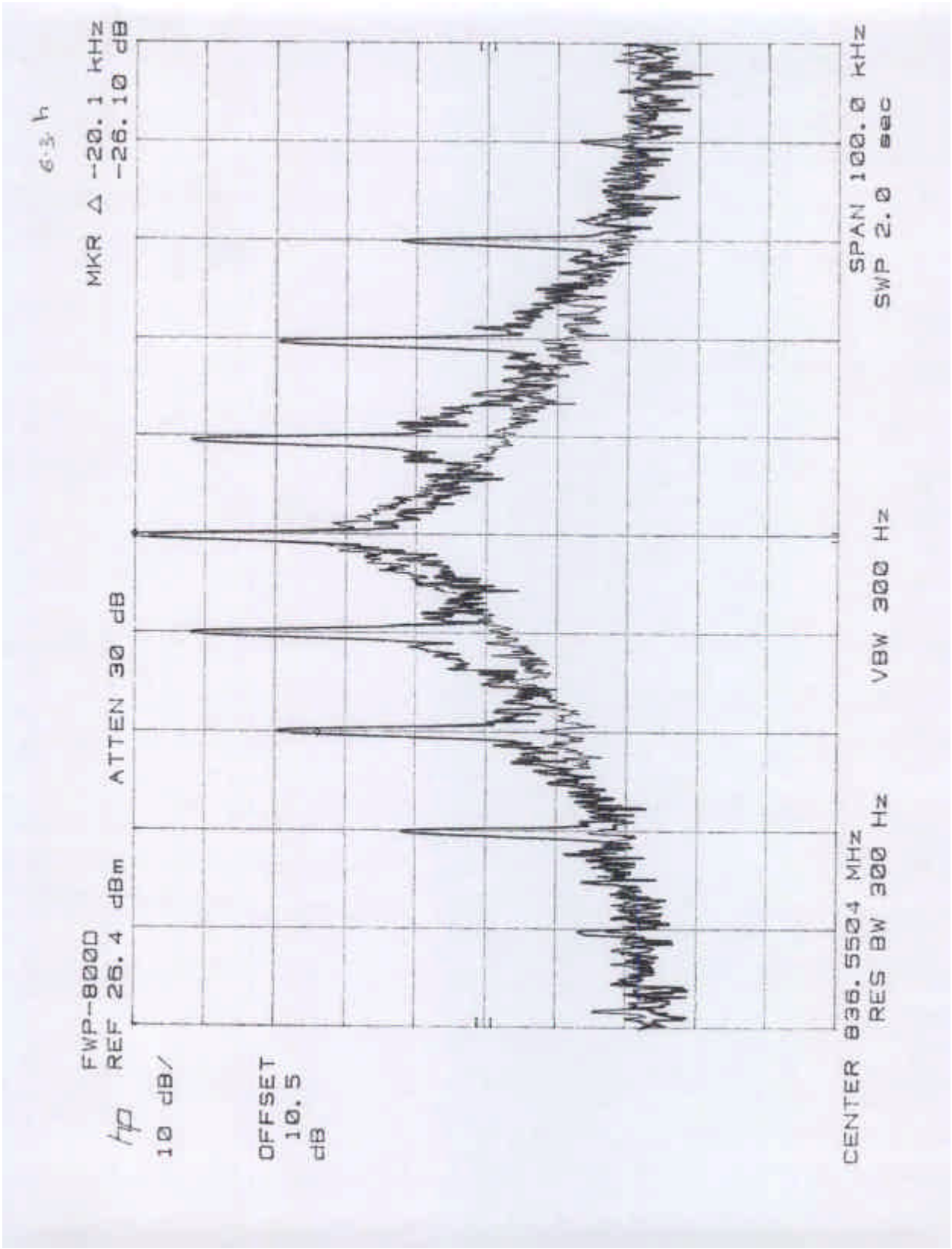

6.3.6
MKR Δ 20.0 kHz
-39.00 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-800D
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

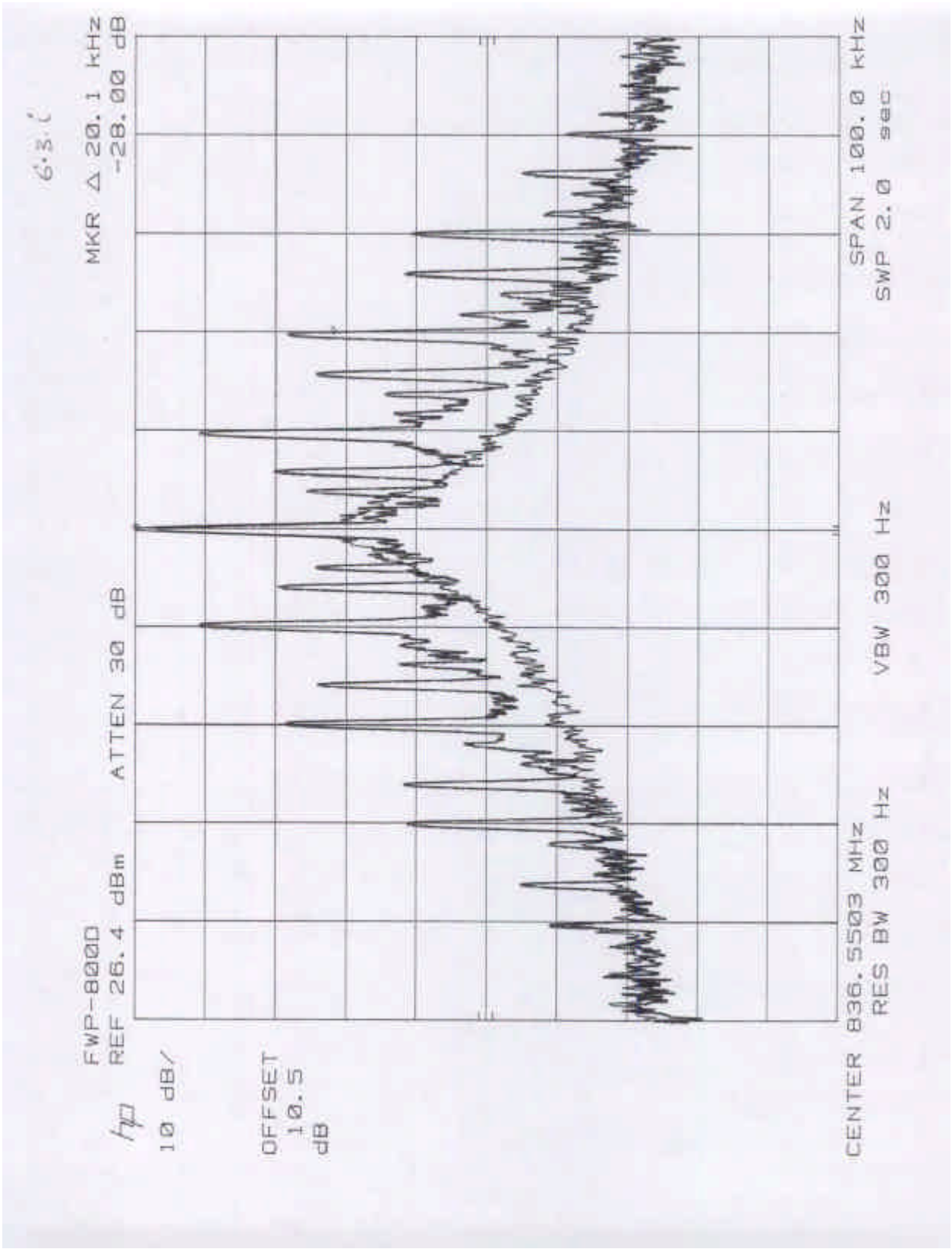

6.3.4
MKR Δ 20.0 kHz
-38.10 dB
SPAN 200.0 kHz
SWP 5.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

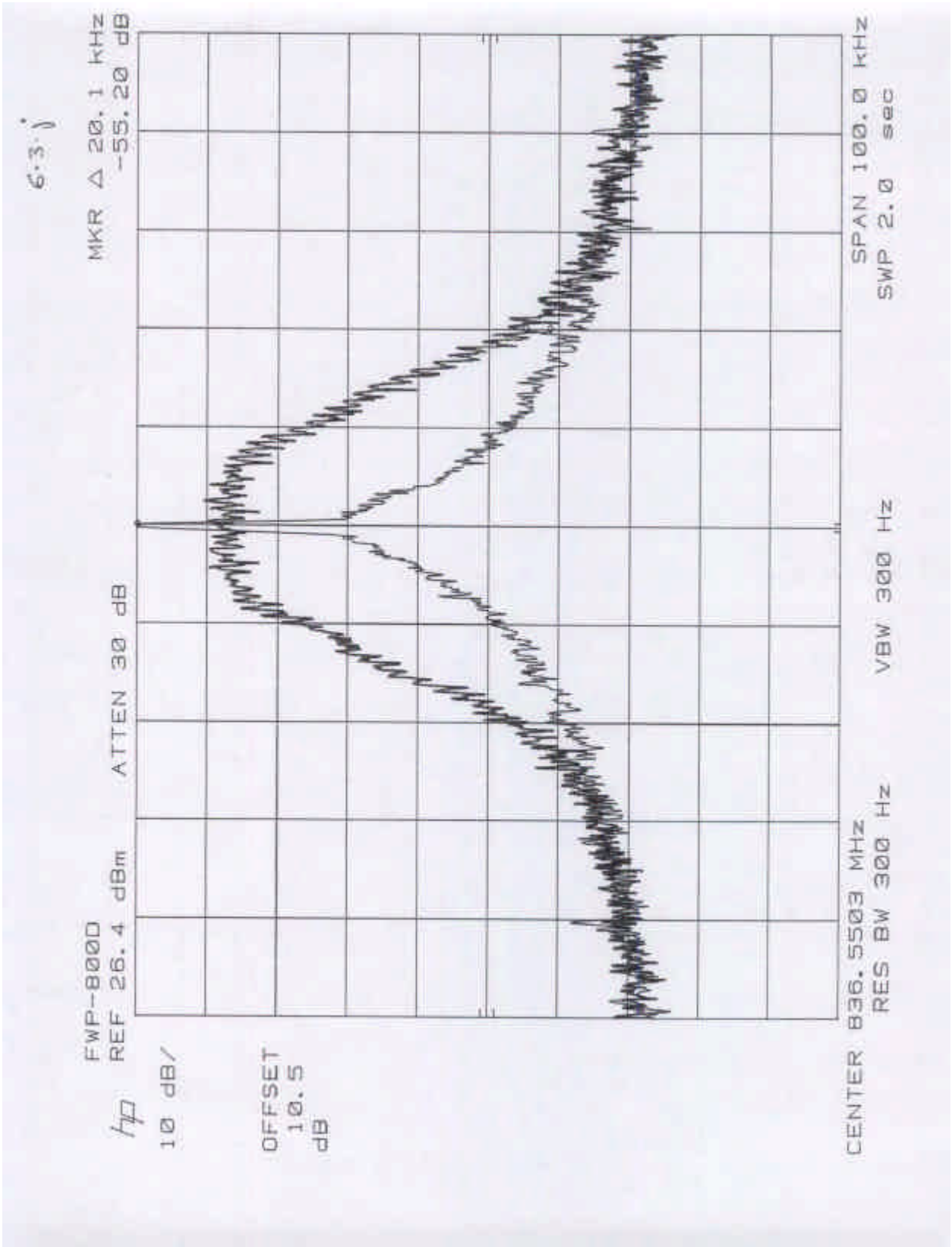

6.3.e
MKR Δ 20.0 kHz
-56.80 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-800D
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

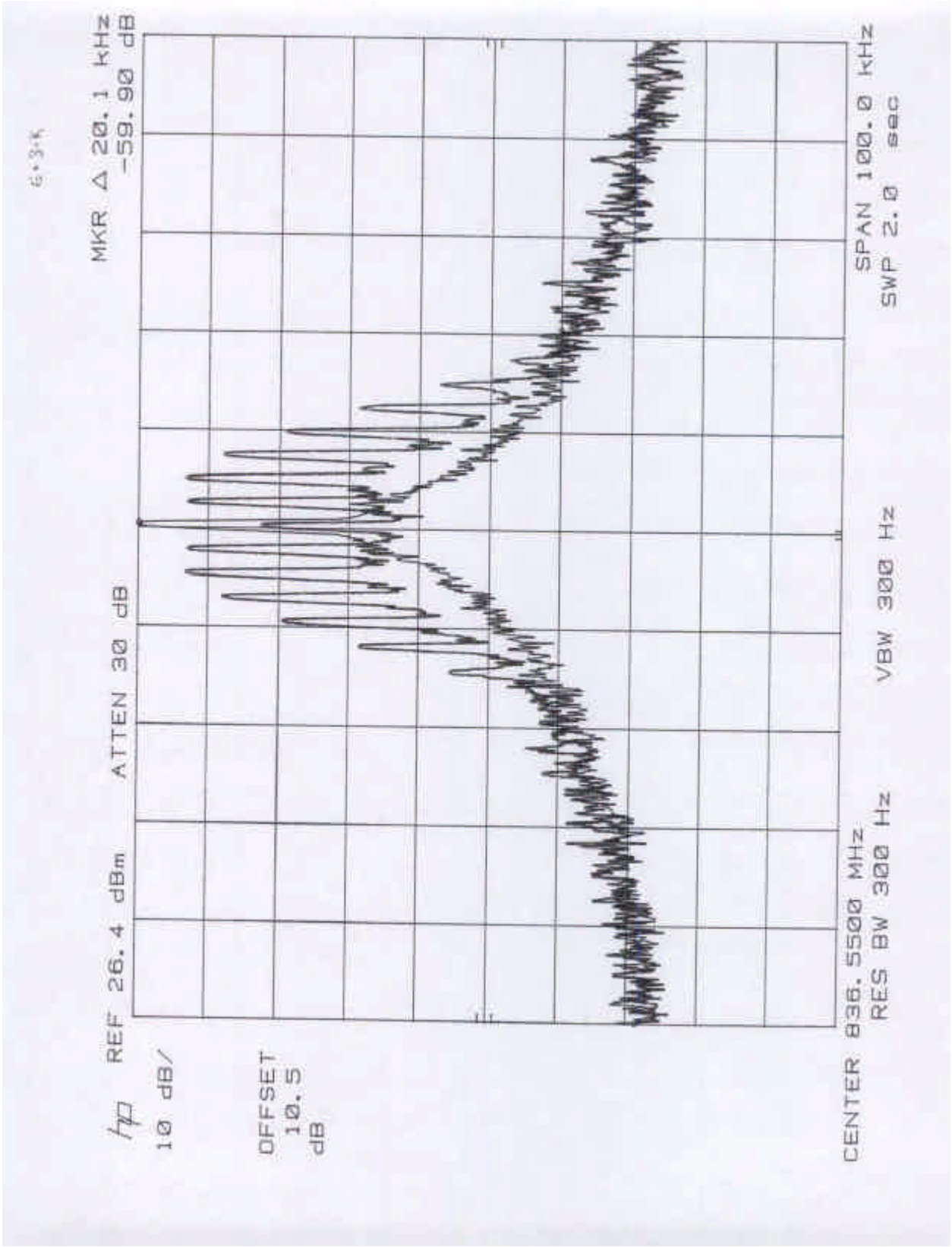

MKR Δ 20.0 kHz
-56.90 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CORR'D
CENTER 836.5500 MHz
RES BW 300 Hz

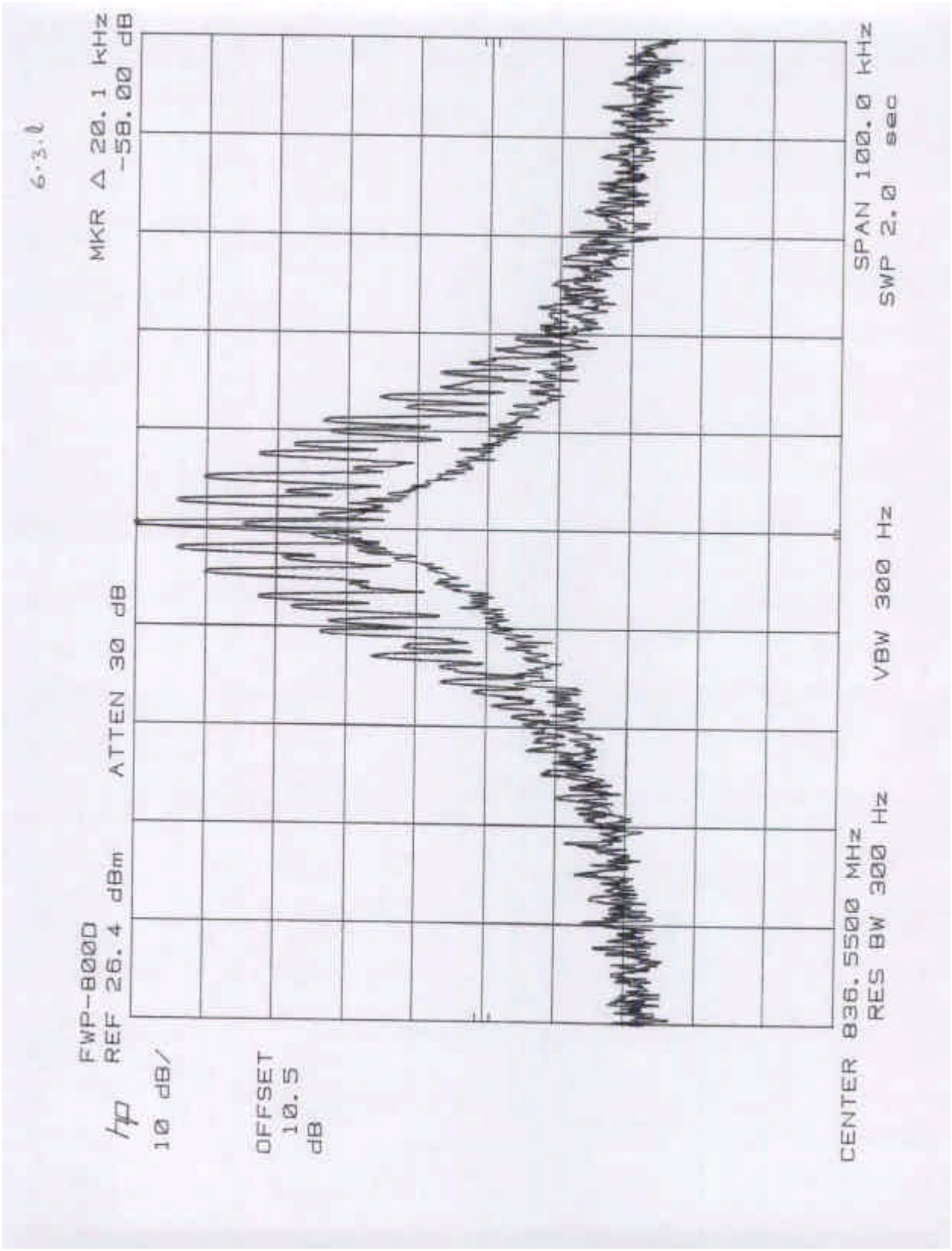

MKR Δ 20.05 kHz
-38.40 dB
SPAN 50.00 kHz
SWP 1.0 sec
FWP-800D
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.55040 MHz
RES BW 300 Hz

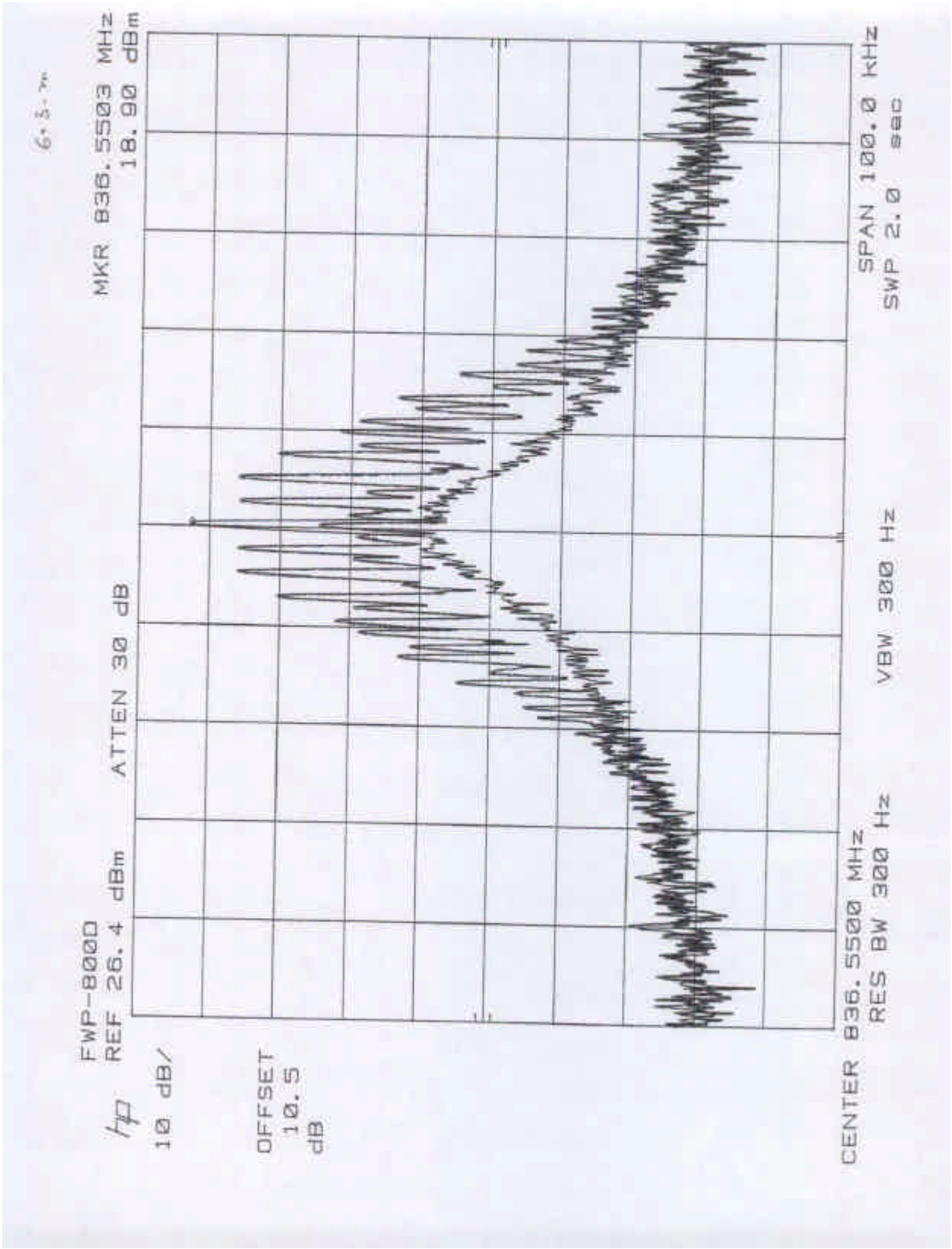

6.3 h
MKR Δ -20.1 kHz
-26.10 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5504 MHz
RES BW 300 Hz

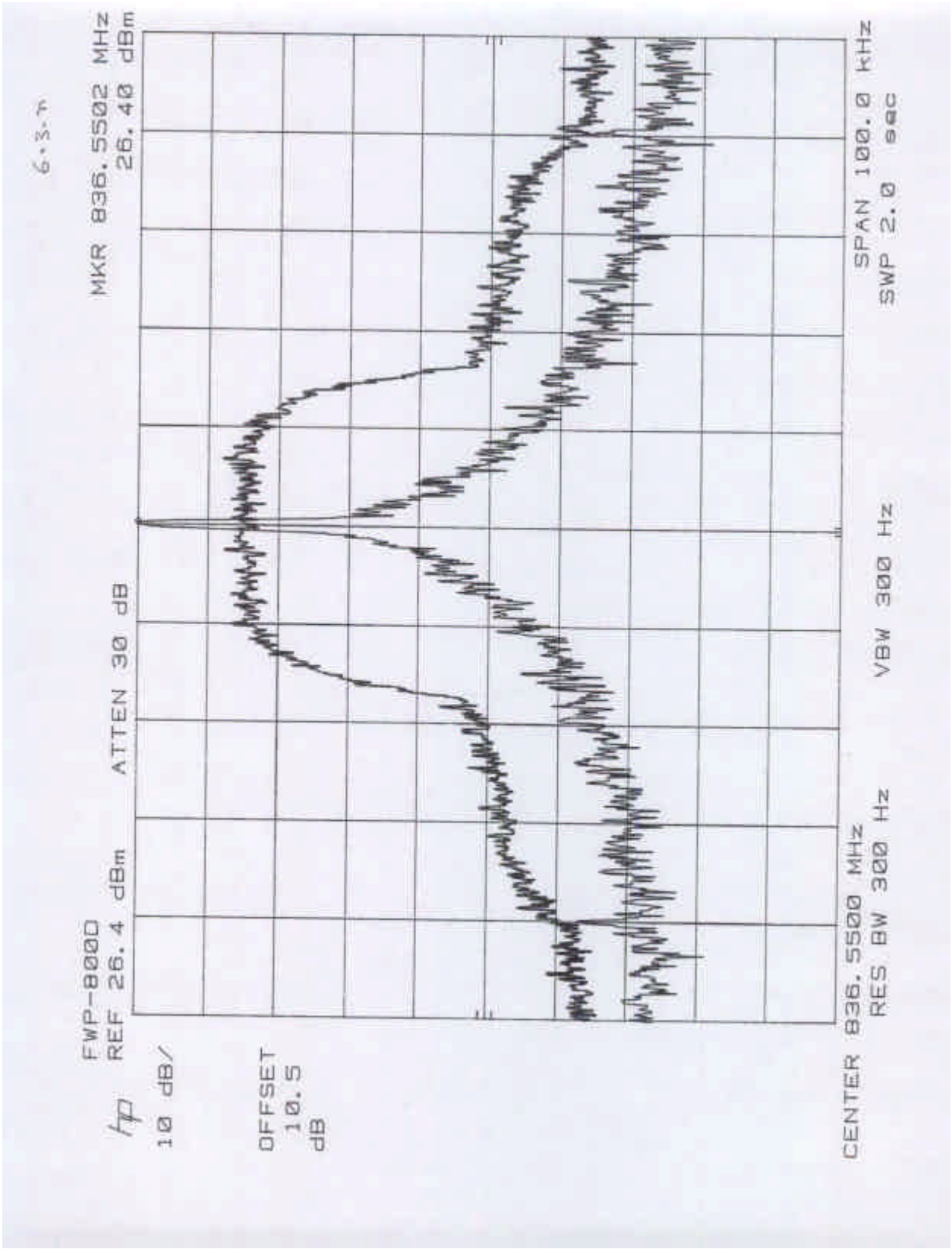

MKR Δ 20.1 kHz
-28.00 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5503 MHz
RES BW 300 Hz

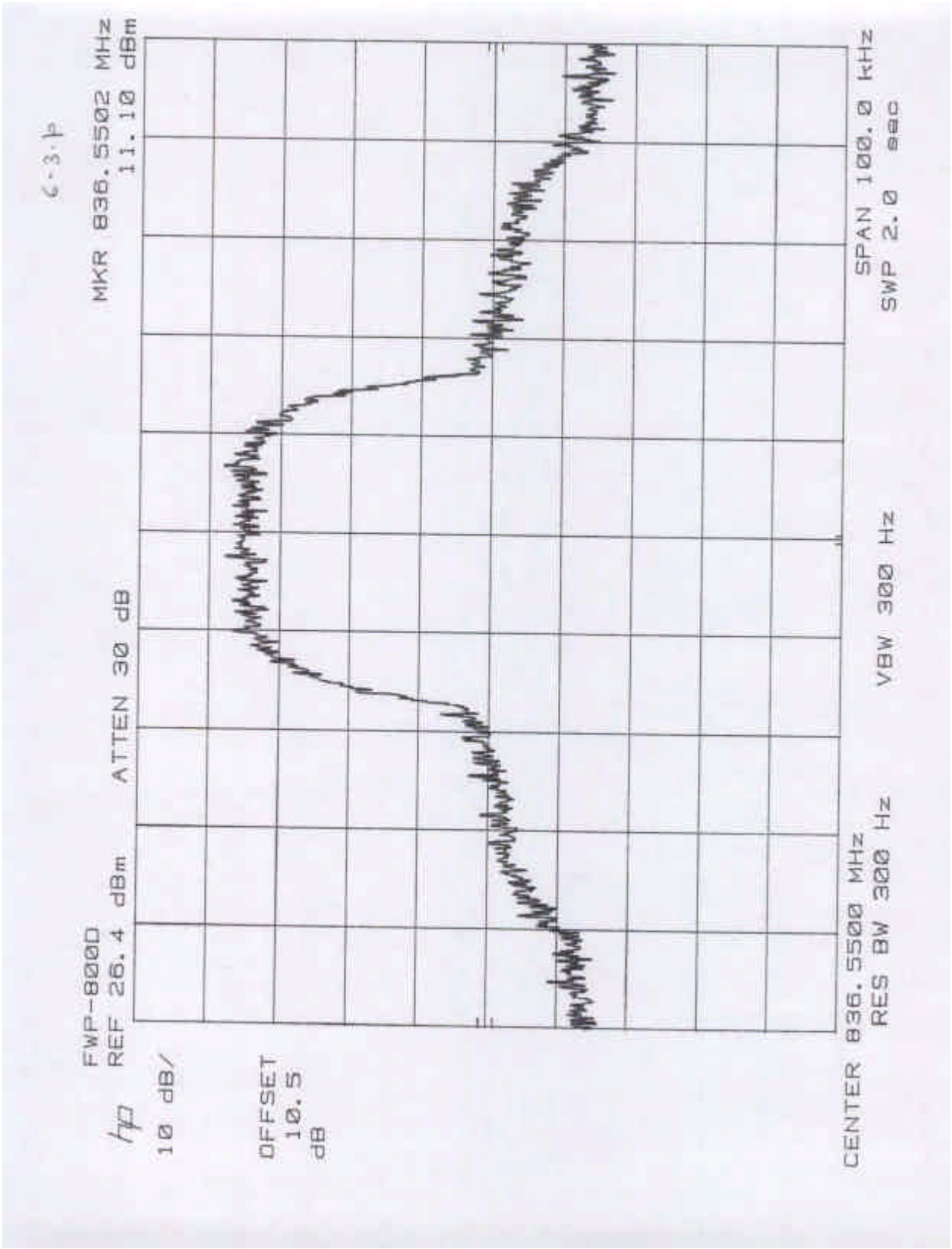

6·3·)
MKR Δ 20.1 kHz
-55.20 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5503 MHz
RES BW 300 Hz


MKR Δ 20.1 kHz
-59.90 dB
SPAN 100.0 kHz
SWP 2.0 sec
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5500 MHz
RES BW 300 Hz


6.3.1
MKR Δ 20.1 kHz
-58.00 dB
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5500 MHz
RES BW 300 Hz


MKR 836.5503 MHz
18.90 dBm
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5500 MHz
RES BW 300 Hz


6.3.7
MKR 836.5502 MHz
26.40 dBm
SPAN 100.0 kHz
SWP 2.0 sec
FWP-800D
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5500 MHz
RES BW 300 Hz


6-3-b
MKR 836.5502 MHz
11.10 dBm
SPAN 100.0 kHz
SWP 2.0 sec
FWP-8000
REF 26.4 dBm
ATTEN 30 dB
VBW 300 Hz
10 dB/
OFFSET
10.5
dB
CENTER 836.5500 MHz
RES BW 300 Hz

7.0 Out of Band Emissions at Antenna Terminals

FCC 22.917(e), 22.917(f), 24.238(a), 24.238(a)

Out of Band Emissions:

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least 43 + 10 log (P) in dB.

Mobile Emissions in Base Frequency Range:

The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed -80 dBm at the transmit antenna connector.

7.1 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 30 kHz. The audio modulating signal was adjusted like it is described in Section 6.1 of this report. Sufficient scans were taken to show the out-of-band emissions if any up to 10th harmonic.

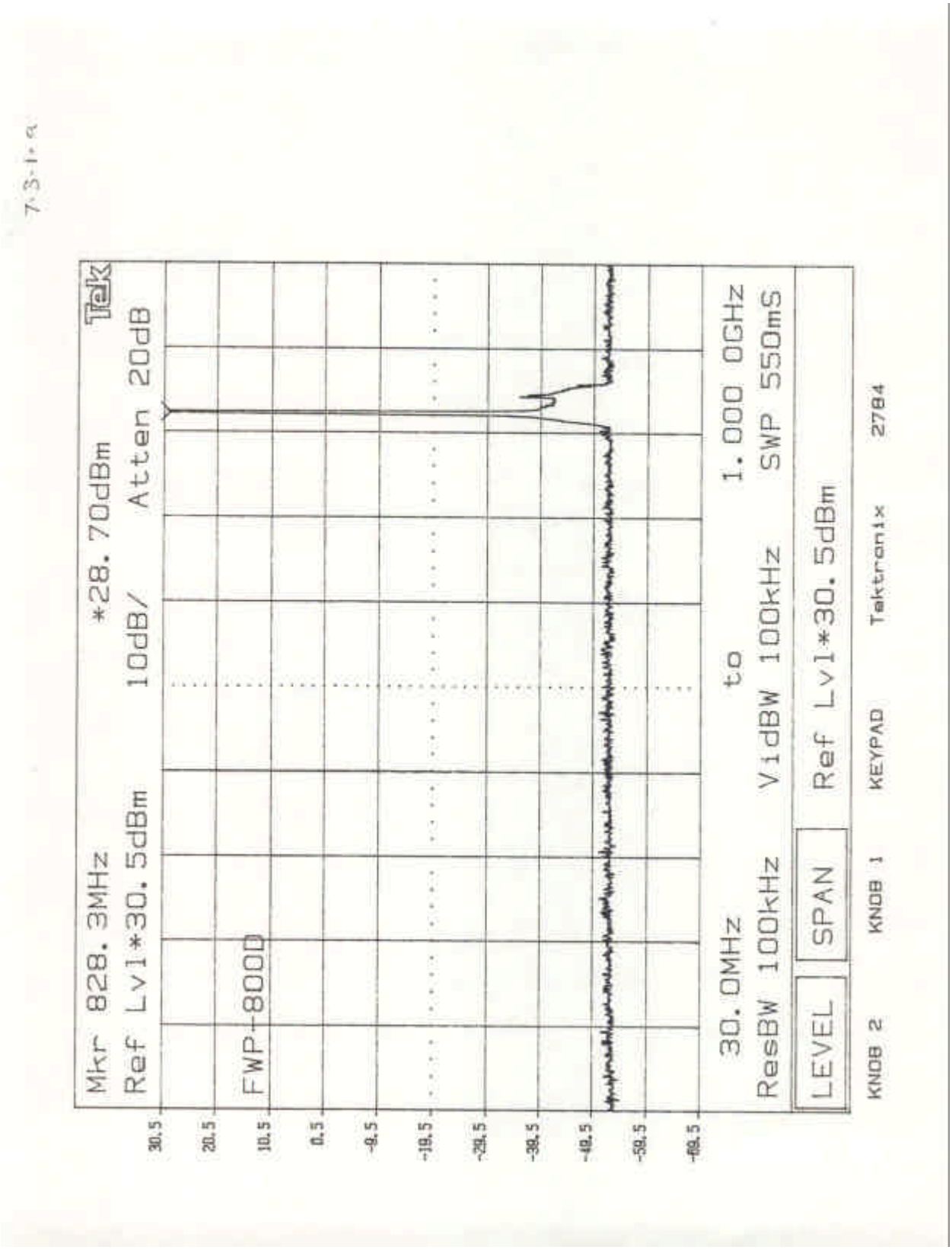
7.2 Test Equipment

HP 8566B Spectrum Analyzer
Leader LFG-1300S Function Generator
Leader LMV-182 AC Millivoltmeter

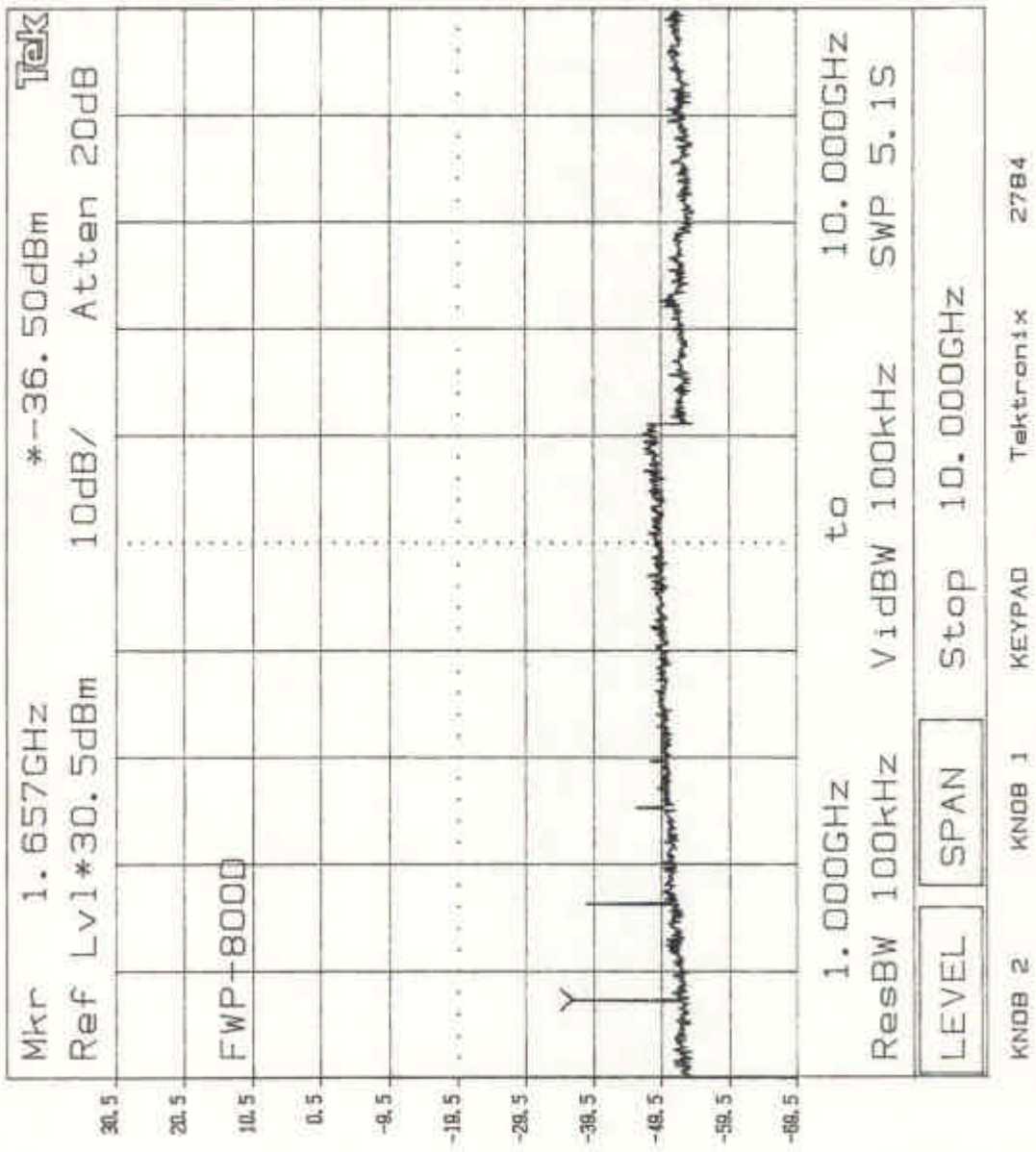
7.3 Test Results

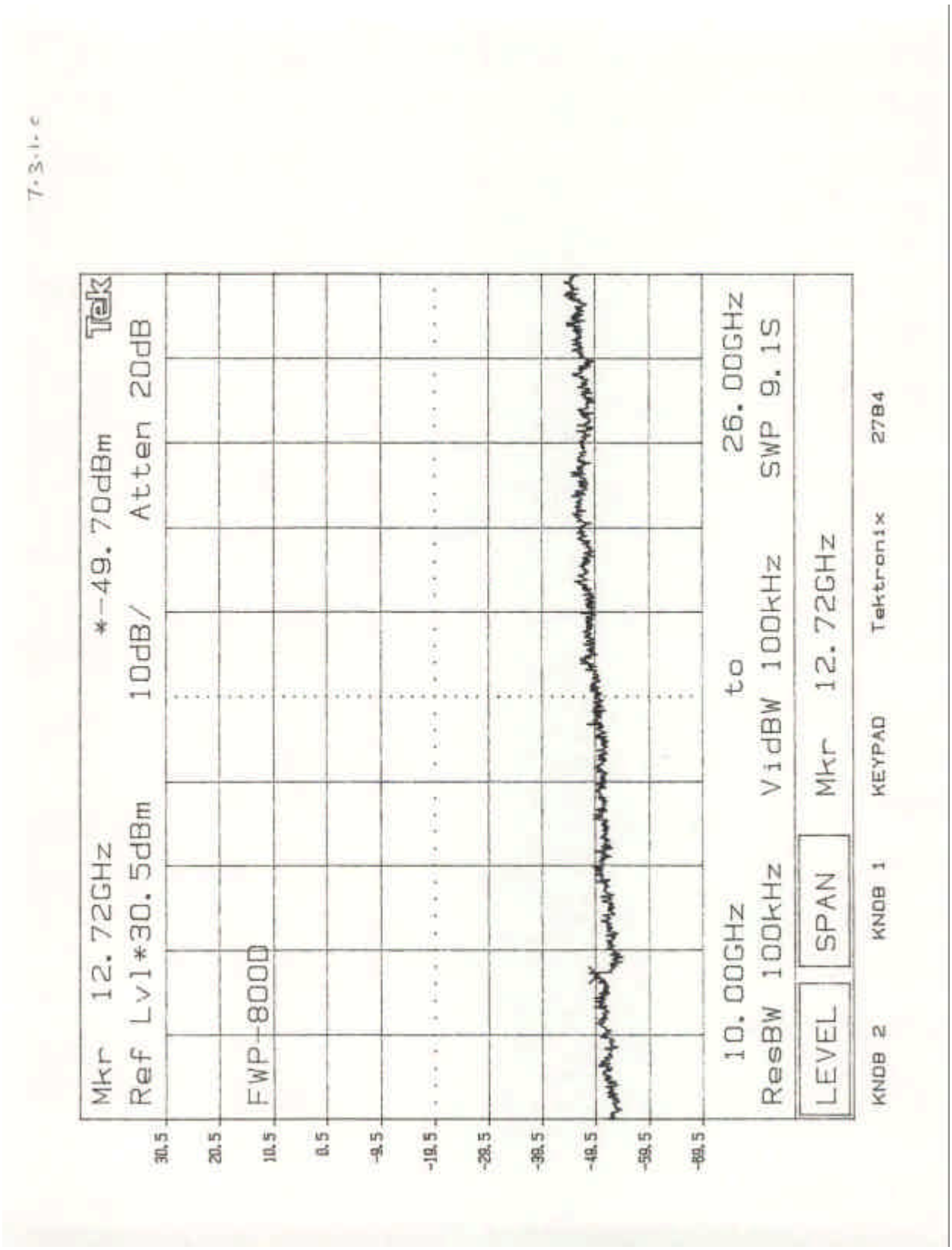
Passed	Refer to the attached plots.

AMPS Mode	
Plot Number	**Description**
7.3.1.a - 7.3.1.c	Low Channel
7.3.2.a - 7.3.2.c	Middle Channel
7.3.3.a - 7.3.3.c	High Channel
7.3.4	Emissions in the receiver band, Low Channel
7.3.5	Emissions in the receiver band, Middle Channel
7.3.6	Emissions in the receiver band , High Channel

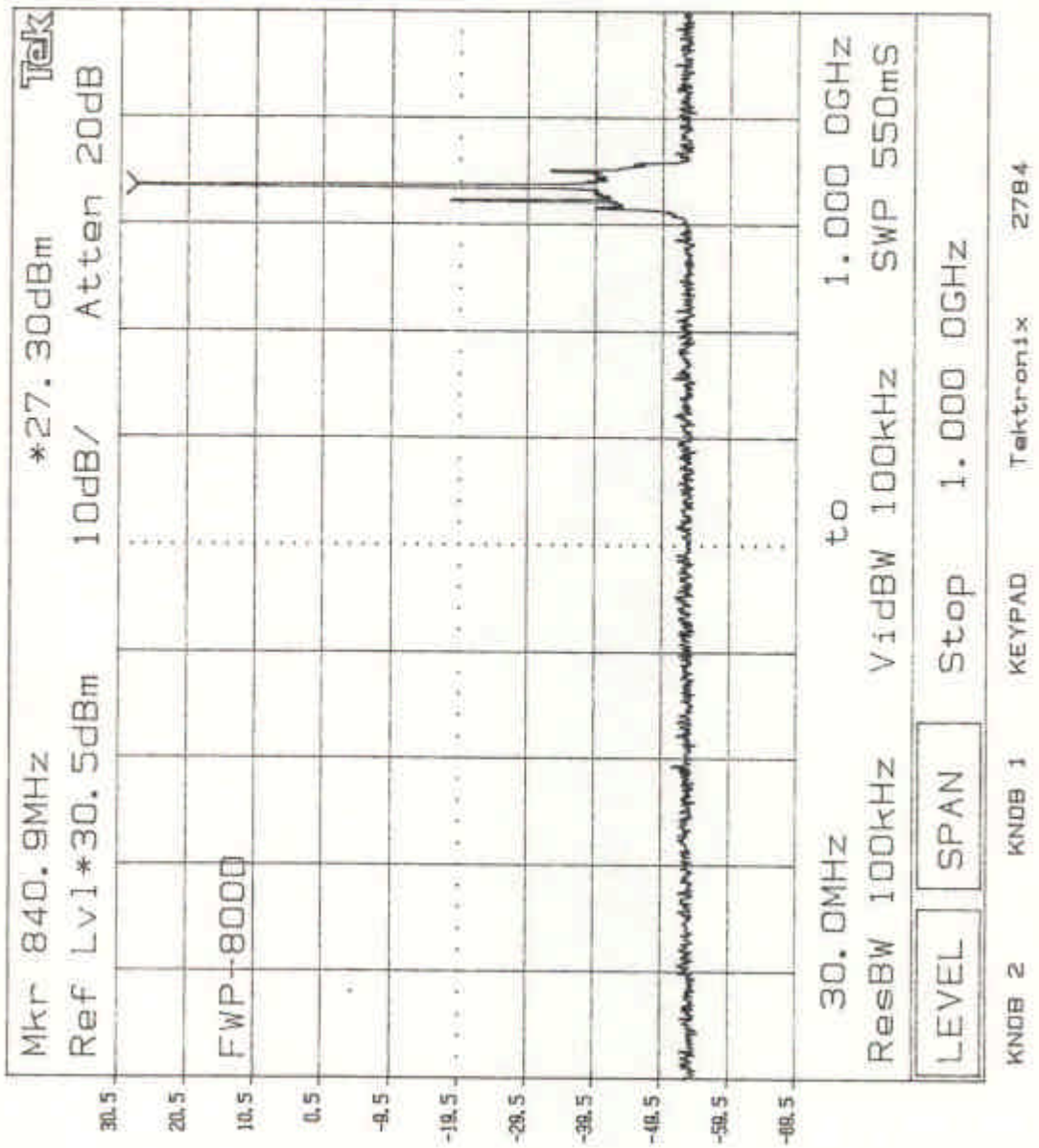

7.3.1.a
Mkr 828.3MHz
*28.70dBm
Ref Lvl*30.5dBm
10dB/
Atten 20dB
FWP+8000
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Ref Lvl*30.5dBm
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

7.3.1.5

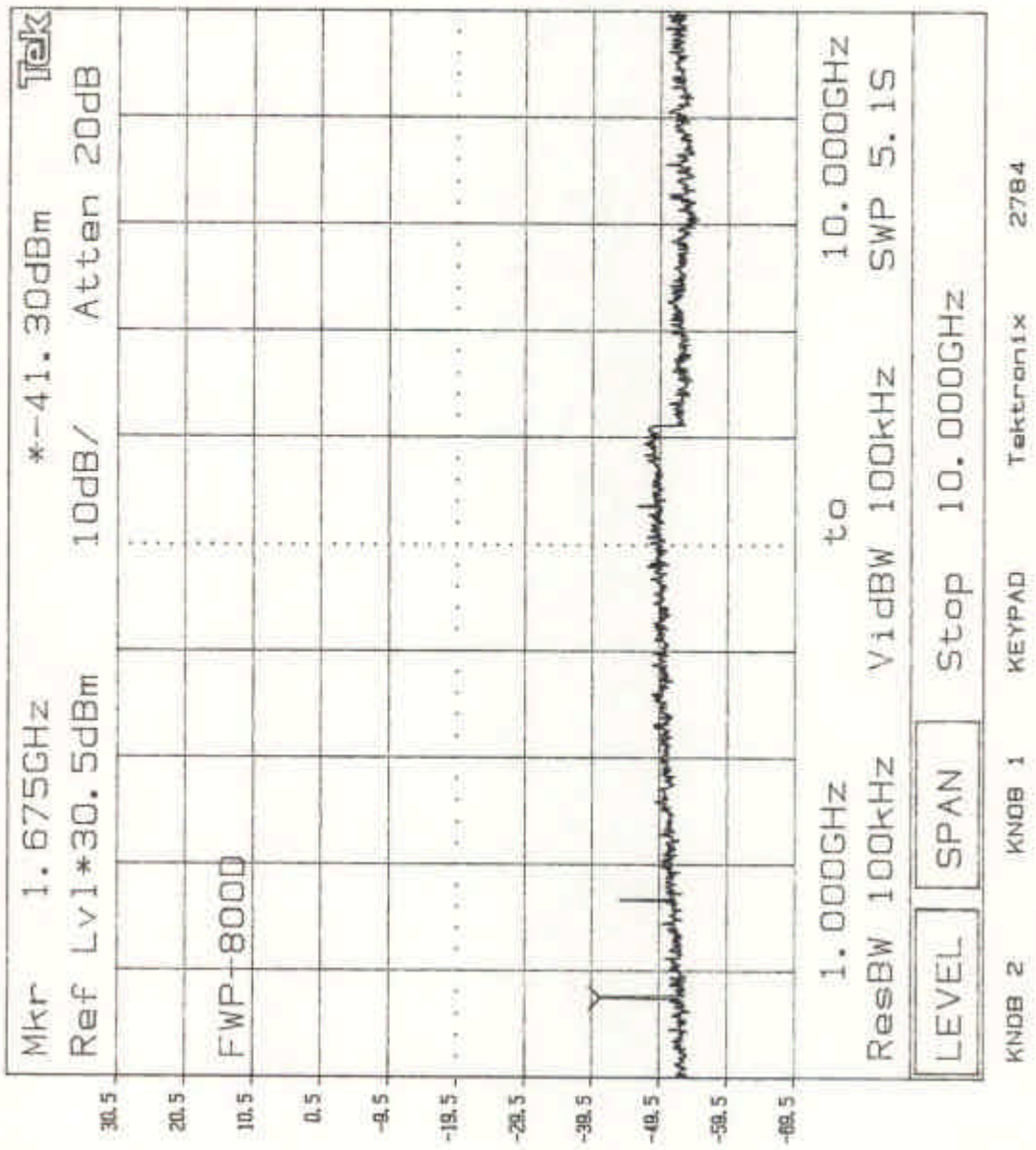

Mkr 1.657GHz
Ref Lvl*30.5dBm
*-36.50dBm
10dB/ Atten 20dB
FWP-8000
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
1.000GHz
ResBW 100kHz
to
10.000GHz
VidBW 100kHz
SWP 5.1S
LEVEL
SPAN
Stop 10.000GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


7.3.1.c
Mkr 12.72GHz
Ref Lvl*30.5dBm
FWP-8000
*-49.70dBm
10dB/
Atten 20dB
Tek
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
10.00GHz
ResBW 100kHz
to
26.00GHz
VidBW 100kHz
SWP 9.1S
LEVEL
SPAN
Mkr 12.72GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

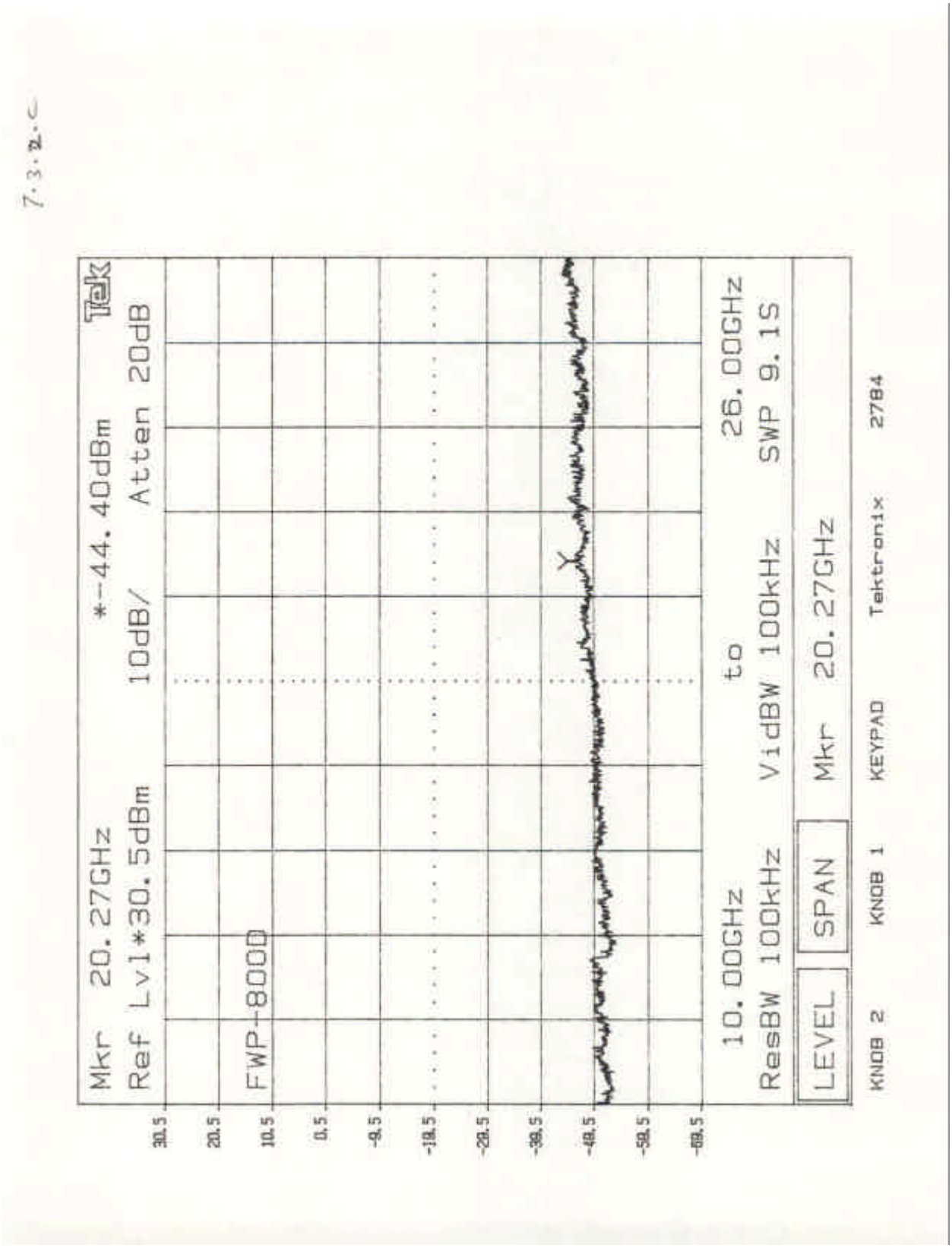
7.3.2.9

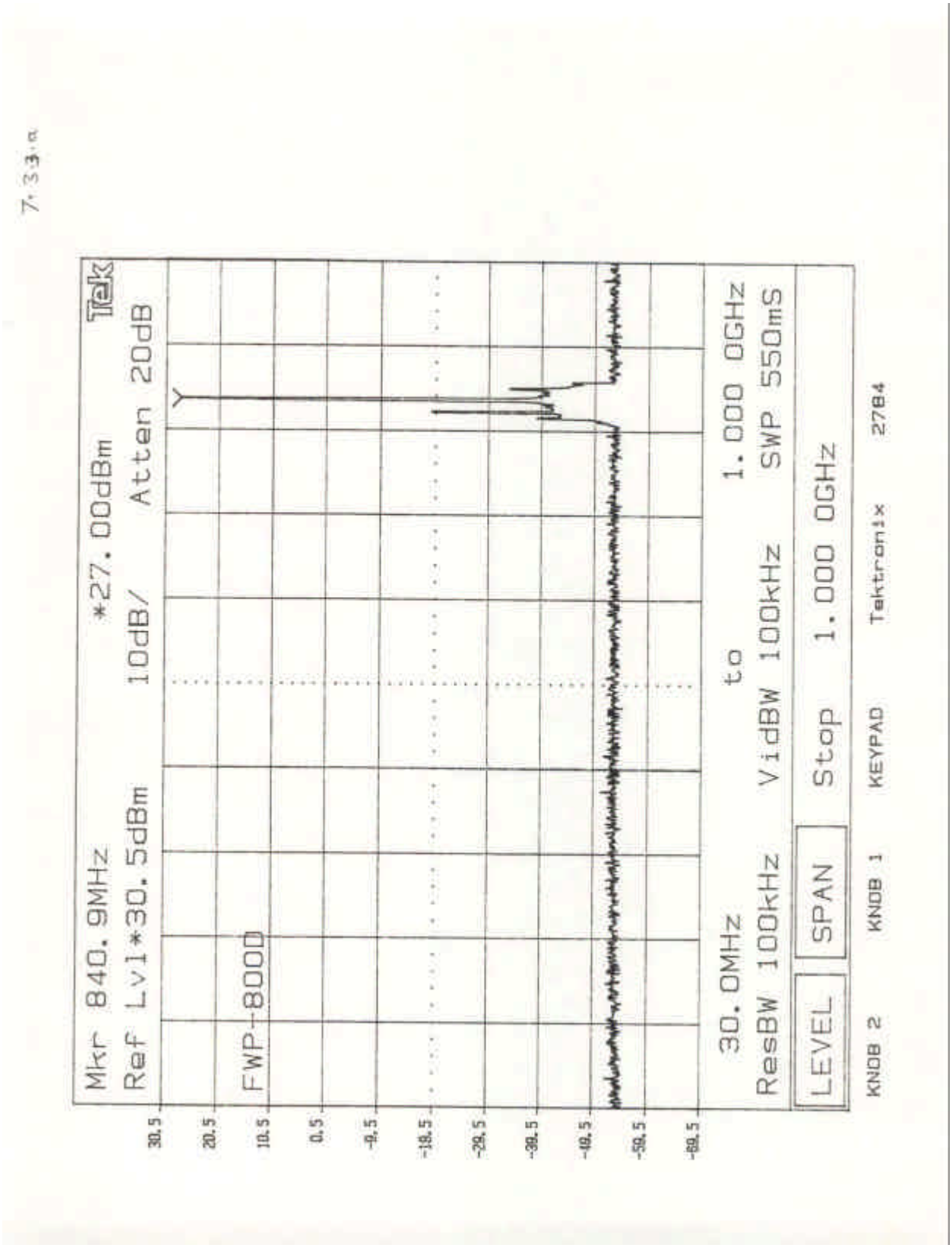

Mkr 840.9MHz
Ref Lvl*30.5dBm
FWP-8000
*27.30dBm
10dB/
Atten 20dB
Tek
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
30.0MHz
ResBW 100kHz
to
1.000 0GHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Stop
1.000 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

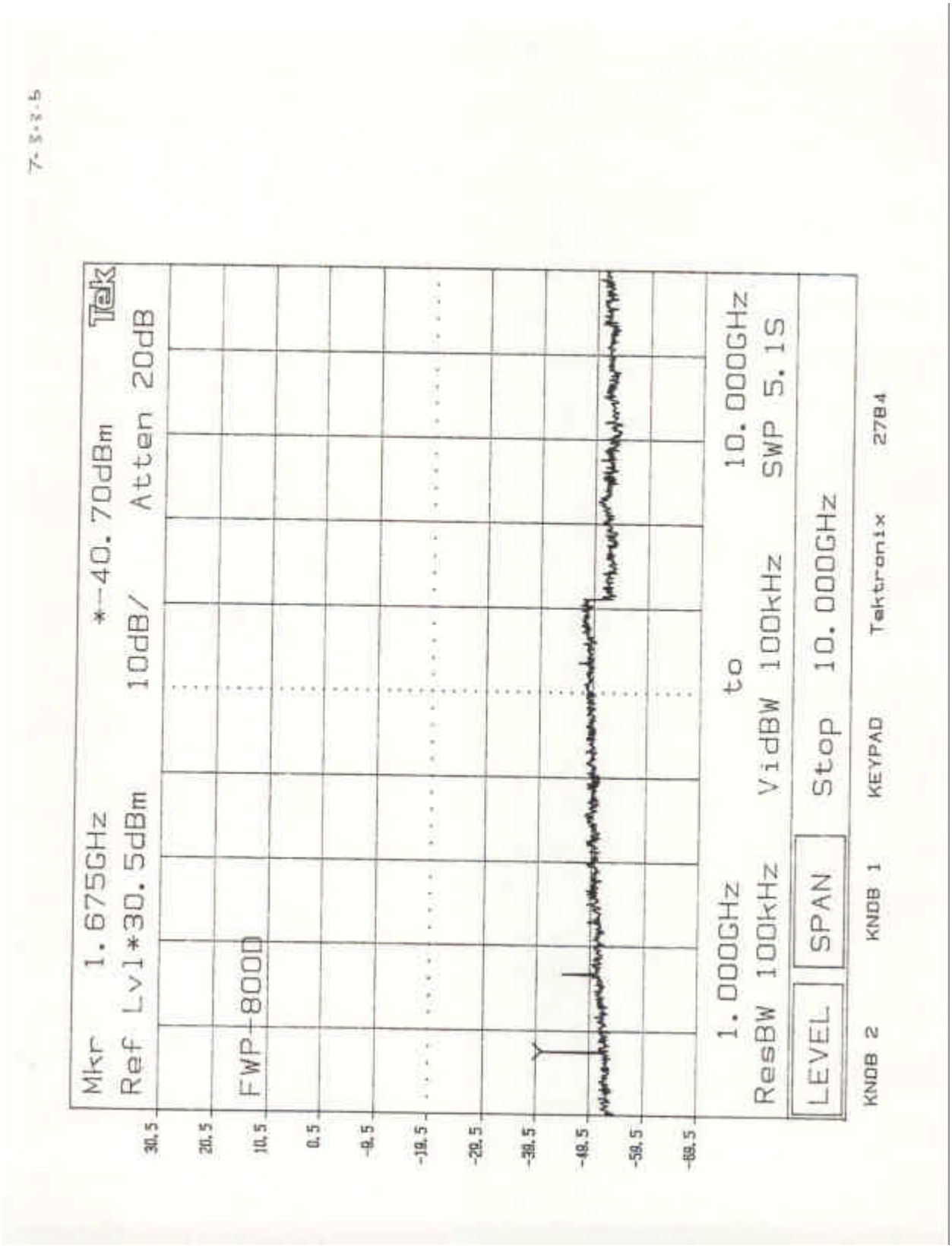
7.3.2.5


Mkr 1.675GHz
*-41.30dBm
Ref Lvl*30.5dBm
10dB/
Atten 20dB
FWP-8000
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
1.000GHz
to
10.000GHz
ResBW 100kHz
VidBW 100kHz
SWP 5.1S
LEVEL
SPAN
Stop 10.000GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

7.3.2.c


Mkr 20.27GHz
*-44.40dBm
Ref Lvl*30.5dBm
10dB/
Atten 20dB
Tek
FWP-8000
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
10.00GHz
to
26.00GHz
ResBW 100kHz
VidBW 100kHz
SWP 9.1S
LEVEL
SPAN
Mkr 20.27GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


7.3.3.a
Mkr 840.9MHz
Ref Lvl*30.5dBm
*27.00dBm
10dB/
Atten 20dB
Tek
FWP-8000
30.5
20.5
10.5
0.5
-9.5
-18.5
-29.5
-39.5
-49.5
-59.5
-69.5
30.0MHz
to
1.000 0GHz
ResBW 100kHz
VidBW 100kHz
SWP 550mS
LEVEL
SPAN
Stop
1.000 0GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784


Mkr 1.675GHz
Ref Lvl*30.5dBm
FWP-8000
*-40.70dBm
10dB/ Atten 20dB
Tek
30.5
20.5
10.5
0.5
-9.5
-19.5
-29.5
-39.5
-49.5
-59.5
-69.5
1.000GHz
ResBW 100kHz
to
10.000GHz
VidBW 100kHz
SWP 5.1S
LEVEL
SPAN
Stop 10.000GHz
KNOB 2
KNOB 1
KEYPAD
Tektronix
2784

8.0 Field Strength of Spurious Radiation

FCC 2.1053

8.1 Test Procedure

The frequency range up to tenth harmonic of each of the three fundamental frequencies (low, middle, and high channels) was investigated.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

At each spurious emission frequency the ERP was measured by the substitution method using a generator and horn antenna. The spurious emissions attenuation was calculated as the difference between ERP in dBm at the fundamental frequency (See Section 3) and at the spurious emissions frequency.

The radiated emissions from digital parts and receiver local oscillator were measured as well.

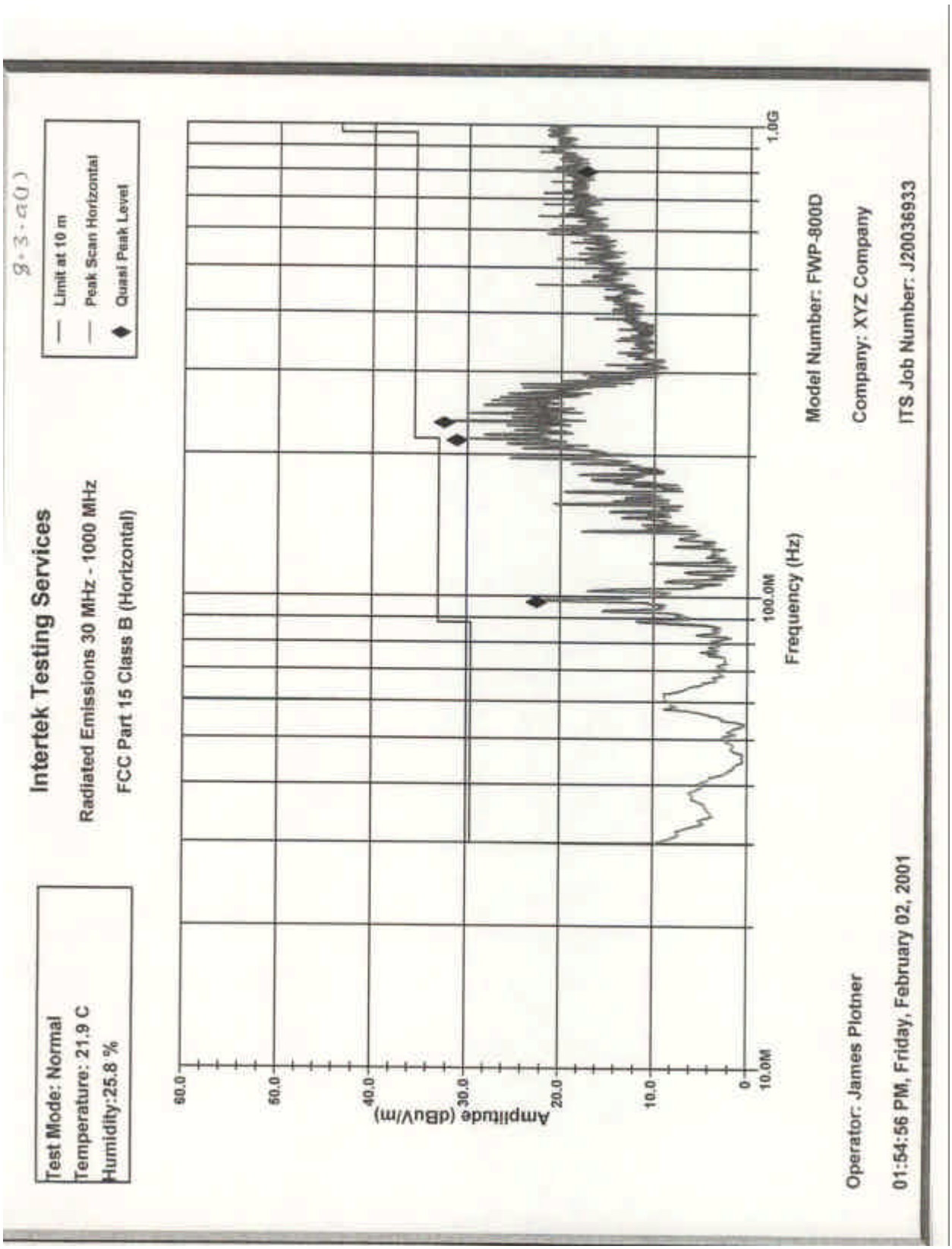
8.2 Test Equipment

EMCO 3143 Bilog Antenna
EMCO 3115 Horn Antenna
HP 8566B Spectrum Analyzer
Tektronix 2782 Spectrum Analyzer
Low Pass Filter
Preamplifiers

8.3 Test Results

Test Result:	Passed, refer to the attached data sheets.

Data Sheet No	Description
8.3.a	Radiated Emissions FCC 15B
8.3.b	Radiated Emissions, Receiver LO & Harmonics
8.3.c	Radiated Emissions Harmonics, AMPS Low Channel
8.3.d	Radiated Emissions Harmonics, AMPS Mid Channel
8.3.e	Radiated Emissions Harmonics, AMPS High Channel
8.3.f	Radiated Emissions Harmonics, TDMA Low Channel
8.3.g	Radiated Emissions Harmonics, TDMA Mid Channel
8.3.h	Radiated Emissions Harmonics, TDMA High Channel
8.3.i	Radiated Emissions by substitution method, Low Channel
8.3.j	Radiated Emissions by substitution method, Mid Channel
8.3.k	Radiated Emissions by substitution method, High Channel


9-3-a(1)
Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (Horizontal)
Limit at 10 m
Peak Scan Horizontal
Quasi Peak Level
Test Mode: Normal
Temperature: 21.9 C
Humidity:25.8 %
Amplitude (dBuV/m)
90.0
50.0
40.0
30.0
20.0
10.0
0
10.0M
100.0M
1.0G
Frequency (Hz)
Model Number: FWP-800D
Company: XYZ Company
ITS Job Number: J20036933
Operator: James Plotner
01:54:56 PM, Friday, February 02, 2001

2-3-402

Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (QP-Horizontal)

Operator: James Plotner
Model Number: FWP-8000
ITS Job Number: JZ0036933
Company: XYZ Company

02:45:21 PM, Friday, February 02, 2001

	1	2	3	4	5	6	7	
Frequency	QP Level	Limit@10m	QP Margin	Raw	Antenna	Cable	Preamp	
MHz	(dBuV/m)		(dB)	(dBuV)	(dB)	(dB)	(dB)	
97.2078 MHz	22.5	33.0	-10.5	44.6	6.5	1.2	32.7	
213.8513 MHz	31.1	33.0	-1.9	49.7	10.2	1.8	33.6	
233.2913 MHz	32.4	35.5	-3.1	50.8	10.5	1.9	33.7	
797.05 MHz	17.4	35.5	-18.1	22.0	22.0	4.1	33.7	

Test Mode: Normal
Temperature: 21.9 C
Humidity:25.8 %

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Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (QP-Vertical)

Operator: James Plotner
Model Number: FWP-800D
ITS Job Number: J20036933
Company: XYZ Company

02:55:53 PM, Friday, February 02, 2001

	1	2	3	4	5	6	7	
Frequency	QP Level	Limit@10m	QP Margin	Raw	Antenna	Cable	Preamp	
MHz	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	(dB)	
97.2078 MHz	20.0	33.0	-13.0	42.9	5.6	1.2	32.7	
155.5288 MHz	25.4	33.0	-7.6	43.7	8.9	1.6	31.8	
233.2876 MHz	29.8	35.5	-5.7	46.9	11.7	1.9	33.7	
252.7275 MHz	26.8	35.5	-8.7	42.8	12.7	2.1	33.7	

Test Mode: Normal
Temperature: 21.9 C
Humidity:25.8 %

Page 1

Data Sheets
8.3.b

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D	**Standard_**	**FCC § 15B**	
EUT:	Fixed wireless Phone	**S/N #:**	X	**Limits_**	2	
Project #:		**Test Date:**	Feb 1, 2001	**Test Distance_**	3	meters
Test Mode:	Receiver Los	**Engineer:**	SureshK	**Duty Relaxation**	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	14	0	5	8	0	21	0	0	0
Model:	EM LPA-25	EMCO 3115	None	CDI P950	CDI P1000	None	Grn M+L	None	None	None

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
988.68	23.8	Peak	7	5	V	23.8	9.4	2.3	0.0	40.5	54.0	-13.5
1837.58	24.4	Peak	14	8	V	26.6	29.3	3.1	0.0	24.8	54.0	-29.2
1001.19	23.6	Peak	14	8	V	26.2	30.3	2.3	0.0	21.8	54.0	-32.2
2002.38	30.1	Peak	14	8	V	30.1	29.1	2.3	0.0	33.4	54.0	-20.6
1013.61	22.6	Peak	14	8	V	26.2	30.3	2.3	0.0	20.8	54.0	-33.2
2014.80	22.9	Peak	14	8	V	30.1	29.1	2.3	0.0	26.2	54.0	-27.8

Notes:	
	a) D.C.F.:Distance Correction Factor
	b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
	c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).
	d) Negative signs (-) in Margin column signify levels below the limits.
	e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

8.3.C

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Jan 29, 2001		TP	0.60	Watt
Test Mode:	Tx@824.04MHz AMPS	**Engineer:**	SureshK		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used	
Number:	7	8	12	8	3	13	21	0	0	0	
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None	
Frequency	**Reading**	**Detector**	**Ant.**	**Amp.**	**Ant. Pol.**	**Ant. Factor**	**Pre-Amp**	**Insert. Loss**	**Net**	**ERP**	**Attn.**	**Margin**
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
824.04	107.4	Peak	7	0	V	21.9	0.0	2.0	131.3	2.47E+03	0.0	N/A
1648.08	36.8	Peak	8	0	V	26.7	0.0	3.0	66.5	8.15E-04	64.8	-24.0
1648.08	29.3	Ave.	8	0	V	26.7	0.0	3.0	59.0	1.45E-04	72.3	-31.5
2472.12	47.0	Peak	8	8	V	29.1	28.5	2.3	49.9	1.78E-05	81.4	-40.6
2472.12	45.1	Ave.	8	8	V	29.1	28.5	2.3	48.0	1.15E-05	83.3	-42.5
3296.16	43.7	Peak	8	8	V	31.3	27.9	2.5	49.6	1.66E-05	81.7	-40.9
3296.16	41.3	Ave.	8	8	V	31.3	27.9	2.5	47.2	9.58E-06	84.1	-43.3
4120.20	32.8	Peak	8	8	V	34.5	27.9	2.9	42.3	3.11E-06	89.0	-48.2
4120.20	21.5	Ave.	8	8	V	34.5	27.9	2.9	31.0	2.30E-07	100.3	-59.5
4944.24	33.3	Peak	8	8	V	34.0	28.1	3.2	42.4	3.17E-06	88.9	-48.1
4944.24	21.9	Ave.	8	8	V	34.0	28.1	3.2	31.0	2.30E-07	100.3	-59.5
5768.28	35.7	Peak	8	8	V	36.6	28.3	3.7	47.7	1.07E-05	83.6	-42.8
5768.28	25.8	Ave.	8	8	V	36.6	28.3	3.7	37.8	1.10E-06	93.5	-52.7
6592.32	33.7	Peak	8	8	V	36.4	28.0	4.2	46.3	7.79E-06	85.0	-44.2
6592.32	22.0	Ave.	8	8	V	36.4	28.0	4.2	34.6	5.26E-07	96.7	-55.9
7416.36	32.0*	Peak	8	8	V	37.0	28.0	4.3	45.3	6.18E-06	86.0	-45.2
7416.36	20.8*	Ave.	8	8	V	37.0	28.0	4.3	34.1	4.69E-07	97.2	-56.4
8240.04	33.0*	Peak	8	8	V	37.5	27.2	4.8	48.1	1.18E-05	83.2	-42.4
8240.04	20.7*	Ave.	8	8	V	37.5	27.2	4.8	35.8	6.94E-07	95.5	-54.7

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.
f) *Noise floor level

8.3.D

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Jan 29, 2001		TP	0.60	Watt
Test Mode:	TX@836.55MHz AMPS	**Engineer:**	Suresh k		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	8	12	8	3	13	21	0	0	0
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None

2

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
836.55	104.4	Peak	7	0	V	22.2	0.0	2.0	128.6	1.33E+03	0.0	N/A
1673.10	36.5	Peak	8	0	V	26.7	0.0	3.0	66.2	7.63E-04	62.4	-21.6
1673.10	35.8	Ave.	8	0	V	26.7	0.0	3.0	65.5	6.48E-04	63.1	-22.3
2509.65	52.4	Peak	8	8	V	30.6	28.5	2.3	56.8	8.74E-05	71.8	-31.0
2509.65	51.6	Ave.	8	8	V	30.6	28.5	2.3	56.0	7.27E-05	72.6	-31.8
3346.20	37.1	Peak	8	8	V	31.3	27.9	2.5	43.0	3.64E-06	85.6	-44.8
3346.20	27.7	Ave.	8	8	V	31.3	27.9	2.5	33.6	4.18E-07	95.0	-54.2
4182.75	34.2	Peak	8	8	V	34.5	27.9	2.9	43.7	4.28E-06	84.9	-44.1
4182.75	21.9	Ave.	8	8	V	34.5	27.9	2.9	31.4	2.52E-07	97.2	-56.4
5019.30	33.4	Peak	8	8	V	35.4	28.3	3.5	44.0	4.58E-06	84.6	-43.8
5019.30	21.9	Ave.	8	8	V	35.4	28.3	3.5	32.5	3.25E-07	96.1	-55.3
5855.85	39.9	Peak	8	8	V	36.6	28.3	3.7	51.9	2.83E-05	76.7	-35.9
5855.85	34.7	Ave.	8	8	V	36.6	28.3	3.7	46.7	8.54E-06	81.9	-41.1
6692.40	32.9	Peak	8	8	V	36.4	28.0	4.2	45.5	6.48E-06	83.1	-42.3
6692.40	21.8	Ave.	8	8	V	36.4	28.0	4.2	34.4	5.03E-07	94.2	-53.4
7528.95	32.4*	Peak	8	8	V	37.8	28.0	4.6	46.8	8.74E-06	81.8	-41.0
7528.95	21.6*	Ave.	8	8	V	37.8	28.0	4.6	36.0	7.27E-07	92.6	-51.8
8365.50	32.2*	Peak	8	8	V	37.5	27.2	4.8	47.3	9.80E-06	81.3	-40.5
8365.50	21.3*	Ave.	8	8	V	37.5	27.2	4.8	36.4	7.97E-07	92.2	-51.4

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.
f) * Noise Floor level

8.3.E

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Jan 29, 2001		TP	0.60	Watt
Test Mode:	TX@848.975MHz AMPS	**Engineer:**	Suresh K		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	8	12	8	3	13	21	0	0	0
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None

2

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
848.97	104.4	Peak	7	0	V	22.0	0.0	2.0	128.4	1.27E+03	0.0	N/A
1697.94	37.5	Peak	8	0	V	26.7	0.0	3.0	67.2	9.58E-04	61.2	-20.4
1697.94	35.3	Ave.	8	0	V	26.7	0.0	3.0	65.0	5.77E-04	63.4	-22.6
2546.91	55.6	Peak	8	8	V	30.6	28.5	2.3	60.0	1.83E-04	68.4	-27.6
2546.91	54.8	Ave.	8	8	V	30.6	28.5	2.3	59.2	1.52E-04	69.2	-28.4
3395.88	47.3	Peak	8	8	V	31.3	27.9	2.5	53.2	3.81E-05	75.2	-34.4
3395.88	45.9	Ave.	8	8	V	31.3	27.9	2.5	51.8	2.76E-05	76.6	-35.8
4244.85	38.2	Peak	8	8	V	34.5	27.9	2.9	47.7	1.07E-05	80.7	-39.9
4244.85	33.1	Ave.	8	8	V	34.5	27.9	2.9	42.6	3.32E-06	85.8	-45.0
5093.82	35.9	Peak	8	8	V	35.4	28.3	3.5	46.5	8.15E-06	81.9	-41.1
5093.82	28.1	Ave.	8	8	V	35.4	28.3	3.5	38.7	1.35E-06	89.7	-48.9
5942.79	49.3	Peak	8	8	V	36.6	28.3	3.7	61.3	2.46E-04	67.1	-26.3
5942.79	48.1	Ave.	8	8	V	36.6	28.3	3.7	60.1	1.87E-04	68.3	-27.5
6791.76	37.2	Peak	8	8	V	36.4	28.0	4.2	49.8	1.74E-05	78.6	-37.8
6791.76	31.5	Ave.	8	8	V	36.4	28.0	4.2	44.1	4.69E-06	84.3	-43.5
7640.73	33.3	Peak	8	8	V	37.8	27.8	4.6	47.9	1.13E-05	80.5	-39.7
7640.73	22.0	Ave.	8	8	V	37.8	27.8	4.6	36.6	8.34E-07	91.8	-51.0
8489.70	45.3	Peak	8	8	V	37.5	27.1	4.8	60.5	2.05E-04	67.9	-27.1
8489.70	43.3	Ave.	8	8	V	37.5	27.1	4.8	58.5	1.29E-04	69.9	-29.1

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.

8.3.F

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Feb 1, 2001		TP	0.60	Watt
Test Mode:	Tx@824.04MHz TDMA	**Engineer:**	Suresh K		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	14	12	8	3	13	21	0	0	0
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None

2

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
824.04	105.6	Peak	7	0	V	21.9	0.0	2.0	129.5	1.63E+03	0.0	N/A
1648.08	39.7	Peak	14	0	V	26.6	0.0	3.0	69.3	1.55E-03	60.2	-19.4
1648.08	24.2	Ave.	14	0	V	26.6	0.0	3.0	53.8	4.39E-05	75.7	-34.9
2472.12	42.2	Peak	14	8	V	30.1	28.5	2.3	46.1	7.45E-06	83.4	-42.6
2472.12	25.5	Ave.	14	8	V	30.1	28.5	2.3	29.4	1.59E-07	100.1	-59.3
3296.16	41.4	Peak	14	8	V	31.3	27.9	2.5	47.3	9.80E-06	82.2	-41.4
3296.16	27.5	Ave.	14	8	V	31.3	27.9	2.5	33.4	4.00E-07	96.1	-55.3
4120.20	33.0	Peak	14	8	V	34.2	27.9	2.9	42.2	3.04E-06	87.3	-46.5
4120.20	21.3	Ave.	14	8	V	34.2	27.9	2.9	30.5	2.05E-07	99.0	-58.2
4944.24	34.3	Peak	14	8	V	33.9	28.1	3.2	43.3	3.90E-06	86.2	-45.4
4944.24	22.3	Ave.	14	8	V	33.9	28.1	3.2	31.3	2.47E-07	98.2	-57.4
5768.28	39.7	Peak	14	8	V	36.1	28.3	3.7	51.2	2.41E-05	78.3	-37.5
5768.28	26.1	Ave.	14	8	V	36.1	28.3	3.7	37.6	1.05E-06	91.9	-51.1
6592.32	35.0	Peak	14	8	V	36.4	28.0	4.2	47.6	1.05E-05	81.9	-41.1
6592.32	22.1	Ave.	14	8	V	36.4	28.0	4.2	34.7	5.40E-07	94.8	-54.0
7416.36	32.6	Peak	14	8	V	38.0	28.0	4.3	46.9	8.96E-06	82.6	-41.8
7416.36	20.8	Ave.	14	8	V	38.0	28.0	4.3	35.1	5.91E-07	94.4	-53.6
8240.04	33.0	Peak	14	8	V	37.9	27.2	4.8	48.5	1.29E-05	81.0	-40.2
8240.04	20.7	Ave.	14	8	V	37.9	27.2	4.8	36.2	7.61E-07	93.3	-52.5

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.

8.3.G

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Feb 1, 2001		TP	0.60	Watt
Test Mode:	TX@836.55MHz TDMA	**Engineer:**	Suresh K		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	14	12	8	3	13	21	0	0	0
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None

2

Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
836.55	106.1	Peak	7	0	V	22.2	0.0	2.0	130.3	1.96E+03	0.0	N/A
1673.10	37.5	Peak	14	0	V	26.6	0.0	3.0	67.1	9.36E-04	63.2	-22.4
1673.10	21.3	Ave.	14	0	V	26.6	0.0	3.0	50.9	2.25E-05	79.4	-38.6
2509.65	54.9	Peak	14	8	V	30.4	28.5	2.3	59.1	1.48E-04	71.2	-30.4
2509.65	33.2	Ave.	14	8	V	30.4	28.5	2.3	37.4	1.00E-06	92.9	-52.1
3346.20	45.7	Peak	14	8	V	31.3	27.9	2.5	51.6	2.64E-05	78.7	-37.9
3346.20	29.5	Ave.	14	8	V	31.3	27.9	2.5	35.4	6.33E-07	94.9	-54.1
4182.75	34.0	Peak	14	8	V	34.2	27.9	2.9	43.2	3.82E-06	87.1	-46.3
4182.75	22.5	Ave.	14	8	V	34.2	27.9	2.9	31.7	2.71E-07	98.6	-57.8
5019.30	33.2	Peak	14	8	V	35.4	28.3	3.5	43.8	4.38E-06	86.5	-45.7
5019.30	22.0	Ave.	14	8	V	35.4	28.3	3.5	32.6	3.33E-07	97.7	-56.9
5855.85	38.4	Peak	14	8	V	36.1	28.3	3.7	49.9	1.78E-05	80.4	-39.6
5855.85	24.9	Ave.	14	8	V	36.1	28.3	3.7	36.4	7.99E-07	93.9	-53.1
6692.40	33.6	Peak	14	8	V	36.4	28.0	4.2	46.2	7.61E-06	84.1	-43.3
6692.40	22.6	Ave.	14	8	V	36.4	28.0	4.2	35.2	6.04E-07	95.1	-54.3
7528.95	32.4	Peak	14	8	V	37.8	28.0	4.6	46.8	8.74E-06	83.5	-42.7
7528.95	21.6	Ave.	14	8	V	37.8	28.0	4.6	36.0	7.27E-07	94.3	-53.5
8365.50	32.2	Peak	14	8	V	37.9	27.2	4.8	47.7	1.07E-05	82.6	-41.8
8365.50	21.3	Ave.	14	8	V	37.9	27.2	4.8	36.8	8.74E-07	93.5	-52.7

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.

8.3.H

Radiated Emissions Test Data

Company:	Wireless Link	**Model #:**	FWP-800D		Req.	FCC 2.993	
EUT:	Fixed Wireless Phone	**S/N or FCC #:**			Test Dist.	3	meters
Project #:	J20036933	**Test Date:**	Feb 1, 2001		TP	0.60	Watt
Test Mode:	TX@848.975MHz TDMA	**Engineer:**	Suresh k		Min. Attn.	40.78	dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	7	14	12	8	3	13	21	0	0	0
Model:	EM LPA-25	EMCO 3115	EMCO 3104	CDI P1000	MC 15542	ACO/400	Grn M+L	None	None	None

2

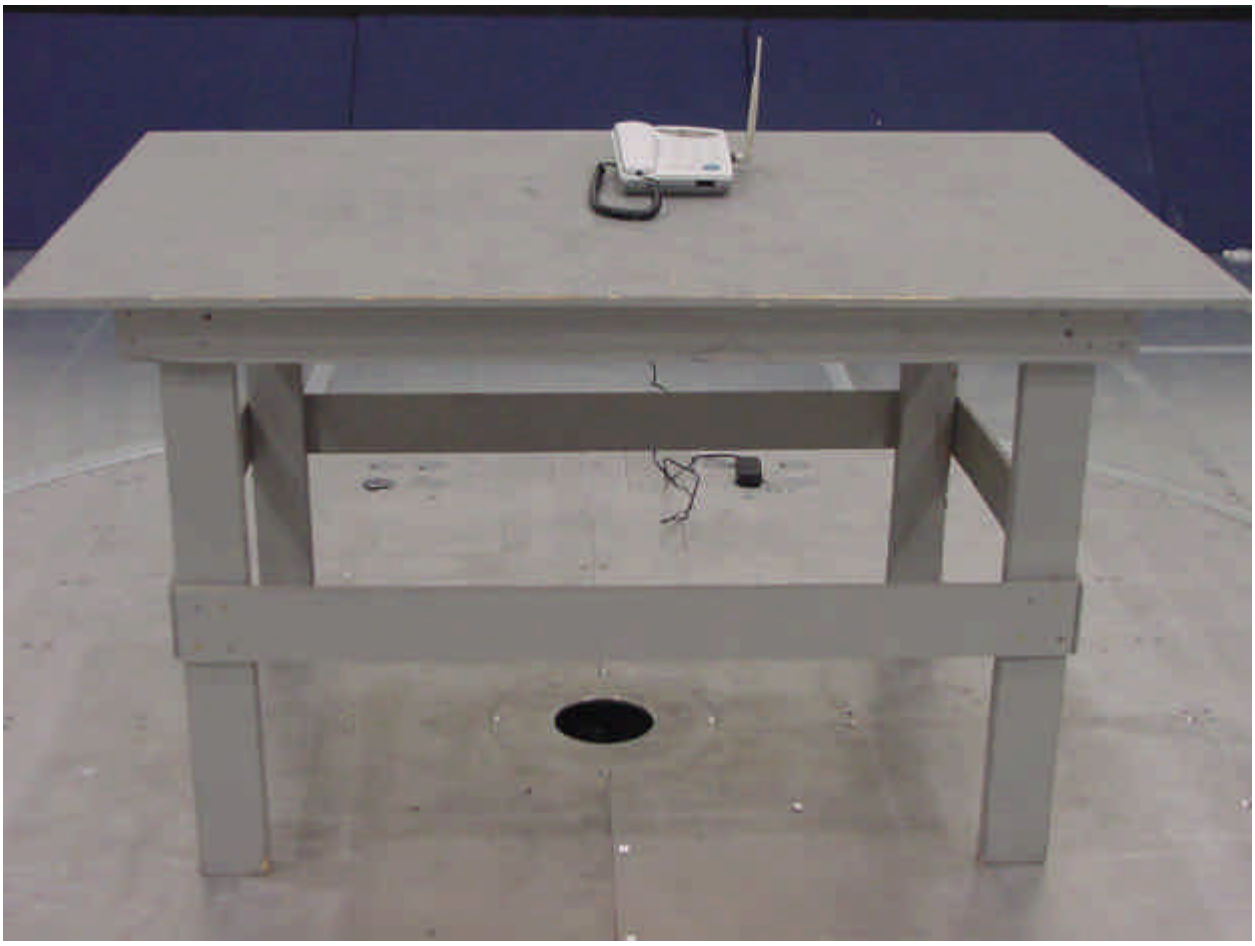
Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB(µV/m)	mW	dBc	dB
848.97	105.0	Peak	7	0	V	22.0	0.0	2.0	129.0	1.45E+03	0.0	N/A
1697.94	39.0	Peak	14	0	V	26.6	0.0	3.0	68.6	1.32E-03	60.4	-19.6
1697.94	23.0	Ave.	14	0	V	26.6	0.0	3.0	52.6	3.33E-05	76.4	-35.6
2546.91	57.5	Peak	14	8	V	30.4	28.5	2.3	61.7	2.70E-04	67.3	-26.5
2546.91	37.2	Ave.	14	8	V	30.4	28.5	2.3	41.4	2.53E-06	87.6	-46.8
3395.88	38.5	Peak	14	8	V	31.3	27.9	2.5	44.4	5.03E-06	84.6	-43.8
3395.88	24.0	Ave.	14	8	V	31.3	27.9	2.5	29.9	1.79E-07	99.1	-58.3
4244.85	36.0	Peak	14	8	V	34.2	27.9	2.9	45.2	6.06E-06	83.8	-43.0
4244.85	24.2	Ave.	14	8	V	34.2	27.9	2.9	33.4	4.00E-07	95.6	-54.8
5093.82	29.3	Peak	14	8	V	35.4	28.3	3.5	39.9	1.79E-06	89.1	-48.3
5093.82	22.2	Ave.	14	8	V	35.4	28.3	3.5	32.8	3.49E-07	96.2	-55.4
5942.79	47.8	Peak	14	8	V	36.1	28.3	3.7	59.3	1.56E-04	69.7	-28.9
5942.79	32.0	Ave.	14	8	V	36.1	28.3	3.7	43.5	4.10E-06	85.5	-44.7
6791.76	36.4	Peak	14	8	V	36.4	28.0	4.2	49.0	1.45E-05	80.0	-39.2
6791.76	23.6	Ave.	14	8	V	36.4	28.0	4.2	36.2	7.63E-07	92.8	-52.0
7640.73	51.7	Peak	14	8	V	37.8	27.8	4.6	66.3	7.79E-04	62.7	-21.9
7640.73	29.9	Ave.	14	8	V	37.8	27.8	4.6	44.5	5.14E-06	84.5	-43.7
8489.70	53.1	Peak	14	8	V	37.9	27.1	4.8	68.7	1.35E-03	60.3	-19.5
8489.70	30.2	Ave.	14	8	V	37.9	27.1	4.8	45.8	6.95E-06	83.2	-42.4

Notes:

a) O.C.F.:Other Correction Factor
b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
e) Negative signs (-) in Margin column signify levels below the limits.

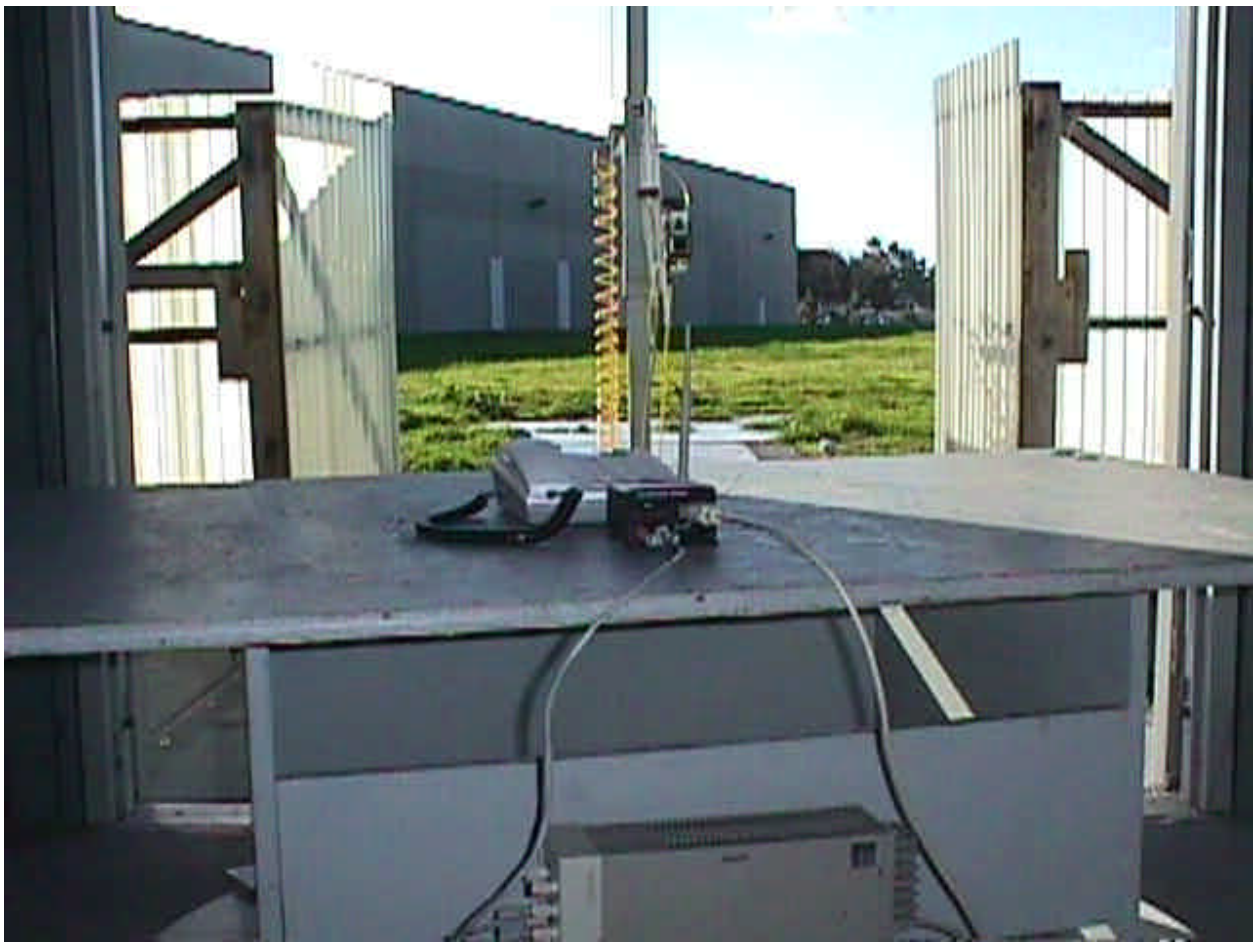
8.4 Radiated Emission Photographs

Radiated Emission Test Setup



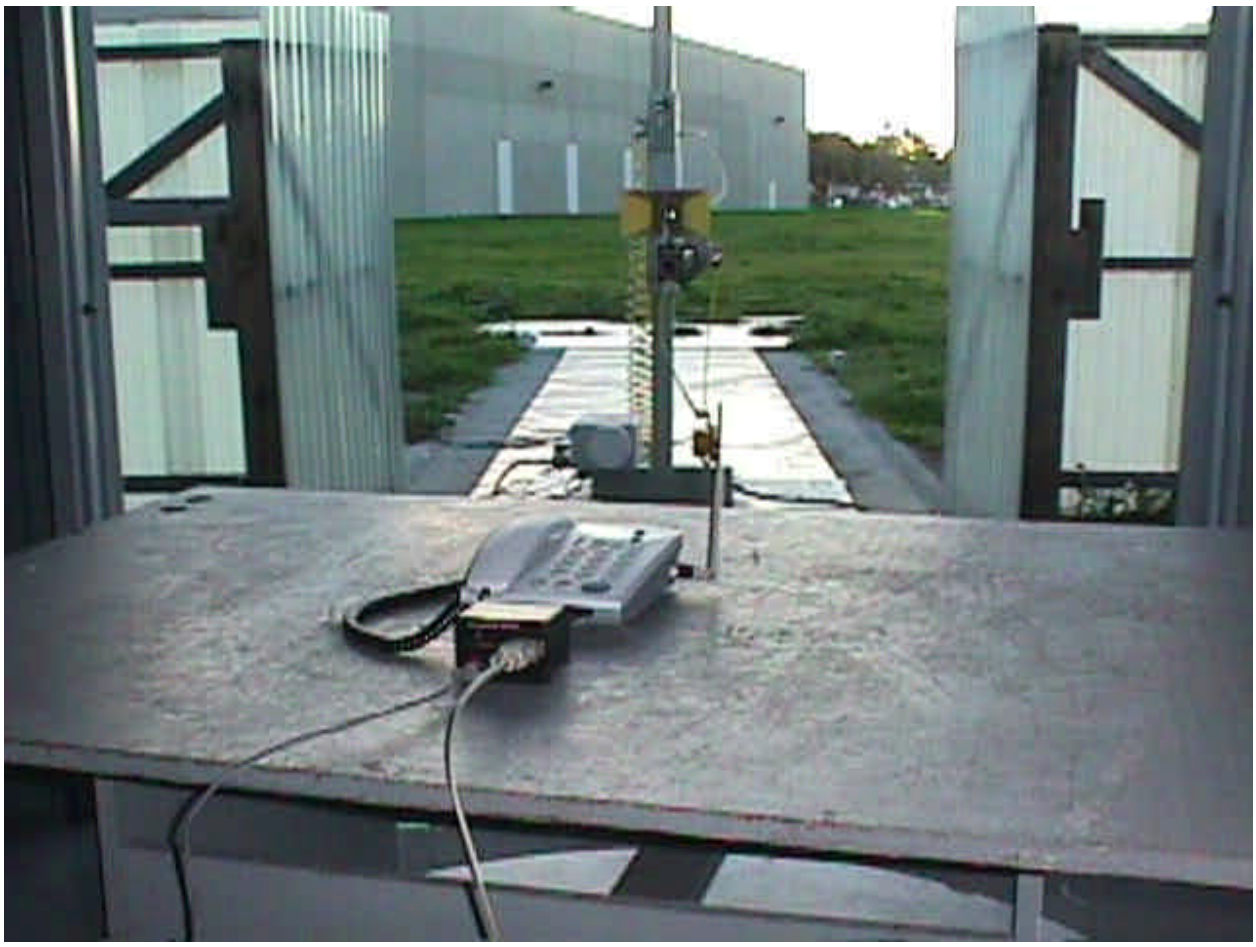
8.4 Radiated Emission Photographs (Continued)

Radiated Emission Test Setup



8.4 Radiated Emission Photographs (Continued)

Radiated Emission Test Setup



9.0 Line Conducted Emissions

FCC 15.107

9.1 Test Procedure

Test procedure described in the ANSI C63.4 Standard was employed.

The EUT was connected to the DC power supply, that was connected to the AC line through the LISNs.

Both HOT and NEUTRAL leads were tested.

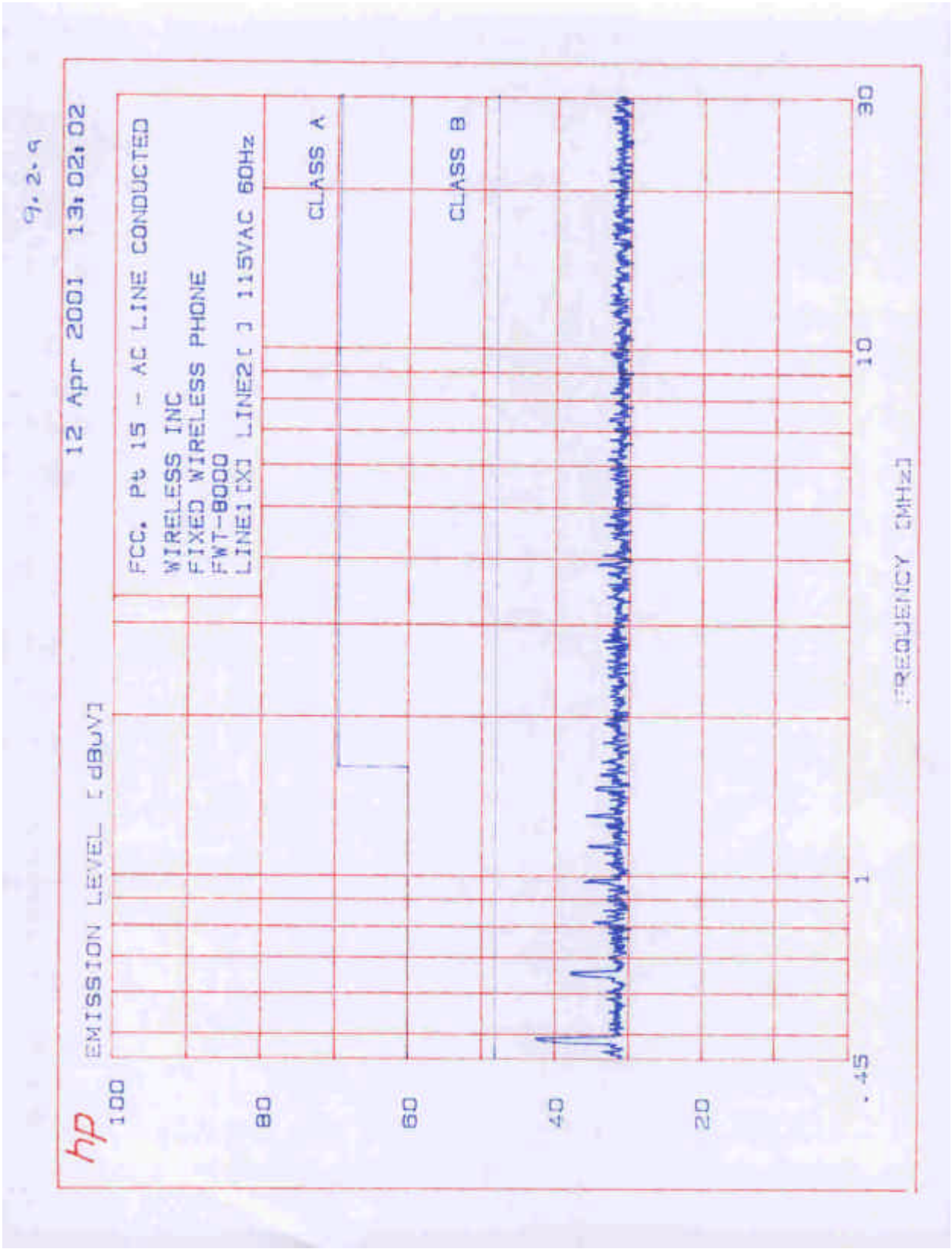
9.2 Test Results

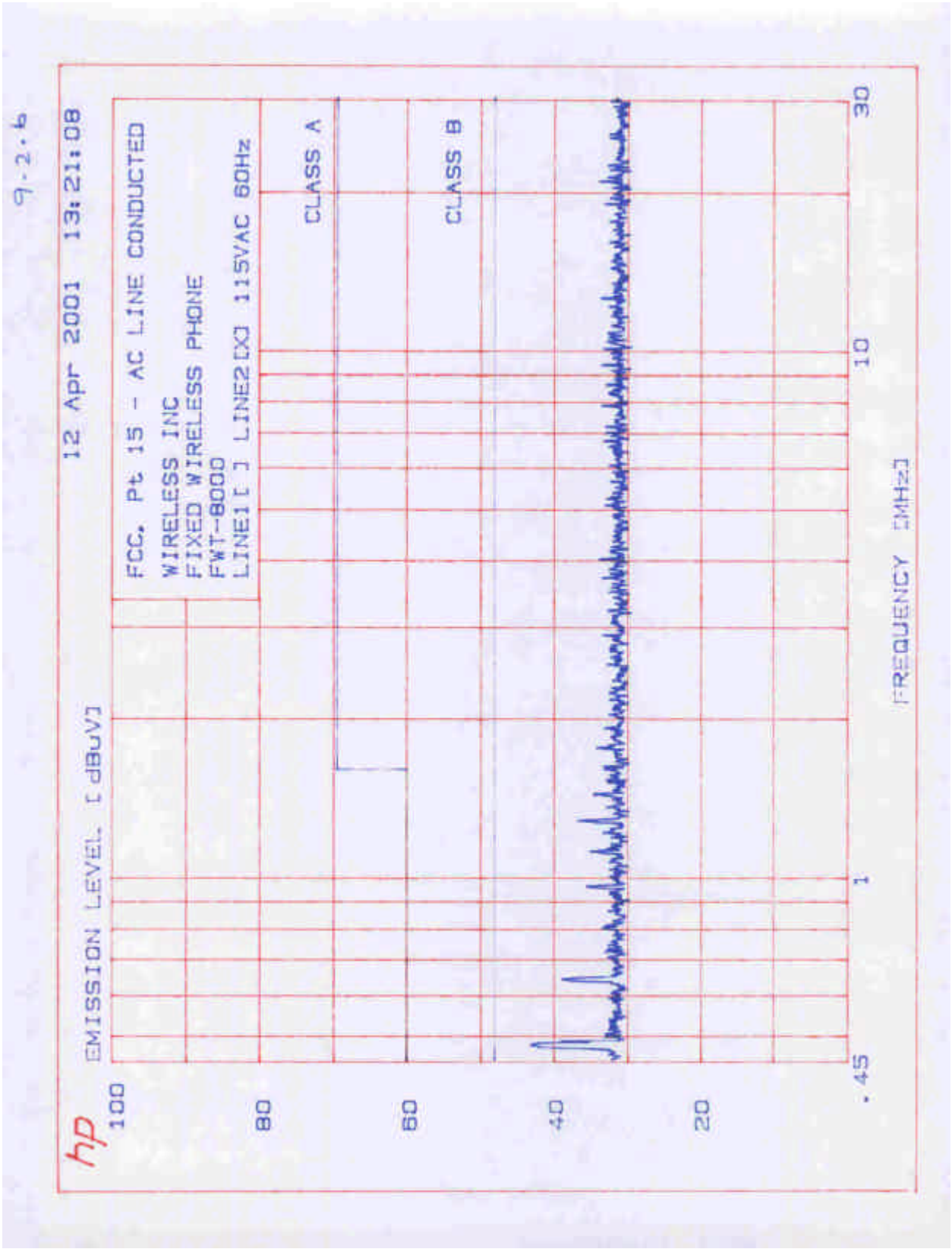
Refer to the attached test data.

Graph #	Description
9.2.a	Line conducted emission, Line 1
9.2.b	Line conducted emission, Line 2

9.3 Line Conducted Emission Photograph

Line Conducted Emission Test Set up


9.2.9
12 Apr 2001 13:02:02
FCC, Pt 15 - AC LINE CONDUCTED
WIRELESS INC
FIXED WIRELESS PHONE
FWT-8000
LINE1(X) LINE2( ) 115VAC 60Hz
CLASS A
CLASS B
EMISSION LEVEL dBuV
FREQUENCY MHz
100
80
60
40
20
.45
1
10
30


9-2-6
12 Apr 2001 13:21:08
FCC, Pt 15 - AC LINE CONDUCTED
WIRELESS INC
FIXED WIRELESS PHONE
FWT-8000
LINE1[ ] LINE2[X] 115VAC 60Hz
CLASS A
CLASS B
EMISSION LEVEL [dBuV]
FREQUENCY [MHz]
100
80
60
40
20
.45
1
10
30
hp

10.0 Frequency Stability vs Temperature
FCC 2.1055, 22.355

Frequency Tolerance: 2.5 ppm

10.1 Test Procedure

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber. The DC leads, RF output cable, and external PTT cable exited the chamber through an opening made for that purpose.

After the temperature stabilized for approximately 20 minutes, the external PTT switch was activated, and the frequency output was recorded from the counter.

10.2 Test Equipment

Temperature Chamber, -50C to +100C
Hewlett Packard 5383A Frequency Counter
Rohde & Schwarz ESVP Test Receiver

10.3 Test Results

Test Result:	Passed

Frequency: 836.52 MHz			
Temperature, C	Frequency (MHz)	Difference (Hz)	Output Power, (dBm)
60	836.519013	-987	26.8
50	836.519588	-412	26.8
40	836.519838	-162	26.8
30	836.519763	-237	26.9
20	836.519700	-300	26.7
10	836.519813	-187	26.7
0	836.519688	-312	26.5
-10	836.519775	-225	26.5
-20	836.519900	-100	26.4
-30	836.519625	-375	26.4

11.0 Frequency Stability vs Voltage
FCC 2.1055, 22.355

Frequency Tolerance: 2.5 ppm

11.1 Test Procedure

An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminates; i.e., the battery end point. The output frequency was recorded for each battery voltage.

11.2 Test Equipment

Hewlett Packard 5383A Frequency Counter
DC Power Supply
Rohde & Schwarz ESVP Test Receiver

11.3 Test Results.

Test Result:	Passed

Transmitting Frequency: 836.01 MHz
Tolerance: +/- 2091 Hz

Supply Battery (Volts)	Frequency (MHz)	Difference (Hz)	Output Power (dBm)
3.4	836.010084	84	25.86
3.6	836.010128	128	26.03
3.9	836.010177	177	26.23
4.5	836.010199	199	26.31

12.0 List of test equipment

Equipment	Manufacturer	Model	Serial #	Cal. Int.	Cal. Due	Used
Bi-log Antenna	EMCO	3143	9509-1160	12	6/08/01	X
Log Periodic Antenna	EMCO	LPA-25	1079	12	4/10/01	X
Double-ridged Horn Antenna	EMCO	3115	8812-3049	12	20/02/01	X
Double-ridged Horn Antenna	EMCO	3115	9107-3712	12	6/25/01	X
Half-wave dipole	Roberts	2	332	12	07/03/01	X
Pre-amplifier	CDI	P1000	N/A	12	11/14/00	X
Pre-amplifier	Avantek	AFT18855	8723H705	12	11/14/00	X
Spectrum Analyzer w/8650 QP Adapter	Hewlett Packard	HP 8566B	2416A00317 2521A01021	6	2/03/01	X
Spectrum Analyzer	Hewlett Packard	HP 3588A	N/A	12	07/03/01	X
Spectrum Analyzer	Tektronix	2784	B3020108	12	8/4/01	X
Peak Power Meter	Hewlett Packard	8900D	3607U00673	12	7/31/01	X
Peak Power Sensor	Hewlett Packard	84811A	3318A05091	12	12/7/99	X
Signal generator	Hewlett Packard	8663	2537A00214	12	6/13/01	X
Radio Communication test set	Marconi	2955A	N/A	12	09/1501	X
AC Millivoltmeter	Leader	LMV-182	7718	12	10/24/01	X
Function generator	HP	8116	2334A1077	12	10/13/01	X

13.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / J20036933	SS	February 28, 2001	Original document