Intertek Testing Services

APPLICATION FOR FCC CERTIFICATION

GVC Corporation

Cordless Telephone

Model: GH2400

FCC ID: DK4GH2400

Report # J99012172

Number of Pages: 28

Date of Report: June 28, 1999

The results contained in this report were derived from measurements performed on the identified test samples. Any implied performance of other samples on this report is dependent on the representative of the samples tested.

Table of Contents

0.0 **Summary of Test Results**

GVC Corporation - MODEL: GH2400
FCC ID: DK4GH2400

TEST	REFERENCE	RESULTS
Radiated Emission	15.249	Complies
Conducted Emission	15.207	Complies
Antenna Requirement	15.203	Complies

Test Engineer:_____ Date: 6/28/99
Shawn McGuinness

Telco Mgr.: _____ Date: 6/28/99
C.K. Li

1.0 General Description

1.1 Product Description

The Conair/South Western Bell Model GH2400 is a cordless telephone.

Please refer to the attached technical description for more details.

1.2 Related Submittal(s) Grants

This is an Application for Certification of a low power transmitter. One transmitter is included in this Application. This specific report details the emission characteristics of transmitter.

The FCC ID for the receiver assoicated with this transmitter is . The receivers are subject to the notification authorization process. A Notification report has been prepared for the receiver.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is Site 1. This test facility and site measurement data have been fully placed on file with the FCC and NVLAP accredited.

2.0 System Test Configuration

2.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For the measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Detector function is in peak mode. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

2.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

2.3 System Test Configuration

2.3.1 Support Equipment

None, the EUT was tested as a standalone device.

2.3.2 Block Diagram of Test Setup

Not applicable, the EUT was tested as a standalone device.

2.4 Equipment Modification

Any modifications installed previous to testing by GVC Corporation will be incorporated in each production model sold/leased in the United States.

No modifications were made to the EUT by Intertek Testing Services.

2.5 Additions, deviations and exclusions from standards

No additions, deviations or exclusion have been made from standard.

3.0 **Emission Results**

AC line conducted emission measurements were performed from 0.45 MH to 30 MHz. Analyzer resolution is 10 kHz or greater.

Radiated emission measurements were performed from 30 MHz to 5000 MHz. Analyzer resolution is 100 kHz or greater for 30 MHz to 1000 MHz, 1 MHz for >1000 MHz.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG

where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

FS = RR + LF

where FS = Field Strength in dB(μV/m)
RR = RA - AG in dB(μV)
LF = CF + AF in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antenna factor of 7.4 dB/m and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB(μV/m). This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dB(μV)	AF = 7.4 dB/m
RR = 23.0 dB(μV)	CF = 1.6 dB
LF = 9.0 dB	AG = 29.0 dB

FS = RR + LF
FS = 23 + 9 = 32 dB(μV/m)

Level in μV/m = Common Antilogarithm {[32 dB(μV/m)]/20} = 39.8 μV/m

3.3 Radiated Emission Data

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Results:	**Passed** by 8.8 dB at 36 MHz

Note: a) All emissions not reported are at least 20 dB below the limits

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EUT:	HANDSET CORDLESS PHONE	S/N #:	NOT LABELED	Limits_	12	
Project #:	J99012172	Test Date:	JUNE 11, 1999	Test Distance_	3	meters
Test Mode:	TX@2462.1Mhz	Engineer:		Duty Relaxation	0	dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	1	0	8	10	0	0	12	0
Model:	EMCO 3303	EMCO 3115	EMCO 3143	None	CDI_P1000	AFT13655	None	None	Grn_M+L	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
2462.10E+0	60.2	Peak	8	0	H	29.8	0.0	2.3	0.0	92.3	94.0	-1.7
2462.10E+0	58.8	Ave.	8	0	H	29.8	0.0	2.3	0.0	90.9	94.0	-3.1
4924.20E+0	40.1	Peak	8	8	H	34.0	28.1	3.2	0.0	49.2	74.0	-24.8
4924.20E+0	36.0	Ave.	8	8	H	34.0	28.1	3.2	0.0	45.1	54.0	-8.9
7386.40E+0	39.1	Peak	8	8	H	36.8	28.0	4.3	0.0	52.2	74.0	-21.8
7386.40E+0	32.7	Ave.	8	8	H	36.8	28.0	4.3	0.0	45.8	54.0	-8.2
9848.00E+0	34.0	Peak	8	8	H	39.8	27.6	5.0	0.0	51.2	74.0	-22.8
9848.00E+0	30.4	Ave.	8	8	H	39.8	27.6	5.0	0.0	47.6	54.0	-6.4
1.23E+4	45.0	Peak	8	10	H	44.1	39.1	5.9	0.0	55.9	74.0	-18.2
1.23E+4	33.2	Ave.	8	10	H	44.1	39.1	5.9	0.0	44.1	54.0	-9.9

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard**	**FCC § 15.249**
EUT:	HANDSET CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits**	12
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance**	3 meters
Test Mode:	TX@2463.5Mhz	**Engineer:**	SHAWN	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	0	0	10	8	0	0	12	0
Model:	EMCO 3303	EMCO 3115	None	None	AFT15855	CDI_P1000	None	None	Gm_M+L	None

Frequency	Reading	Detector	Ant. #	Amp. #	Ant. Pol. H/V	Ant. Factor dB(1/m)	Pre-Amp dB	Insert. Loss dB	D. C. F. dB	Net dB(µV/m)	Limit @3m dB(µV/m)	Margin dB
MHz	dB(µV)	P/A/Q										
2463.50E+0	60.0	Peak	8	0	H	29.8	0.0	2.3	0.0	92.1	94.0	-1.9
2463.50E+0	57.1	Ave.	8	0	H	29.8	0.0	2.3	0.0	89.2	94.0	-4.8
4926.90E+0	41.2	Peak	8	8	H	34.0	28.1	3.2	0.0	50.3	74.0	-23.7
4926.90E+0	36.4	Ave.	8	8	H	34.0	28.1	3.2	0.0	45.5	54.0	-8.5
7390.30E+0	38.6	Peak	8	8	H	36.8	28.0	4.3	0.0	51.7	74.0	-22.3
7390.30E+0	32.8	Ave.	8	8	H	36.8	28.0	4.3	0.0	45.9	54.0	-8.1
9853.80E+0	33.4	Peak	8	8	H	39.8	27.6	5.0	0.0	50.6	74.0	-23.4
9853.80E+0	31.0	Ave.	8	8	H	39.8	27.6	5.0	0.0	48.2	54.0	-5.8
1.23E+4	44.6	Peak	8	10	H	44.1	39.1	5.9	0.0	55.5	74.0	-18.6
1.23E+4	34.0	Ave.	8	10	H	44.1	39.1	5.9	0.0	44.9	54.0	-9.2

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard_**	**FCC § 15.249**
EUT:	HANDSET CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits_**	12
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance_**	3 meters
Test Mode:	TX@2464.8Mhz	**Engineer:**	SHAWN	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	0	0	10	8	0	0	12	0
Model:	EMCO 3303	EMCO 3115	None	None	AFT15855	CDI_P1000	None	None	Grn_M+L	None

Frequency	Reading	Detector	Ant. #	Amp. #	Ant. Pol. H/V	Ant. Factor dB(1/m)	Pre-Amp dB	Insert. Loss dB	D. C. F. dB	Net dB(µV/m)	Limit @3m dB(µV/m)	Margin dB
MHz	dB(µV)	P/A/Q										
2464.80E+0	60.5	Peak	8	0	H	29.8	0.0	2.3	0.0	92.6	94.0	-1.4
2464.80E+0	59.0	Ave.	8	0	H	29.8	0.0	2.3	0.0	91.1	94.0	-2.9
4929.60E+0	42.1	Peak	8	8	H	34.0	28.1	3.2	0.0	51.2	74.0	-22.8
4929.60E+0	38.4	Ave.	8	8	H	34.0	28.1	3.2	0.0	47.5	54.0	-6.5
7394.20E+0	40.6	Peak	8	8	H	36.8	28.0	4.3	0.0	53.7	74.0	-20.3
7394.20E+0	32.9	Ave.	8	8	H	36.8	28.0	4.3	0.0	46.0	54.0	-8.0
9859.20E+0	34.0	Peak	8	8	H	39.8	27.6	5.0	0.0	51.2	74.0	-22.8
9859.20E+0	32.9	Ave.	8	8	H	39.8	27.6	5.0	0.0	50.1	54.0	-3.9
1.23E+4	45.0	Peak	8	10	H	44.1	39.1	5.9	0.0	55.9	74.0	-18.2
1.23E+4	35.0	Ave.	8	10	H	44.1	39.1	5.9	0.0	45.9	54.0	-8.2

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard_**	**FCC § 15.249**
EUT:	BASE SET CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits_**	12
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance_**	3 meters
Test Mode:	TX@2435.1MHZ	**Engineer:**		**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	1	0	8	10	0	0	12	0
Model:	EMCO 3303	EMCO 3115	EMCO 3143	None	CDI_P1000	AFT16855	None	None	Gm_MH L	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
2435.10E+0	48.9	Peak	8	0	H	29.8	0.0	2.3	0.0	81.0	94.0	-13.0
4870.30E+0	40.1	Peak	8	8	H	34.0	28.1	3.2	0.0	49.2	74.0	-24.8
4870.30E+0	35.6	Ave.	8	8	H	34.0	28.1	3.2	0.0	44.7	54.0	-9.3
7305.40E+0	38.7	Peak	8	8	H	36.8	28.0	4.3	0.0	51.8	74.0	-22.2
7305.40E+0	33.6	Ave.	8	8	H	36.8	28.0	4.3	0.0	46.7	54.0	-7.3
9735.50E+0	33.0	Peak	8	8	H	39.8	27.3	5.0	0.0	50.5	74.0	-23.5
9735.50E+0	24.6	Ave.	8	8	H	39.8	27.3	5.0	0.0	42.1	54.0	-11.9
1.22E+4	38.2	Peak	8	10	H	44.1	39.1	5.9	0.0	49.1	74.0	-25.0
1.22E+4	31.0	Ave.	8	10	H	44.1	39.1	5.9	0.0	41.9	54.0	-12.2

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard_**	**FCC § 15.249**
EUT:	BASE SET CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits_**	12
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance_**	3 meters
Test Mode:	TX@2436.4Mhz	**Engineer:**		**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	1	0	8	10	0	0	12	0
Model:	EMCO 3303	EMCO 3115	EMCO 3143	None	CDI_P1000	AFT16855	None	None	Gm_M+L	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
2436.30E+0	47.6	Peak	8	0	H	29.8	0.0	2.3	0.0	79.7	94.0	-14.3
4872.70E+0	39.2	Peak	8	8	H	34.0	28.1	3.2	0.0	48.3	74.0	-25.7
4872.70E+0	31.6	Ave.	8	8	H	34.0	28.1	3.2	0.0	40.7	54.0	-13.3
7309.10E+0	37.3	Peak	8	8	H	36.8	28.0	4.3	0.0	50.4	74.0	-23.6
7309.10E+0	29.8	Ave.	8	8	H	36.8	28.0	4.3	0.0	42.9	54.0	-11.1
9745.60E+0	33.0	Peak	8	8	H	39.8	27.3	5.0	0.0	50.5	74.0	-23.5
9745.60E+0	23.8	Ave.	8	8	H	39.8	27.3	5.0	0.0	41.3	54.0	-12.7
1.22E+4	38.4	Peak	8	10	H	44.1	39.1	5.9	0.0	49.3	74.0	-24.8
1.22E+4	32.1	Ave.	8	10	H	44.1	39.1	5.9	0.0	43.0	54.0	-11.1

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard_**	**FCC § 15.249**
EUT:	BASE SET CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits_**	12
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance_**	3 meters
Test Mode:	TX@2437.8Mhz	**Engineer:**		**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	1	0	8	10	0	0	12	0
Model:	EMCO 3303	EMCO 3115	EMCO 3143	None	CDI_P1000	AFT16855	None	None	Gm_M+L	None

Frequency	Reading	Detector	Ant. #	Amp. #	Ant. Pol. H/V	Ant. Factor dB(1/m)	Pre-Amp dB	Insert. Loss dB	D. C. F. dB	Net dB(µV/m)	Limit @3m dB(µV/m)	Margin dB
MHz	dB(µV)	P/A/Q										
2437.80E+0	48.4	Peak	8	0	H	29.8	0.0	2.3	0.0	80.5	94.0	-13.5
4875.60E+0	39.4	Peak	8	8	H	34.0	28.1	3.2	0.0	48.5	74.0	-25.5
4875.60E+0	34.0	Ave.	8	8	H	34.0	28.1	3.2	0.0	43.1	54.0	-10.9
7313.40E+0	37.8	Peak	8	8	H	36.8	28.0	4.3	0.0	50.9	74.0	-23.1
7313.40E+0	29.5	Ave.	8	8	H	36.8	28.0	4.3	0.0	42.6	54.0	-11.4
9751.20E+0	34.2	Peak	8	8	H	39.8	27.3	5.0	0.0	51.7	74.0	-22.3
9751.20E+0	24.5	Ave.	8	8	H	39.8	27.3	5.0	0.0	42.0	54.0	-12.0
1.22E+4	39.0	Peak	8	10	H	44.1	39.1	5.9	0.0	49.9	74.0	-24.2
1.22E+4	33.0	Ave.	8	10	H	44.1	39.1	5.9	0.0	43.9	54.0	-10.2

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Company:	GVC CORPORATION	**Model #:**	GH2400	**Standard_**	**FCC § 15B**
EUT:	BASE CORDLESS PHONE	**S/N #:**	NOT LABELED	**Limits_**	2
Project #:	J99012172	**Test Date:**	JUNE 11, 1999	**Test Distance_**	3 meters
Test Mode:	CHARGING	**Engineer:**	SHAWN	**Duty Relaxation**	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used
Number:	17	8	2	1	2	9	0	4	2	0
Model:	EMCO 3301	EMCO 3115	EMCO 3143	HP 8447D	HP 8447D	WJ	None	RG214 U	RG214	None

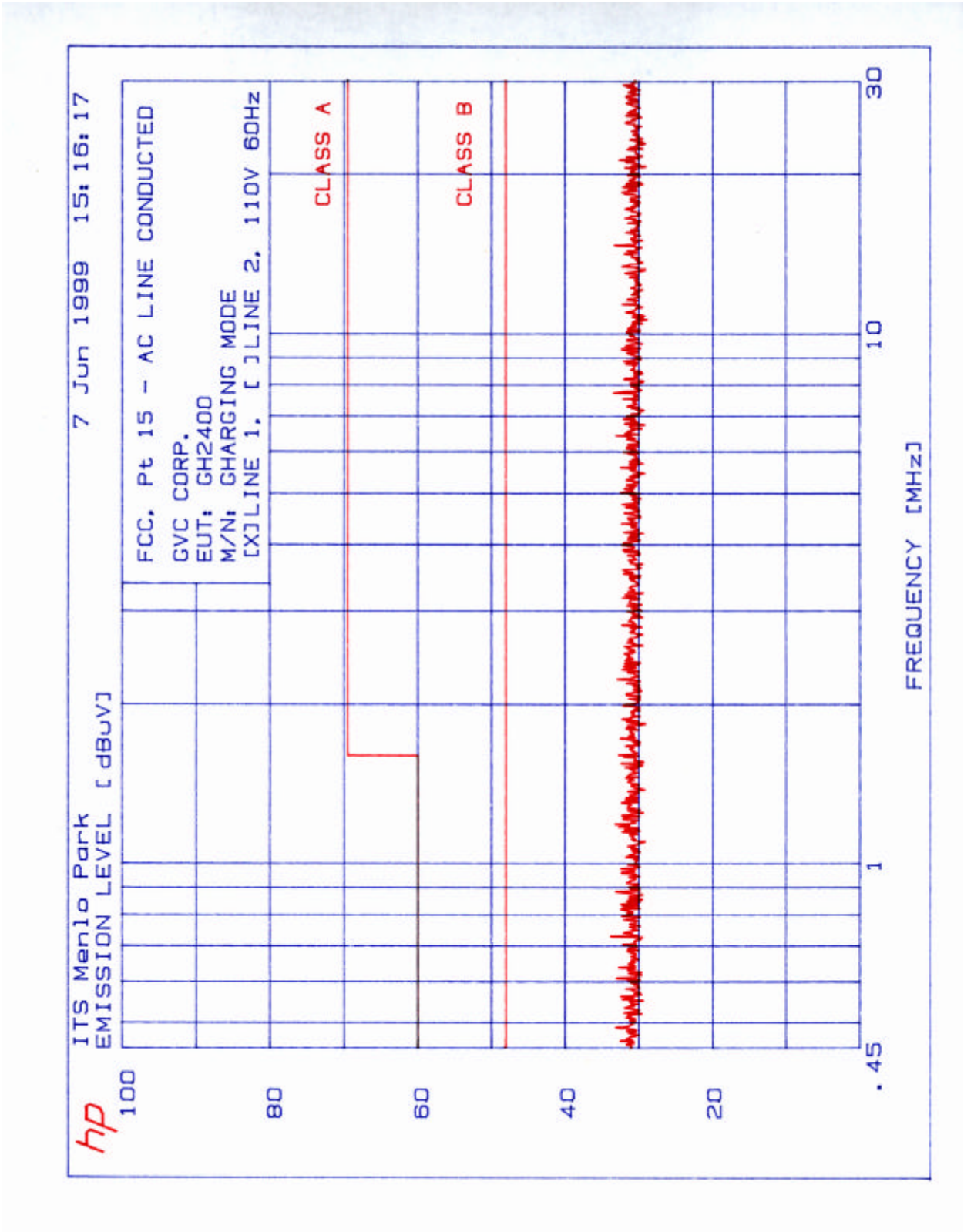
Frequency	Reading	Detector	Ant.	Amp.	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHz	dB(µV)	P/A/Q	#	#	H/V	dB(1/m)	dB	dB	dB	dB(µV/m)	dB(µV/m)	dB
48.00E+0	41.2	Peak	2	2	H	8.5	22.3	1.0	0.0	28.4	40.0	-11.6
32.00E+0	38.4	Peak	2	1	V	11.0	27.2	0.8	0.0	23.0	40.0	-17.0

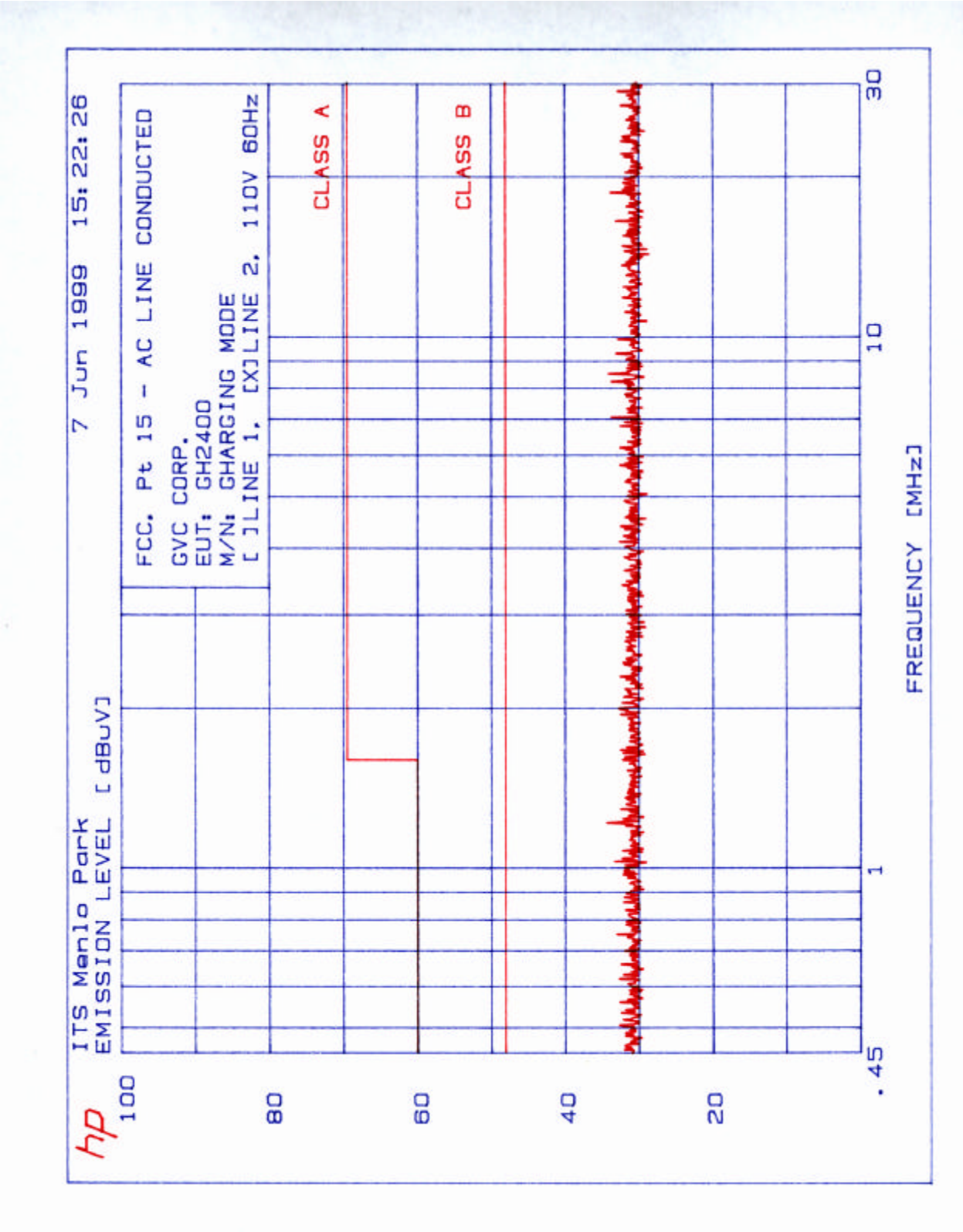
3.5 Conducted Emission Data

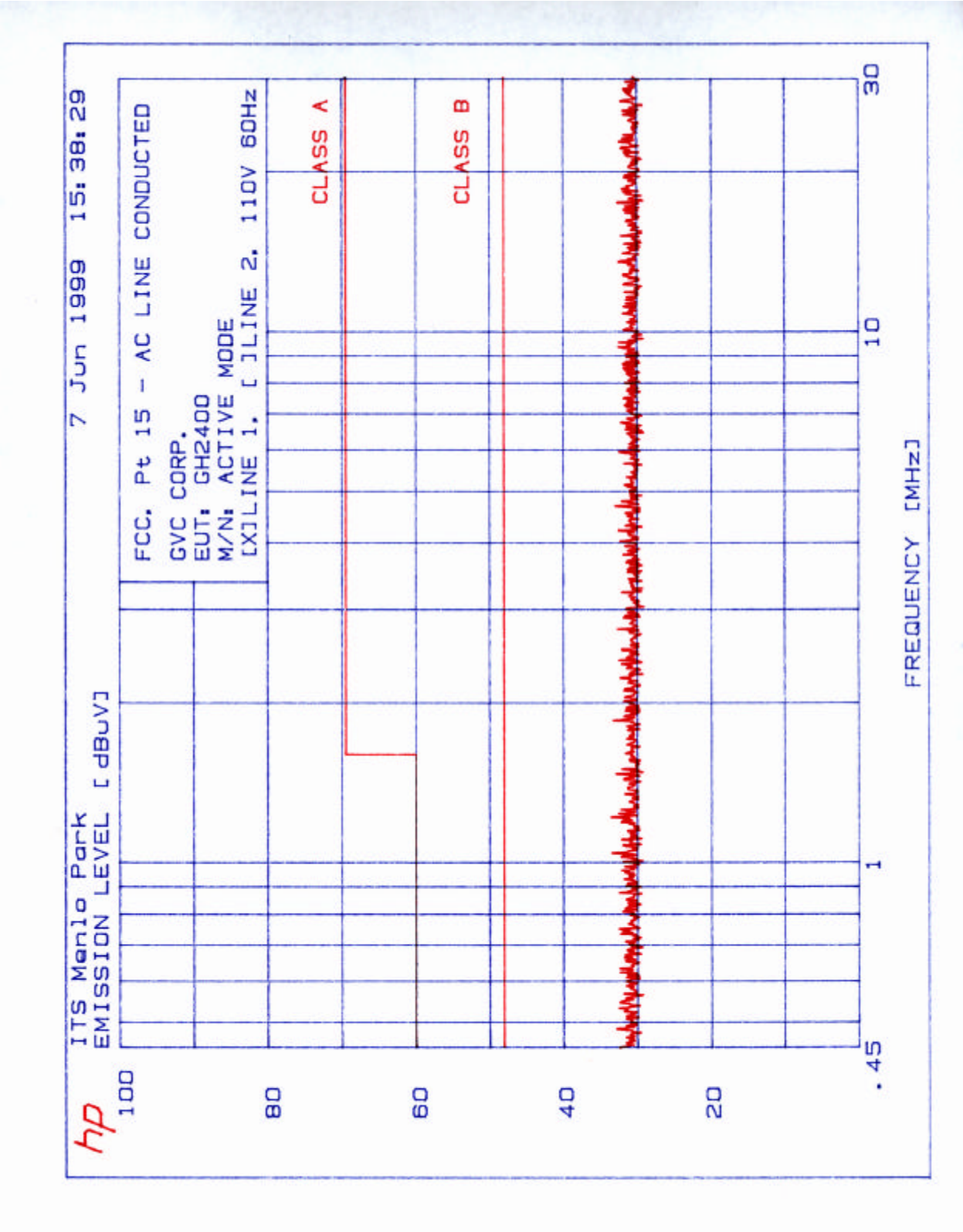
The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

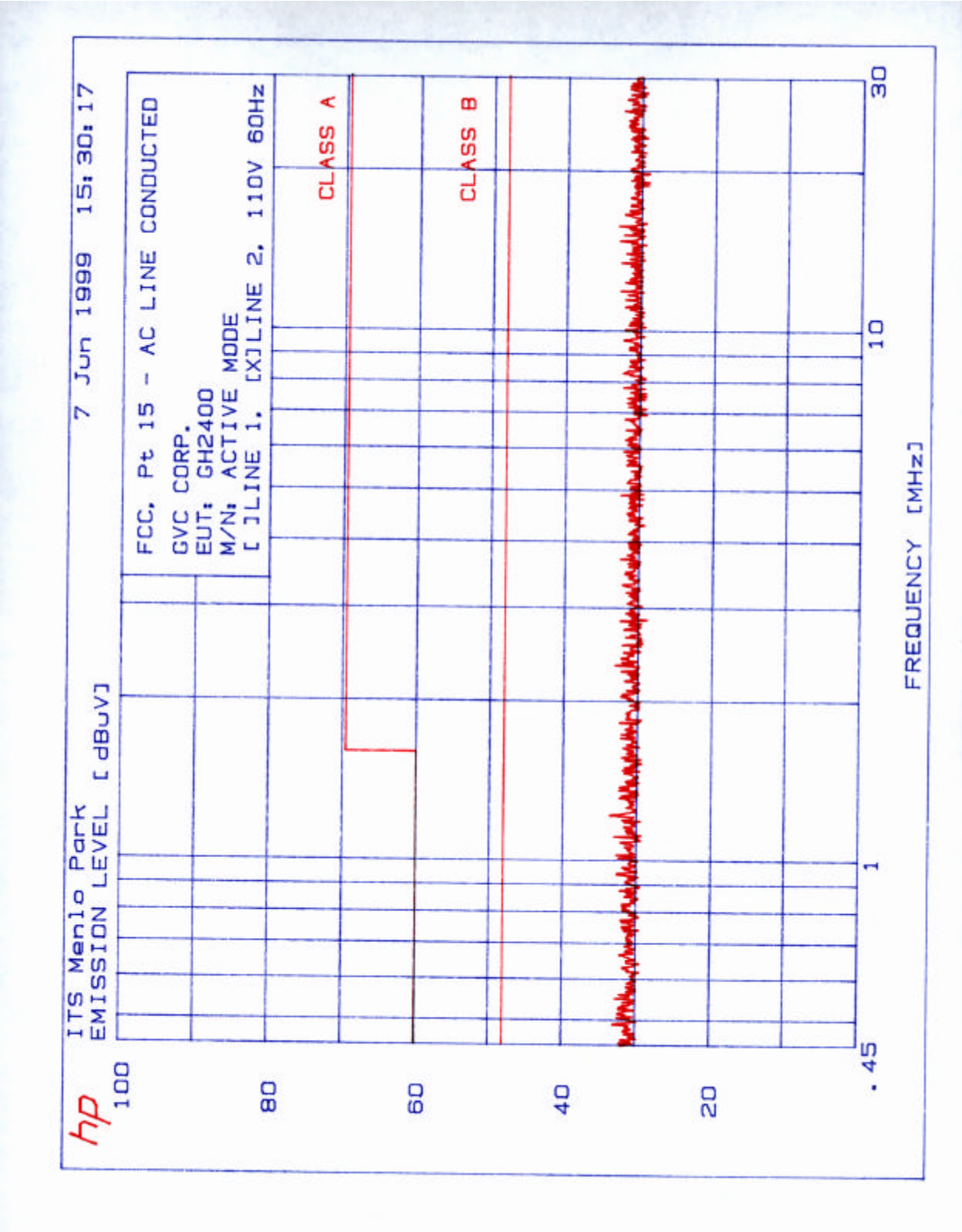
Results:	**Passed** by 27 dB at 1.1 MHz

Note: a) A complete scan from 0.45 - 30 MHz was made.


7 Jun 1999 15:16:17
ITS Menlo Park
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
GVC CORP.
EUT: GH2400
M/N: CHARGING MODE
[X]LINE 1, [ ]LINE 2, 110V 60Hz
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]


7 Jun 1999 15:22:26
ITS Menlo Park
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
GVC CORP.
EUT: GH2400
M/N: CHARGING MODE
[ ]LINE 1, [X]LINE 2, 110V 60Hz
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

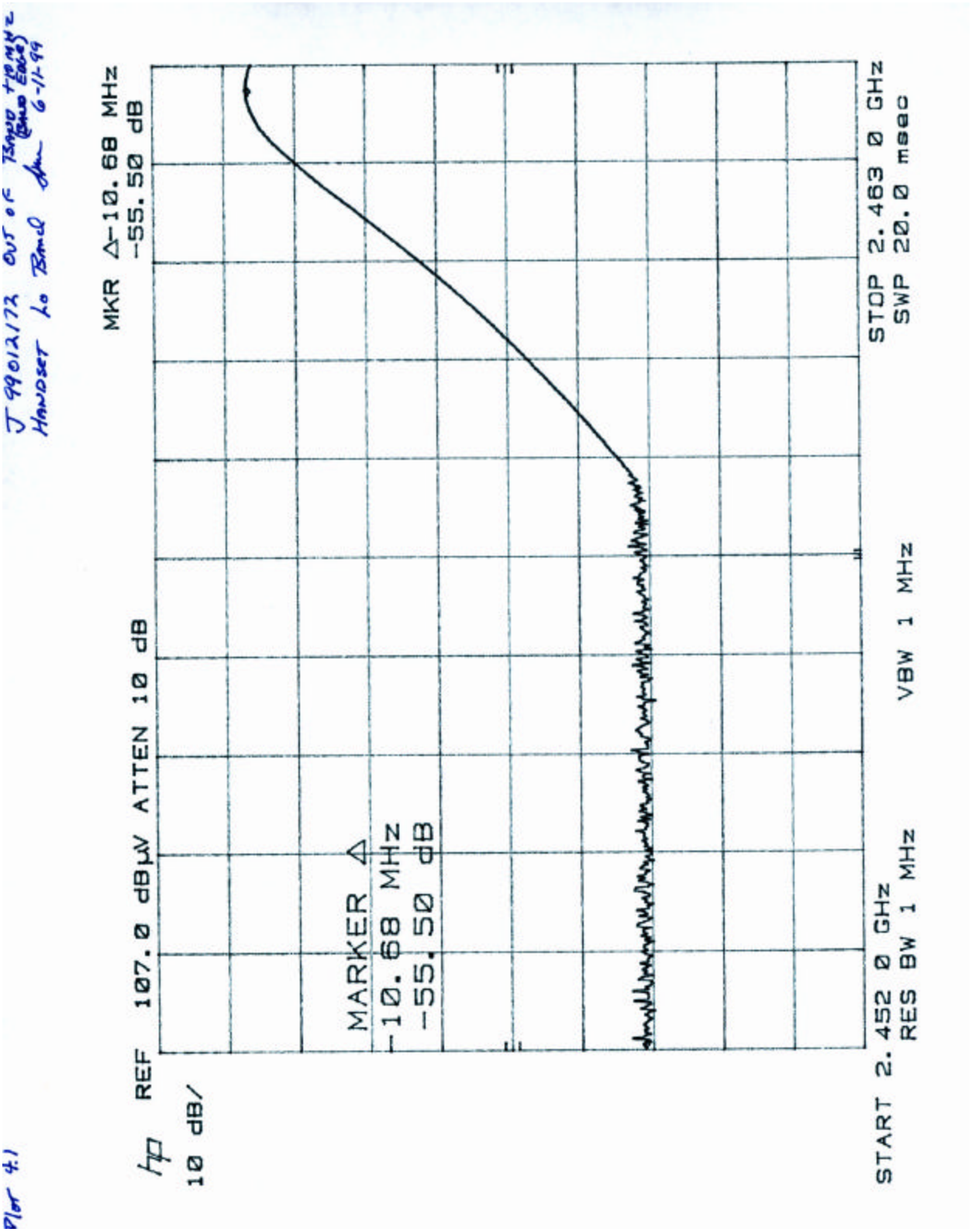

7 Jun 1999 15:38:29
ITS Menlo Park
EMISSION LEVEL [dBuV]
FCC, Pt 15 - AC LINE CONDUCTED
GVC CORP.
EUT: GH2400
M/N: ACTIVE MODE
[X]LINE 1. [ ]LINE 2. 110V 60Hz
CLASS A
CLASS B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

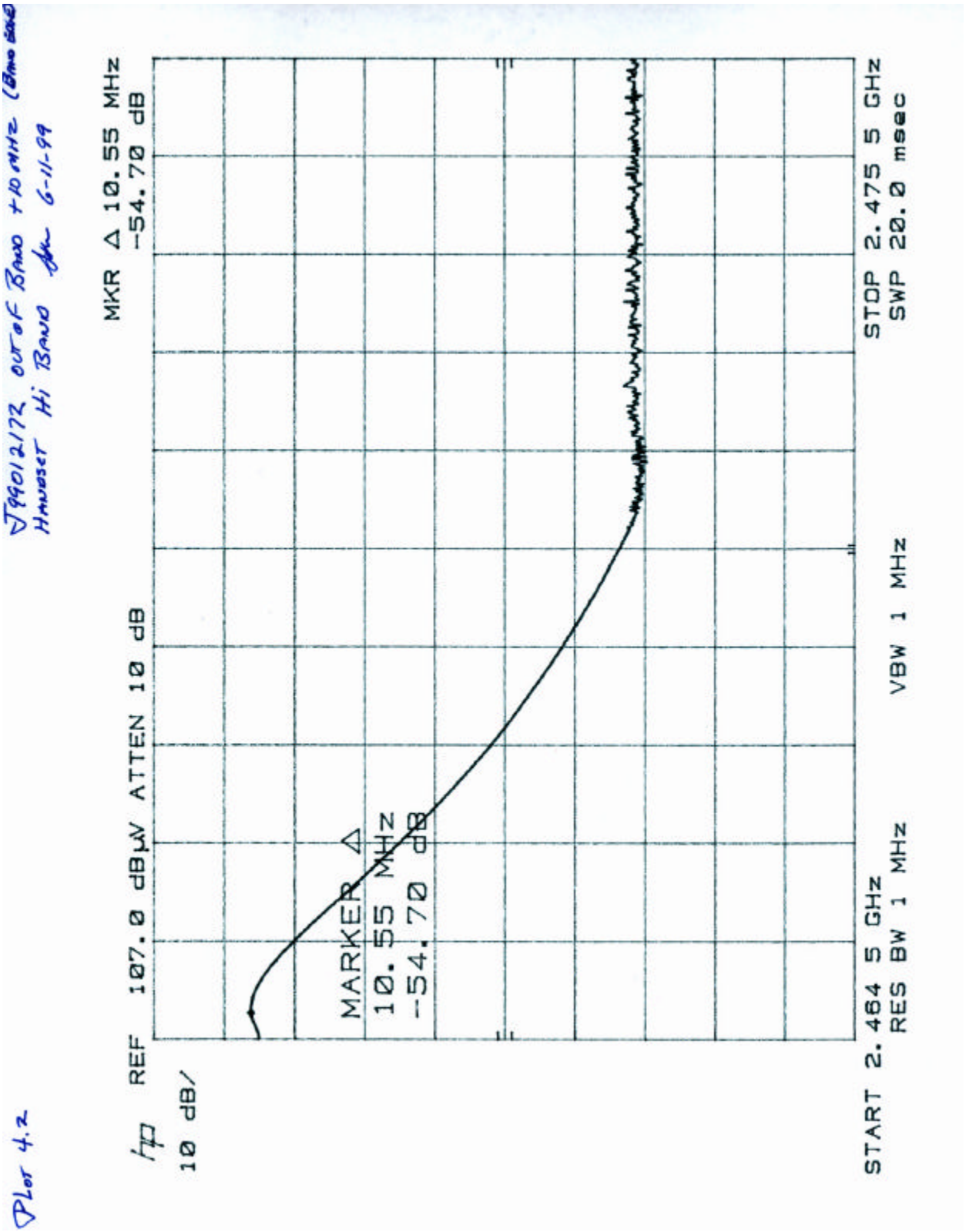

7 Jun 1999 15:30:17
FCC, Pt 15 - AC LINE CONDUCTED
GVC CORP.
EUT: GH2400
M/N: ACTIVE MODE
[ ]LINE 1. [X]LINE 2. 110V 60Hz
CLASS A
CLASS B
ITS Menlo Park
EMISSION LEVEL [dBuV]
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

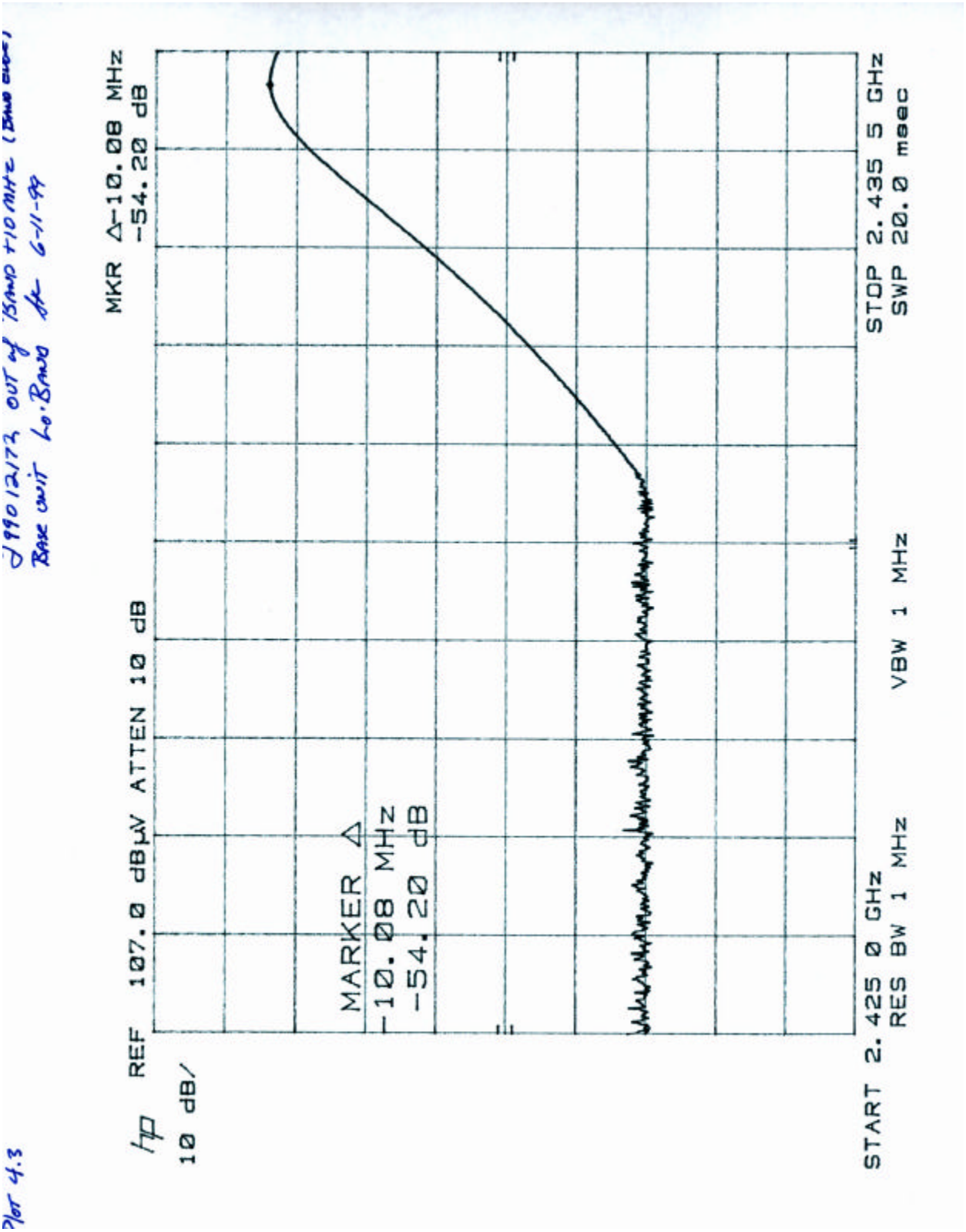
4.0 **Out of Band Emission Plot**

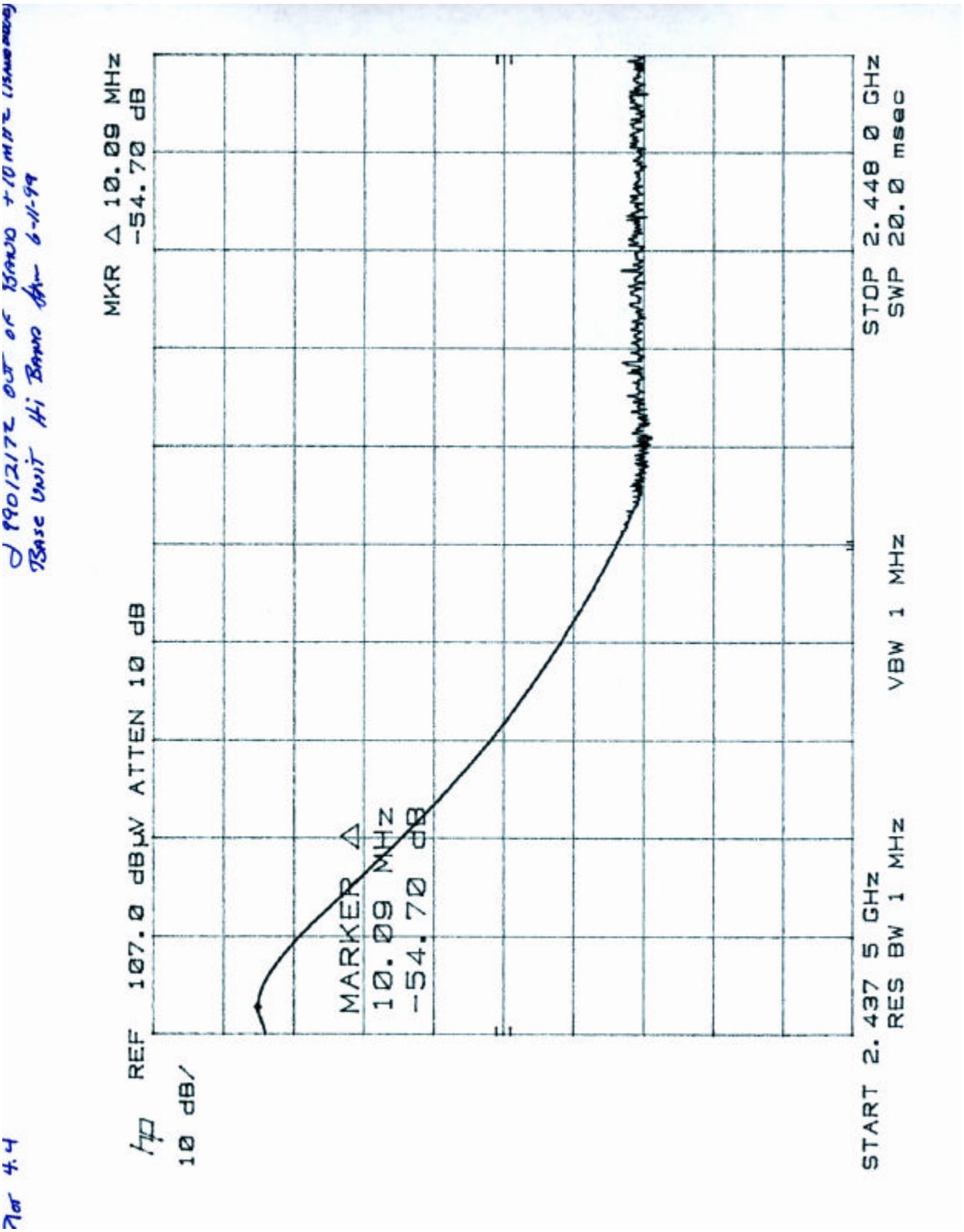
The following plots show the relative spurious emission level of the transmitter.

Plot #	Description
4.1	Out of Band (Bandedge + 10 MHz) Handset, Low Band
4.2	Out of Band (Bandedge + 10 MHz) Handset, Hi Band
4.3	Out of Band (Bandedge + 10 MHz) Base, Low Band
4.4	Out of Band (Bandedge + 10 MHz) Base, Hi Band


J99012172 Out of Band Trans (Band Edge)
Handset Lo Band 6-11-99
MKR Δ-10.68 MHz
-55.50 dB
STOP 2.463 0 GHz
SWP 20.0 msec
REF 107.0 dBµV ATTEN 10 dB
10 dB/
MARKER Δ
-10.68 MHz
-55.50 dB
VBW 1 MHz
START 2.452 0 GHz
RES BW 1 MHz
Plot 4.1


J99012172 out of Band +10 MHz (Band edge)
Hmidset Hi Band 6-11-99
Plot 4.2
MKR Δ 10.55 MHz
-54.70 dB
STOP 2.475 5 GHz
SWP 20.0 msec
REF 107.0 dBμV ATTEN 10 dB
10 dB/
MARKER Δ
10.55 MHz
-54.70 dB
VBW 1 MHz
START 2.464 5 GHz
RES BW 1 MHz


J990 12172 OUT of BAND +10 MHz (BAND EDGE)
Base unit Lo. Band 6-11-99
Plot 4.3
hp
REF 107.0 dBµV ATTEN 10 dB
10 dB/
MKR Δ-10.08 MHz
-54.20 dB
MARKER Δ
-10.08 MHz
-54.20 dB
START 2.425 0 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 2.435 5 GHz
SWP 20.0 msec


MKR Δ 10.09 MHz
-54.70 dB
REF 107.0 dBµV ATTEN 10 dB
10 dB/
MARKER Δ
10.09 MHz
-54.70 dB
START 2.437 5 GHz
RES BW 1 MHz
VBW 1 MHz
STOP 2.448 0 GHz
SWP 20.0 msec

5.0 **Antenna Requirement**

✔	The transmitter uses a permanently connected antenna.
	The antenna is affixed to the EUT using a unique connector which allows for replacement of a broken antenna, but does NOT use a standard antenna jack or electrical connector.
	The EUT requires professional installation. Please refer to the attached documentation for details).

6.0 List of Exhibits

Exhibit 1 **ID Label Format**

Exhibit 2 **ID Label Location**

Exhibit 3 **Equipment Photographs**

Exhibit 4 **Block Diagram**

Exhibit 5 **Circuit Diagram**

Exhibit 6 **This Test Report**

Exhibit 7 **Test Setup Photos**

Exhibit 8 **Instruction Manual**