TEST REPORT TO FCC PART 15 SUBPART B AND EN55022 FOR:

GRAPHIC DIGITIZER MODEL NO. 11120, 11120A, 35120 AND 35120A

FCC ID: ECP11120

PREPARED FOR:

CalComp
Input Technologies Division
14555 North 82nd Street
Scottsdale, AZ 85260

PREPARED BY:

Kenneth B. Jacobson
Product Support Engineer
CalComp
Input Technologies Division
14555 North 82nd Street
Scottsdale, AZ 85260

DATE OF REPORT:

02/17/98

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I. OVERVIEW OF TEST REPORT

The procedures used for the conducted and radiated tests were derived from the American National Standard ANSI C63.4-1991 as stated in FCC CFR 47, Part 15, Paragraph 15.31. The test side attenuation and layout was done in accordance with ANSI C63.4-1991 and is on file with the FCC as required in FCC CFR 47, Part 2, Paragraph 2.948.

PRODUCT TESTED:	Digitizer Model No. 11120, 11120A, 35120 and 35120A
TRADE NAME:	Creation Station
APPLICANT:	CalComp Input Technologies Division 14555 North 82nd Street Scottsdale, AZ 85260
MANUFACTURER:	Same as Applicant
TEST FACILITY LOCATION:	Same as Applicant
TEST DATE:	01/14/98

The measurement data contained in this report reflects an accurate representation of the emission characteristics of the produce mentioned above.

REPORT PREPARED AND APPROVED BY: _____

Kenneth B. Jacobson
Product Support Engineer
CalComp Digitizer Division

II. STATEMENT OF COMPLIANCE

Under the test configuration as described in this test report, the product tested has shown that it complies to the requirements of:

FCC RULES, PART 15, SUBPART B, CLASS B LIMITS

The product tested has shown that it also complies to the requirements of:

EC STANDARD EN55022/CISPR 22, CLASS B LIMITS

We, CalComp Digitizer Division, assume full responsibility to manufacture the product as shown in the enclosed photographs to uphold compliance to the FCC rules.

SIGNED: _____
Don Addiss

TITLE: Director of Engineering

DATE: 2/18/98

III. DESCRIPTION OF TEST SAMPLE

The "Digitizer Tested" is a microprocessor-based device that can convert graphic information into accurate digital information for entry into the host computer. The digitizer can be used for drawing, drafting, mapping, desktop publishing, animation, menuing, and presentation graphics.

The basic operation of the digitizer is as follows:

The transducer electromagnetically induces voltages into precisely positioned grid conductors beneath the tablets surface. The digitizers electronics finds the grid conductors with the largest signals and converts the grid signals into digital position data. The digitizer then sends the information out the communication port to the host. The data generated indicates the distance vertically and horizontally from the origin on the digitizers surface.

The digitizer intentionally radiates a 1.8432 MHZ signal through the grid to the transducer. When the transducer receives this signal, it converts it's energy into a DC voltage source via a tank circuit and this DC voltage powers the electronic components in the transducer such that it can radiate back to the digitizer (also at 1.8432 MHZ) for positioning and button information as outlined previously.

The digitizer also can be installed in a Macintosh environment without any change to the electronics or PWB. An ADB cable is installed at the manufactured stage in place of a RS-232 cable which tells the PIC 16C65 micro to transmit ADB data instead of RS-232 data by shorting out certain pins on the connector. The micro uses an inverter to drive a transistor for the ADB interface. These parts are always installled and has shown during testing that no new emissions are produced (no new clocks are generated). For test purposes, Model 11120 was used for testing.

Model 35120 is identical to Model 11120 as well as Model 35120A is identical to Model 11120A, the model number is the only difference. The reason for the different model numbers is for marketing the digitzer in different markets, i.e., CAD design versus graphic artist use.

The digitizer operates with 5VDC which is powered from the host via the I/O cable.

IV. SUBASSEMBLIES OF TEST SAMPLE

The Model 11120, 11120A, 35120 and 35120A Digitizer has only one PWB. Any other subassemblies/accessories would be the cursor. All of these are shown in the attached photographs of the products.

V. TEST EQUIPMENT AND CALIBRATION

The following is a list of equipment and calibration dates that are used at CalComp's test site.

TEST EQUIPMENT	MODEL	CALIBRATION DATE	FREQUENCY
Com-Power Log Periodic Antenna	CPAL-100	06/04/97	1 Year
Com-Power Biconical Antenna	AB-100	06/04/97	1 Year
Electro-Metrics Loop Antenna	ALR 25	06/09/97	1 Year
Eaton LISN	94641-1	06/15/97	1 Year
EMCO LISN	3825/2	06/15/97	1 Year
HP Specturm Analyzer with Quasi-Peak Adapter	8568B 85650A	11/27/97	1 Year
HP Signal Generator	HP8656B	03-21-97	1 Year
EMCO Turntable	1060	N/A	N/A
HP Plotter	HP7470	N/A	N/A
Cable	RG-59/U	05/13/97	1 Year

VI. CABLE LOSS AND ANTENNA FACTORS

A.H. SYSTEMS INC.
9710 COZYCROFT AVE.
CHATSWORTH, CA 91311
(818) 998-0223

3 Meter Calibration Horizontal Polarization
Gain and Antenna Factors for a Biconical Antenna
Com Power Model Number: AB-100
Serial Number: 01537
Date: 04-JUN-97

50	10.4	-6.17
60	9.6	-3.79
70	9.1	-1.95
80	9.1	-0.79
90	9.5	-0.17
100	10.2	0.05
110	10.7	0.37
120	11.5	0.33
130	11.8	0.73
140	12.5	0.67
150	12.7	1.07
160	13.1	1.23
170	13.7	1.16
180	14.7	0.65
190	15.0	0.82
200	16.0	0.27
210	15.6	1.09
220	15.6	1.50
230	15.7	1.78
240	16.9	0.95
250	17.5	0.71
260	18.1	0.45
270	18.5	0.37
280	19.4	-0.21
290	19.9	-0.41
300	20.8	-1.01
310	21.7	-1.63
320	23.2	-2.85
330	24.3	-3.68

ADD ANTENNA FACTOR PLUS CABLE LOSS TO RECEIVER READING
IN dBuV TO CONVERT TO FIELD INTENSITY IN dBuV/METER.
CALIBRATION PER ANSI C63.5 METHODOLOGY.

A.H. SYSTEMS INC.
9710 COZYCROFT AVE.
CHATSWORTH, CA 91311
(818) 998-0223

10 meter Calibration Horizontal Polarization
Gain and Antenna Factors for a Biconical Antenna
Com Power Model Number: AB-100
Serial Number: 01537
Date: 04-JUN-97

50	9.5	-5.27
60	9.2	-3.39
70	8.9	-1.75
80	8.7	-0.39
90	9.1	0.23
100	9.9	0.35
110	10.6	0.47
120	11.2	0.63
130	11.4	1.13
140	12.0	1.17
150	12.1	1.67
160	13.2	1.13
170	13.6	1.26
180	14.3	1.05
190	15.1	0.72
200	15.3	0.97
210	15.4	1.29
220	15.5	1.60
230	16.0	1.48
240	16.5	1.35
250	17.0	1.21
260	18.1	0.45
270	17.3	1.57
280	18.6	0.59
290	18.7	0.79
300	19.4	0.39
310	20.8	-0.73
320	22.1	-1.75
330	22.4	-1.78

ADD ANTENNA FACTOR PLUS CABLE LOSS TO RECEIVER READING
IN dBuV TO CONVERT TO FIELD INTENSITY IN uV/METER.
CALIBRATION PER ANSI C63.5 METHODOLOGY.

A.H. SYSTEMS INC.
9710 COZYCROFT AVE.
CHATSWORTH, CA 91311
(818) 998-0223

3 Meter Calibration Horizontal Polarization
Log Periodic Antenna Com Power Model CPAL-100
Date: 04-JUNE-97 SN: 1011

300	14.5	5.29
325	14.5	5.98
350	15.0	6.13
375	15.2	6.53
400	15.8	6.59
425	16.9	5.91
450	18.0	5.31
475	18.1	5.68
500	18.1	6.13
525	18.4	6.25
550	18.9	6.15
575	18.7	6.74
600	19.2	6.61
625	19.4	6.76
650	19.7	6.80
675	20.3	6.53
700	21.2	5.95
725	22.8	4.65
750	24.3	3.45
775	21.7	6.33
800	22.5	5.81
825	22.5	6.08
850	22.8	6.03
875	22.7	6.39
900	22.7	6.63
925	23.2	6.37
950	24.0	5.80
975	24.3	5.73
1000	24.7	5.55
1100	25.5	5.57
1200	25.8	6.03
1300	28.1	4.43
1400	30.0	3.17
1500	35.2	-1.43

Add Antenna Factor plus cable loss to receiver reading in dBuV to convert to field intensity in dBuV/Meter. Calibration per SAE ARP-958 (1 meter) or ANSI C63.5 (3 and 10 meters)

A.H. SYSTEMS INC.
9710 COZYCROFT AVE.
CHATSWORTH, CA 91311
(818) 998-0223

10 Meter Calibration Horizontal Polarization
Log Periodic Antenna Com Power Model CPAL-100
Date: 04-JUNE-97 SN: 1011

[illegible] MHz	[illegible] dB	[illegible] dB
300	13.4	6.39
325	13.2	7.28
350	14.2	6.93
375	14.5	7.23
400	14.9	7.39
425	16.3	6.51
450	17.7	5.61
475	18.0	5.78
500	18.1	6.13
525	17.9	6.75
550	18.2	6.85
575	18.2	7.24
600	18.7	7.11
625	19.0	7.16
650	19.5	7.00
675	20.1	6.73
700	20.8	6.35
725	22.3	5.15
750	23.3	4.45
775	21.2	6.83
800	21.9	6.41
825	22.1	6.48
850	22.5	6.33
875	22.2	6.89
900	22.3	7.03
925	22.7	6.87
950	23.7	6.10
975	24.0	6.03
1000	24.6	5.65
1100	25.3	5.77
1200	25.5	6.33
1300	27.8	4.73
1400	29.5	3.67
1500	34.9	-1.13

Add Antenna Factor plus cable loss to receiver reading in dBuV to convert to field intensity in dBuV/Meter. Calibration per SAE ARP-958 (1 meter) or ANSI C63.5 (3 and 10 meters)

A.H. SYSTEMS INC.
9710 COZYCROFT AVE.
CHATSWORTH, CA 91311
(818) 998-0223

Model: ALR 25
Electro Metrics Loop Antenna
Date: 09-Jun-97
SN: 443

Switch Position # 4	
1 MHz	47.1
2 MHz	46.1
3 MHz	44.3
4 MHz	42.2
5 MHz	41.6
Switch Position # 3	
4 MHz	42.6
6 MHz	40.1
8 MHz	39.8
10 MHz	39.6
12 MHz	39.4
14 MHz	39.4
Switch Position # 2	
Inoperative	
Switch Position # 1	
10 MHz	34.7
15 MHz	32.6
20 MHz	29.9
25 MHz	29.3
30 MHz	28.0

CONVERSION FORMULAS: dBuV/m = dBuV + AF
dBuA/m = dBuV/m - 51.5 dB

RG 59/U 3 METER CABLE LOSS

MHZ	LOSS (db)	MHZ	LOSS (db)
		280	1.30
30	.47	290	1.37
35	.31	300	1.61
40	.64	310	1.28
45	.77	320	1.53
50	.70	330	1.71
55	.69	340	1.99
60	.76	350	1.84
65	.67	360	2.11
70	.48	370	2.06
75	.36	380	1.82
80	.23	390	2.29
85	.16	400	2.02
90	.12	410	2.18
95	.19	420	2.12
100	.24	430	2.31
105	.31	440	2.43
110	.48	450	2.57
115	.71	460	2.62
120	.45	470	3.03
125	.46	480	3.04
130	.50	490	3.18
135	.61	500	3.21
140	.61	525	2.94
145	.46	550	2.54
150	.58	575	2.85
155	.87	600	3.18
160	.95	625	3.15
165	.48	650	3.54
170	.48	675	3.71
175	.75	700	3.93
180	1.23	725	4.08
185	1.07	750	3.70
190	.43	775	3.65
195	.38	800	3.52
200	.58	825	4.41
210	.46	850	4.51
220	.58	875	4.33
230	.61	900	4.29
240	.90	925	4.78
250	.80	950	4.91
260	1.17	975	4.93
270	1.13	990	4.87

VII. DESCRIPTION OF EQUIPMENT/CABLES USED FOR TESTING

The test sample was connected and tested to the following equipment:

PERIPHERAL	MAKE/MODEL	SERIAL NO.	FCC ID
PC	DELL 466/MX	34GL1	E2K486MX
Monitor	DELL VC5	33E2424	ARFKDM1466
Keyboard	DELL AT101R	M9310-021237	GYUR05SK
Printer	Epson FX-850	00C0042889	BKM9A8P82PA
Mouse	Logitech M-SR14	LC4293001363	DZLMSR14

DESCRIPTION OF CABLE

All cabling is shielded. See attached photograghs.

VIII. RADIATED TEST PROCEDURE

Testing in the field as specified in ANSI C63.4, Section 8, the EUT was evaluated from the range of 30-1,000 mhz. The EUT was placed on a wooden turntable .8 meter above the groundplane and at a distance of 3 meters from the search antenna.

Maximum emissions were obtained by rotating the turntable and raising and lowering the search antenna while manipulating the cables which are bundled as specified. Appendix D in ANSI C63.4 was used for a reference. Both horizontal and vertical polarizations of the antenna were scanned and the position is noted on the radiated data sheet. Worst case configuration is shown in Photographs 1 and 2.

All emission levels were measured with a spectrum analyzer and represent peak readings at 100khz bandwidth resolution. Converting the spectrum analyzer readings of dbm to dbμv/m proceeds as follows:

A. Convert dbm to dbμv by adding 107db to the reading in dbm. This is derived from the voltage for a power level into a 50ohm load.

B. Finally, adding the antenna factor with any cable loss to the dbμv reading yields dbμv/m.

By formula: dbμv/m = dbm (reading) + 107db + AF + CL

Where: AF = Antenna Factor in db
CL = Cable Loss in db

IX. RADIATED TEST DATA/PHOTOGRAPHS

COMPANY NAME: CalComp DATE: 01/14/98

TEST SAMPLE: Digitizer Model 11120

SERIAL NUMBER: N/A

ANTENNA TYPE: DIPOLE ____ BICONICAL X LOG PER ____ LOOP ____

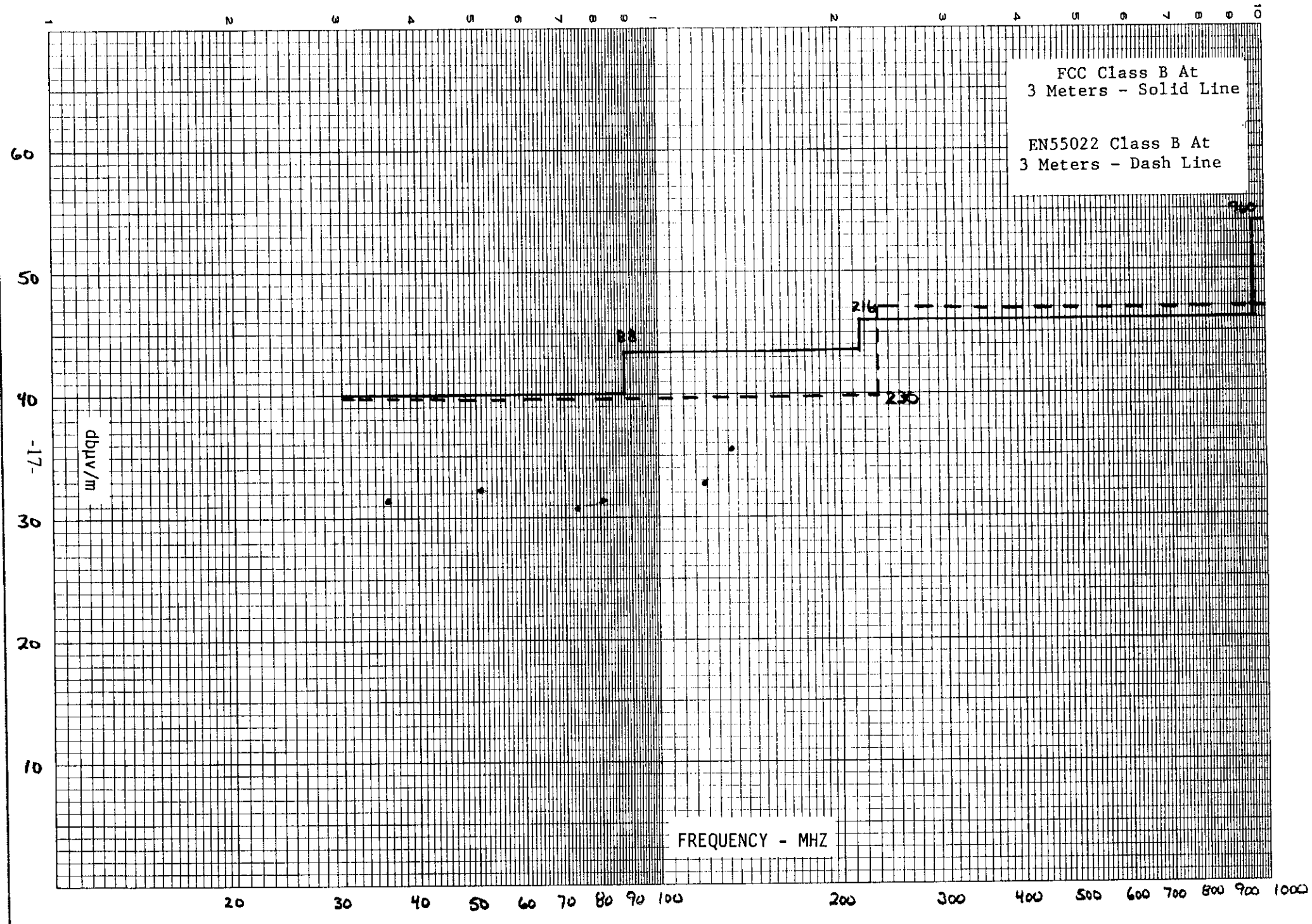
TEST DISTANCE: 3M PEN ____ CURSOR X

EMISSION FREQUENCY	ANT. POL.	ANT. HEIGHT (M)	AZIMUTH* DEGREES	METER READ dbµv	ANTENNA FACTOR & CABLE LOSS	FINAL READING dbµv/m	FCC LIMIT dbµv/m	MARGIN
35.80	V	1.5	180	20.85	10.71	31.56	40	+8.44
50.80	V	1.5	190	21.19	11.10	32.29	40	+7.71
73.33	V	1.5	200	21.36	9.58	30.94	40	+9.06
80.75	V	1.5	150	21.96	9.33	31.29	40	+8.71
118.00	V	1.5	200	20.66	12.30	32.96	43.5	+10.54
132.80	V	1.5	210	23.09	12.43	35.52	43.5	+7.98

* A 0-degree reading means the front of the EUT is facing the antenna. 180 degrees would mean the back of the EUT is facing the antenna. Rotation is clockwise from 0 degrees.

NO. 340R-L210 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
2 CYCLES X 10 DIVISIONS PER INCH

EUGENE DIETZGEN CO.
MADE IN U. S. A.



X. CONDUCTED TEST PROCEDURE

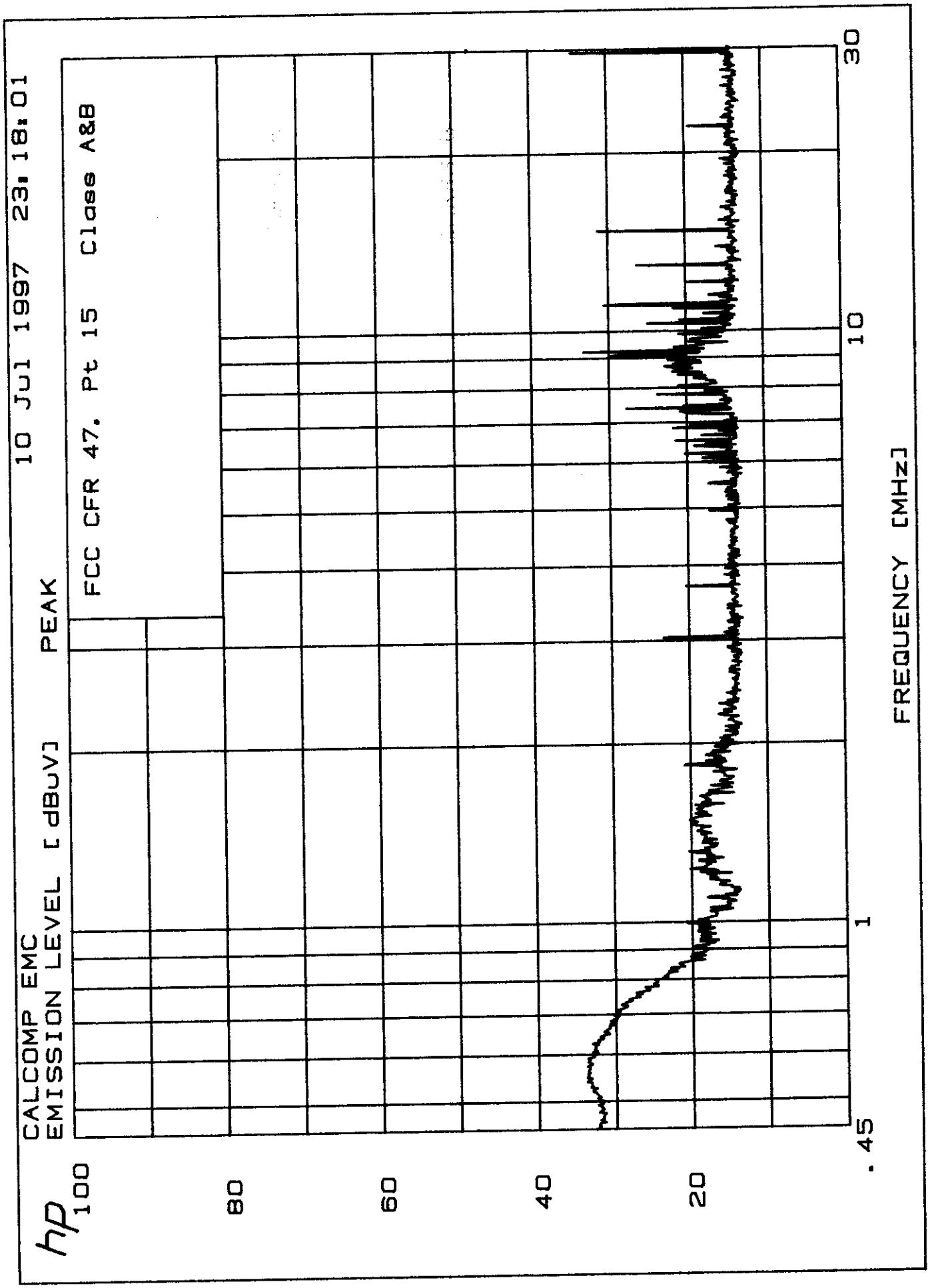
Since the EUT gets it's power from the host as mentioned in the description, Section III, the entire system (printer, monitor and computer) were hooked to the same LISN . The EUT was set up over a horizontal ground plane measuring approximately 2.5 x 3 meters and beside a vertical ground plane measuring about 2 x 2 meters as outlined in ANSI C63.4, Paragraphs 5.2.1 and 5.2.2. Any excess power cord between the LISN and EUT was folded back and forth to form a bundle not exceeding 40cm in length. All test procedures used ANSI C63.4, Paragraph 7.2.1 as a reference. Test configuration is shown in Photographs 3 and 4.

The following graphs show the resulting conducted tests and each graph shows the following:

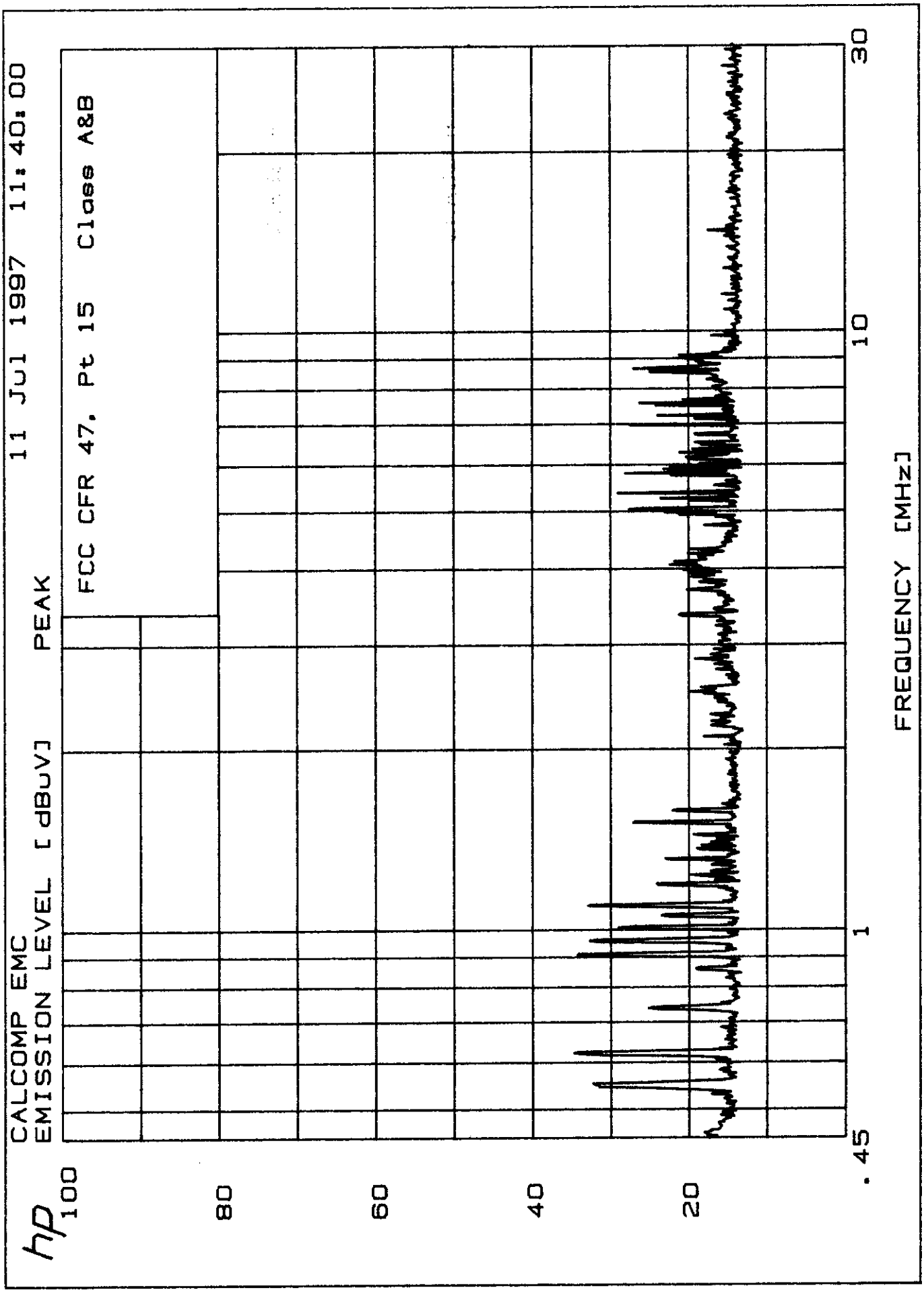
GRAPH NUMBER	FREQUENCY RANGE, MHZ	POWER LINE SIDE	GROUNDING
1	.45-30	Line	Ungrounded
2	.45-30	Neutral	Ungrounded
3	.45-1	Line	Ungrounded
4	.45-1	Neutral	Ungrounded
5	.15-30	Line	Ungrounded
6	.15-30	Neutral	Ungrounded

On all graphs, the red horizontal line is the maximum FCC Class B Reference Level or EN55022 Class B Level.

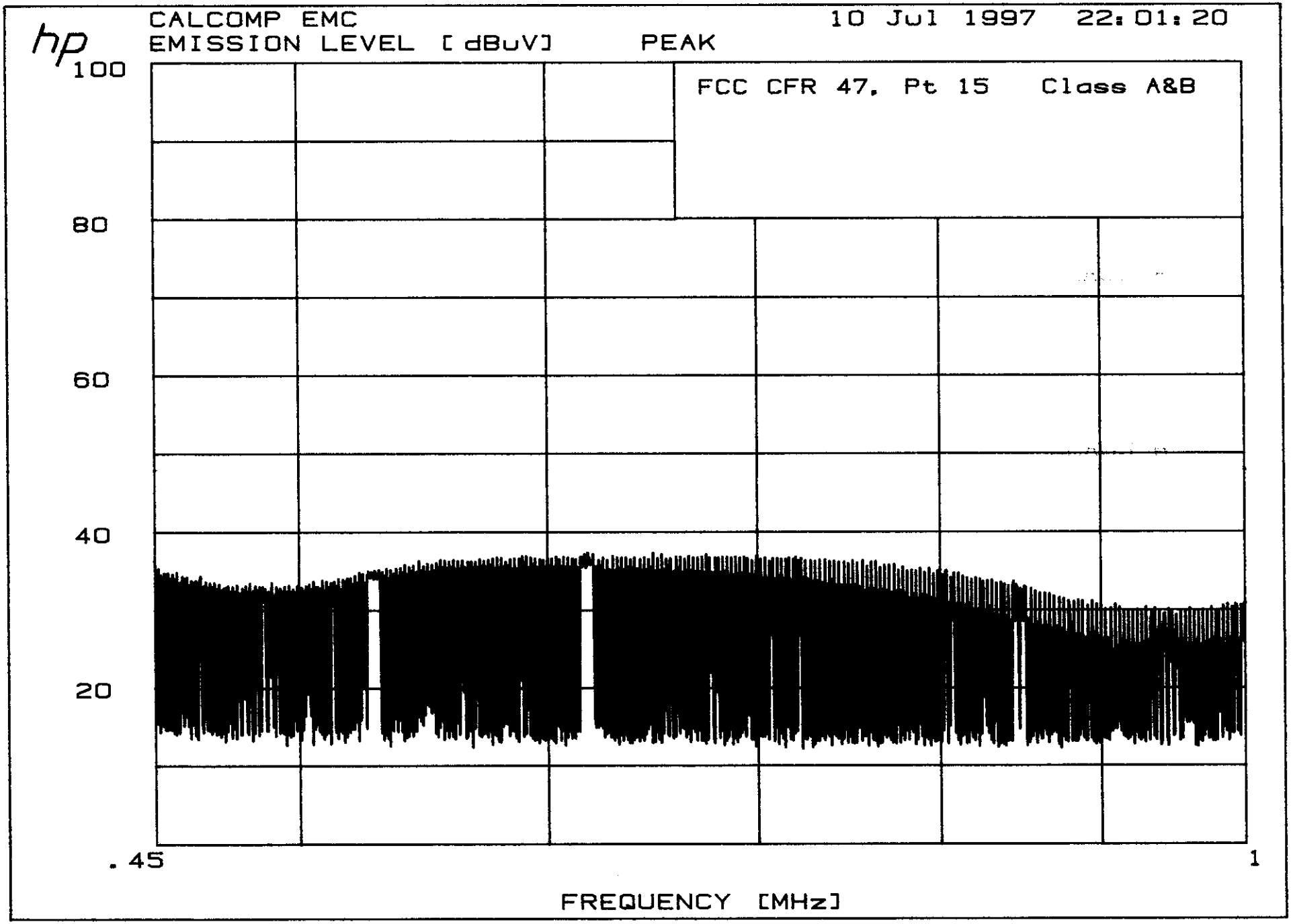
XI. CONDUCTED TEST DATA/PHOTOGRAPHS


10 Jul 1997 23:18:01
FCC CFR 47, Pt 15 Class A&B
CALCOMP EMC
EMISSION LEVEL [dBuV] PEAK
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

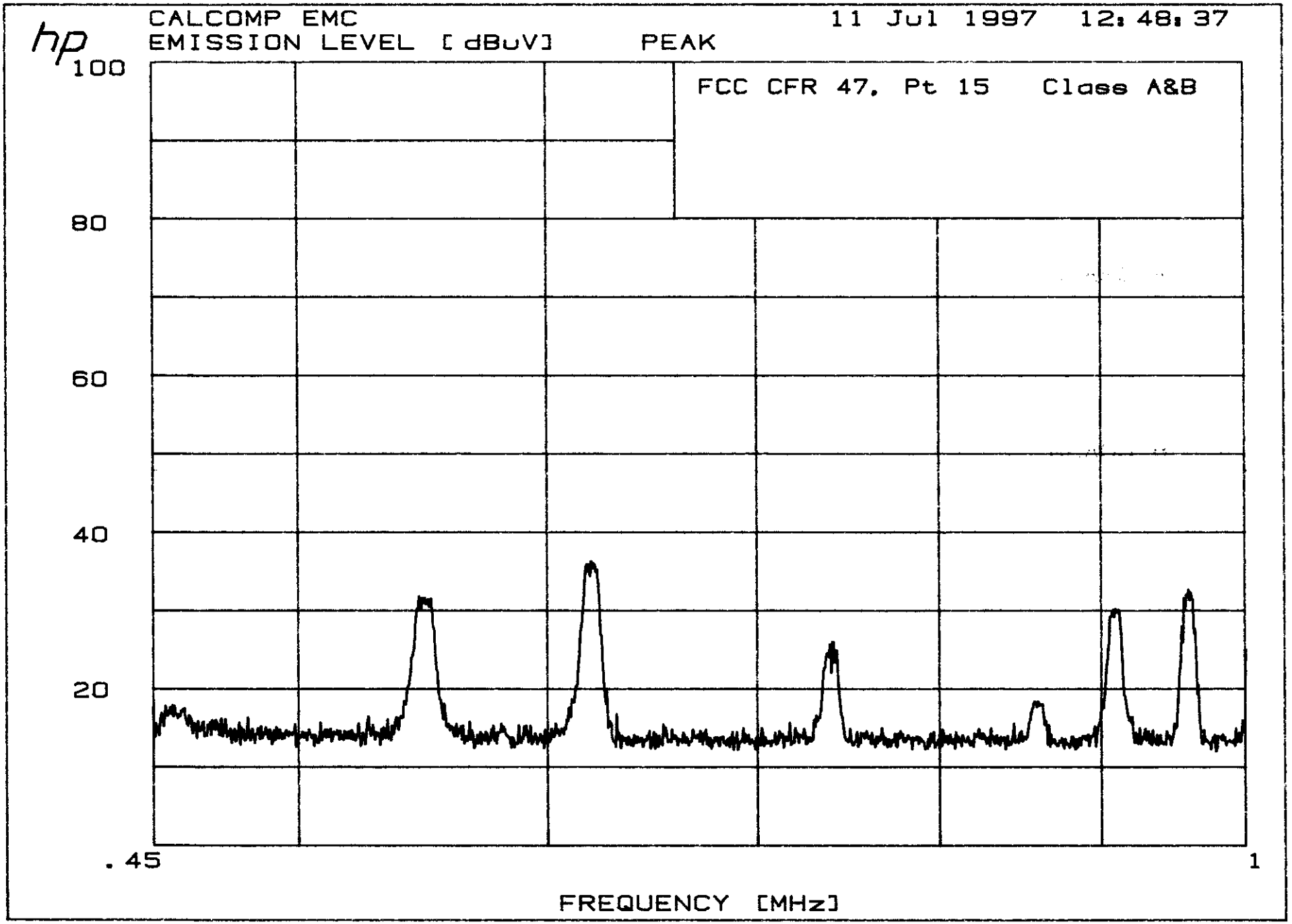
Graph 1


CALCOMP EMC
EMISSION LEVEL [dBuV]
11 Jul 1997 11:40:00
PEAK
FCC CFR 47, Pt 15 Class A&B
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

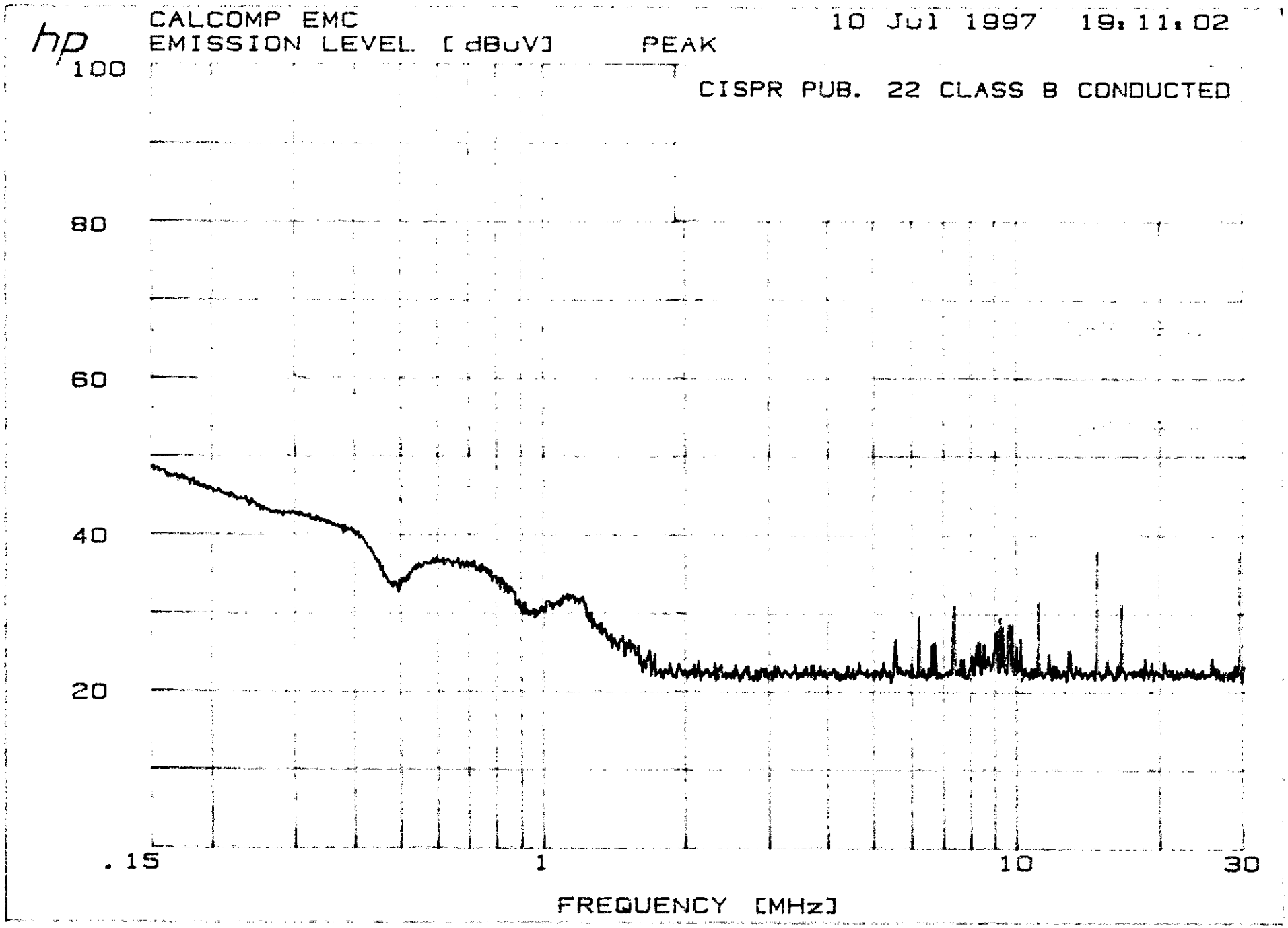
Graph 2


CALCOMP EMC
10 Jul 1997 22:01:20
EMISSION LEVEL [dBuV]
PEAK
FCC CFR 47, Pt 15 Class A&B
100
80
60
40
20
.45
1
FREQUENCY [MHz]

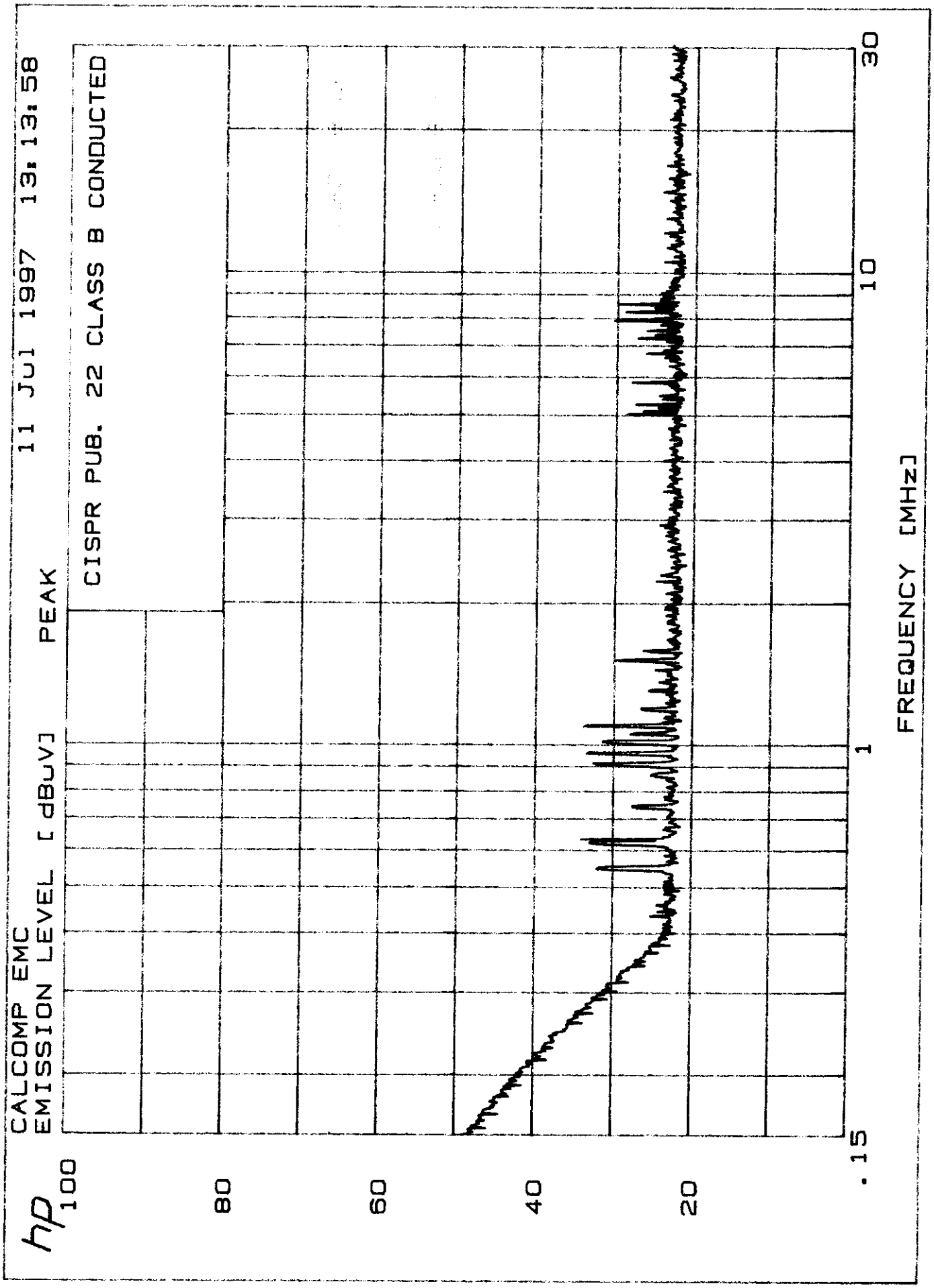
Graph 3
-23-


CALCOMP EMC
11 Jul 1997 12:48:37
EMISSION LEVEL [dBuV]
PEAK
FCC CFR 47, Pt 15 Class A&B
100
80
60
40
20
.45
1
FREQUENCY [MHz]

Graph 4
-24-


hp
CALCOMP EMC
EMISSION LEVEL [dBuV]
PEAK
10 Jul 1997 19:11:02
CISPR PUB. 22 CLASS B CONDUCTED
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]

Graph 5


CALCOMP EMC
EMISSION LEVEL [dBuV]
PEAK
11 Jul 1997 13: 13: 58
CISPR PUB. 22 CLASS B CONDUCTED
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]

Graph 6

XII. SUMMARY OF RESULTS

The Digitizer Model 11120, 11120A, 35120 and 35120A has shown that it passes both radiated and conducted test limits for FCC Class B as noted in FCC's CFR 47, Park 15, Paragraphs 15.107 and 15.109. Worst case margin was noted to be +7.71db at 50.80Mhz. All margins are stated in Section IX; radiated test data, Page 16. This product has also shown that it passes the Class B limits as specified in CISPR 22/EN55022 standards as set in CISPR 22 Publication, Paragraphs 4 and 5.

The product tested had no specific modifications done to it to pass the above limits.