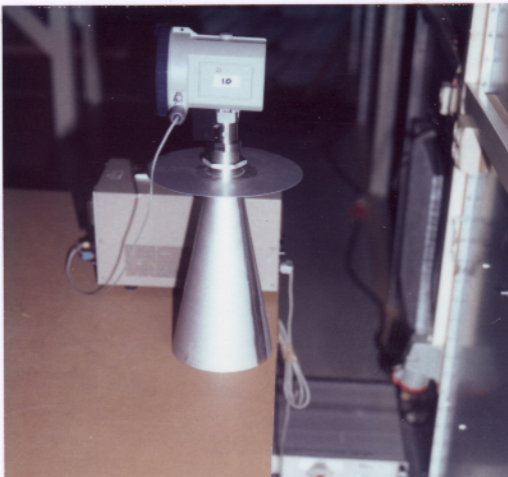
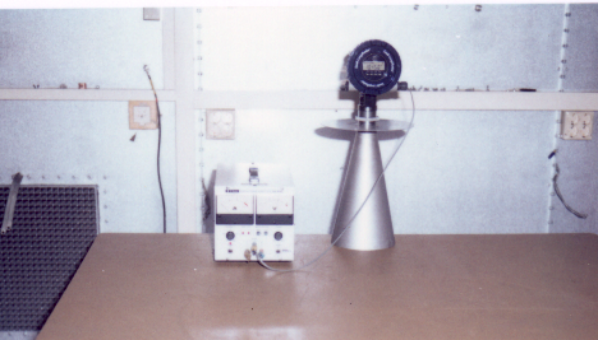

List over Appendixes.

<u>Appendix No</u>	<u>Note</u>
1	Test set-up, photos
2	Test set-up, photos
3	Power line filter
4	Radar pulse data
5	CE, 0.45 - 30 MHz, live
6	CE, 0.45 - 30 MHz, neutral
7	RE, 9 kHz – 30 MHz
8	RE, 30 - 300 MHz, VP, 3 m, 8” Antenna
9	RE, 30 - 300 MHz, HP, 3 m, 8” Antenna
10	RE, 300 - 1000 MHz, VP, 3 m, 8” Antenna
11	RE, 300 - 1000 MHz, HP, 3 m, 8” Antenna
12	Calculation of radiated emission
13	Test equipment set-up
14 - 21	Fundamental, 6.22 GHz. All Antennas
22 - 28	Harmonic, 12.44 GHz. All Antennas
29	Calculation of Final Emission Levels, 1 - 40 GHz

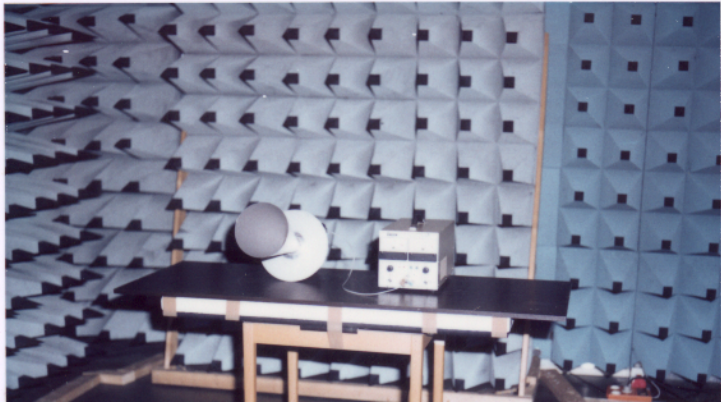
Test set-up, Conducted Emission



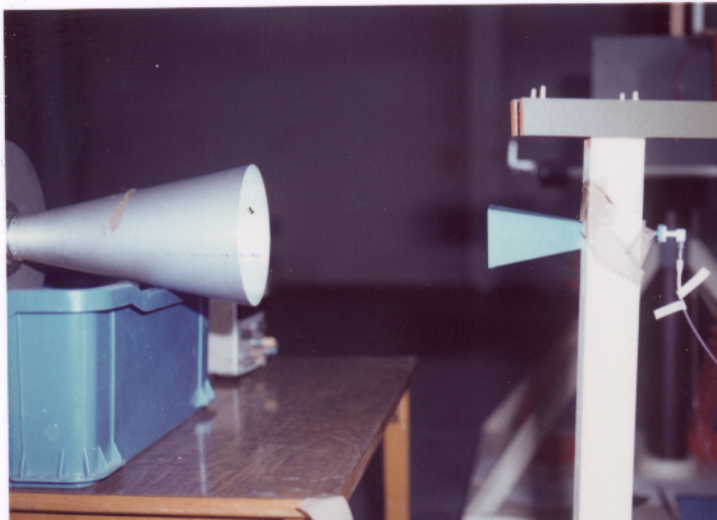
Test set-up, Conducted Emission



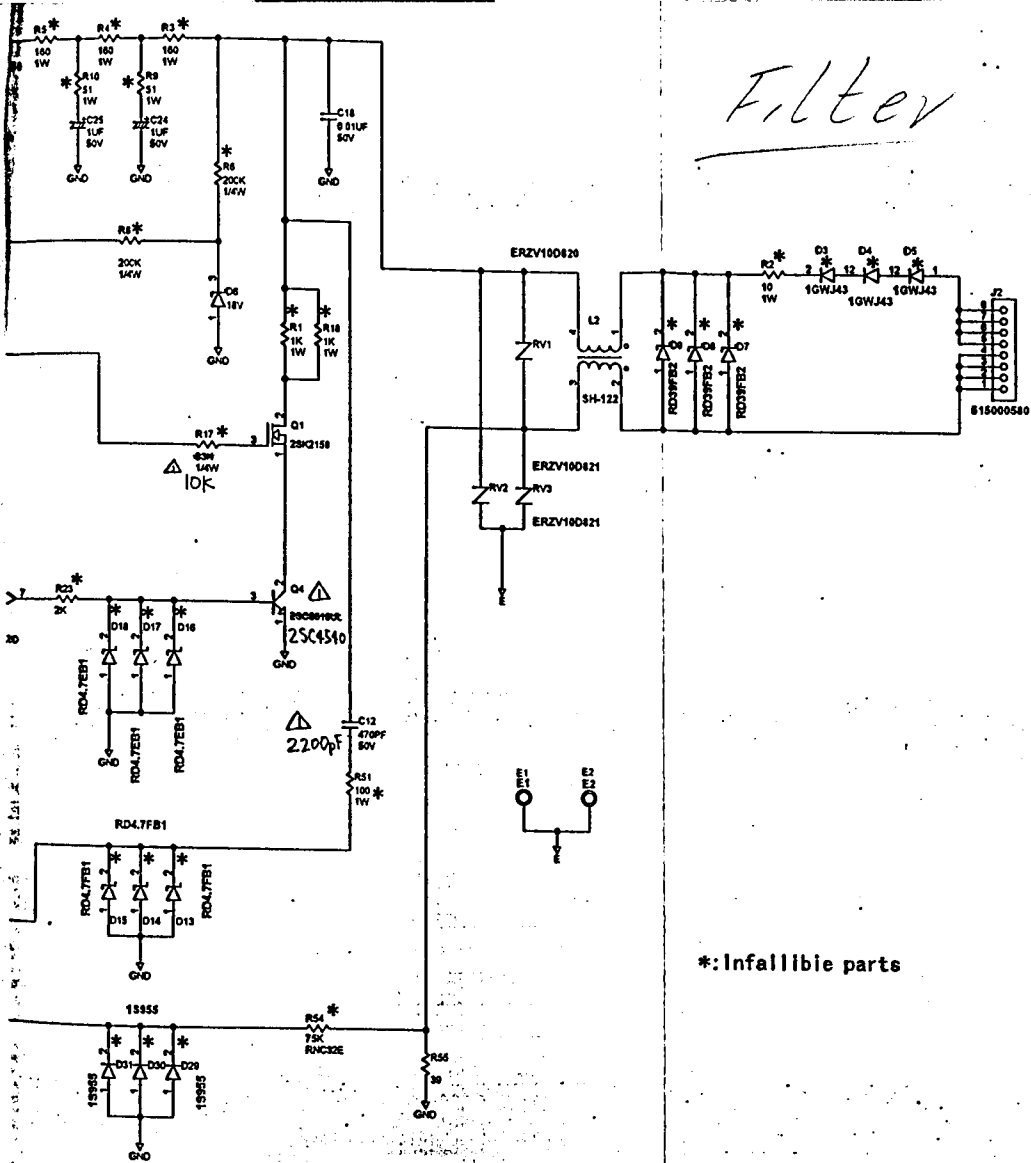
Test set-up, Pretest of Radiated Emission 30 - 1000 MHz



Radiated emission, check of harmonics

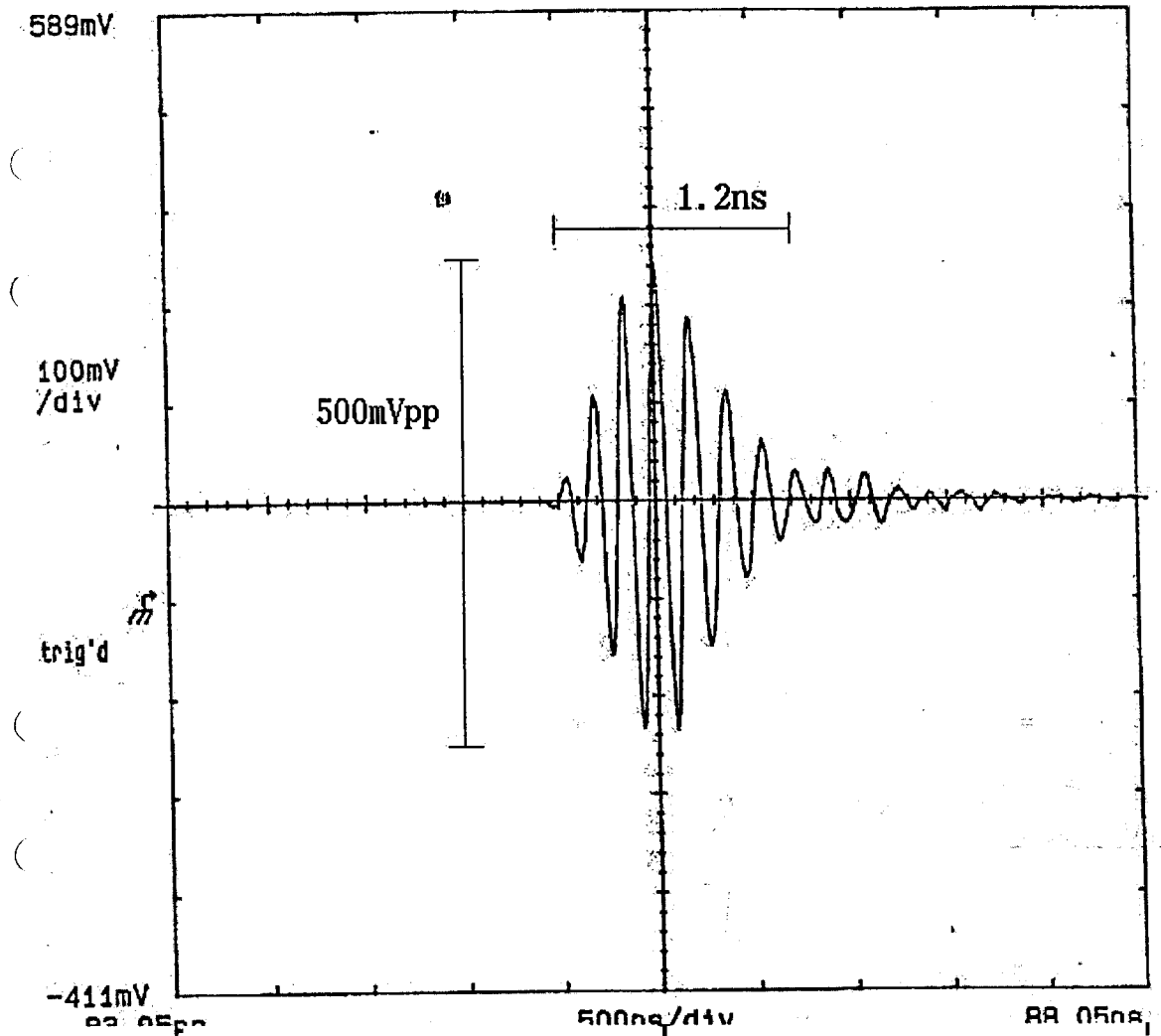


Power Line Filter



△					CHK-10 CIRCUIT DIAGRAM				
△	-								
△	-								
△	99-9-18	3 parts	T. Kinoshita						
MARK	日付 DATE	変更項目 REVISION	担当 SIGN	製 図 DRAWN BY	設 計 CHARGED BY	検 図 CHECKED BY	承認 APPROVED BY		
記事 NOTE				サイズ SIZE					
B				T. Kinoshita	T. Kinoshita	S. Taketake	R. Kobayashi		
TOKIMEC				尺 度 SCALE	図面番号 DRAWING NO.		REV	SHT	
株式会社 トキメック TOKIMEC INC.				日 付 DATE	1999-8-20	51509908	2	1/2	

Radar pulse data

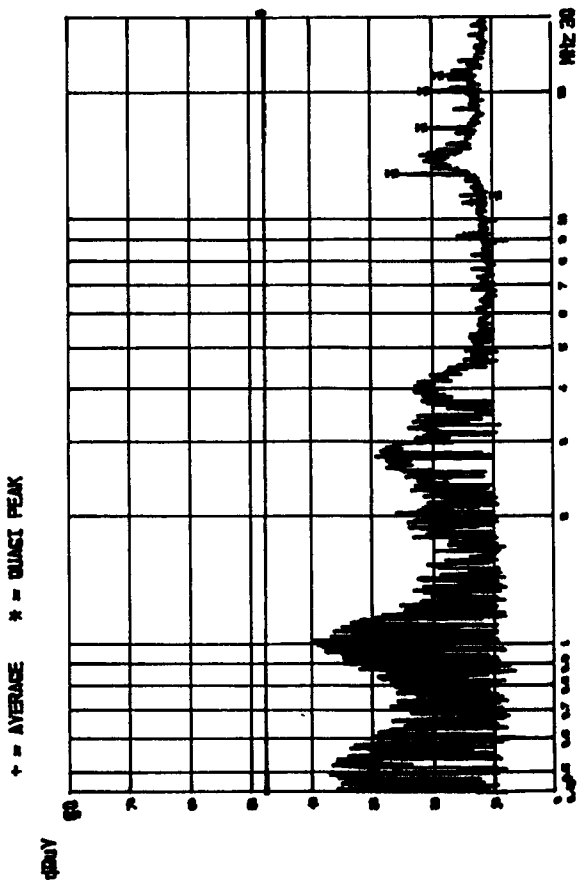


Frequency MHz	Average dBuV	AV-Margin dBuV	Quasi dBuV	Peak dBuV	QP-Margin dBuV
0.4894	-	-	-	29.3	-16.7
0.4962	6.2	-41.6	-	29.6	-16.4
0.5224	-	-	-	29.9	-16.1
0.5324	-	-	-	29.6	-16.4
0.5672	-	-	-	31.2	-16.8
0.5901	-	-	-	32.1	-14.9
1.0041	-	-	-	33.4	-14.6
1.0278	-	-	-	33.2	-14.6
1.0471	-	-	-	32.2	-15.8
9.2176	-	-	-	12.6	-24.2
11.0614	-	-	-	12.6	-35.4
11.8221	-	-	-	9.4	-36.6
12.9048	-	-	-	25.8	-21.5
14.2873	-	-	-	19.8	-22.2
16.5917	-	-	-	21.7	-25.3
20.2768	-	-	-	21.2	-25.6
22.1224	-	-	-	18.8	-23.2

* Limit exceeded

**Saab Marine Electronics AB
 Conducted Emission Test**

Start of Test: 14.MAR'00 . 13:51
 E.U.T.: Saab Looprader pre e/m: 10
 Oper. Condition: With 6' horn. (Unshielded pow. cable)
 Operator: BO SIDLOEM
 Test Spec: FCC Part 15, Subpart C. Conducted RFI
 Start Fr. Stop Fr. IF-BW Display Att. Transducer
 MHz MHz KHz Mode dB type
 0.4500 20.0000 10.00 Max Hold 0 NSLK



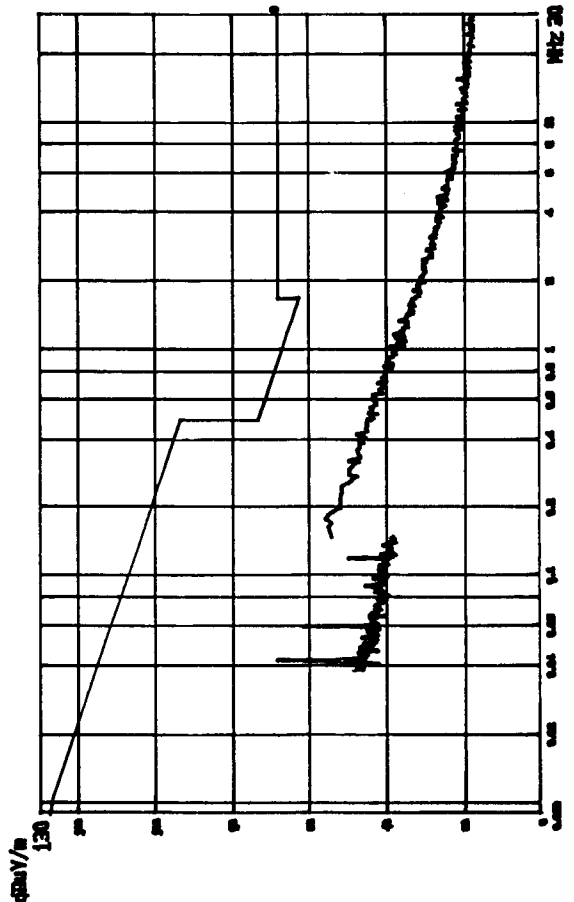
CONDUCTED EMISSION ON 115 V ac. neutral terminal

no list available

**Saab Marine Electronics AB
 Radiated Emission Pretest**

Start of Test: 14.MAR'00 . 10:24
 E.U.T.: Saab Loopradar pre e/n: 10
 Oper. Condition: With 6' horn. (Unshielded pow. cable)
 Operator: RO GIDLÖEH
 Test Spec: FCC Part 15 Subp. C 0.003 - 30 MHz @ 3 m.
 Pretest With 8502.

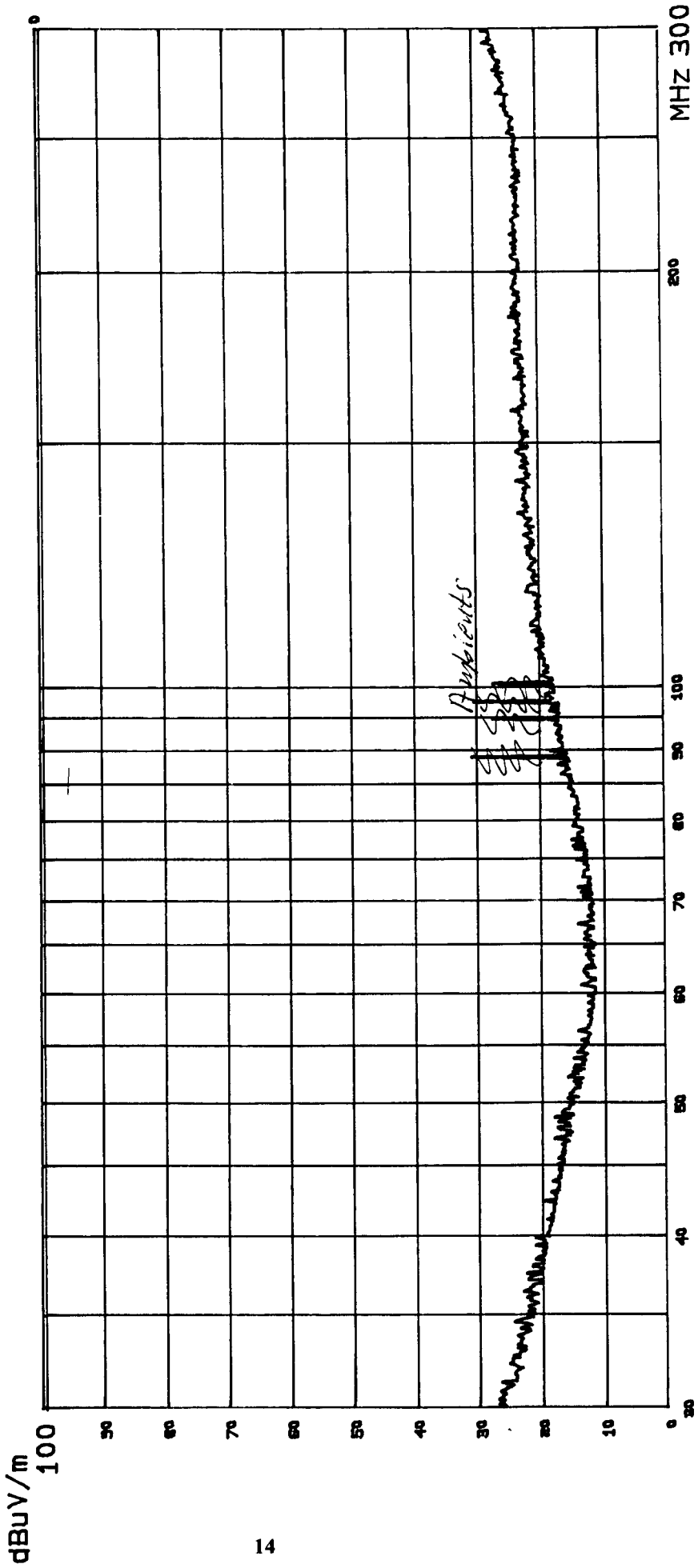
Start Fr. Stop Fr. IF-BW Detect Att. Meas.T. Trashed.
 MHz MHz KHz tor dB g type
 0.0090 0.1499 0.2 Peak LB 0.005 LOOP
 0.1500 20.0000 10 Peak LN 0.005 LOOP



PRELIMINARY PEAK SPECTRUM SIGNATURE (NOT FINAL TEST)

Start Fr. MHz 30.0000 Stop Fr. MHz 299.9999 IF-BW KHz 120 Detec dB LN 0.020 Meas. T. s
 Trans. type ~~100P~~ EM6912

Saab Marine Electronics AB
 Radiated Emission Pretest
 Start of Test: 14.MAR'00 . 11:31
 E.U.T.: Saab Loopradar pro s/n: 10
 Oper. Condition: With 8' horn. (Unshielded pow. cable)
 Operator: BO BJÖLÖEN
 Test Spec: Pretest executed with EM-ant.in anechoic chamber. 30-300 MHz

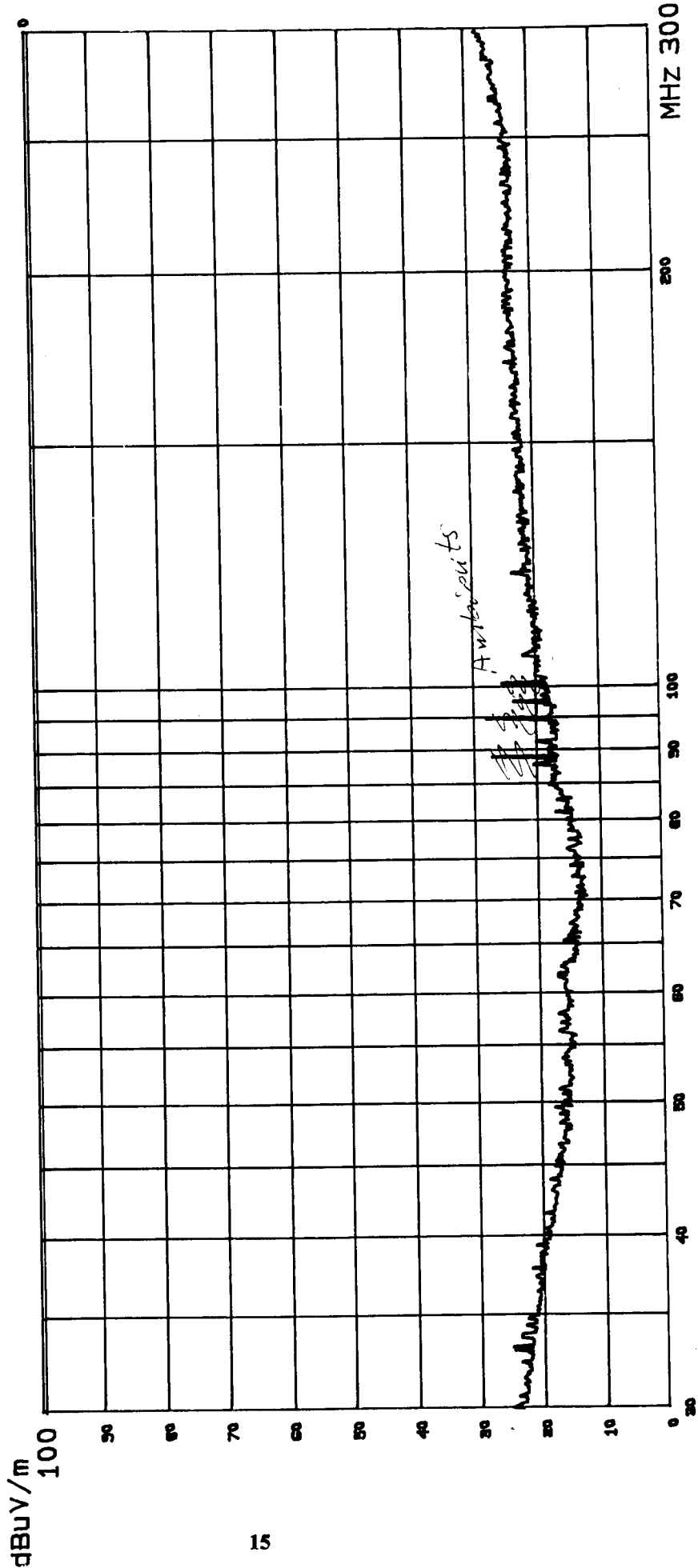


PRELIMINARY PEAK SPECTRUM SIGNATURE (NOT FINAL TEST) V P

Start Fr. 30.0000 MHz Stop Fr. 299.9999 MHz IF-BM Detec for 120 Peak LN 0.020 Meas. T. type Trained. *EM 6982*

**Saab Marine Electronics AB
 Radiated Emission Pretest**

Start of Test: 14.MAR'00 . 11:31
 E.U.T.: Saab Loopradar pra e/n: 10
 Oper. Condition: With 6' horn. (Unshielded pow. cable)
 Operator: BO GIDLOEM
 Test Spec: Pretest executed with EN-ant.in anechoic chamber. 30-300 MHz



PRELIMINARY PEAK SPECTRUM SIGNATURE (NOT FINAL TEST) HP

Start Fr. 300.0000 1000.0000 120 Peak LN 0.020 EM6950
 MHz MHz KHz dB
 Stop Fr. 1000.0000 120 Peak LN 0.020 EM6950
 MHz MHz KHz dB
 IF-BW Detec Att. Meas.T. Transd.
 type

**Saab Marine Electronics AB
 Radiated Emission Pretest**

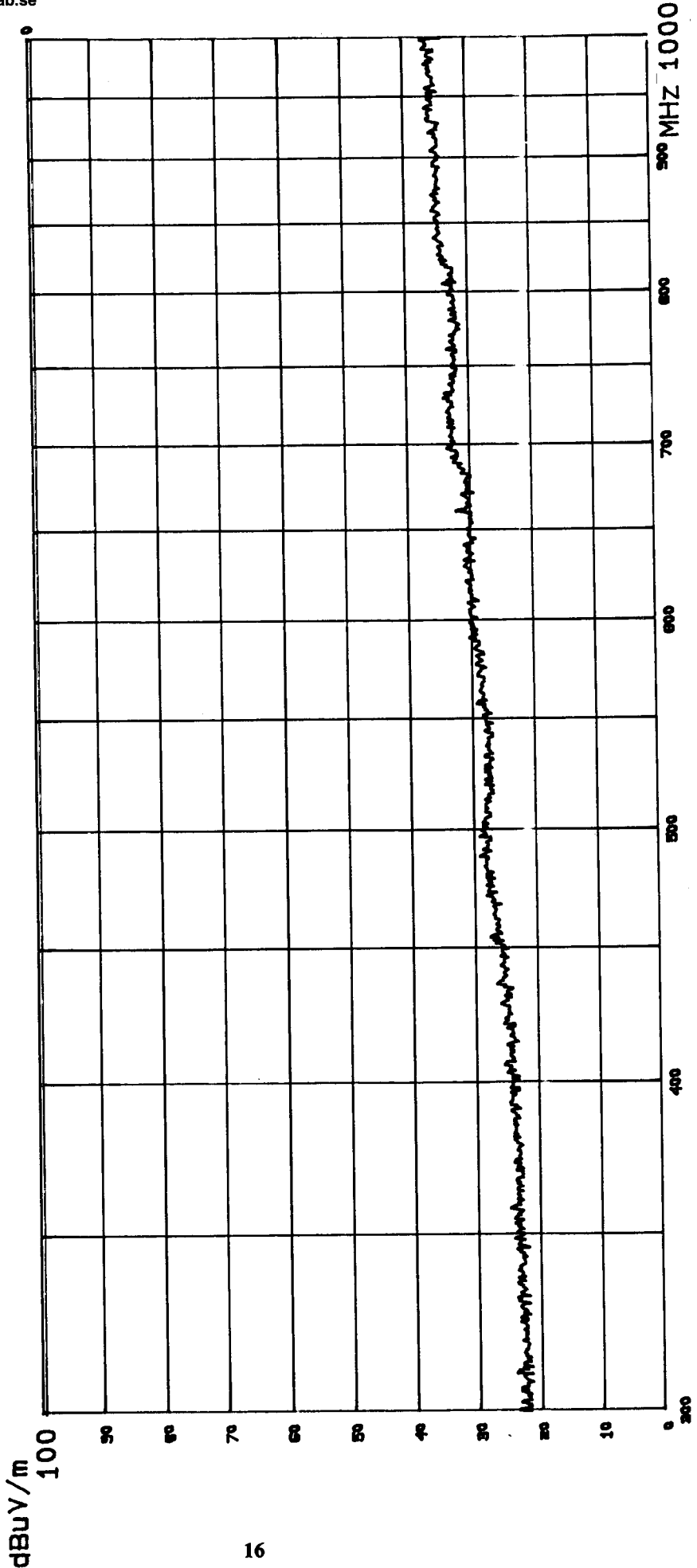
Start of Test: 14.MAR'00 . 11:54

E.U.T.: Saab Loopradar pro s/m: 10

Oper. Condition: With 6' horn. (Unshielded pow. cable)

Operator: BO GIDLÖEN

Test Spec: Pretest executed with EN-ant.in anechoic chamber. 0.2-1 GHz

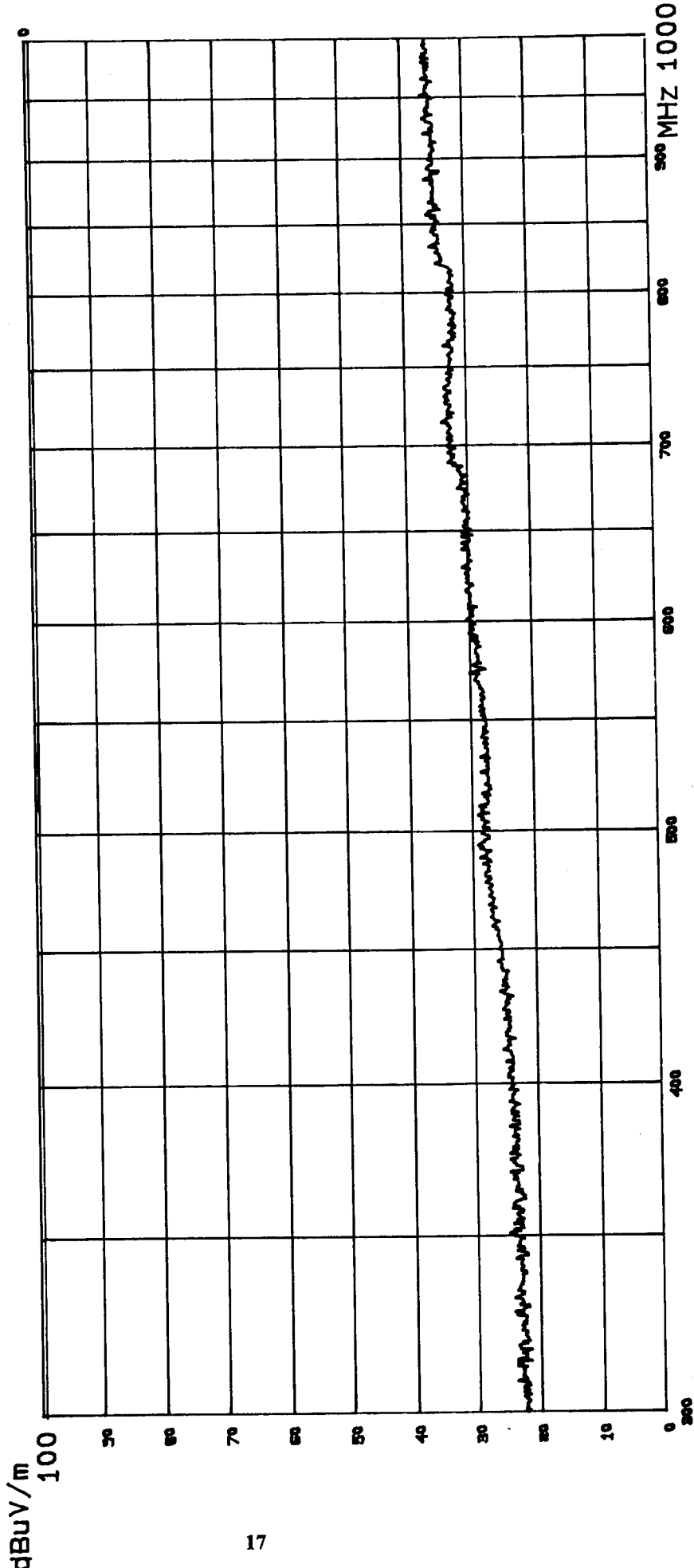


Start Fr. Stop Fr. IF-BW Detec Att. Meas. T. Trained.
 MHz MHz KHz dB type
 300.0000 1000.0000 120 Peak LN 0.020 EM6960

**Saab Marine Electronics AB
 Radiated Emission Pretest**

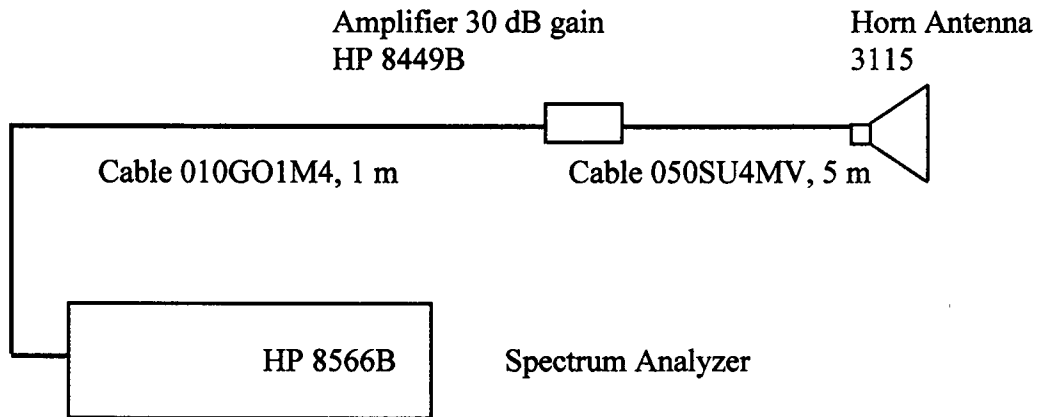
Start of Test: 14.MAR'00 . 11:54
 E.U.T.: Saab Loopradar pre s/n: 10
 Oper. Condition: With 6' horn. (Unshielded pow. cable)
 Operator: BO GIDLOEM

Test Spec: Pretest executed with EM-ant.in anechoic chamber. 0.3-1 GHz

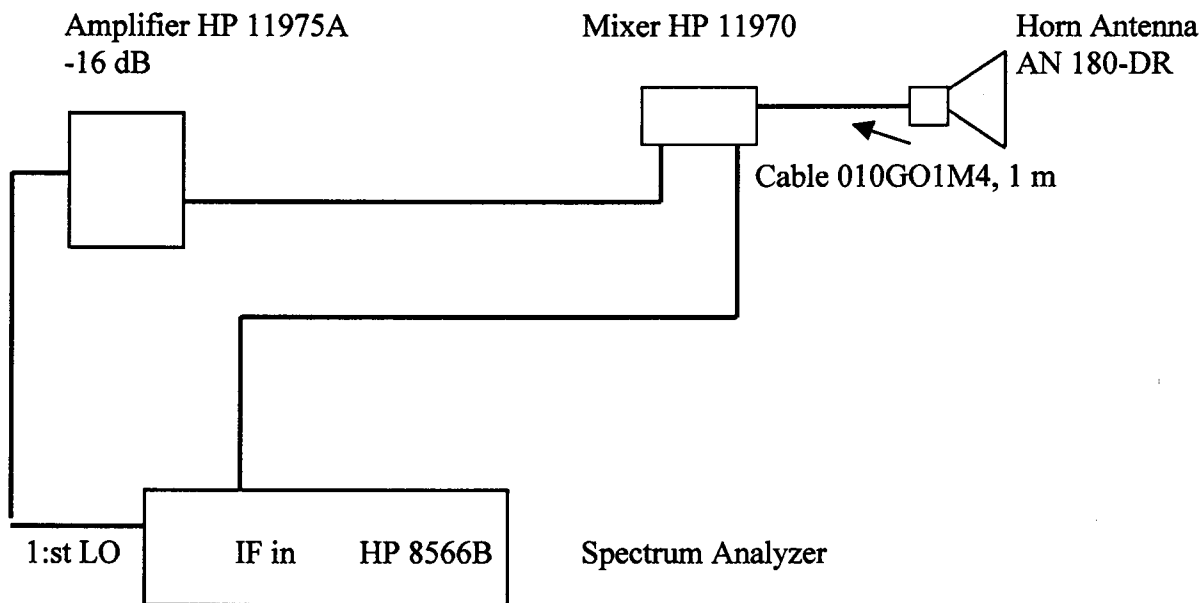


Test equipment set-up

1 - 18 GHz:



18 - 40 GHz:



MKR 6.220 GH

53.10 dB

ATTEN 10 dB

REF 65.0 dBμV

hp

5 dB/

VIDEO BW

1 MHz

SPAN 5.00 GH

SWP 125 msec

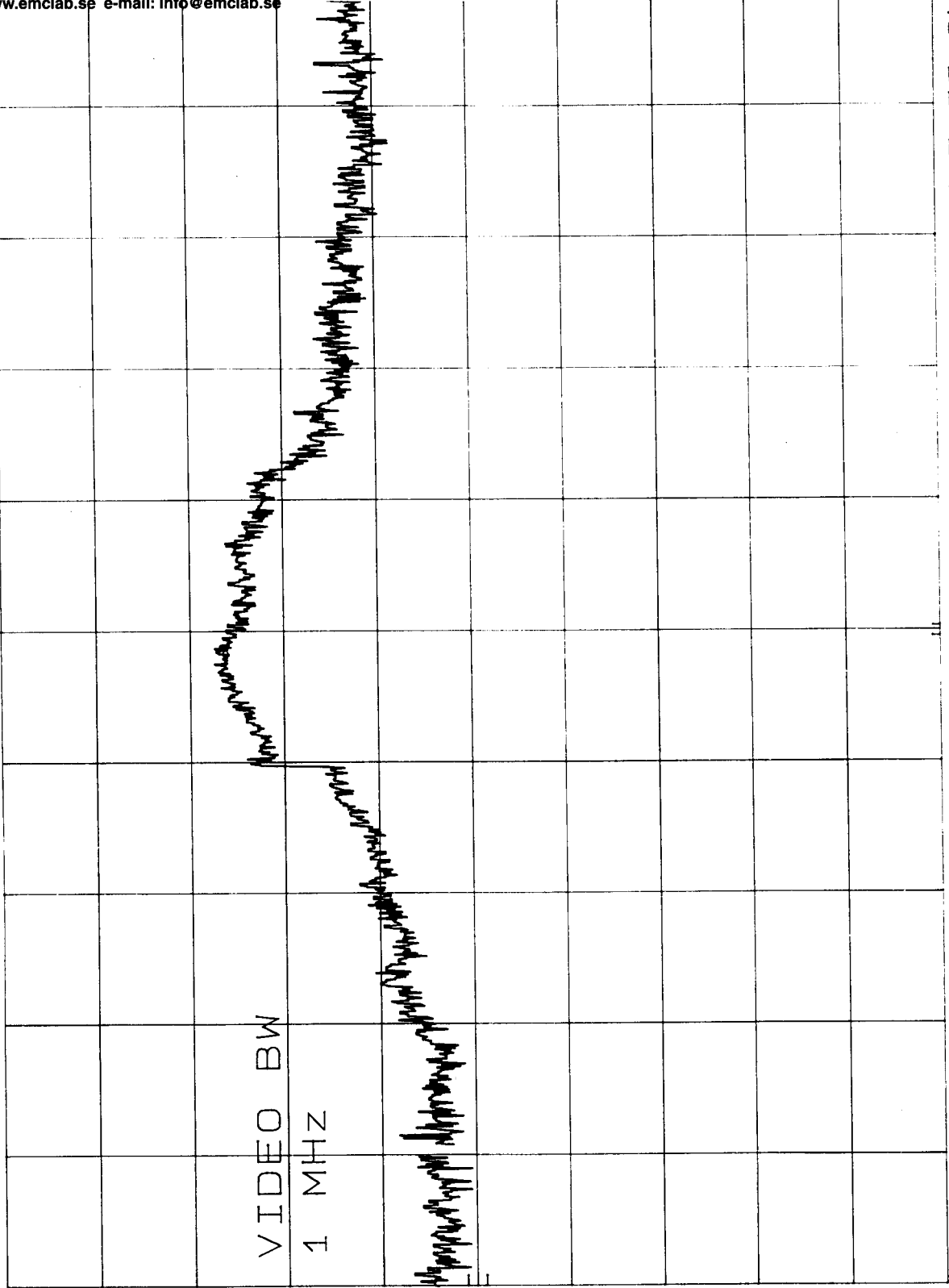
VBW 1 MHz

CENTER 6.31 GHZ

RES BW 1 MHz

8" horn Peak, max hold 3 m VP

000315 BG



MKR 6.220 GHz
 46.60 dB

REF 65.0 dBμV
 ATTN 10 dB

hp
 5 dB/

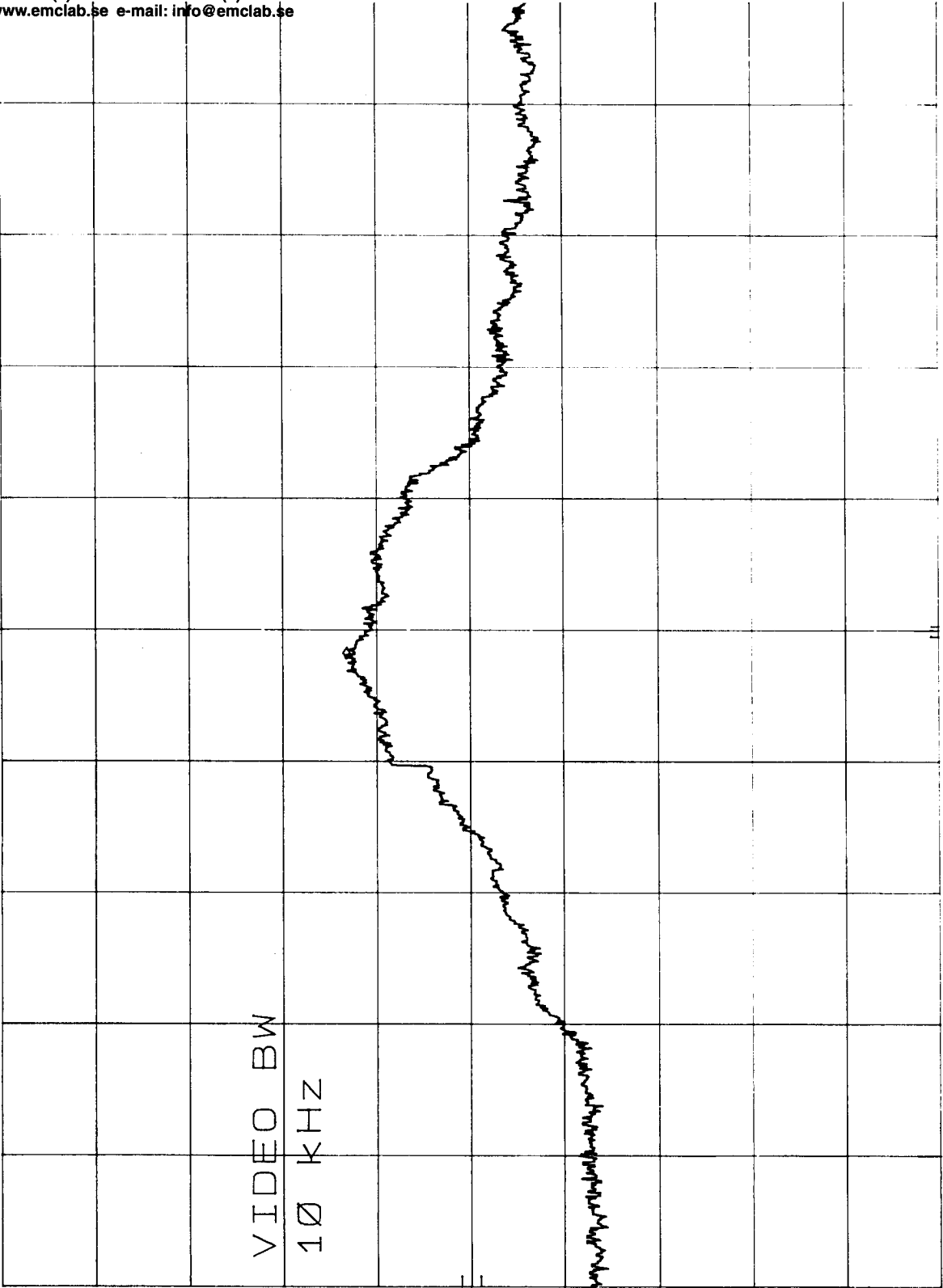
VIDEO BW
 10 KHZ

SPAN 5.00 GHz
 SWP 1.50 sec

VBW 10 KHZ

CENTER 6.31 GHz
 RES BW 1 MHz

8" horn AV 3m VPMax



000315 RG

MKR 6.220 GHz

51.55 dB

REF 65.0 dBµV ATTEN 10 dB

HP

5 dB/

VIDEO BW
 1 MHz

SPAN 5.00 GHz
 SWP 125 msec

VBW 1 MHz

CENTER 6.31 GHz
 RES BW 1 MHz

VP Max

6" horn Peak 3m

ANNE 15 RC

MKR 6.220 GHz

44.20 dB

ATTEN 10 dB

REF 65.0 dBμV

hp
 5 dB/

VIDEO BW
 10 KHZ

SPAN 5.00 GHz
 SWP 1.50 sec

VBW 10 KHZ

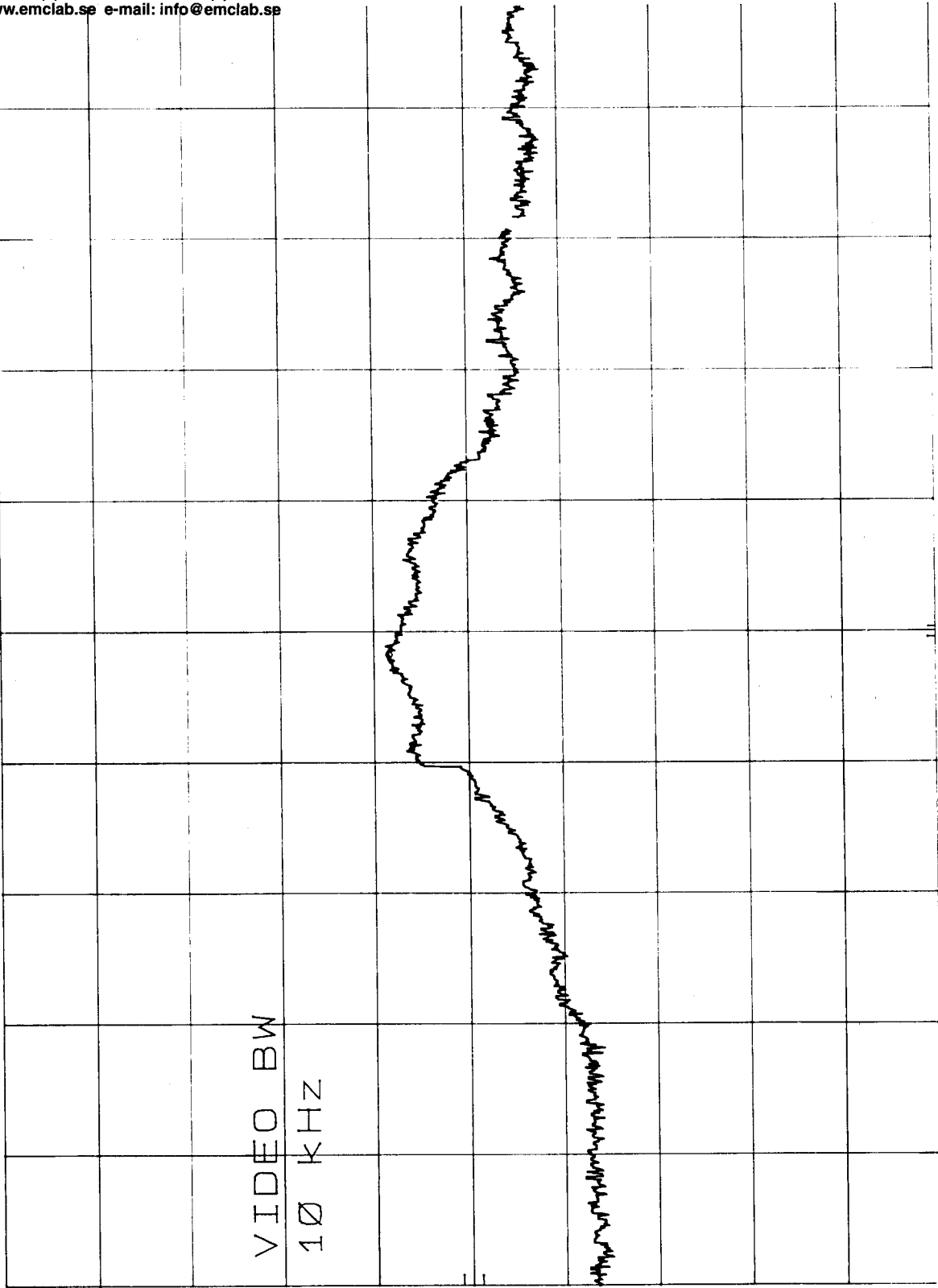
CENTER 6.31 GHz

RES BW 1 MHz

VP Max

6" horn AV 3m

000315 B6



MKR 6.220 GH
49.30 dB

HP REF 65.0 dBμV ATTEN 10 dB

HP

5 dB/

VIDEO BW
1 MHz

SPAN 5.00 GH
SWP 125 msec

VBW 1 MHz

CENTER 6.31 GHZ

RES BW 1 MHz

4" horn Peak 3m VP Max

000315 BG

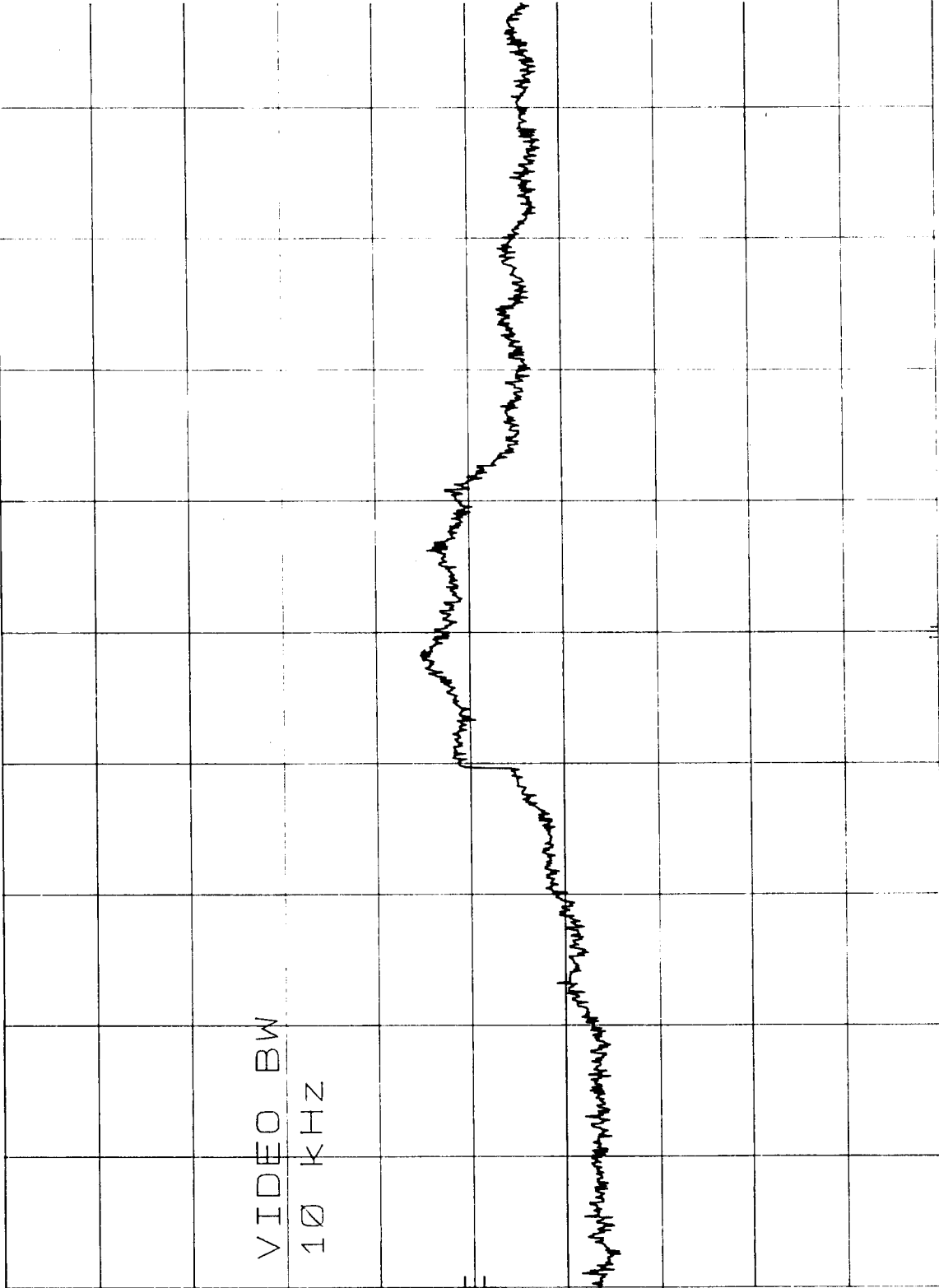
MKR 6.220 GH
 42.40 dBL

REF 65.0 dBμV ATTEN 10 dB

hp

5 dB/

VIDEO BW
 10 KHZ



SPAN 5.00 GH
 SWP 1.50 SEC

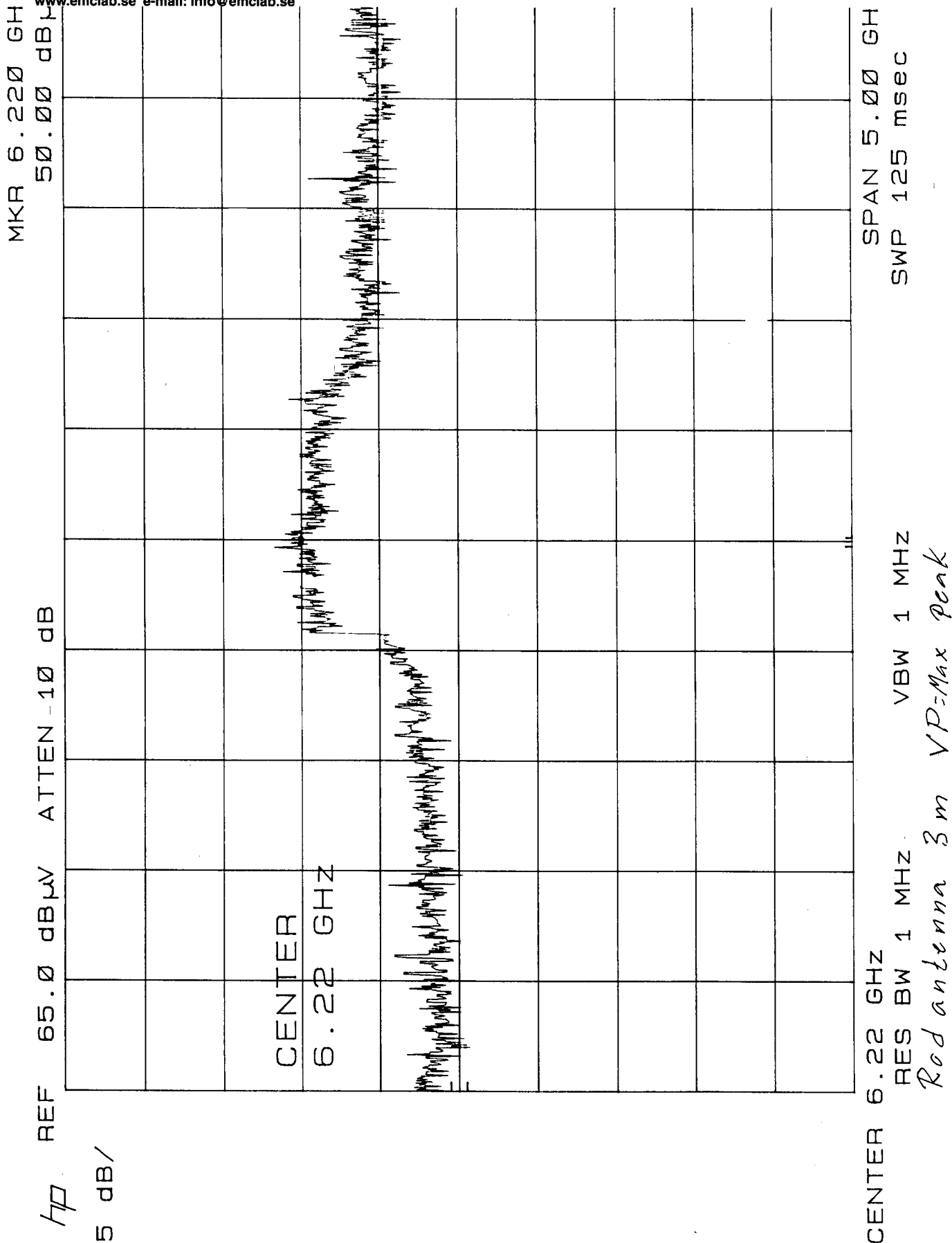
VBW 10 KHZ

CENTER 6.31 GHZ
 RES BW 1 MHZ

4" horn AV 3 m VP Max

000715 RC

30.



42.

MKR 6.220 GH

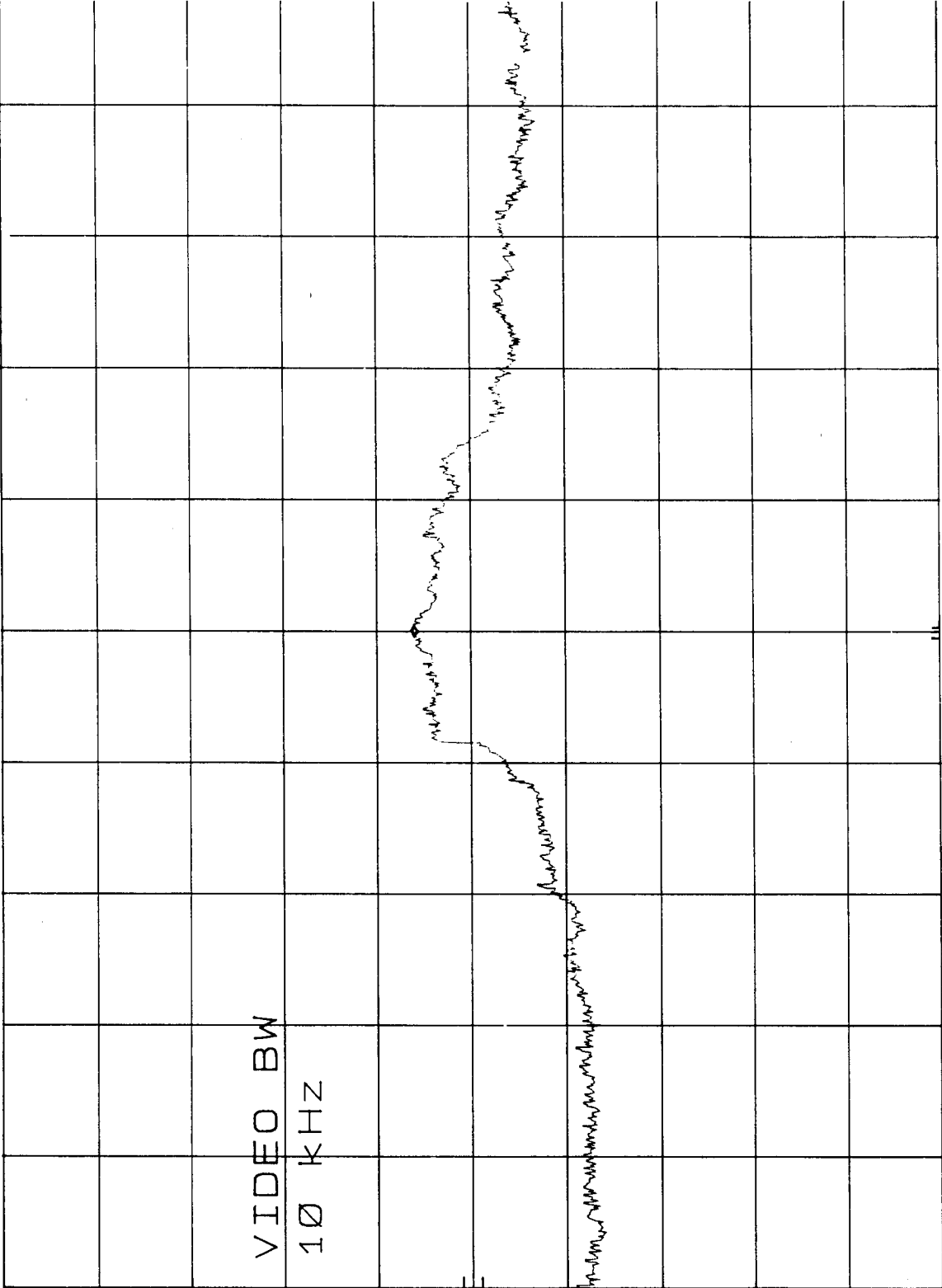
REF 65.0 dBμV

ATTEN 10 dB

hp

5 dB/

43.00 dBμ



CENTER 6.22 GHZ

RES BW 1 MHz

VBW 10 KHZ

SPAN 5.00 GH

SWP 1.50 sec

Rod antennen 3 m VP AV

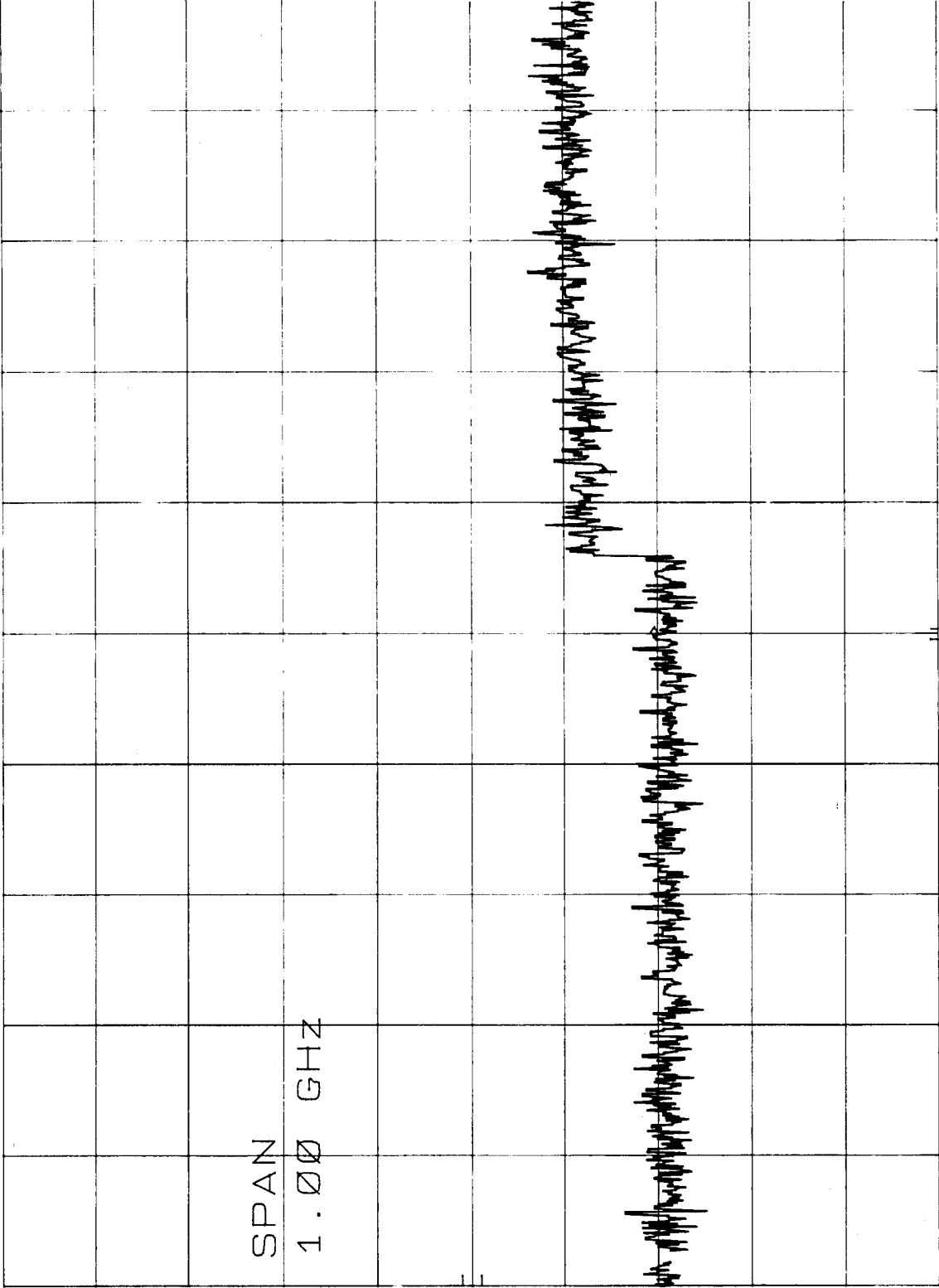
000315 BG

MKR 12.440 GH
 25.15 dBμ

HP REF 60.0 dBμV ATTEN 10 dB

5 dB/

SPAN
 1.00 GHZ



SPAN 1.00 GH
 SWP 30.0 sec

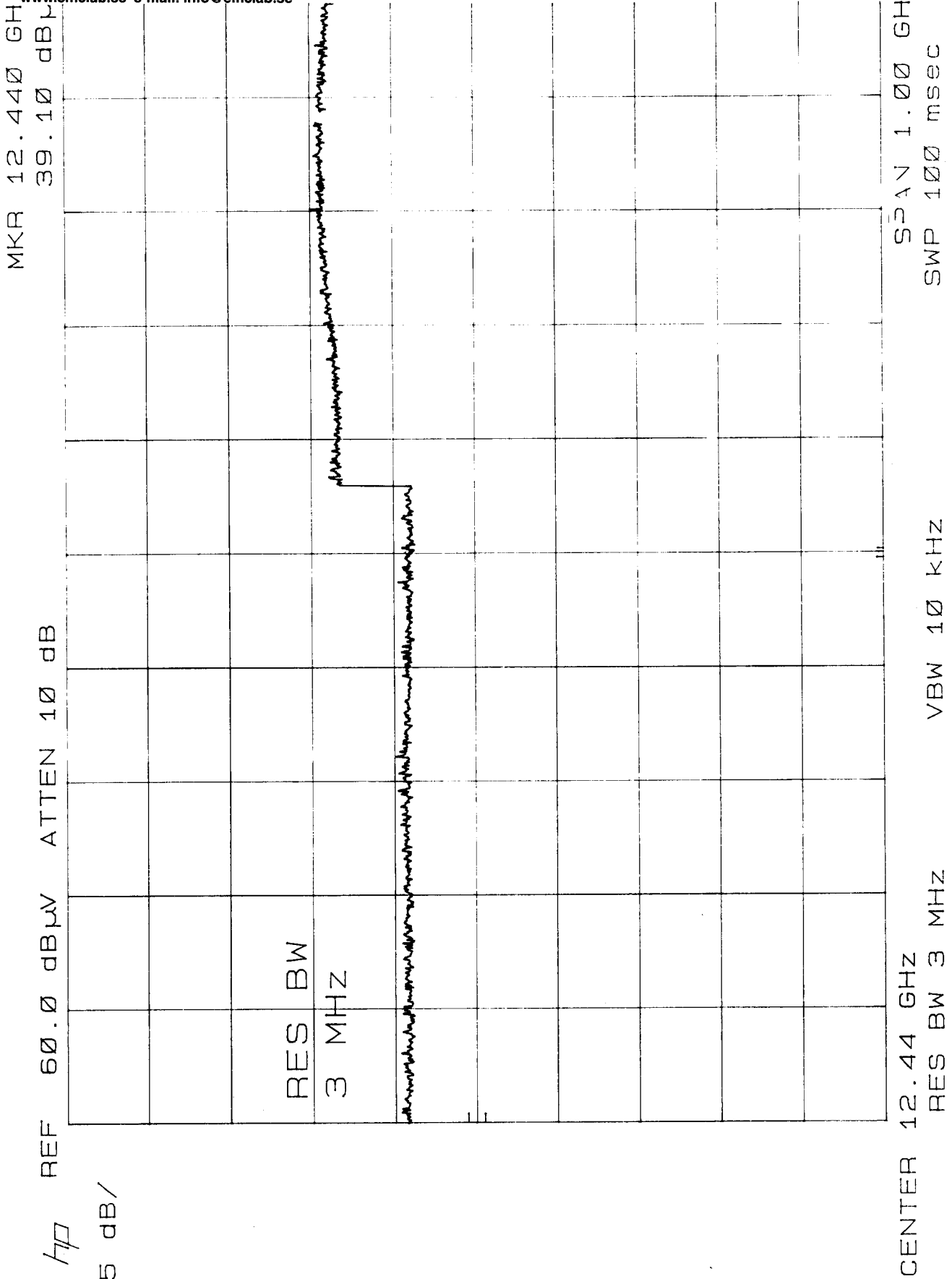
VBW 10 KHZ

CENTER 12.44 GHZ
 RES BW 10 KHZ

8" horn Peak 0.3 μm VP

000315 BG

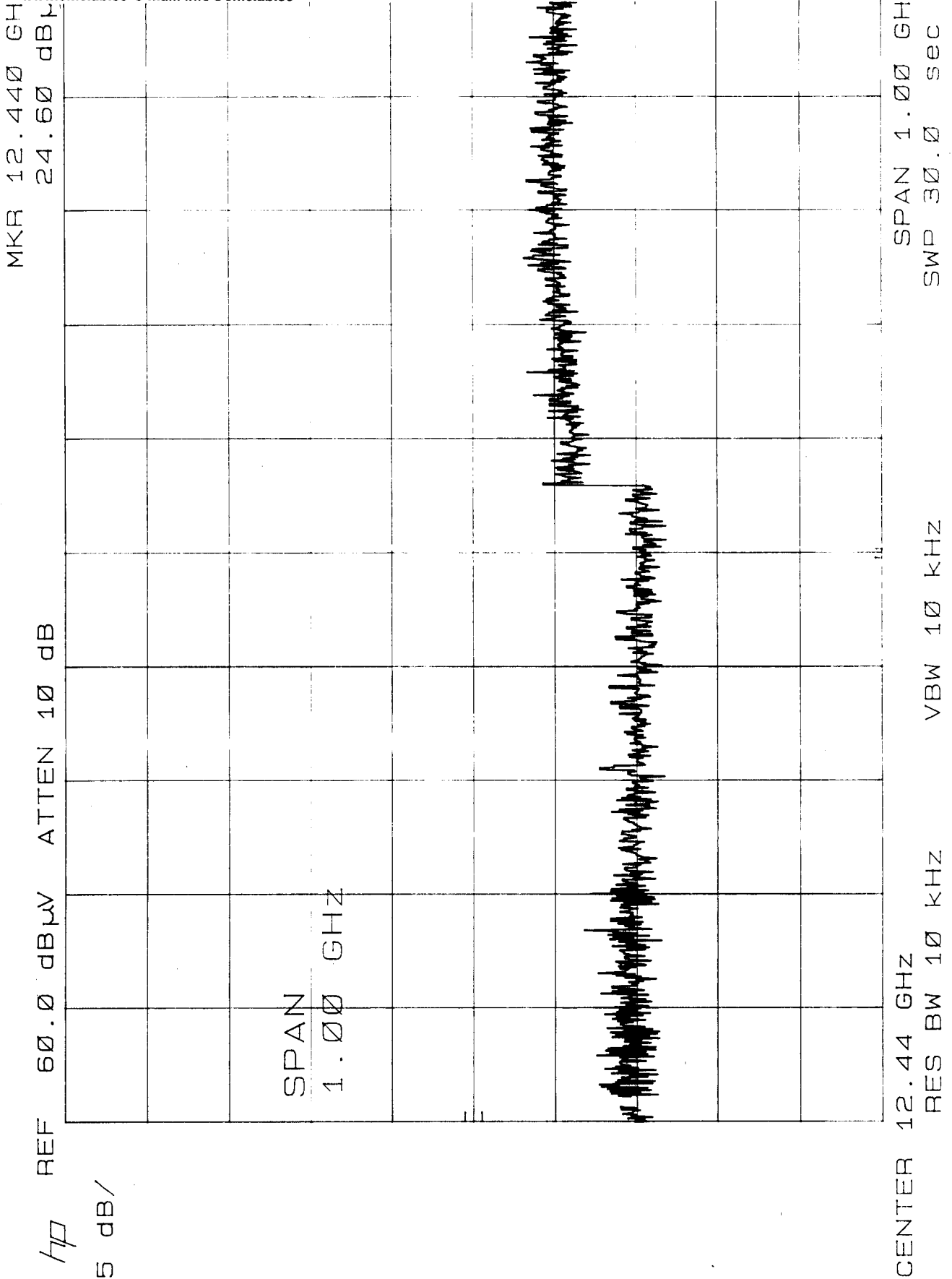
16.



000315 RG Q" h o v A V A 2 m V P

15.

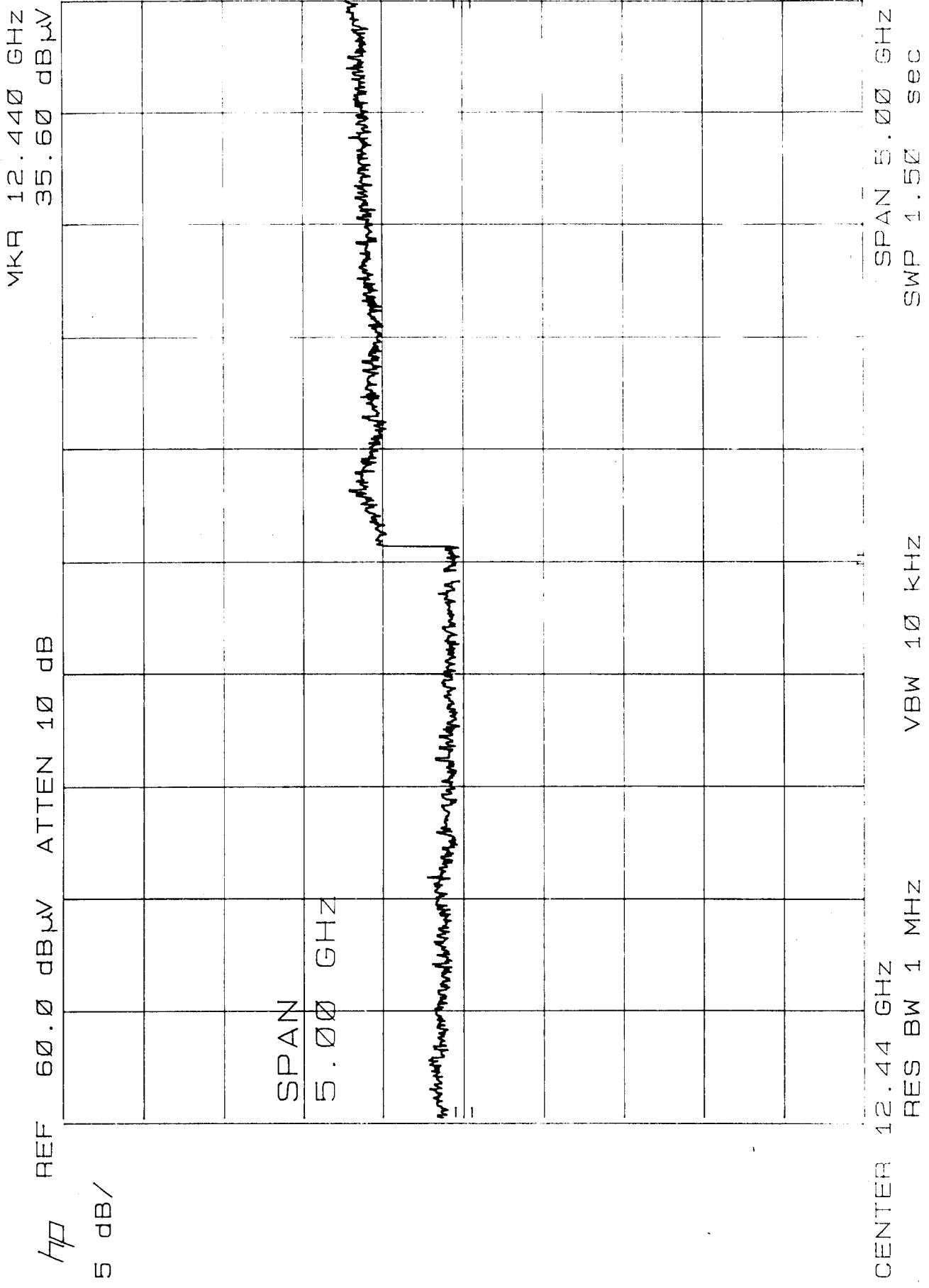
hp
5 dB/



hp
 5 dB/

6" horn peak 0.3 VP

000315 BG



24.

000315 BG

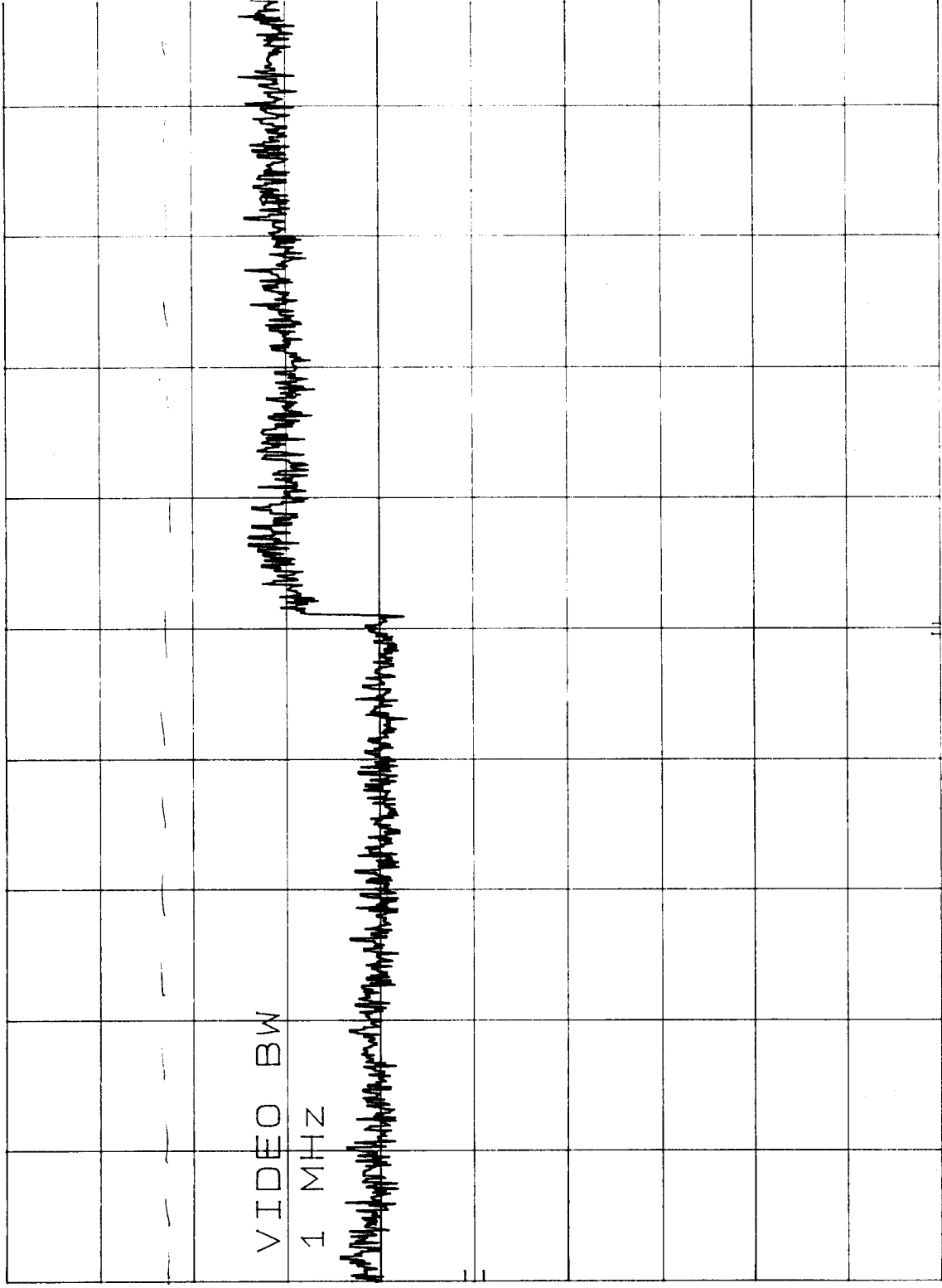
32.

MKR 14.080 GHz
 51.15 dBμV

HP REF 65.0 dBμV ATTEN 10 dB

5 dB/

Handwritten notes:
 774)
 51
 45



SPAN 5.00 GHz
 SWP 125 msec

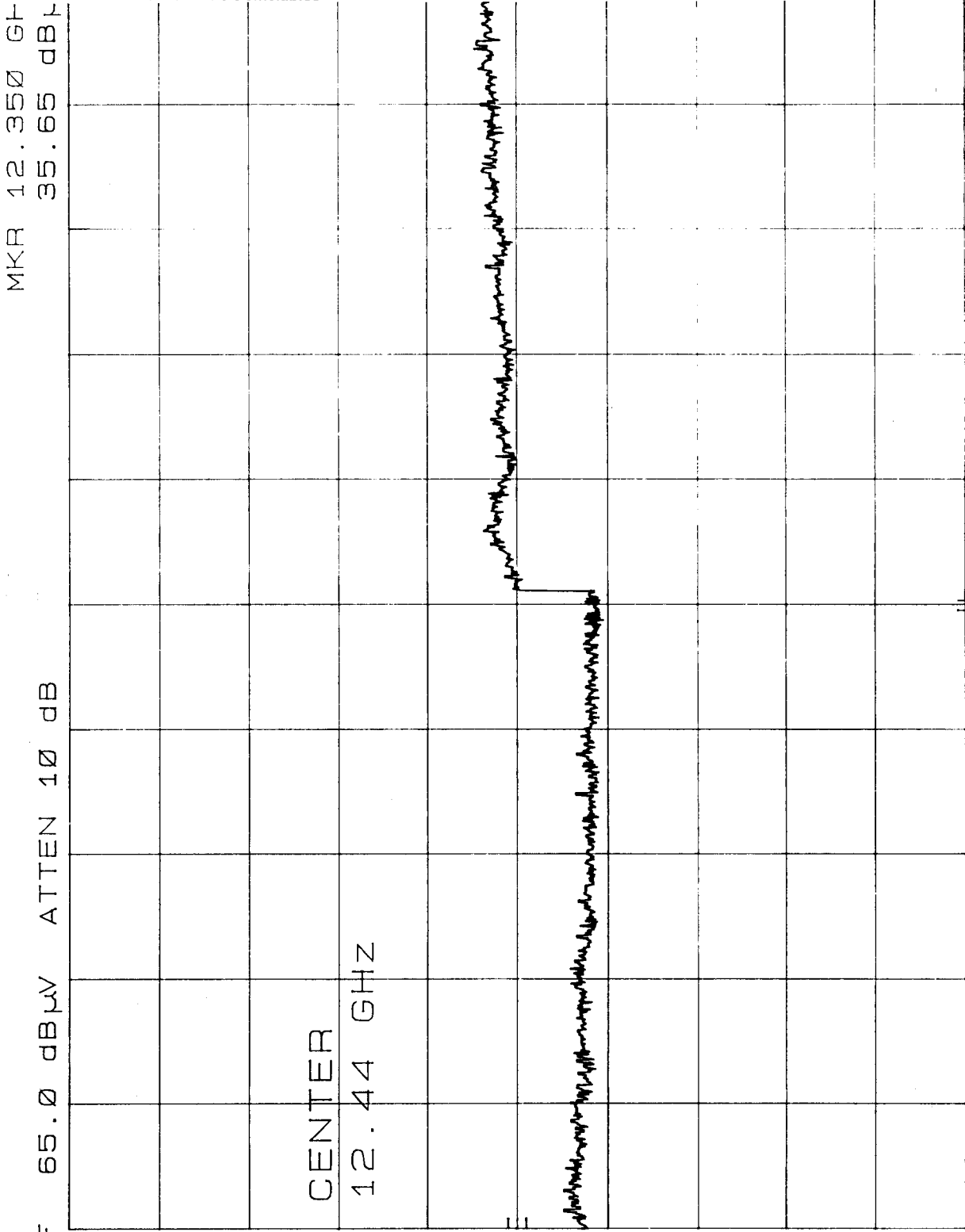
VBW 1 MHz

RES BW 1 MHz

CENTER 12.44 GHz

4" horn Peak 0.3 m VP

000315 RG

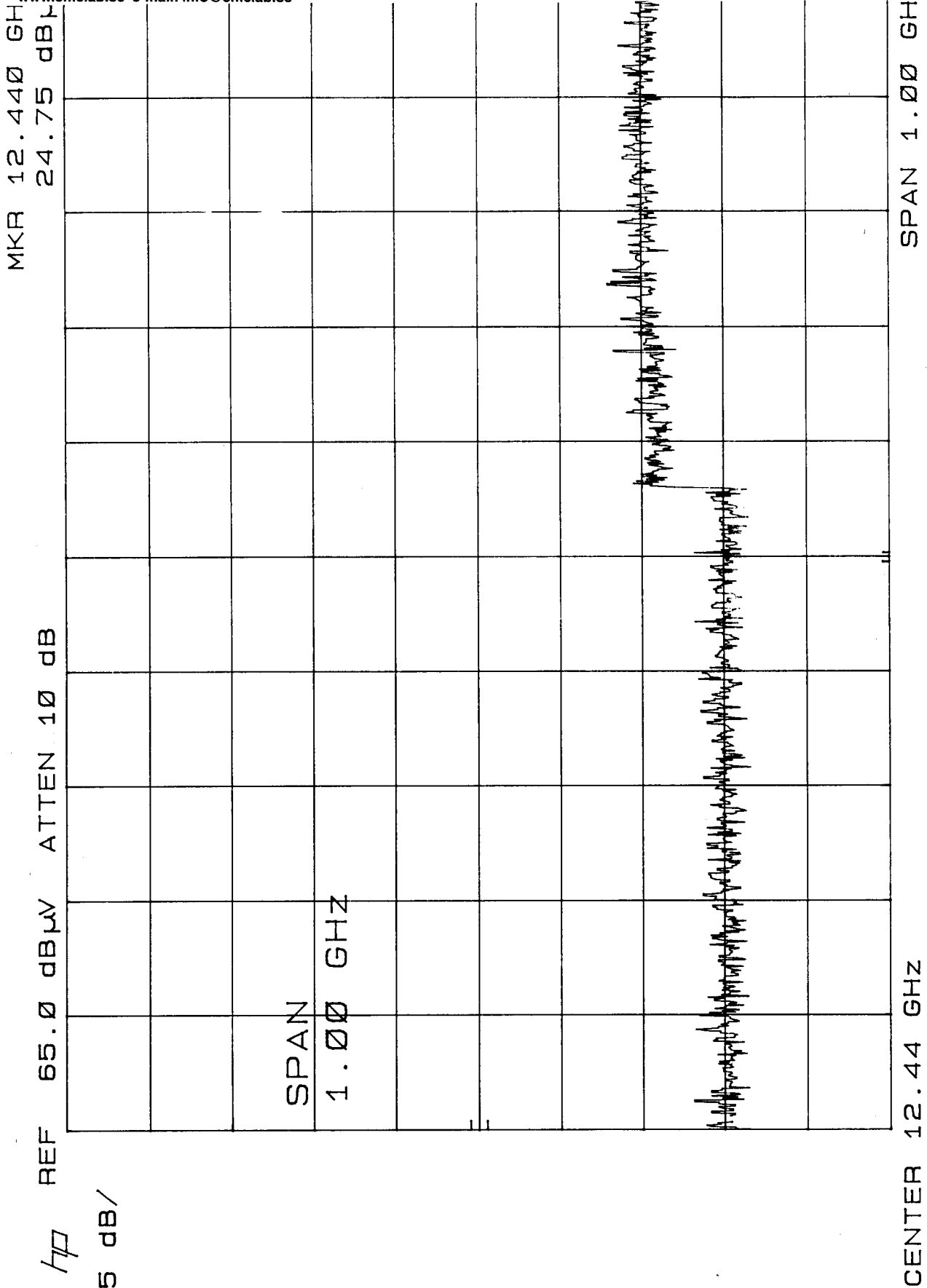


33.

HP
 5 dB/

CENTER 12.44 GHz

000315 BG



43.

HP
 5 dB/

Red antenna 0.3 m VP ~~AV~~ Peak

000315 RC

Radiated Fieldstrength Test. Calculation of Final Emission Levels

EUT: Radar Level Gauge. Model Saab Loopradar, s/n 010.

Test spec.: 47 Cfr Ch. 1 (10-1-99 Edition):
Part 15, Subpart C, Field Disturbance Sensor.
Radiated emission, Open Area Test Site
3 m and 0.3 m antenna distance.

Date: March 14 - 15, 2000

Operation: Normal operating conditions

Field strength (dBuV/m) = Amplitude (dBuV) + Antenna factor (dB/m) + cable loss (dB) + Gain (dB)

Tested frequency range: 1 - 40 GHz

Measured maximum peak and average values.

Freq.	Antenna type	Amplitude peak / av.	RBW / VBW	Antenna factor	Preamp gain	Cable loss C1	Cable loss C2	Field strength	Dist	Limit (1-40 GHz)	Margin to limit	Note
GHz		dB μ V	kHz / kHz	dB/m	dB	dB	dB	dB μ V/m	m	dB μ V/m	dB	
6.22	8"	53.1 / -	1000/1000	35.3	- 34.5	3.5	1.1	58.5	3	74	- 15.5	peak
6.22	8"	- / 46.6	1000 / 10	35.3	- 34.5	3.5	1.1	52.0	3	54	- 2.0	av.
6.22	6"	51.6 / -	1000/1000	35.3	- 34.5	3.5	1.1	57.0	3	74	- 17.0	peak
6.22	6"	- / 44.2	1000 / 10	35.3	- 34.5	3.5	1.1	49.6	3	54	- 4.4	av.
6.22	4"	49.3 / -	1000/1000	35.3	- 34.5	3.5	1.1	54.7	3	74	- 19.3	peak
6.22	4"	- / 42.4	1000 / 10	35.3	- 34.5	3.5	1.1	47.8	3	54	- 6.2	av.
6.22	Rod	50.0 / -	1000/1000	35.3	- 34.5	3.5	1.1	55.4	3	74	- 18.6	peak
6.22	Rod	- / 43.0	1000 / 10	35.3	- 34.5	3.5	1.1	48.4	3	54	- 5.6	av.
12.44	8"	25* / -	10 / 10	39.7	- 33.0	5.2	1.5	38.4*	0.3	94	- 55.6	peak
12.44	8"	- / 39*	3000 / 10	39.7	- 33.0	5.2	1.5	52.4*	0.3	74	- 21.6	av.
12.44	6"	25* / -	10 / 10	39.7	- 33.0	5.2	1.5	38.4*	0.3	94	- 55.6	peak
12.44	6"	- / 36*	1000 / 10	39.7	- 33.0	5.2	1.5	49.4*	0.3	74	- 24.6	av.
12.44	4"	46* / -	1000/1000	39.7	- 33.0	5.2	1.5	59.4*	0.3	94	- 34.6	peak
12.44	4"	- / 36*	1000 / 10	39.7	- 33.0	5.2	1.5	49.4*	0.3	74	- 24.6	av.
12.44	Rod	25* / -	10 / 10	39.7	- 33.0	5.2	1.5	38.4*	0.3	94	- 55.6	peak
18.66	All	< 18* / -	10 / 10	32.6	-	-	1.9	< 52.5*	0.3	94	- 41	peak
24.88	All	< 15* / -	10 / 10	33.8	-	-	2.3	< 51.1*	0.3	94	- 43	peak
31.10	All	< 18* / -	10 / 10	34.9	-	-	2.5	< 55.4*	0.3	94	- 38	peak
37.32	All	< 16* / -	10 / 10	36.6	-	-	2.9	< 55.5*	0.3	94	- 38	peak

* = Noise level