

Marstech Limited

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TEST REPORT

REPORT DATE:	25 July 2001	REPORT NO:	21280D
CONTENTS:	See Table of Contents		
SUBMITTOR:	ATLINKS USA, Inc. 101 West 103 rd Street Indianapolis, IN 46290-1102 USA		
SUBJECT:	Model No: 27925XXX-A FCC ID: G9H2-7925		
TEST SPECIFICATION	CFR 47 FCC Part 15 NOTE: Tests Conducted Are "Type" Tests.		
DATE SAMPLE RECEIVED:	3 July 2001	DATE TESTED:	11 July 2001
RESULTS:	Equipment tested complies with referenced specification.		
ALTERATIONS	None		
Tested by:	Edward Chang	Approved by:	Robert G. Marshall, P. Eng.
		Date:	July 26/01
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Authorized by:
Professional Engineer
Ontario

Engineering &
Administrative



Testing For FCC
Submissions/Verifications

Approved Test Facility



TECHNICAL REPORT - FCC 2.1033(b)

Applicant

ATLINKS USA, Inc.
101 West 103rd Street
Indianapolis, IN
46290-1102 USA

FCC Identifier

G9H2-7925

Manufacturer

Huiyang CCT Telecommunications Products Co. Ltd.
CCT Technology Park, San He Economic Experimental Zone
Huiyang City, Guangdong Province
P. R. of China

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EXHIBIT D

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

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PRODUCT DESCRIPTION

The Model 27925XXX-A is a two-line 2.4GHz cordless telephone that operates in the 2403.55 to 2476.95 MHz band. The antenna used for the base and the handset is permanently attached to the EUT. Its actual frequency range is:

Base: 2403.55 to 2405.50

Handset: 2475.00 to 2476.95

A complete frequency list is shown on the next page.

FREQUENCY TABLE OF 27925 (1602)

- CHANNEL SPACE : 50KHz

JUNE. 6. 14.

- 1'ST I.F : 10.7MHz

TCXO(X-TAL) : 11.10MHz

- 2'ND I.F : 450KHz

CH	BASE (MHz)		PORTABLE (MHz)	
	TX	LOCAL (10.7)	TX	LOCAL (10.7)
1	2403.55	2464.30	2475.00	2414.25
2	2403.60	2464.35	2475.05	2414.30
3	2403.65	2464.40	2475.10	2414.35
4	2403.70	2464.45	2475.15	2414.40
5	2403.75	2464.50	2475.20	2414.45
6	2403.80	2464.55	2475.25	2414.50
7	2403.85	2464.60	2475.30	2414.55
8	2403.90	2464.65	2475.35	2414.60
9	2403.95	2464.70	2475.40	2414.65
10	2404.00	2464.75	2475.45	2414.70
11	2404.05	2464.80	2475.50	2414.75
12	2404.10	2464.85	2475.55	2414.80
13	2404.15	2464.90	2475.60	2414.85
14	2404.20	2464.95	2475.65	2414.90
15	2404.25	2465.00	2475.70	2414.95
16	2404.30	2465.05	2475.75	2415.00
17	2404.35	2465.10	2475.80	2415.05
18	2404.40	2465.15	2475.85	2415.10
19	2404.45	2465.20	2475.90	2415.15
20	2404.50	2465.25	2475.95	2415.20
21	2404.55	2465.30	2476.00	2415.25
22	2404.60	2465.35	2476.05	2415.30
23	2404.65	2465.40	2476.10	2415.35
24	2404.70	2465.45	2476.15	2415.40
25	2404.75	2465.50	2476.20	2415.45
26	2404.80	2465.55	2476.25	2415.50
27	2404.85	2465.60	2476.30	2415.55
28	2404.90	2465.65	2476.35	2415.60
29	2404.95	2465.70	2476.40	2415.65
30	2405.00	2465.75	2476.45	2415.70
31	2405.05	2465.80	2476.50	2415.75
32	2405.10	2465.85	2476.55	2415.80
33	2405.15	2465.90	2476.60	2415.85
34	2405.20	2465.95	2476.65	2415.90
35	2405.25	2466.00	2476.70	2415.95
36	2405.30	2466.05	2476.75	2416.00
37	2405.35	2466.10	2476.80	2416.05
38	2405.40	2466.15	2476.85	2416.10
39	2405.45	2466.20	2476.90	2416.15
40	2405.50	2466.25	2476.95	2416.20

TEST FACILITY AND EQUIPMENT LIST

FACILITIES

- Radiated ANSI C63.4 (FCC OET/55) open field 3 metre test range. This test range is protected from the cold and moisture by a non-conductive enclosure.
- Conducted 2.5m Anechoic Chamber

EQUIPMENT

Anritsu 2601A Spectrum Analyzer
Advantest R3261A Spectrum Analyzer
Hewlett-Packard RF generator # 8640 B with an 002 doubler
A.H. Systems biconical antenna; 20 MHz to 330 MHz
A.H. Systems log periodic antenna; 300 MHz to 1.8 GHz
Eaton dipole antennas; T1, T2, T3 25 MHz to 1.0 GHz
Roberts dipole antennas; T1, T2, T3 & T4 25 MHz to 1.0 GHz
Compliance Design P950 Preamp (16 dB) ... 25 MHz to 1.0 GHz

NOTE:

The Anritsu 2601A Spectrum Analyzer and the Advantest R3261A Spectrum Analyzer are calibrated annually, and that calibration is directly traceable to the National Research Council of Canada. (NRC)
This equipment is only used by qualified technicians and only for the purpose of EMI measurements.
The three metre test range has been carefully evaluated to the ANSI document C63.4 and will be remeasured for reflections and losses every three years.

ADDITIONAL TEST EQUIPMENT LIST

- 1 Spectrum Analyzer: HP 8591EM, S/N 3639A00995, Calibrated April 2001
- 2 Spectrum Analyzer: ANRITSU 2601A, S/N MT64544, Calibrated May 2001
- 3 Spectrum Analyzer: IFR AN940, S/N 635001039, Calibrated March 2001
- 4 Preamp: HP 8449B, S/N 3008A00378, Calibrated August 2000
- 5 Horn Antenna: Q-PAR 6878/24, S/N 1721, 1.5-18GHz
- 6 Line Impedance Stabilization Network.: Marstech, Cal. July 2000

TEST PROCEDURE

GENERAL:

Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal transmission.

POWER LINE CONDUCTED INTERFERENCE:

The procedure used was ANSI STANDARD C63.4 1992 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the UUT was 24°F with a humidity of 60%.

BANDWIDTH 6.0dB:

The measurements were made with the spectrum analyzer's resolution bandwidth (RBW)=1.0MHz and the video bandwidth (VBW)=1.0MHz and the span set as shown on plot.

POWER OUTPUT:

The radiated output power was measured with the spectrum analyzer and Double Ridged Horn Antenna.

RADIATION INTERFERENCE:

The test procedure used was ANSI STANDARD C63.4-1992 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 1.0GHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 24°F with a humidity of 60%.

15.107 (a) POWER LINE CONDUCTED INTERFERENCE

Requirements: 0.45 - 30MHz 250 μ V or 47.96dB μ V

Test Procedure: ANSI STANDARD C63.4-1992.
The spectrum was scanned from 0.45 to 30MHz.

Test Data:

The highest emission read for LINE was 14.72 dB μ V@ 7.18 MHz.

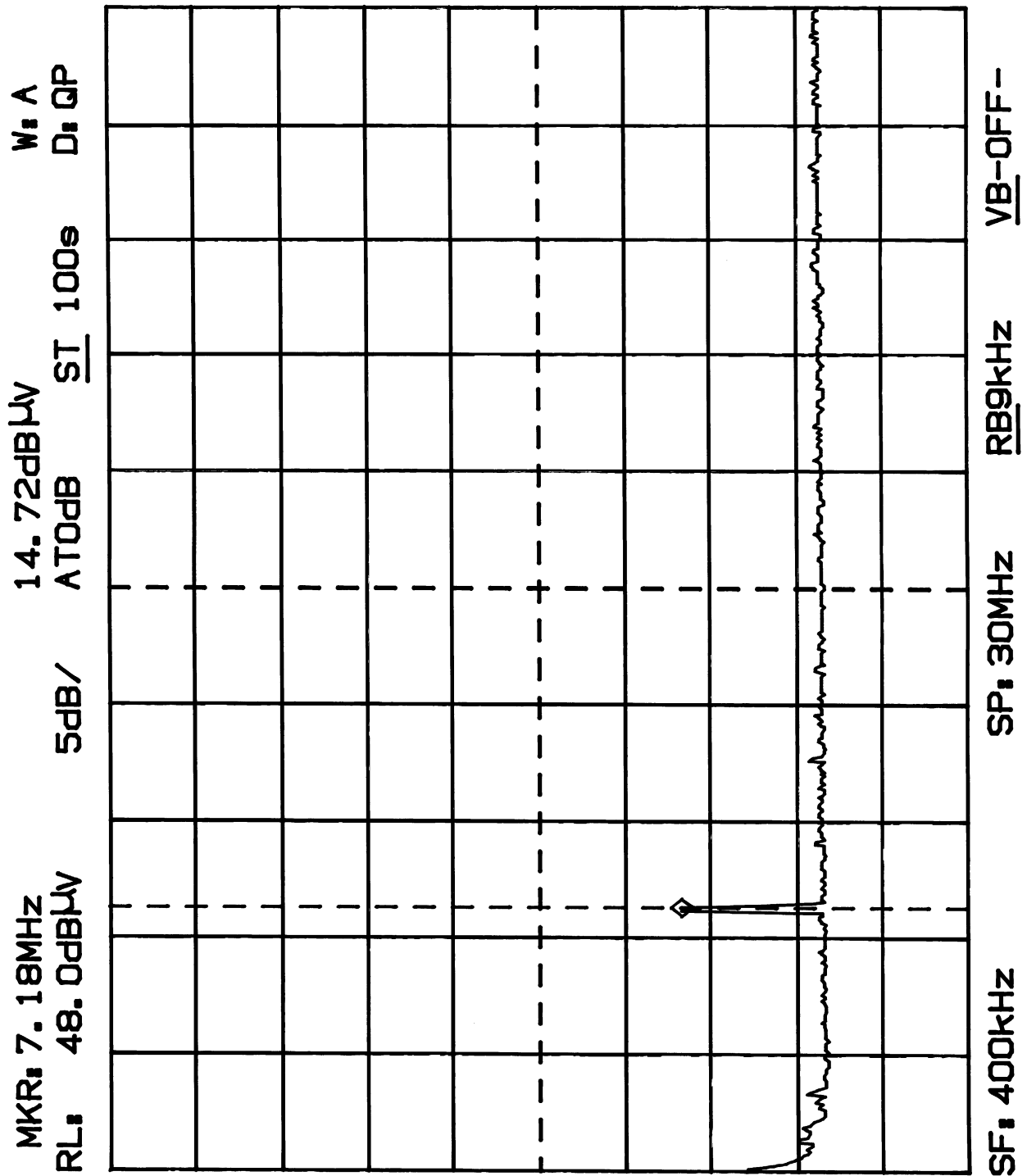
The highest emission read for NEUTRAL was 14.75 dB μ V@ 7.18 MHz.

The graphs on Exhibit D(1)-8 to -9 represent the emissions taken for this device.

Test Results:

Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

POWER LINE CONDUCTED EMISSIONS
MODEL 27925XXX-A; LINE



MR: 7.18MHz **RL:** 48.0dBμV **W:** A **D:** QP
14.75dBμV **5dB/** **AT0dB** **ST 100s** **VB-OFF-**
SP: 30KHz **RB9kHz** **SF: 400kHz**

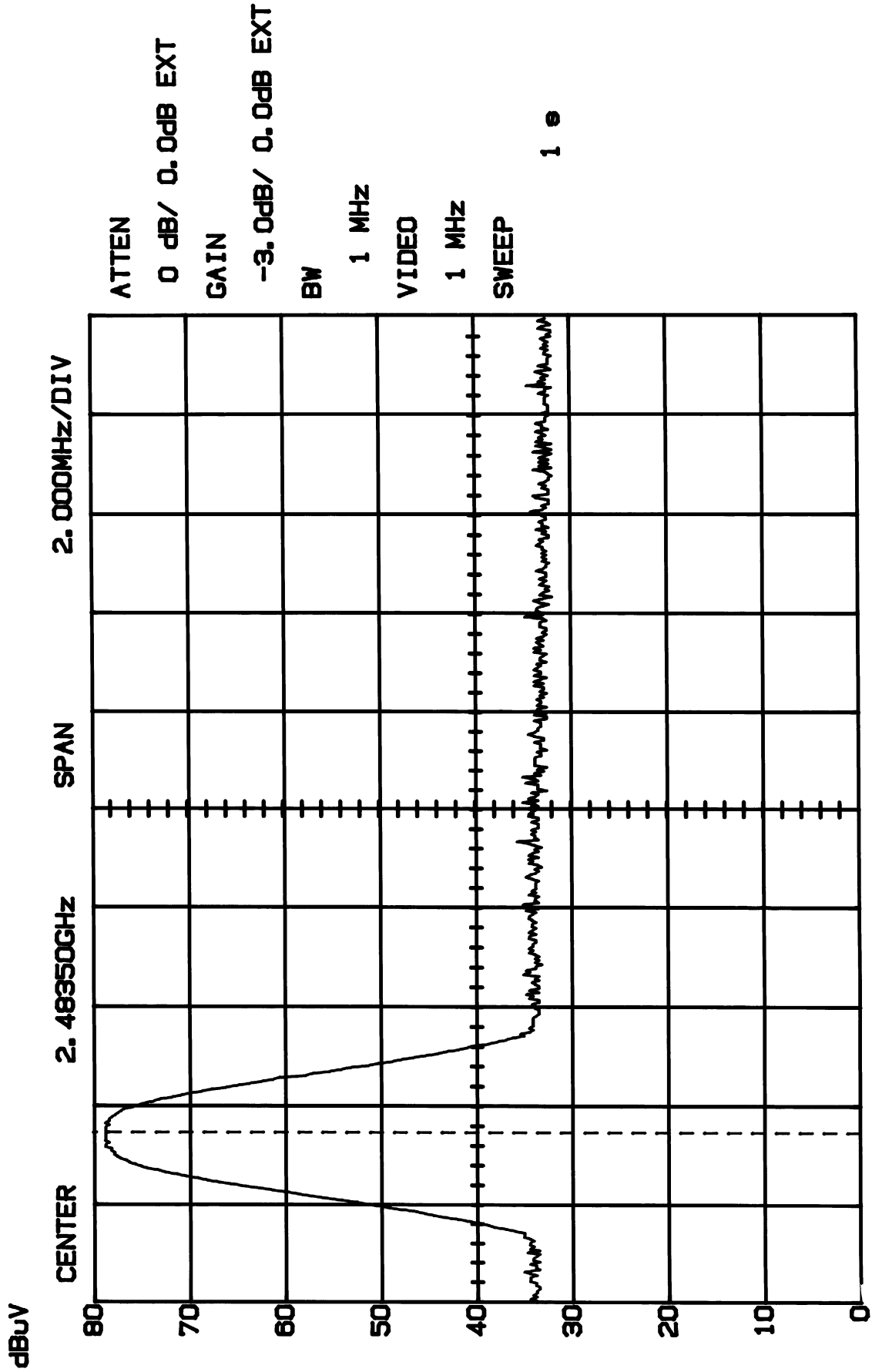
15.249 (c) BAND EDGES

Requirements: Emissions outside of the frequency band must be attenuated 50dB below the fundamental.

Measurement: The base was attenuated by 50 dB. The headset was attenuated by 50 dB.

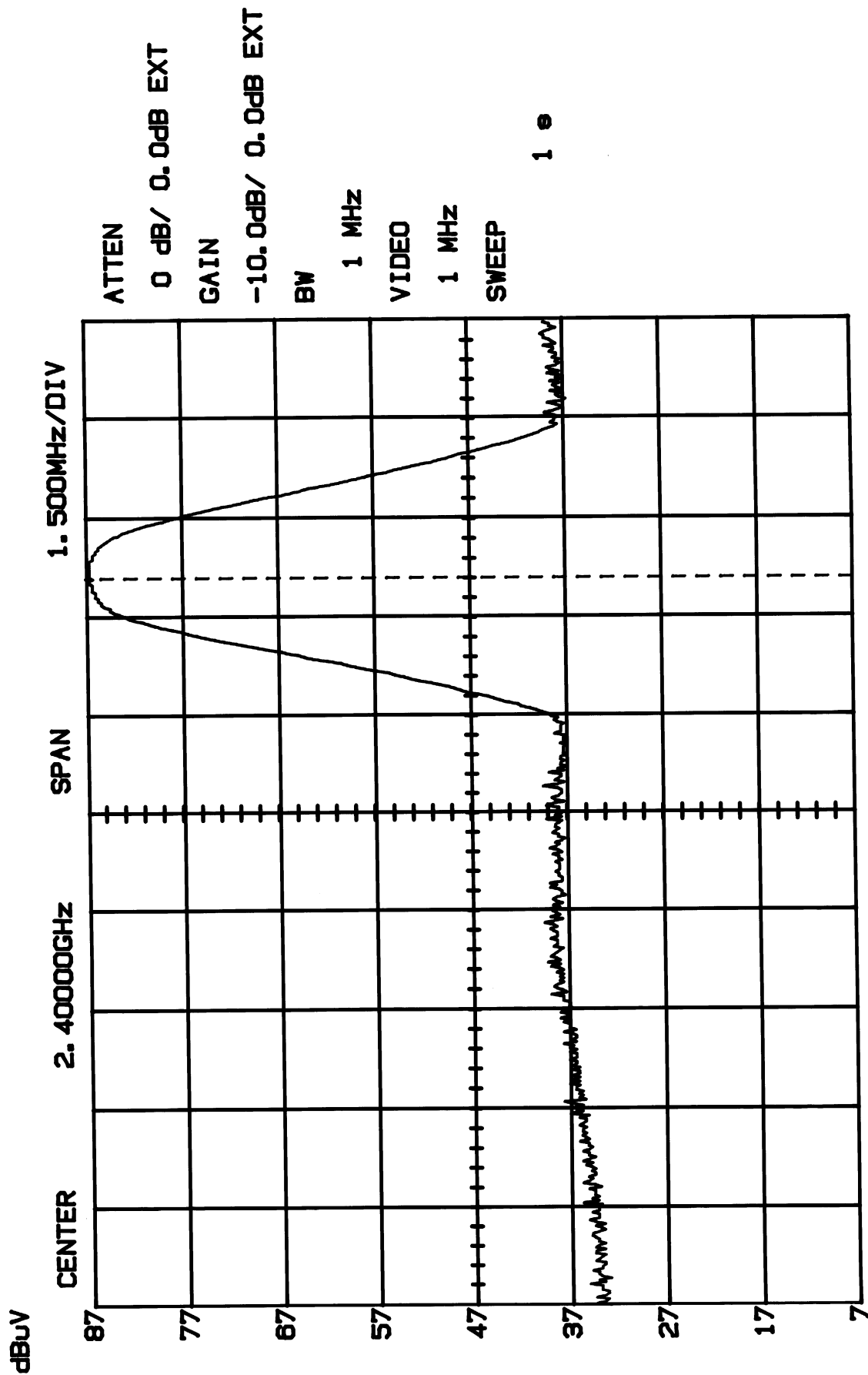
Measurement Data: The Bandedge was measured at the Low end of the band for the base, and the High end of the band for the handset. See Plots [Exhibits D(1)-11 to -12].

**BAND EDGE ATTENUATION
MODEL 27925XXX-A; (Handset)**



M1 78.75dB/ 2.47698GHz

BAND EDGE ATTENUATION MODEL 27925XXX-A; (Base)



FCC ID: G9H2-7925
Marstech Report No. 21280D
EXHIBIT D(1)-12

M1 86.37dB/ 2.40360GHz

11:18:38 07-09-2001

2.202 BANDWIDTH

Handset

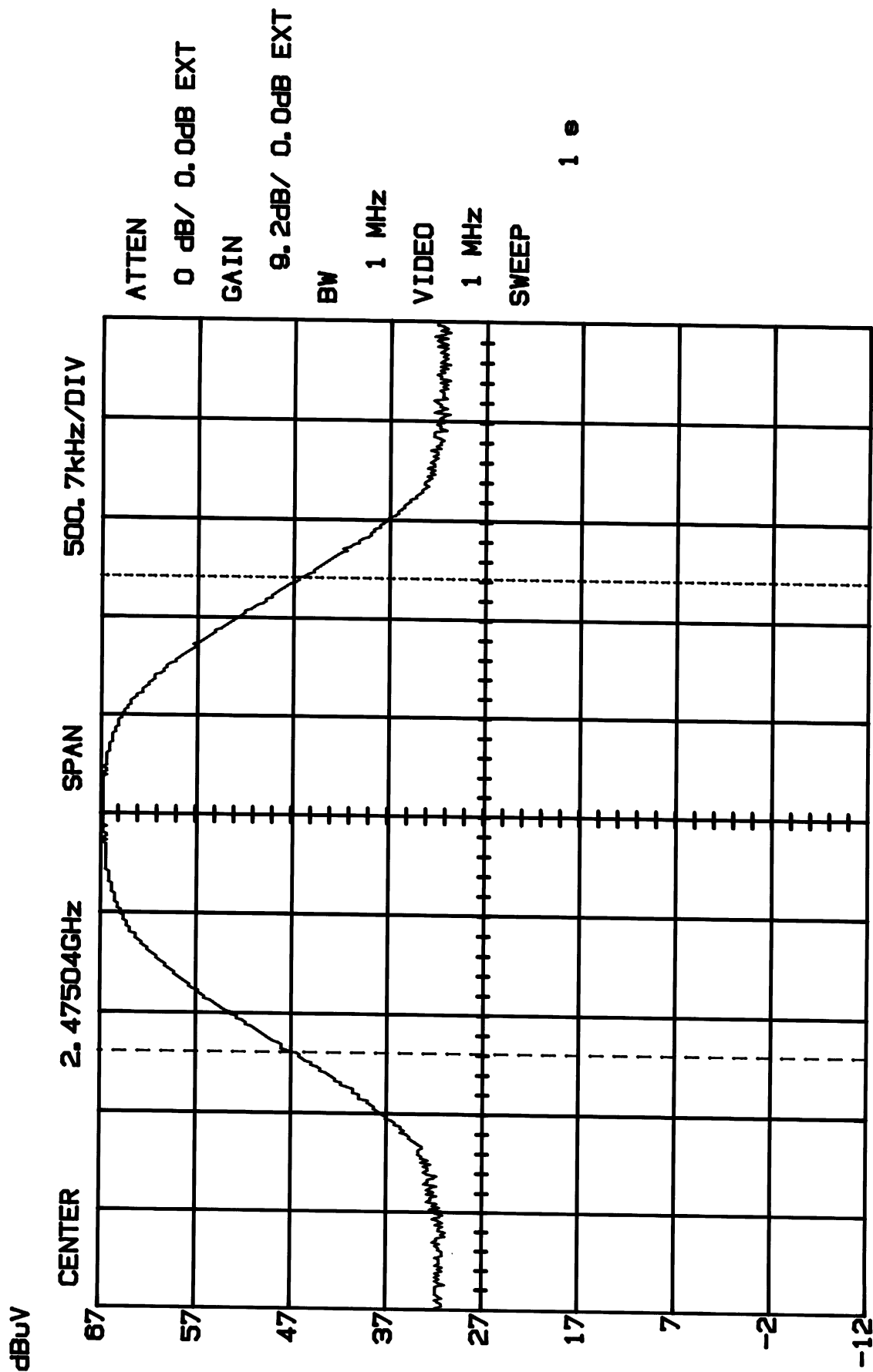
Channel 1:	2.41 MHz	[Refer to Exhibit A(1)-14]
Channel 40:	2.43 MHz	[Refer to Exhibit A(1)-15]

Base:

Channel 1:	2.45 MHz	[Refer to Exhibit A(1)-16]
Channel 40:	2.39 MHz	[Refer to Exhibit A(1)-17]

BANDWIDTH = 2.5 MHz

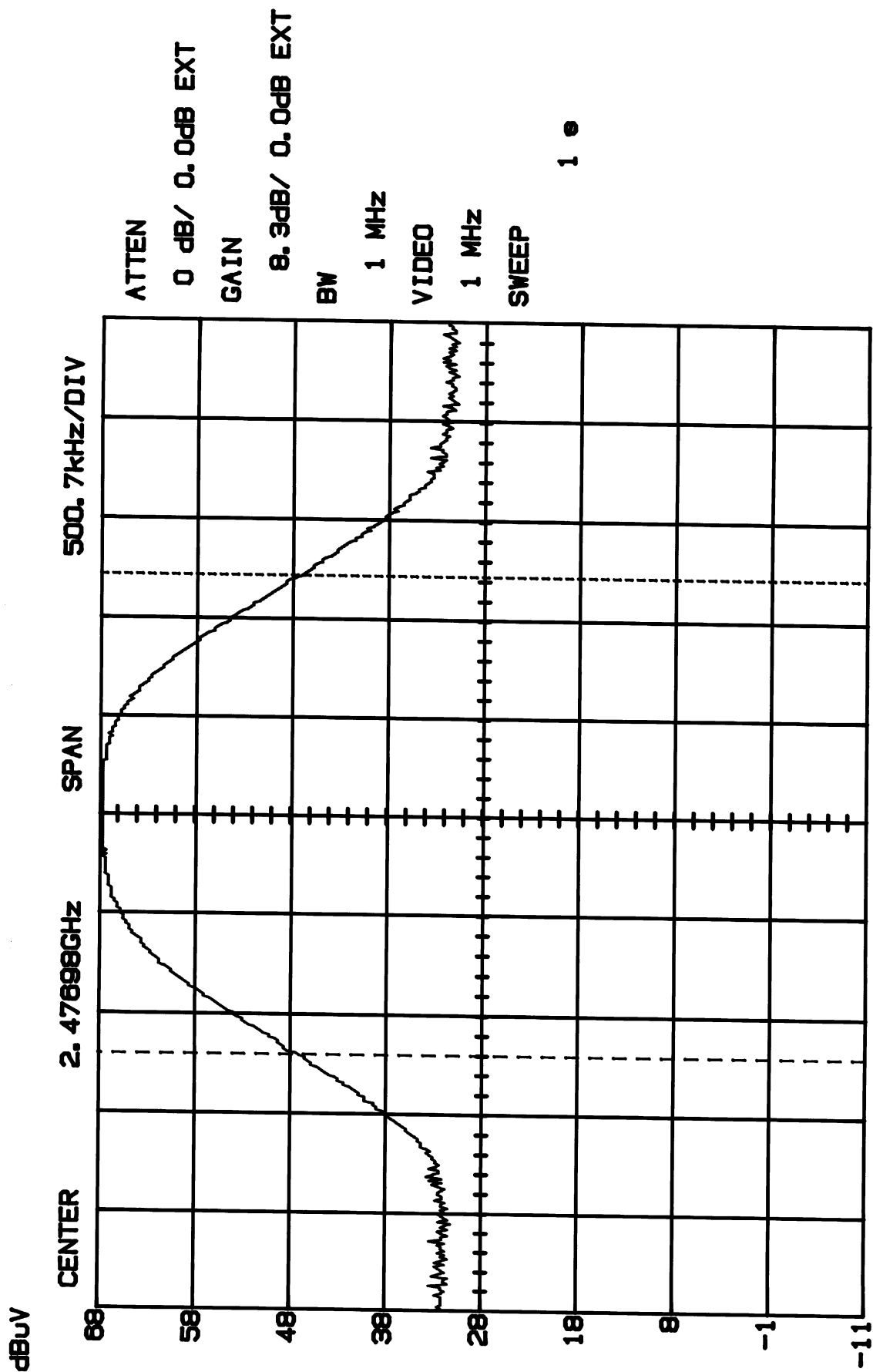
20dB BANDWIDTH (Channel 1)
MODEL 27925XXX-A (Handset)



M1 47.17dB/ 2.47385GHz Δ 0.00dB/ 2.41MHz

11:46:58 07-09-2001

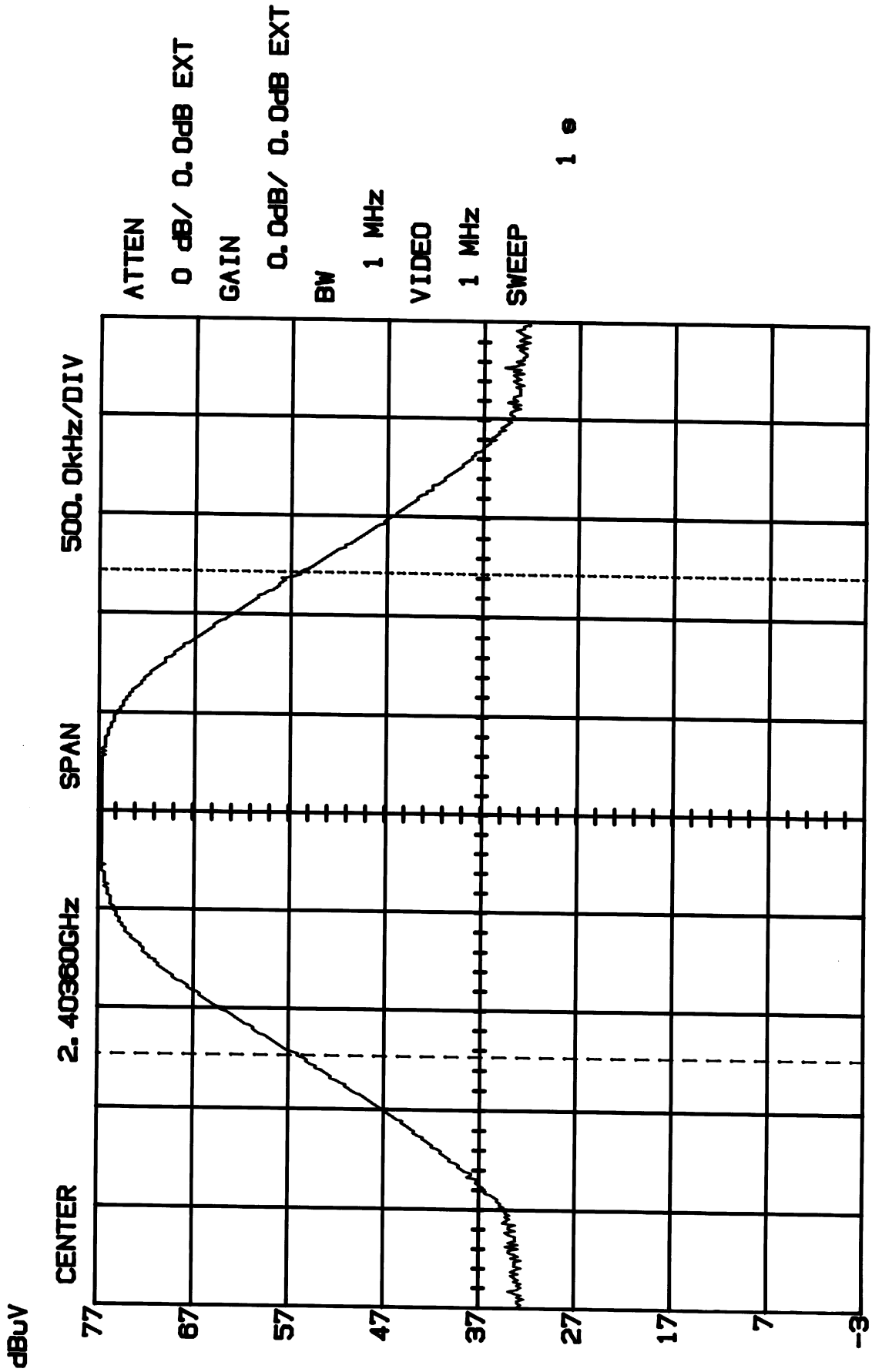
20dB BANDWIDTH (Channel 40)
MODEL 27925XXX-A (Handset)



M2 47.76dB/ 2.47621GHz Δ 0.00dB/ 2.43MHz

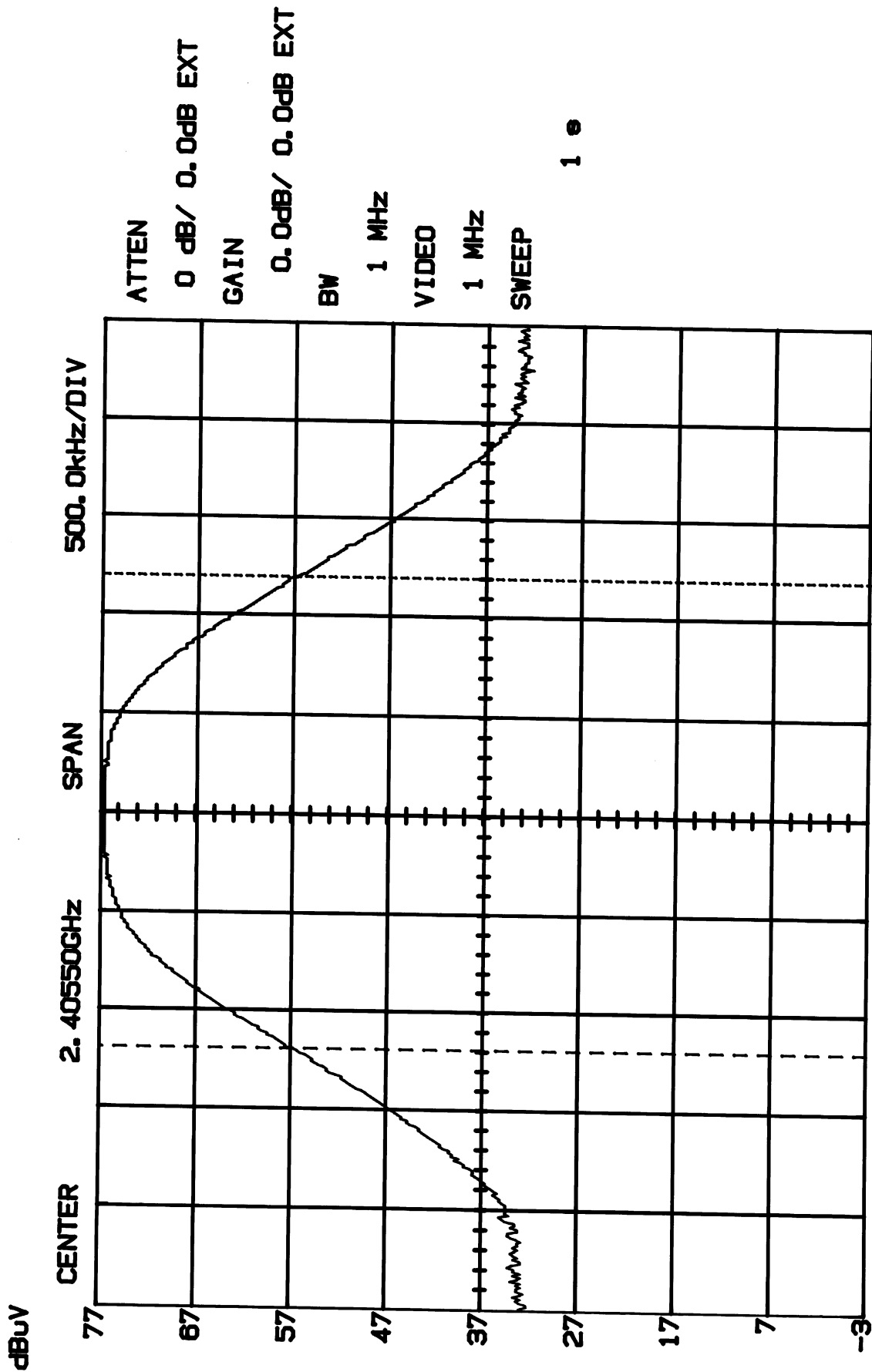
11:52:28 07-09-2001

20dB BANDWIDTH (Channel 1)
MODEL 27925XXX-A (Base)



M2 56.06dB/ 2.40482GHz Δ 0.00dB/ 2.45MHz

20dB BANDWIDTH (Channel 40)
MODEL 27925XXX-A (Base)



M2 56.68dB/ 2.40670GHz Δ 0.00dB/ 2.39MHz

15.249 (a) and 15.249 (b)
FIELD STRENGTH OF EMISSIONS

Requirements:

<u>Field Strength of Fundamental</u>	<u>Field Strength of Harmonics</u>		<u>15.209</u>
2.400-2.4835 GHz 94 dB μ V/M	54 dB μ V/m@ 3m	30-88 MHz	40 dB μ V/m@ 3m
		88-216 MHz	43.5
		216-960 MHz	46
		Above 960 MHz	54

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

Emissions that fall in the restricted bands (15.205) must be less than 54dB μ V/m

FIELD STRENGTH OF EMISSIONS

Test Data:**HANDSET UNIT**

Emission Frequency MHZ	Meter Reading @3m dB μ V	Antenna	Cable and ACF dB	Field Strength dB μ V/M	FCC Limit dB μ V/M	Margin dB	Detector & BW KHz
<u>Channel 1</u>							
2475.030	48.00	Horn V	33.50	81.50	94	-12.50	PK 1000
4950.06	---						
7425.09	---						
<u>Channel 40</u>							
2476.980	49.00	Horn V	33.51	82.51	94	-11.490	PK 1000
4953.96	---						
7430.94	---						
9907.92	---						

FIELD STRENGTH OF EMISSIONS**Test Data:****BASE UNIT**

Emission Frequency MHZ	Meter Reading @3m dBμV	Antenna	Cable and ACF dB	Field Strength dBμV/M	FCC Limit dBμV/M	Margin dB	Detector & BW KHz
<u>Channel 1</u>							
2403.57	58.00	Horn V	33.38	91.80	94	-2.20	PK 1000
4807.14	10.76	Horn V	37.90	48.66	54	-5.40	PK 1000
7210.71	10.42	Horn V	43.46	53.88	54	-0.12	PK 1000
9613.42	---						
<u>Channel 40</u>							
2405.50	58.00	Horn V	33.38	91.38	94	-2.62	PK 1000
4811.00	11.76	Horn V	37.90	49.66	54	-4.34	PK 1000
7216.50	10.42	Horn V	43.46	53.88	54	-0.12	PK 1000
9622.00	---						