Marstech Limited

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Authorized by: Professional Engineers Ontario
Engineering & Administrative
CERTIFICATED UL AGENCY
Testing For FCC Submissions/Verifications
Approved Test Facility
Qualified SITE

TEST REPORT

REPORT DATE:	11 June 2002	REPORT NO:	22134D
CONTENTS:	See Table of Contents		
SUBMITTOR:	ATLINKS USA, Inc. 101 West 103rd Street Indianapolis, IN 46290-1102 USA		
SUBJECT:	Model No: **27936XXX-B**		
	FCC ID: G9H2-7928A		
TEST SPECIFICATION	FCC 47 CFR Part 15 NOTE: Tests Conducted Are "Type" Tests.		
DATE SAMPLE RECEIVED:	21 May 2002 and 05 June 2002	DATE TESTED:	27 May 2002 and 10 June 2002
RESULTS:	Equipment tested complies with referenced specification, with the following modifications:		
ALTERATIONS	**Base Unit and Handset:** **New shield can with more solder pads was used.** **Coil antennae (TX & RX) were used.** **Handset:** **R18 resistor was changed to 10K ohm.**		
Tested by:	Ed. Chang Edward Chang	Approved by: Date:	Robert G. Marshall, P. Eng. June 13/02

REGISTERED PROFESSIONAL ENGINEER R. G. MARSHALL

TECHNICAL REPORT - FCC 2.1033(b)

Applicant

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

FCC Identifier

G9H2-7928A

Manufacturer

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

TABLE OF CONTENTS

EXHIBIT D

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

"Report of Measurements"

Exhibit D(1)-1 to D(1)-20 - Test Data/Measurements
Exhibit D(2)-1 to D(2)-2 - Test Set-Up Photo
Exhibit D(3) - Measurement Facility (3 meter site)

TABLE OF CONTENTS

TEST REPORT CONTAINING:

PRODUCT DESCRIPTION

The Model 27936XXX-B is a single-line 2.4GHz cordless telephone with speakerphone and caller ID, that operates from 2402.3 to 2480.55 MHz. The antenna used for the base and the handset is permanently attached to the EUT. Its actual frequency range is:

Base:	2402.32 MHz to 2408.18 MHz
Handset:	2474.76 MHz to 2480.61 MHz

A complete frequency list is shown on the following page.

	2.4 Ghz FREQUENCY TABLE			
1	2474.7000	Mhz	2402.3000	Mhz
2	2474.8500	Mhz	2402.4500	Mhz
3	2475.0000	Mhz	2402.6000	Mhz
4	2475.1500	Mhz	2402.7500	Mhz
5	2475.3000	Mhz	2402.9000	Mhz
6	2475.4500	Mhz	2403.0500	Mhz
7	2475.6000	Mhz	2403.2000	Mhz
8	2475.7500	Mhz	2403.3500	Mhz
9	2475.9000	Mhz	2403.5000	Mhz
10	2476.0500	Mhz	2403.6500	Mhz
11	2476.2000	Mhz	2403.8000	Mhz
12	2476.3500	Mhz	2403.9500	Mhz
13	2476.5000	Mhz	2404.1000	Mhz
14	2476.6500	Mhz	2404.2500	Mhz
15	2476.8000	Mhz	2404.4000	Mhz
16	2476.9500	Mhz	2404.5500	Mhz
17	2477.1000	Mhz	2404.7000	Mhz
18	2477.2500	Mhz	2404.8500	Mhz
19	2477.4000	Mhz	2405.0000	Mhz
20	2477.5500	Mhz	2405.1500	Mhz
21	2477.7000	Mhz	2405.3000	Mhz
22	2477.8500	Mhz	2405.4500	Mhz
23	2478.0000	Mhz	2405.6000	Mhz
24	2478.1500	Mhz	2405.7500	Mhz
25	2478.3000	Mhz	2405.9000	Mhz
26	2478.4500	Mhz	2406.0500	Mhz
27	2478.6000	Mhz	2406.2000	Mhz
28	2478.7500	Mhz	2406.3500	Mhz
29	2478.9000	Mhz	2406.5000	Mhz
30	2479.0500	Mhz	2406.6500	Mhz
31	2479.2000	Mhz	2406.8000	Mhz
32	2479.3500	Mhz	2406.9500	Mhz
33	2479.5000	Mhz	2407.1000	Mhz
34	2479.6500	Mhz	2407.2500	Mhz
35	2479.8000	Mhz	2407.4000	Mhz
36	2479.9500	Mhz	2407.5500	Mhz
37	2480.1000	Mhz	2407.7000	Mhz
38	2480.2500	Mhz	2407.8500	Mhz
39	2480.4000	Mhz	2408.0000	Mhz
40	2480.5500	Mhz	2408.1500	Mhz

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 2002
2. Spectrum Analyzer: ANRITSU 2601A, S/N MT64544, Calibrated May 2002
3. Spectrum Analyzer: IFR AN940, S/N 635001039, Calibrated March 2002
4. Preamp: HP 8449B, S/N 3008A00378, Calibrated August 2001
5. Horn Antenna: Q-PAR 6878/24, S/N 1721, 1.5-18GHz
6. Line Impedance Stabilization Network.: Marstech, Cal. July 2001

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 EUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the EUT was 24°C 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 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 EUT was 24°C with a humidity of 60%.

15.107 (a) POWER LINE CONDUCTED INTERFERENCE

Requirements: 0.45 - 30MHz 250μV or 47.96dBμV

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

Test Data:

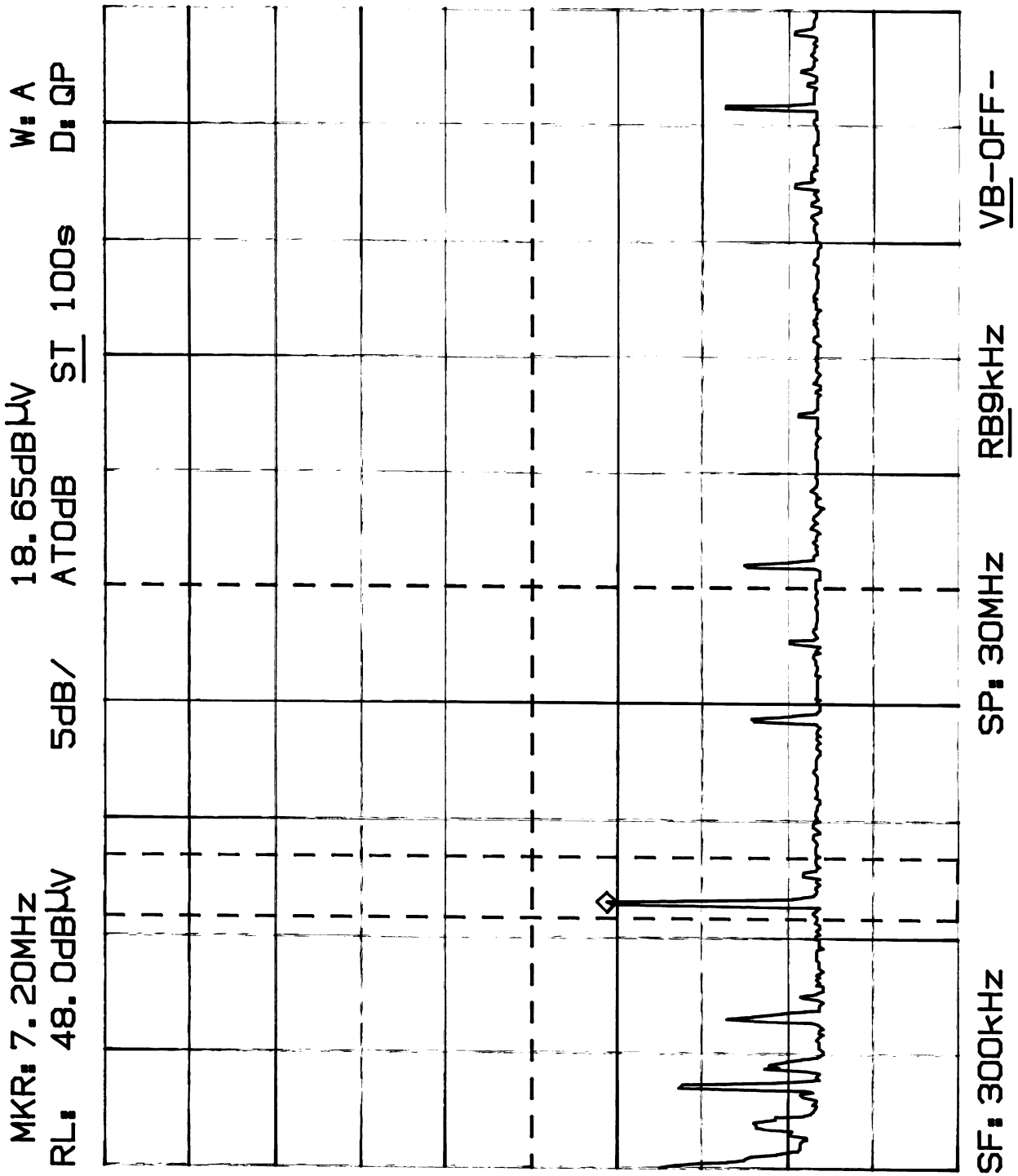
The highest emission read for LINE was 18.65 dBμV@ 7.20 MHz.
The highest emission read for NEUTRAL was 19.25 dBμV@ 7.32 MHz.

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

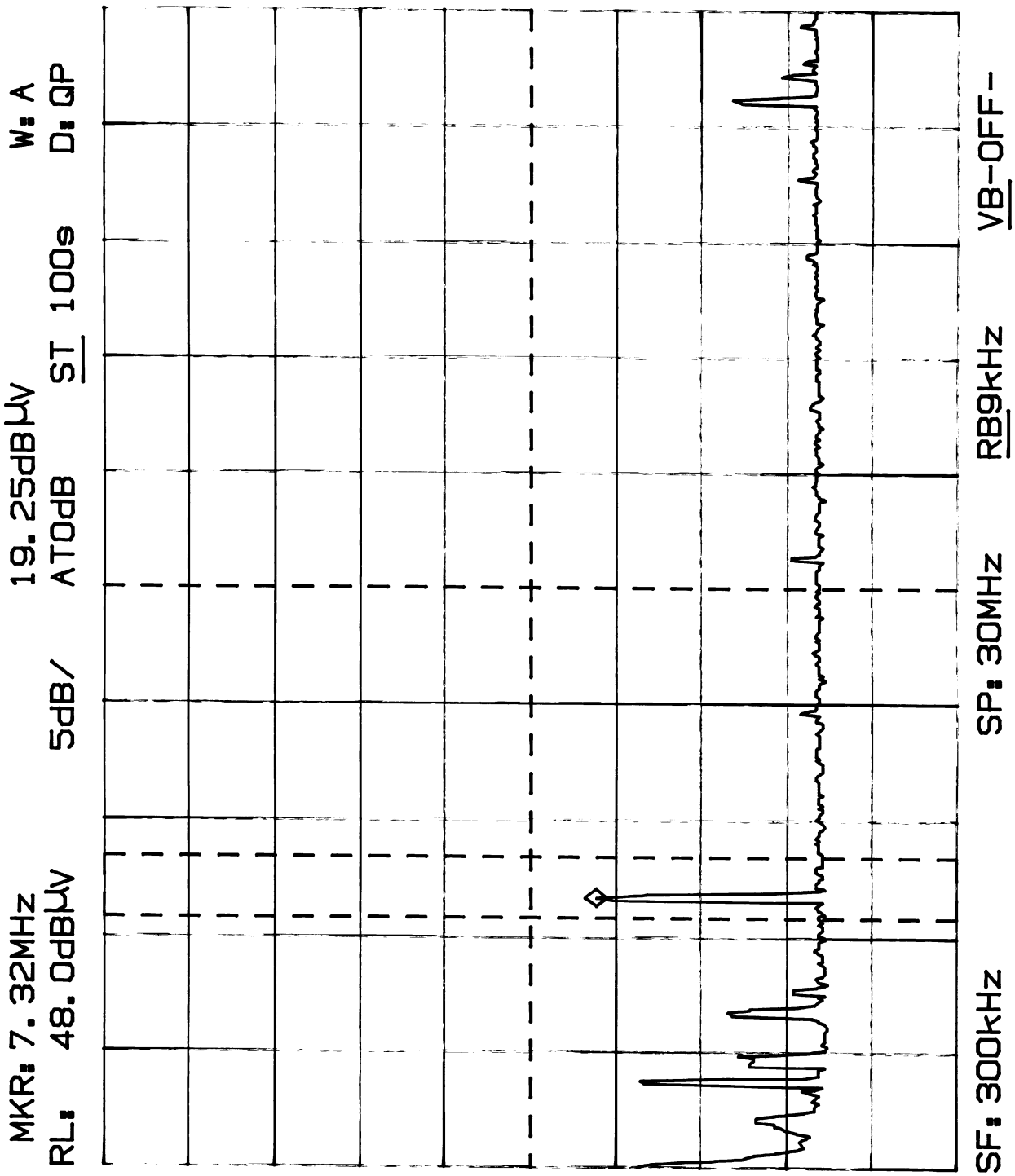
Test Results:

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 27936XXX-B; LINE



POWER LINE CONDUCTED EMISSIONS
MODEL 27936XXX-B; NEUTRAL



FCC ID: G9H2-7928A
Marstech Report No. 22134D
EXHIBIT D(1)-9

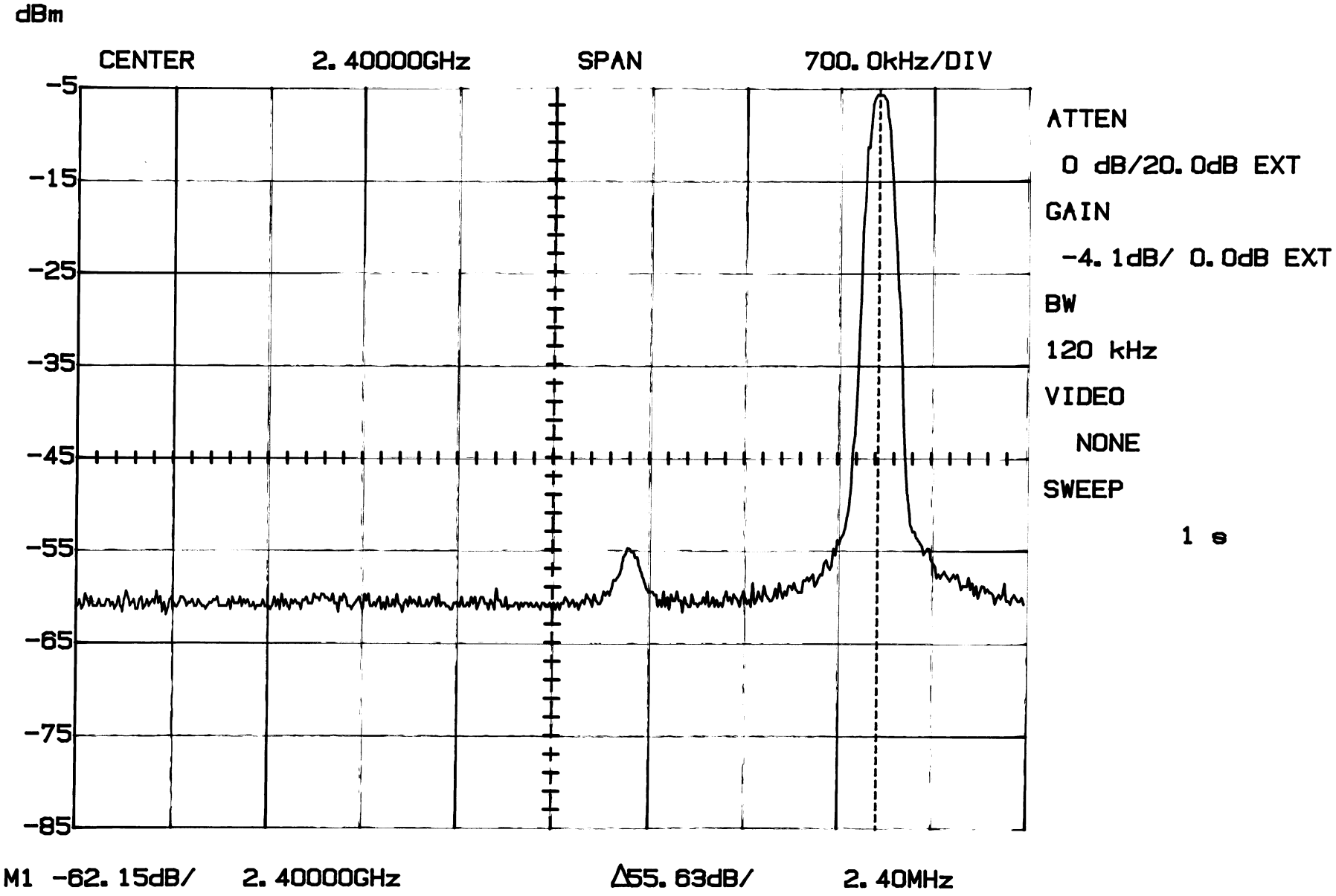
15.249 (c) BAND EDGES

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

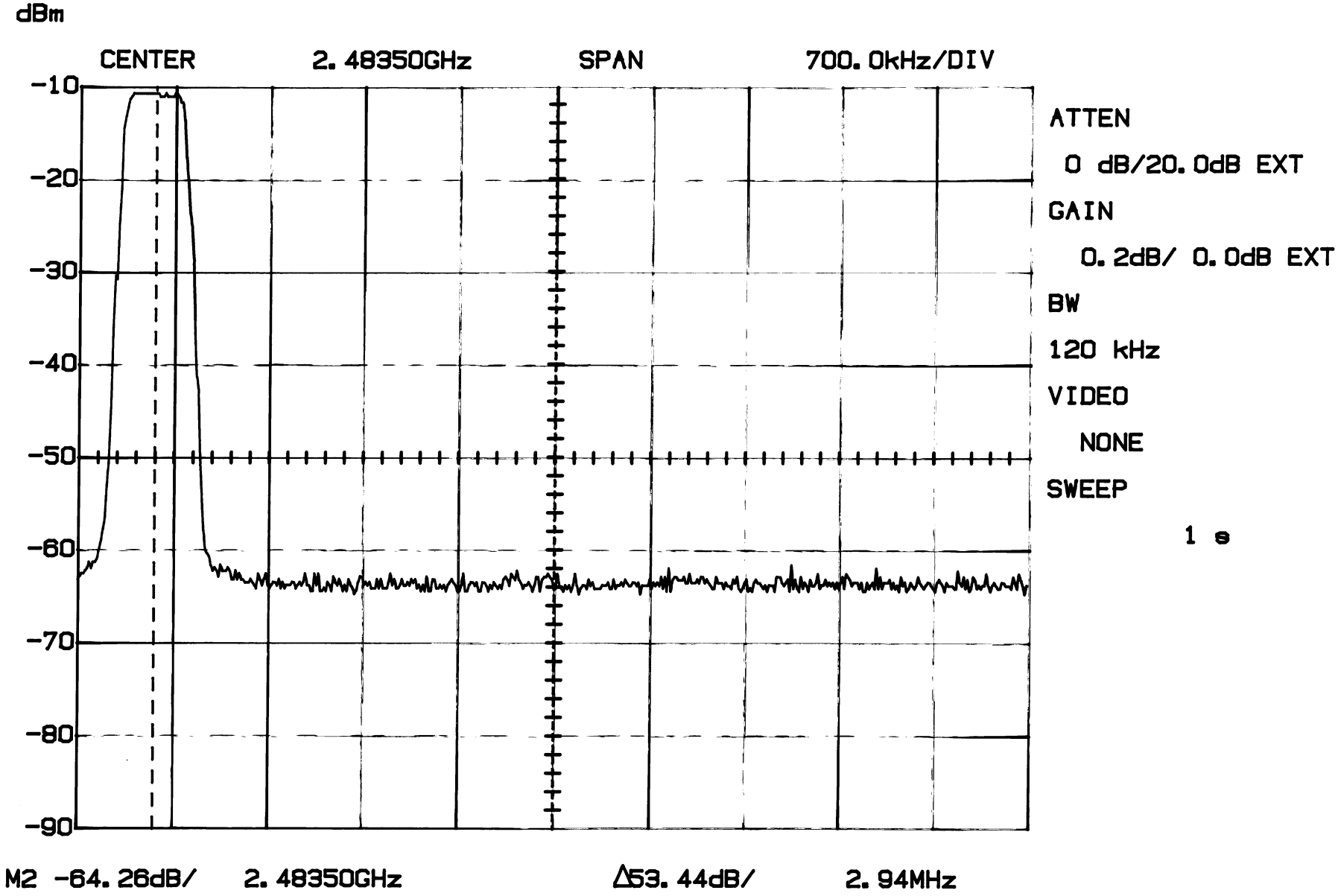
Measurement: The base was attenuated by 50 dB. The headset was attenuated by 50 dB.

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 (Base)
MODEL 27936XXX-B



BAND EDGE (Handset)
MODEL 27936XXX-B



2.202 BANDWIDTH

Base:

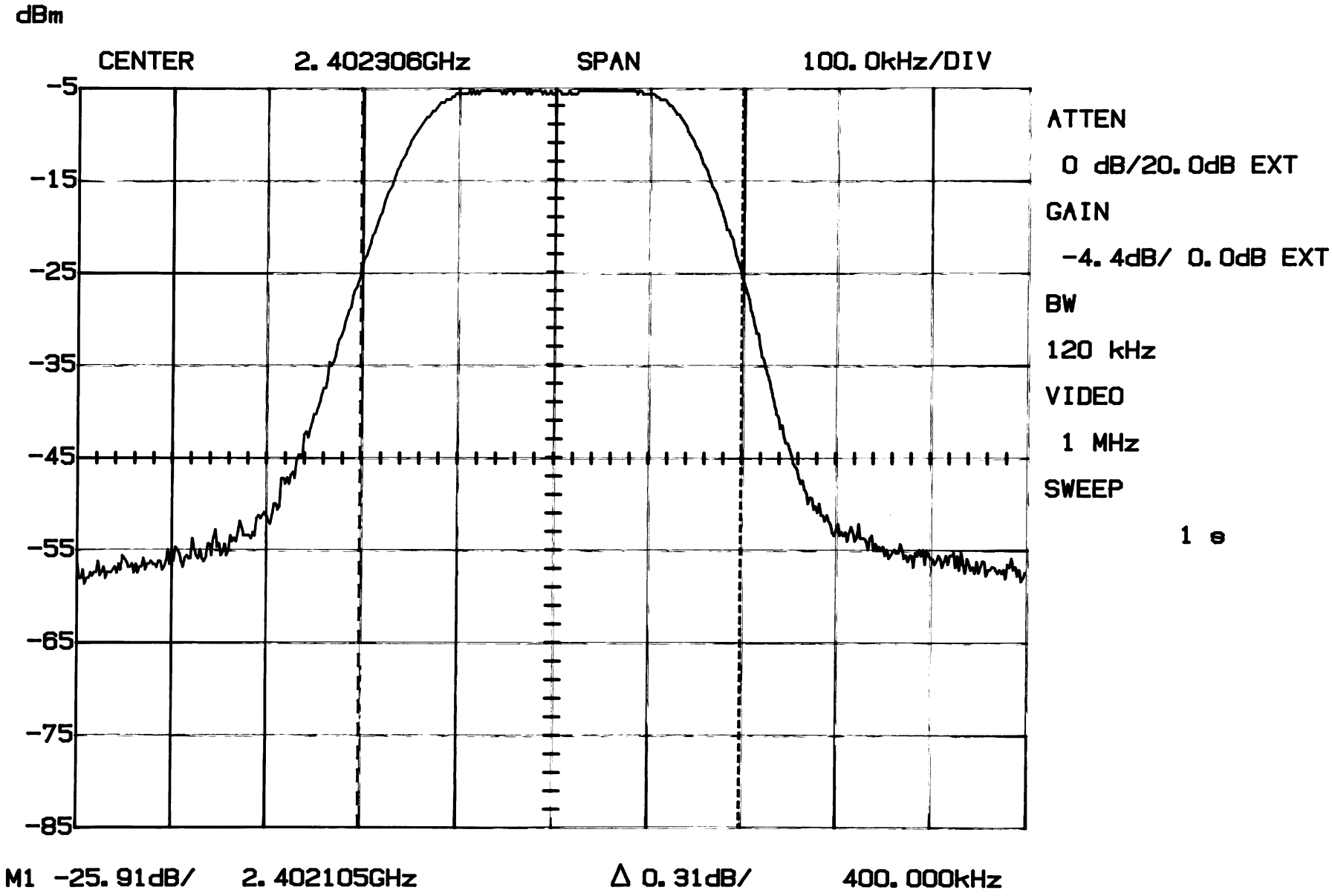
Channel 1: **0.400 MHz** [Refer to Exhibit D(1)-14]
Channel 40: **0.383 MHz** [Refer to Exhibit D(1)-15]

Handset:

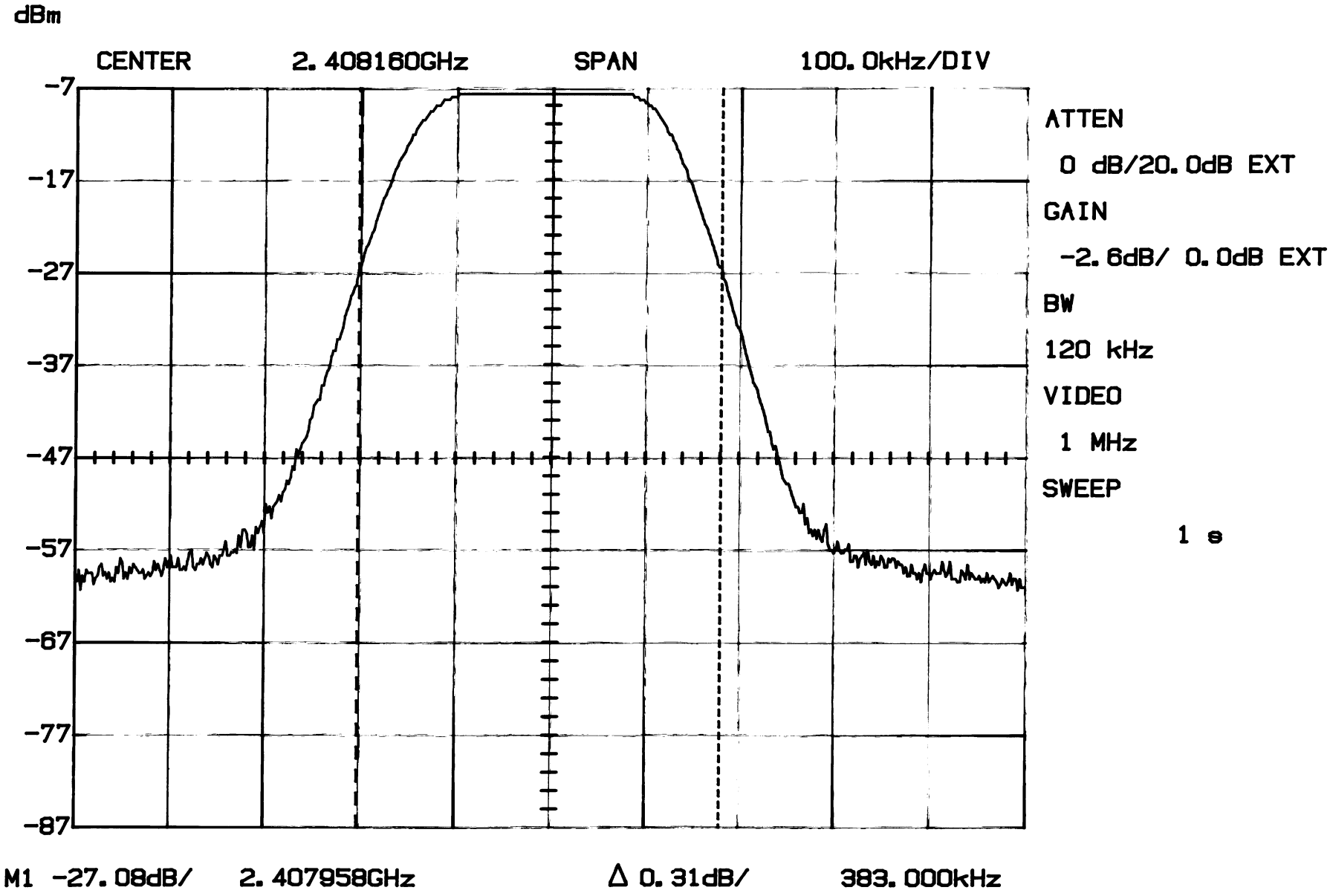
Channel 1: **0.509 MHz** [Refer to Exhibit D(1)-16]
Channel 40: **0.532 MHz** [Refer to Exhibit D(1)-17]

BANDWIDTH = **0.400 MHz** (Base)
0.532 MHz (Handset)

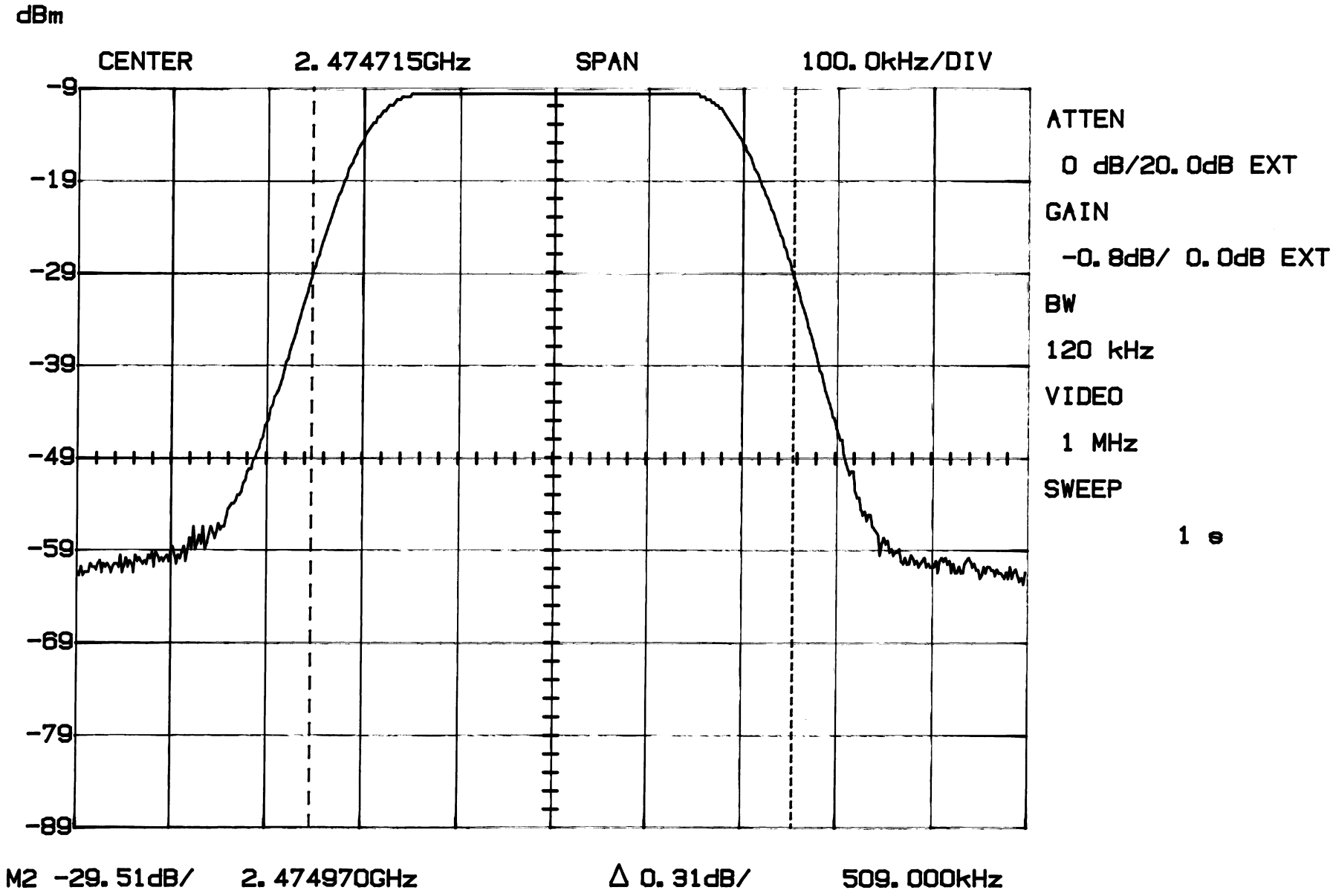
20dB BANDWIDTH (Channel 1)
MODEL 27936XXX-B (Base)



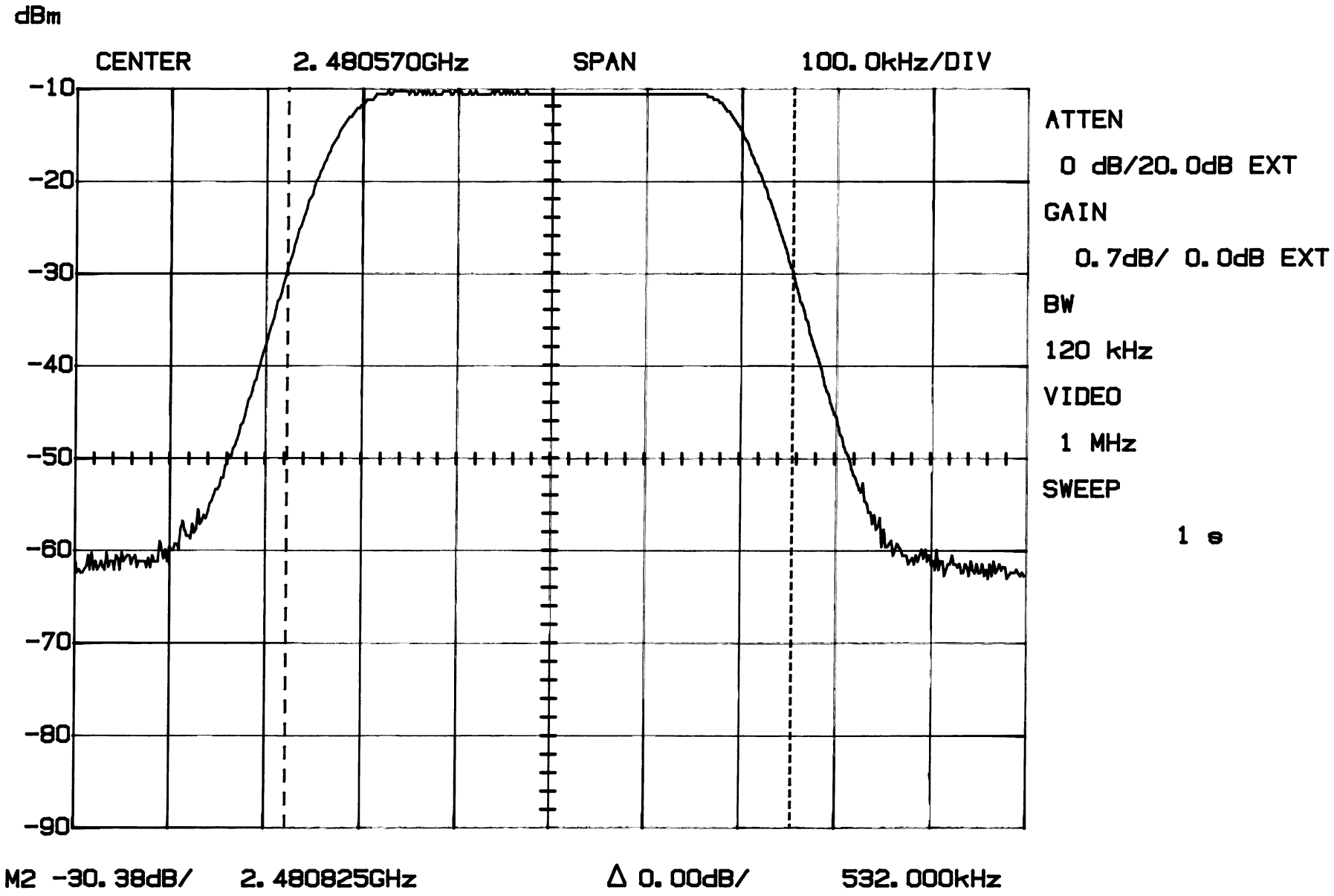
20dB BANDWIDTH (Channel 40)
MODEL 27936XXX-B (Base)



20dB BANDWIDTH (Channel 1)
MODEL 27936XXX-B (Handset)



20dB BANDWIDTH (Channel 40)
MODEL 27936XXX-B (Handset)



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

Requirements:

Field Strength of Fundamental	Field Strength of Harmonics	15.209	
		30-88 MHz	40 dBμV/m@ 3m
2.4023-2.4806 GHz 94dBμV	54 dBμV/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 54dBμV/m

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
Channel 1							
2402.32	**57.00**	**Horn V**	**33.38**	**90.38**	**94**	**-3.62**	**PK 1000**
4804.64	11.00	Horn V	37.90	48.90	54	-5.10	PK 1000
7206.96	3.00	Horn V	43.24	46.24	54	-7.76	PK 1000
9609.28	---						
Channel 40							
2408.18	**58.00**	**Horn V**	**33.38**	**91.38**	**94**	**-2.62**	**PK 1000**
4816.36	11.00	Horn V	37.90	48.90	54	-5.1	PK 1000
7224.54	3.00	Horn V	43.29	46.29	54	-7.71	PK 1000
9632.72	---						

NOTE: Modification:

New shield can with more solder pads was used.
Coil antennae (TX and RX) were used.

FIELD STRENGTH OF EMISSIONS

Test Data: **HANDSET 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
Channel 1							
2474.76	**59.00**	**Horn V**	**33.50**	**92.50**	**94**	**-1.50**	**PK 1000**
4949.52	11.00	Horn H	38.36	49.36	54	-4.64	PK 1000
7424.28	4.00	Horn H	43.89	47.89	54	-6.11	PK 1000
9899.04	---						
Channel 40							
2480.61	**59.00**	**Horn V**	**33.51**	**92.51**	**94**	**-1.49**	**PK 1000**
4961.22	11.00	Horn H	38.40	49.40	54	-4.60	PK 1000
7441.83	4.00	Horn H	43.92	47.92	54	-6.08	PK 1000

NOTE: Modifications:

New shield can with more solder pads was used.
Coil antennae (TX and RX) were used.
R18, 4.7KΩ resistor was changed to 10KΩ.