

February 14, 2001

Mr. Eric Weber  
Radio Sound, Inc.  
1713 Cobalt Drive  
Louisville, KY 40299-2449

Dear Mr. Weber,

Enclosed please find the results of testing on January thru February 12, 2002 by Philips Consumer Electronics Company (reference FCC Part 2 and Part 95, April 2, 1996 General rules and Regulations Applicable to the Equipment Authorization Program) on a Citizen Band Transceiver Model # RS9803UD manufactured by Radio Sound, Inc.

This measurement report indicates that Radio Sound Model RS9803UD Citizen Band Transceiver complies with FCC Part 2 and Part 95 General Rules and Regulations Applicable to the Equipment Authorization Program.

If you have any questions concerning the above, please refer to report number 20221.

Sincerely,

Richard K. Moyers

Richard K. Moyers  
Business Coordinator - EMI/EMC

RKM/rw

Enclosure

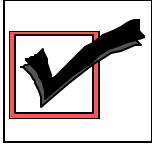
## **LIST OF EXHIBITS**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

1. Engineering Statement
2. Technical Specifications
3. List of Test Equipment
4. NVLAP Certificate and Scope of Accreditation
5. 2.1046 RF Power Output
6. 2.1047(B) Modulation Characteristics Modulation Verses Frequency
7. 2.1047(B) Modulation Characteristics Modulation Verses Voltage
8. 2.1047 Over Modulation Transient Response
9. 2.1049 Occupied Bandwidth
10. 2.1051 Spurious Emissions at Antenna Terminals
11. 2.1053 Spurious Radiation
12. 2.1055 Frequency Stability
13. 15.111 Antenna Conducted
14. 95.631 Spurious Emissions
15. 95.635 Maximum Transmitter Power
16. 8 x 10Photographs of EUT
17. User Manual and Schematics

# **SECTION 1**

## **ENGINEERING STATEMENT**



## **Engineering Statement**

All measurement data on the attached reports was taken pursuant to FCC Rules and Regulations on the Philips Consumer Electronics Company test facility at Knoxville, Tennessee, which is recognized by the FCC. Although this data is taken under stringent laboratory conditions and to the best of our knowledge, represents accurate data, it must be recognized that emissions from this type equipment may be greatly affected by the final installation of the equipment. Therefore, Philips Consumer Electronics Company, while supporting the accuracy of the data in this report, takes no responsibility for use of equipment based on these tests. The manufacturer of this equipment must take full responsibility for any field problems, which may arise, and agrees that Philips Consumer Electronics Company, in performing its functions in accordance with its objectives and purposes, does not assume or undertake to discharge any responsibility of the manufacturer to any other party or parties.

This measurement report was compiled and approved by:

\_\_\_\_\_  
Richard K. Moyers  
Business Coordinator EMI/EMC

## **SECTION 2**

# **TECHNICAL SPECIFICATIONS**

## **SECTION 3**

### **LIST OF EQUIPMENT**

## TEST EQUIPMENT

REPORT # 20221

FCC D: JOFRS9803UD

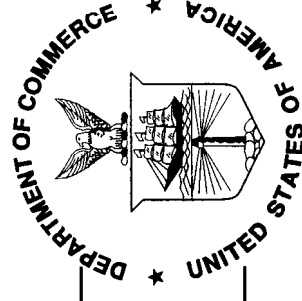
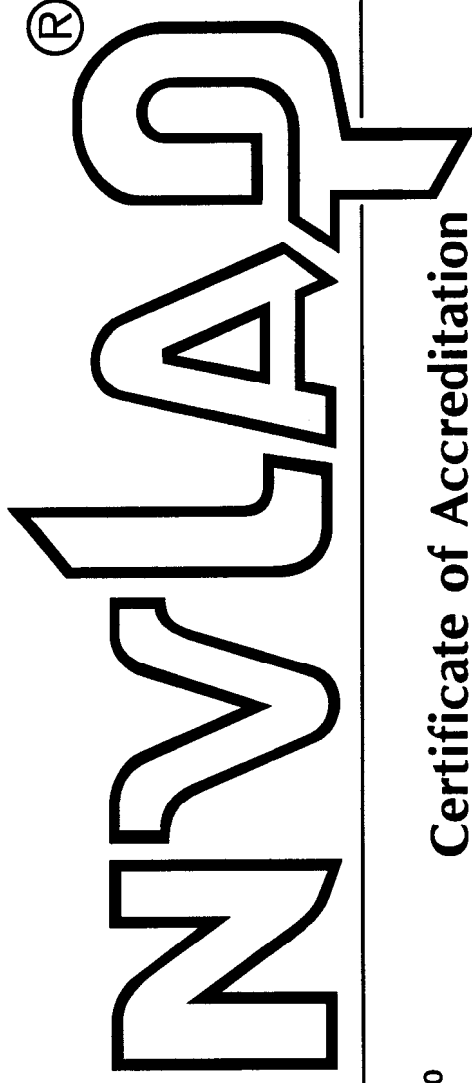
MODEL	S/N	CAL DATE
Regulated DC Power Supply		
HP8498A 50 Ohm Pad		
Wavetek 144 Function Generator		
HP8482A Power Sensor	2652A18534	5-18-01
HP438A Power Meter	2445A01258	5-18-01
Marconi 2305 Modulation Analyzer	169849014	4-24-01
HP8568B Spectrum Analyzer	T-29655	3-28-01
HP5386A Frequency Counter	2704A01588	5-18-01
Envirotronics EH510-2-30 Temperature		
/HumidityTest Chamber	04/961466	5-24-01
Tektronix 2230 Oscilloscope	25795	4-23-01
Fluke 8050A Digital Multimeter	4105077	7-23-01
HP3325A Function Generator	2652A24162	4-23-01
HP8112A Pulse Generator		

## **SECTION 4**

# **NVLAP CERTIFICATE AND SCOPE OF ACCREDITATION**



United States Department of Commerce  
National Institute of Standards and Technology



ISO/IEC GUIDE 25:1990  
ISO 9002:1987

**Certificate of Accreditation**

**PHILIPS TESTING SERVICE**  
KNOXVILLE, TN

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

**ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

June 30, 2002

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology

NVLAP Lab Code: 200409-0

## Scope of Accreditation



Page: 1 of 1

### ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

NVLAP LAB CODE 200409-0

#### PHILIPS TESTING SERVICE

One Philips Drive, P.O. Box 14810

Knoxville, TN 37914-1810

Mr. Fred A. Fisher

Phone: 865-521-4720 Fax: 865-521-4786

E-Mail: [fred.fisher@philips.com](mailto:fred.fisher@philips.com)

URL: <http://www.philipstesting.com>

#### *NVLAP Code Designation / Description*

#### Emissions Test Methods:

12/CIS22	IEC/CISPR 22:1997: Limits and methods of measurement of radio disturbance characteristics of information technology equipment
12/F01	FCC Method - 47 CFR Part 15 - Digital Devices
12/F01a	Conducted Emissions, Power Lines, 450 KHz to 30 MHz
12/F01b	Radiated Emissions
12/T51	AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

June 30, 2002

Effective through

*David F. Alderman*

For the National Institute of Standards and Technology

## **SECTION 5**

### **2.1046 RF POWER OUTPUT**

## **TEST PROCEDURES**

### **2.1046 RF POWER OUTPUT**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

The CB antenna output connector was connected to an HP 8498A 30 dB attenuator, which was connected to an HP 438A power meter with an HP 8482A power sensor. The CB was then powered on and channel 1 was selected. The microphone was then keyed and subjected to a tone 1000 Hz using a HP model 3325A Function generator. The (1000 Hz) tone was determined to provide maximum modulation under normal DC power conditions. The carrier power output was measured to determine compliance with the 4 watts carrier power limit. This procedure was then performed on channels 2 - 40.

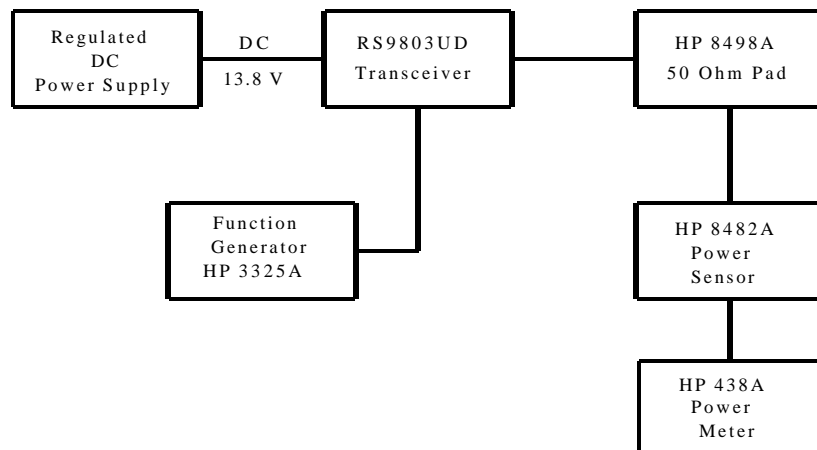
# TEST PROCEDURES

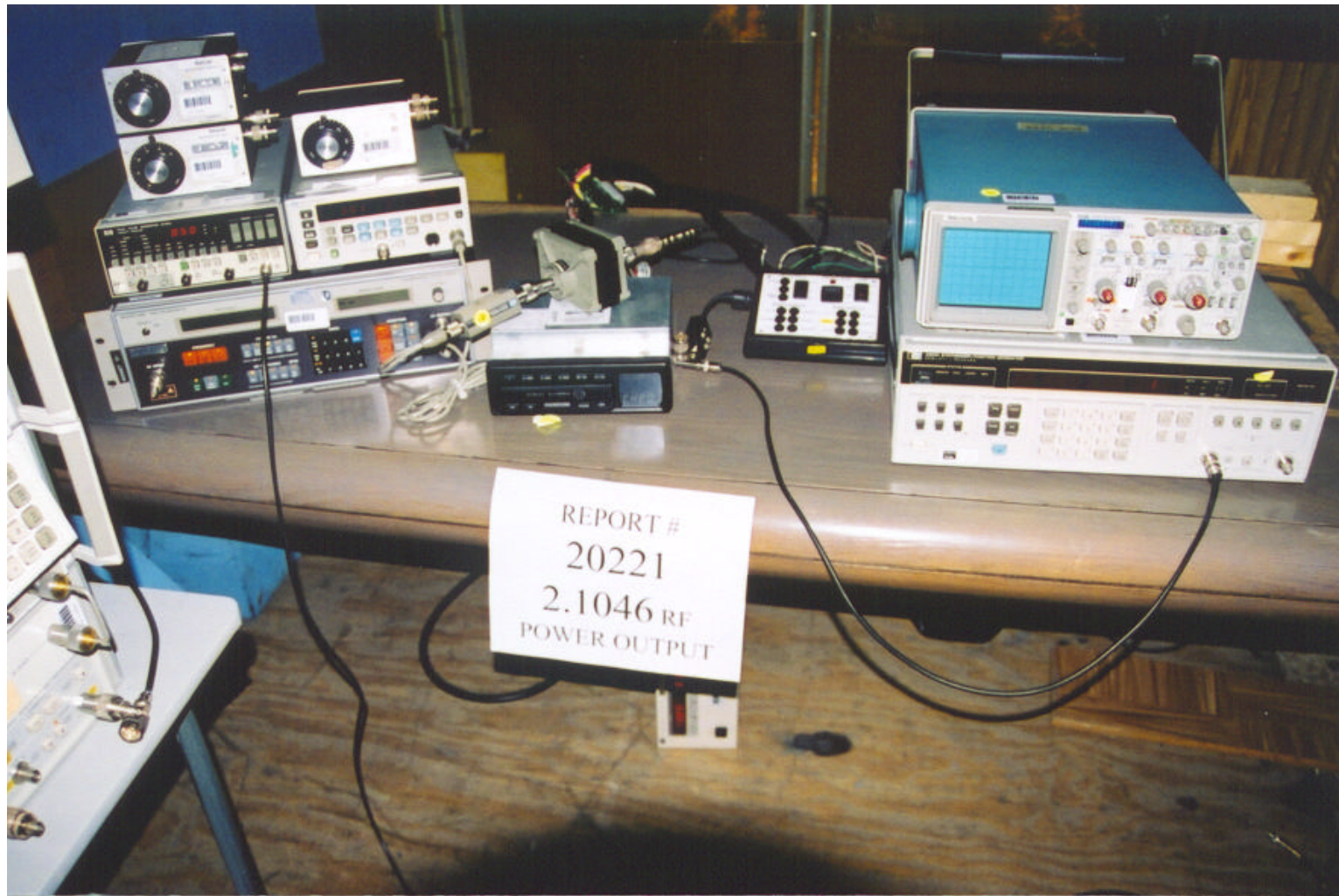
## 2.1046 RF POWER OUTPUT

REPORT # 20221  
FCC D: JOFRS9803UD

### 2.1046 RF POWER OUTPUT

#### TEST SET UP





**FCC PART 2**  
**(2.1046 RF POWER OUTPUT)**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

**Model Number:** RS9803UD  
**Manufacturer:** Radio Sound  
**Device:** Citizen Band Transceiver (27 MHz)  
**Test Condition:** 13.8 VDC, Modulation = 0%

<u>CHANNEL</u>	<u>POWER (WATTS)</u>	<u>CHANNEL</u>	<u>POWER (WATTS)</u>
1	3.46	21	3.69
2	3.48	22	3.69
3	3.49	23	3.69
4	3.51	24	3.69
5	3.53	25	3.69
6	3.54	26	3.69
7	3.55	27	3.69
8	3.57	28	3.69
9	3.58	29	3.69
10	3.59	30	3.69
11	3.60	31	3.69
12	3.61	32	3.68
13	3.63	33	3.68
14	3.63	34	3.68
15	3.64	35	3.67
16	3.66	36	3.67
17	3.67	37	3.66
18	3.67	38	3.65
19	3.67	39	3.65
20	3.68	40	3.64

**FCC PART 2**  
**(2.1046 POWER OUTPUT)**

**REPORT # 20221**

**FCC D: JOFRS9803UD**

**Model Number:** RS9803UD  
**Manufacturer:** Radio Sound  
**Device:** Citizen Band Transceiver (27 MHz)  
**Test Condition:** 13.8VDC, Modulation = 1000 Hz tone at a level 16 dB greater than that necessary to produce 50% modulation.

<u>CHANNEL</u>	<u>POWER (WATTS)</u>	<u>CHANNEL</u>	<u>POWER (WATTS)</u>
1	3.60	21	3.93
2	3.63	22	3.94
3	3.64	23	3.96
4	3.67	24	3.94
5	3.69	25	3.95
6	3.70	26	3.96
7	3.72	27	3.97
8	3.75	28	3.98
9	3.77	29	3.98
10	3.78	30	3.98
11	3.79	31	3.98
12	3.82	32	3.98
13	3.83	33	3.98
14	3.84	34	3.98
15	3.85	35	3.98
16	3.87	36	3.98
17	3.88	37	3.98
18	3.89	38	3.98
19	3.91	39	3.98
20	3.92	40	3.98



## **SECTION 6**

### **2.1047 (B) MODULATION CHARACTERISTICS**

#### **MODULATION VS. FREQUENCY**

**TEST PROCEDURES**  
**2.1047(B) MODULATION CHARACTERISTICS**  
**MODULATION VS. FREQUENCY**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

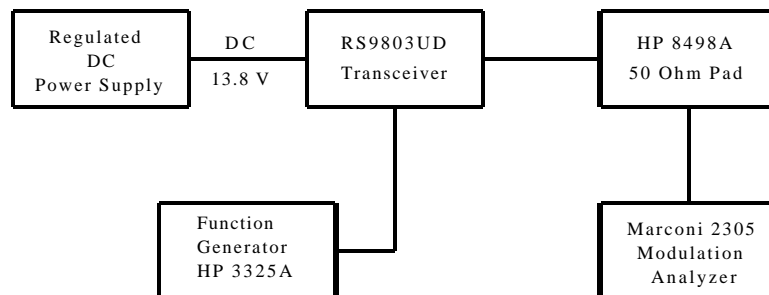
The CB antenna output connector was connected to an HP 8498A 30 dB attenuator, and was connected to a Marconi 2305 Modulation Analyzer. The CB was then powered on and channel 1 was selected. A HP3325A Function generator was coupled to the microphone input, which was used to feed a tone with a constant 4Vp-p amplitude to the CB. The modulated input frequency was then varied and the percent (%) modulation was recorded. This procedure was then performed on channels 19 and 40. Channels 1, 19, and 40 were found sufficient to show the modulation limiting capability.

## **2.1047 (B) MODULATION CHARACTERISTICS MODULATION VERSES FREQUENCY**

**REPORT # 20221  
FCC D: JOFRS9803UD**

### **2.1047 (B) MODULATION CHARACTERISTICS MODULATION VERSES FREQUENCY**

#### **TEST SET UP**







<p><b>FCC PART 2</b></p> <p><b>2.1047 (B) MODULATION CHARACTERISTICS</b></p>
--

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

Model Number: RS9803UD  
Manufacturer: Radio Sound  
Device: Citizen Ban Transceiver (27 MHz)  
Test Condition: Modulation Verses Frequency 500mV-Amplitude

CHANNEL	FREQUENCY	% MODULATION
1	100 Hz	12.67%
	1000 Hz	85.5%
	2500 Hz	37.6%
	5000 Hz	2.6%

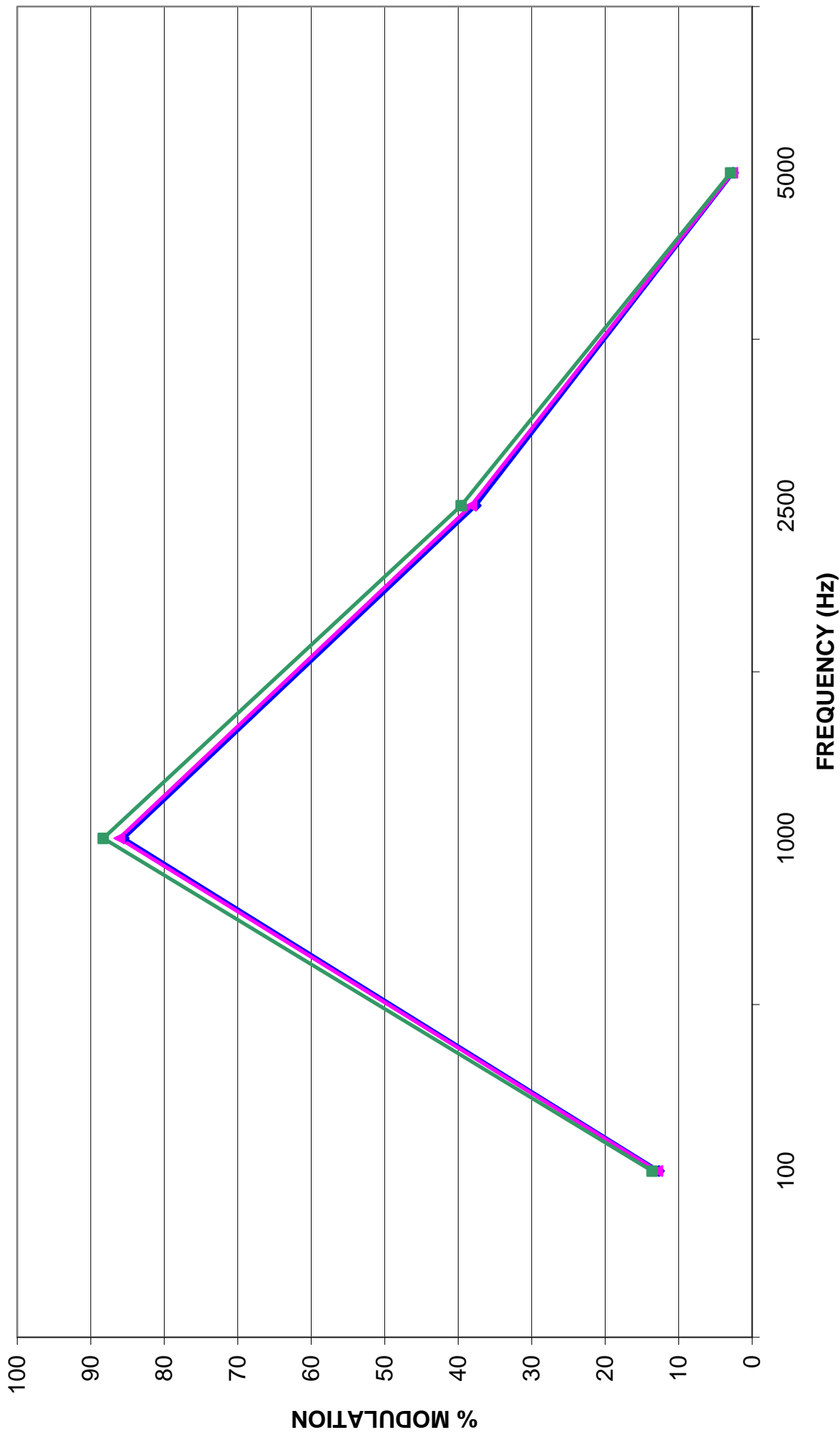
CHANNEL	FREQUENCY	% MODULATION
19	100 Hz	12.9%
	1000 Hz	86.1%
	2500 Hz	38.2%
	5000 Hz	2.7%

CHANNEL	FREQUENCY	% MODULATION
40	100 Hz	13.6%
	1000 Hz	88.3%
	2500 Hz	39.6%
	5000 Hz	2.9%

# 2.1047 (B) MODULATION CHARACTERISTICS

## MODULATION VERSES FREQUENCY

AMPLITUDE = 500mv



CHANNEL 1 CHANNEL 19 CHANNEL 40

## **SECTION 7**

### **2.1047 (B) MODULATION CHARACTERISTICS**

#### **MODULATION VS. VOLTAGE**



**TEST PROCEDURES**  
**2.1047(B) MODULATION CHARACTERISTICS**  
**MODULATION VS. VOLTAGE**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

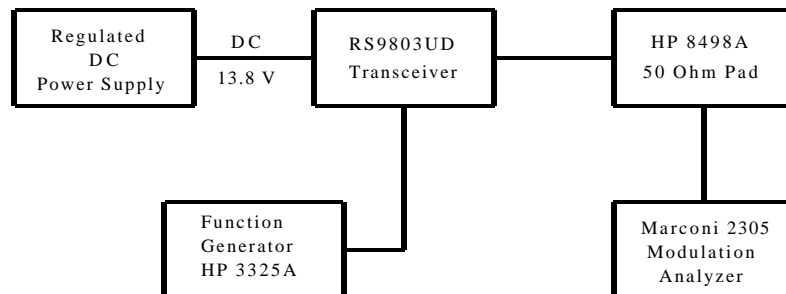
The CB antenna output connector was connected to an HP 8498A 30 dB attenuator, and was connected to a Marconi 2305 Modulation Analyzer. The CB was then powered on and channel 40 was selected. A HP3325A function generator was coupled to the microphone input, which was used to feed a 100, 1000, 2500 AND 5000 Hz tone to the CB. The modulated input voltage was then varied and the percent (%) modulation was recorded.

## **2.1047 (B) MODULATION CHARACTERISTICS MODULATION VERSES VOLTAGE**

**REPORT # 20221  
FCC D: JOFRS9803UD**

### **2.1047 (B) MODULATION CHARACTERISTICS MODULATION VERSES VOLTAGE**

#### **TEST SET UP**







<p align="center"><b>FCC PART 2</b></p> <p align="center"><b>2.1047 (B) MODULATION CHARACTERISTICS</b></p>
--

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

CHANNEL	FREQUENCY	AMPLITUDE	MODULATION
40	100 Hz	5 mV	.55%
		10 mV	.63%
		50 mV	.95%
		100 mV	1.6%
		200 mV	2.9%
		500 mV	13.6%
		1 V	32.7%
		2 V	39.5%
		3 V	41.9%
		4 V	40.2%
		5 V	40.2%
		10	60.5%

CHANNEL	FREQUENCY	AMPLITUDE	MODULATION
40	1000 Hz	5 mV	13.3%
		10 mV	26.8%
		50 mV	71.0%
		100 mV	75.6%
		200 mV	79.0%
		500 mV	88.3%
		1 V	87.8%
		2 V	82.1%
		3 V	71.2%
		4 V	66.2%
		5 V	63.3%
		10 V	58.8%

<p align="center"><b>FCC PART 2</b></p> <p align="center"><b>2.1047 (B) MODULATION CHARACTERISTICS CONT...</b></p>
--

REPORT # 20221  
FCC D: JOFRS9803UD

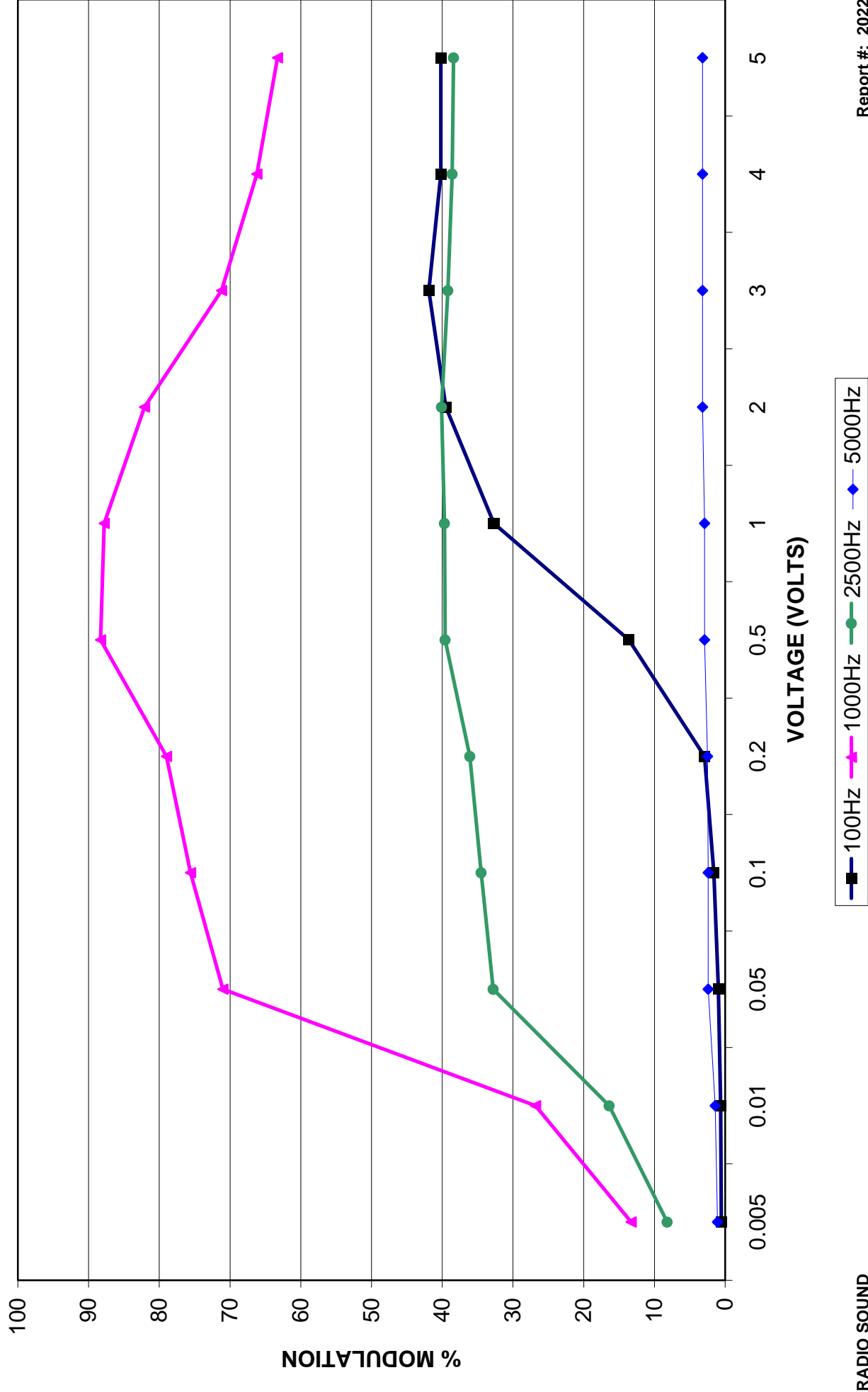
CHANNEL	FREQUENCY	AMPLITUDE	MODULATION
40	2500 Hz	5 mV	8.2%
		10 mV	16.4%
		50 mV	32.8%
		100 m	34.5%
		200 mV	36.1%
		500 mV	39.6%
		1 V	39.7%
		2 V	40.1%
		3 V	39.2%
		4 V	38.6%
		5 V	38.4%
		10 V	37.9%

CHANNEL	FREQUENCY	AMPLITUDE	MODULATION
40	5000 Hz	5 mV	1.1%
		10 mV	1.4%
		50 mV	2.4%
		100 mV	2.4%
		200 mV	2.5%
		500 mV	2.9%
		1 V	2.9%
		2 V	3.2%
		3 V	3.2%
		4 V	3.2%
		5 V	3.2%
		10 V	3.3%

# 2.1047 (B) MODULATION CHARACTERISTICS

## MODULATION VERSES VOLTAGE

### CHANNEL 40



## **SECTION 8**

### **2.1047 OVER MODULATION**

#### **TRANSIENT RESPONSE**



## **TEST PROCEDURES**

### **TRANSIENT OVER MODULATION**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

The CB antenna output connector was connected to an HP 8498A 30 dB attenuator, which was connected to an HP 8568B spectrum analyzer. The CB was then powered on and channel 1 was selected.

2.1047(b.)

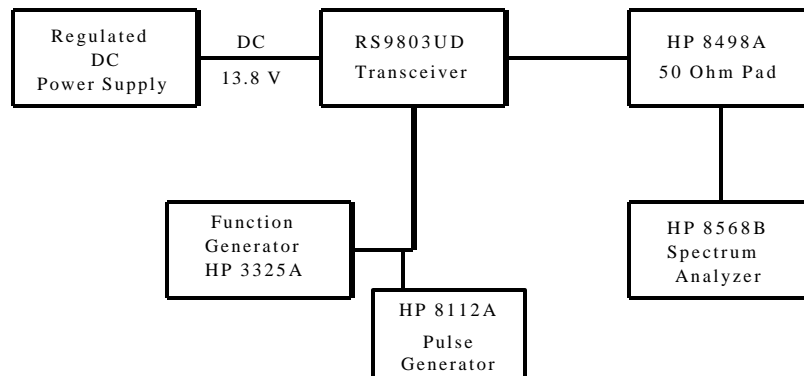
1. Set audio modulating signal at 2500hz, at level 16dB greater than required for 50% modulation at audio frequency of maximum response. This signal is pulsed at 1 P.P.S. with pulse width of 0.5 sec.
2. Tune the spectrum analyzer to the channel on which the transmitter is set and adjust the settings as for the measurement of occupied bandwidth.
3. Then tune the spectrum analyzer to the adjacent channel (+- 10KHZ) to that on which the transmitter is set, place it in the "Zero-Scan" and observe the transients caused by the pulsed modulation.

## 2.1047 OVERMODULATION TRANSIENT RESPONSE

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

### 2.1047 OVER MODULATION TRANSIENT RESPONSE

#### TEST SET UP







## **2.1047 OVERMODULATION TRANSIENT RESPONSE**

**REPORT # 20221**

**FCC D: JOFRS9803UD**

Response in upper adjacent channel (Ch. 22)

The transient is 53.9 dB below un-modulated carrier level with a time duration of:  
≈40 milliseconds

Response in lower adjacent channel (Ch. 20)

The transient is 59.9 dB below un-modulated carrier level with a time duration of:  
≈40 milliseconds





RESPONSE IN LOWER ADJACENT CHANNEL (CHANNEL NO. 20)

HP REF 146.6 dBμV ATTEN 20 dB +0 dB MKR Δ 40.00 msec -2.30 dB

10 dB/

OFFSET

29.6

dB

DL

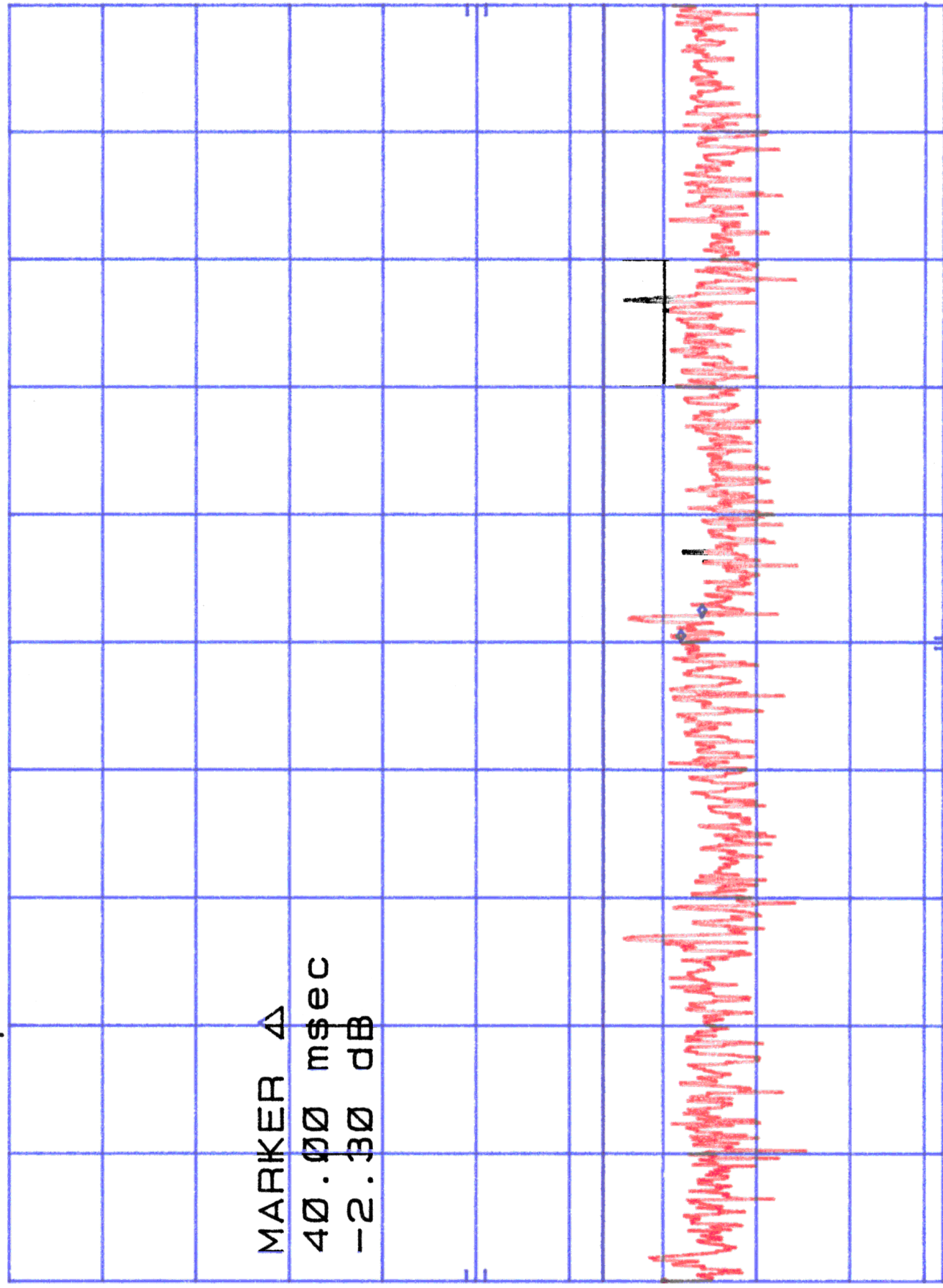
83.0

dBμV

MARKER Δ

40.00 msec

-2.30 dB



CENTER 27.204 800 MHz

RES BW 1 kHz

VBW 1 kHz

SPAN 0 Hz

SWP 2.00 sec

RESPONSE IN UPPER ADJACENT CHANNEL (CHANNEL NO 22)

HP

0 d

OFF

dB

D

8

d μV

RF

4

d μV

0 dB

0 d

0 d

0 d

0 d

0 d

MARKER Δ

0.00 mse

0.0 dB

C R

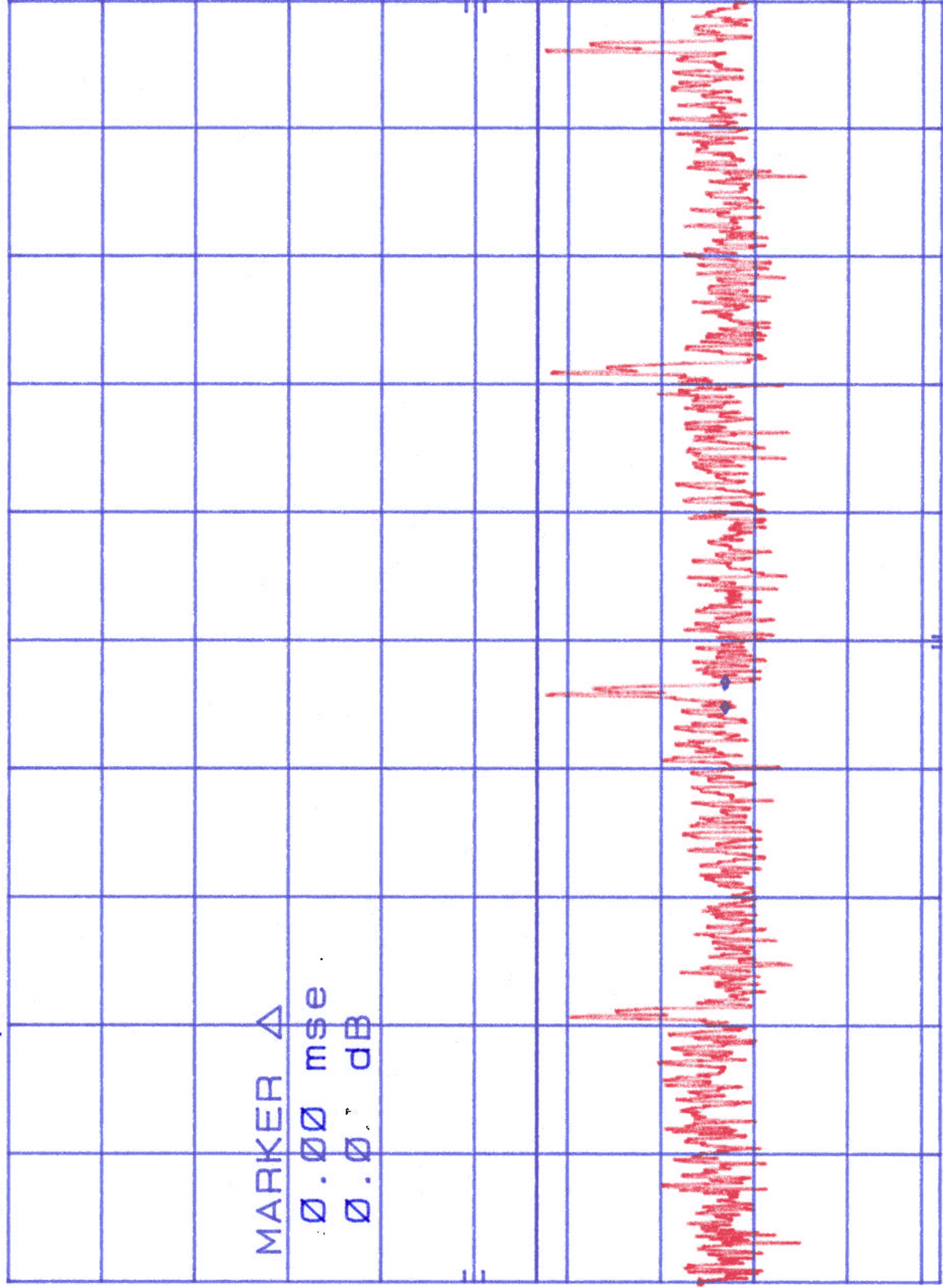
5 000 MHz

KHz

P

00

sec





## **SECTION 9**

### **2.1049 OCCUPIED BANDWIDTH**

## **TEST PROCEDURES**

### **2.1049 OCCUPIED BANDWIDTH**

**REPORT # 20221**  
**FCC D: JOFRS9803UD**

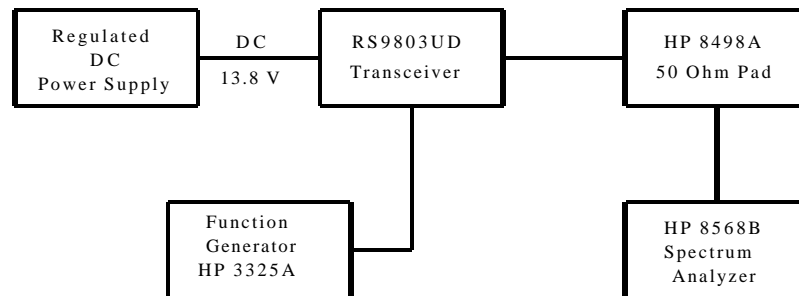
The CB antenna output connector was connected to an HP 8498A 30 dB attenuator and connected to an HP 8568B spectrum analyzer. The CB was powered on and channel 1 was selected. The microphone was then keyed and subjected to a 2500 Hz tone using a HP 3325A function generator which was coupled into the microphone input jack. The spectrum analyzer was adjusted so that the bandwidth could be determined as prescribed in 2.1049 of the FCC Rules and Regulations. This test was then performed on channels 19 and 40 under modulated and un-modulated conditions. A graph of each condition and applicable channel is provided.

## 2.1049 OCCUPIED BANDWIDTH

REPORT # 20221  
FCC D: JOFRS9803UD

### 2.1049 OCCUPIED BANDWIDTH

#### TEST SET UP





CHIRP

0.00

4

8

MARKER

6.965 0.00 MHz

142.30 dBμV

CORR D

CORR D

0.00

4

8

0.00

4

8

0.00

4

8

0.00

4

8