Test Report:	4W07941
Applicant:	Northern Airborne Technology Ltd. 1925 Kirschner Road Kelowna, BC, V1Y 4N7
Equipment Under Test: **(EUT)**	NPX136D-070, VHF Radio
FCC ID:	GOLNPX136D
In Accordance With:	**FCC Part 22** **FCC Part 90**
Tested By:	Nemko Canada Inc. 303 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	Glen Westwell, Wireless Technologist
Date:	16 April 2004
Total Number of Pages:	31

Table of Contents

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 22 and FCC Part 90.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

TESTED BY: _____ DATE: 16 April 2004
Kevin Carr, EMC/EMI/Wireless Specialist

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complied
Audio Frequency Response	2.1047	Complied
Audio Low-Pass Filter Response	2.1047	Complied
Modulation Limiting	2.1047	Complied
Occupied Bandwidth	2.1049	Complied
Spurious Emissions at Antenna Terminals	2.1051	Complied
Field Strength of Spurious Emissions	2.1053	Complied
Frequency Stability	2.1055	Complied
Transient Frequency Behavior	——	Complied

Footnotes For N/A's:

Test Conditions:

Indoor Temperature: 24°C
Humidity: 17%

Outdoor Temperature: 7°C
Humidity: 78%

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Section 2. General Equipment Specification

Manufacturer:	Northern Airborne Technology Ltd.
Model No.:	NPX136D-070
Serial No.:	1002
Date Received In Laboratory:	23 Mar. 2004
Nemko Identification No.:	1

Transmitter

Power Input:		28 VDC
Frequency Range:		136.0000 – 173.9975 MHz
99% Occupied Bandwidth:	**Analog Voice–WB**	14.7kHz
	Analog Voice–NB	5.8kHz
	Digital Voice	7.0kHz
Emission Designator:	**Analog Voice–WB**	14kF3E
	Analog Voice–NB	05k8F3E
	Digital Voice	07k0F1E
Crystal Frequencies:		5, 12.8, 20 MHz
Power Output (Manufacturer's Rating):		40.0 dBm, 10.0 Watts
Power Output Adjustment:		1W/10W factory presets
Operator Selection of Operating Frequency:		Front Panel Control – 1W/10W

Receiver

Power Input:	28 VDC
Frequency Range:	136.0000 – 173.9975 MHz
Tunable Bands:	1
Operator Selection of Operating Frequency:	Front Panel Control

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Kevin Carr	**Date of Test: 23 Mar. 2004**

Minimum Standard: ± 1 dB

Test Results: Complied

Measurement Data:

Manufacturer's Rating:	40.0dBm
Measured Power Output:	40.6dBm

Section 4. Audio Low-Pass Filter Response

Para. No.: 2.1047

Test Performed By: Kevin Carr	**Date of Test: 23 Mar. 2004**

Minimum Standard: Not applicable.

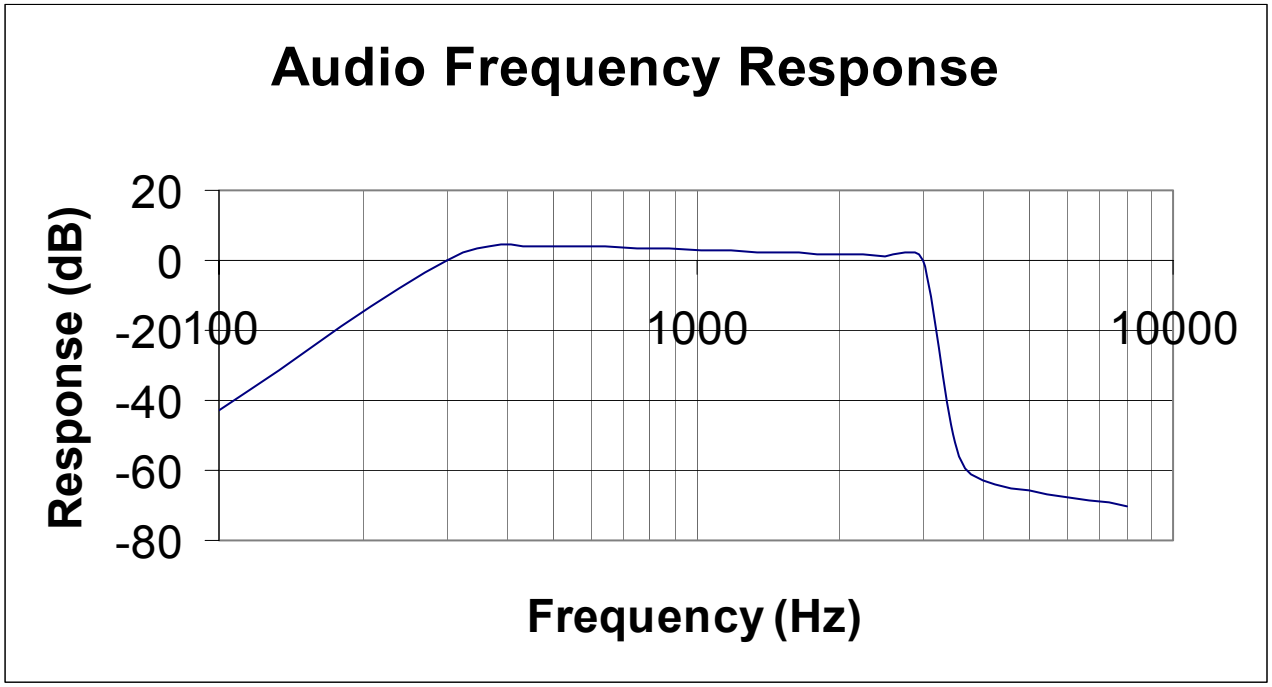
Test Results: Complied

The equipment has provision for audio low pass filter.

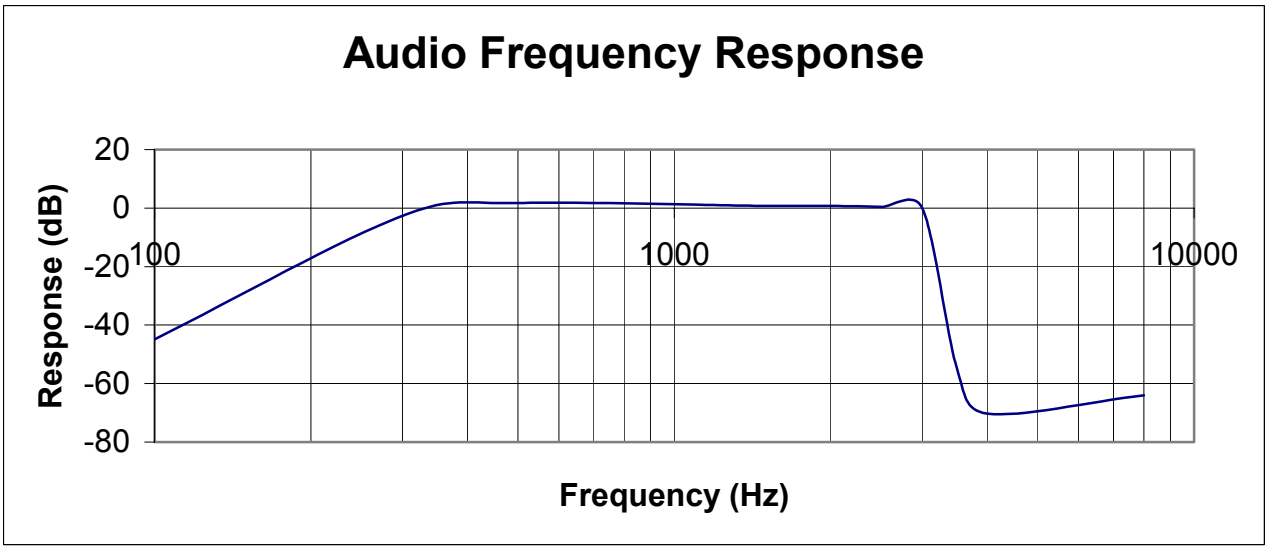
Measurement Data: See attached graph.

Audio Response

N.B.



W.B.



Section 5. Modulation Limiting

Para. No.: 2.1047

Test Performed By: Kevin Carr	**Date of Test: 23 Mar. 2004**

Minimum Standard: Not Applicable

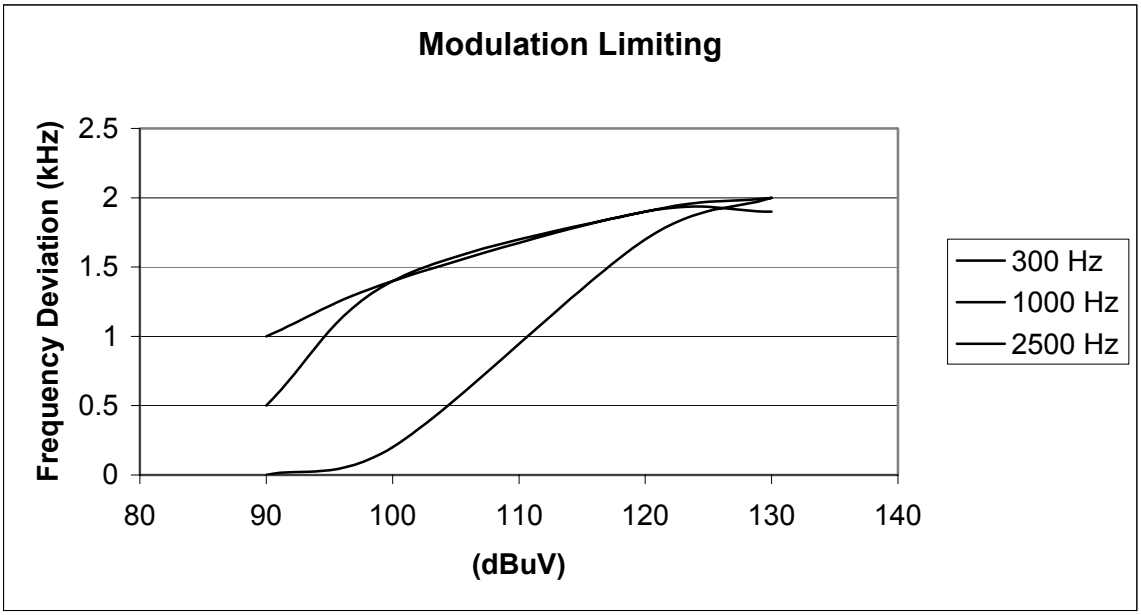
Test Results: Complied

The maximum frequency deviation is less than ±5 kHz for wideband mode and less than ±2.5 kHz for narrowband mode.

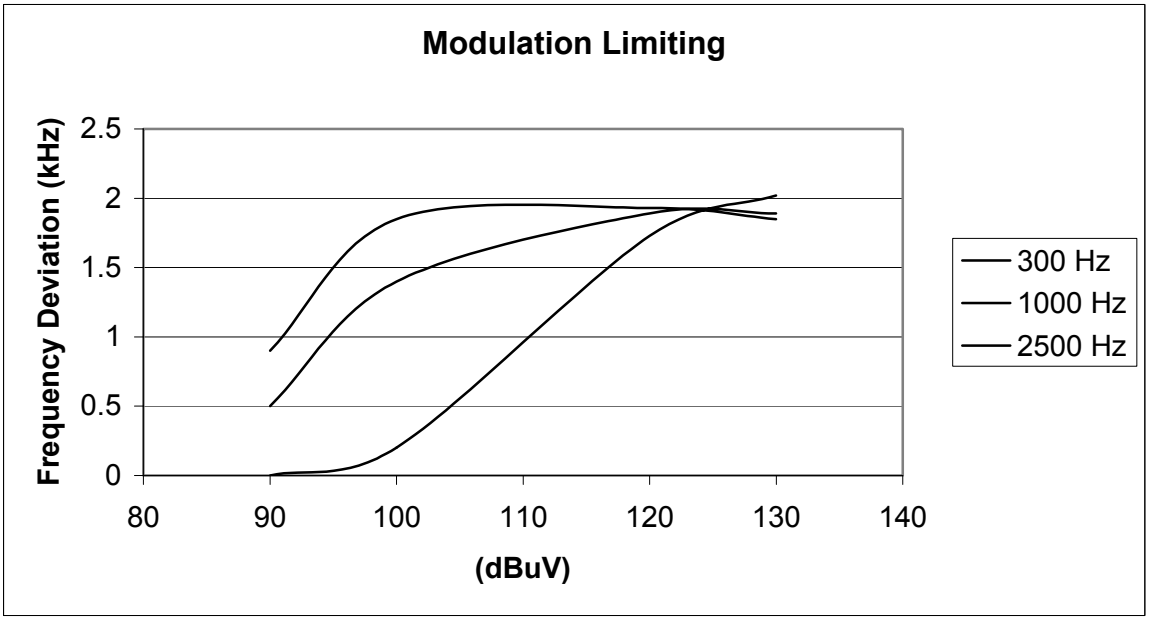
Measurement Data: See attached graphs.

Modulation Limiting

NB



WB



Section 6. Occupied Bandwidth

Para. No.: 2.1049

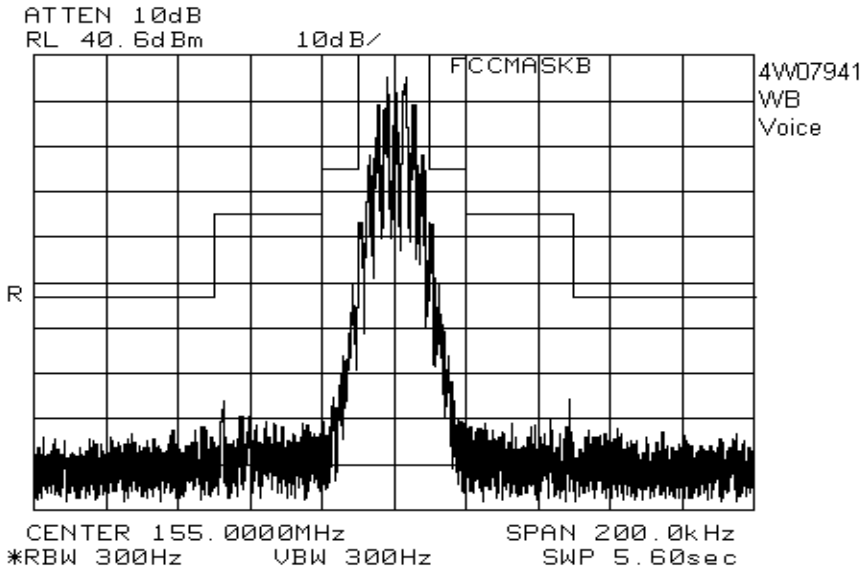
Test Performed By: Kevin Carr	**Date of Test: 25 Mar. 2004**

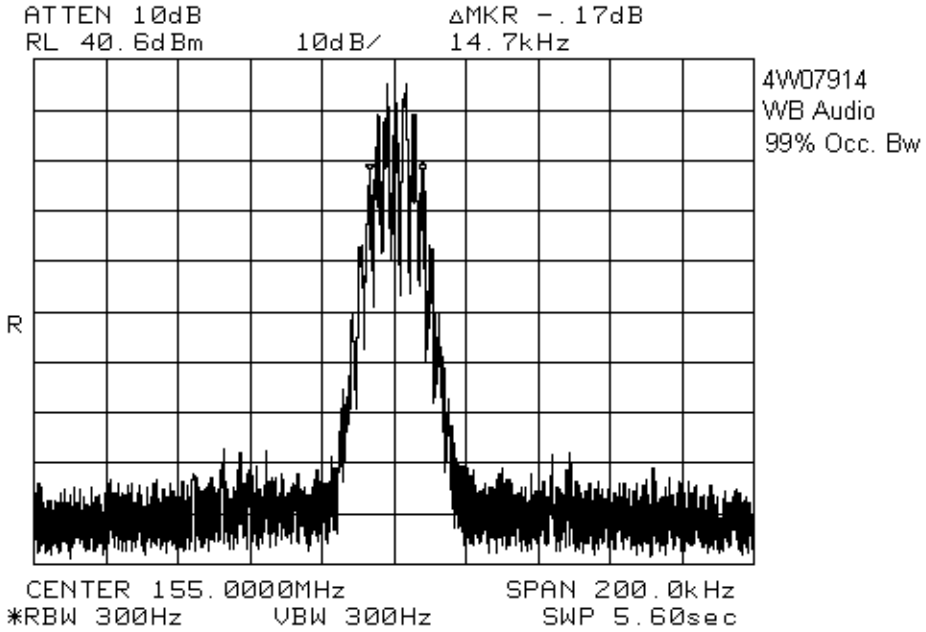
Minimum Standard: Para. No.'s 90.210(b)
90.210(d)
22.359(a), (b)(1) & (b)(2)

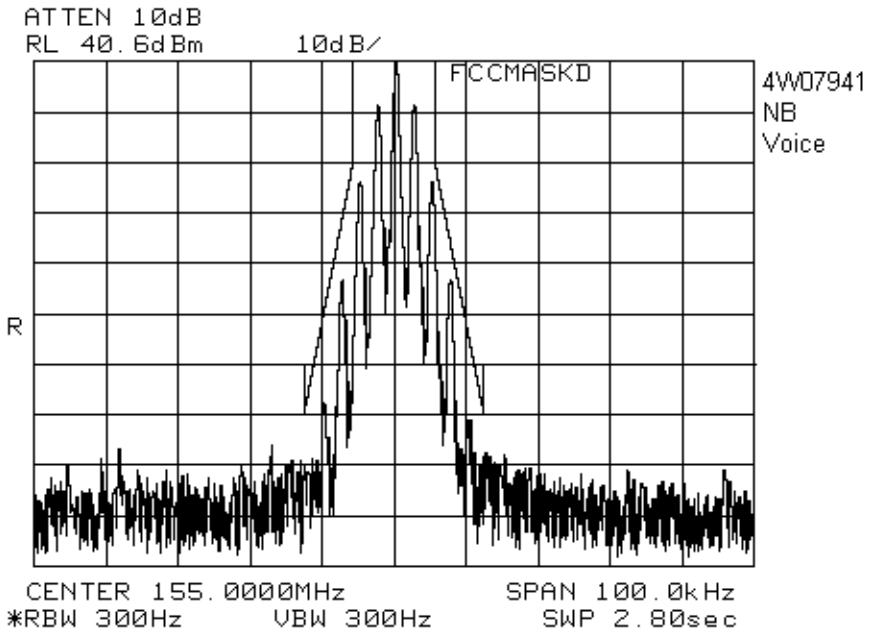
Test Results: Complied

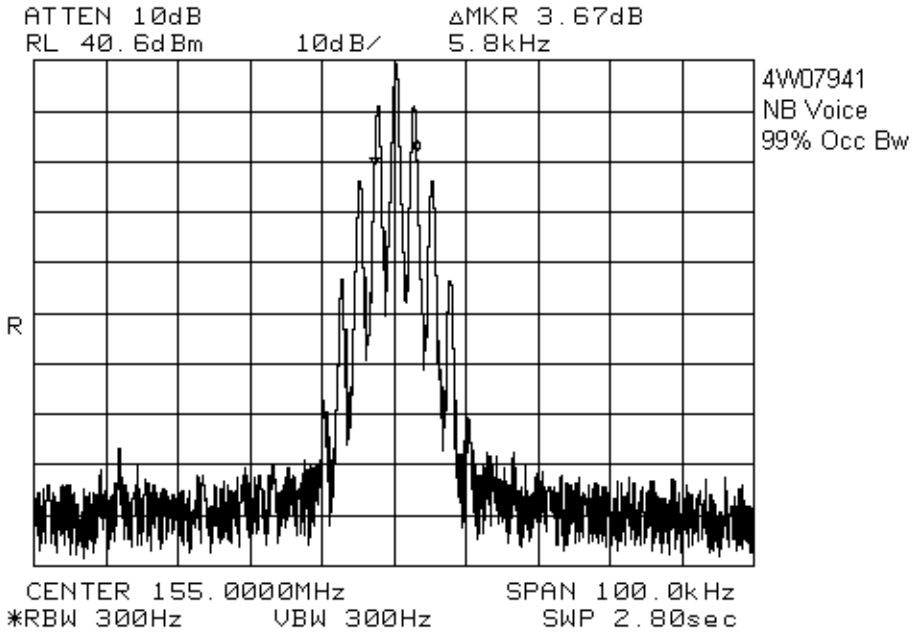
Measurement Data: See attached graphs.

Analog Voice

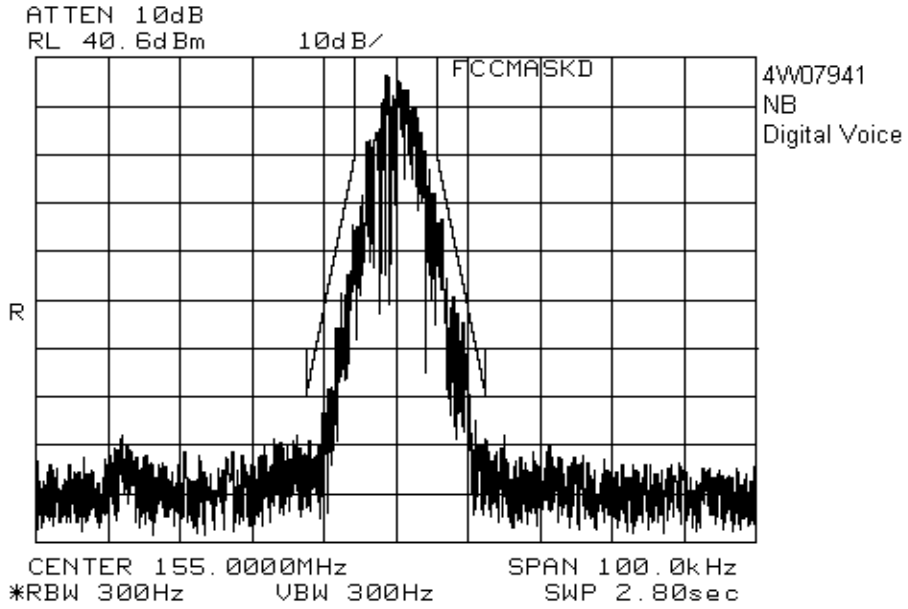


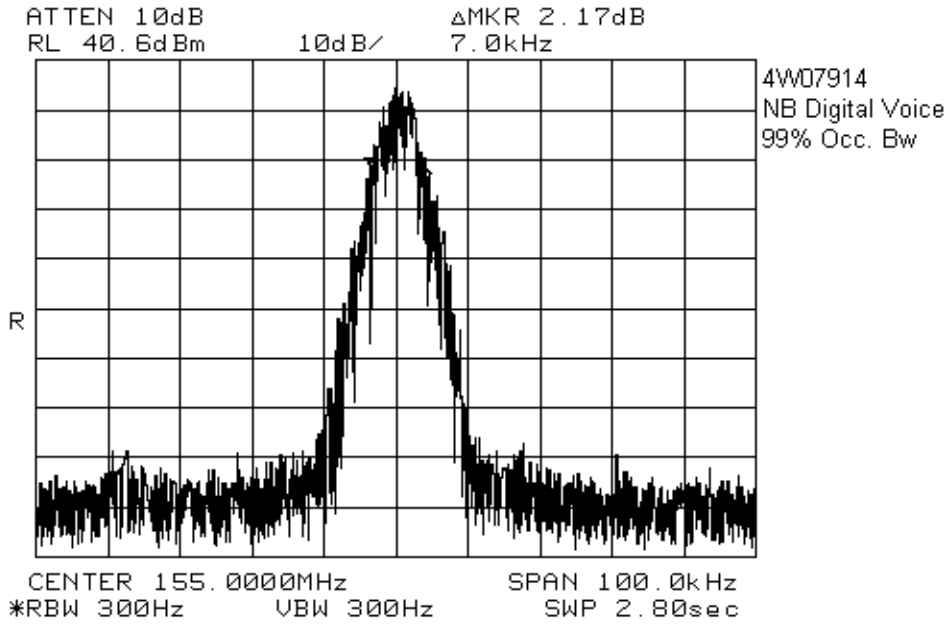



ATTEN 10dB
RL 40.6dBm
10dB/
FCCMASKD
4W07941
NB
Voice
R
CENTER 155.0000MHz
SPAN 100.0kHz
*RBW 300Hz
VBW 300Hz
SWP 2.80sec


ATTEN 10dB
RL 40.6dBm
10dB/
ΔMKR 3.67dB
5.8kHz
4W07941
NB Voice
99% Occ Bw
R
CENTER 155.0000MHz
SPAN 100.0kHz
*RBW 300Hz
VBW 300Hz
SWP 2.80sec

Digital Voice





Section 7. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

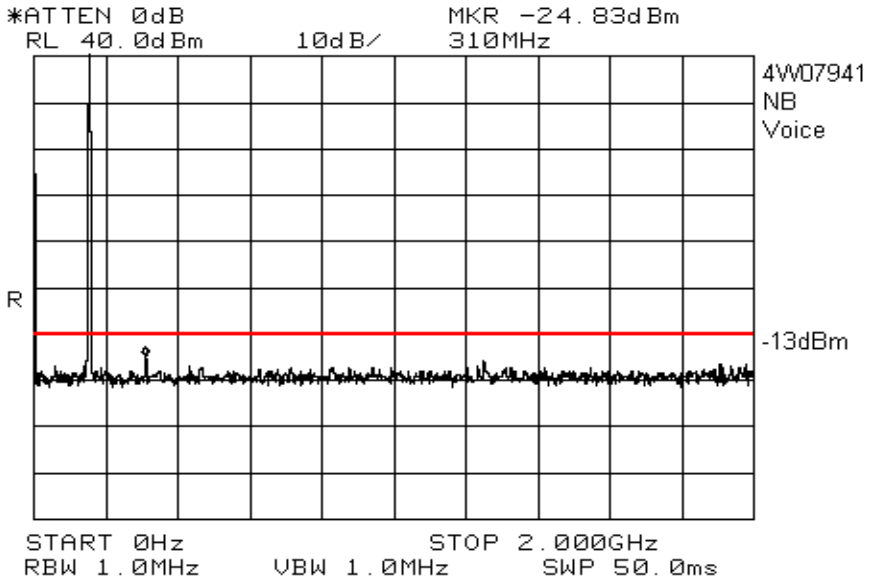
Test Performed By: Kevin Carr	**Date of Test: 25 Mar. 2004**

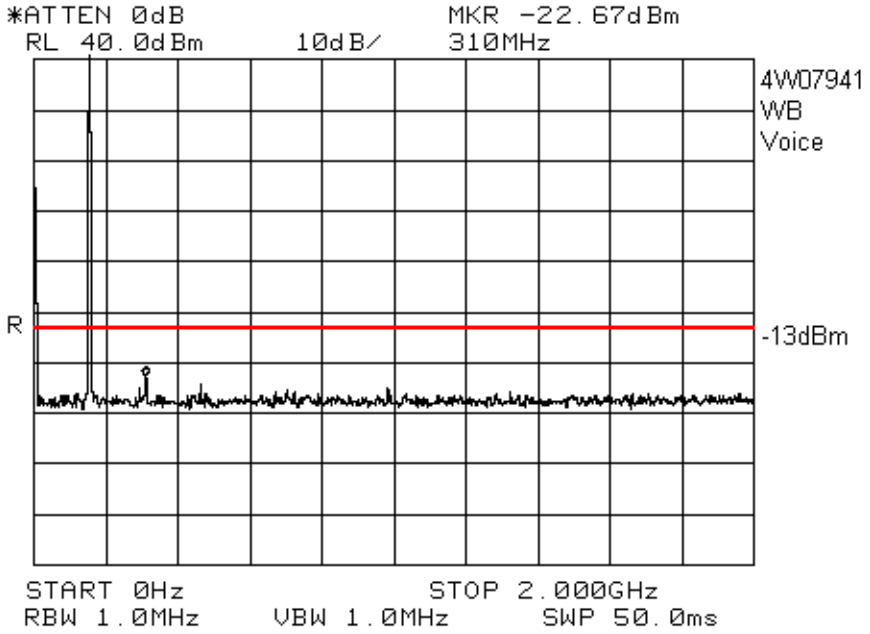
Minimum Standard: Para. No.'s 90.210 (b)(d)
22.359(a), (b)(1) & (b)(2)

Test Results: Complied

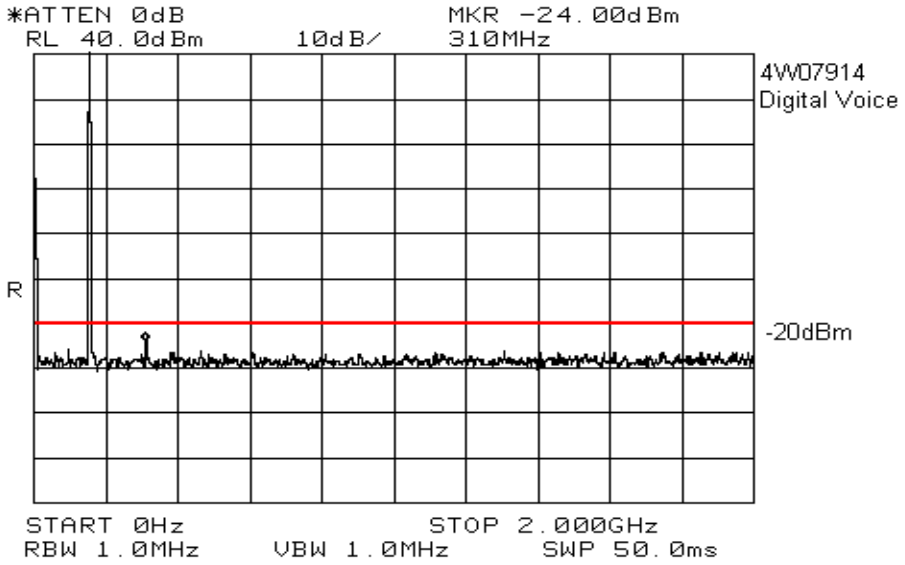
Measurement Data: See attached graphs.

Analog Voice





Digital Voice



Section 8. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Kevin Carr	**Date of Test: 25 Mar. 2004**

Minimum Standard: Para. No.'s 90.210 (b), (d)
22.359 (a), (b)(1) & (b)(2)

Test Results: Complied

Measurement Data: See attached tables.

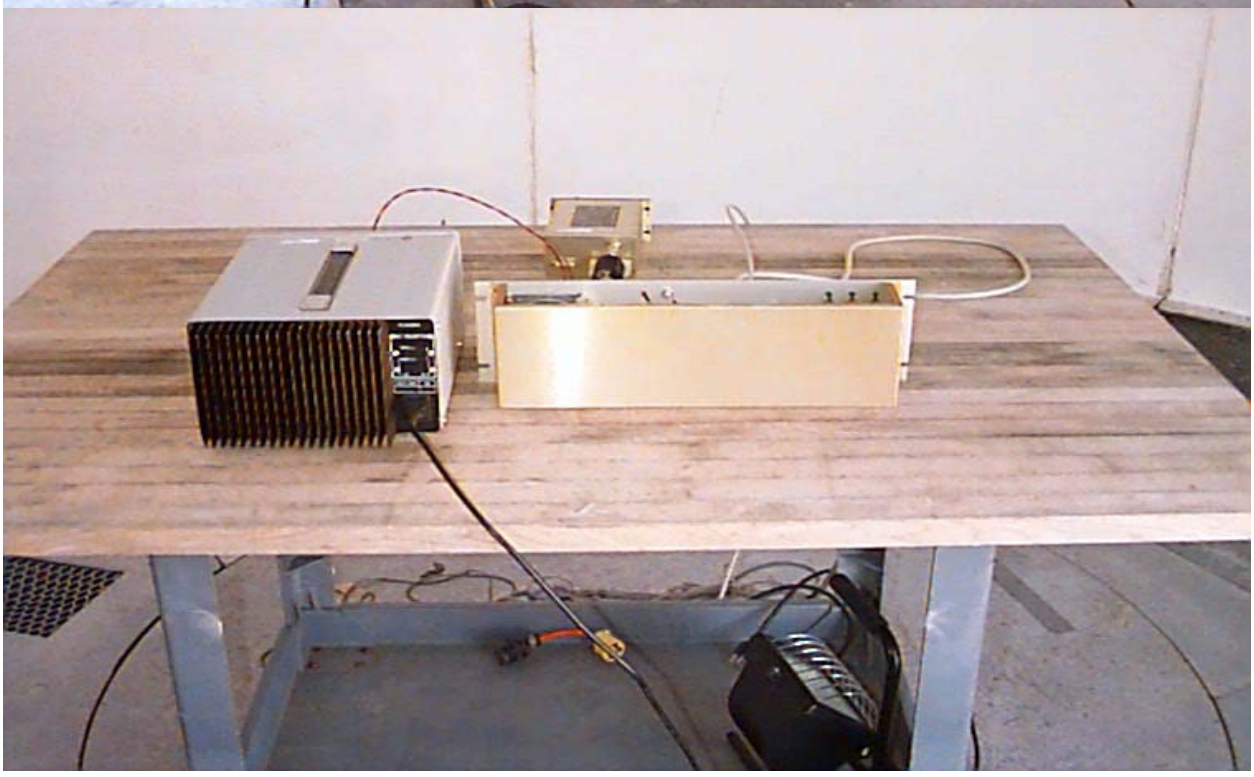
Radiated Emissions:

Standard:	Signal Substitution			**Date:**	24 Mar. 04	**Tester:**	**Dome #**	1
Tower:	A	**Distance:**	3 m	**Location:**	Ottawa	Kevin Carr		
Receiver:	8565E	**Comment:**		**Temp:**	7	**Humidity:**	78	

	Frequency (MHz)	**Antenna**	**Polarity**	**RCVD Signal (dBuV)**	**Sig. Sub. Factor**	**Emission Level (dBm)**	**Limit (dBm)**	**Margin (dB)**	**Detector**	**Amp.**
1	310.0000	LP2	V	26.0	-82.3	-56.3	-20.0	36.3	Peak	-----
2	310.0000	LP2	H	31.1	-83.3	-52.2	-20.0	32.2	Peak	-----
3	465.0000	LP2	V	10.9	-79.7	-68.8	-20.0	48.8	Peak	-----
4	465.0000	LP2	H	17.3	-81.0	-63.7	-20.0	43.7	Peak	-----
5	775.0000	LP2	V	9.6	-72.3	-62.7	-20.0	42.7	Peak	-----
6	775.0000	LP2	H	9.5	-73.5	-64.0	-20.0	44.0	Peak	-----
7	930.0000	LP2	V	11.1	-70.2	-59.1	-20.0	39.1	Peak	-----
8	930.0000	LP2	H	9.3	-70.5	-61.2	-20.0	41.2	Peak	-----
9	620.0000	LP2	H	14.0	-77.2	-63.2	-20.0	43.2	Peak	-----
10	620.0000	LP2	V	9.8	-76.0	-66.2	-20.0	46.2	Peak	-----
11	1085.0000	Horn2	V	58.0	-120.6	-62.6	-20.0	42.6	Peak	1-2GHz
12	1085.0000	Horn2	H	58.2	-120.5	-62.3	-20.0	42.3	Peak	1-2GHz
13	1240.0000	Horn2	V	54.0	-120.2	-66.2	-20.0	46.2	Peak	1-2GHz
14	1240.0000	Horn2	H	56.9	-121.4	-64.5	-20.0	44.5	Peak	1-2GHz
15	1395.0000	Horn2	V	52.0	-119.7	-67.7	-20.0	47.7	Peak	1-2GHz
16	1395.0000	Horn2	H	47.8	-118.8	-70.9	-20.0	50.9	Peak	1-2GHz
17	1549.7000	Horn2	V	53.0	-118.8	-65.8	-20.0	45.8	Peak	1-2GHz
18	1549.0000	Horn2	H	50.0	-119.4	-69.4	-20.0	49.4	Peak	1-2GHz

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW
Note 3: Emissions below 1 GHz, RBW/VBW = 100kHz, Emissions Above 1 GHz, RBW/VBW = 1MHz

Set up Photos:



Section 9. Frequency Stability

Para. No.: 2.1055

Test Performed By: Kevin Carr	**Date of Test: 26 Mar. 2004**

Minimum Standard: Para. No.'s 22.355
90.213

Test Results: Complies

The maximum frequency drift is 256. Hz.
This is 1.7 ppm.

Measurement Data: See attached tables.

Standard Test Frequency: 155.000068MHz
Standard Test voltage: 28.0VDC

Measurement Data

Voltage Stability

	Ref. Freq.	Measured	Variance	
	(MHz)	(MHz)	(Hz)	ppm
85%, 23.8VDC	155.000068	155.000045	23	0.1
100%, 28.0VDC	155.000068	155.000068	0	0.0
115%, 32.2VDC	155.000068	155.000045	23	0.1

Temperature Stability

	Ref. Freq.	Measured	Variance	
	(MHz)	(MHz)	(Hz)	ppm
-30	155.000068	154.999812	256	1.7
50	155.000068	155.000008	60	0.4

Section 10. Transient Frequency Behaviour

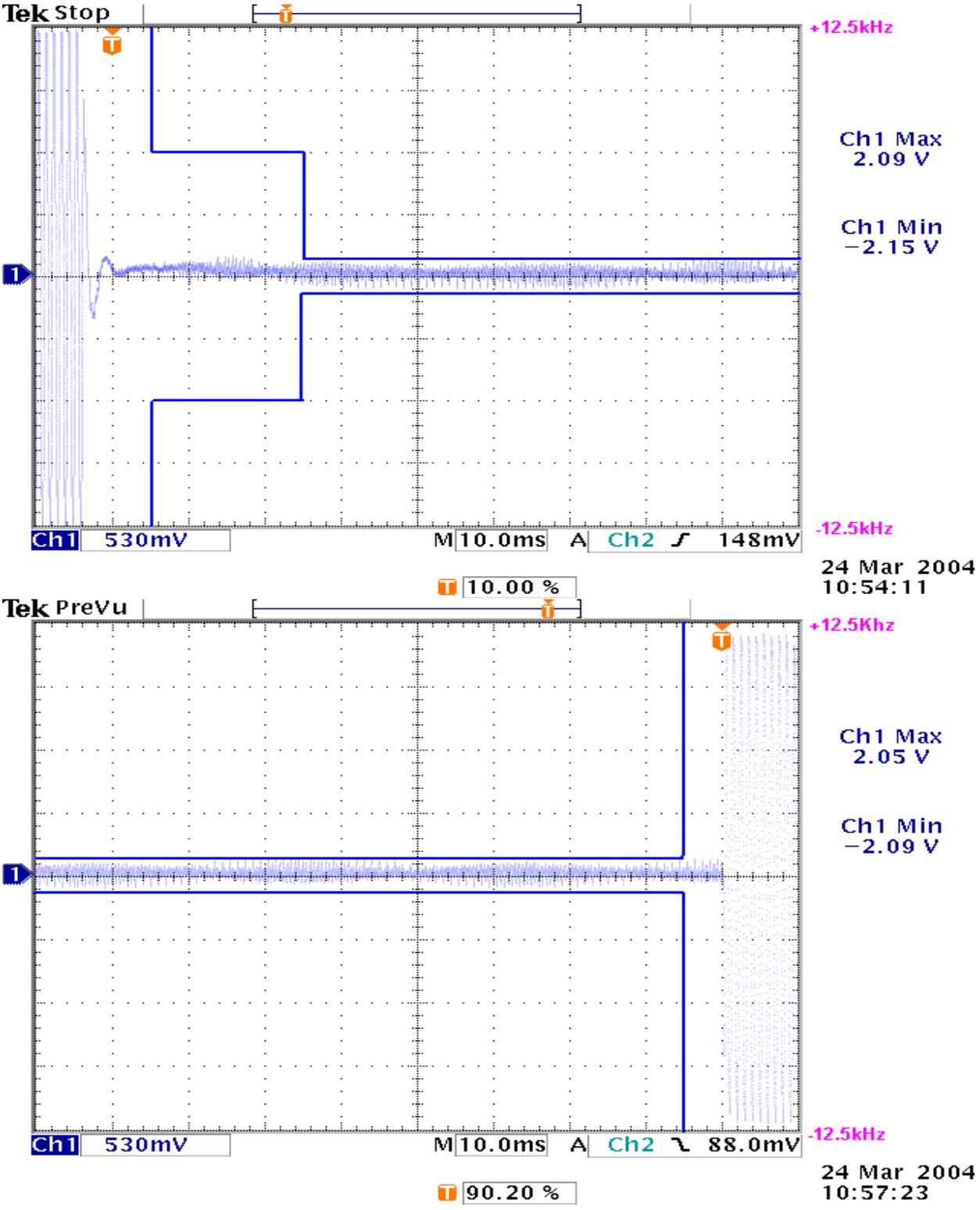
Test Performed By: Kevin Carr	**Date of Test: 24 Mar. 04**

Minimum Standard: Para. No. 90.214

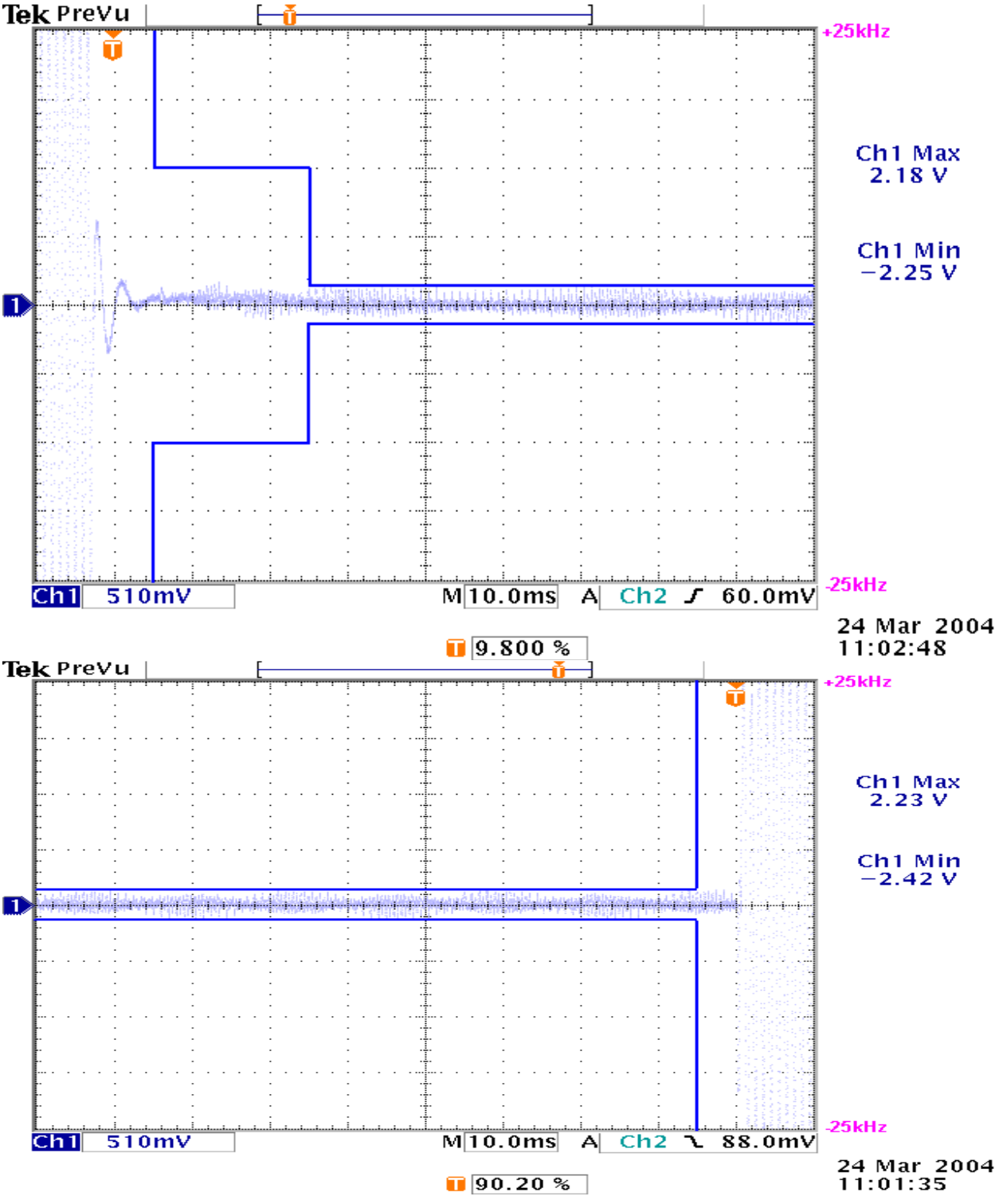
Test Results: Complied

Measurement Data: See attached graphs.

Narrow Band

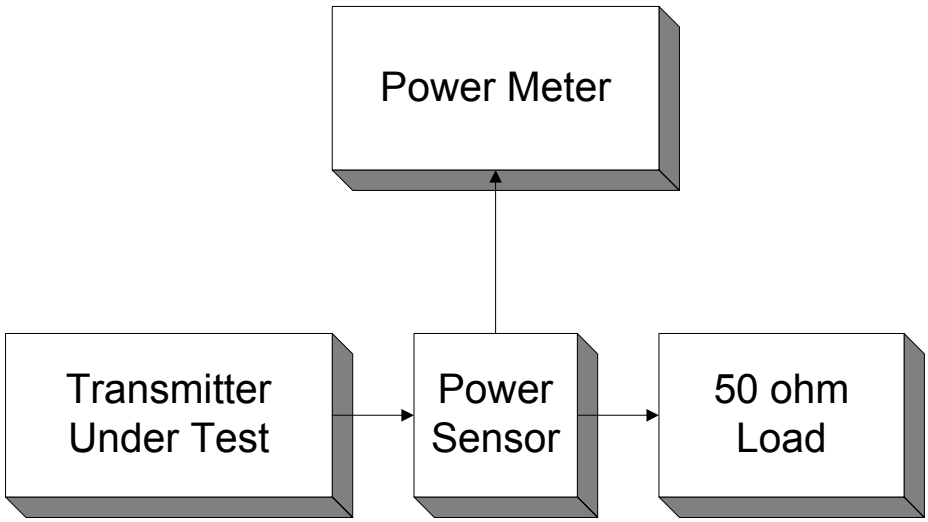

Tek Stop
+12.5kHz
Ch1 Max
2.09 V
Ch1 Min
−2.15 V
Ch1 530mV
M 10.0ms A Ch2 148mV
-12.5kHz
24 Mar 2004
10:54:11
10.00 %
Tek PreVu
+12.5Khz
Ch1 Max
2.05 V
Ch1 Min
−2.09 V
Ch1 530mV
M 10.0ms A Ch2 88.0mV
-12.5kHz
24 Mar 2004
10:57:23
90.20 %

Wide Band

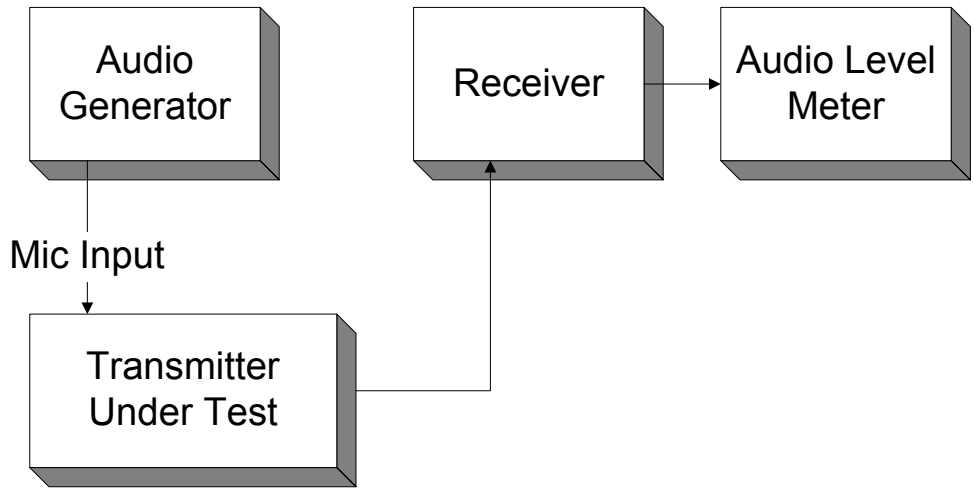

Tek PreVu
+25kHz
Ch1 Max
2.18 V
Ch1 Min
−2.25 V
-25kHz
Ch1 510mV
M 10.0ms A Ch2 60.0mV
24 Mar 2004
11:02:48
9.800 %
Tek PreVu
+25kHz
Ch1 Max
2.23 V
Ch1 Min
−2.42 V
-25kHz
Ch1 510mV
M 10.0ms A Ch2 88.0mV
90.20 %
24 Mar 2004
11:01:35

Section 11. Block Diagrams

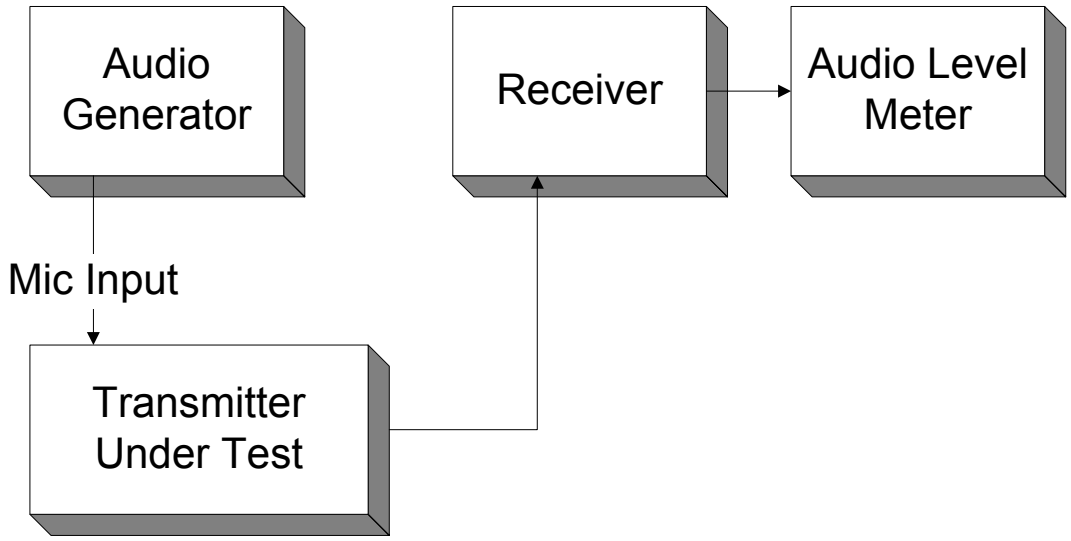
Para. No. 2.1046 - R.F. Power Output



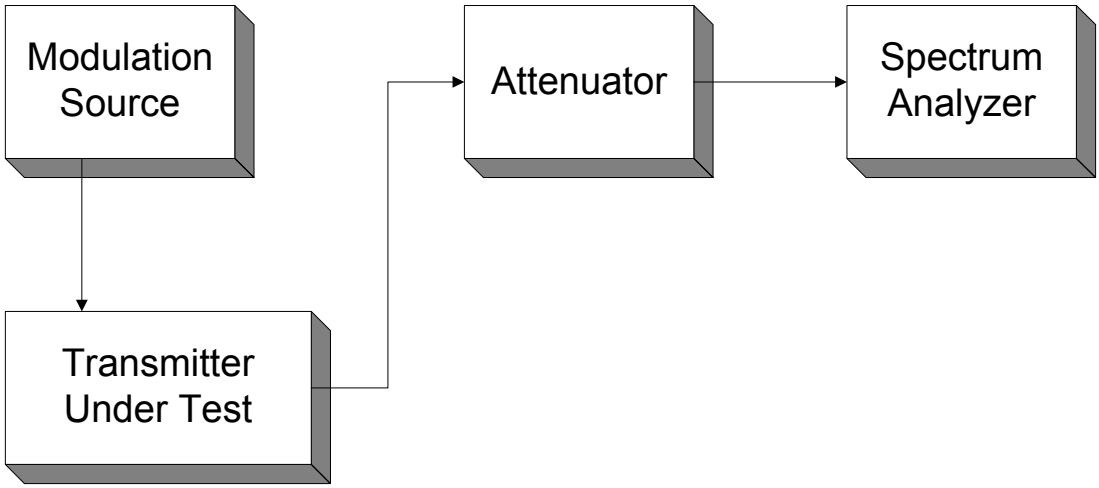
Para. No. 2.1047 - Audio Frequency Response



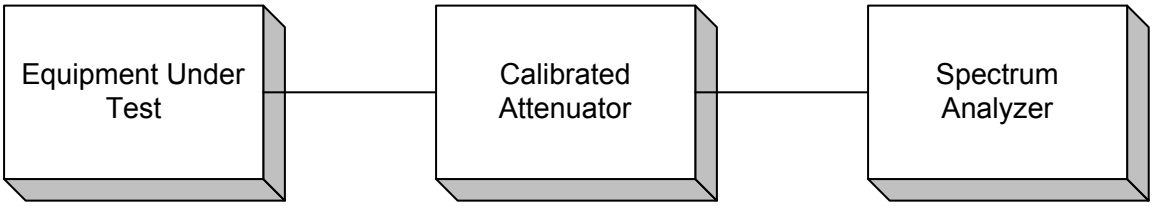
Para. No. 2.1047 - Modulation Limiting



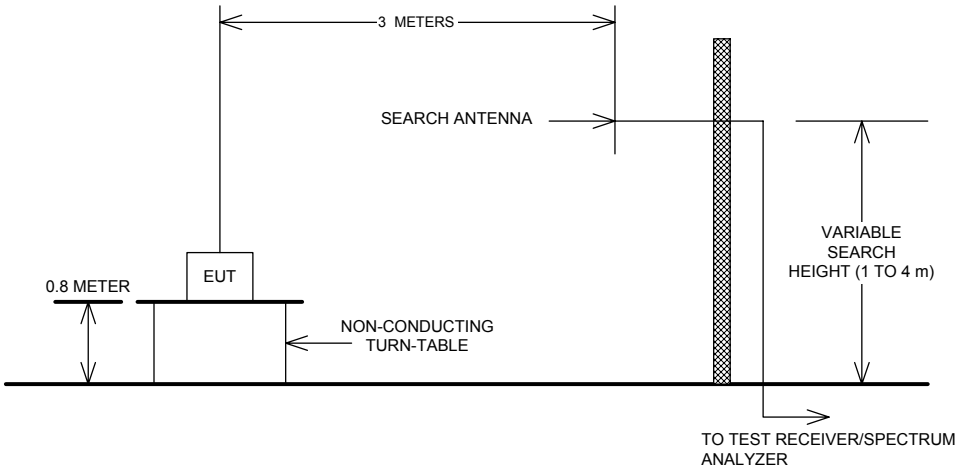
Para. No. 2.1049 - Occupied Bandwidth



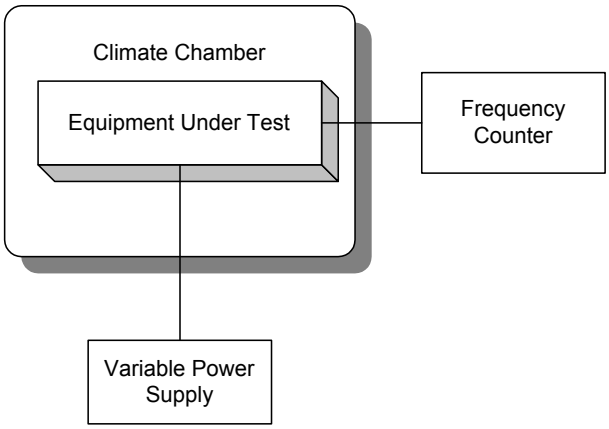
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



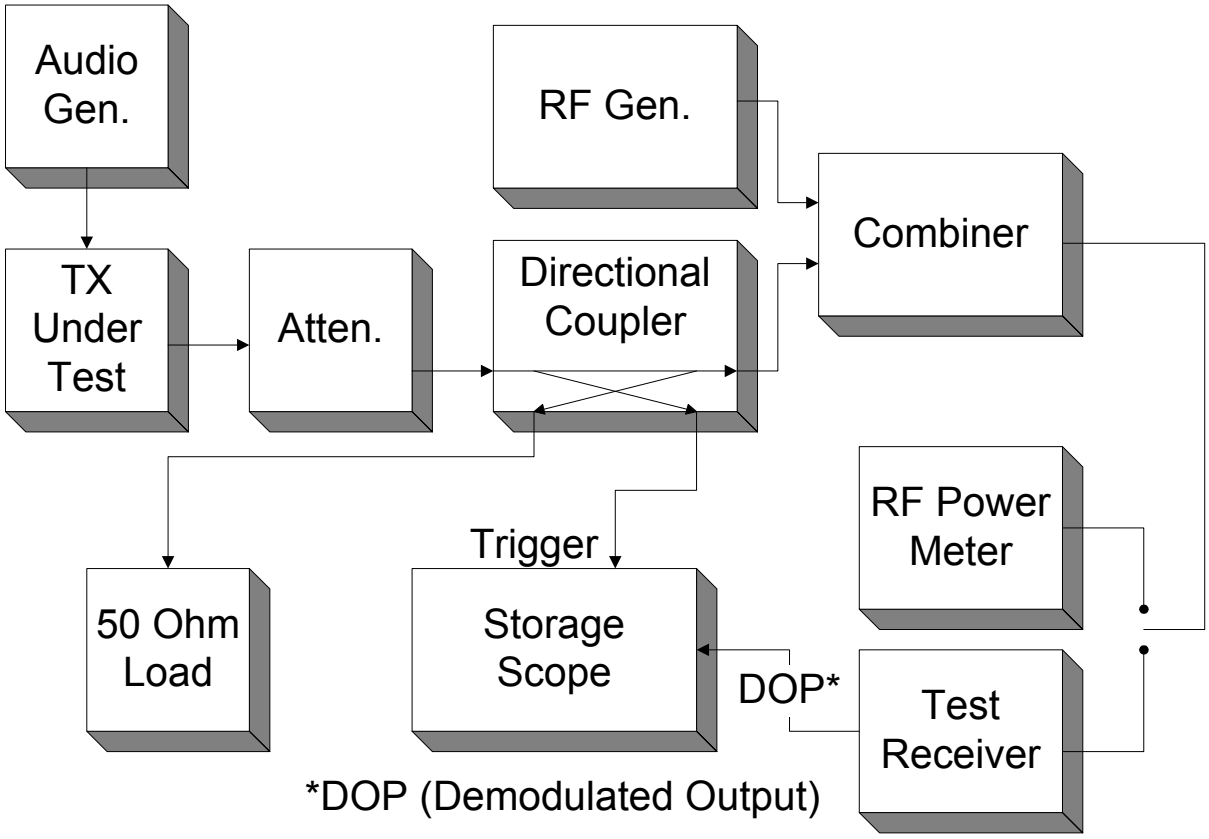
Para. No. 2.1053 - Field Strength of Spurious Radiation



Para. No. 2.1055 - Frequency Stability



Para. No. 90.214 - Transient Frequency Behaviour



Voice

This measurement was made using measurement procedure TIA/EIA Land Mobile FM or PM Communications Equipment Measurement and Performance Standards TIA/EIA-603 February 1993 Telecommunications Industry Association (American National Standard ANSI/TIA/EIA-603-1992 Approved: October 27, 1992) Para. no. 2.2 Methods of Measurement for Transmitters Para. no. 2.2.19 Transient Frequency Behaviour (page no. 83).

Data

This measurement was made using measurement procedure TIA/EIA Digital C4FM/CQPSK Transceiver Measurement Methods TSB102.CAAA Para. no. 2.2.17 Transient Frequency Behaviour (page no. 74).

Section 12. Test Equipment List

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	July. 03/03	July. 03/04
1 Year	Horn Antenna #2	EMCO	3115	FA000825	Dec. 10/03	Dec. 10/04
1 Year	Log Periodic Antenna #2	EMCO	3148	FA001355	May. 09/03	May. 09/04
1 Year	1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	June. 18/03	June. 18/04
3 Year	Signal Generator	Rohde & Schwarz	SMIQ03	FA001091	Sept. 25/03	Sept. 25/06

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair