

KTL Test Report:	0R03310.1
Applicant:	Daniels Electronics Ltd. 43 Erie Street Victoria, BC V8V 1P8
Equipment Under Test: (E.U.T.)	VT-3/160-SN VHF Transmitter
In Accordance With:	FCC Part 80
Tested By:	KTL Ottawa Inc. 3325 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	 G. Westwell, Technologist
Date:	
Total Number of Pages:	24

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EQUIPMENT: VT-3/160-SN VHF Transmitter

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 80.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

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".



NVLAP LAB CODE: 100351-0

TESTED BY: _____ DATE: _____
Russell Grant, Wireless Group Manager

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This report applies only to the items tested.

EQUIPMENT: VT-3/160-SN VHF Transmitter

Summary Of Test Data

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

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 2. General Equipment Specification

Manufacturer: Daniels Electronics Ltd.

Model No.: VT-3/160-SN

Date Received In Laboratory: December 7, 2000

KTL Identification No.: Item #1

Transmitter

RF Output Power: 8W

Frequency Range: 156 – 162 MHz

Emission Designator: 11K0F3E
16K0F3E

Channel Spacing: 12.5 kHz, 25 kHz

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 3. RF Power Output

Para. No.: 2.1046

Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: $\pm 1\text{dB}$

Test Results: Complies.

Measurement Data: 8W

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 4. Audio Frequency Response

Para. No.: 2.1047

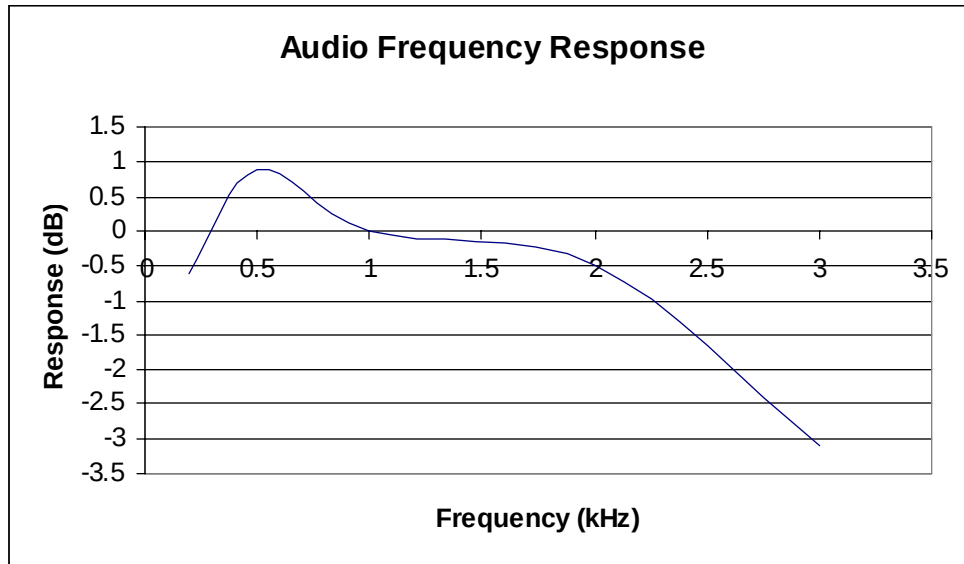
Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: N/A

Test Results: Complies.

Measurement Data: See attached graph.

EQUIPMENT: VT-3/160-SN VHF Transmitter



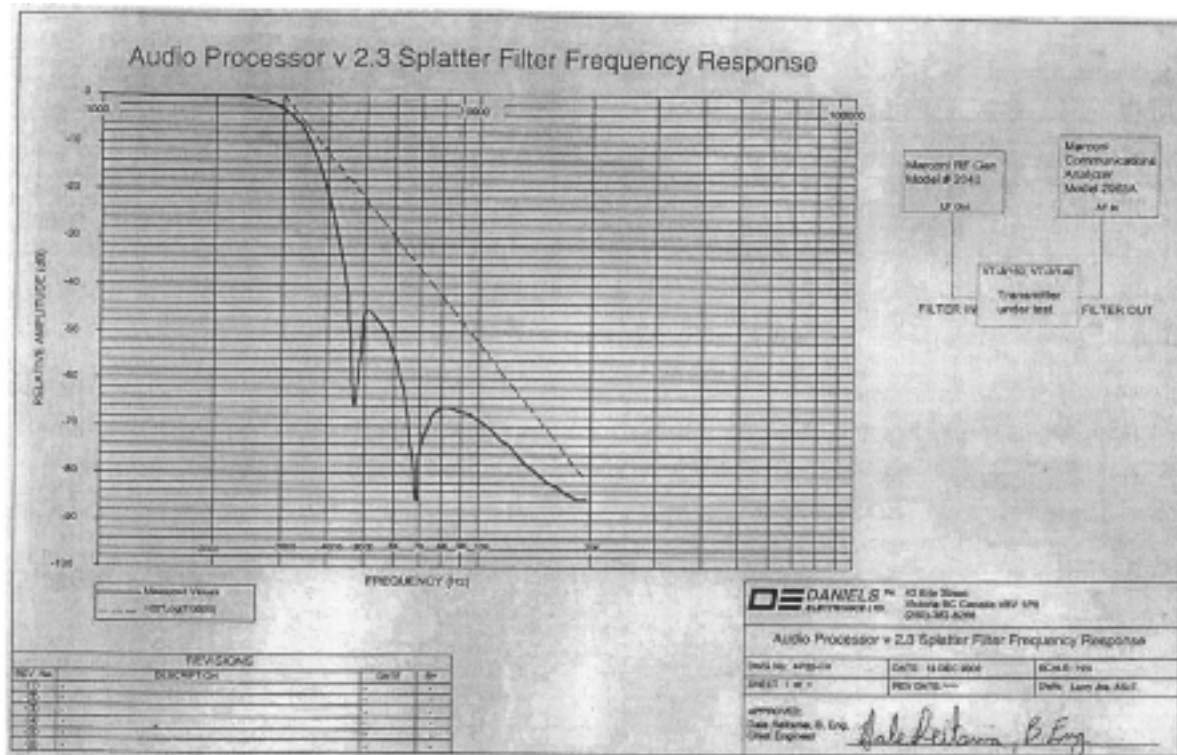
EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 5. Audio Low-Pass Filter Response**Para. No.: 2.1047**

Test Performed By: Daniels Electronics Ltd.	Date of Test: December 12, 2000
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Minimum Standard: 80.213 (e), 60 log (f/3)**Test Results:** Complies.**Measurement Data:** See attached graph.

EQUIPMENT: VT-3/160-SN VHF Transmitter



EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 6. Modulation Limiting

Para. No.: 2.1047

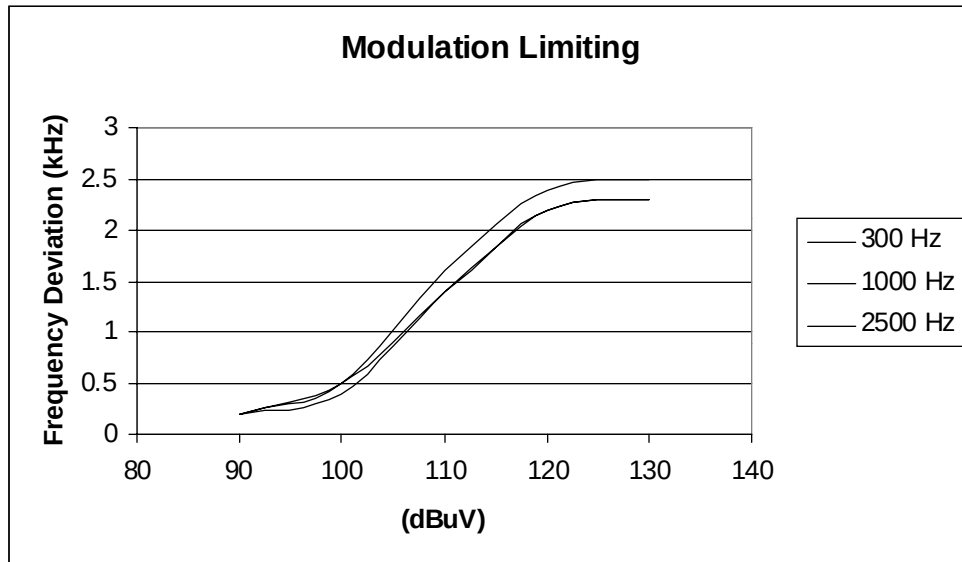
Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: 80.205(b), 5kHz

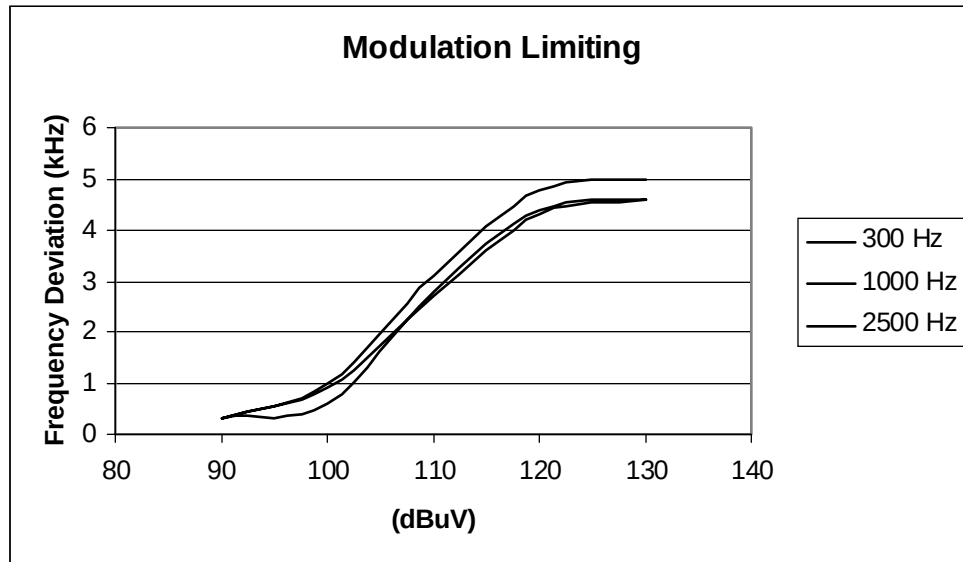
Test Results: Complies.

Measurement Data: See attached graphs.

EQUIPMENT: VT-3/160-SN VHF Transmitter



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EQUIPMENT: VT-3/160-SN VHF Transmitter

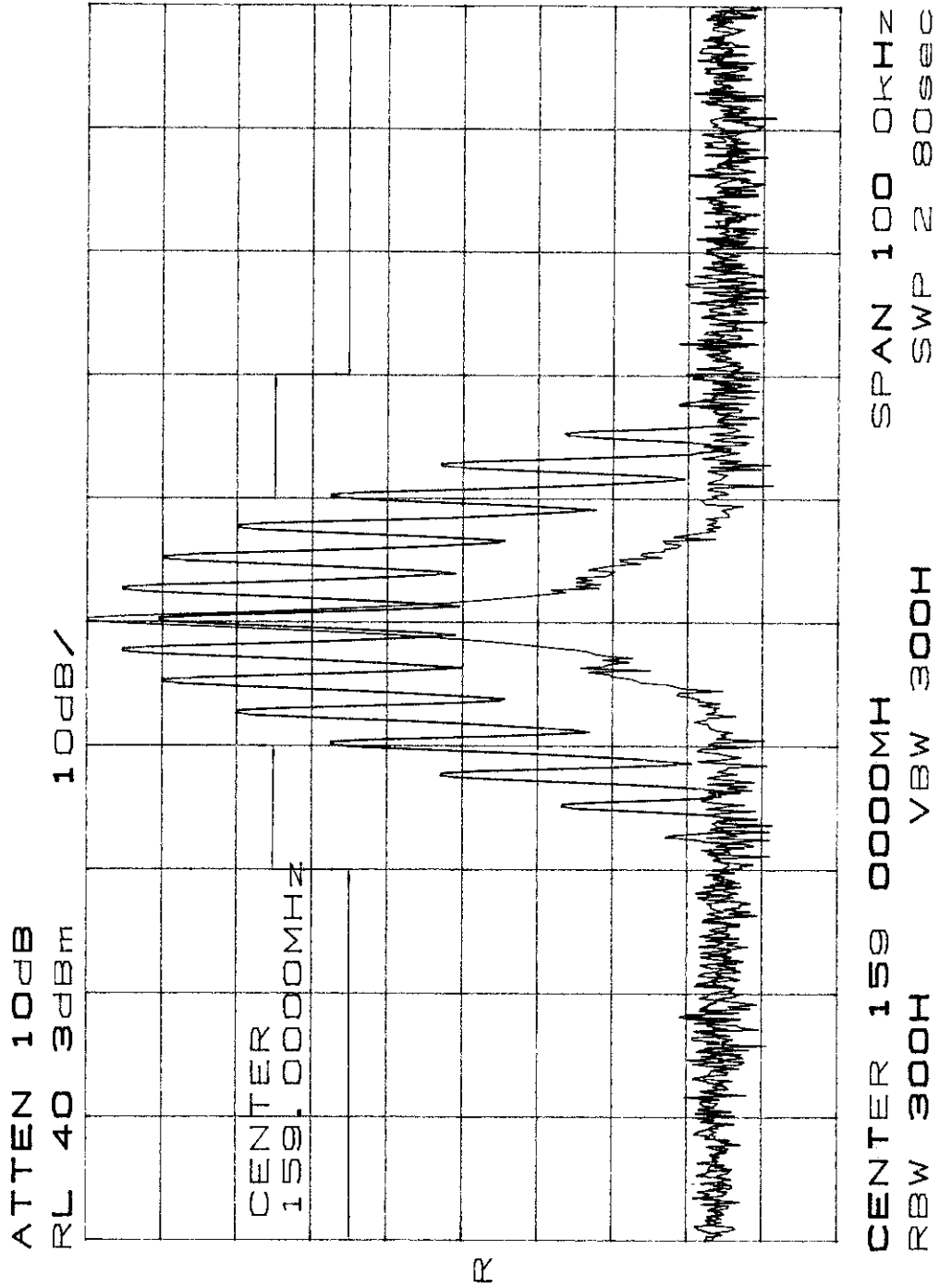
Section 7. Occupied Bandwidth**Para. No.: 2.1049**

Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: 80.211(f)**Test Results:** Complies.**Measurement Data:** See attached graph.

Modulated 2500 Hz at 16dB overdrive, 5 kHz peak frequency deviation.

EQUIPMENT: VT-3/160-SN VHF Transmitter



EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 8. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: 80.211(f), -13 dBm

Test Results: Complies.

Measurement Data:

Tx 159 MHz, 8 W

 No emissions detected.

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 9. Field Strength of Spurious Emissions**Para. No.: 2.1053**

Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: 80.211(f)**Test Results:** Complies.

The strongest emission is –67.6 dBm at 318 MHz. This is 47.6 dB below the specification limit.

Measurement Data: See attached table.

*EQUIPMENT: VT-3/160-SN VHF Transmitter***Test Data - Field Strength of Spurious Emissions**

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVP		RBW(kHz): 120		Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dB μ V)	Cor. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBm)	Limit (dBm)	Margin (dB)
318.0	SSV	V	8.0	-77.4			-69.4	-20.0	49.4
318.0	SSH	H	11.0	-78.6			-67.6	-20.0	47.6
Notes: B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole * Re-Measured Using Dipole Antenna. () Denotes Failing Emission Level. (1) 120 kHz, Q-Peak, (2) 10 kHz, Peak, (3) 100 kHz RGW, 300 kHz VBW, Peak, (4) 300 kHz RBW, 1 MHz VBW, Peak, (5) 1 MHz RBW, 3 MHz VBW, Peak, (6) 1 MHz RBW, 10 Hz VBW, Peak N.D. = Not Detected									

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 10. Frequency Stability**Para. No.: 2.1055**

Test Performed By: Russell Grant	Date of Test: December 19, 2000
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Minimum Standard: 80.209, 5ppm**Test Results:** Complies.**Measurement Data:** The maximum frequency drift is 18 Hz. This is 0.113 ppm.

EQUIPMENT: VT-3/160-SN VHF Transmitter

Measurement Data

Test Condition	Frequency (MHz)	Frequency Drift (Hz)
85% STV	158.999993	-7
STV	158.999993	-7
115% STV	158.999993	-7
-30	159.000013	13
-20	159.000005	5
-10	158.999996	-4
0	158.999988	-12
10	158.999982	-18
30	158.999995	-5
40	159.000000	0
50	159.000001	1
55	158.999998	-2

EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 11. Test Equipment List

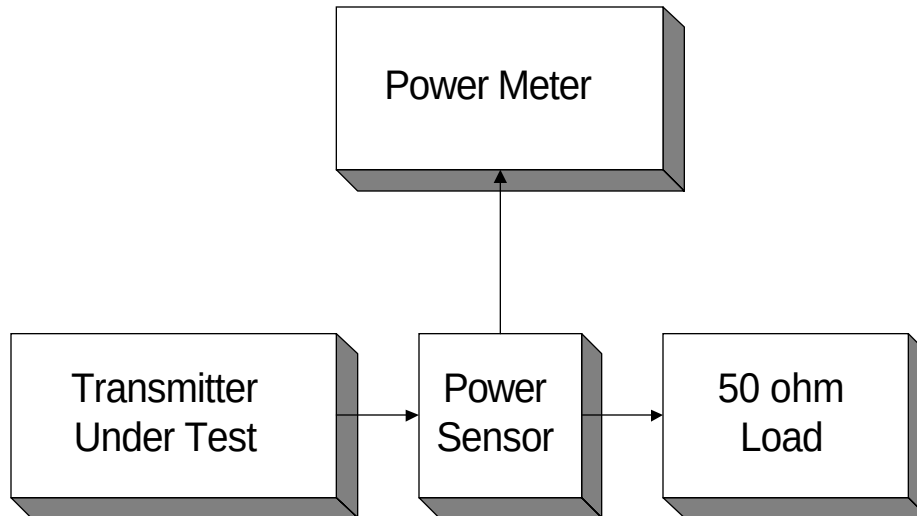
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	June 16/00	June 16/01
1 Year	Radio Communications	Rohde & Schwarz	CMTA 54	840343/013	Dec. 14/99	Dec. 14/00
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
	Power Supply	Astron	VS-50M	8405071	NCR	NCR
1 Year	Attenuator	Narda	768-10	9709	Oct. 8/99	Oct. 8/00
1 Year	Attenuator	Narda	769-20	4153	Oct. 1/99	Oct. 1/00
1 Year	Attenuator	Narda	776B-20	FA001400	Oct. 15/99	Oct. 15/00
1 Year	Attenuator	Narda	776B-20	FA001401	Oct. 15/99	Oct. 15/00
2 Year	RF Millivoltmeter	Rohde & Schwarz	URV5	FA000420	Oct. 6/99	Oct. 6/01
2 Year	Power Sensor	Rohde & Schwarz	URV5-Z5	FA000419	Oct. 6/99	Oct. 6/01
1 Year	Receiver	Rohde & Schwarz	ESVP	892661/014	April 5/00	April 5/01
1 Year	Horn Antenna	EMCO #2	3115	4336	Nov. 11/99	Nov. 11/00
1 Year	Log Periodic Antenna 1	EMCO	LPA-25	1141	Aug. 4/99	Aug. 4/00
1 Year	Dipole Antenna Set	EMCO #2	3121C	FA001349	June 27/00	June 27/01
1Year	Frequency Counter	Hewlett Packard	HP5350A	2444A00135	May 7/00	Nov. 7/00

NA: Not Applicable
NCR: No Cal Required
COU: CAL On Use

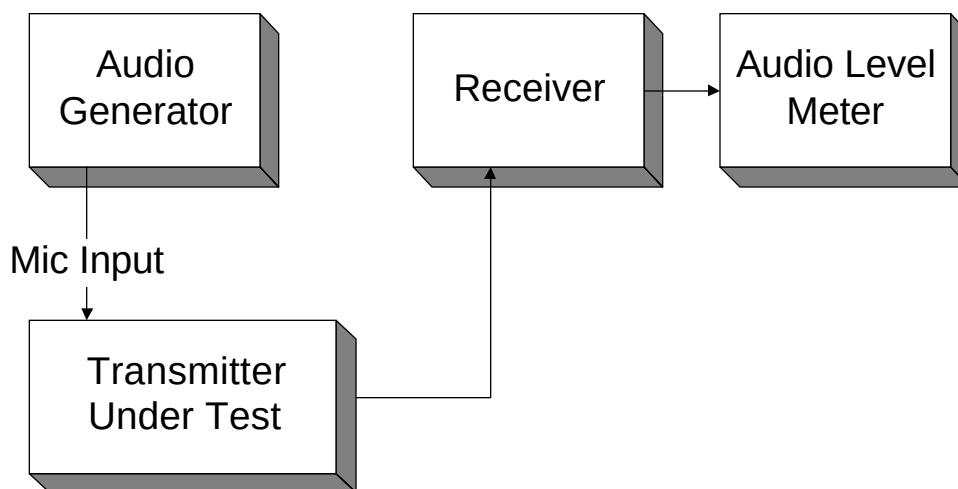
EQUIPMENT: VT-3/160-SN VHF Transmitter

Section 12. Test Diagrams

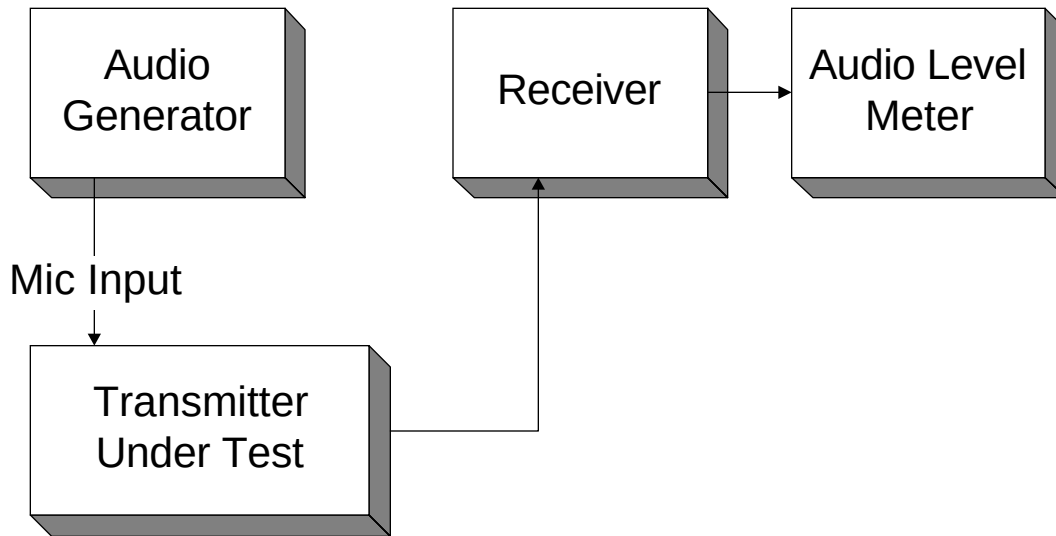
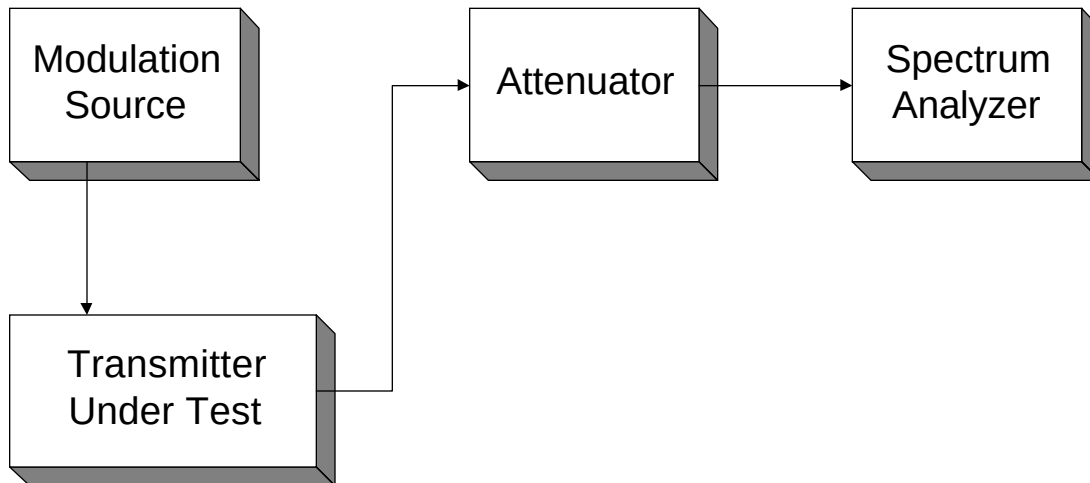
Para. No. 2.1046 - R.F. Power Output



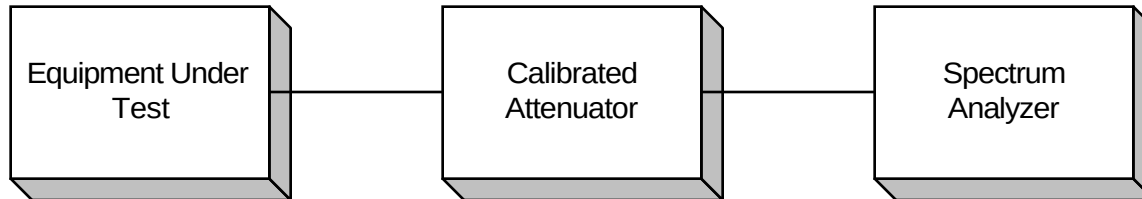
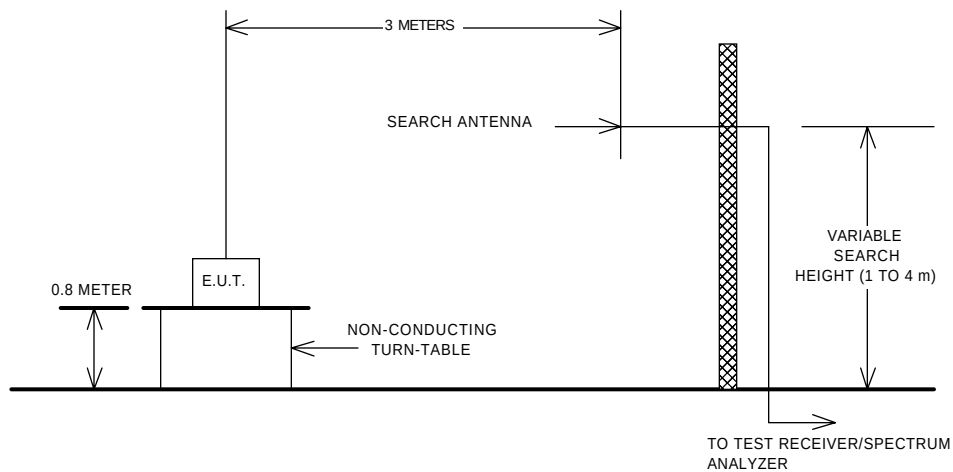
Para. No. 2.2.1047 - Audio Frequency Response



EQUIPMENT: VT-3/160-SN VHF Transmitter

Para. No. 2.1047 - Modulation Limiting**Para. No. 2.1049 - Occupied Bandwidth**

EQUIPMENT: VT-3/160-SN VHF Transmitter

Para. No. 2.1051 - Spurious Emissions at Antenna Terminals**Para. No. 2.1053 - Field Strength of Spurious Radiation****Para. No. 2.1055 - Frequency Stability**