



Nemko

Test Report:

3W07649
Issue II

Applicant:

Daniels Electronics Ltd.
43 Erie Street
Victoria, B.C., V8V 1P8

Equipment Under Test:

30W VHF Power Amplifier
136-174MHz

FCC ID:

H4JAMP-3-150

In Accordance With:

FCC Part 22, 80 & 90

Tested By:

Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By:

Kevin Carr, EMC Specialist

Date:

4 December 2003

Total Number of Pages:

21

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EQUIPMENT: AMP-3/150-30

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, 80, & 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: _____
Glen Westwell, Wireless Technologist

DATE: 4 December 2003

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This report applies only to the items tested.

EQUIPMENT: AMP-3/150-30

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	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	N/A

Notes:

- (1) This application is for a 136-174MHz 30W amplifier(s) used in the transmit path for a single channel only, and is driven by FCC & Industry Canada approved exciters. This amplifier is connected via coaxial connection and operated in an equipment rack.
- (2) This amplifier does not translate the RF input, therefore frequency stability is not applicable.
- (3) The EUT used to determine verification and performance was the AMP-3/160-30, 150-174MHz amplifier driven by an FCC and Industry Canada approved exciter with F3E & F1E modulations.

Indoor Temperature: 21 °C
 Humidity: 31 %

Outdoor Temperature: 6 °C
 Humidity: 55 %

EQUIPMENT: AMP-3/150-30

Section 2. General Equipment Specification

Manufacturer:	Daniels Electronics Ltd.
Model No. of EUT:	AMP-3/160-30
Model No. of Family:	AMP-3/150-30 (AMP-3/140-30 & AMP-3/160-30)
Serial No. of EUT:	S/N 10005
Date Received In Laboratory:	03 Nov, 2003
Nemko Identification No.:	#1
Frequency Range:	136-174MHz (F3E, F1E, F3D, F1D)
Frequency Range of EUT:	150-174MHz (F3E, F1E)
Amplifier RF Output (Rated):	10 - 30W
Amplifier Gain (Rated):	10dB
Emission Designator (modulation):	F3E, F1E F3D, F1D G3E

EQUIPMENT: AMP-3/150-30

Section 3. RF Power Output**Para. No.: 2.1046****Test Performed By: Glen Westwell****Date of Test: 5 Nov. 2003****Test Results:** Complies.

The maximum RF output power is within ± 1 dB of the manufacturer's rating.

Measurement Data: Rated Power = 30W (44.8dBm)

Frequency (MHz)	Rated Power (dBm)	Measured Power (dBm)
150	44.8	44.8
162	44.8	44.6
174	44.8	44.2

Section 4. Occupied Bandwidth

Para. No.: 2.1049

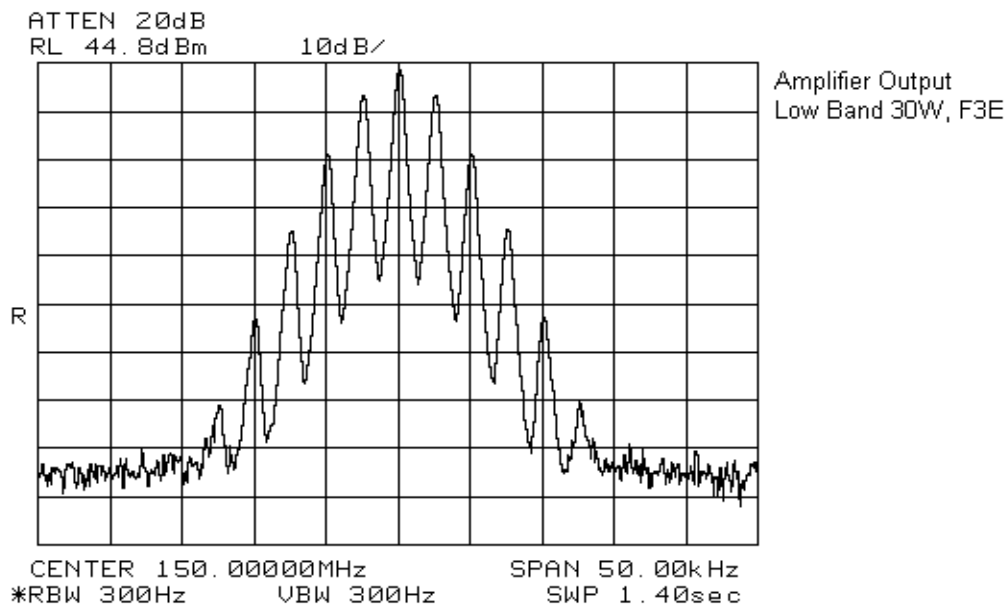
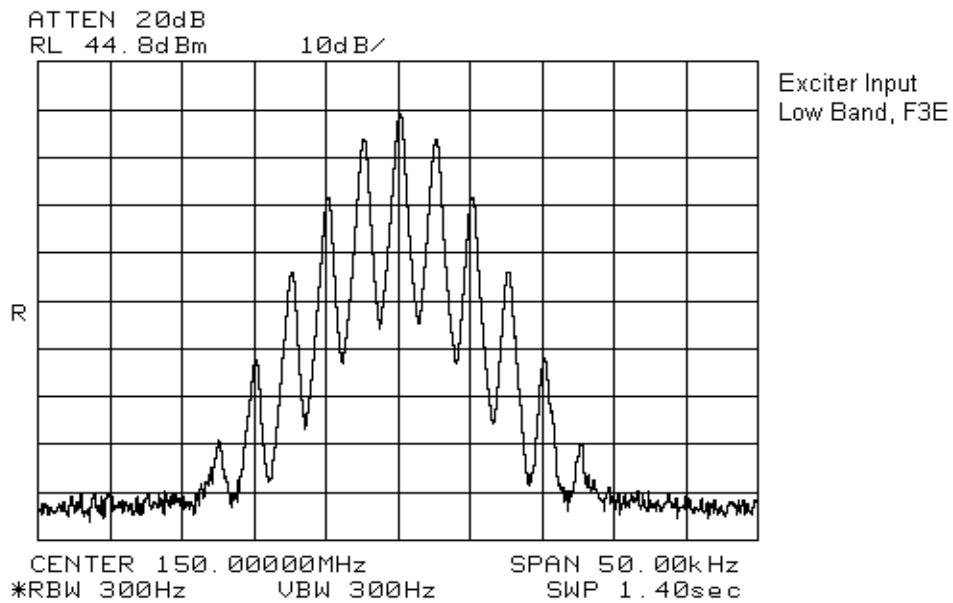
Test Performed By: Glen Westwell	Date of Test: 5 Nov. 2003
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Test Results: Complies.

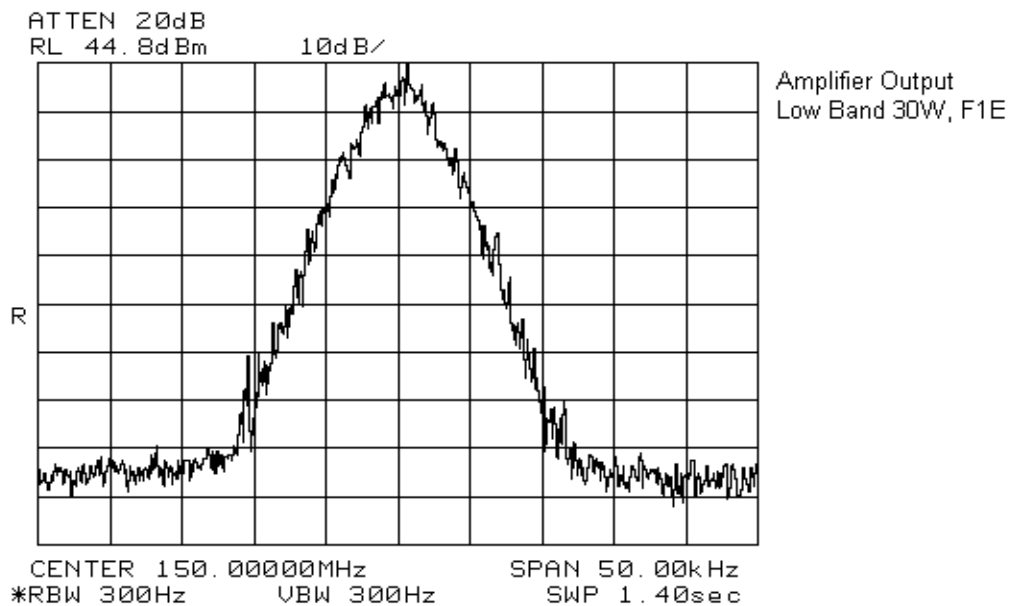
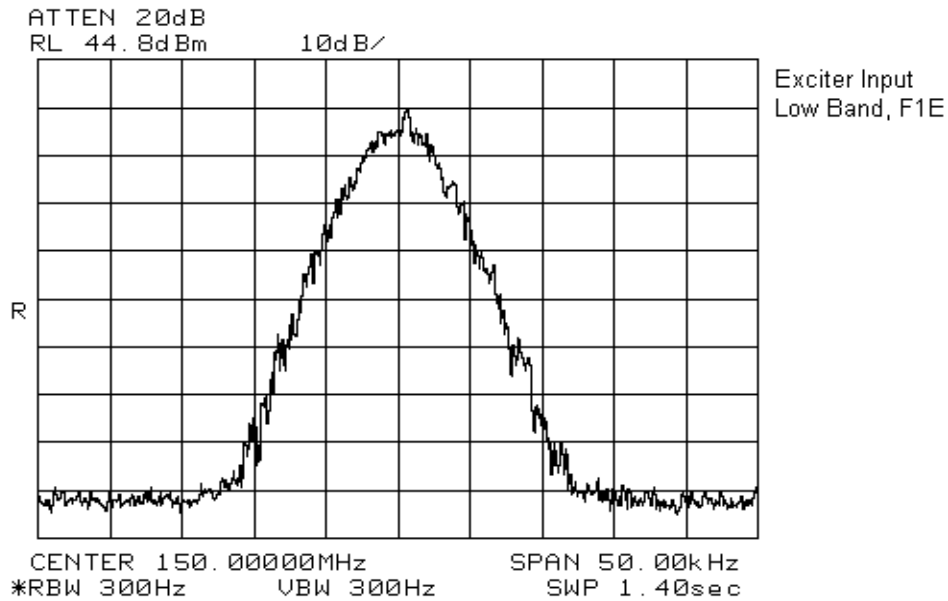
The occupied bandwidth was measured by comparison of input to the output signal. This was done in order to determine if there was any degradation to the output signal due to the amplification through the repeater.

Test Data: See attached graph(s).

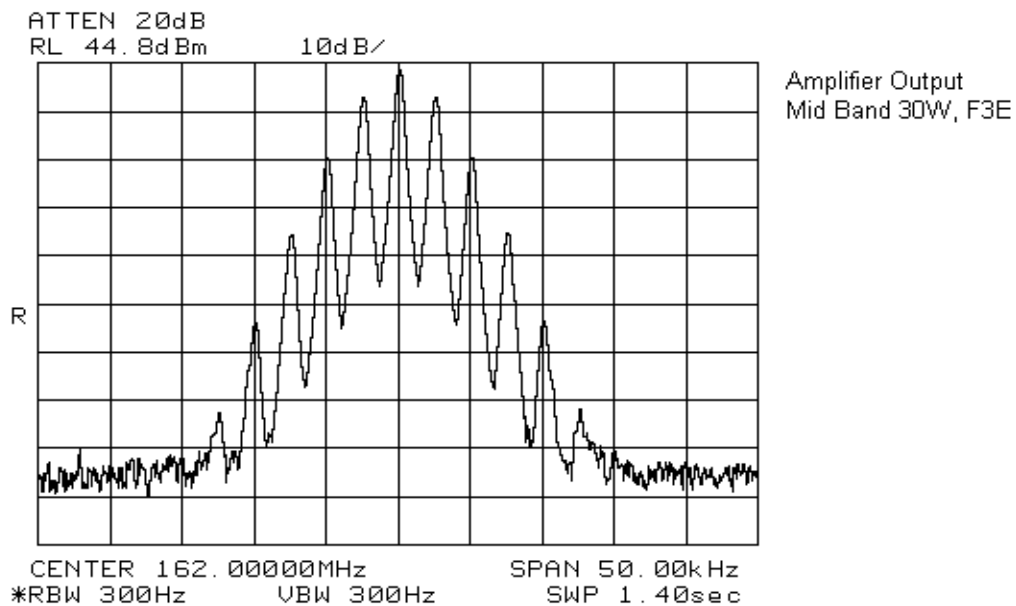
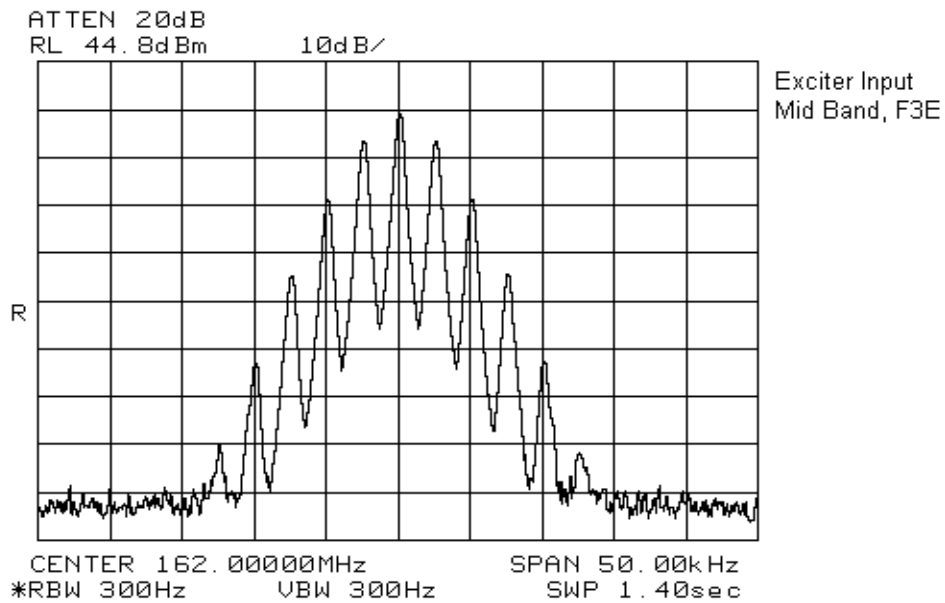
EQUIPMENT: AMP-3/150-30



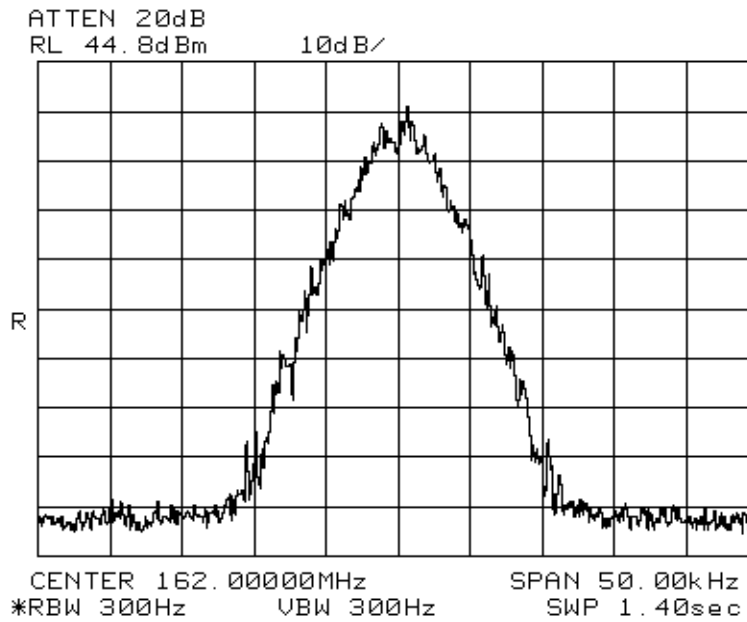
EQUIPMENT: AMP-3/150-30



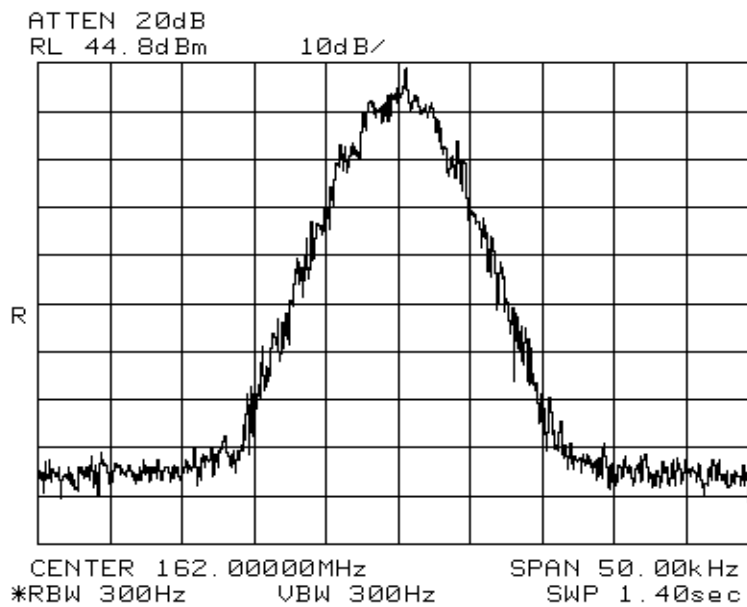
EQUIPMENT: AMP-3/150-30



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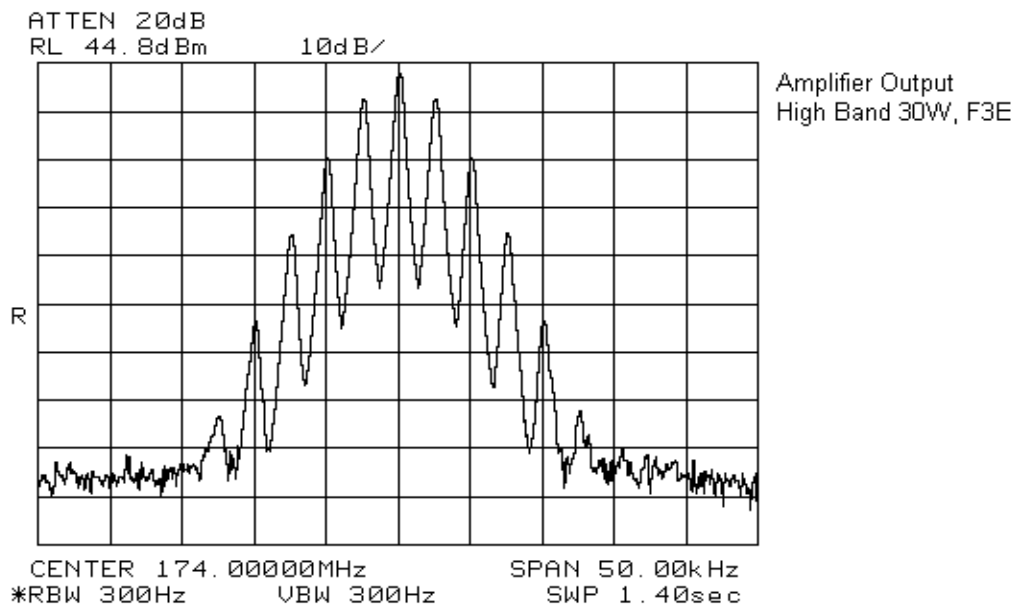
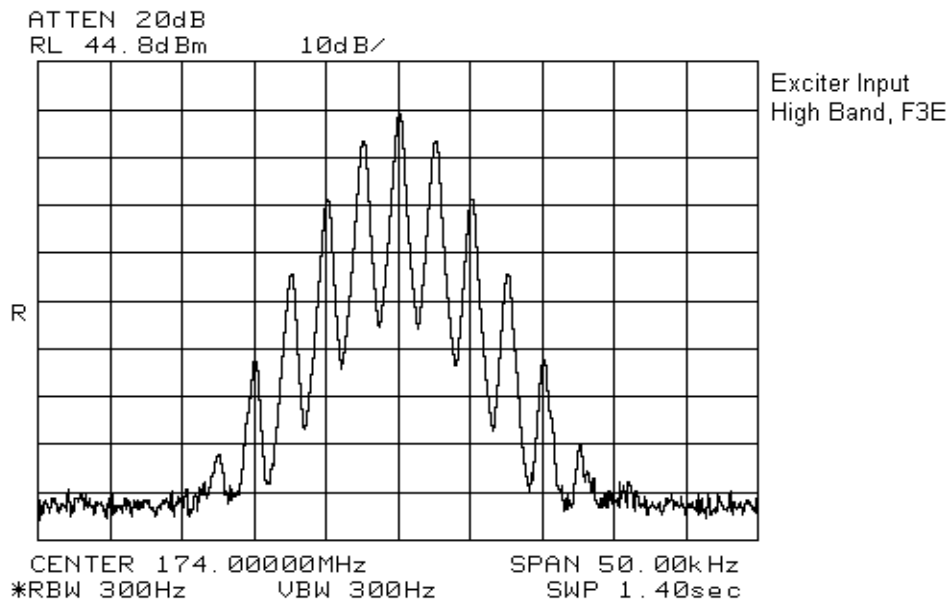


Exciter Input
Mid Band, F1E

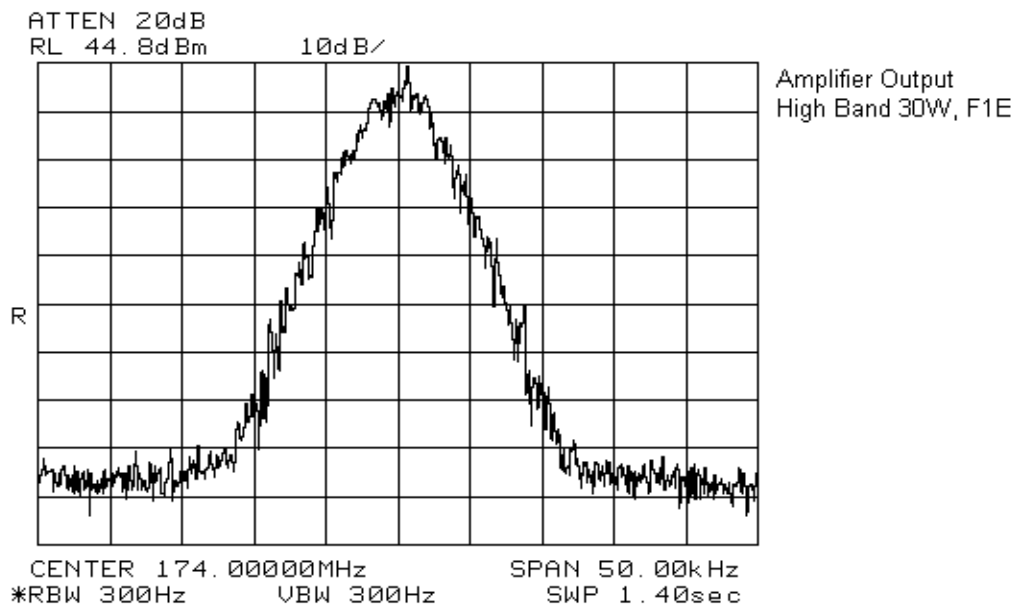
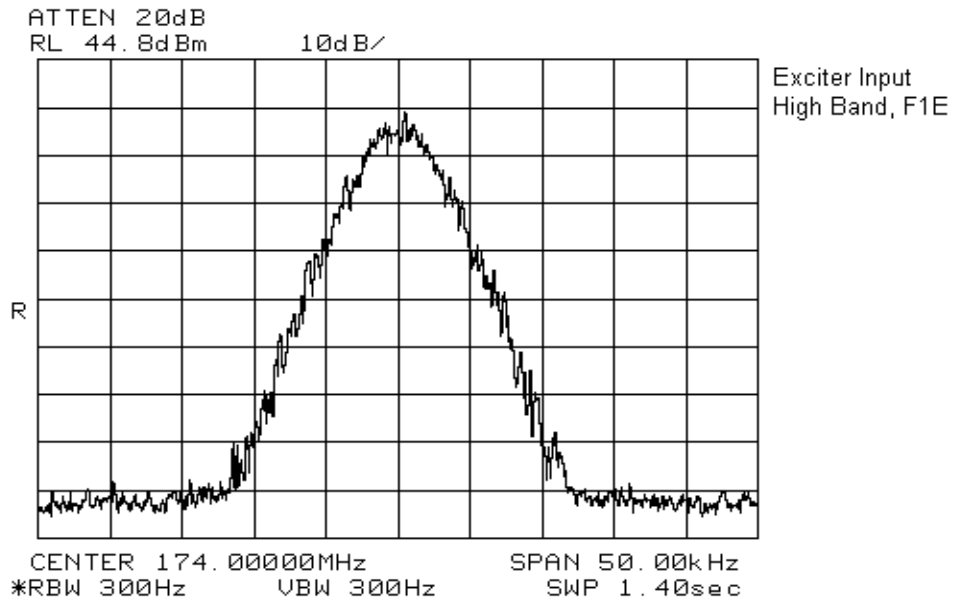


Amplifier Output
Mid Band 30W, F1E

EQUIPMENT: AMP-3/150-30



EQUIPMENT: AMP-3/150-30



Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

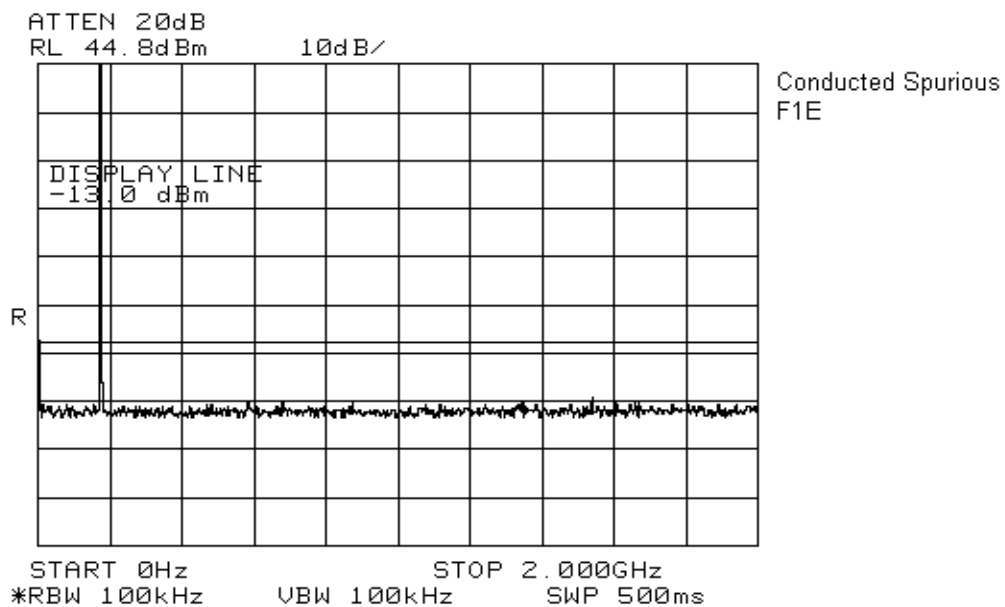
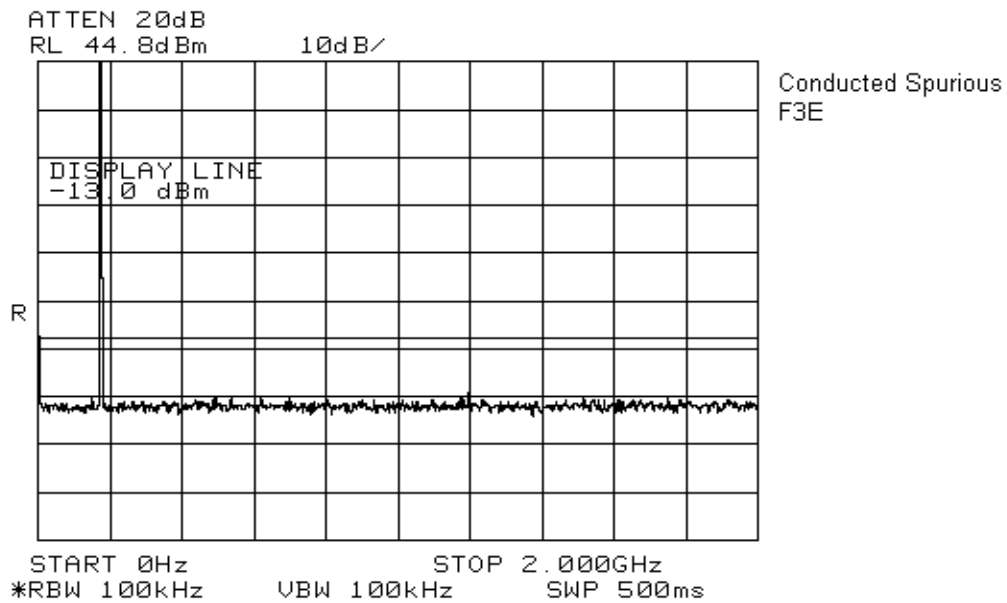
Test Performed By: Glen Westwell	Date of Test: 5 Nov. 2003
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Minimum Standard: -13dBm

Test Results: Complies.

Measurement Data: See attached graphs (worst case).

EQUIPMENT: AMP-3/150-30



EQUIPMENT: AMP-3/150-30

Section 6. Field Strength of Spurious

Para. No.: 2.1053

Test Performed By: Glen Westwell	Date of Test: 6 Nov. 2003
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Minimum Standard: -13dBm

Test Results: Complies.

Measurement Data: See attached graphs and table (worst case).

Radiated Spurious Emissions were evaluated using the signal substitution method as per ANSI/TIA/EIA-603.

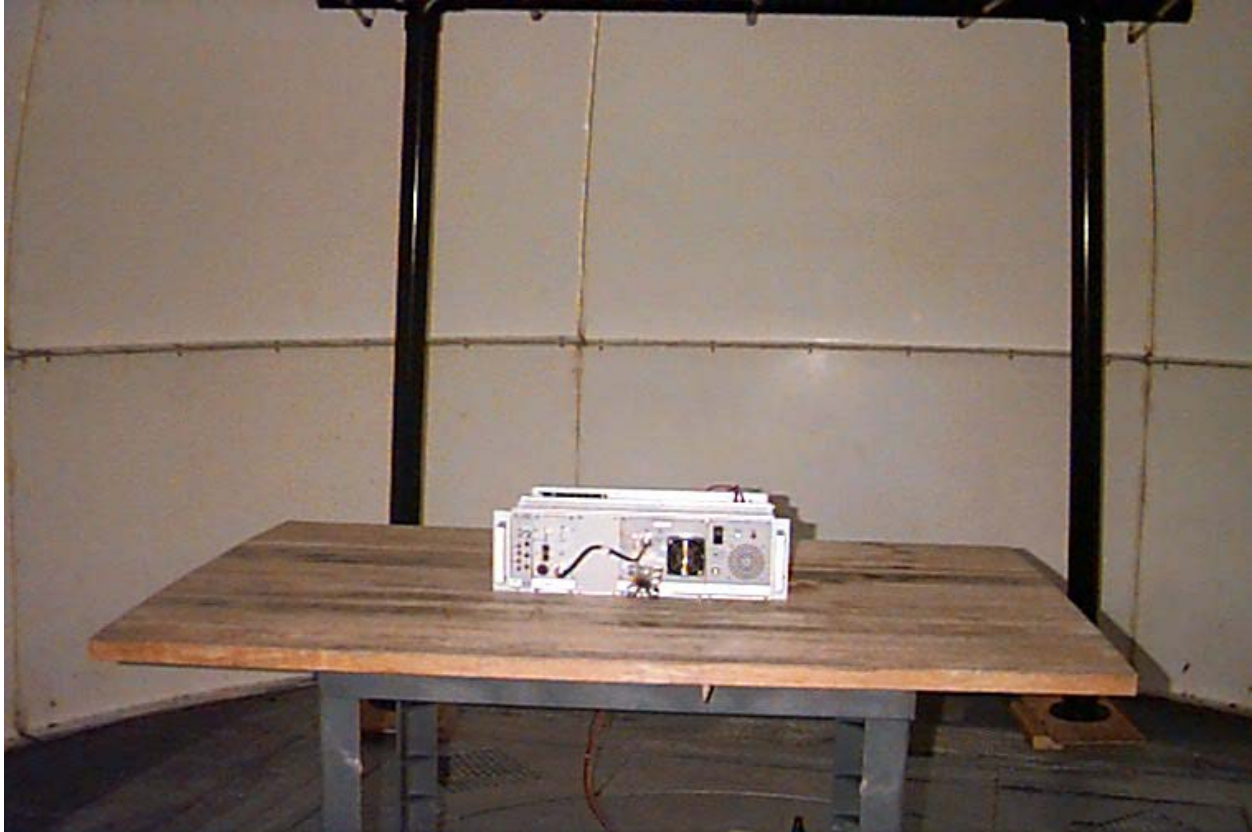
*EQUIPMENT: AMP-3/150-30***Test Data-Field Strength of Harmonic & Spurious Emissions**

Test Distance (meters) : 3	Range: A	Receiver: HP8564E	RBW(kHz): 100	Detector: Peak		
Freq. (MHz)	Ant.	Pol (V/H)	RCVD Signal (dBμV)	Signal Substitution Level (dBm)	Limit (dBm)	Margin (dB)
324.0000	LP1	V	44.3	-37.8	-13.0	24.8
324.0000	LP1	H	45.0	-38.1	-13.0	25.1
486.0000	LP1	V	38.0	-41.0	-13.0	28.0
486.0000	LP1	H	35.3	-44.9	-13.0	31.9
All spurious and harmonic emissions to the 10 th harmonic were searched.						

All spurious and harmonic emissions to the 10th harmonic were searched.

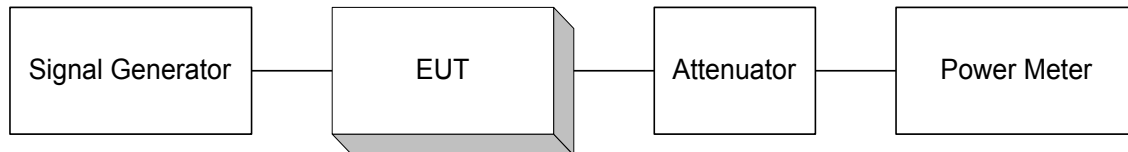
EQUIPMENT: AMP-3/150-30

Radiated Emissions Set-Up Photo

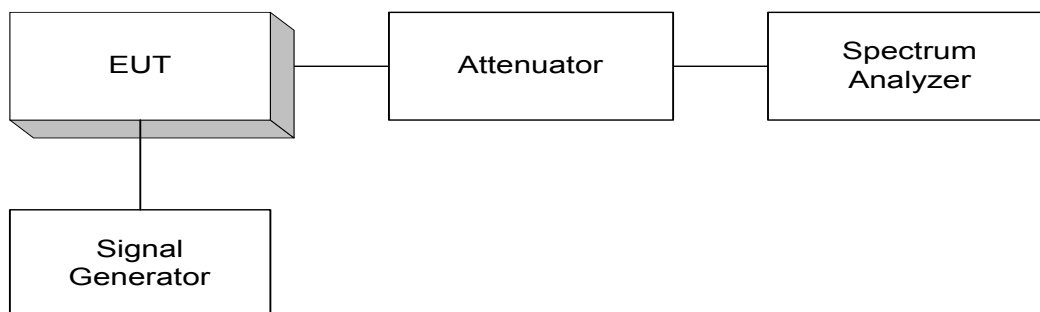


Section 7. Block Diagrams

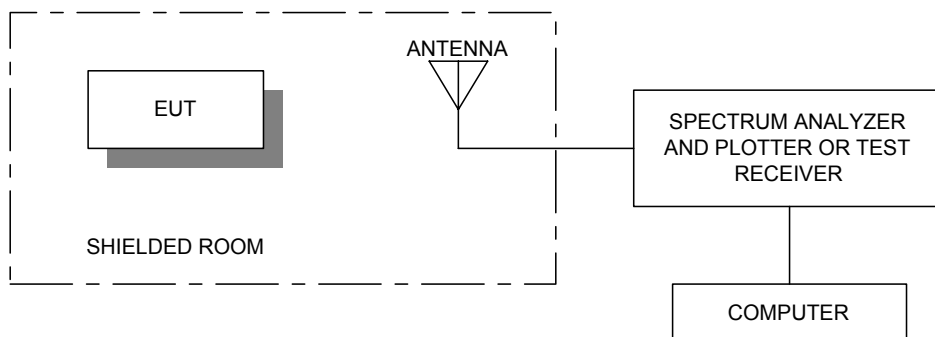
Para. No. 1046 - R.F. Power Output



Para. No. 2.1049 - Occupied Bandwidth

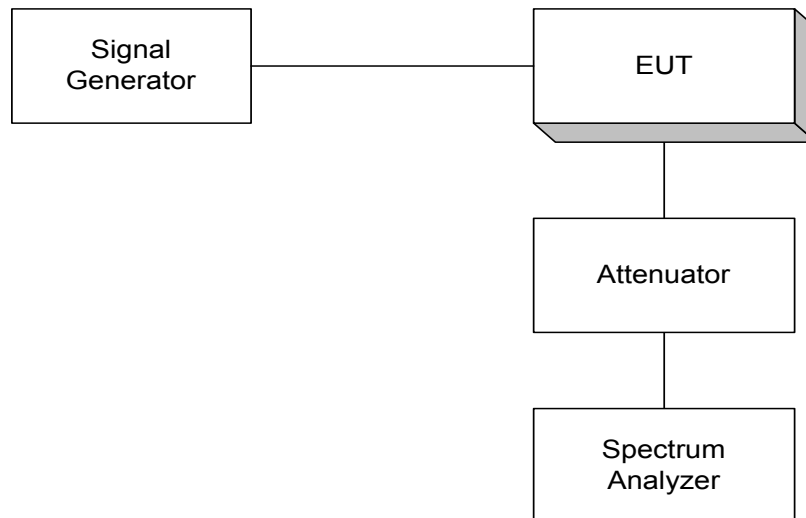


Pre-Scan for Spurious emissions



EQUIPMENT: AMP-3/150-30

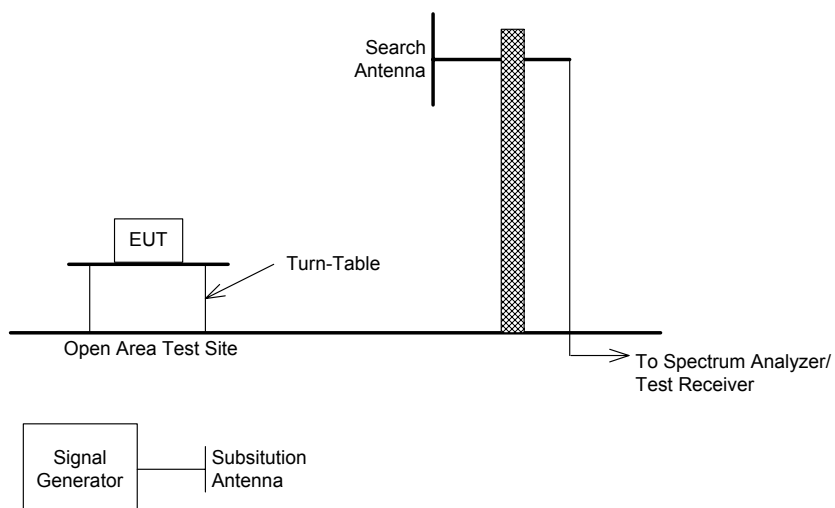
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation

TIA/EIA 603

Effective Radiated Power
Spurious Emissions



EQUIPMENT: AMP-3/150-30

Section 8. Test Equipment List

CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8564E	FA001367	13 May 03	13 May 04
1 Year	Spectrum Analyzer-1	Hewlett Packard	8566B	2311A02238	27 Nov 2002	27 Nov 2003
1 Year	Spectrum Analyzer Display-1	Hewlett Packard	8566B	2314A04759	27 Nov 2002	27 Nov 2003
1 Year	RF Millivoltmeter	Rohde & Schwarz	URV5	FA000420	20 May 03	20 May 04
1 Year	Insertion Unit	Rohde & Schwarz	URV5-Z4	FA000905	10 Apr 03	10 Apr 04
1 Year	Power Sensor	Rohde & Schwarz	URV5-Z5	FA000419	10 Apr 03	10 Apr 04
1 Year	Radio Communications	Rohde & Schwarz	CMTA 54	FA001317	17 Oct 03	17 Oct 04
1 Year	Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Sept. 02/03	Sept. 02/04

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