

KTL Test Report: 0R02734

Applicant: Tait Electronics Ltd.
558 Wairakei Road
Burnside
Christchurch, New Zealand

**Equipment Under Test:
(E.U.T.)** T857-26-1010 Standard
T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

In Accordance With: **FCC Part 22**
FCC Part 90

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: 26

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*EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced**FCC ID: CASTEL0049*

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.



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: T857-26-1010 Standard T857-26-1012 Externally Referenced**FCC ID: CASTEL0049*

Summary Of Test Data

Name Of Test	Para. No.	Result
RF Power Output	2.1046	Complies
Audio Frequency Response	2.1047	Not Applicable
Audio Low-Pass Filter Response	2.1047	Not Applicable
Modulation Limiting	2.1047	Not Applicable
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
Transient Frequency Behavior	——	Complies

Footnotes For N/A's:**Test Conditions:**

Indoor Temperature: 23 °C
 Humidity: 50 %

Outdoor Temperature: 25 °C
 Humidity: 65 %

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Section 2. General Equipment Specification

Manufacturer: Tait Electronics Ltd.

Model No.: T857-26-1010 Standard
T857-26-1012 Externally Referenced

Date Received In Laboratory: July 24, 2000

KTL Identification No.: Item #1 & 2

Transmitter: 120 VAC

Power: 50W

RF Output Power: 11K2F1D Wideband
6K0F1D Narrowband

Emission Designator: Modulation: POCSAG 1200 bps
Bn = $2M+2DK$ $M=B/2$
B = 1200
D = 5000
K = 1
Bn = 11200 Hz
For D = 2700
Bn 6600 Hz

*EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced**FCC ID: CASTEL0049*

Section 3. RF Power Output**Para. No.: 2.1046**

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard: ± 1 dB**Test Results:** Complies. The RF power output is within 0.7 dB of the manufacturer's rating.**Measurement Data:**

Measured (W)	Rated (W)
58.9	50.0

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

Section 4. Occupied Bandwidth

Para. No.: 2.1049

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard: Para. No.'s 90.210(c)
 90.210(d)
 22.359(b)(2)

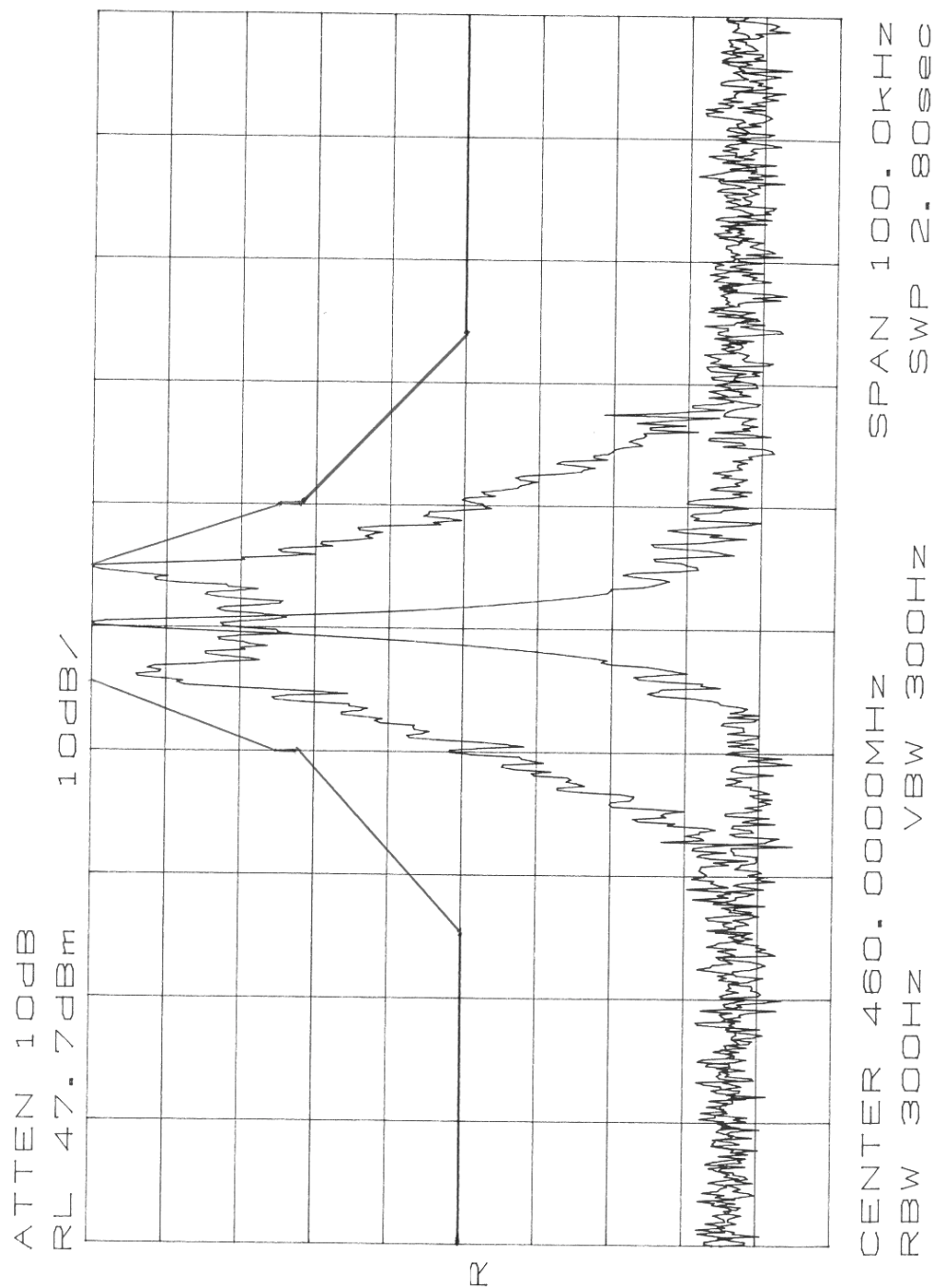
Test Results: Complies.

Measurement Data: See attached graphs.

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

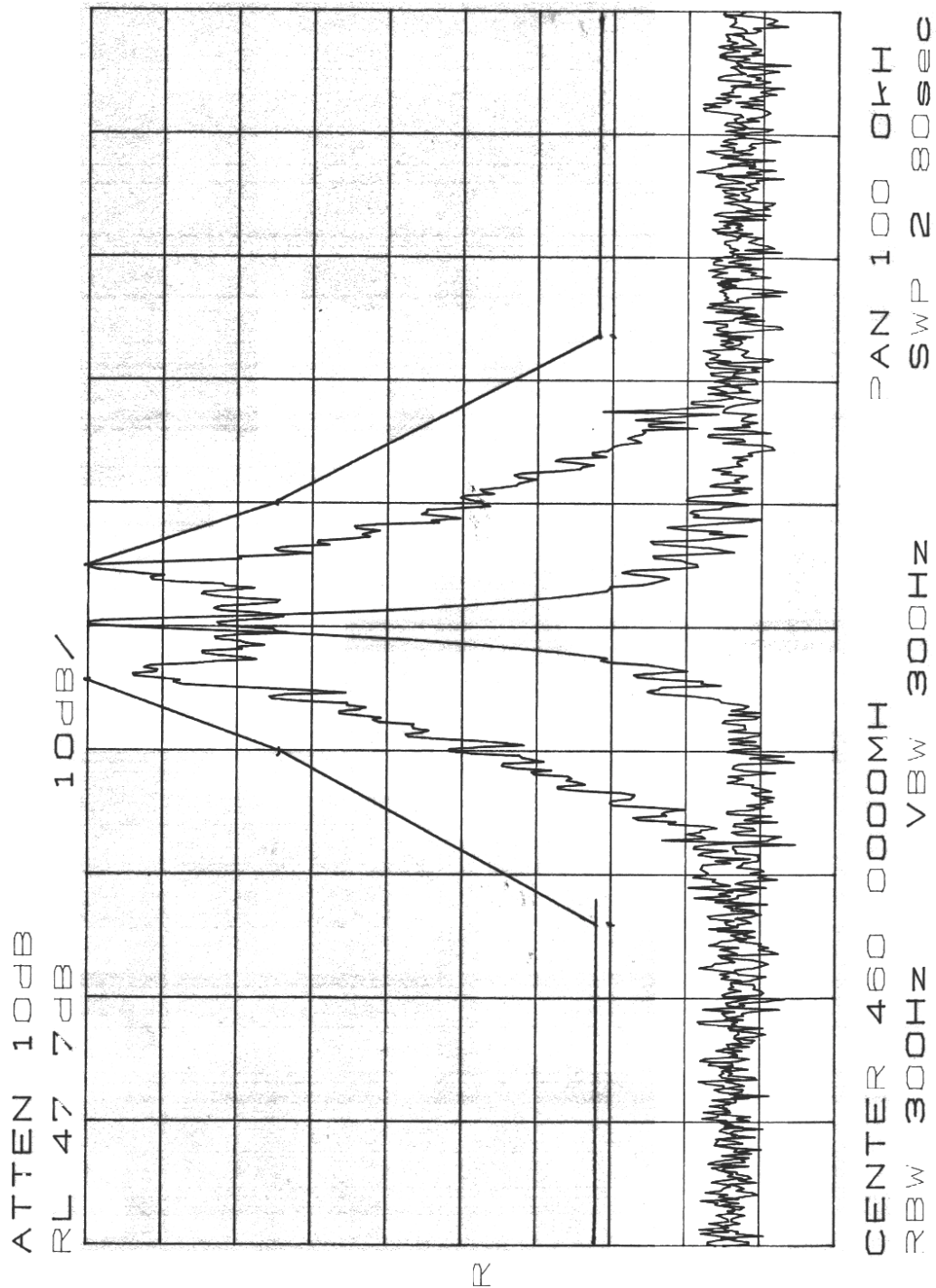
Modulated 1200 bps POCSAG4, 5 kHz Frequency Deviation 90.210(c) Mask



EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

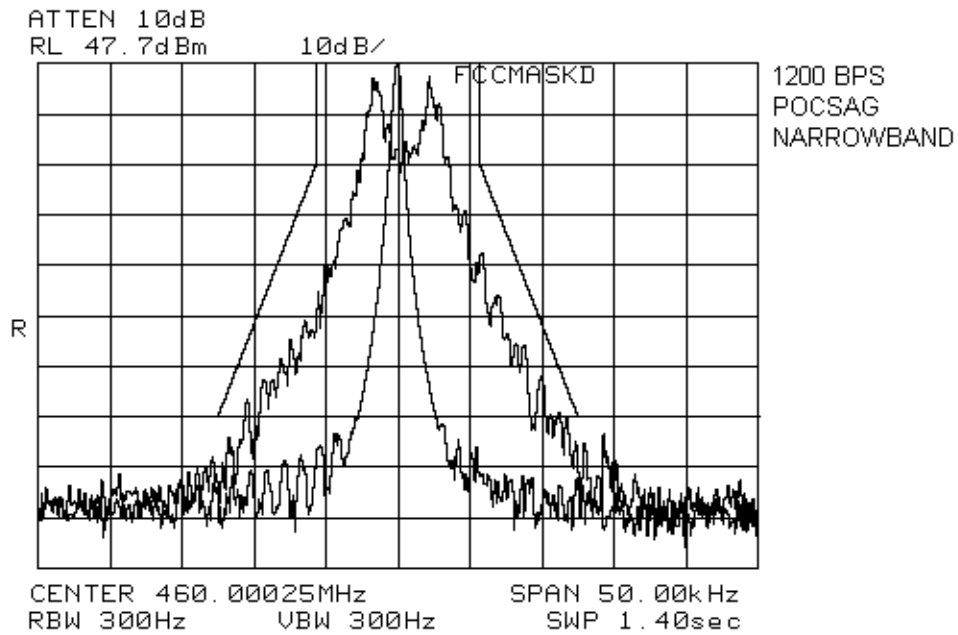
FCC ID: CASTEL0049

Modulated 1200 bps POCSAG4, 4.5 kHz Frequency Deviation 22.359(b)(2) Mask



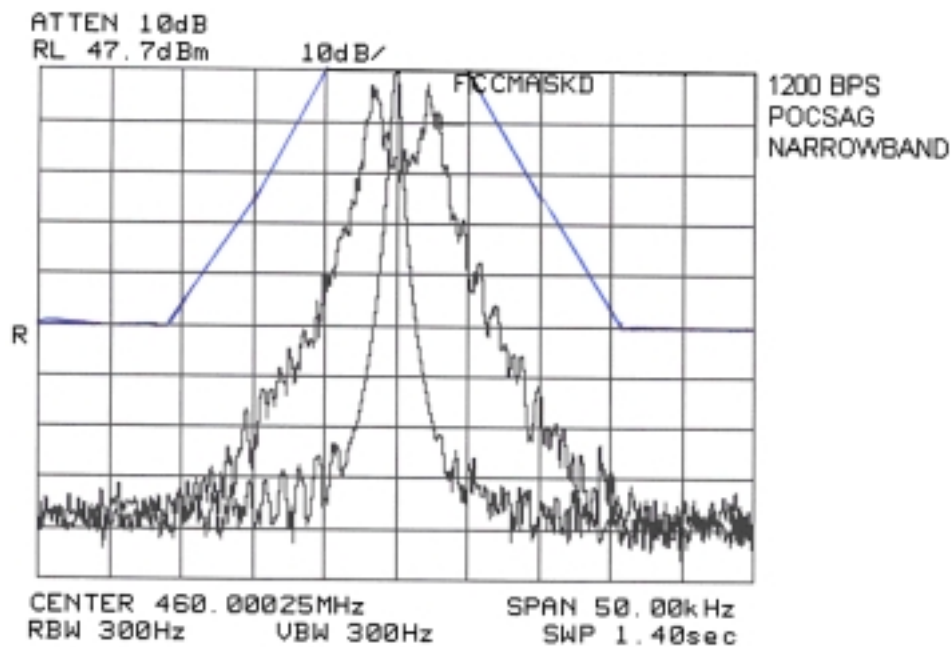
EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

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Section 5. Spurious Emissions at Antenna Terminals

Para. No.: 2.1051

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard:	Para. No.'s	90.210 (c)(d) 22.359 (b)(2)
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Test Results: Complies.

No emissions were detected within 20dB of the specification limit.

Measurement Data: See attached graphs.

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

Section 6. Field Strength of Spurious Emissions

Para. No.: 2.1053

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard: Para. No.'s 90.210 (c), (d)
 22.359 (b)(2)

Test Results: Complies. The worst case emission is 66.5 dB μ V/m @ 3m at 3680 MHz. This is 8.7 dB below the specification limit.

Measurement Data: See attached tables.

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

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Test Data - Radiated Emissions

Test Distance (meters) : 3		Range: A Tower		Receiver: ESVP		RBW(kHz): 1 MHz		Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dBμV/m)	Ant. Factor (dB)**	Amp. Gain (dB)***	Dist. Corr. (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
EXTERNAL									
920.0	L/P	V	15.1	30.3			45.4	77.4	32.0
920.0	L/P	H	16.2	30.3			46.5	77.4	30.9
1380.0	Hrn2	V	67.3	30.5	-48.0		49.8	75.2	25.4
1380.0	Hrn2	H	68.7	30.5	-48.0		51.2	75.2	24.0
1840.0	Hrn2	V	73.6	33.3	-48.1		58.8	75.2	16.4
1840.0	Hrn2	H	73.0	33.3	-48.1		58.2	75.2	17.0
2300.0	Hrn2	V	70.3	36.2	-59.2		47.3	75.2	27.9
2300.0	Hrn2	H	72.8	36.2	-59.2		49.8	75.2	25.4
2760.0	Hrn2	V	80.3	38.1	-59.9		58.5	75.2	16.7
2760.0	Hrn2	H	80.6	38.1	-59.9		58.8	75.2	16.4
3220.0	Hrn2	V	78.8	39.7	-59.4		59.1	75.2	16.1
3220.0	Hrn2	H	78.5	39.7	-59.4		58.8	75.2	16.4
3680.0	Hrn2	V	80.3	41.6	-57.6		64.3	75.2	10.9
3680.0	Hrn2	H	82.5	41.6	-57.6		66.5	75.2	8.7
4140.0	Hrn2	V	64.0	43.0	-54.6		52.4	75.2	22.8
4140.0	Hrn2	H	65.1	43.0	-54.6		53.5	75.2	21.7
4600.0	Hrn2	V	59.5	43.9	-55.6		47.8	75.2	27.4
4600.0	Hrn2	H	60.0	43.9	-55.6		48.3	75.2	26.9
STANDARD									
3680.0	Hrn2	V	77.5	41.6	-57.6		61.5	75.2	13.7
3680.0	Hrn2	H	81.8	41.6	-57.6		65.8	75.2	9.4
3220.0	Hrn2	V	78.7	39.7	-59.4		59.0	75.2	16.2
3220.0	Hrn2	H	78.8	39.7	-59.4		59.1	75.2	16.1
Notes: B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole * Re-measured using dipole antenna. ** Includes cable loss when amplifier is not used. *** Includes cable loss. () Denotes failing emission level. N.D. = Not Detected									

*EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced**FCC ID: CASTEL0049*

Section 7. Frequency Stability

Para. No.: 2.1055

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard: Para. No.'s 22.355
90.213

Test Results: Complies. The maximum frequency drift is 375 Hz.
This is 0.815 ppm and 4 Hz, 0.00870 ppm external.

Measurement Data: Standard Test Voltage (STV): 120 VAC
Test Frequency: 460.000 MHz

Test Condition	Frequency (MHz)	Frequency Drift (Hz)
-30	460.000 375	375
-20	460.000 270	270
-10	460.000 238	238
0	460.000 108	108
+10	460.000 027	027
+20	460.000 041	041
+30	460.000 047	047
+40	460.000 126	126
+50	460.000 163	163

There was no change in the frequency due to $\pm 15\%$ variation of standard test voltage.

The maximum frequency drift using external reference is 4 Hz.

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

Section 8. Transient Frequency Behaviour

Test Performed By: Russell Grant	Date of Test: August 10, 2000
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Minimum Standard: Para. No. 90.214

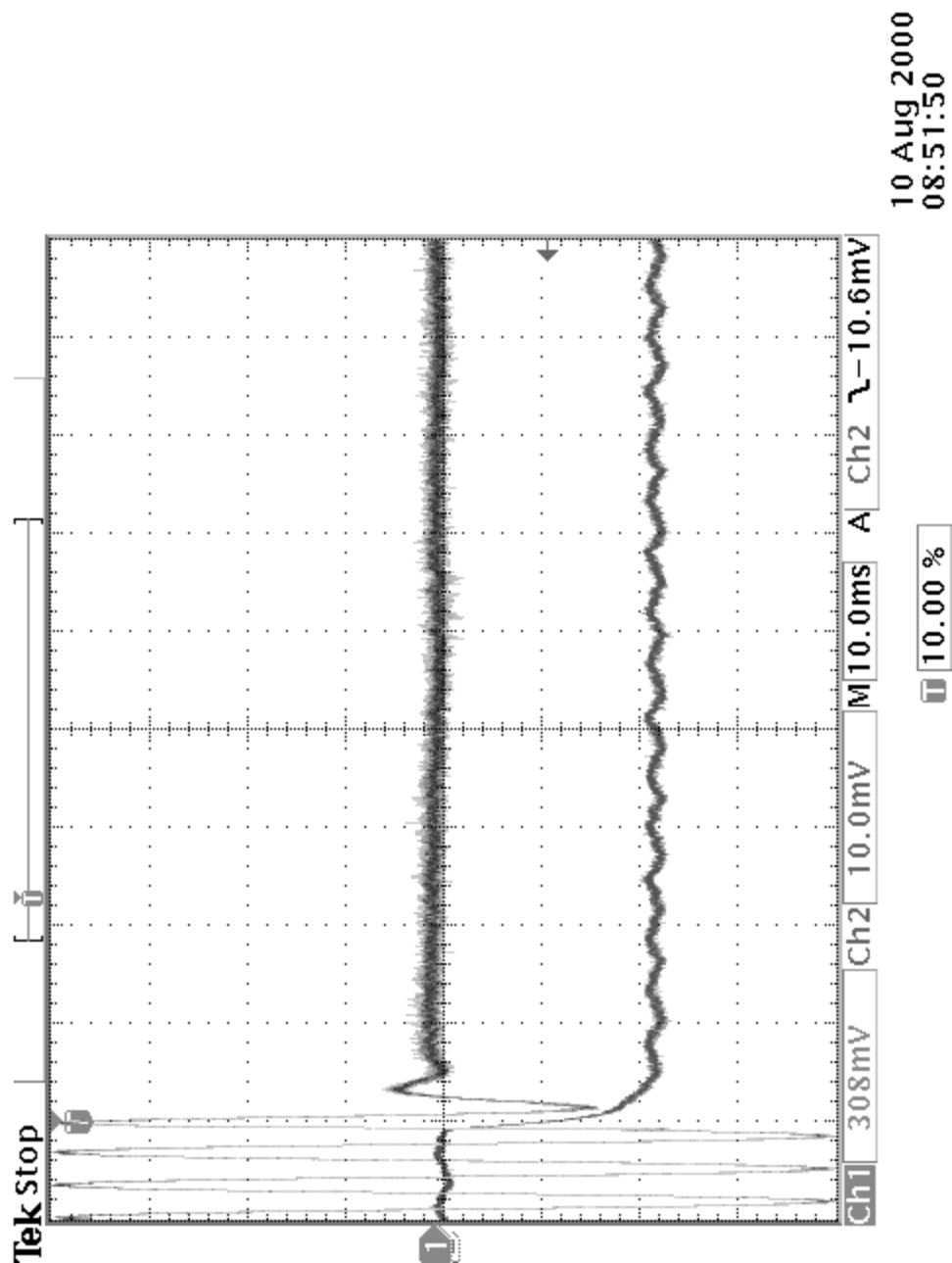
Test Results: Complies.

Measurement Data: See attached graphs.

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

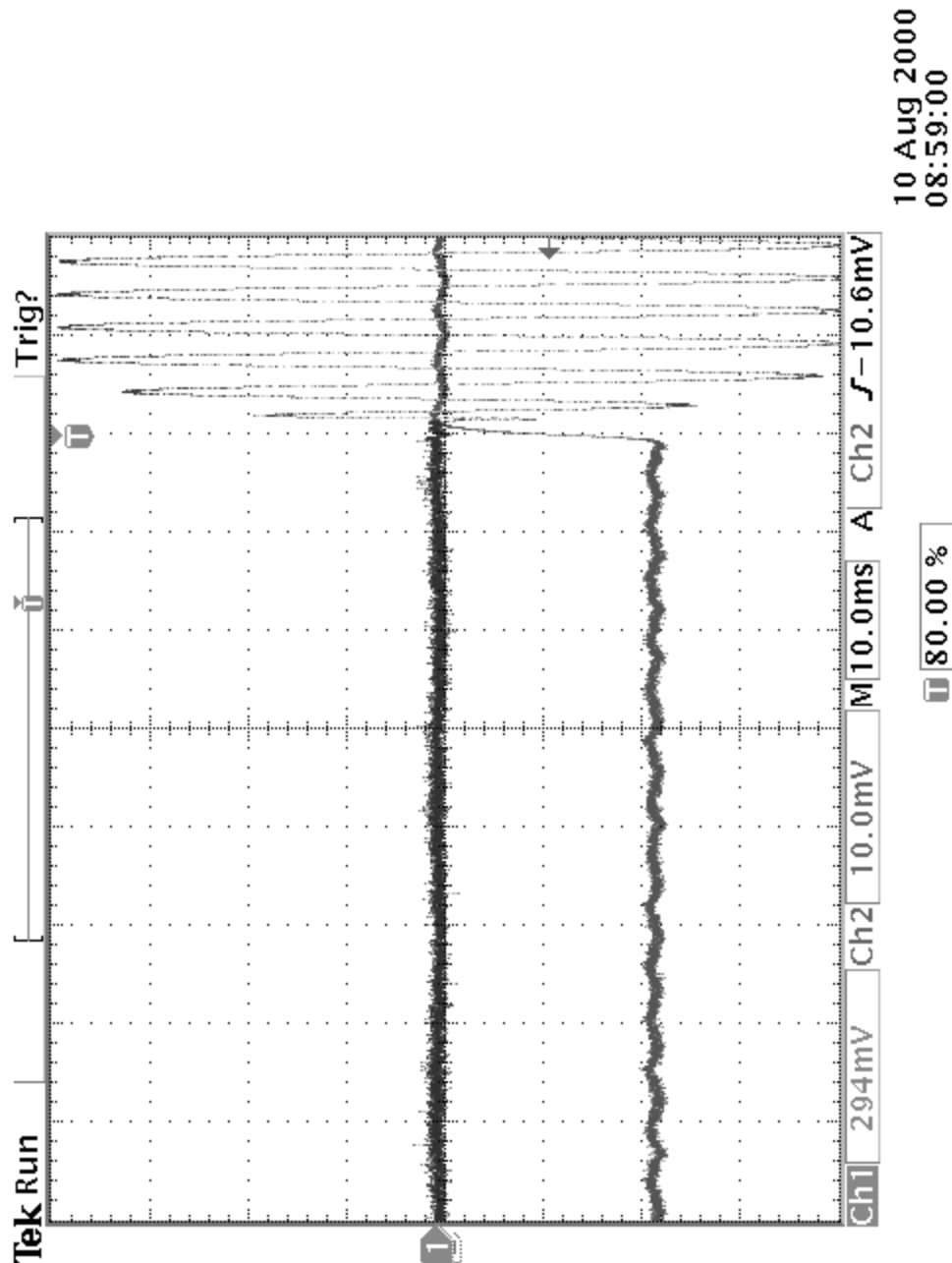
Wideband ± 25 kHz



EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

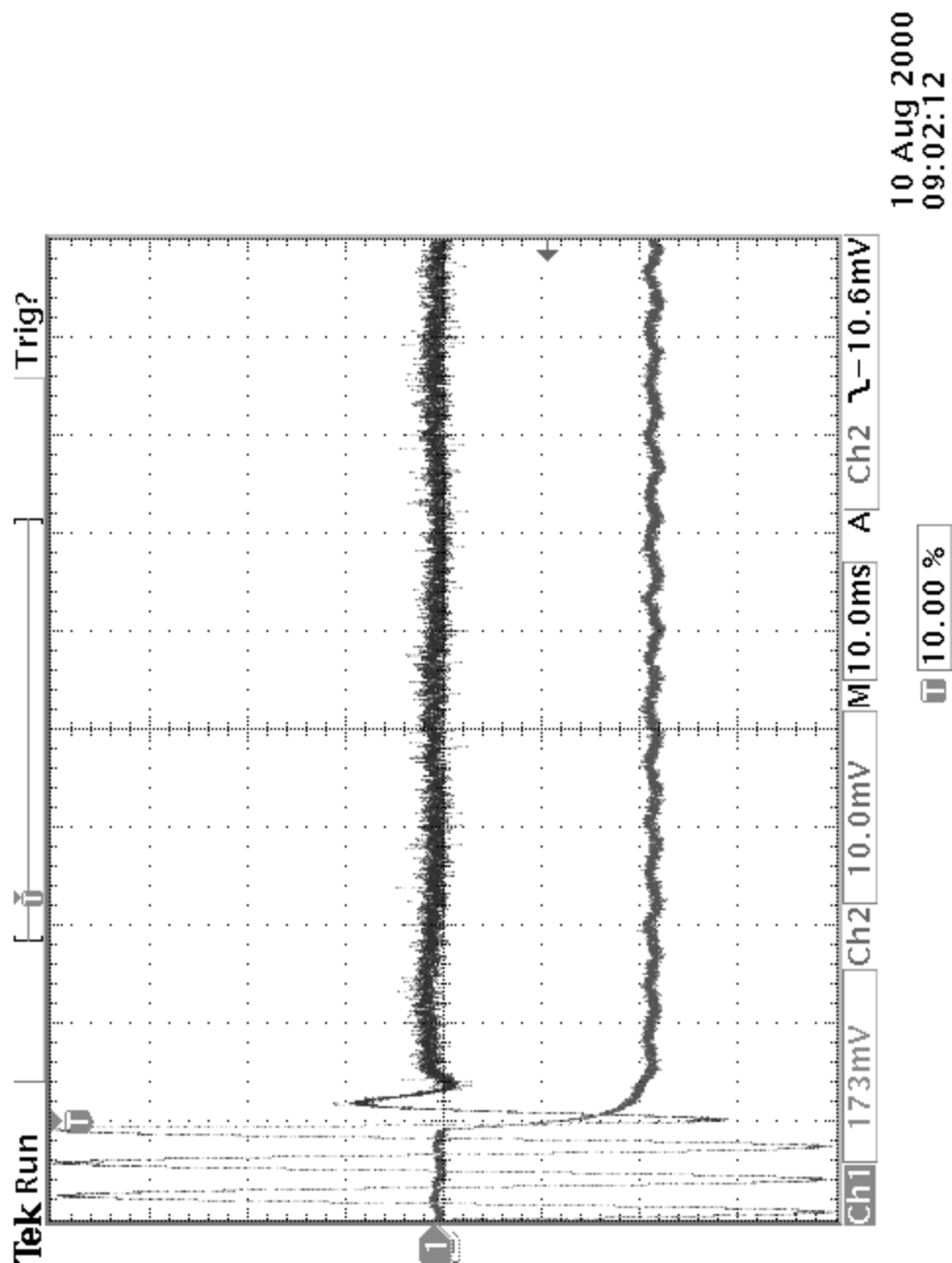
Wideband ± 25 kHz



EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

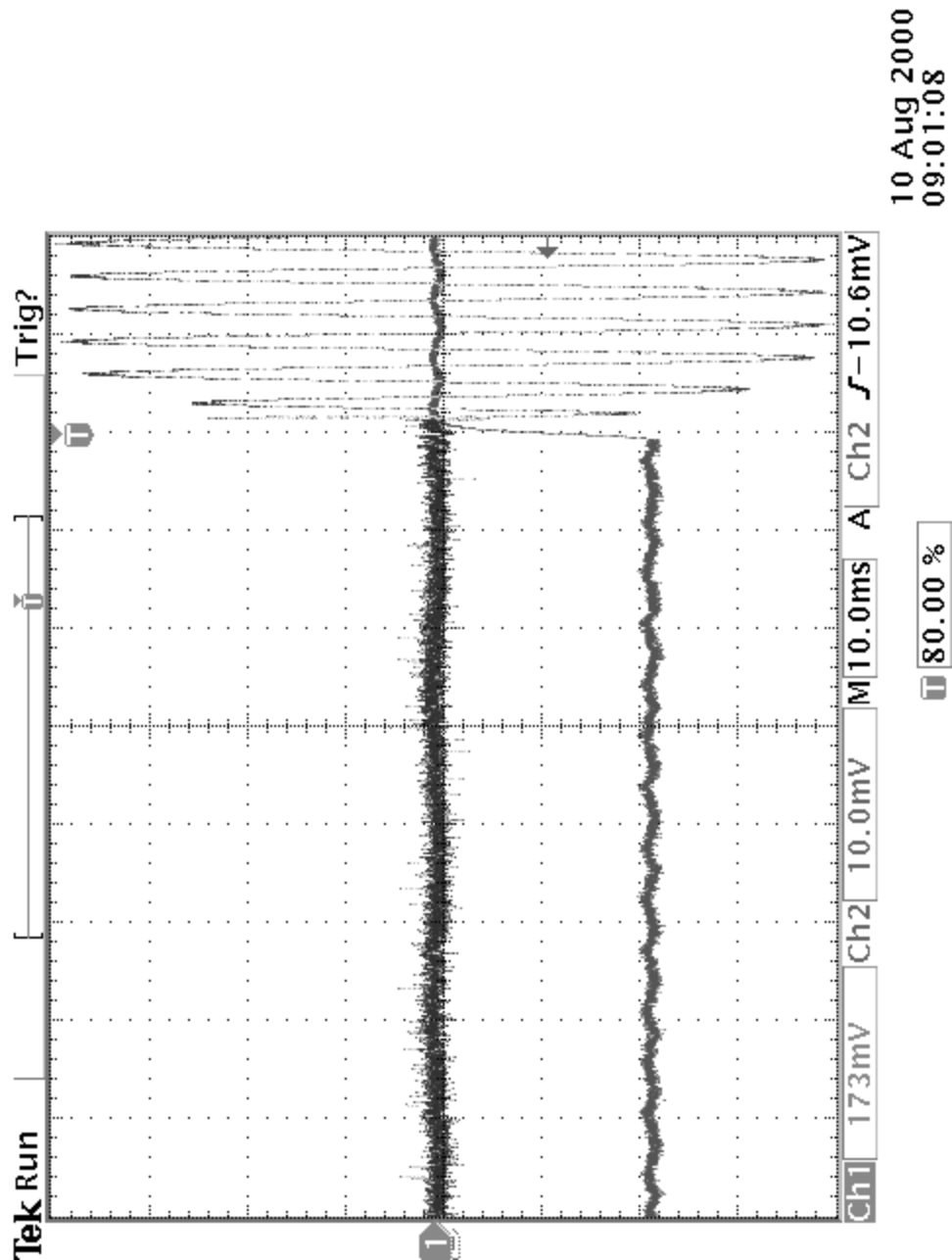
Narrowband ± 12.5 kHz



EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced

FCC ID: CASTEL0049

Narrowband ± 12.5 kHz



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Section 9. 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	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
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
2 Year	Insertion Unit	Rohde & Schwarz	URV5-Z4	FA000905	Oct. 6/99	Oct. 6/01
2 Year	Power Sensor	Rohde & Schwarz	URV5-Z5	FA000419	Oct. 6/99	Oct. 6/01
1 Year	Horn Antenna	EMCO #2	3115	4336	Nov. 11/99	Nov. 11/00
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

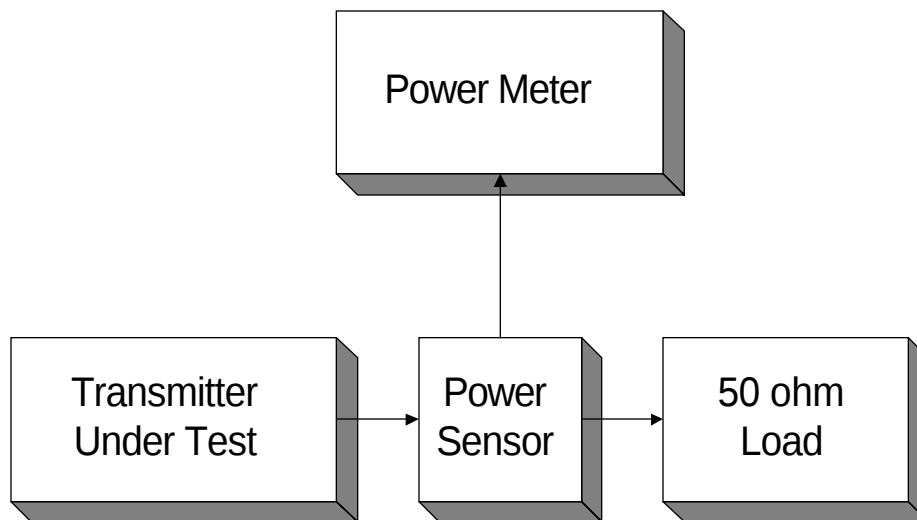
EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced
FCC ID: CASTEL0049

Annex A

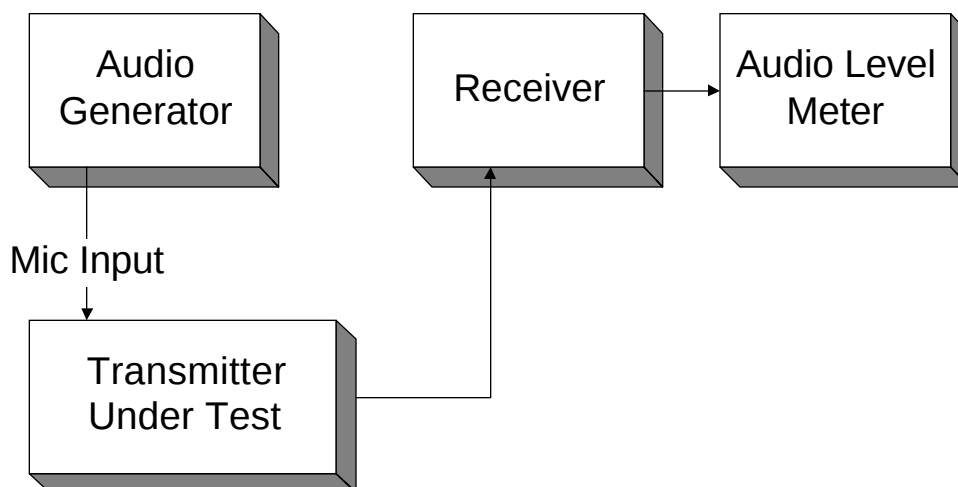
Test Diagrams

EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced
FCC ID: CASTEL0049

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

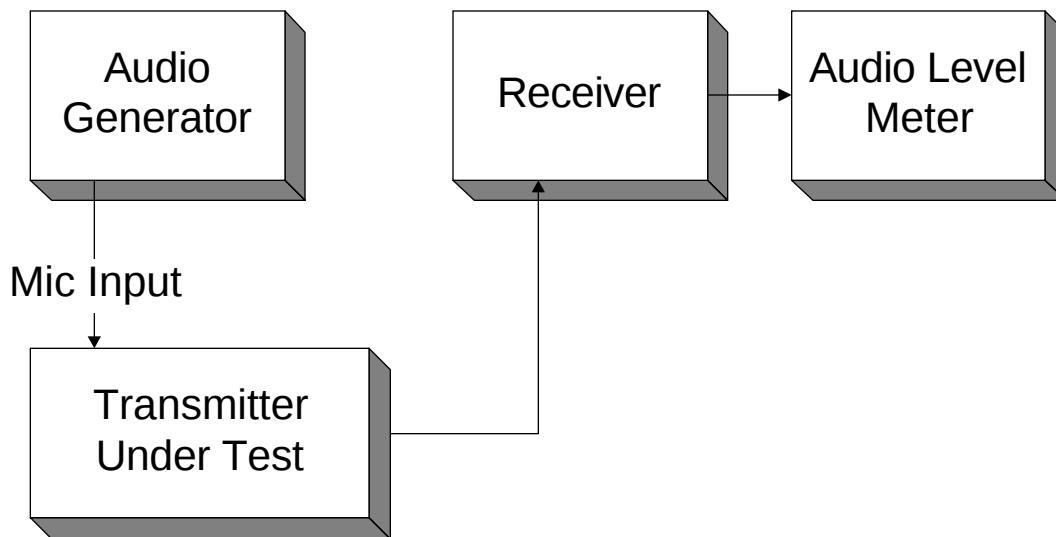


Para. No. 2.1047 - Audio Frequency Response

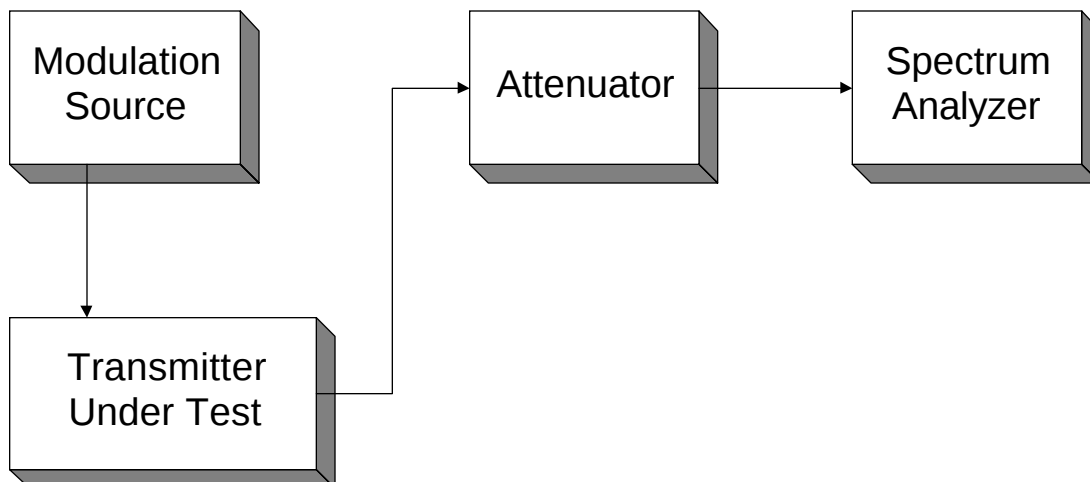


EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced
FCC ID: CASTEL0049

Para. No. 2.1047 - Modulation Limiting

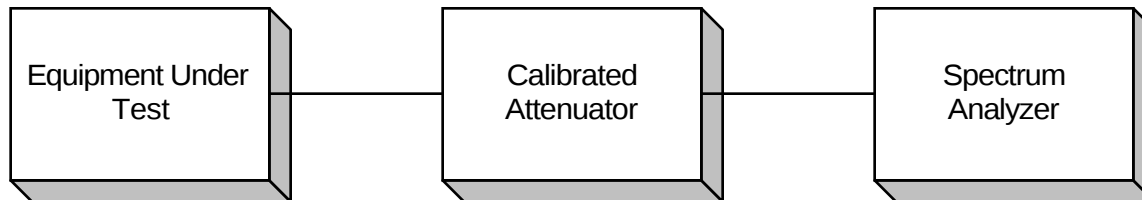


Para. No. 2.1049 - Occupied Bandwidth

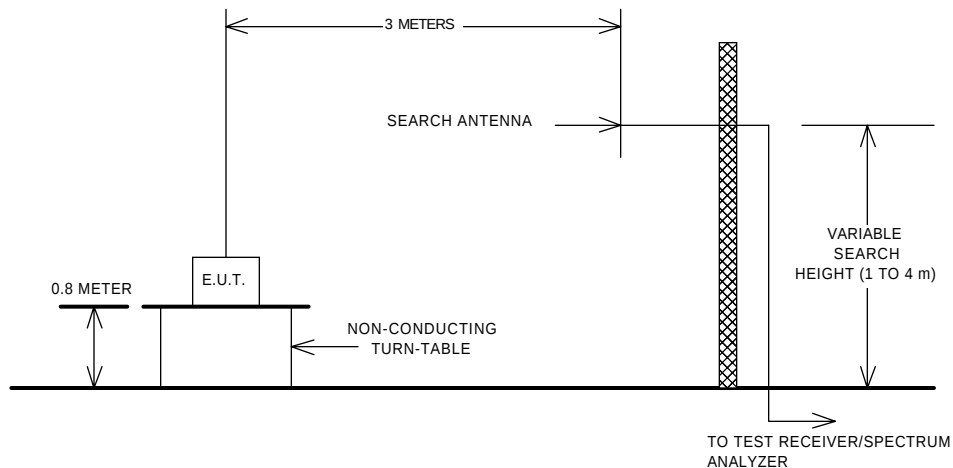


EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced
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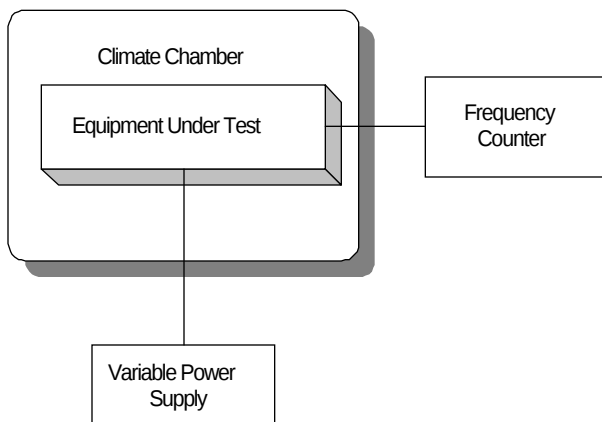
Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Spurious Radiation

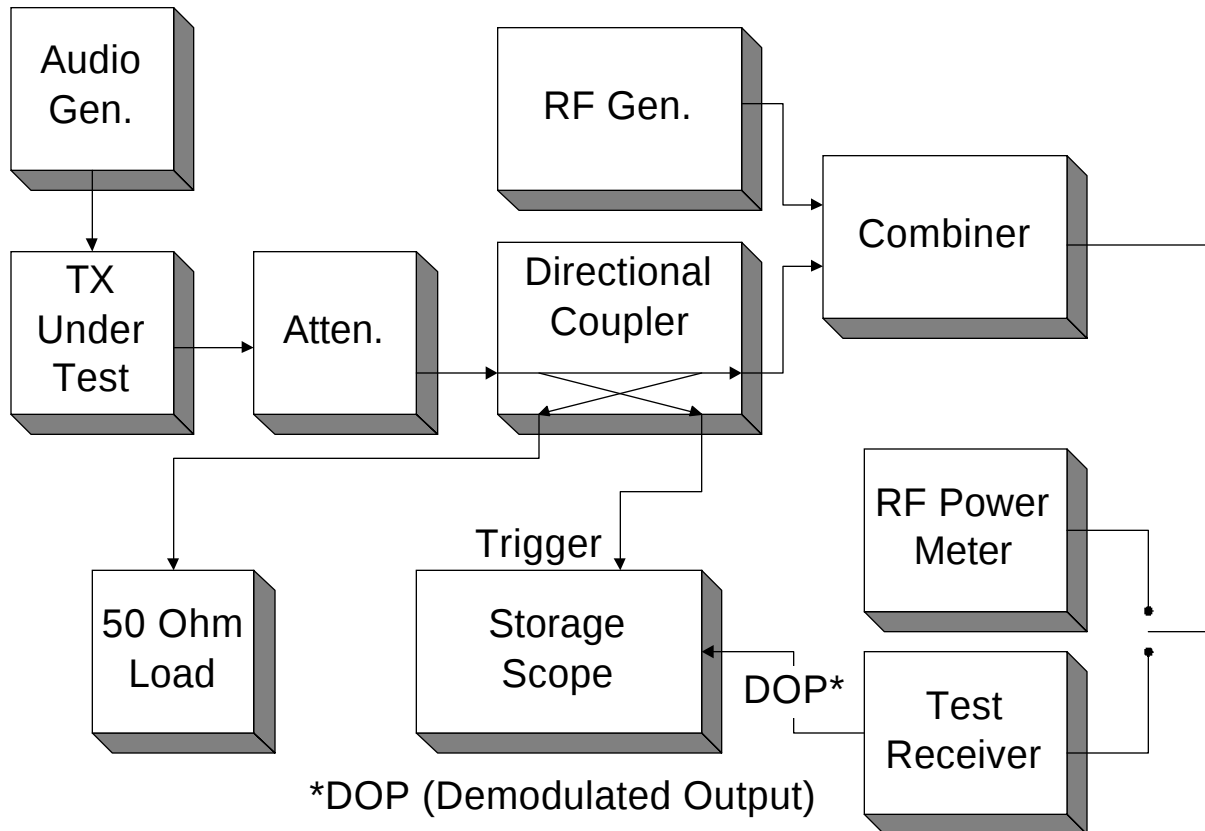


Para. No. 2.1055 - Frequency Stability



EQUIPMENT: T857-26-1010 Standard T857-26-1012 Externally Referenced
FCC ID: CASTEL0049

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).