

## TEST REPORT.

Reference Number : T93161A

Date : 16 November 1993

EQUIPMENT MAKE : TAIT

EQUIPMENT MODEL : T2010-513


SERIAL NUMBER : 421250

COUNTRY OF ORIGIN : NEW ZEALAND

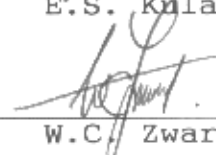
SUBMITTER :

TAIT ELECTRONICS LTD  
558 WAIRAKEI RD  
PO BOX 1645  
CHRISTCHURCH  
NEW ZEALAND

Technical Officer

  
E.S. Kulatea

Chief Technical Officer

  
W.C. Zwart

The results in this report relate only to the item tested.

This Report Contains: 14 pages of Preamble/Results  
1 page of Appendix

If reproduced, all pages must be reproduced in full.

**Code of Federal Regulation 47**

**Part 90**

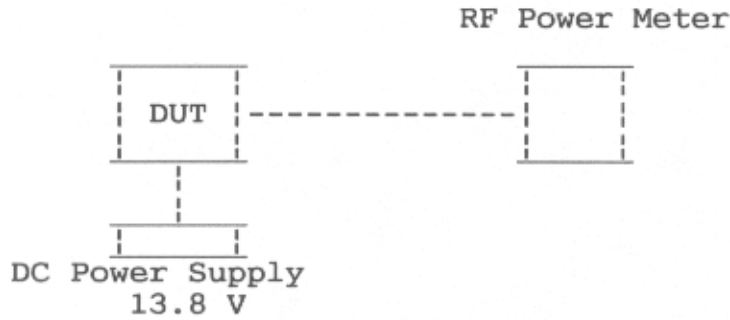
**PRIVATE LAND-MOBILE RADIO SERVICES**

SUMMARY OF TEST RESULTS

2.985	RF Power Output	Complies
2.987	Modulation Characteristic	
	a) Low Pass Filter	Complies
	b) Limiting	Complies
2.989	Occupied Bandwidth	
	a) Analogue Modulation	Complies
	b) Digital	Complies
2.991	Conducted Spurious Emissions	Complies
2.993	Radiated Spurious Emissions	
2.995	Frequency Stability	Complies
2.997	Frequency Spectrum	Complies

TEST RESULTS.

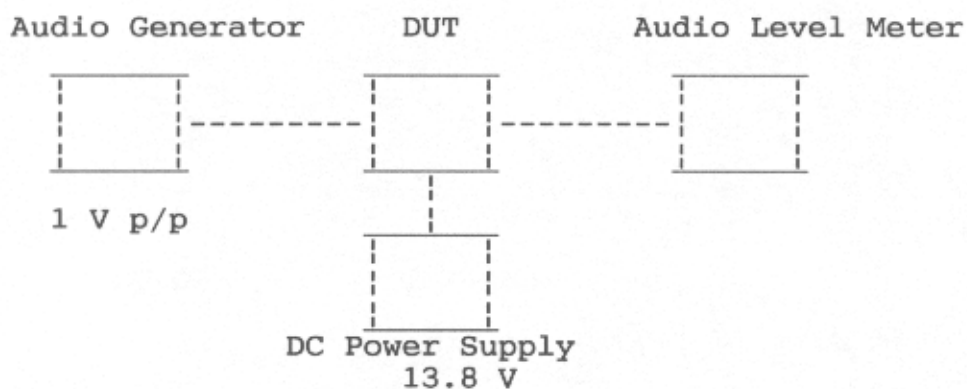
2.985 RF Power Output.



Results:

	450.1 MHz	450.9 MHz
STV/SAT	23.4 W	23.4 W
STV/SAT	5.5 W	5.5 W

90.205 Limits :	<u>Freq. Band</u>	<u>Maximum</u>
	25 MHz - 100 MHz	300 watts
	100 MHz - 216 MHz	350 watts
	450 MHz - 470 MHz	75 watts
	470 MHz - 512 MHz	350 watts

**2.987 Modulation Characteristics. Low Pass Filter Response**

**Remarks:** The input to and the output from the radio was made available through the 9 pin connector at rear.

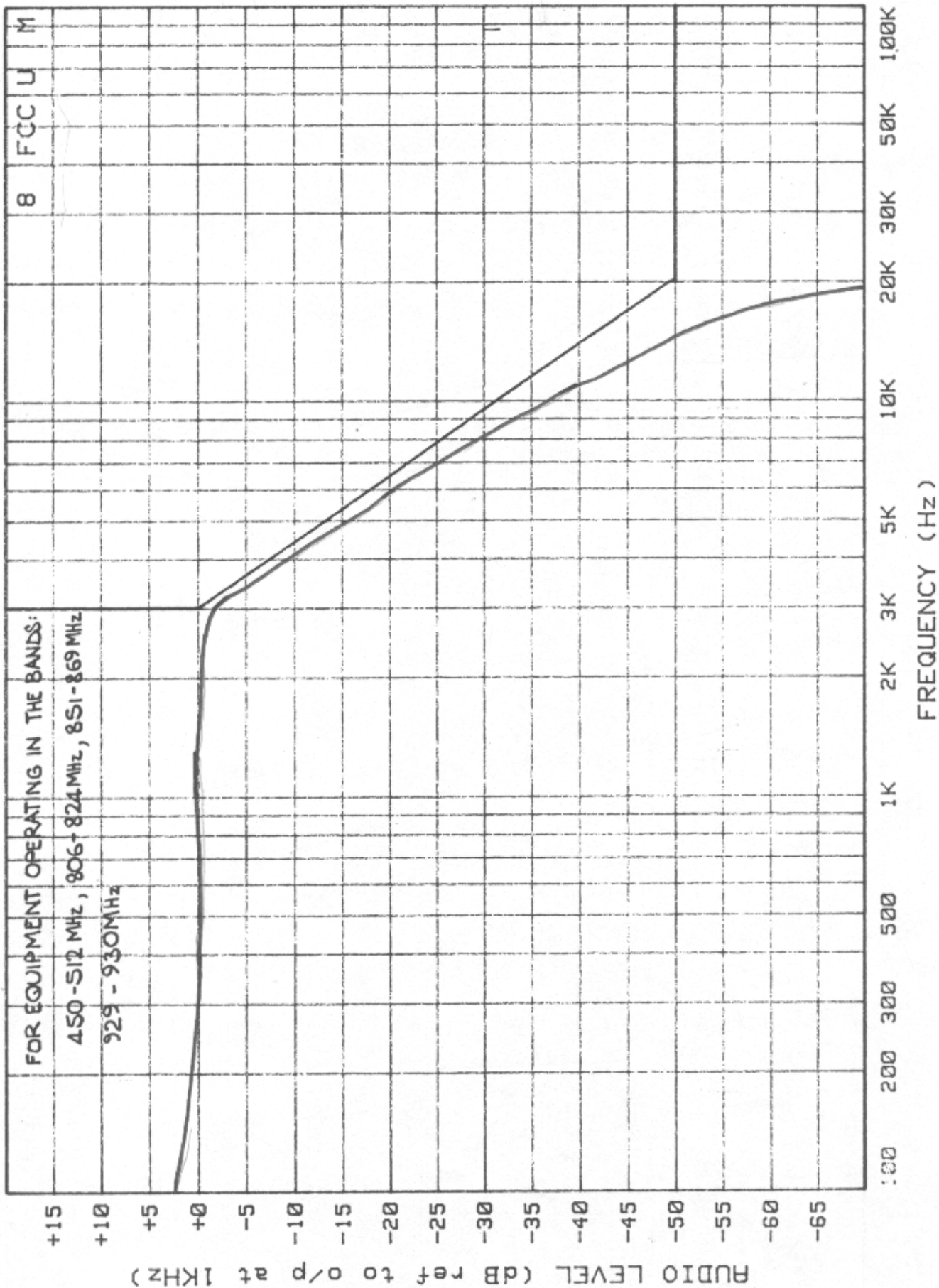
**Results.**

See the frequency response plot.

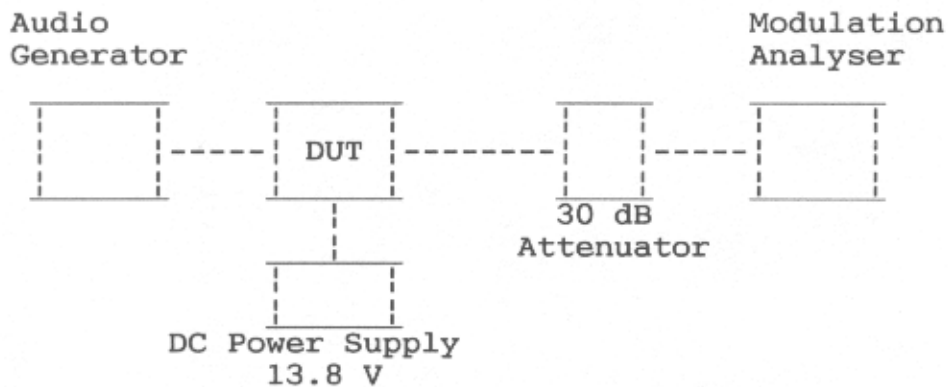
**90.211 Limits.**

The limits are drawn on the graph.

# CFR 47 - PART 90 TRANSMITTER AF CIRCUIT RESPONSE



## 2.987 Modulation Characteristics. Modulation Limiting

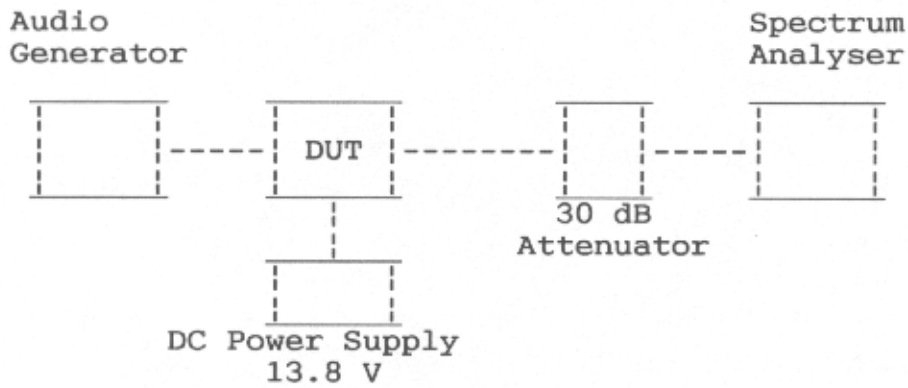


## Results.

Input Level (dBm)	Deviation (kHz)				
	200 Hz	500 Hz	1.0 kHz	2.0 kHz	3.0 kHz
-40.0	-	-	-	-	-
-35.0	0.1	0.1	0.1	0.1	0.1
-30.0	0.2	0.2	0.2	0.2	0.2
-25.0	0.3	0.3	0.3	0.4	0.3
-20.0	0.6	0.6	0.6	0.6	0.5
-15.0	1.0	1.0	1.0	1.1	0.8
-10.0	1.7	1.7	1.9	1.9	1.4
- 5.0	3.0	3.0	3.1	3.3	2.4
0.0	3.6	3.7	4.0	4.4	3.3
+ 5.0	3.7	3.9	4.4	4.6	3.5
+10.0	4.0	4.3	4.5	4.7	3.6
+15.0	4.3	4.5	4.5	4.7	3.6

## 90.209 Limits.

Frequencies below 947 MHz 5.0 kHz max deviation.

**2.989 Occupied Bandwidth. Analogue (F3E)****Results.**

See the spectrum analyser plots.

**90.209 Limits.**

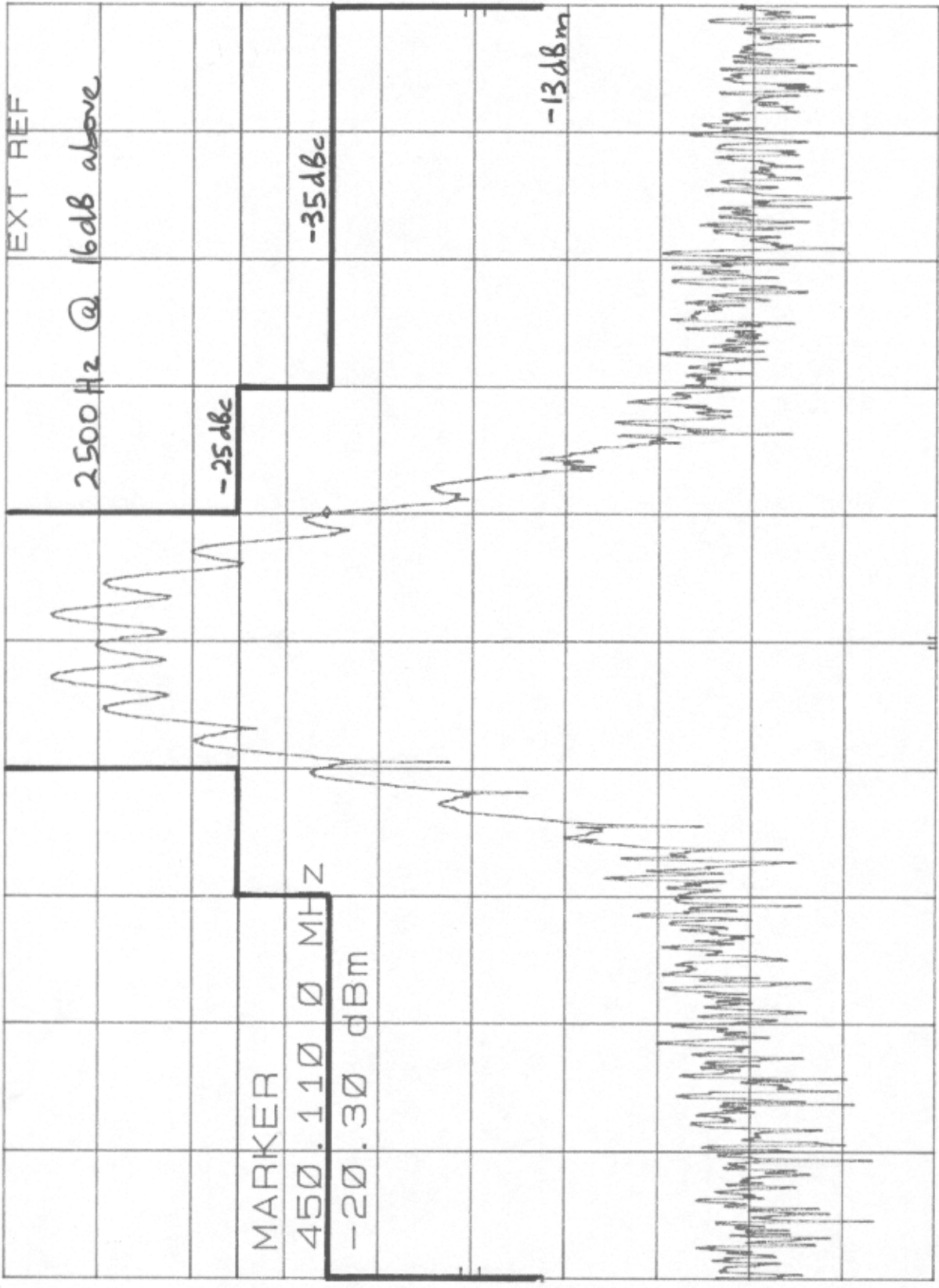
The limits are drawn on the plots.



TAIT T2010-513 SN421250 11/11/93 T93161A MKR 450.110 MHz  
REF 14.0 dBm ATTEN 50 dB

hp

10 dB/



MARKER

450.110 MHz

-20.30 dBm

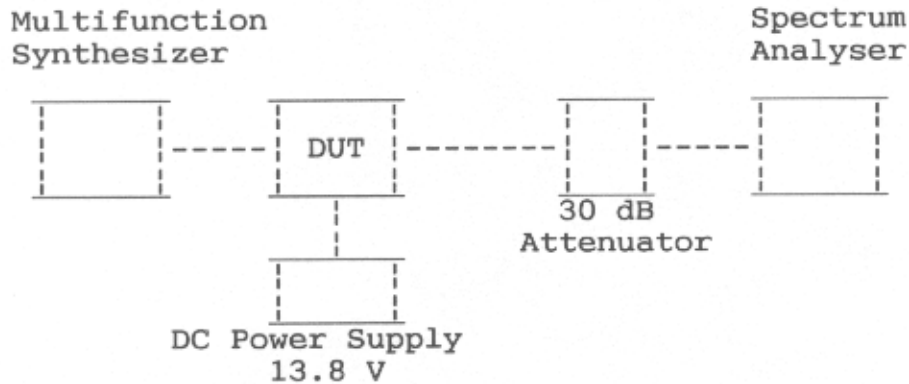
DL  
-11.0  
dBm

CORR'D

CENTER 450.100 MHz  
RES BW 1 KHZ  
SPAN 100 KHZ  
SWP 300 msec  
VBW 3 KHZ

ESL

## 2.989 Occupied Bandwidth. Digital (F1D)

**Results.**

See the spectrum analyser plots.

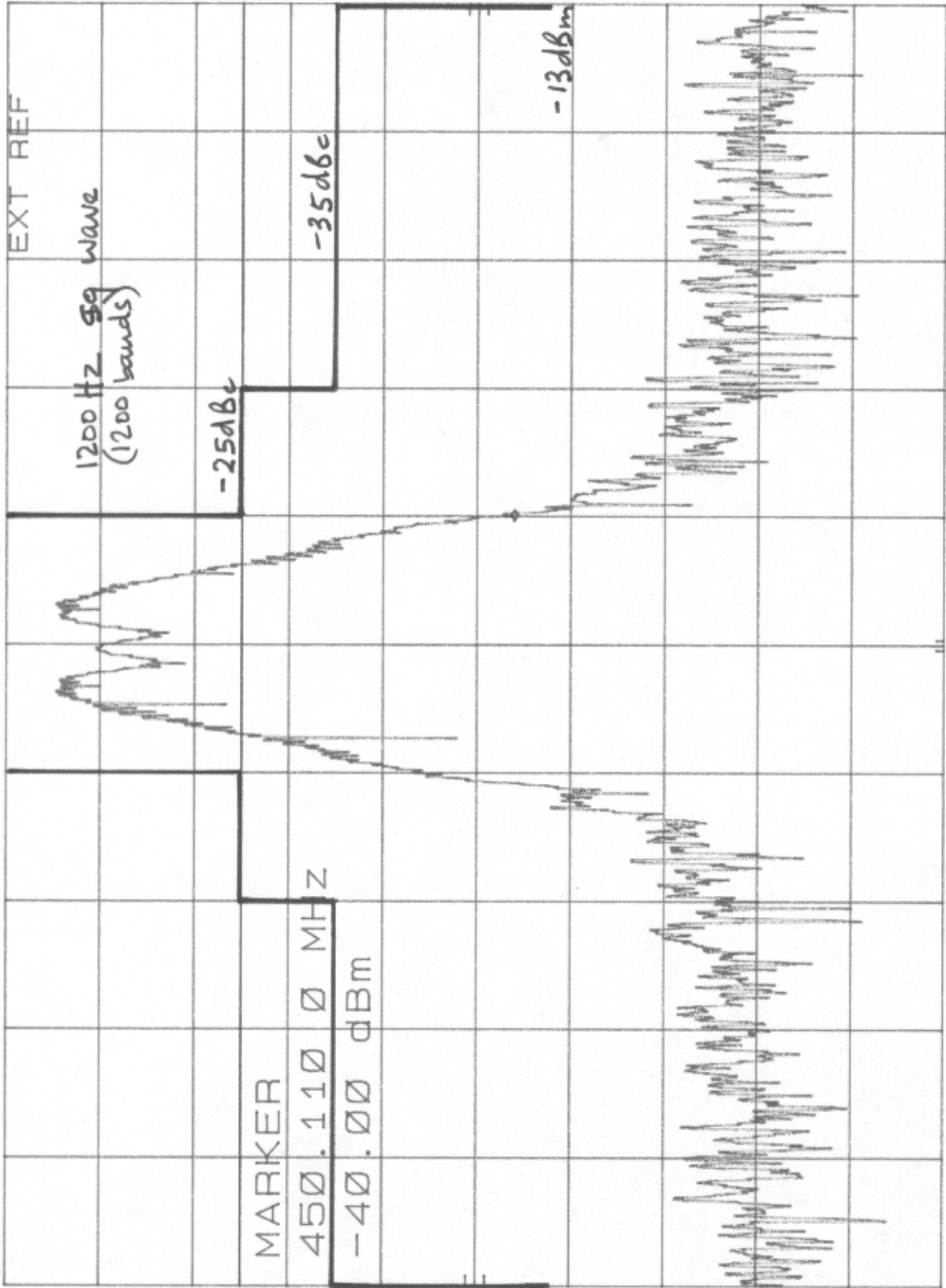
**90.209 Limits.**

The limits are drawn on the plots.

TAIT T2010-513 SN421250 11/11/93 T93161A MKR 450.110 0 MHZ  
REF 14.0 dBm ATTN 50 dB

HP

10 dB/



MARKER

450.110 0 MHZ

-40.00 dBm

DL  
-11.0  
dBm

-13dBm

CENTER 450.100 MHZ

RES BW 1 KHZ

VBW 3 KHZ

SPAN 100 KHZ

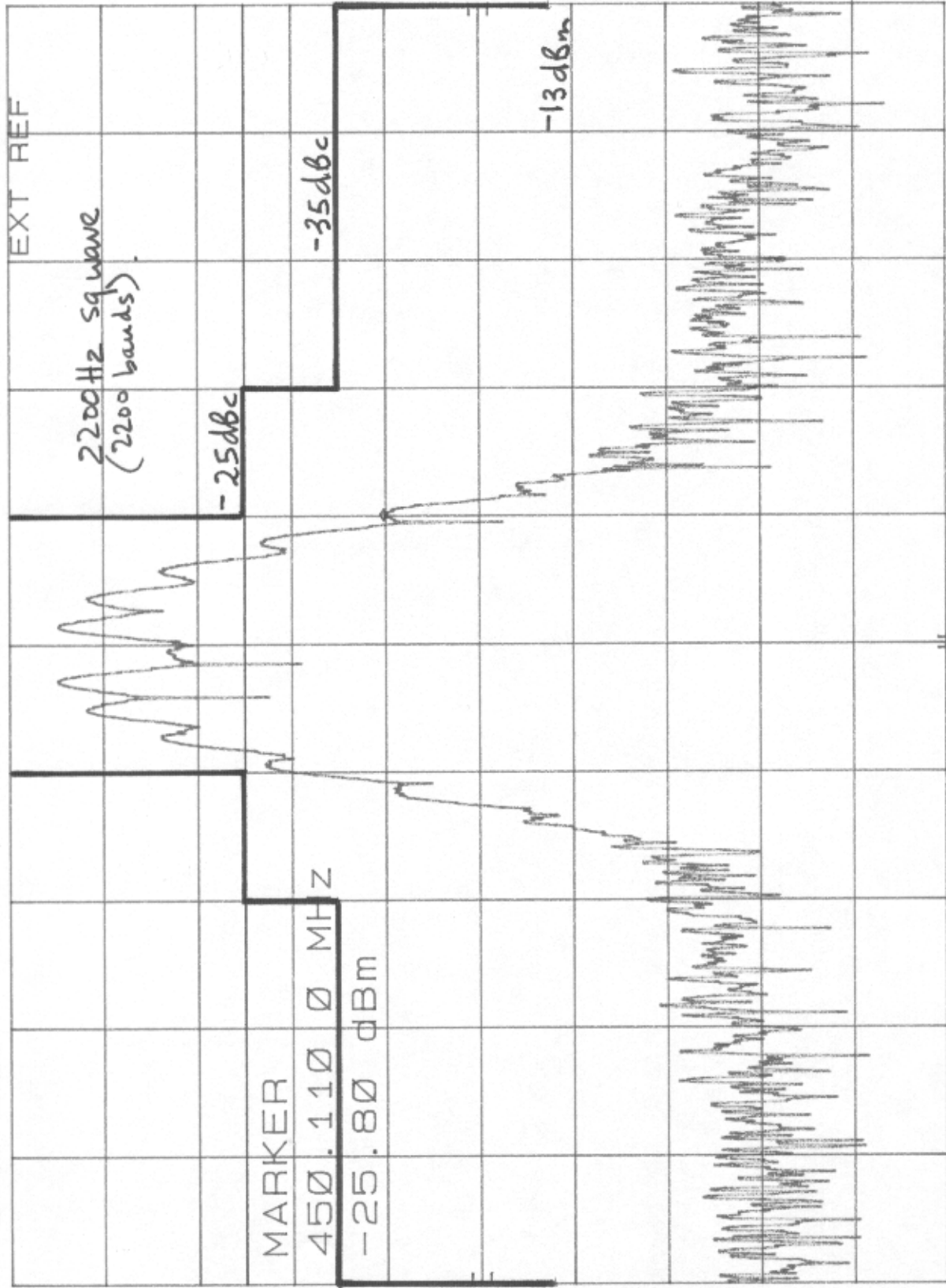
SWP 300 msec

ESK

TAIT T2010-513 SN421250 11/11/93 T93161A MKR 450.110 0 MHZ  
REF 14.0 dBm ATTEN 50 dB -25.80 dBm

hp

10 dB/



DL  
-11.0  
dBm

CORR'D

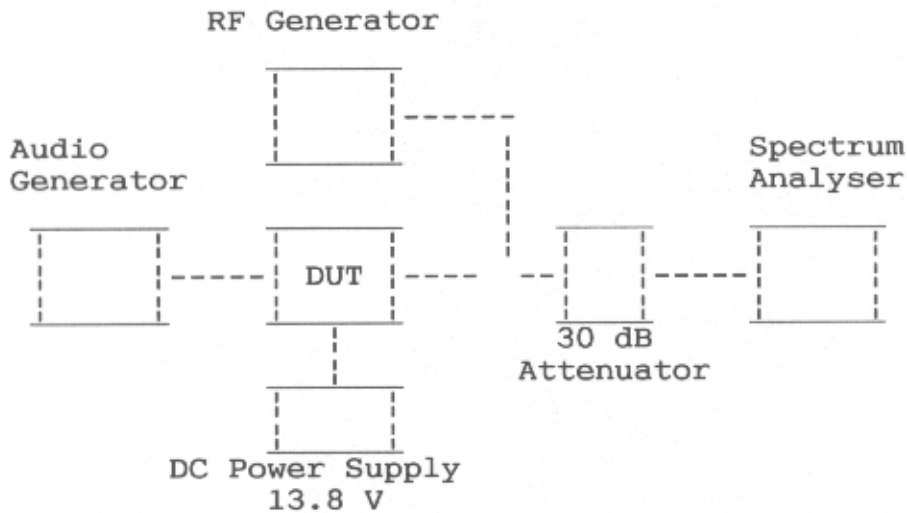
ESK

CENTER 450.100 MHZ  
RES BW 1 KHZ

VBW 3 KHZ

SPAN 100 KHZ  
SWP 300 msec

2.991 and 2.997 Conducted Spurious Emissions.



Results.

450.1 MHz

Emission Freq. (MHz)	Level dBm
437.295	-39.5
462.9	-40.0

450.9 MHz

Emission Freq. (MHz)	Level dBm
438.105	-39.5
463.695	-39.2

Remarks:

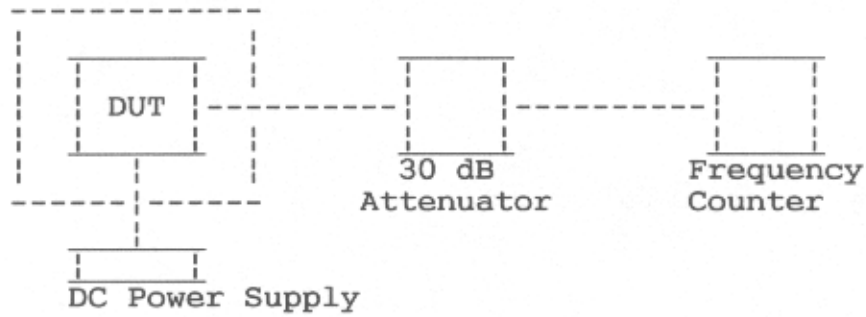
The harmonics to 10 fc are well below the limit. (lower than the levels given in the table above).

90.209 Limits:

for frequencies below 947 MHz -13 dBm

2.995 Frequency Stability.

Environmental Chamber



Results:

450.1 MHz

Temperature ° C	Frequency Error (kHz)		
	11.7 V	13.8 V	15.9 V
+ 50	-1.14	-1.13	-1.14
+ 40	-1.12	-1.11	-1.11
+ 30	-1.05	-1.04	-1.04
+ 20	-0.65	-0.65	-0.65
+ 10	-0.24	-0.24	-0.24
+ 00	+0.16	+0.17	+0.17
- 10	+0.34	+0.33	+0.33
- 20	+0.17	+0.17	+0.16
- 30	-0.20	-0.21	-0.21

Remarks:

Results recorded 30 minutes after the temperature reached the set point.

90.213 Limits:

450 MHz - 470 MHz      5 ppm.

A P P E N D I X 1.

EQUIPMENT LIST FOR BAY 1 (E1154)

Test equipment used to check the performance of the radio product is listed below.

Lab No	Model	Description
E1209	HP 436A	RF Power Meter
E1083	HP 8482A	Power Sensor
E1042	HP 6034A	DC Power Supply
E1208	HP 8566B	Spectrum Analyser
E1090	HP 8901B	Modulation Analyser
E1067	HP 8642B	Signal Generator
E1100	HP 59306A	Relay Actuator
E1002	HP 8904A	Multi-function Synthesizer
E1329	HP 8491A	10dB Attenuator
E1308	WEINSCHEL 49-20-43	20dB Attenuator
E1062	ANRITSU ML422C	Audio Level Meter
E1143	ANRITSU MG443B	Audio Generator
	DYNATECH D2-116A20	Coaxial Switch (Sw 1)
	HP 8761B	Coaxial Switches (Sw 2 - 8)
	RG214/U 430mm	Coax Cable (CC1)
	RG214/U 700mm	Coax Cable (CC2)
	RG214/U 430mm	Coax Cable (CC3)
	RG214/U 430mm	Coax Cable (CC4)
	RG214/U 1500mm	Coax Cable (CC5)
	RG214/U 430mm	Coax Cable (CC6)

NOTE:

- (a) Full details of Equipment calibration are available from the Laboratory on request.