Section (C)

Index for Measurement Data

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90.207	Type of Emission	12K0F3E	
90.209	Bandwidth Limitations	12.5 kHz	
90.210	Emission Mask (B) as per 90.211	11 kHz	
90.214	Transient Frequency Behavior	<8 mil Sec	
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90.209	Occupied Bandwidth	<11 kHz	8-9
	Mean RF Power attenuation 10 kHz from center frequency	-60 dBc	
2.1051	Spurious Emissions Conducted	-60 dBc	10-13
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2.1055	Frequency Stability	>.0025%	16-17
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15.109	Radiated emission limits	< 150 UV at 3 meters max.	18

MEASUREMENT DATA REQUIRED FOR CERTIFICATION

(A) RADIO FREQUENCY POWER OUTPUT

RF power output at output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in 2.1046 (A) .

POWER MEASUREMENTS

The DC power into the final RF stage and RF power output into the RF load were determined in the following manner. Refer to Schematic OP111. C86, C85, C81, R57 and C76 were adjusted for the maximum RF output power into a Boonton Model 42A power meter of 2 watts. The maximum RF output power was obtained with the value of components called out in the part list. The maximum DC current into the RF final "Q13 was measured to be 305mA accros a .1 ohm resistor in series with L28. at the maximum DC input voltage of 13.8 VDC. The maximum current measured into the driver transistor "Q12" was 41 mA across a 1 Ohm resistor in series with L24.

RF power delivered to the power meter for the units tested is as follows:

Unit #	Frequency		Power Measured
1	163.075	MHz	1 .92 Watts
2	159.165	MHz	1..91 Watts

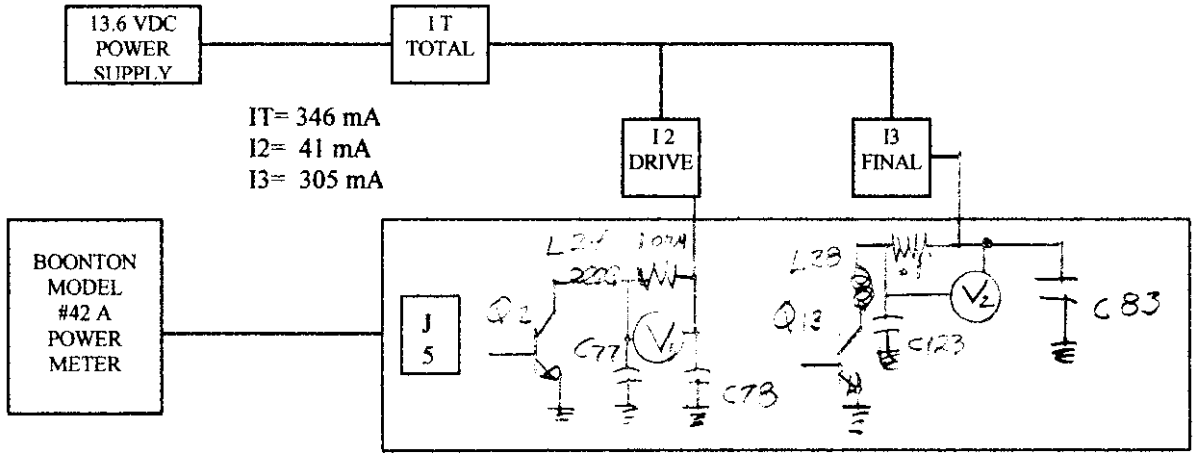


FIG (1)

(B) MODULATION CHARACTERISTICS 2.1047 A&B

Voice modulated communications equipment: A curve or equivalent data showing the frequency response of the audio modulating circuit over a frequency range of 100 to 5000 Hz shall be submitted as specified in 2.987 (A).

MODULATION CHARACTERISTICS MEASUREMENTS

The following equipment was used to measure the modulation characteristics of Model 6327 units #1 & #2: H/P 400 GL RMS Voltmeter, H/P 3310 Audio Generator. See Fig. (2). Refer to Print (6327MB) Note: An audio signal was injected at R21 and hard limiter comprised of D1-D4. The resulting signal is then passed through the low pass filter U20.

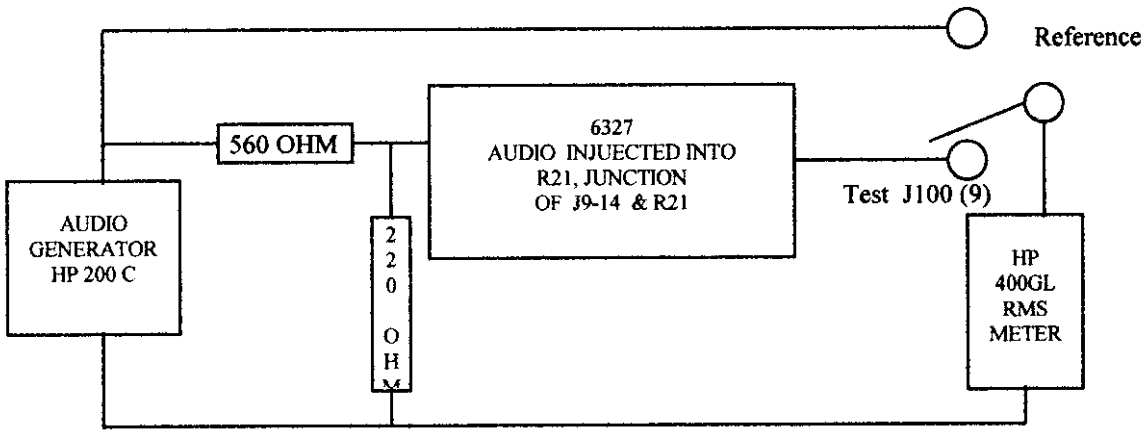


FIG (2)

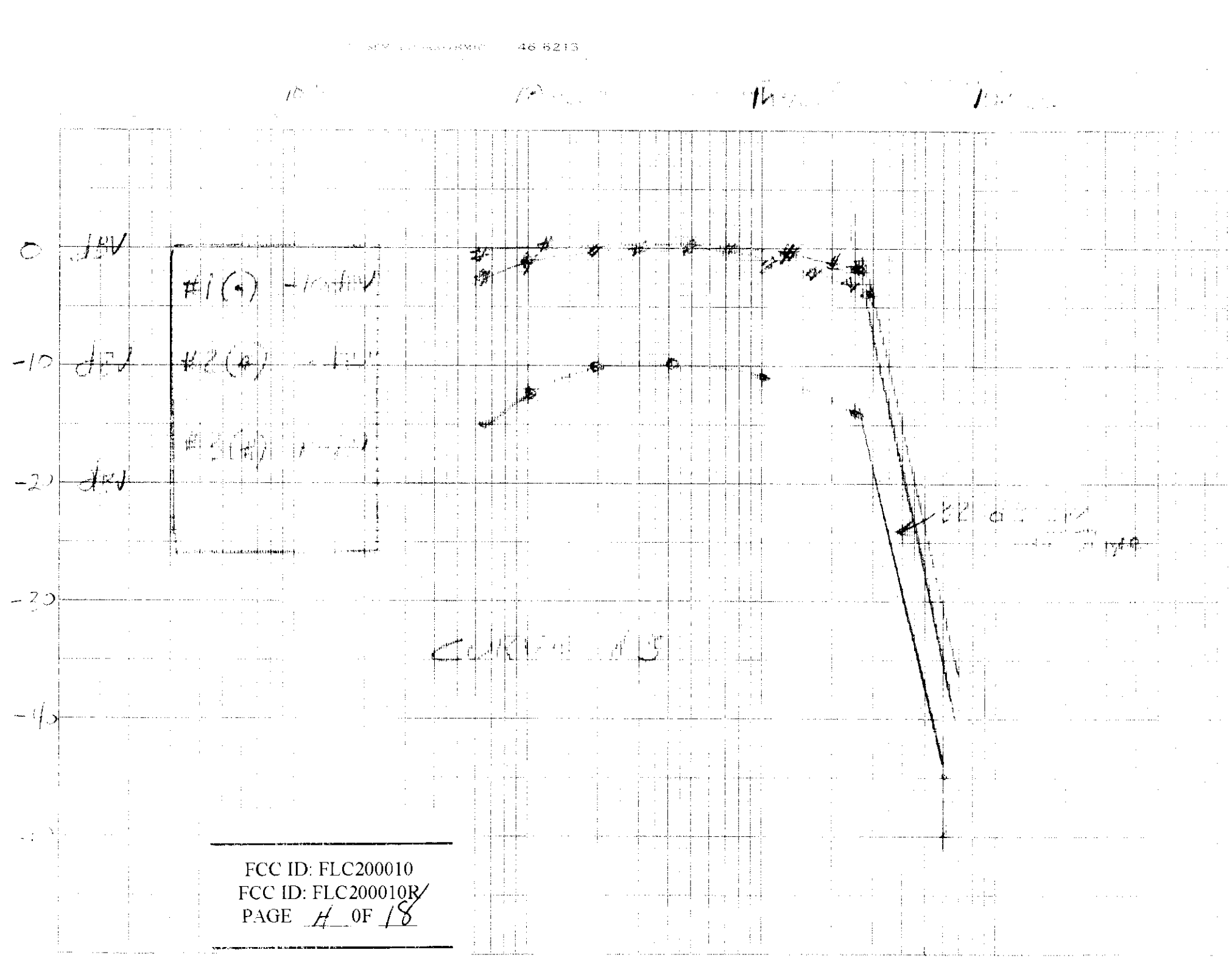
The audio level was held constant across the audio spectrum while the following curves were being made. See Fig. (3), page 4.

Curve #1: The input level was adjusted to -10 dbV rms. This level is not sufficient to cause the limiter circuitry to be activated. This curve illustrates the audio response to the modulator before limiting after passing through the low pass filter

Curve #2: The input level was increased to 3dbV rms. This level is sufficient to cause the limiter to become activate . The limiter threshold is 825 mVRMS at this point in the circuitry. This level will be the 0 dB reference on the three audio response curves.

Curve #3: The input level was increased to 10dbV rms. This level is sufficient to cause the limiter to be in hard-limiting across the entire audio spectrum being investigated. Curve #3 illustrates that the audio level into the modulator does not exceed the reference level.

The modulator sensitivity is 1 VRMS per 3 kHz deviation at the junction of R72 and J100; Pin # (1) The modulation can be decreased by adjusting R72. The range of the limiter is in excess of 30dB. Please Note: The modulation is factory adjusted for the proper deviation, sealed and is not user adjustable. Curve (3A) illustrates the modulator deviation sensitivity with respect to voice frequency modulation.



FCC ID: FLC200010
FCC ID: FLC200010R/
PAGE 14 OF 18

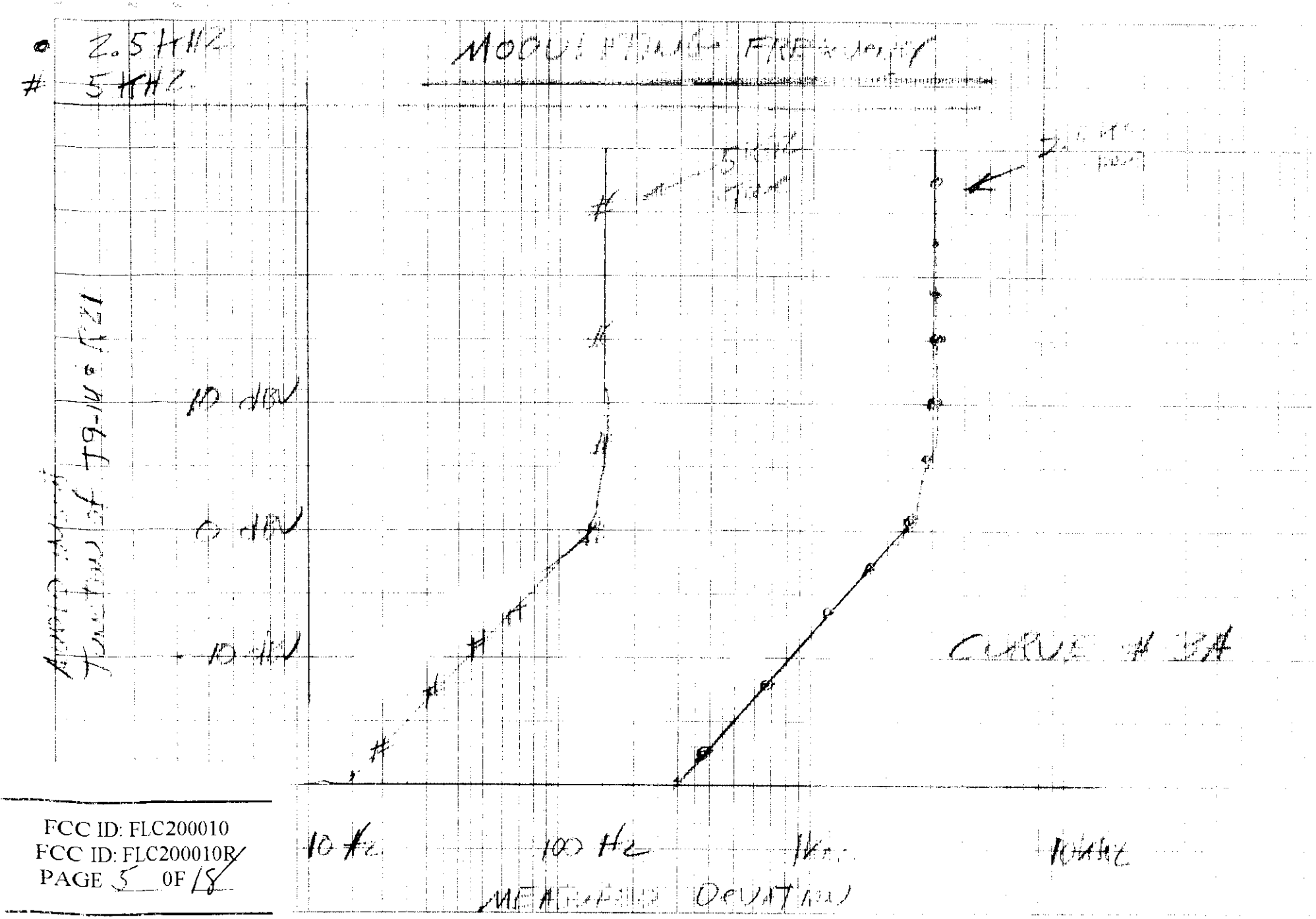
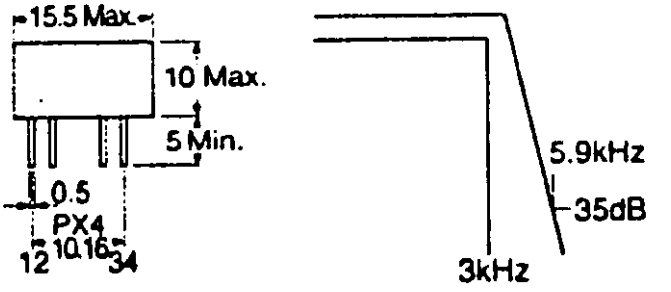

2.5 kHz
5 kHz
10 dBV
0 dBV
10 dBV
10 Hz
100 Hz
1 kHz
10 kHz
CURVE #

Fig. 2 Low Pass Filter



Pin No.
1 INPUT
2 GND
3 OUTPUT
4 Vc

TK5426

NO DATA

(C) OCCUPIED BANDWIDTH (90.209) (1)

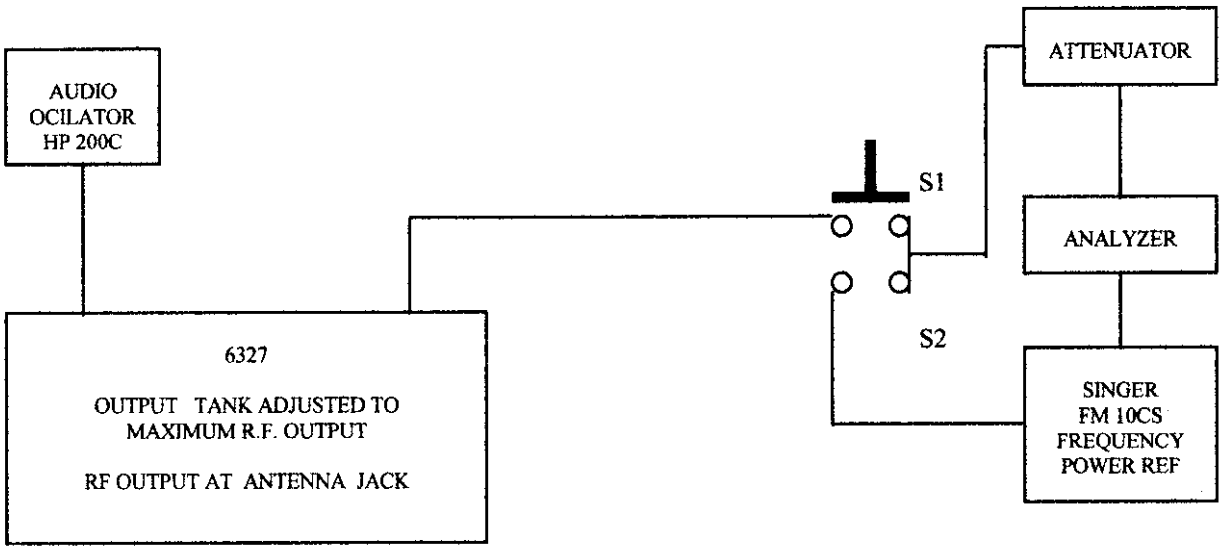
The frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission. When modulated by and input signal 16 dB greater than required to produce 50% modulation, test at 2500 Hz.

MEASURED OCCUPIED BANDWIDTH

Model 6327 Test Units #1 & #2 had less than 11 kHz occupied bandwidth at 2500 Hz modulation . Please note: Audio level was held constant for 1000, 2500 and 5000 Hz test.

TEST EQUIPMENT SET-UP FOR CONDUCTIVE OCCUPIED BANDWIDTH

H/P Model 182C and 8558B spectrum analyzer; Singer FM10CS Kay Model 40-0 attenuator



SPECTRUM ANALYZER SETTING

Bandwidth 500 Hz
Horizontal (X plane)
Vertical (Y plane)
Video Filter: off

Scan time 20 msec per division
10 KHz per division
10 dbM per division
Log Scale: on

See page 9 for spectrum display.

(D) SPURIOUS EMISSIONS FROM THE TRANSMITTING EQUIPMENT FOR THE FOLLOWING CONDITIONS:

(A) CONDUCTED SPURIOUS EMISSIONS (2.1051)

Test procedure as started in EIA standards RS-316-5.3 with the following exceptions. The antenna on the transmitter was removed. The antenna output was then connected to a H/P 8558B Spectrum analyzer which presents a 50 ohm load to the transmitter output, and the spectrum was investigated for spurious emissions from the lowest crystal oscillator frequency to 1.8 GHz. The audio level was adjusted 16 db greater than required to produce 50% modulation at 2500 Hz and injected into J21, junction of j9-14 and R21 audio input. Spurious 20 dB below the Permissible value need not be reported.

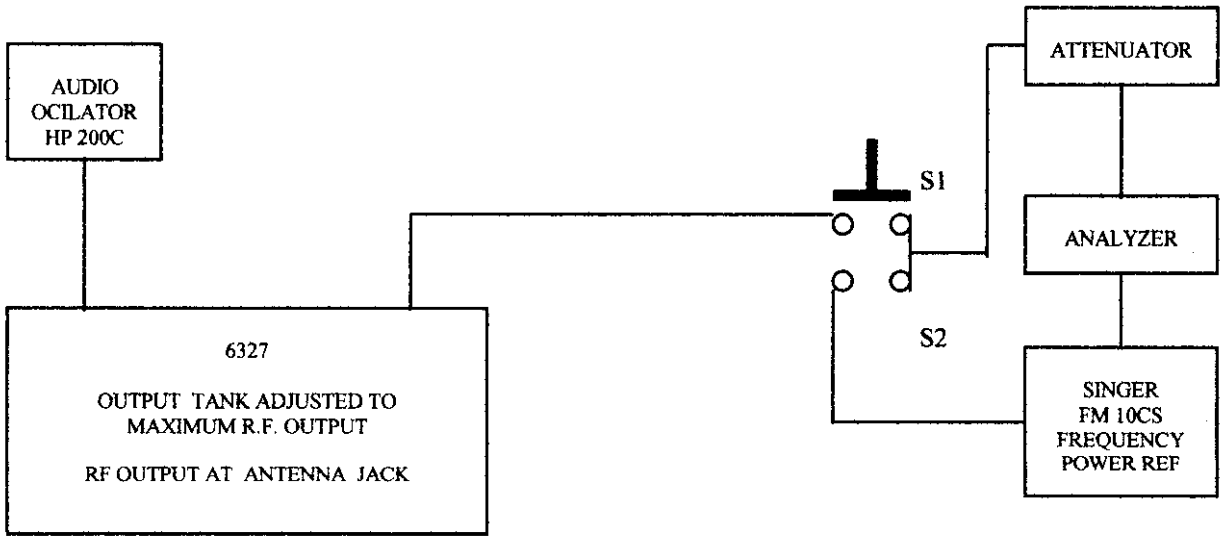
TEST EQUIPMENT SET-UP FOR CONDUCTIVE SPURIOUS EMISSIONS

The following equipment was used to measure the conductive spurious emissions of Model 6327, Units #1 & #2: at the antenna output connector

H/P Model 182C and 8558B spectrum analyzer; Singer FM10CS; Kay Model 40-0 attenuator

TEST EQUIPMENT SET-UP FOR CONDUCTIVE SPURIOUS EMISSIONS

Bandwidth 1MHz	Scan time 10 msec per division
Horizontal (X plane)	100 MHz per division
Vertical (Y plane)	10 dbM per division
Video Filter: off	Log Scale:: on



The spectrum analyzer was set up whereby any spurious emissions conducted less than -60 dbM below the carrier would be recorded. The spectrum was scanned from the lowest oscillator frequency to 1.8 GHz.

MEASURED SPURIOUS EMISSIONS

Test Unit #1:

Center Frequency: 163.075 MHz reference level 33 dBm (Page 12 of 18)

Recorded Spurious Emissions

Frequency MHz	Level in dbM	--	Frequency MHz	Level in dbM
326.150 MHz	-38 dBm		1.386 GHz	-29 dBm
1.786 Ghz	-35 dBm			

The maximum conducted spurious emission was -62 dBc . The emission was on 1.386 GHz which is the 8th harmonic of the Carrier.

Test Unit #2:

Center Frequency: 159.165 MHz, reference level 33 dbM (Page 13 of 18)

Recorded Spurious Emissions

Frequency MHz	Level in dbM	--	Frequency MHz	Level in dbM
318.336 MHz	-29 dbM		1.352 GHz	-28 dBm
477.504 MHz	-32 dbM			

The maximum conducted spurious emission was 61 dbc. The emission was on 1.352 Ghz which is the 8 harmonic of the carrier.

The noise floor was -40dbM on all above measurements. See pages 12 and 13 for spectrum display.

(E) FIELD STRENGH MEASUREMENTS OF SPURIOUS RADIATION (2.1053)

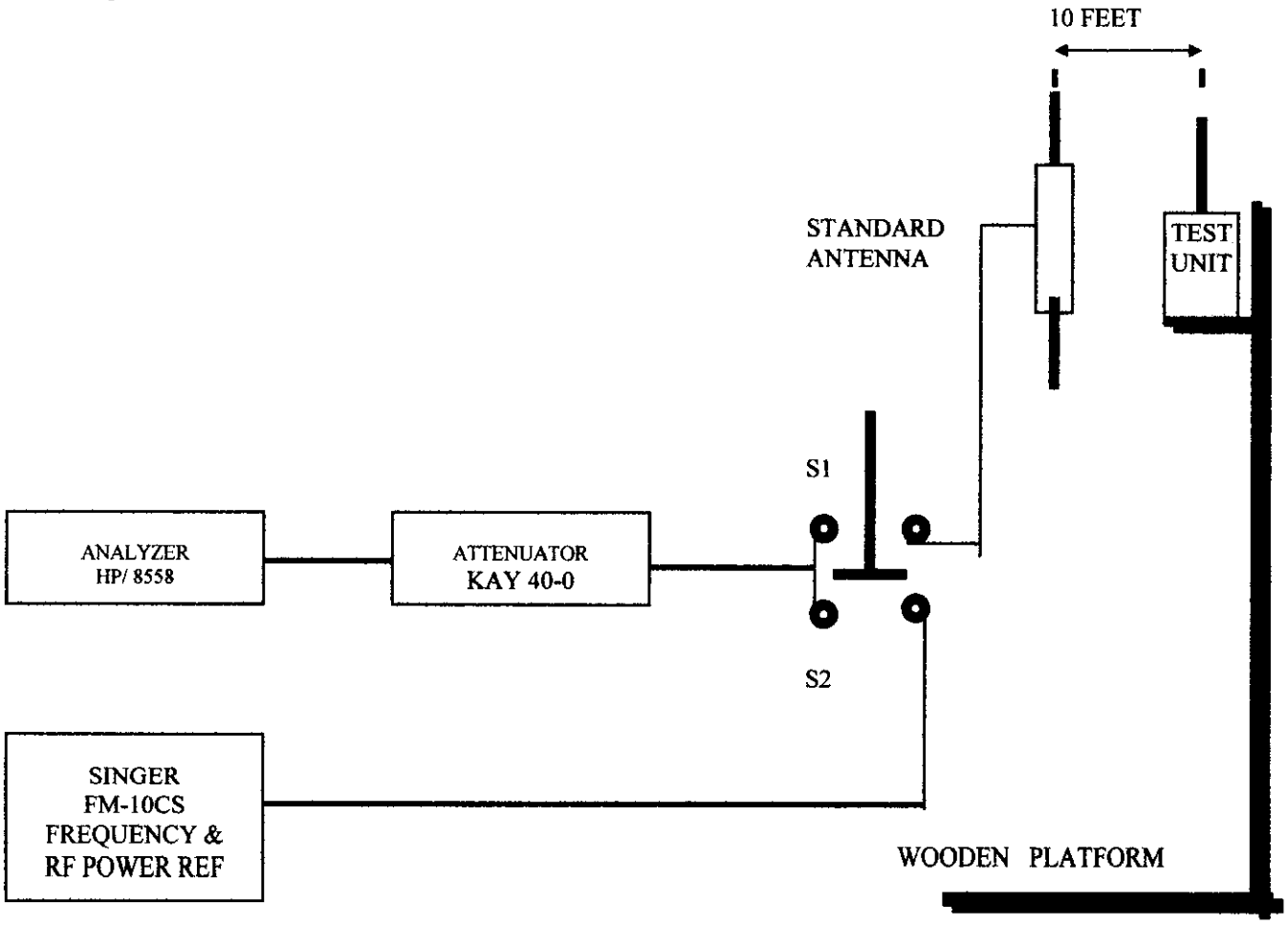
Measurements made in accordance with procedures outlined in FCC bulletin OCE 19 February 1968. Test units were tuned to the following frequency:

Unit #1	163.075 MHz
Unit #2	159.165 MHz

The antenna on the test units was a 1/4 wave whip. The standard antenna was located 10 feet from the test unit when the measurements were made. Test results are listed below. In all cases, results indicate the maximum intensity observed. The spectrum was investigated for spurious emissions from the lowest crystal oscillator frequency to 1.8 GHz.

TEST EQUIPMENT SET-UP FOR RADIATED SPURIOUS EMISSIONS (2.993) (A)

The following equipment was used to measure the radiated spurious emissions of Model 6327, Units #1 & #2:
Singer FM10CS H/P Model 182C and 8558B Spectrum Analyzer Kay Model 40-0 Attenuator
Singer Metric KT105D



EQUIPMENT SET-UP (Fig . 5)

SPECTRUM ANALYZER SETTINGS

Bandwidth 100 MHz	Scan time 10 msec per division
Horizontal (X plane)	10 MHz per division
Vertical (Y plane)	10 dbM per division
Video filter: off	log scale: on

Please Note: When using the standard antenna (KT-105D), dipole antenna DM-105-TI was used up to 140 MHz, DM-105-T2 was used from 040-400 MHz, DM-105 -T3 was used from 400 and up.

MEASURED RADIATED SPURIOUS EMISSIONS

Test Unit #1 :

Center Frequency: 163.075 MHz Field Intensity on Analyzer

Carrier Level . . . . . -19 dbM

2nd harmonic of carrier (326.150 MHz). . . . . -69 dbM

Test Unit #1 :

Center Frequency: 159.165 MHz. Field Intensity on Analyzer

Carrier Level . . . . . -21 dbM

2nd harmonic of carrier (318.330 MHz).. . . . . -71 dbM

Ambient noise level with transmitter off -79 dbM

FREQUENCY STABILITY (2.1055) (A)

(A) TEMPERATURE FROM -30 TO 50 DEGREES CENTIGRADE

The transmitter was placed in a chamber along with a centigrade thermometer and exposed to the following temperature extremes. Note: Each frequency measurement was made at the specified temperature after a five hour thermal stabilization period.

TEMPERATURE C.	-- UNIT #1 (Hz)	-- UNIT #2 (Hz) --	
-30	163,076,552	159,166,537	
-20	163,076,079	159,166,186	
-10	163,075,655	159,166,852	
0	163,075,459	159,165,550	
10	163,075,247	159,165,231	
20	163,075,003	159,165,009	NORMALIZED
30	163,074,644	159,164,690	
40	163,074,350	159,164,420	
50	163073910	159,164,006	
Delta (f)	2,641 kHz	2,531 kHz	
Delta (c)	80 degrees	80 degrees	
Stability	.00162%	.00159%	

Frequency stability better than .002% over temperature range.

Note: The 6327 uses two 6 VDC, 7 AMP gel cells in series to power the repeater. The battery is rechargeable. The operating range of the transmitter is strictly dependent on the battery characteristics.

TEST EQUIPMENT SET-UP FOR TEMPERATURE STABILITY TEST

H/P Model 5383A Frequency Meter; PMC Model BPA 20D Power Supply; Delta 575OCSD Temperature Chamber: Fluke thermocouple

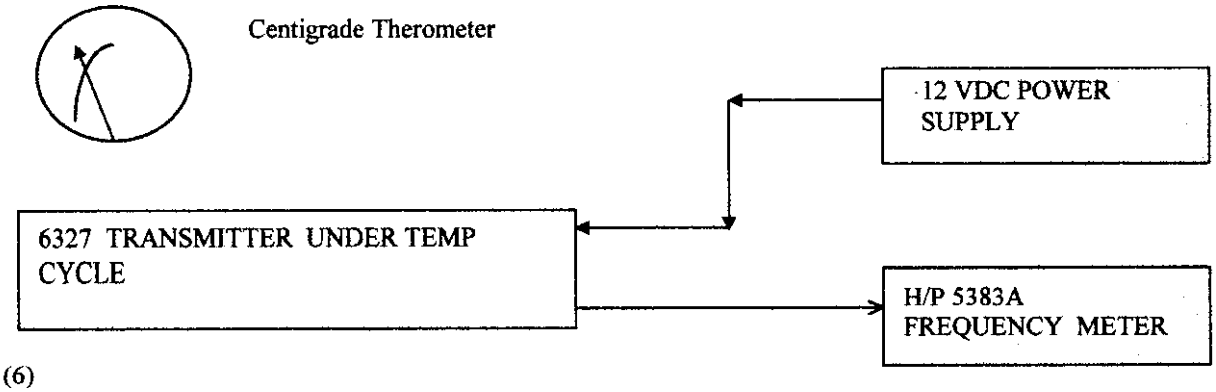


Fig (6)

PRIMARY SUPPLY VOLTAGE

(B) The primary supply voltage was varied from 85% To 115% of the normal supply voltage at the input to the external battery connection SW1.

UNIT	DELTA (V)	VOLTAGE	FREQUENCY	DELTA (F)
		13.80	163,074,902	
1	3.6 VDC	12.00	163,075,003	NORMALIZED
		10.20	163,075,311	309 CPS
		13.80	159,164,810	
2	3.6 VDC	12.00	159,165,002	NORMALIZED
		10.20	159,165,211	401 CPS

Frequency stability better than .001% over power supply voltage change.

TEST EQUIPMENT SET-UP FOR POWER SUPPLY STABILITY TEST

Same as under FREQUENCY STABILITY with the following exceptions: The temperature was held constant at 25 degrees C and the power supply voltage was varied.

Antenna Power conduction limits for receiver 15.111

(A) Measurement set-up as conducted spurious emissions, Page 10 of 18.
Note: During these measurements the transmitter was squelched OFF
Any radiation at terminals must not exceed 2 nanowatts

	Receive Frequency:	*LO Fundamental*	*Spurious Emissions*
1)	*167.075 MHz*	*52.125 MHz*	*(52.125 MHz: .3 nanowatts)* *(104.25 MHz; .2 nanowatts*
2)	*162.025 MHz*	*50.441 MHz*	*(50.441 MHz; .4 nanowatts)*
3)	*154.165 MHz*	*47.821 MHz*	*(95.642 MHz .4 nanowatts)*

No spurious spurious emissions were noted above the 2nd harmonic of the Fundamental.
Frequency measured to the 6th harmonic of the LO. LO. Noise floor was .1 nanowatts

Radiated emission limits 15.109

(A) Measurement set-up as Field Strength Measurements of Spurious Radiation's, Page 14 of 18.
Note: During these measurements the transmitter was squelched OFF
Any radiation must not exceed 150 UV at 3 meters.

Ambient noise floor was 47 UV per meter. The only spurious observed due to the LO Is as follows

	Receive Frequency:	*Recorded Spurious*	
1)	*167.075 MHz*	*52.125 MHz*	*67 UV*
2)	*162.025 MHz*	*Nothing*	
3)	*154.165 MHz*	*47.821 MHz*	*59 UV*

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