## Section (C)

## Index for Measurement Data

| FCC Section: | Description | 6327 Measurements | Page |
|---|---|---|---|
| 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 | |
| 2.1046 | RF Power into Final | 500 mill Watts Max | |
| 2.1047 | Modulation Characteristics | 1 VRMS for 3kHz Deviation | |
| 90.209 | Occupied Bandwidth | <11 kHz | |
| | Mean RF Power attenuation 10 kHz from center frequency | -43 dBc | |
| 2.1051 | Spurious Emissions Conducted | -43 dBc | |
| 2.1053 | Spurious Emissions Radiated | -43 dBc | |
| 2.1055 | Frequency Stability | >.005% | |

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 7559. C15, C18, C22 and C14 were adjusted for the maximum RF output power into a Boonton Model 42A power meter. 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 "Q1 was measured to be 123mA. across a .1 ohm resistor placed in series with L8 at 6 VDC. The maximum current into IC1 which contains the driver transistor was 11 mA.

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

| Unit # | Frequency | | Power Measured |
|---|---|---|---|
| 1 | 158.550 | MHz | 472 milwatts |
| 2 | 155.425 | MHz | 481 milwatts |

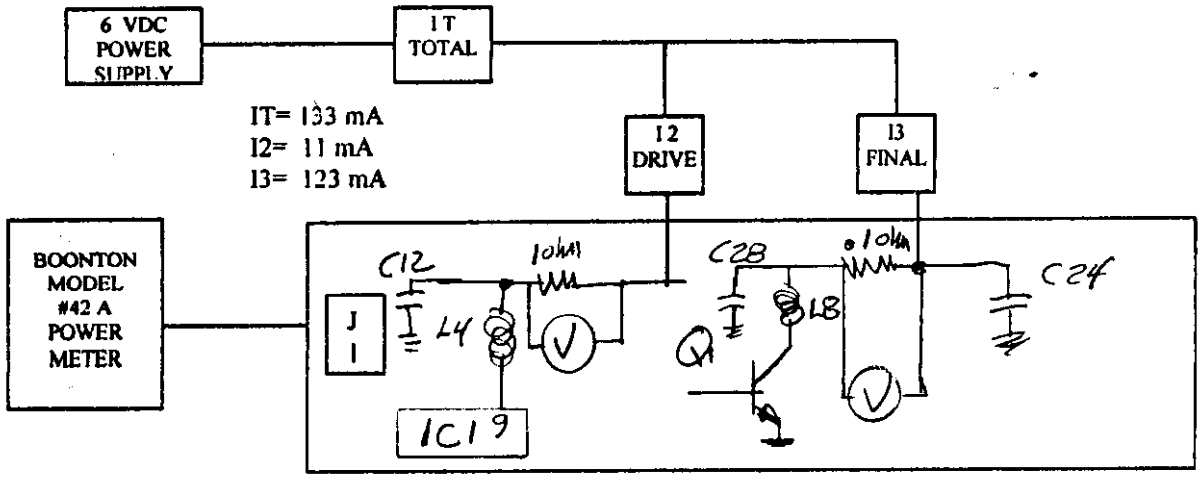



FIG (1)

(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 7559 units #1 & #2: H/P 400 GL RMS Voltmeter, H/P 3310 Audio Generator. See Fig. (2). Refer to Print ( TM7559) Note: A low impedance audio signal was injected at the Junction of C2 and R2. This signal is then amplified and hard limited by IC1. IC1 audio output is then passed through the low pass filter IC2 . Its output is applied to IC1 modulator at pin #3.

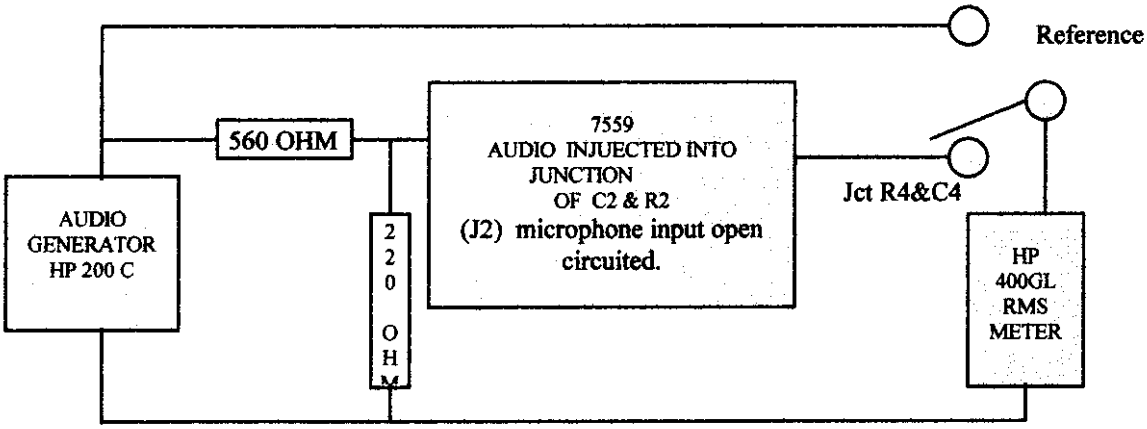



FIG (2)

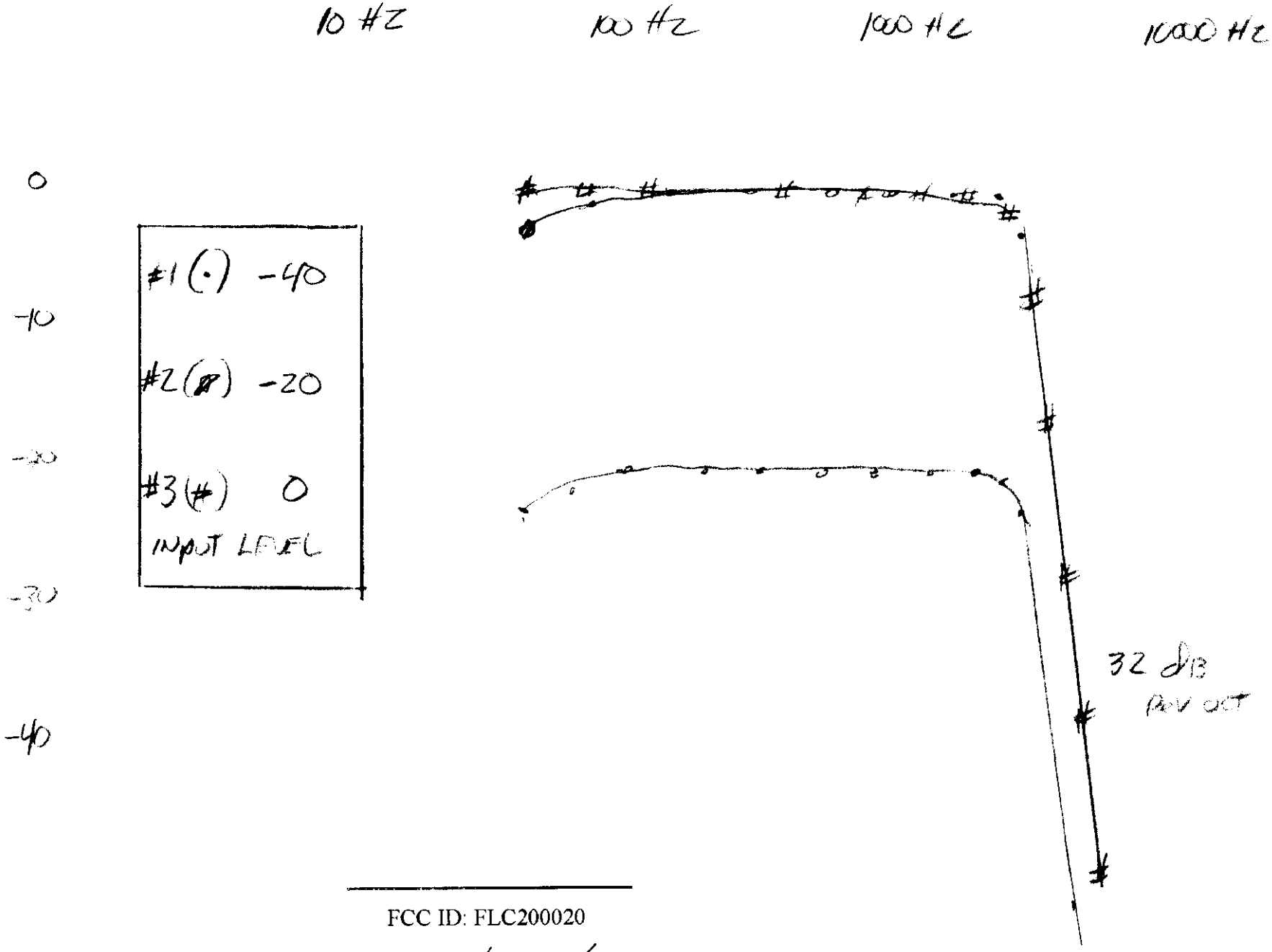
The audio level was held constant across the audio spectrum while the following curves were being made. See Fig. (3), page 4.

Curve #1: The input level was adjusted to -40 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 -20dbV rms. This level is sufficient to cause the limiter to become active. This level will be the o dB reference on the three audio response curves.

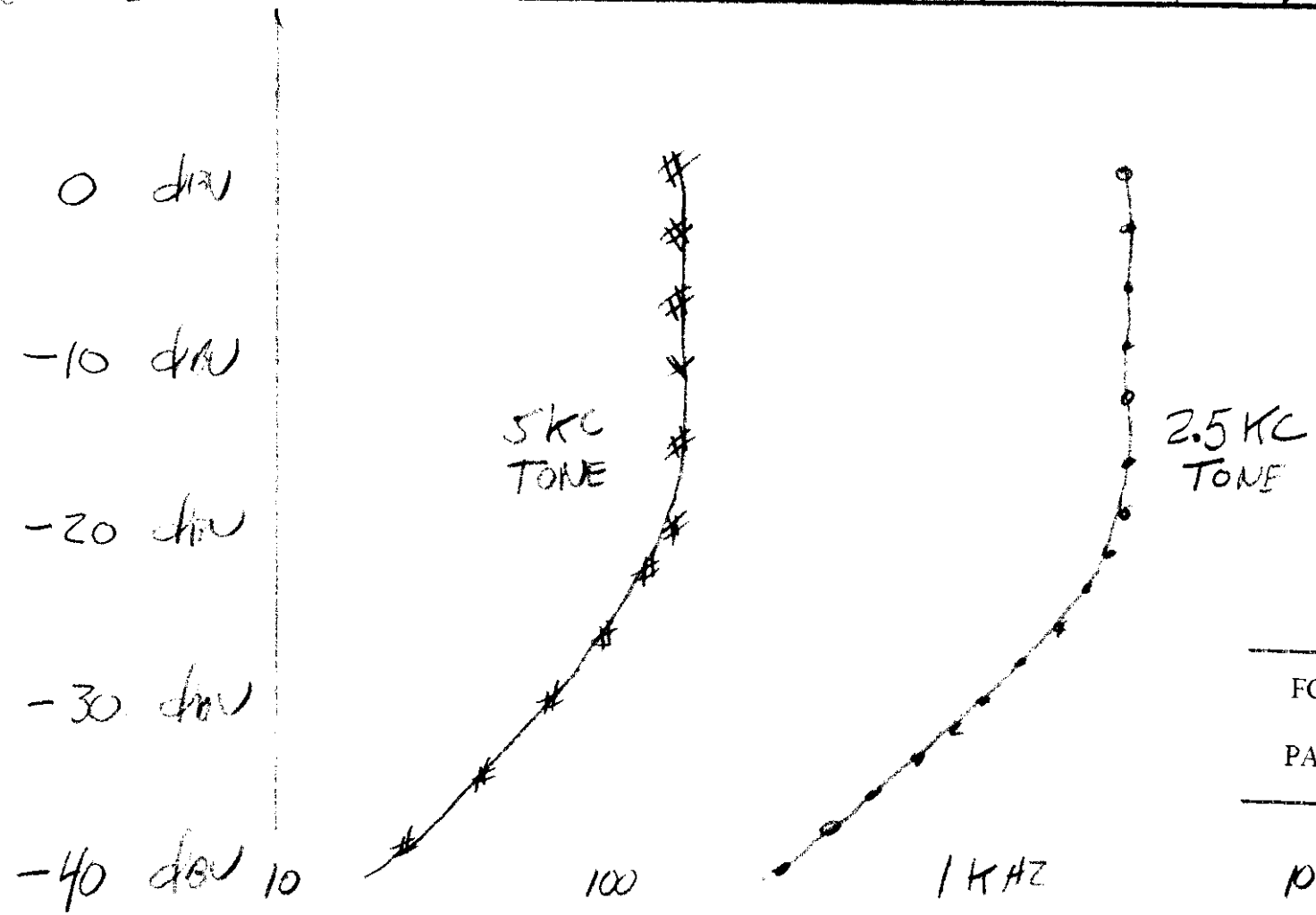
Curve #3: The input level was increased to 0dbV rms. This level is sufficient to cause the limiter to be in hard-limiting across the entire audio spectrum being investigated Curve #3 illustrates that the audio level into the modulator does not exceed the reference level.

The modulator sensitivity is 1 VRMS per 3 kHz deviation at the junction of R4 and C4 and Pin # (3), IC1. The modulation can be decreased by adjusting the values of R5 & R6. The range of IC1 limiter is in excess of 30dB. Please Note: The modulation is factory adjusted for the proper deviation.


10 HZ
100 Hz
1000 HZ
10000 Hz
0
-10
-20
-30
-40
#1 (·) -40
#2 (#) -20
#3 (#) 0
INPUT LEVEL
32 dB
AV OUT

• 2.5 KHZ
# 5 KHZ

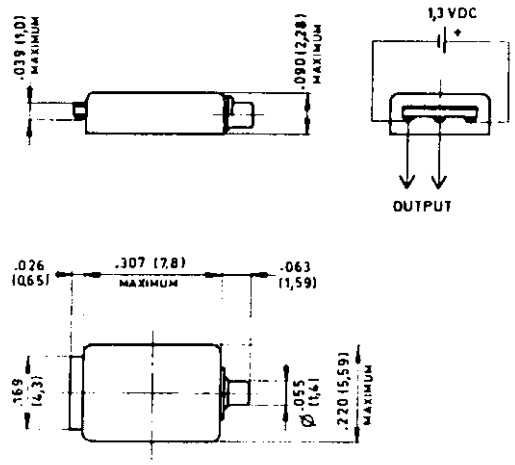
## MODULATING FREQUENCY




## MEASURED DEVIATION

# LECTRET

PERFORMANCE SPECIFICATION
MODEL 1242




DIMENSIONS IN INCHES (MM)

New subminiature condenser microphone for professional applications. A special feature is the low frequency cut of 5dB per octave below 1 KHz which improves the quality of voice communications in noisy environments. Transducers represent the state of the art in resistance to shock and vibration and in acoustic performance. A novel electret element and integral preamplifier are included.

| | |
|---|---|
| Noise level («A»-weighted) (2 KHz equivalent SPL) | 32 dB nom. |
| Supply voltage | 3 V (.9-20 V) |
| Current drain at 3 V | 30 µA |
| Output impedance | 1,5-4 Kohm |
| Distortion (3%THD at 3 V supply) | 115 dB SPL |

Sensitivity (dbV)

| Frequency | min | nom | max |
|---|---|---|---|
| 300 Hz | | - 73 | |
| 1000 Hz | - 69 | - 65 | - 61 |
| 2000 Hz | | - 62 | |
| ~ 3800 Hz | | - 60 | |

Device conformity range of deviation from 1 KHz

| | | | |
|---|---|---|---|
| 300 Hz | - 12 dB | to | - 5 dB |
| 1000 Hz | | 0 | |
| 2000 Hz | + 1 dB | to | + 5 dB |
| ~ 3800 Hz | + 2 dB | to | + 10 dB |

PATENTS PENDING

FCC ID: FLC200020

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## FREQUENCY RESPONSE

(Measured with 3 V supply and high impedance amplifier)

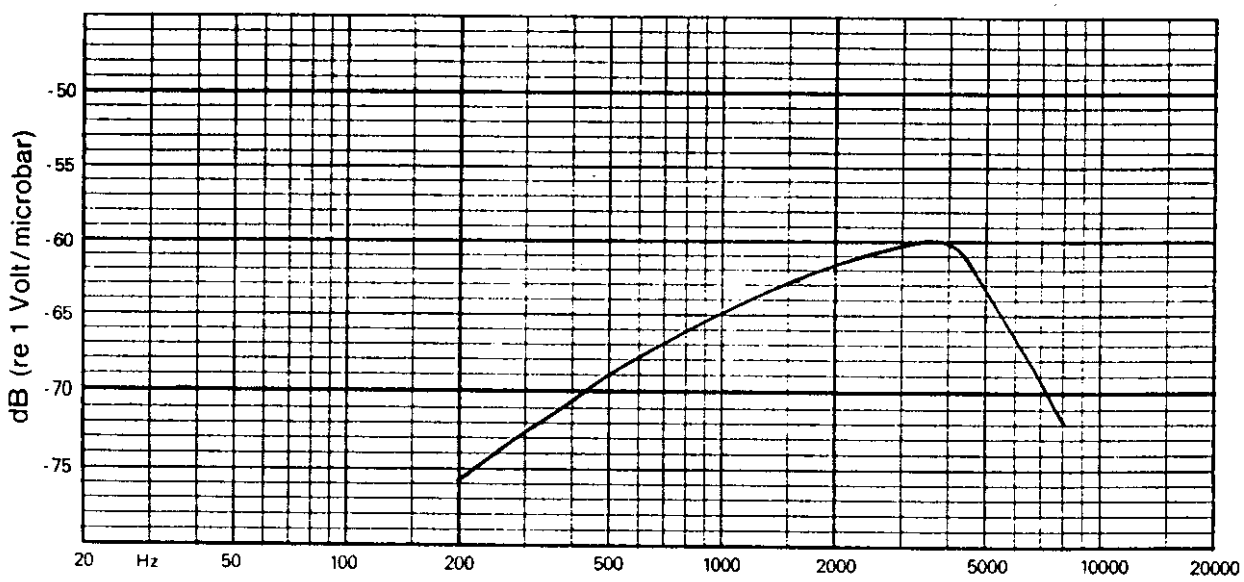
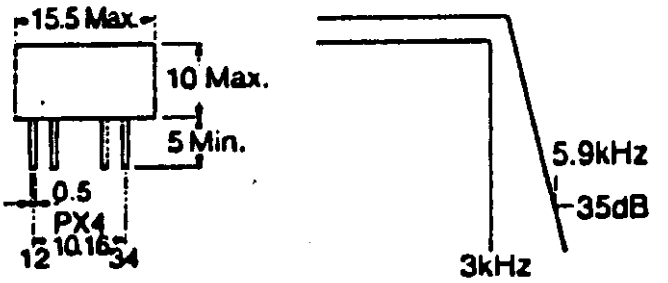


**Fig. 2 Low Pass Filter**




| Pin No. |
|---|
| 1 INPUT |
| 2 GND |
| 3 OUTPUT |
| 4 Vc |

TK5426

(C) OCCUPIED BANDWIDTH (90.209) (1)

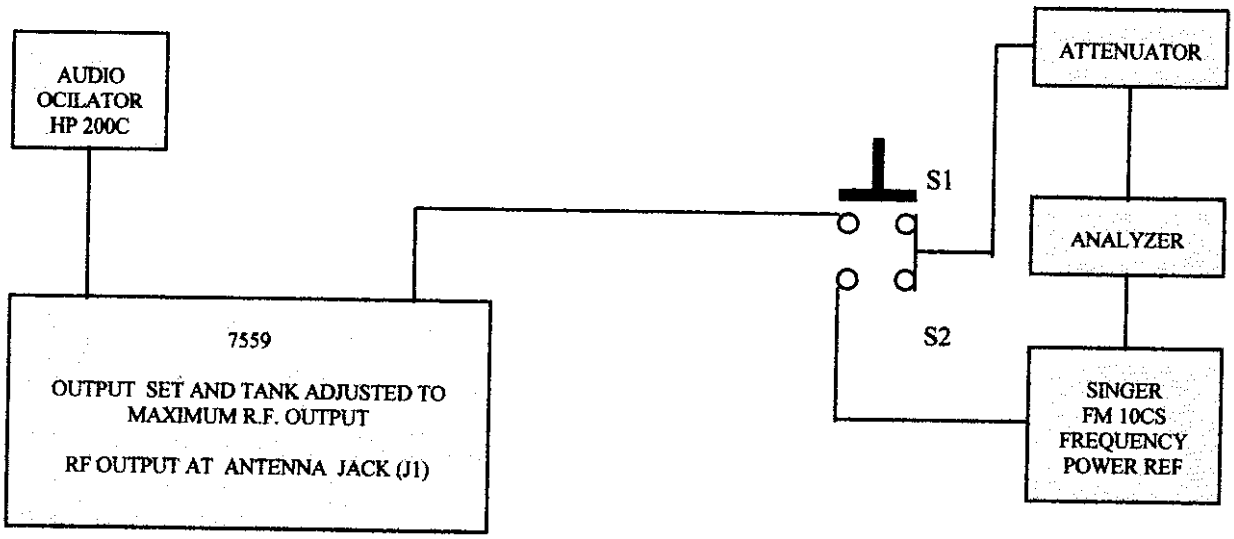
The frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission. When modulated by and input signal 16 dB greater than required to produce 50% modulation, test at 2500 Hz.

MEASURED OCCUPIED BANDWIDTH

Model 7559 Test Units #1 & #2 had less than 11 kHz occupied bandwidth at 2500 Hz modulation. Please note: Audio level was held constant for 1000 and 2,500 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.

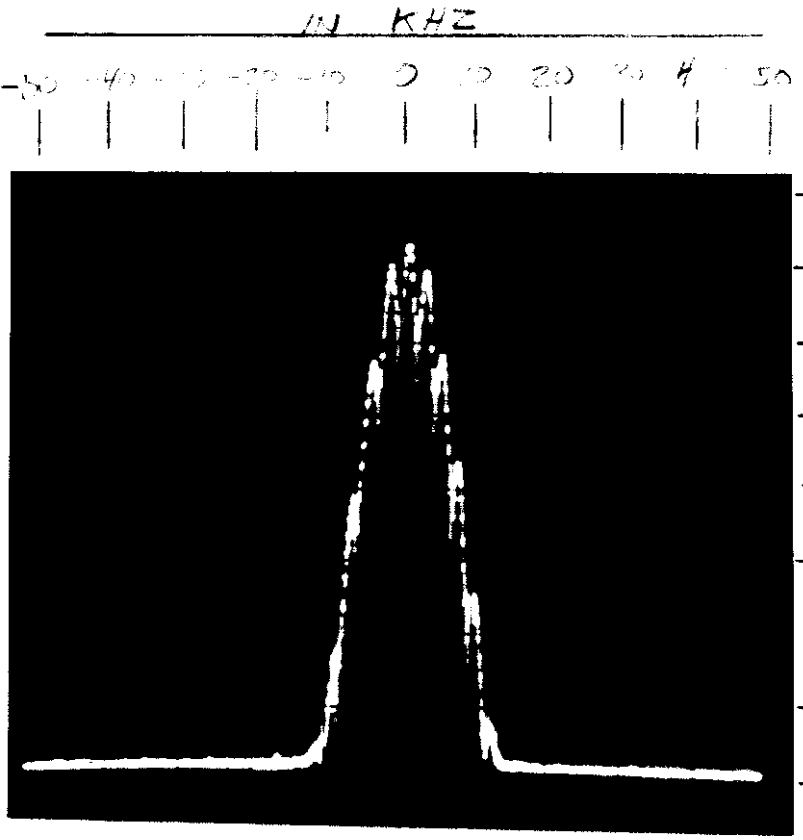



SPECTRUM ANALYZER SETTING

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

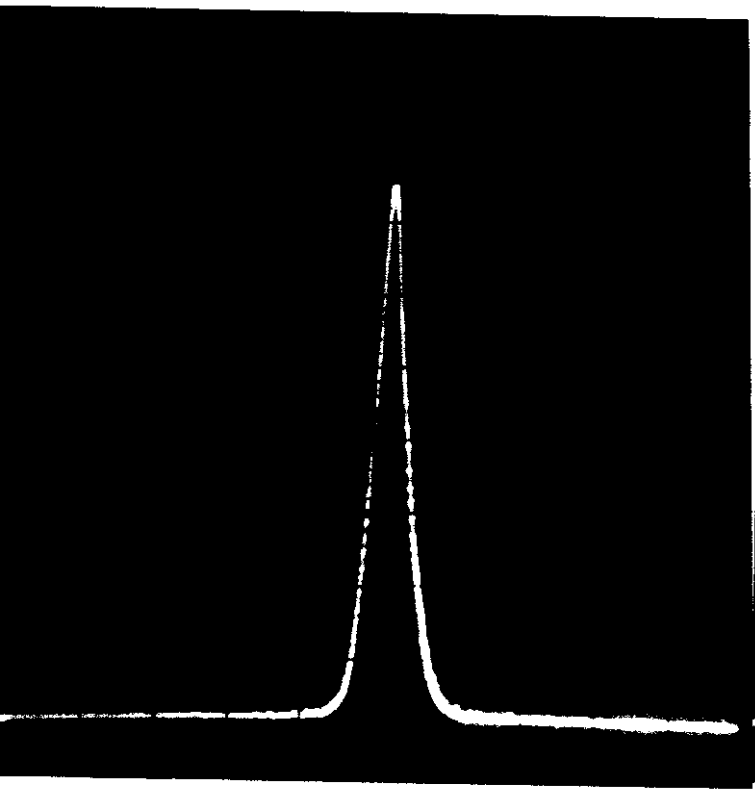
Scan time 20 msec per division
10 KHz per division
10 dbM per division
Log Scale: on

See page 9 for spectrum display.

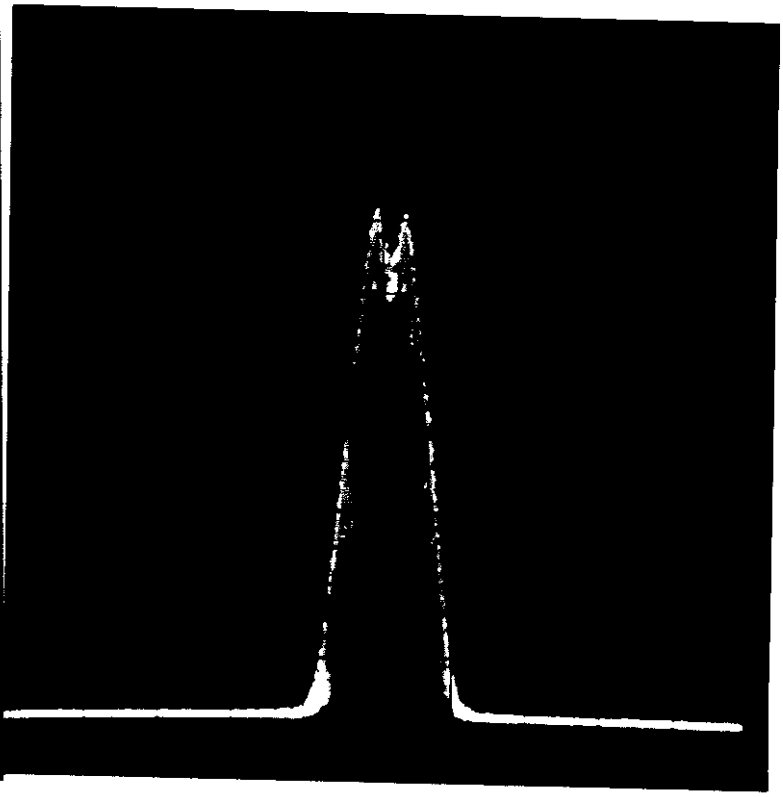



NOTE: SAME SCALE ALL PHOTOS

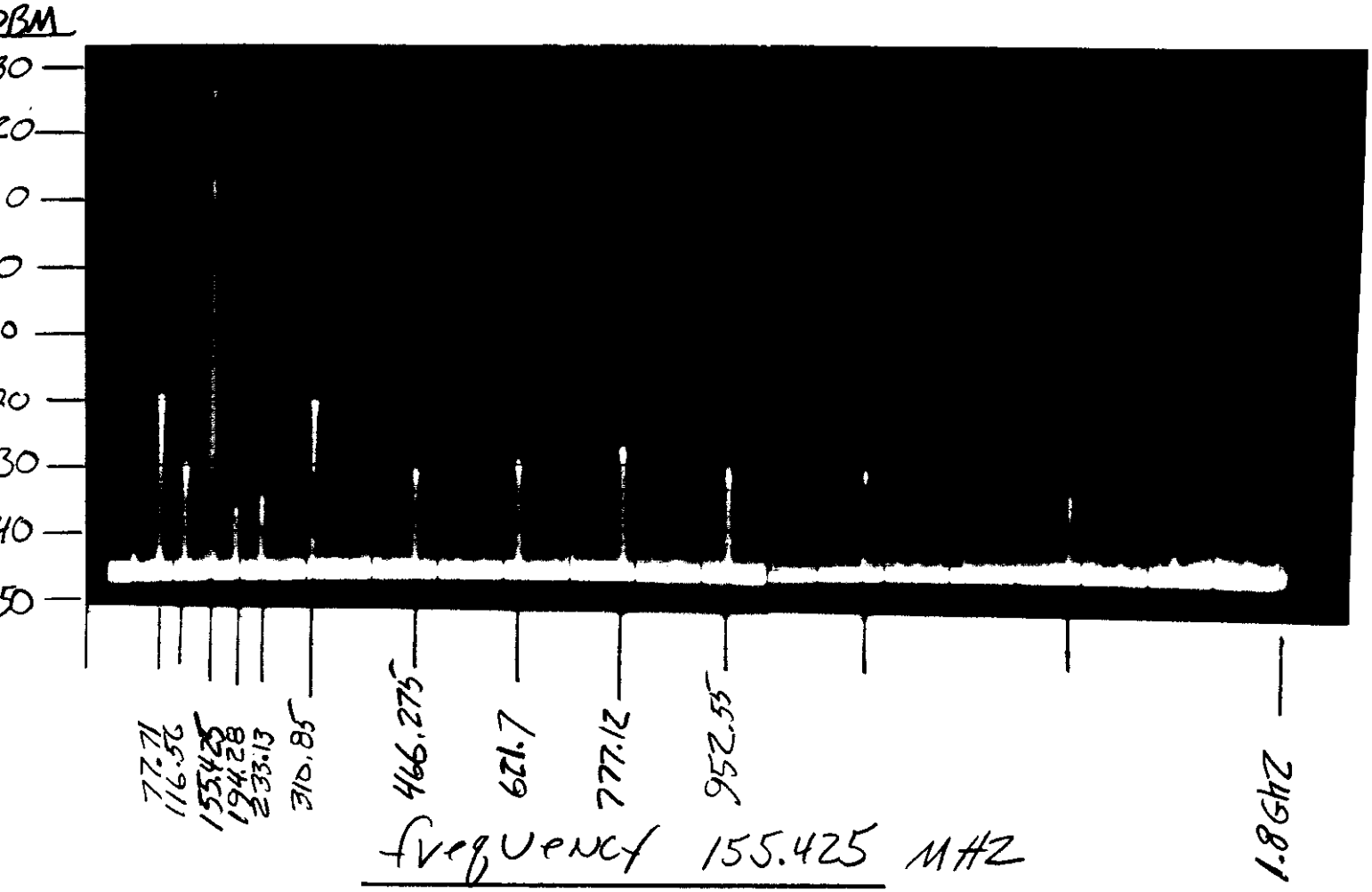
2.500 KHZ TONE

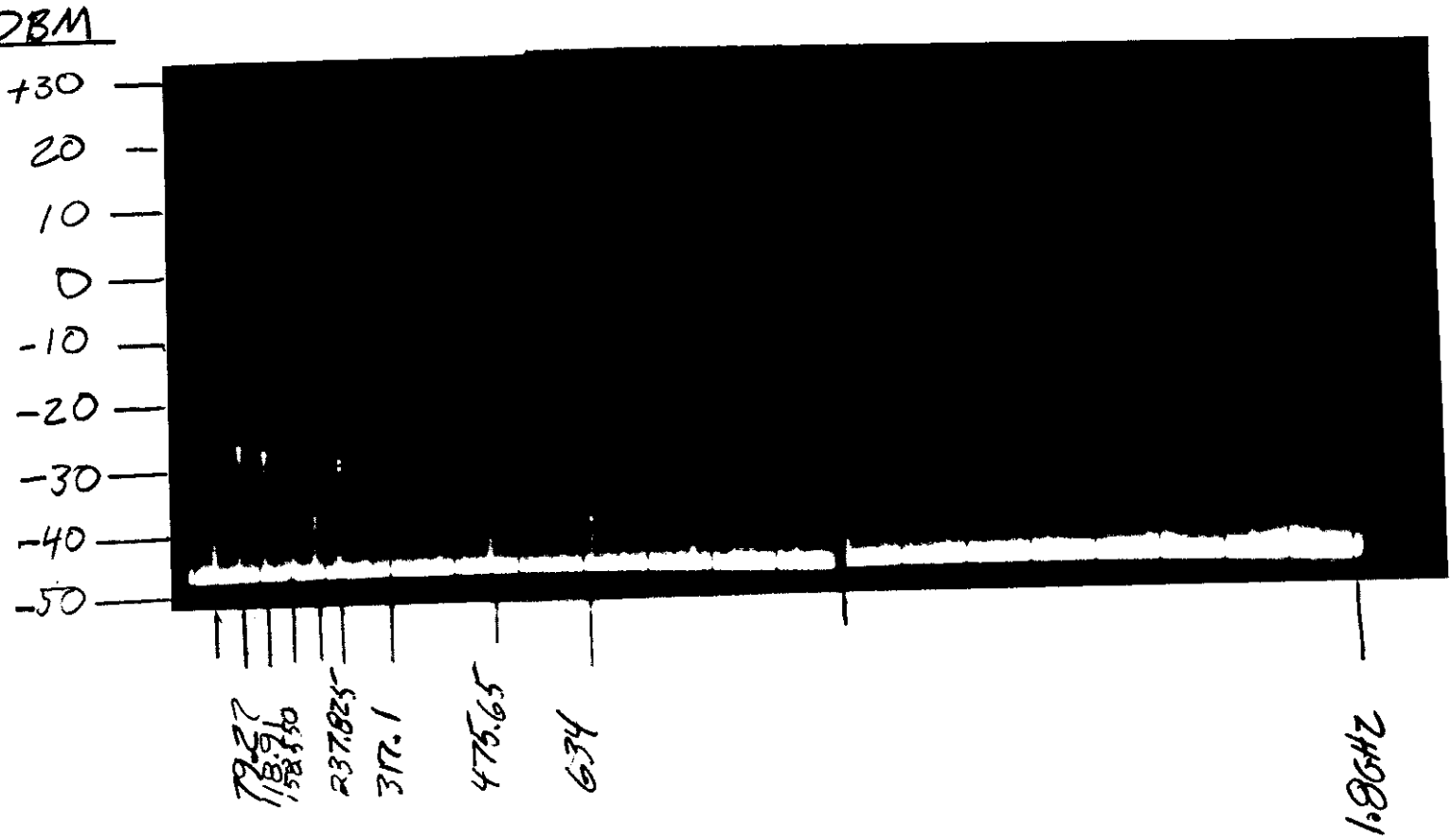


CARRIER



1 KHZ TONE


dBM
30
20
0
0
0
20
30
40
50
77.71
116.56
155.425
194.28
233.13
310.85
466.275
621.7
777.12
952.55
1.8GHz
frequency 155.425 MHz




frequency 158.550 MHz

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

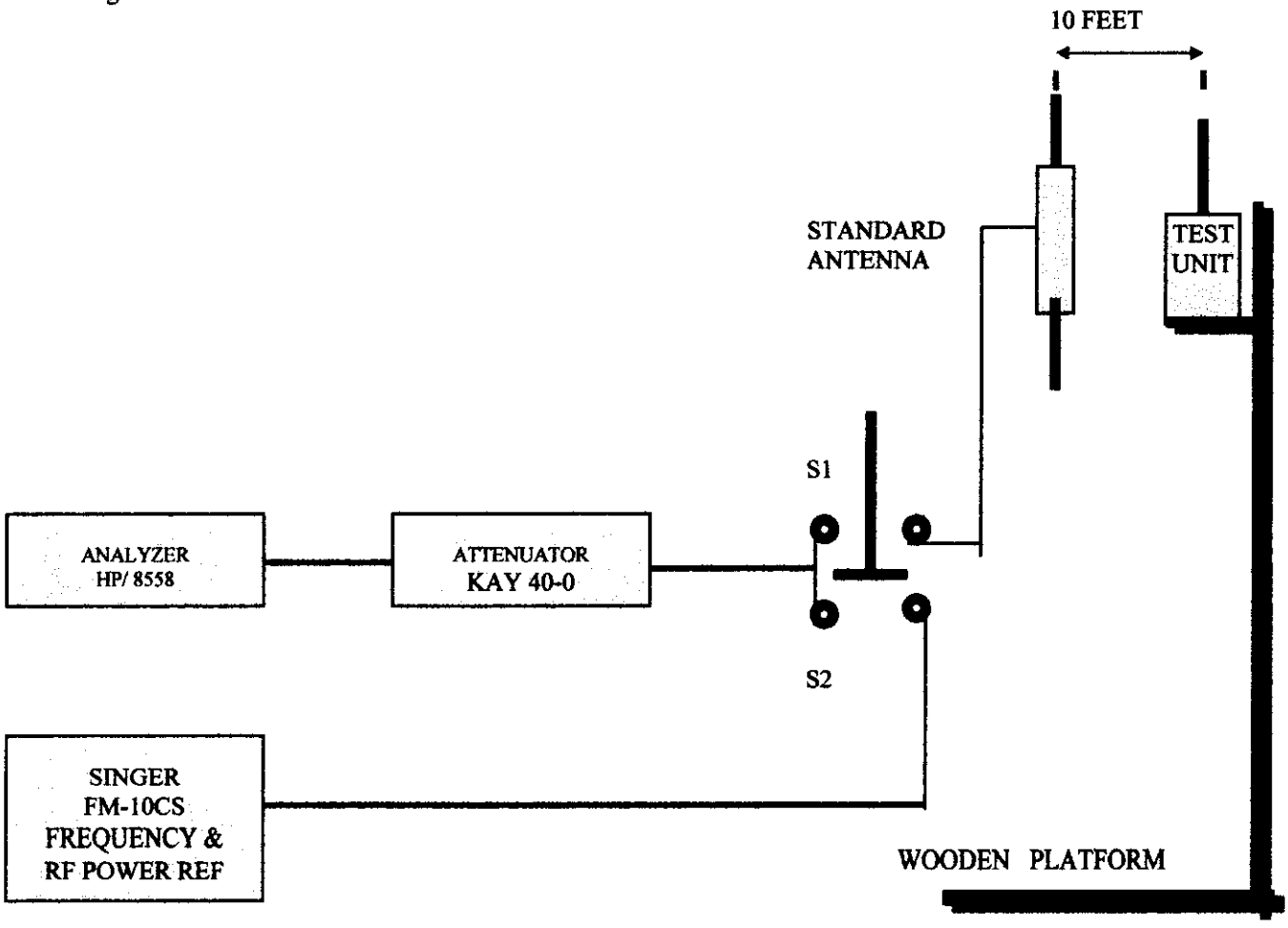
Measurements made in accordance with procedures outlined in FCC bulletin OCE 19 February 1968. Test units were tuned to the following frequency:

| | |
|---|---|
| Unit #1 | 158.550 Mhz |
| Unit #2 | 155.425 Mhz. |

The external microphone was connected to the test units. 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 7559, 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: 158.550 Mhz Field Intensity on Analyzer

Carrier Level ..... -18 dbM

2nd harmonic of carrier (317.10)..... -62 dbM

3rd harmonic of carrier (475.65)..... -68 dbM

Test Unit #1 :

Center Frequency: 155.425 Mhz Field Intensity on Analyzer

Carrier Level ..... -21 dbM

2nd harmonic of crystal (77.71) -73 dbM

2nd harmonic of carrier (310.85)..... -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 | 158,551,522 | 155,426,507 | |
| -20 | 158.551,173 | 155,426,165 | |
| -10 | 158,550,856 | 155,425,854 | |
| 0 | 158,550,55 | 155,425,559 | |
| 10 | 158.550,222 | 155,425,233 | |
| 20 | 158,550.000 | 155,425,000 | NORMALIZED |
| 30 | 158,549,682 | 155,424,673 | |
| 40 | 158,549,397 | 155,424,390 | |
| 50 | 158,548,985 | 155,423,989 | |
| Delta (f) | 2.53 KHz | 2.61 KHz | |
| Delta (c) | 80 degrees | 80 degrees | |

Frequency stability better than .002% over temperature range.

Note: The 7559 uses a three 1.5 VDC Alkaline AAA transistor batteries to power the transmitter. The battery is a throwaway. 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

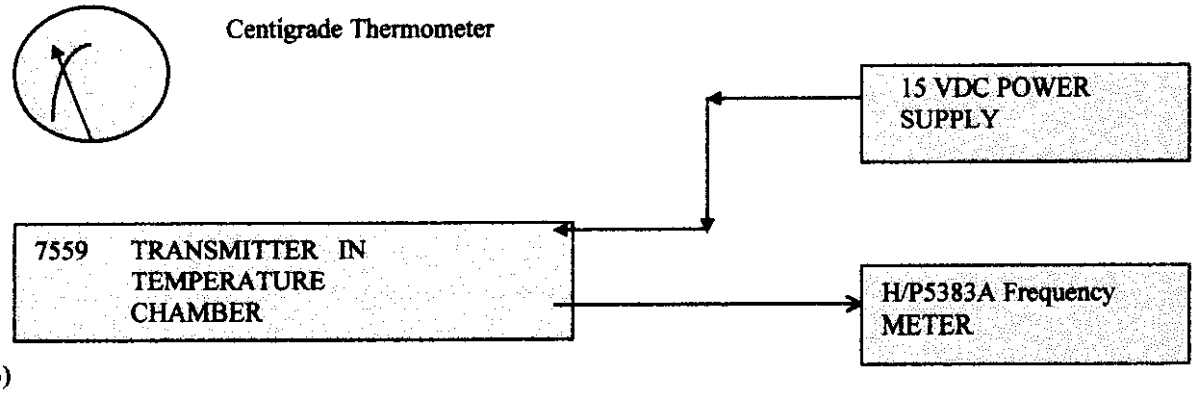



Fig (6)

PRIMARY SUPPLY VOLTAGE

(B) The primary battery 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 DC | FREQUENCY HZ | DELTA (F) |
|---|---|---|---|---|
| | | 3.80 | 155,425,727 hZ | |
| 1 | 2 .4 VDC | 4.50 | 155,425,650 | NORMALIZED |
| | | 5.20 | 155,425,617 | 110 CPS |
| | | 3.80 | 158,550,474 | |
| 2 | 2 .4 VDC | 4.50 | 158,550,540 | NORMALIZED |
| | | 5.20 | 158,550,640 | 166 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.