LIST OF EXHIBITS

The enclosed report is subdivide into three sections under the following headings:

Section (A)	*Overview and FCC ID:*
Section (B)	*Description of equipment, operation and tune-up Procedure.*
Section (C)	*Measurements and data required for certification.*
Section (D)	*Photographs and drawings revealing equipment construction.*

SECTION (A)

Overview

This technical report provides information required for Certification under FCC Part 90 for Model 7559, 120 Mw Flat pack body transmitter, manufactured by Swintek Enterprises Inc. This device is intended for use by police agencies during certain undercover operations where voice and other audible activities can be monitored remotely. It is contained in a Plastic case. Exhibits are provided in this report as set forth in Part 2. of the Rules and Regulations. Initial estimates are that approximately 100 per year of Model 7559 will be manufactured.

FCC Identifier:

The FCC Identifier for the above described device is shown below:

FCC ID: FLC200020

Section (B), page 6 of 6 illustrates a drawing of the FCC ID: label. The location of the FCC ID label is shown in Section (D), Photograph #1. The FCC ID: label will be located as shown in the photograph.

Section (B)

Technical Description:

Model 7559 is a 4.5 VDC, (three AAA batteries) powered transmitter. It is designed to be worn on the body of undercover police officers during certain undercover operations whereby voice and other audible activity can be monitored or recorded from a remote receiver station.

The design is such that the batteries and microphone and antenna are all contained within the plastic enclosure on a single PC assembly. An optional cord electret microphone is offered which allows the transmitter to use an external microphone when necessary. The transmitter will operate continuously for a 2 hr. period at the rated power.

Transmitter Specifications:

General

Power input:	*4.5 VDC: (3 ea.) AAA Batteries*
Current Consumption:	*110 mA 120mW fixed power output*
Package	*Delrin*
Temperature range	*-30 to 60C*
Distortion:	*<5% at 1KHZ, 2KHZ deviation*
B(n)=2M+2D=	*2(3kHz)+2(3kHz)=12kHz*

TRANSMITTER

Emission	*12K0F3E*
Number of channels	*1 standard*
Frequency control	*crystal*
Modulation	*FM*
Modulation sensitivity	*3 kHz deviation for one Volt RMS*
Frequency Response	*300-3KHZ (-32 dB oct low pass filter)*
Power Output	*120 mW: maximum.*
Spurious Output	*-43 dBc Maximum*
Frequency Stability	*50PPM*
Duty Cycle	*Continuous*

Transmitter Circuit Description

General

The Swintek 7559 VHF transmitter utilizes a single board, battery powered, crystal controlled, FM modulated, 120 mill-watt transmitter. It features a 300-3000 kHz, Toko active low pass filter with an attenuation 36 dB per octave above 3 kHz. The transmitter utilizes a 4.5 VDC boost inverter to increase and regulate the transmitter voltage a 6VDC

The transmitter consists of four active semiconductors devices: A single IC1 transmitter subsystem (Motorola MC2833), A MRF5812 Power Amplifier; a MAX 637 Voltage Boost regulator and a Toko THB127B low pass active filter.

Crystal Oscillator

The Model 7559 transmits a single channel Frequency Modulated (FM) Signal containing analogue telephone information. It occupies a bandwidth of approximately 12 kHz, resulting in an emission designator of 12KOF3E. The 7559 operates at a single, fixed frequency in the range of 154.500 to 172 mHz. It maximum power rating is 120 Mw. No means are provided to adjust the output power. The transmitter will operate continuously for a 2+ hours with a new batteries installed. A constant voltage boost power supply is used to maintain the transmitter at a constant voltage of 6VDC. Frequency drift at the end of battery life is less than 500 hZ and power output is typically less then 100 mW.

IC1 includes a microphone amplifier, oscillator, buffer and two auxiliary RF amplifier transistors. The Oscillator is a Colpitts type. The frequency is set by the crystal YM1. This crystal is a third overtone, series mode which is rated at 5PPM over the temperature range of -30 to 50 degrees C. .The crystal oscillates on the fundamental frequency of Fc= (Fc+20kHz)/4 mHz. The frequency is adjusted to center frequency by means of L2

The oscillator is modulated by the internal variable reactance of IC1; MC2833. An internal op-amp with diode clamp limiting, is capacity coupled to an electret microphone input. The output of this op-amp is passes through low pass filter THB127B. The audio output of this filter is used to vary the reactance modulator in IC1.

MODULATION LIMITING CIRCUITRY

The peak to peak audio frequency voltage being applied to the modulator is hard limited by the audio op-amp of IC1 at a maximum of one volts peak to peak. This signal is then passed through an active Toko THB127B, low pass filter to remove all frequencies above 3kHz at a slope of 35 dB per octave. The audio output level to the modulator is adjusted by the combination of R5 and R6. This level is factory set to 3kHz deviation and sealed.

Buffer & First Multiplier

The first auxiliary amplifier is used as a 4X multiplier. C13 and L3 are adjusted to the 4^{th} harmonic. The second transistor acts as a buffer, providing approximately 20 mW of drive to Q1. C14 and L5 are adjusted to the 4^{th} harmonic of the crystal for maximum drive at minimum spurious at the desired output frequency.

FCC ID:FLC200020

Final Amplifier

The MRF5812, (Q1) power amplifier is biased into class A conduction to reduce even order harmonics and to reduce drive requirement. It operates at the nominal voltage of 6VDC and has an efficiency of approximately 50%. The power output of the final power stage is controlled by the bias resistor R14. A nominal current of 50 ma is required for normal operation at its specified power output.

Harmonic Filter

L7, L8, L10, C17, C18,and C22 and associated components form a 3-pole bandpass filter centered at approximately 150MHz. Harmonic signal are filtered from Q1 and the transmit signal is passed to the RF output jack, J1.

Voltage Regulator/Boost

IC3 is a low power boost or inverting DC-DC converter. An internal .5 Amp MOSFET switch reduces the total part count and allows a switching speed up to 100 kHz. L12 and D1 form the switching circuit. C26, C25, and C24 filter the DC output. R15 and R16 set the output voltage to 6VDC.

Indicators

LED-1 will glow green whenever the power switch (SW-1) is set to on.

TRANSMITTER CRYSTAL SPECIFICATIONS

VHF Transmitter Crystal

Specification ID	YM1
Function	Colpitts Oscillator
Formula	F=Fc/4
Crystal Frequency Range	(FX) 37.5 MHz to 43.2 mHz
Carrier Frequency Range	(F0) 154.500 MHz to 172 MHz
Holder Type	HC-18/U
Mode	3 rd overtone
Frequency Tolerance	± 10 PPM
Stability (--20 degrees C to +60C)	± 5.0 PPM
Upper Turn Point (±7 degrees C)	45 degrees C
Series Resistance	20 Ohm max.
Load Capacitance	56pF

Tune Up Procedure

A. *Connect a through-line wattmeter to the output of the transmitter (J1). Connect a 30dB pad to the output of the wattmeter and the output of the pad to a spectrum analyzer.*

B. *Supply 4.5 VDC to battery input. Turn On power switch SW-1*

C. *Adjust C13 for maximum Oscillator drive to multiplier stage. Adjust L2 to F carrier output Frequency +_ .0001%*

D) *Adjust C14 (Quad multiplier) for maximum RF output.*

E. *While monitoring the spectrum analyzer, adjust C15, C18 and C22 for maximum carrier signal with minimum spurious emissions.*

F. *Inject a capacity decoupled 1Vrms Sign wave at 1 kHz into the junction of R2 and R7. The maximum deviation should be 3 kHz. If not re-set the value of R5 and R6*

G. *While monitoring the spectrum analyzer, readjust C13, C14, C15, C18 and C22 for minimum spurious with fixed bias resistor R14 set for a maximum carrier power of 120 mW. All spurious content less then -43dBc.*

Section (C)

Index for Measurement Data

FCC Section:	Description	7559 Measurements	Page
90.207	Type of Emission	12K0F3E	
90.209	Bandwidth Limitations	12.5 kHz	
90.217	Emission Mask (B) as per 90.217	12.5 kHz	
90.214	Transient Frequency Behavior	<8 mil Sec	
2.1046	RF Power into Final	120 mill Watts Max	
2.1047	Modulation Characteristics	1 VRMS for 3kHz Deviation	
90.209	Occupied Bandwidth	12.5 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 43mA. 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		Output Power Measured
1	158.550	MHz	118 milwatts
2	155.425	MHz	115 milwatts

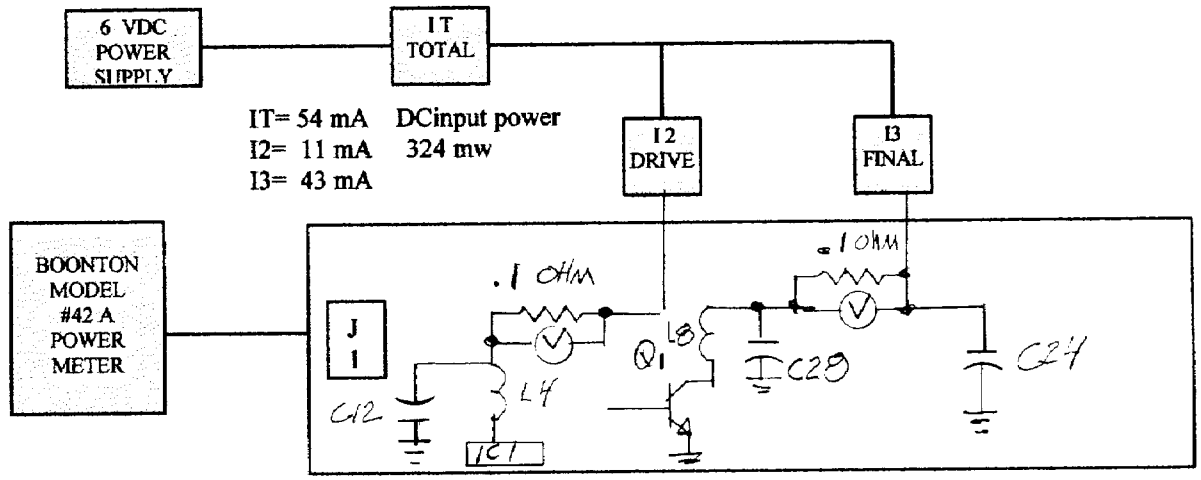


FIG (1)

(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.

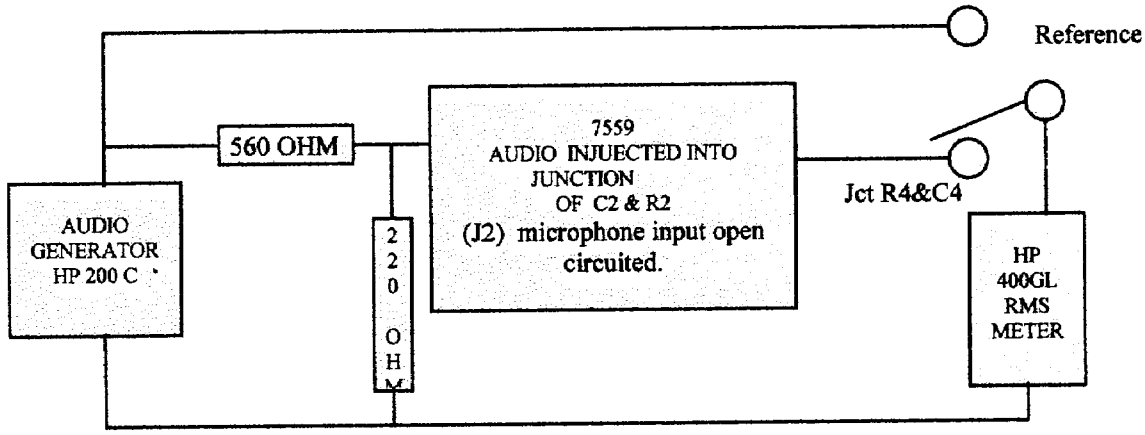


FIG (2)

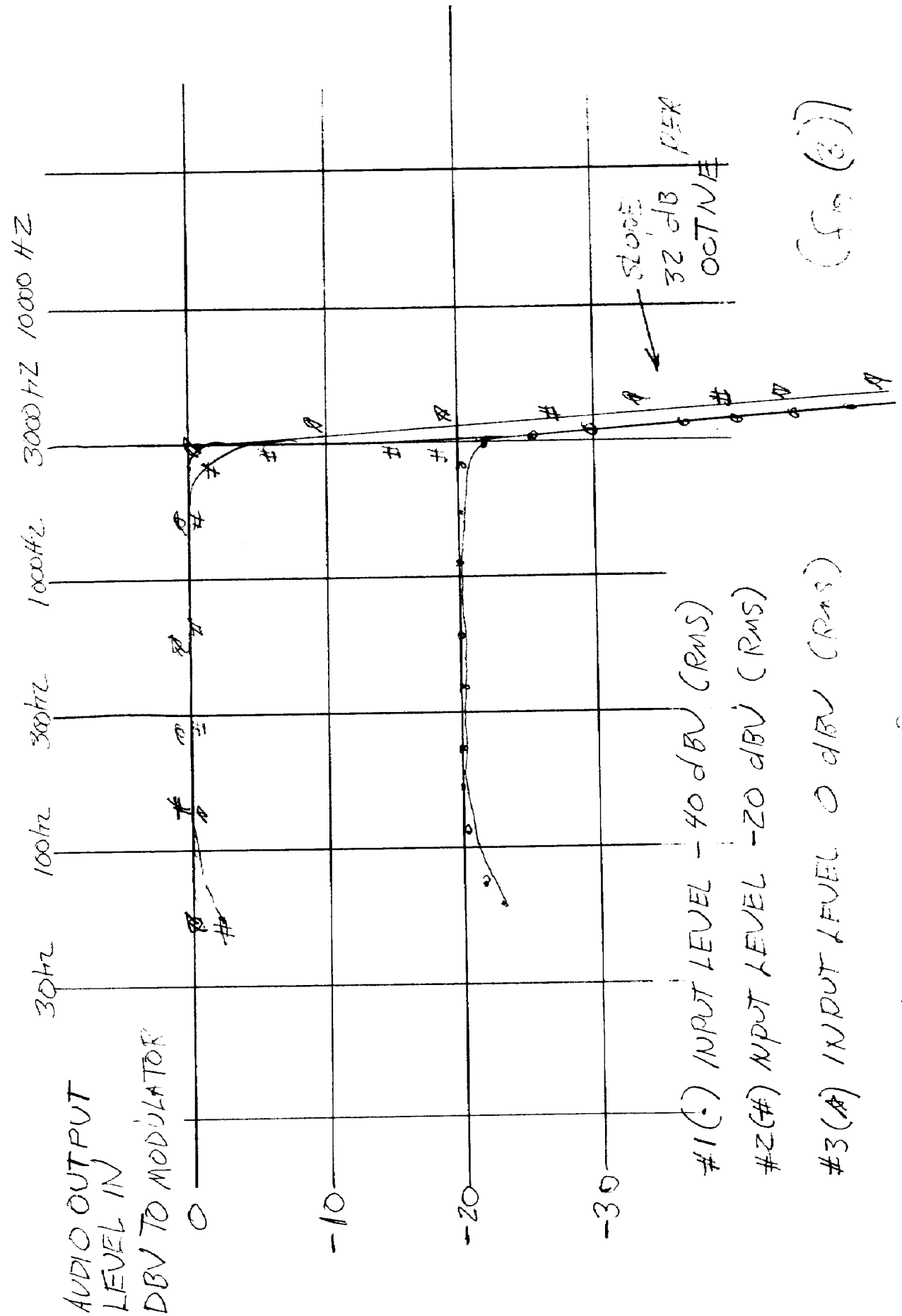
The audio level was held constant across the audio spectrum while the following curves were being made. See Fig. (3), page 4.

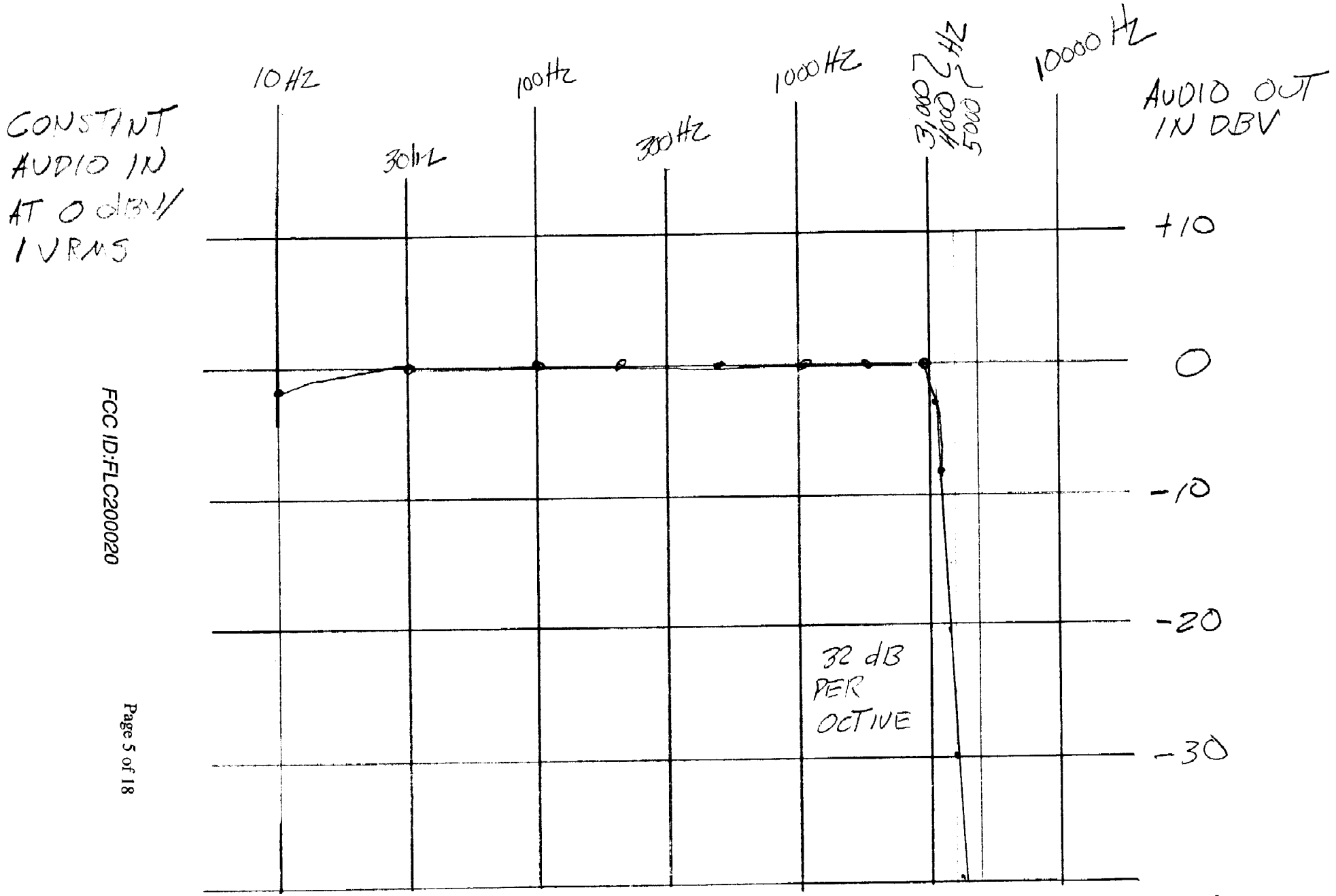
Curve #1: The input level was adjusted to -40 dbV rms. This level is not sufficient to cause the limiter circuitry to be activated. This curve illustrates the audio response to the modulator before limiting after passing through the low pass filter

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.

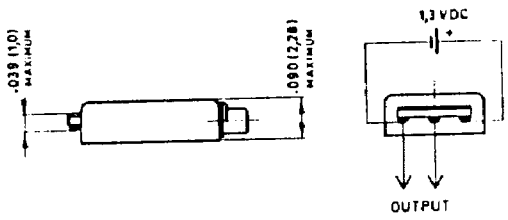

AUDIO OUTPUT LEVEL IN DBV TO MODULATOR
0
-10
-20
-30
30Hz
100Hz
300Hz
1000Hz
3000Hz
10000Hz
SLOPE 32 dB PER OCTAVE
#1(·) INPUT LEVEL -40 dBV (RMS)
#2(#) INPUT LEVEL -20 dBV (RMS)
#3(#) INPUT LEVEL 0 dBV (RMS)
0 dBV = 1 VOLT RMS

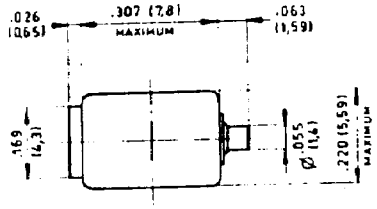


AUDIO FREQUENCY RESPONCE
AUDIO LOW PASS FILTER
TK 5426 (IC2) fig (2)

PERFORMANCE SPECIFICATION
MODEL 1242

ELECTRET





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

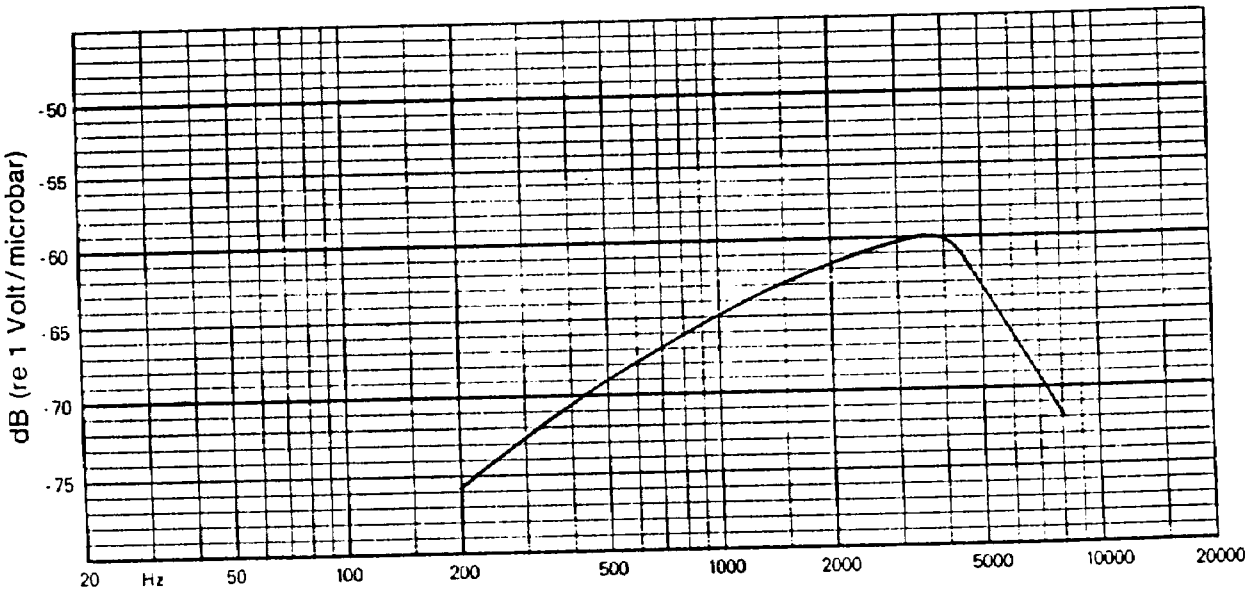
PATENTS PENDING

FCC ID: FLC200020

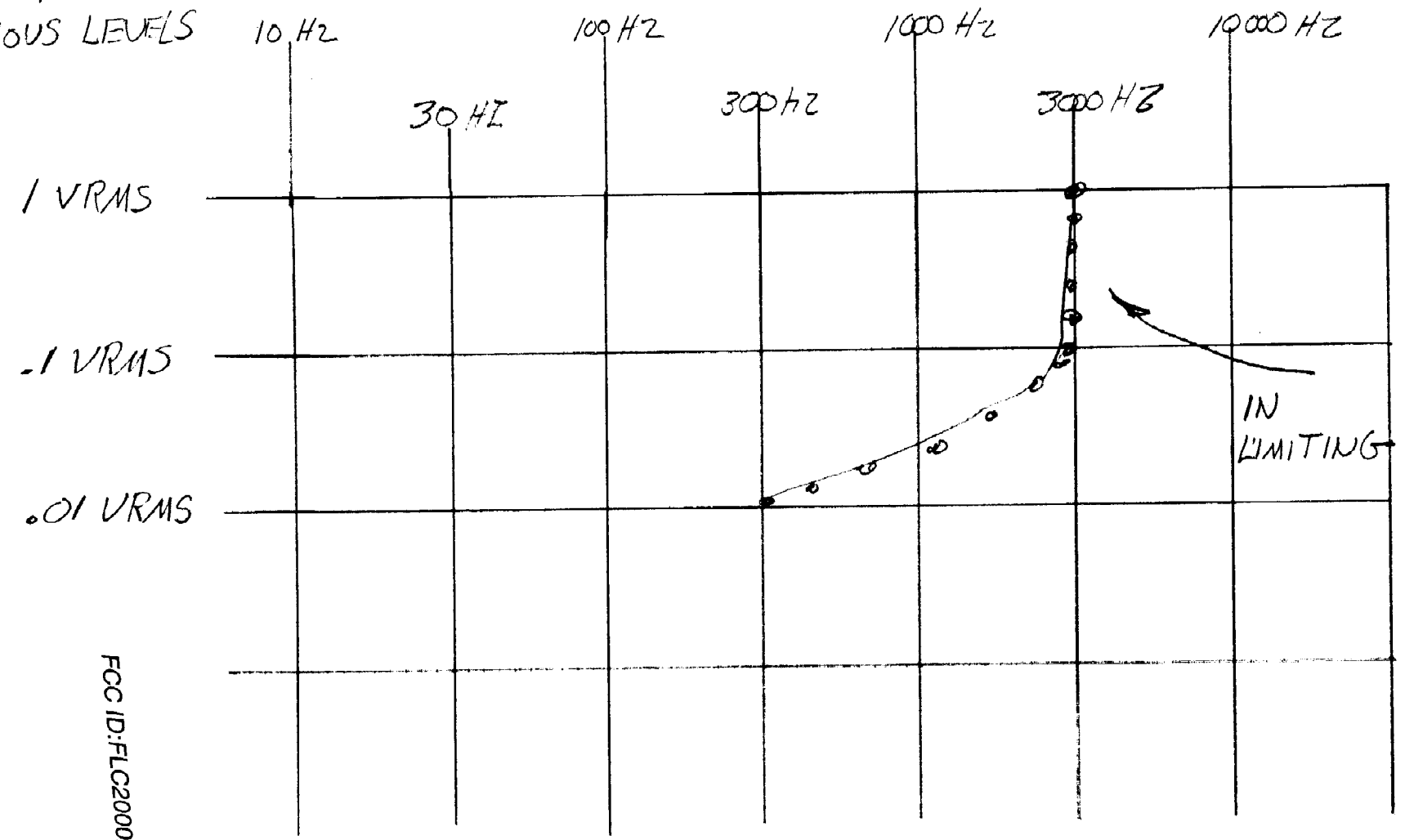
PAGE 6 OF 18

FREQUENCY RESPONSE

(Measured with 3 V supply and high impedance amplifier)



AUDIO INPUT
TONE AT
2500 HZ
VARIOUS LEVELS



(C) OCCUPIED BANDWIDTH (90.2137(b)

For equipment designed to operate with a 12.5 kHz channel bandwidth, the sum of the bandwidth occupied by the emitted signal plus the bandwidth required for frequency stability shall be adjusted so that any emission appearing on a frequency 25 kHz or more removed from the assigned frequency is attenuated at least 30 dB below the unmodulated carrier

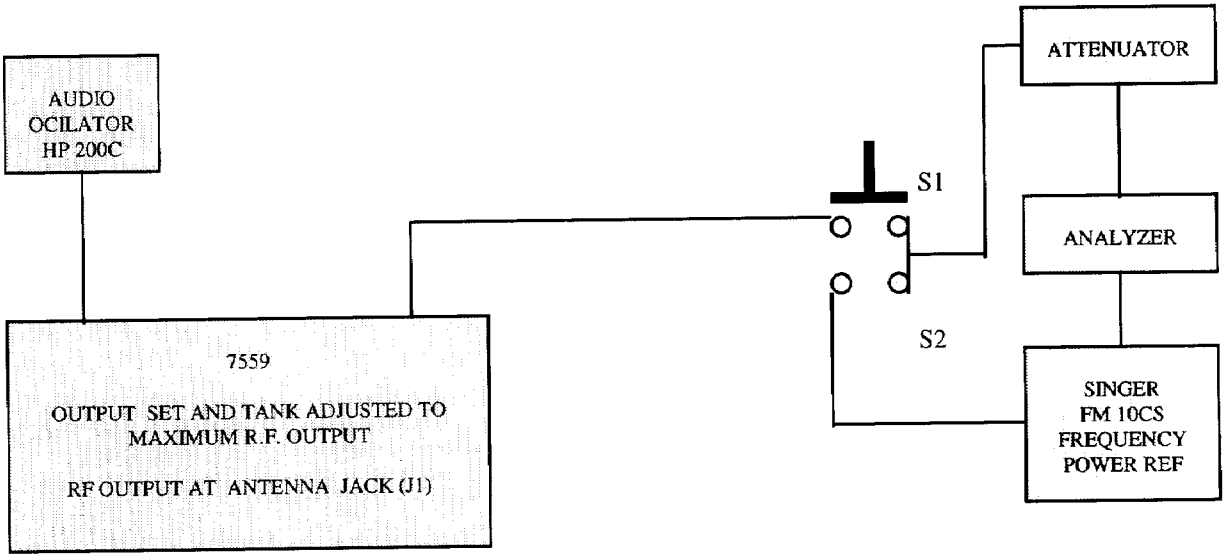
.

MEASURED OCCUPIED BANDWIDTH

When modulated by and input signal 16 dB greater than required to produce 50% modulation, test at 2500 Hz 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 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 Figure A&B

See page 9 for spectrum display.

5kHz per horizontal division Figure C

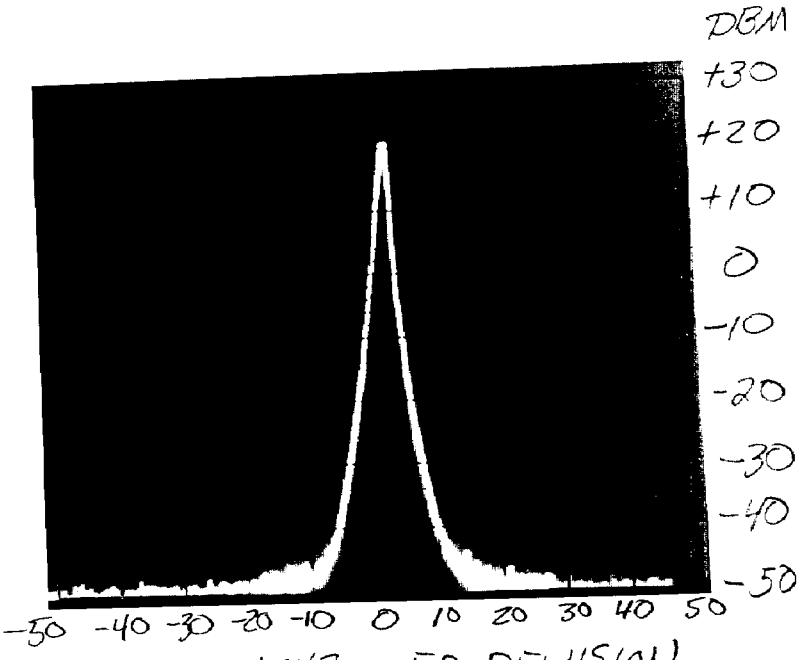


fig (A)

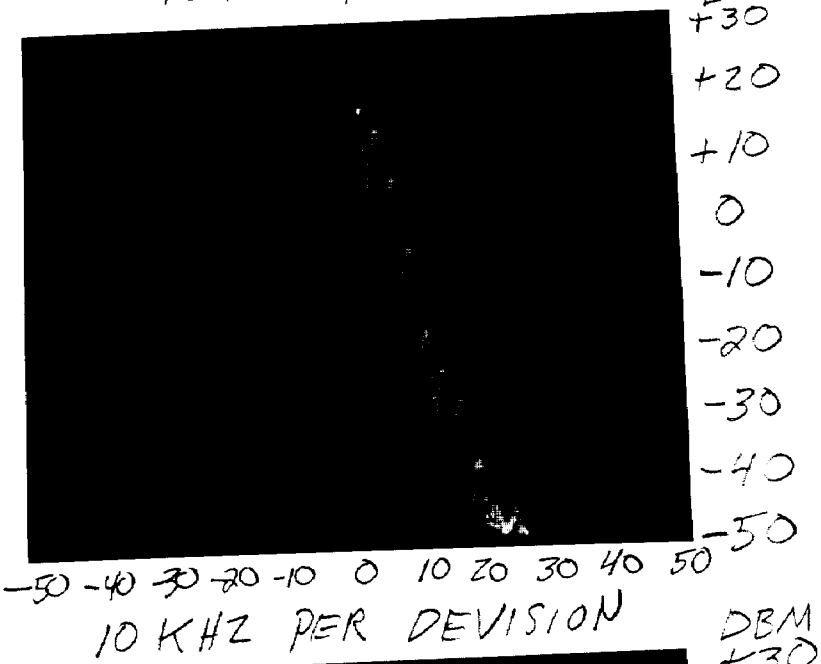


fig (B)

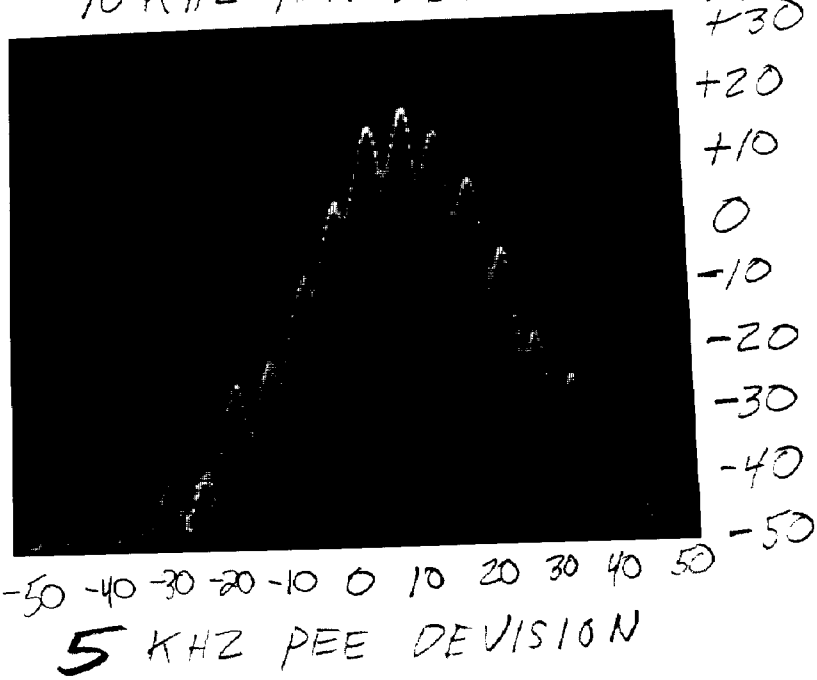
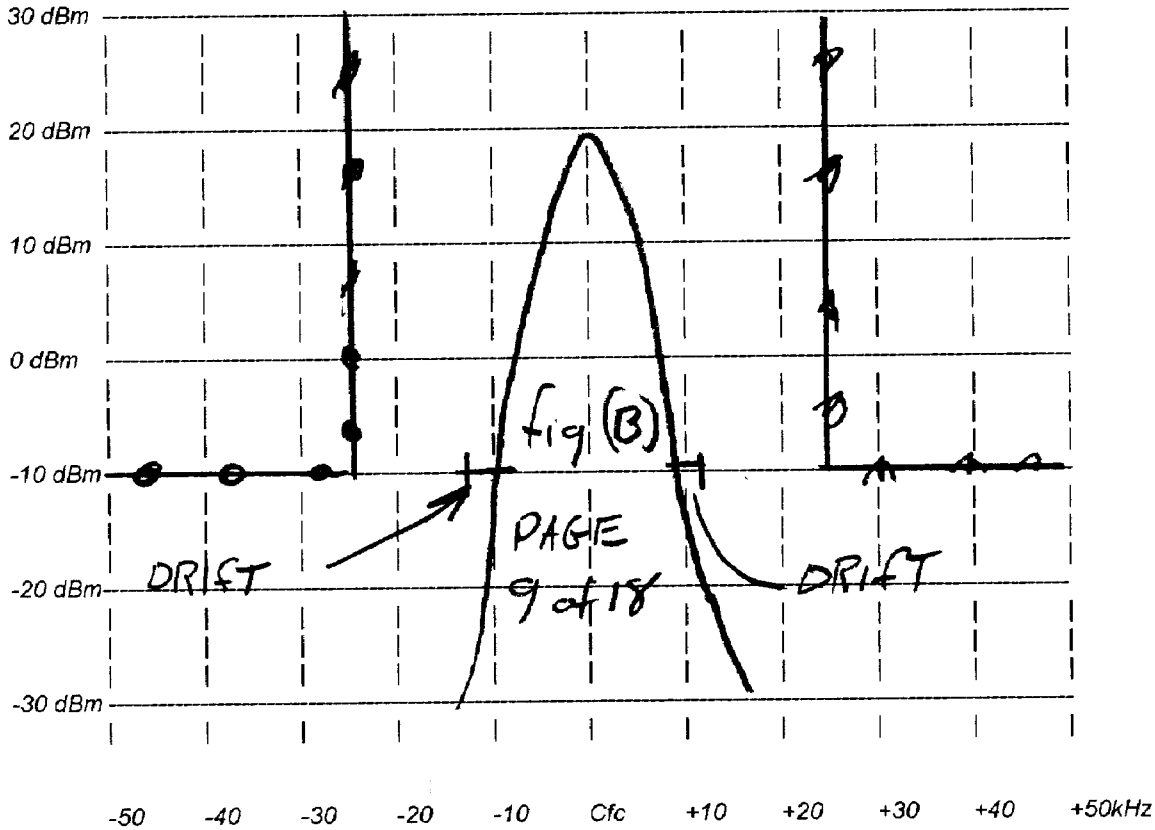


fig (C)

90.217: Modulation mask for 12.5 Hz bandwidth. Subpart (b)



Vertical divisions expressed in bBm, 10 db per box

Horizontal divisions expressed in kHz. 10 kHz per decision

Ctc is the center frequency

** Emission Mask*

Refer to Fig (B)

FCCID: FLC200020

(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, (J1) 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 at the junction of C2 & R2, (J2) microphone input open circuited. Spurious 20 dB below the permissible value need not be reported

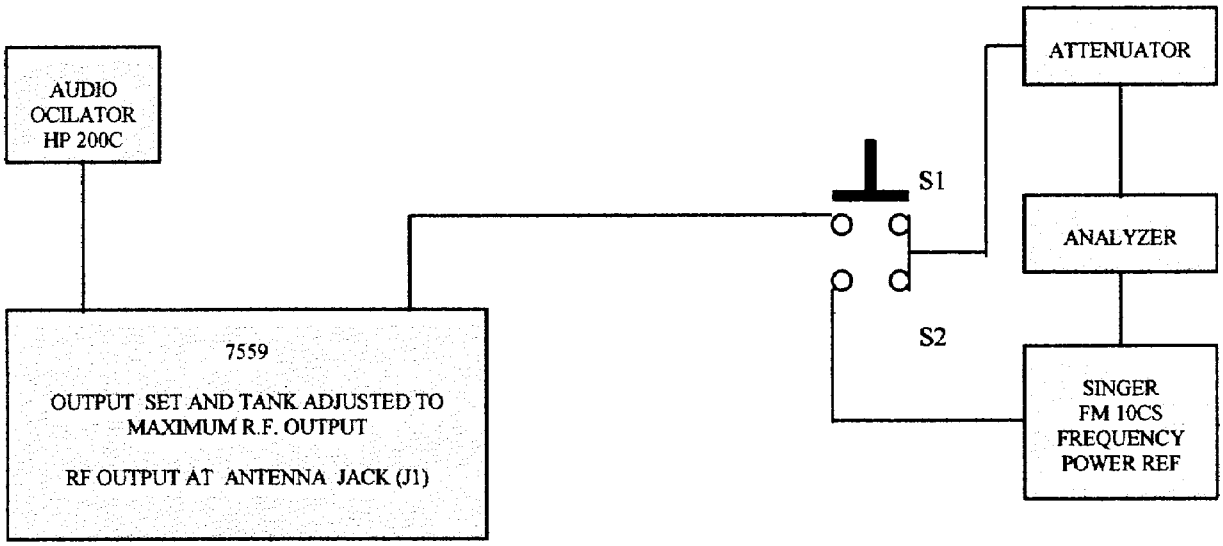
TEST EQUIPMENT SET-UP FOR CONDUCTIVE SPURIOUS EMISSIONS

The following equipment was used to measure the conductive spurious emissions of Model 7559, 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: 155.425 MHz reference level 20 dbM

Recorded Spurious Emissions

Frequency mHz	Level dbM --	Frequency mHz	Level dbM	Frequency mHz	Level dBm
77.71	-25				
116.56	-30	310.85	-40		
CARRIER	20	All else	<-40		
194.28	-35				

All conducted spurious emission were 45 dB below carrier. The emission was on 77.71 MHz which is the 2nd harmonic of the crystal oscillator.

Test Unit #2:

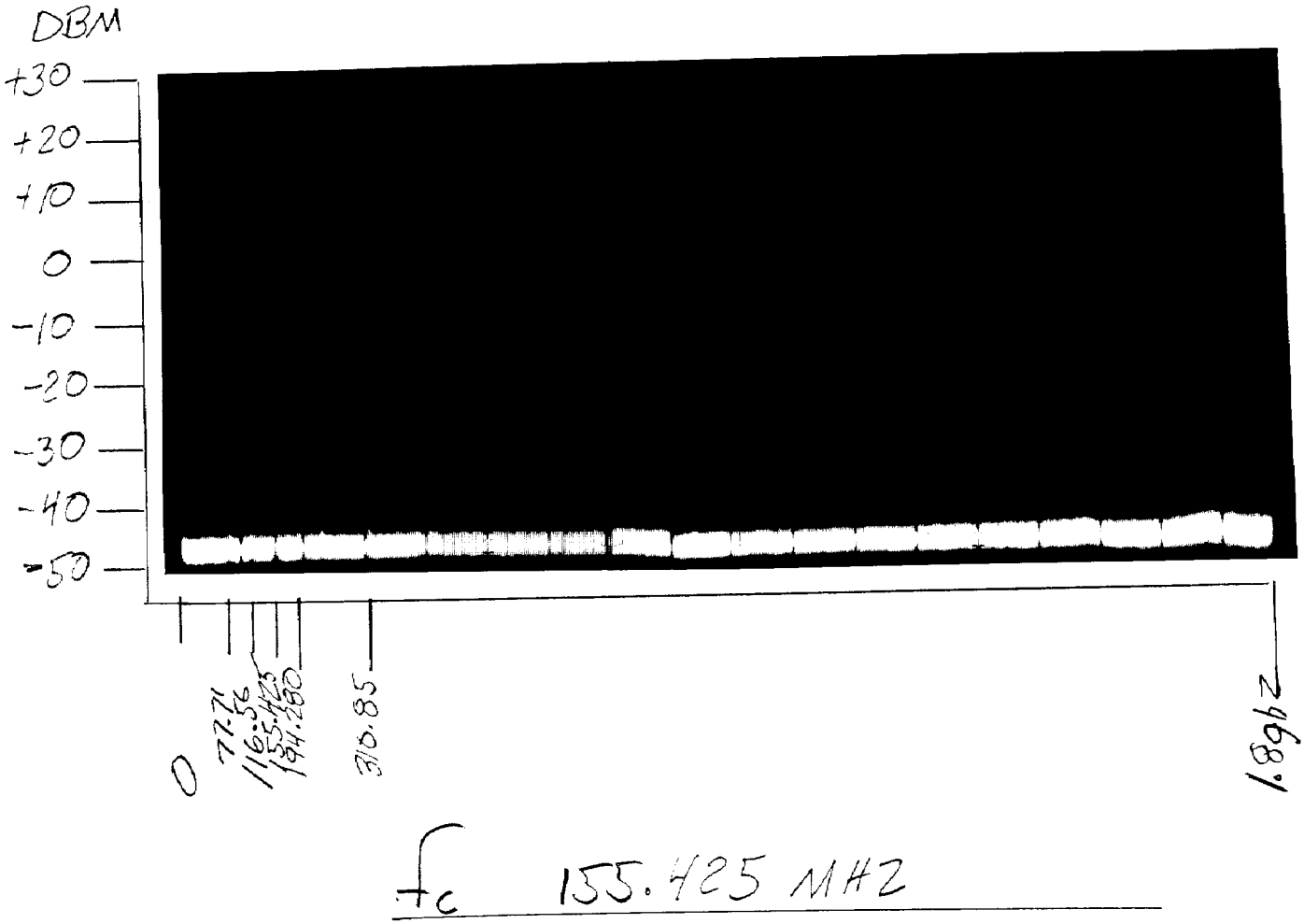
Center Frequency: 158.550 MHz, reference level 20 dbM

Recorded Spurious Emissions

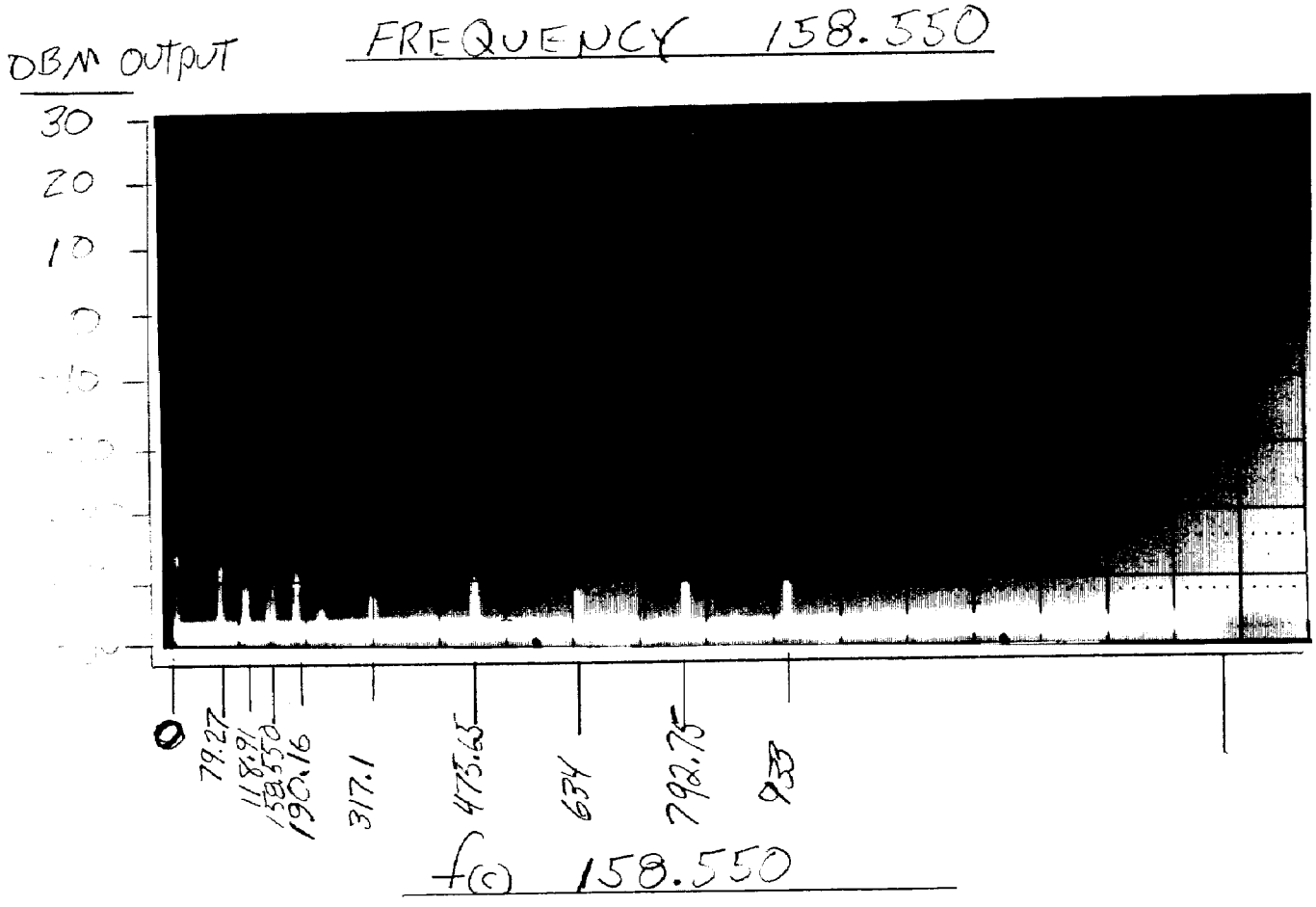
Frequency MHz	Level in dbM --	Frequency MHz	Level in dbM
79.275	-35	475.65	-40
118.91	-42	634	-42
CARRIER	20	All else	<-40
237.825	-45		
317.1	-44		
190.16	-38		

All spurious emissions were 55 dB bellow carrier. The emission was on 79.275 mHz which is the 2nd harmonic of the carrier.

The noise floor was -45dbM on all above measurements. See pages 12 and 13 for spectrum display.



fc 155.425 MHZ


FREQUENCY 158.550
DBM OUTPUT
30
20
10
0
79.27
118.91
158.550
190.16
317.1
475.65
634
792.75
93
fo 158.550

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

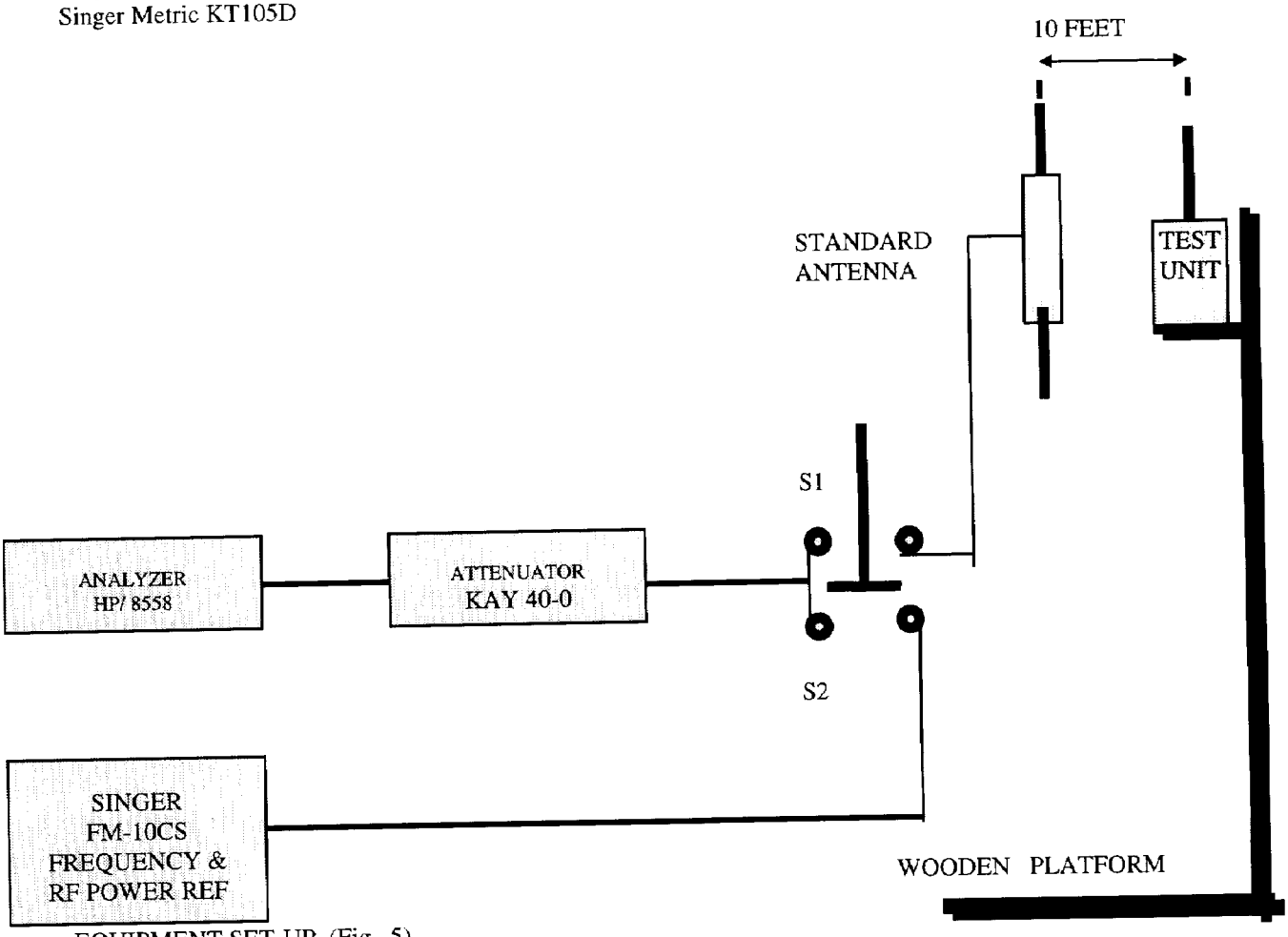
Measurements made in accordance with procedures outlined in FCC bulletin OCE 19 February 1968. Test units were tuned to the following frequency:

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 . . . . . -23 dbM

2nd harmonic of crystal (79.27). . . . . -64 dbM

3rd harmonic of carrier (475.65) . . . . . -69 dbM

Test Unit #1 :

Center Frequency: 155.425 MHz Field Intensity on Analyzer

Carrier Level . . . . . -26 dbM

2nd harmonic of crystal (77.71) -74 dbM

2nd harmonic of carrier (310.85)... . . . . -70 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

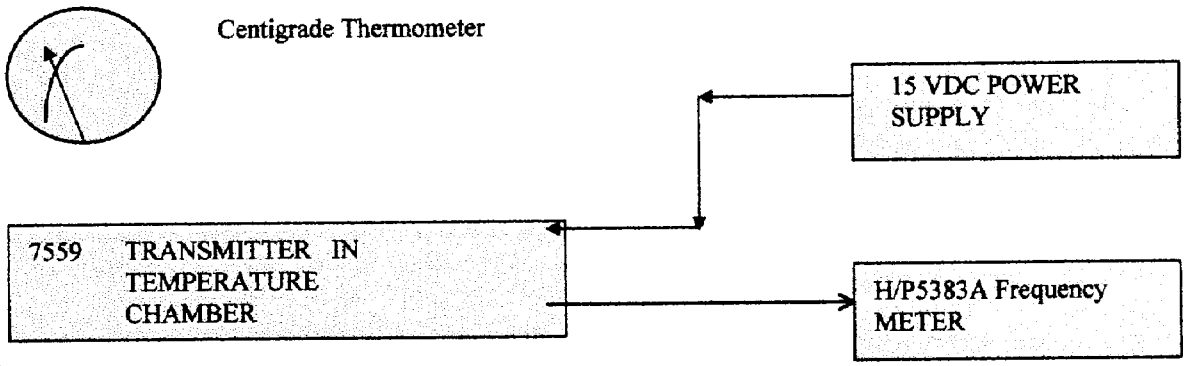


Fig (6)

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)
1	2 .4 VDC	3.80 4.50 5.20	155,425,727 hZ 155,425,650 155,425,617	NORMALIZED 110 CPS
2	2 .4 VDC	3.80 4.50 5.20	155,550,474 155,550,540 158,550,640	NORMALIZED 166 CPS

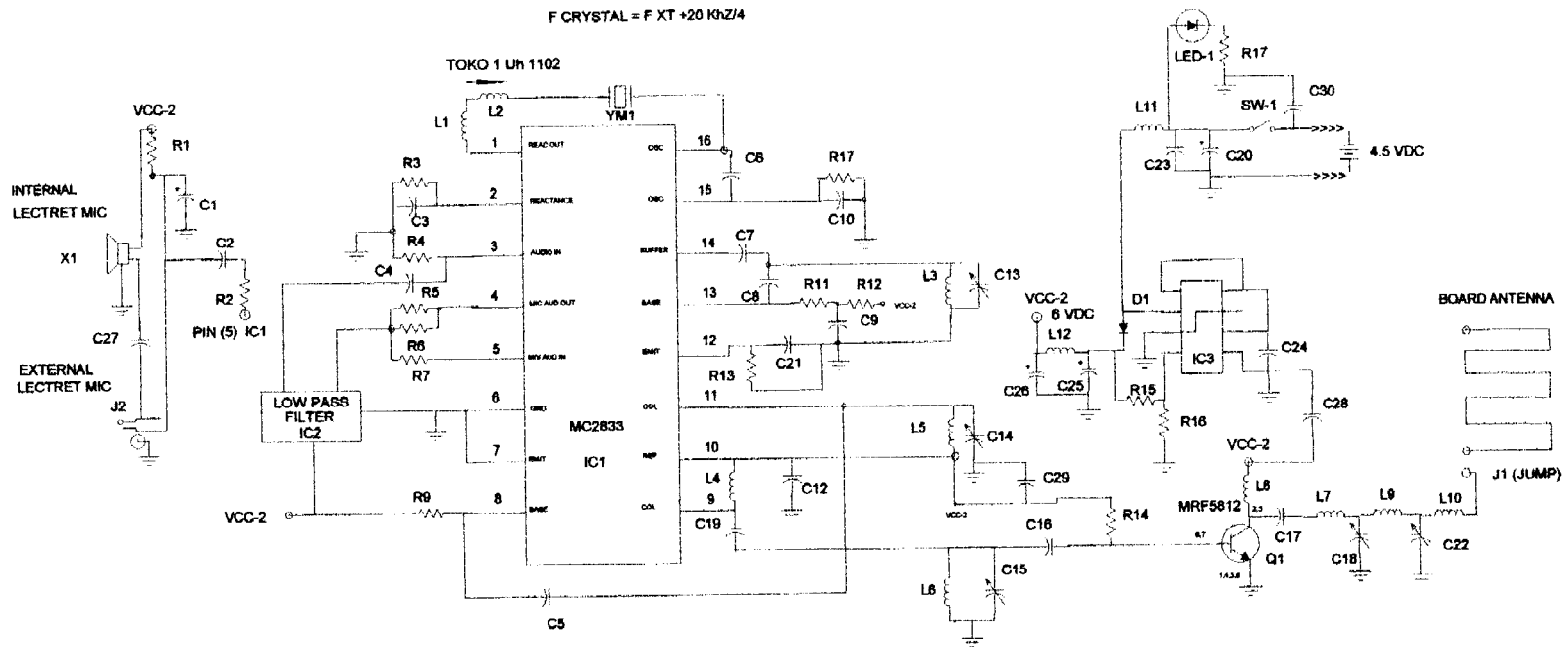
Frequency stability better than .001% over power supply voltage change.

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.

INDEX FOR SECTION D

FCC ID:FLC200020



(A) LAST RESISTOR R17

(B) LAST RESISTOR C30

(C) ALL RESISOTRS 1/8 WATT, 5%

(D) LAST INDUCTOR L12

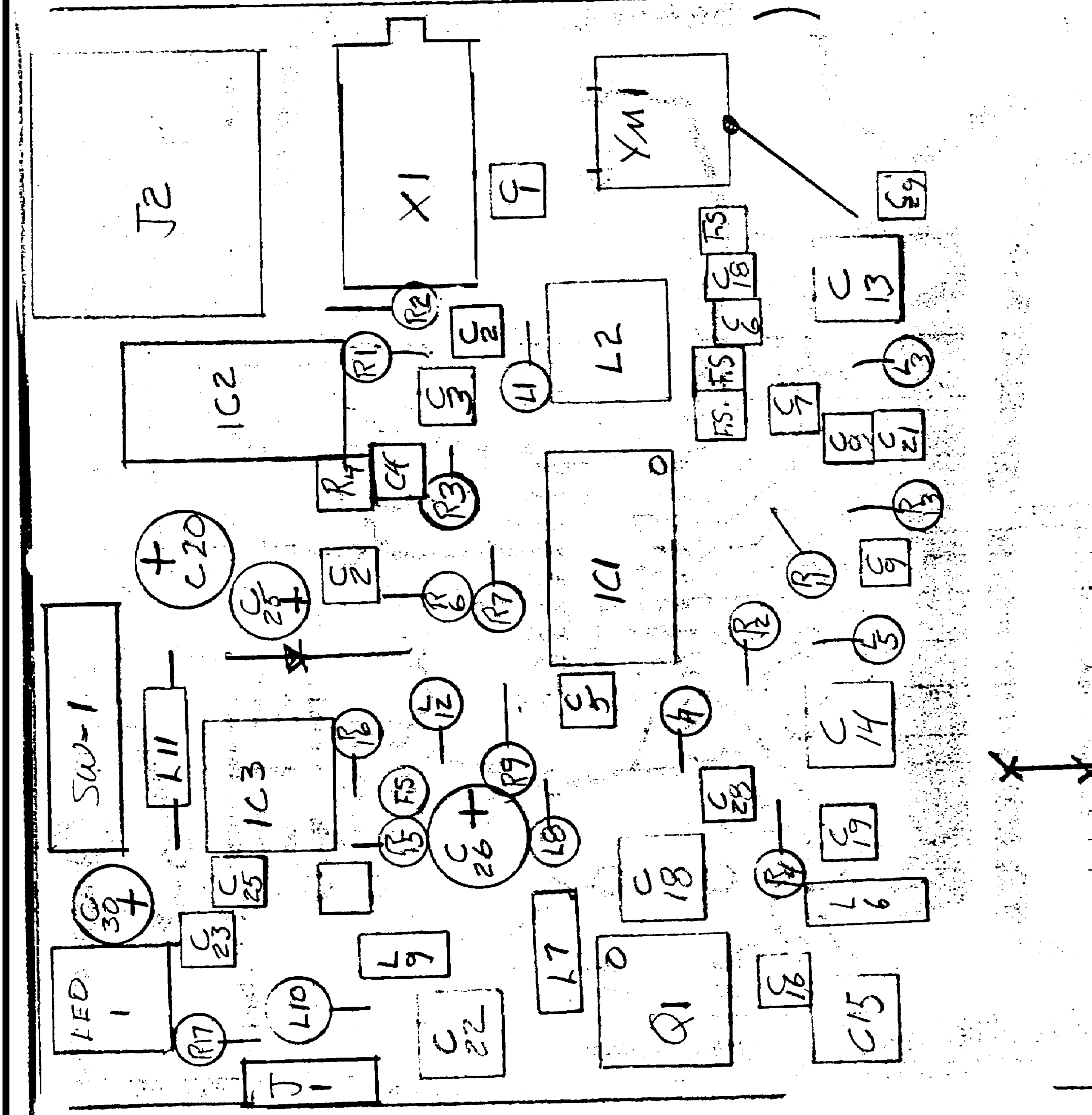
SWINTEK

965 SHULMAN AVE, SANTA CLARA CA

BOARD #

TRANSMITTER MODEL 7559

DATE 9/18/98


J2
X1
XM1
IC2
IC1
IC3
L2
Q1
SW-1
LED 1
C20
C26
L11
L7
L9
C18
C14
C13
C15
C22

FLATPACK PART LIST

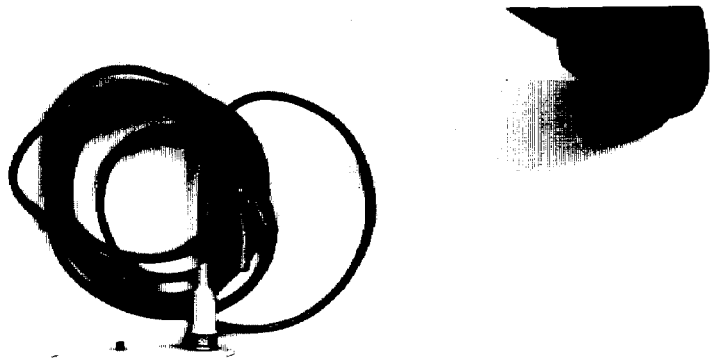
9/18/98

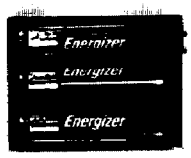
SYMBOL	PART DESCRIPTION		TOL
R1	4.7K	1/8 WATT	5%
R2	680 OHM	1/8 WATT	5%
R3	47K	1/8 WATT	5%
R4	56K	1/8 WATT	5%
R5	22K	1/8 WATT	5%
R6	47K	1/8 WATT	5%
R7	220K	1/8 WATT	5%
R8	56K	1/8 WATT	5%
R9	F/S	1/8 WATT	5%
R10	F/S	1/8 WATT	5%
R11	220K	1/8 WATT	5%
R12	220k	1/8 WATT	5%
R13	1k	1/8 WATT	5%
R14	22k	1/8 WATT	5%
R15	F.S.	1/8 WATT	5%
R16	10K	1/8 WATT	5%
R17	47K	1/8 WATT	5%
R18	680 OHM	1/8 WATT	5%
R19			
R20			

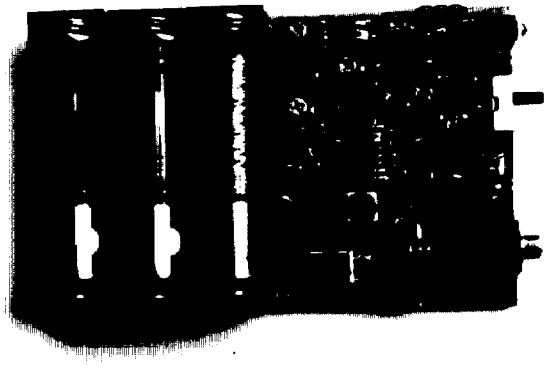
C1	2.2 Uf	TAN	80%+
C2	.1 uF	CER	Y5F
C3	.047 uF	CER	Y5F
C4	.01 uF	CER	Y5F
C5	5 pf	CER	NPO
C6	5 pf	CER	NPO
C7	10 pf	CER	NPO
C8	15 pf	CER	NPO
C9	.1 uf	CER	Y5F
C10	39 pf	CER	NPO
C11	f.s.	CER	NPO
C12	39 pf	CER	NPO
C13	7/35 pf	CER	N750
C14	7/35 pf	CER	N750
C15	7/35 pf	CER	N750
C16	10 pf	CER	NPO
C17	39 pf	CER	NPO
C18	7/35 pf	CER	N750
C19	22 pf	CER	NPO
C20	2.2 uf	TAN	80%+
C21	.1 uf	CER	Y5F
C22	7/35 pf	CER	N570
C23	.1 UF	CER	Y5F
C24	.1UF	CER	Y5F
C25	16 UF	TAN	PLUS 80-20
C26	16 UF	TAN	PLUS 80-21
C27	.1 UF	CER	Y5F

L1	1 UH		10%
L2	TOKO 1 UH	VAR	
L3	1 U.47 UH		
L4	1 UH		10%
L5	T-20-0 5T		
L6	T20-10 6T		
L7	1 UH		10%
L8	1 UH		10%
L9	T20-10 6T		
L10	T20-10 6T		
L11			
L12			

X1	Letret microphone	
IC1	MOTOROLA MC2333D	
IC2	BOOST REGULATOR	MAX629
Q1	MOTOROLA MRF 2812	
YM1	HC/18, SERIES, CRYSTAL	
SW-1	SLIDE SWITCH 152891	




Energizer
Energizer
Energizer



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OPERATING INSTRUCTION FOR MARK7559 ® FLAT PACK XT

1) Three AAA volts Alkaline Batteries power the 7559 body wire transmitter. The transmitter run-time will diminish significant if zinc Carbon batteries are used

2) Hold the transmitter in your hand with the batteries facing up.

3) Insert three fresh AAA Alkaline batteries. Observe the battery snaps and direction indicators for proper insertion.

4) The 7559 transmitter is equipped with an internal microphone and is completely self contained. An OPTIONAL SWINTEK TLM-S microphone can be ordered with a LOCKING collar on the plug end. Normally only one or two revolutions is required to fasten this microphone for remote mic applications. Do not use pliers to tighten or you will rune the connector and void the warranty.

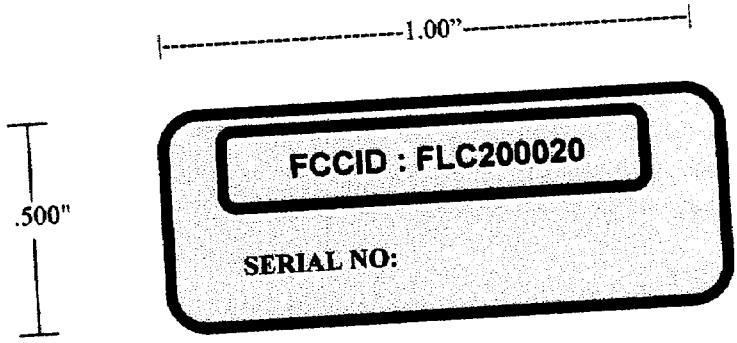
5) The following controls and indicators are present:

   a) Power Switch: When set to the ON position, the transmitter will turn on and the green power LED will glow.

   b) Power LED

   c) Removing the optional cord microphone will activate the internal microphone. This allows the 7559 to be completely self-contained. The external microphone is not required as an external antenna.

6) Always test the range of the unit before using. The transmitter should be taped vertically down the leg. The microphone wire should be taped to the chest area. Always use a pouch for the transmitter, as it gets warm. Never re-use your batteries. Always use NEW batteries! Typical runtime is 1.5 to 2 hours for Alkaline and 3-4 hours for lithium.



Label will be metal aluminum , adhesive back, non-removable, black letters with screened background