

**EXHIBIT B #6 – REPORT OF MEASUREMENTS OF RADIATED AND
CONDUCTED EMISSIONS**

FCC/MELLON

DEC 14 1998

SEE ATTACHED

FCC ID: NCN62

Compliance Statement

The GoComm FRS Model 62 S/N 001 has been tested in accordance with the requirements contained in the appropriate Commission regulations. These tests were performed using measurement procedure C63.4-1992. The tests were performed for Andrew Andros of GoComm Wireless Corporation located at 1544 Sawdust Rd., Suite 303, The Woodlands, Texas 77380.

To the best of my knowledge, These tests demonstrate that the equipment complies with the appropriate standards. I further certify that the measurements were made by Austin Radio Labs, 9502 Meadowheath Dr., Austin, Texas 78729. Final Measurements were performed on the open field test site meeting the requirements of C63.4-1992 over the frequency range of interest.

Tests were conducted by F.R. Ripley Jr Date 10/28/98

Additional Unit Information

No Antenna Conducted test was performed as the unit has a permanent antenna.

The power radiated on each channel is identical.

There are no interconnecting cables. The unit is battery powered. If rechargeable batteries are used they may be recharged by a generic charger (not provided) through the external microphone jack. Because the radio could be left on receive during charging an AC power line Conducted test was performed. All testing was done with accessory microphone and earphones attached.

GoComm FRS Model 62 S/N 001 LO Radiated Emission 15.209										31040/SIT
Number	Mhz	SA dBm	Cable	AF	AMP	dBuV/M	3 Meter		P/F	Antenna
							Limit	Margin		
1	460.265	-55.6	1.4	17.4	29.3	40.9	46	5.1	P	EMCO 3146
2	920.5	-63.9	1.5	23.5	28.7	39.4	46	6.6	P	EMCO 3146
4	1841	-69.7	3.3	25.7	27.8	38.5	54	15.5	P	LMRGA118
5	2301.25	-79.5	3.5	27.4	30.4	28	54	26	P	LMRGA118
6	2761.5	-60.9	3.8	28.1	30	48	54	6	P	LMRGA118
7	3221.75	-74.3	4.4	29.5	29	37.6	54	16.4	P	LMRGA118
Note: for 1&2 Antenna Vertical ; FRS vertical with front to antenna.										
Note: for 4 -7 Antenna Vertical ; FRS laying on back with antenna left or right.										
Note: LO cycles on and off. On 680 Ms. Off 100 Ms. Duty factor 87.2 %										
Math: SA dBm +107 + Cable + AF - AMP = dBuV/M peak										
Tested at Austin Radio Labs on 10/24/98 by <i>F.R. Ripley Jr.</i>										

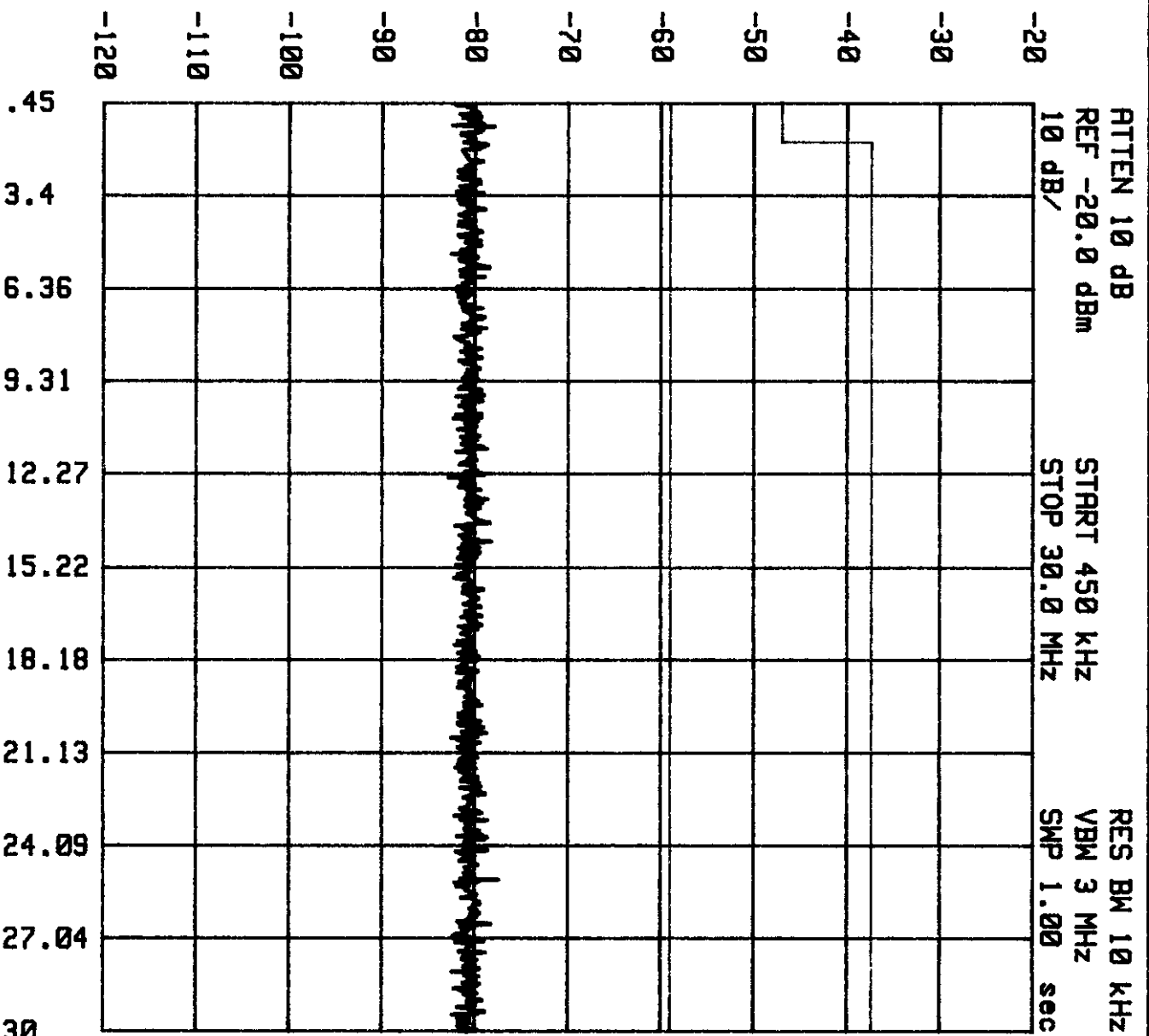
Note: no significant radiation was observed at any frequency from any source within the receiver section except from the local oscillator which was within limits as shown above.

Test Equipment utilized in testing		31040/SIT	
GoComm FRS Model 62 S/N 001			
Item	Manufacturer	Model	Last Cal
Spectrum Analyzer	Hewlet Packard	HP8566A	1/22/98
Antenna	EMCO	3146	6/28/98
Antenna	LambdaMetrics	LMRGA118	6/26/98
Antenna	AEL	H5001	6/26/98
Antenna	AEL	H5100	6/26/98
LISN	ARL	ARLL10S	1/22/98
Cable to LISN	Belden	RG-214	1/27/98
Cable w / Ferrite	Belden	RG-214	10/15/98
Cable to OATS	Andrew	LDF-50	10/15/98
Cable to Mast	Storm	#1	10/15/98
Cable to SA	L.W.Gore	P1	10/15/98
Cable to BPF	L.W.Gore	P2	10/15/98
Cable to AMP	L.W.Gore	P3	10/15/98
Amplifier Assembly	ARL	ARLAA1	1/22/98
Band Pass Filter	Telonic	TTF1000-5	3/7/98

FCC ID: NCN62

GoComm FRS Model 62 S/N 001 Transmitter Radiated Emission 15.209										31040/SIT
								3 Meter		
Number	Mhz	SA dBm	Cable	BPF	AF	AMP	dBuV/M	Limit	Margin	P/F
1	462.563	-6.2	1.4	0	17.4	0	119.6	122.2	2.6	P
2	925.125	-62.7	2.7	0.3	23.5	28.7	42.1	46	3.9	P
3	1387.69	-70.5	3	0.2	20	31	28.7	54	25.3	P
4	1850.25	-65.2	3.3	0	20.4	27.8	37.7	54	16.3	P
5	2312.81	-74.8	3.5	0	25.6	30.4	30.9	54	23.1	P
6	2775.38	-76.6	3.8	0	25.7	30	29.9	54	24.1	P
7	3237.94	-79.1	4.4	0	25.9	29	29.2	54	24.8	P
Note: 119.6 dBuV/M at 3 Meters is = 275 MW ERP Limit is 500 MW 95.639 (d)										
Note: Antenna and FRS both vertical with FRS front to antenna.										
Note: Bandpass filter is Telonic TTF 1000-5-5EE										
Note: Harmonic 8 - 10 below noise floor at any distance. Noise floor -83 dBm.										
Math: SA dBm +107 + Cable + BPF + AF - AMP = dBuV/M										
Tested at Austin Radio Labs 10/23/98 by <i>F.R. Fisher</i>										

Summary Conducted Emission 15.207				31040/SIT
GoComm FRS Model 62 S/N 001				
Mhz	uV	Limit uV	Margin dB	Line
5.53	0.138	250	18.2	Neutral
25.15	0.136	250	18.3	Hot
28.64	0.133	250	18.5	Neutral
26.1	0.129	250	18.8	Neutral
14.4	0.129	250	18.8	Hot
29.53	0.125	250	19	Neutral
No significant conducted signals				
Tested at Austin Radio Labs on 10/24/98				
Tested by <i>FR Ripley</i>				



CONDUCTED SIGNAL 15.207
FCC CLASS A & B

GOCOMM

FRS MODEL 62

RECEIVE - Charging

HOT LINE

UPPER LIMIT IS A

TRACE DETECTION PEAK HOLD

PEAK SIGNALS ARE:

- 1 . -77.3 AT 25.15 MHz
- 2 . -77.8 AT 1.16 MHz
- 3 . -78.1 AT 14.4 MHz
- 4 . -78.2 AT 26.57 MHz
- 5 . -78.3 AT 13.81 MHz
- 6 . -78.4 AT 5.65 MHz

HP8566A LAST CAL 1/22/98
LISN LAST CAL 1/27/98
TESTED AT 02:05 PM ON 10/24/98
AUSTIN RADIO LABS 31040/517
SHIELDED ROOM

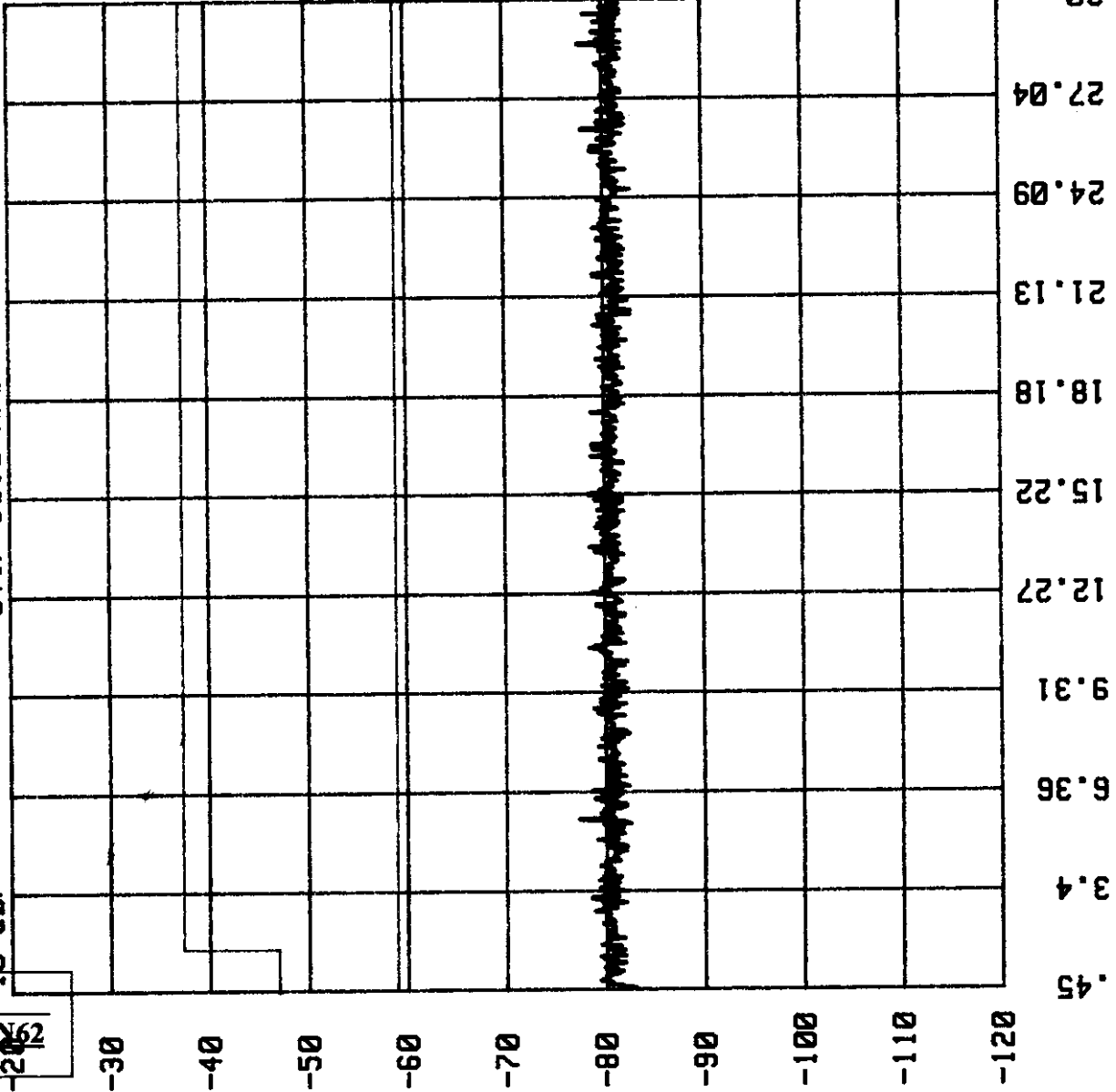
FCC ID: AUCN62

FCC ID: NCN62

CONDUCTED SIGNAL 15,207
FCC CLASS A & B

RES BW 10 kHz
VBW 3 MHz
SWP 1.00 sec

ATTEN 10 dB
REF -20.0 dBm
10 dB/
START 450 kHz
STOP 30.0 MHz



GOCOMM
FRS MODEL62
RECEIVE - Charging
NEUTRAL LINE
UPPER LIMIT IS A
TRACE DETECTION PEAK HOLD
PEAK SIGNALS ARE:
1 : -77.2 AT 5.53 MHz
2 : -77.5 AT 28.64 MHz
3 : -77.8 AT 26.1 MHz
4 : -78 AT 29.53 MHz
5 : -78.3 AT 10.62 MHz
6 : -78.3 AT 15.23 MHz

HP8566A LAST CAL 1/22/98
LISN LAST CAL 1/27/98
TESTED AT 02:15 PM ON 10/24/98

AUSTIN RADIO LABS 31040/SIT
SHIELDED ROOM

FCC ID: NCN62

ATTEN 10 dB
REF -20.0 dBm
10 dB/

CENTER 467.712 5 MHz VBM 3 MHz
SPAN 50.0 kHz
RES BW 300 Hz
SWP 1.50 sec

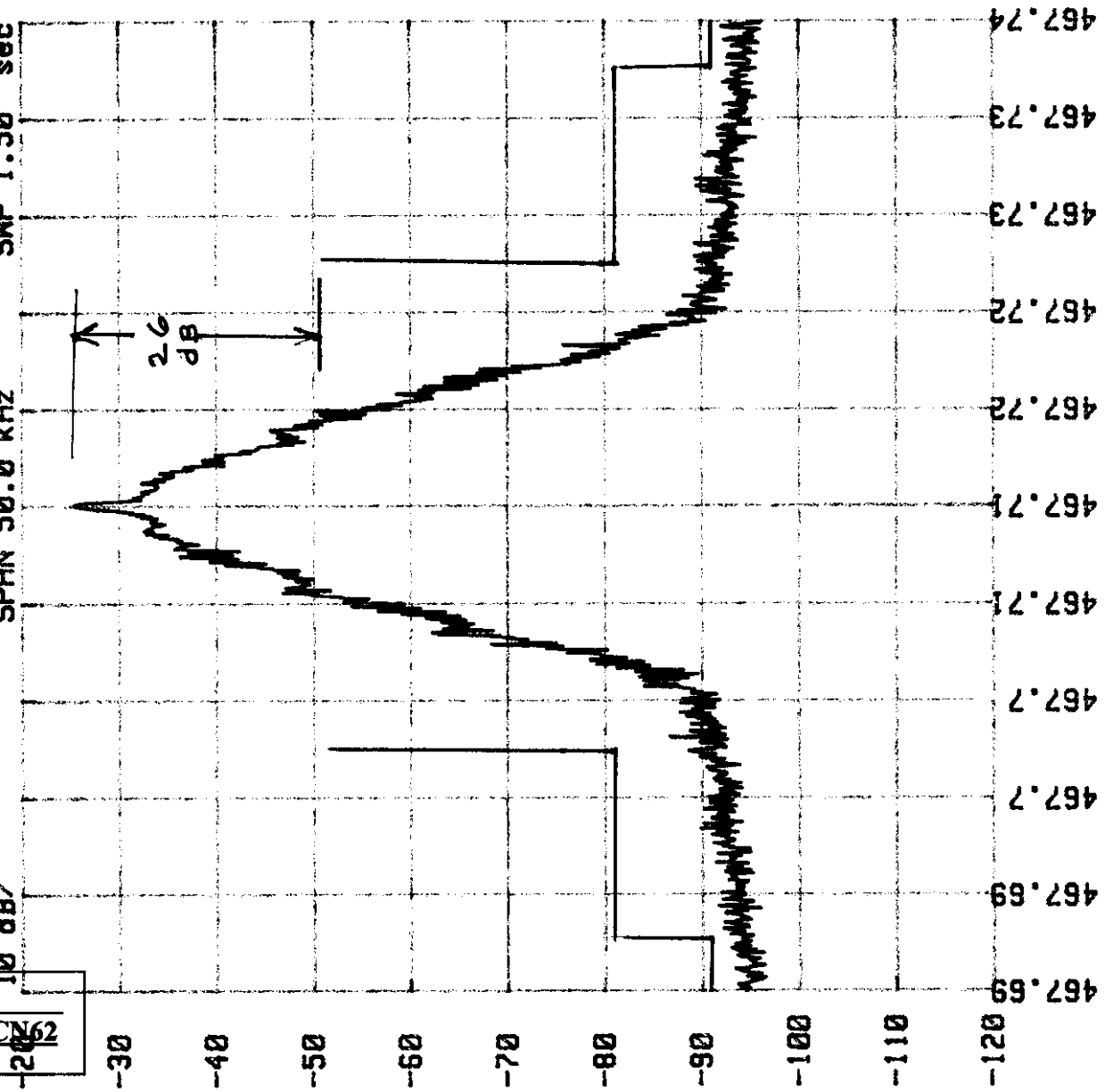
GOCOMM FRS MOD 62
OCCUPIED BW CH14
DATE 10/27/98

UNWANTED RADIATION

95.635 (6)

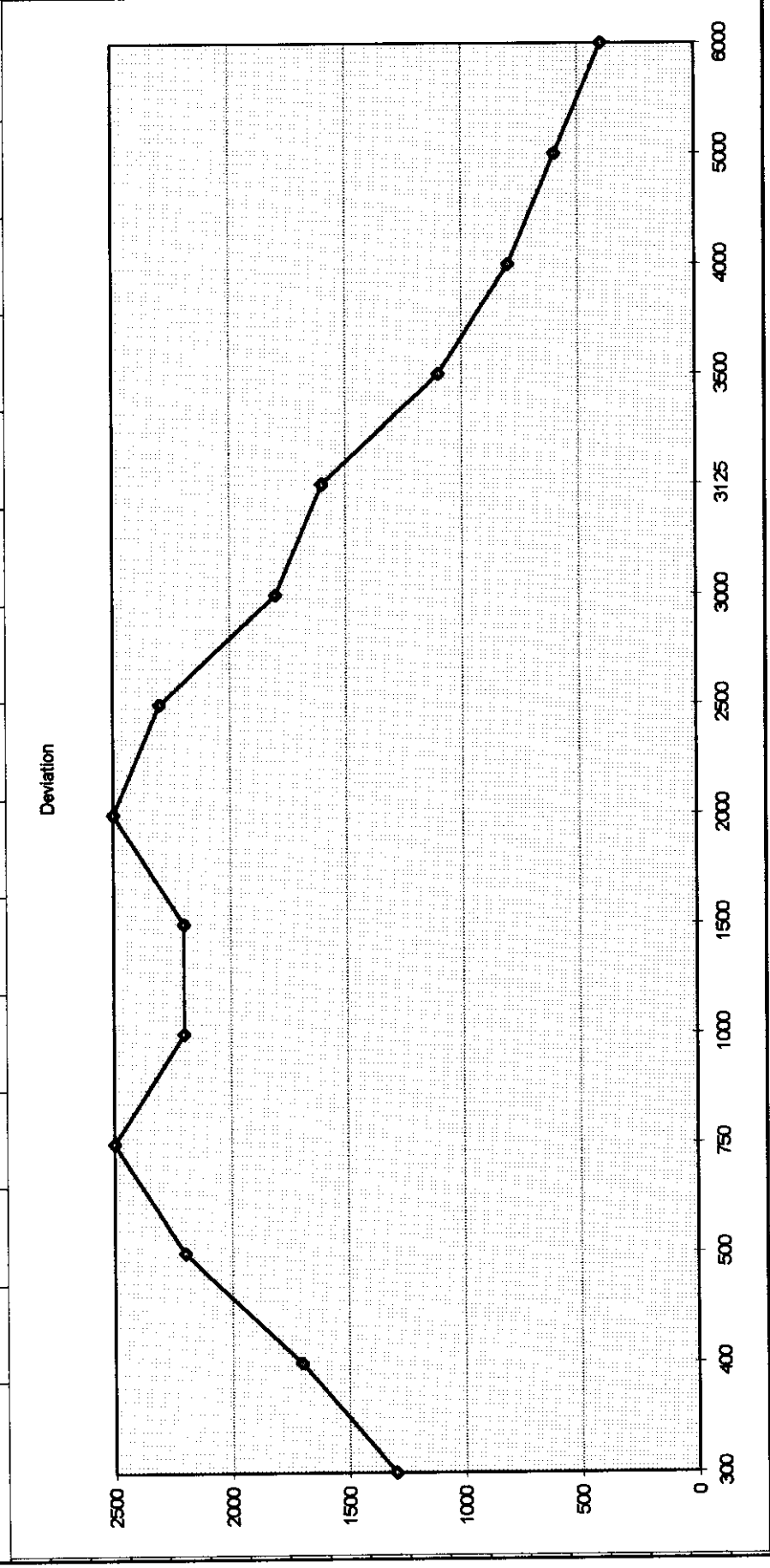
BW $\approx$ 9 kHz

Limit $\approx$ 12.5 kHz 95.633 (6)



AUSTIN RADIO LABS

GoComm FRS Model 62 S/N 001 Modulation 95.637 (a)														31040/SIT			
FCC ID																	
Frequency	300	400	500	750	1000	1500	2000	2500	3000	3125	3500	4000	5000	6000			
Deviation	1300	1700	2200	2500	2200	2200	2500	2300	1800	1600	1100	800	600	400			
2nd	-5.7	-3.35	-1.1	0	-1.1	-1.1	0	-0.72	-2.85	-3.87	-7.13	-9.9	-12.4	-15.9			
62																	
Tested with audio source of 100 dB SPL at 10 CM																	
Tested at Austin Radio Labs 10/27/98 by _____																	



FCC ID: NCN62

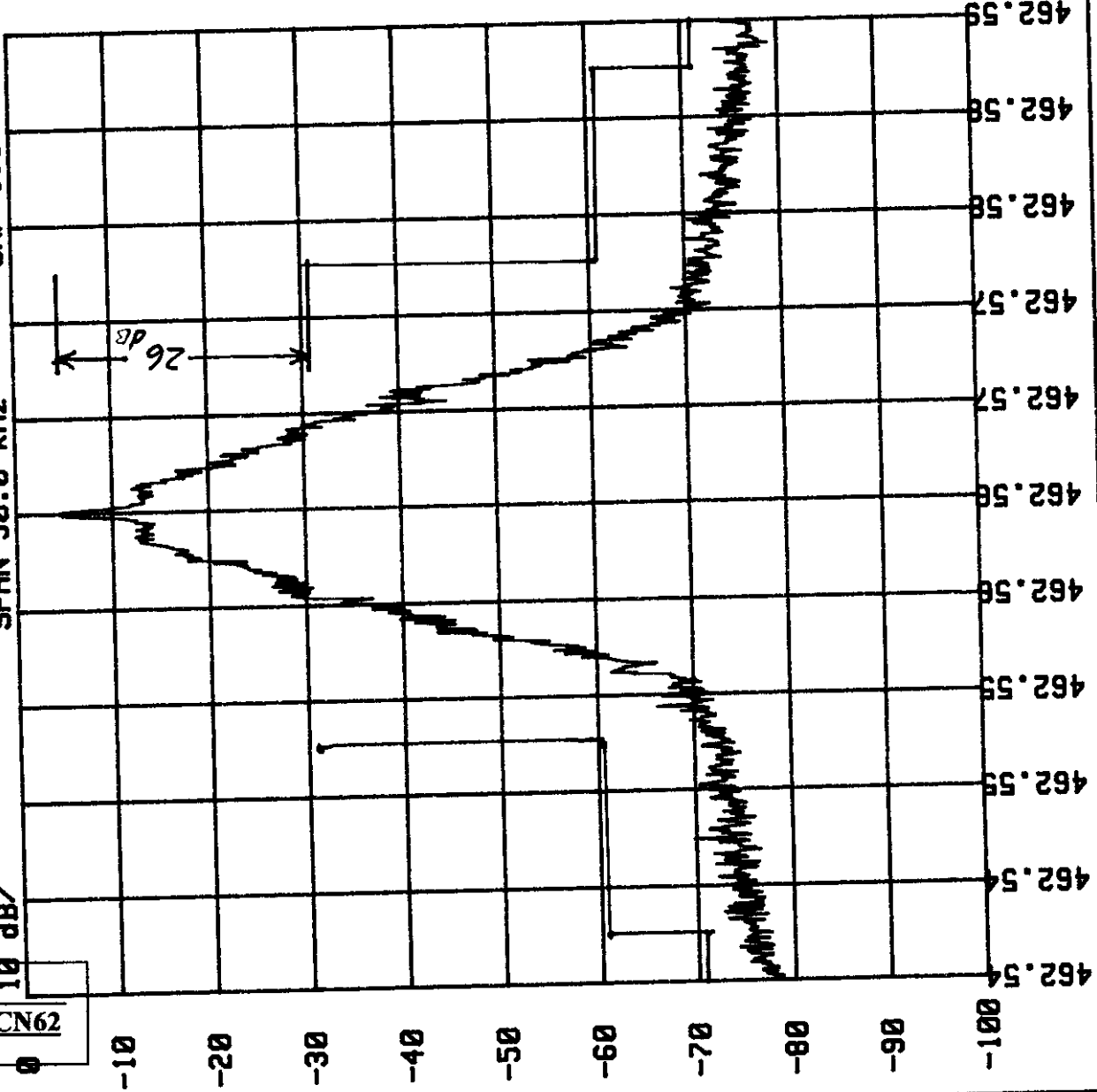
GOCOMM FRS MOD 62
OCCUPIED BANDWIDTH CH #1
DATE 10/27/98

RES BW 300 Hz
CENTER 462.562 5 MHz VBM 3 MHz
SPAN 50.0 kHz SWP 1.50 sec

ATTEN 10 dB
REF 0.0 dBm
10 dB/

UNWANTED RADIATION
95.635(b)

BW ≈ 9 kHz
Limit = 12.5 kHz 95.633 (c)



AUSTIN RADIO LABS 31040/SIT

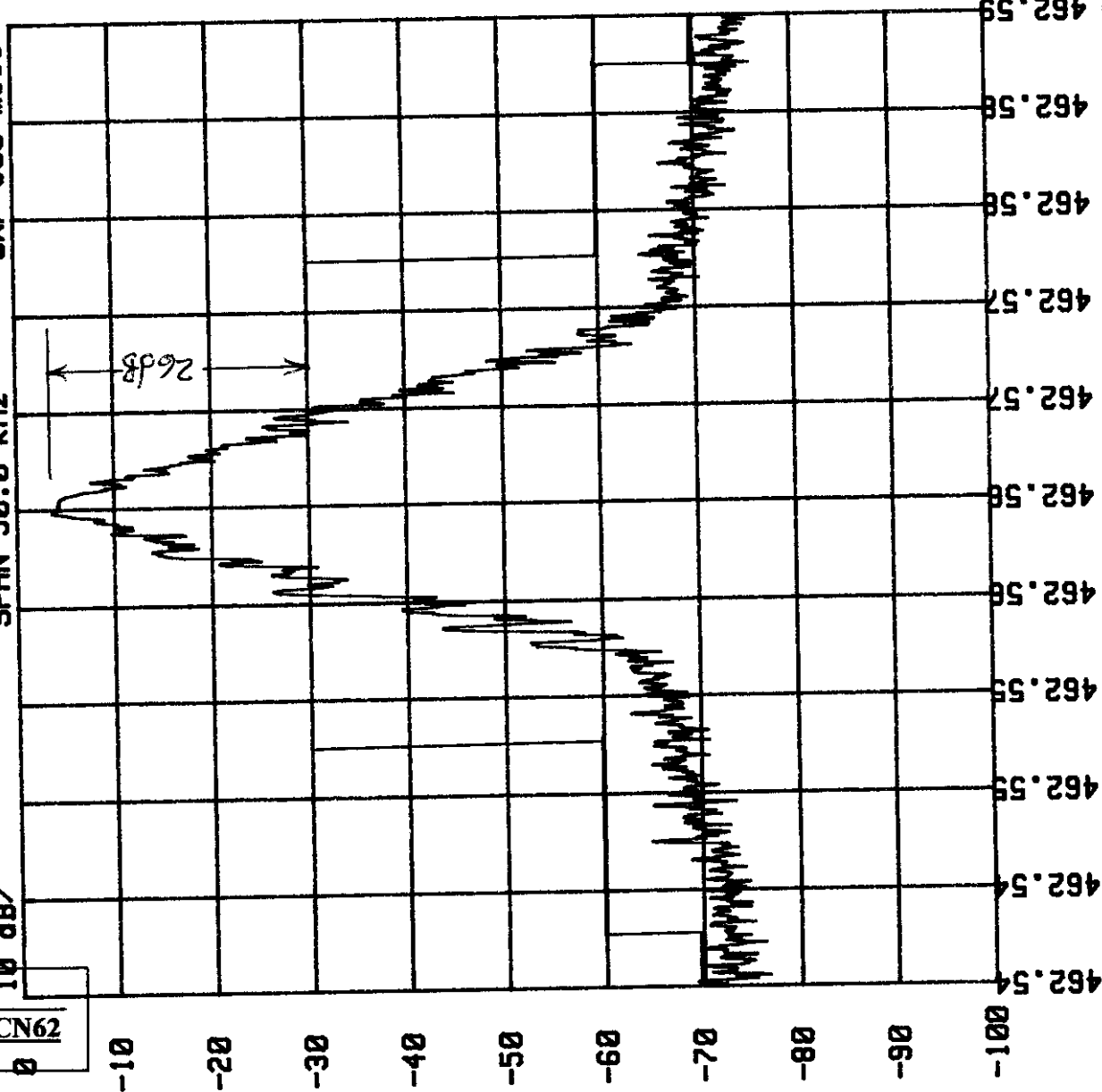
FCC ID: NCN62

ATTEN 10 dB
REF 0.0 dBm
10 dB/

CENTER 462.562 5 MHz VBW 3 MHz
SPAN 50.0 kHz RES BW 1 kHz
SWP 300 msec

GOCOMM FRS MOD62
OCCUPIED BANDWIDTH
DATE 10/26/98

Unwanted Radiation
95.635 (b)



BW $\approx$ 9 kHz

Limit $\approx$ 12.5 kHz 95.633 (c)

← Limited by Spectrum Anal
Filter See 300 Hz Filter

AUSTIN RADIO LABS 31040/51T

Summary Radiated Emission 15.209				31040/SIT
GoComm FRS Model 62 S/N 001				3 Meter
Mhz	dBuV	Limit	Margin	Mode
462.563	42.1	46	3.9	Transmit
460.265	40.9	46	5.1	Receive
2761.5	48	54	6	Receive
920.5	39.4	46	6.6	Receive
1850.25	37.7	54	16.3	Transmit
3221.75	37.6	54	16.4	Receive
See notes on Transmitted and LO radiation pages				
Tested at Austin Radio Labs on 10/24/98				
Tested by <i>F.R. Ripley Jr</i>				

Suppliers of

**EXHIBIT B #4 – BRIEF DESCRIPTION OF THE CIRCUIT FUNCTIONS OF
THE DEVICE, ALONG WITH A STATEMENT DESCRIBING HOW THE
DEVICE OPERATES**

FCC/MELLON

DEC 14 1998

SEE ATTACHED

FCC ID: NCN62

-TABLE OF CONTENTS-

A. Technical description

1. General
2. Modulation emission type
3. RF output power
4. Receiver IF and Local oscillator Frequencies
5. Rating of final output Transistor
(Manufacturers data sheets attached)
6. Circuit description
 - a. Transmitter circuit
 1. PLL synthesizer circuitry
 2. RF amplification
 3. Circuit for suppression of spurious radiation
 4. Circuit for limiting modulation
 5. Circuit for limiting power
 - b. Receiver circuit
7. CTCSS Tone Frequency
8. Transmitter tune up procedure
9. Block diagram
10. Schematic diagram
11. Draft of owners manual
12. PCB Layout

A. Technical Description

1. General

The front panel controls are :

1. Channel up-down selector buttons.
2. Mode select button
3. Key-lock and Lamp on-off button.
4. VOX/CALL button
5. PTT switch
6. MONITOR switch
7. Receiver Volume (with power ON-OFF switch)

Accessible connectors are :

1. Ear phone-Mic JACK
2. Rechargeable battery charging JACK (through MIC JACK)
3. Belt clip

LCD indicators are :

1. Receiving indicator
2. Transmitting indicator
3. Low battery indicator
4. CALL/SCAN/VOX/key-lock indicator.

Power is supplied by three 1.5 volt "AA" cells
or 1.2 volt "AA" Nickel-Cadmium cells.

The NI-CD batteries may be charged through the charger jack(MIC jack).

2. Modulation emission type : F3E

3. RF output power : 450 milliwatts With 4.5 volts DC at battery terminal

4. Receiver IF and Local oscillator frequencies

IF	---- 1'st IF :	21.7MHz.	2'nd IF :	450KHz.
Local oscillator---	1'st local :	440.8625-446.0125MHz.	2'nd local:	21.25MHz

5. Rating of RF Final output Transistor

Transistor BLT50 has an absolute maximum power dissipation rating of 2.0 watts at an ambient temperature of 50 degrees centigrade.

See attached manufacturer's data sheets.

FCC ID: NCN62

6. circuit description

Transmitter circuit

1. PLL synthesizer circuitry

The transmitter uses a phase-locked-loop(PLL) circuit to synthesize the local oscillator frequencies for receiving and transmitting.

This employs one PLL IC and only one crystal. IC5 is a CMOS large scale integrated circuit containing reference oscillator, phase detector, active low pass filter and programmable divider.

The programmable divider controlled by CPU divides the output of the VCO (voltage controlled oscillator).

Crystal X2 (21.25MHZ) provides a reliable frequency standard which controls the local oscillator frequencies. The reference-frequency divider inside IC5 counts down the oscillator signal and passes it on to the phase detector, where it is compared with the signal from the programmable divider. An error voltage is generated by the phase comparator, which is proportional to the phase difference between the two divided signals. This error voltage appears on charge pump pin passes through the active LPF (low pass filter), where the error voltage is integrated and harmonics and noise are filtered out. The resulting DC voltage is applied to the varicap diode D2. Its capacity varies with the applied DC voltage. Because of this capacitance change, the output frequency of the VCO is corrected. With precise adjustments, the VCO frequency is accurate and precise when the system is "locked".

This means that the phase detector senses no phase differences between the two signals, and the VCO generates a frequency that is as accurate and stable as the reference crystal oscillator. The VCO circuit is consist of D2, Q5, L502 and C1.

The circuit is connected in the form of a Hartley oscillator with varicap diode D2 as part of the tank circuit. The VCO circuit generates a signal ranging from 461MHZ to 467MHZ. The IC5(TB31202FN) includes an unlock-signal-detector circuit. If the condition occurs, pin5 goes low. Transmission cannot be made if a code other than those for the assigned channel is input to IC5.

2. RF Amplification

The output of VCO amp Q4 is fed through D13 and C120 to the pre driver amp Q20. The output is then supplied to the driver amp Q1 and Q2. These output is coupled to the base of final RF stage Q8. The Q8 output is supplied to the antenna through L-C filter tuning circuit.

3. Circuit for suppression of spurious radiation

In addition to the inter stage filtering, the output of final Q8 is coupled to the antenna through a triple "PI" network (L23,L22,L26,C56,C82,C84) which serves both to match and reduce harmonics to adequate level.

4. Circuit for limiting modulation

The audio output from microphone is fed to TX AUDIO IN of IC2(FX465) through the microphone amplifier IC9 (NJM2902D). This output signal is limited on IC9(NJM2902C) and then fed to the buffer amplifier IC8(NJM2904A) through the splatter filter (NJM2902A, NJM2902B).

Thus overall audio limiting circuit keeps the modulation from exceeding 2.5 KHZ for inputs approximately 60dB greater than that required to produce 1.5 KHZ modulation.

5. Circuit for limiting power

During alignment, R— is selected to limit available power to about 450mili-watts and

Receiver circuit

1. Receiver

The receiver is a double conversion superhetrodyne with the first IF at 21.7MHz and the second IF at 450KHz. The PLL synthesizer supplies the first local oscillator 21.7MHz below the received frequency and the second local oscillator at 21.25MHz.

The 460MHz signal received on herical antenna is fed into and amplified by Q15 RF amplifier through the LC band pass filter(L24,C140,L25,C88,C89). The amplified signal goes into first mixer, dual gate FET(Q3). The first local oscillator is VCO output with the frequency ranging from 440.8625 to 446.0125 MHz. The converted signal goes into first IF(21.7MHz) crystal filter and goes into second mixer input through the IF amplifier Q16. The converted output signal from pin 3 goes to 450KHz band pass filter FL2 and fed into the input of a five stage limiter of pin 5 of IC3. The output of limiter from pin 7 drives a multiplier both internally direct and externally through a quadrature coil IFT1 to detect the FM. The audio signal from pin 9 is de-emphasized at R92,C113 and goes into sub-audio tone decoder IC2(FX465). The audio output from pin 19 of tone decoder IC is fed and amplified by power amplifier IC5(NJM2073) through the audio volume controller.

7. CTCSS Tone Frequency

Voice are mixed with a subaudible CTCSS(Continuous Tone Controlled Subaudible Squelch) tone as means of directing messages among user groups sharing the same RF frequencies.

There are 38 standard tones in the range of 67Hz-250.3Hz as shown below.

CODE NO.	FREQUENCIES(HZ)	CODE NO.	FREQUENCIES(HZ)
1	67.0	20	131.8
2	71.9	21	136.5
3	74.4	22	141.3
4	77.0	23	146.2
5	79.7	24	151.4
6	82.5	25	156.7
7	85.4	26	162.2
8	88.5	27	167.9
9	91.5	28	173.8
10	94.8	29	179.9
11	97.4	30	186.2
12	100.0	31	192.8
13	103.5	32	203.5
14	107.2	33	210.7
15	110.9	34	218.1
16	114.8	35	225.7
17	118.8	36	233.6
18	123.0	37	241.8
19	127.3	38	250.3

8. Transmitter tune up procedure

1. Connect DC 4.5 volts to battery terminals.
2. Set at channel No.8
3. Connect DC VOLT METER to pin 3 of VCO unit.
4. Adjust VC1 for the voltage to be 1.2V at TX MODE.
5. Connect POWER METER to ANT TERMINAL.
6. Adjust VR2 for the OUTPUT POWER to be maximum.
7. Repeat step 4 to step 6, if needed.
8. Check that the output power is below than 490 milliwatts on channel 1 and channel 14.
9. Check that frequency tolerance is within 600Hz of channel center frequency.
10. Check that all spurious output is at least 60 dB below fundamental.
11. Check that with 2500Hz modulation, occupied bandwidth is at least 6dB better than limit specification.

SEMICONDUCTOR Complement and Functions

1. Logic PCB BLOCK

Ref.No.	Type	Transmitter Function	Receiver Function
Q1	DTC143 EK	LED SW.	
Q3	KRA225S	None	AMP POWER SW.
Q5	DTC143 EK	CPU Reset	
Q8	MMBT3904	VOX AMP.	None
Q9	KRA225S	MIC. SW.	None
Q100	DTC143 EK	None	AMP POWER SW.
Q101	MMBT3906	EXT.AMP SW.	None
D1	KDS187	None	RX. TONE DET.
D2,D3	M2	POWER Protector	
LED1,2	LN1372SG	Backlight	
IC1	TMP47C422F	1Chip microprocessor	
IC2	FX465D5	CTCSS CODEC.	CTCSS CODEC
IC3	93C46	EEPROM	
IC4	TK11230AMTL	Voltage Regulator	
IC5	NJM2073M	None	RX. Audio AMP.
IC8	NJM2094	TX Audio AMP.	None
IC9	NJM2092	TX Audio AMP.	None

2. RF PCB BLOCK

Q1,2	2SC5321	TX Driver	None
Q3	3SK229	None	RX Mixer
Q8	BLT50	TX Power AMP.	None
Q10	KRA225S	TX. Power SW.	None
Q15	BFQ67W	None	RX RF AMP
Q16	BFQ67W	None	RX IF AMP
Q17	KRA225S	None	RX en SW.
Q18	KRA225S	TX en SW.	None
Q20	2SC3356	TX pre AMP.	None
Q26	KRC106S	TX en SW.	None
Q102	KRA225S	TX en SW.	None
D13	KDS114	TX SW.	None
D16	1SS314	TX SW.	None
D17	1SS314	None	RX Protector
D18	KDS114	None	RX SW.
D22	KDS114	None	RX SW.
D25	KDS114	TX Bias	None
IC3	MC3361D	None	RX IF
IC5	TB31202FN	PLL	PLL

FCC ID: NCN62

Ref.No.	Type	Transmitter Function	Receiver Function
IC8	TK11227MTL	Voltage Regulator	

3. VCO PCB BLOCK

Q6	2SC5231	AMP	AMP
Q7	2SC5231	Oscillator	Oscillator
D4	1SV229	Varicap.	Varicap.
D5	1SV229	Varicap.	Varicap.
D6	KDS114	Limiter	Limiter

FCC ID: NCN62

**EXHIBIT B #5 – BLOCK DIAGRAM SHOWING THE FREQUENCY OF ALL
OSCILLATORS IN THE DEVICE, AND SCHEMATIC DRAWINGS**

RECEIVED

DEC 1998

SEE ATTACHED

FCC ID: NCN62