REALISTIC®

Service Manual

21-9110

TRC-1001

40-CHANNEL CB TRANSCEIVER

Catalog Number: 21-9110

CUSTOM MANUFACTURED FOR TANDY CORPORATION

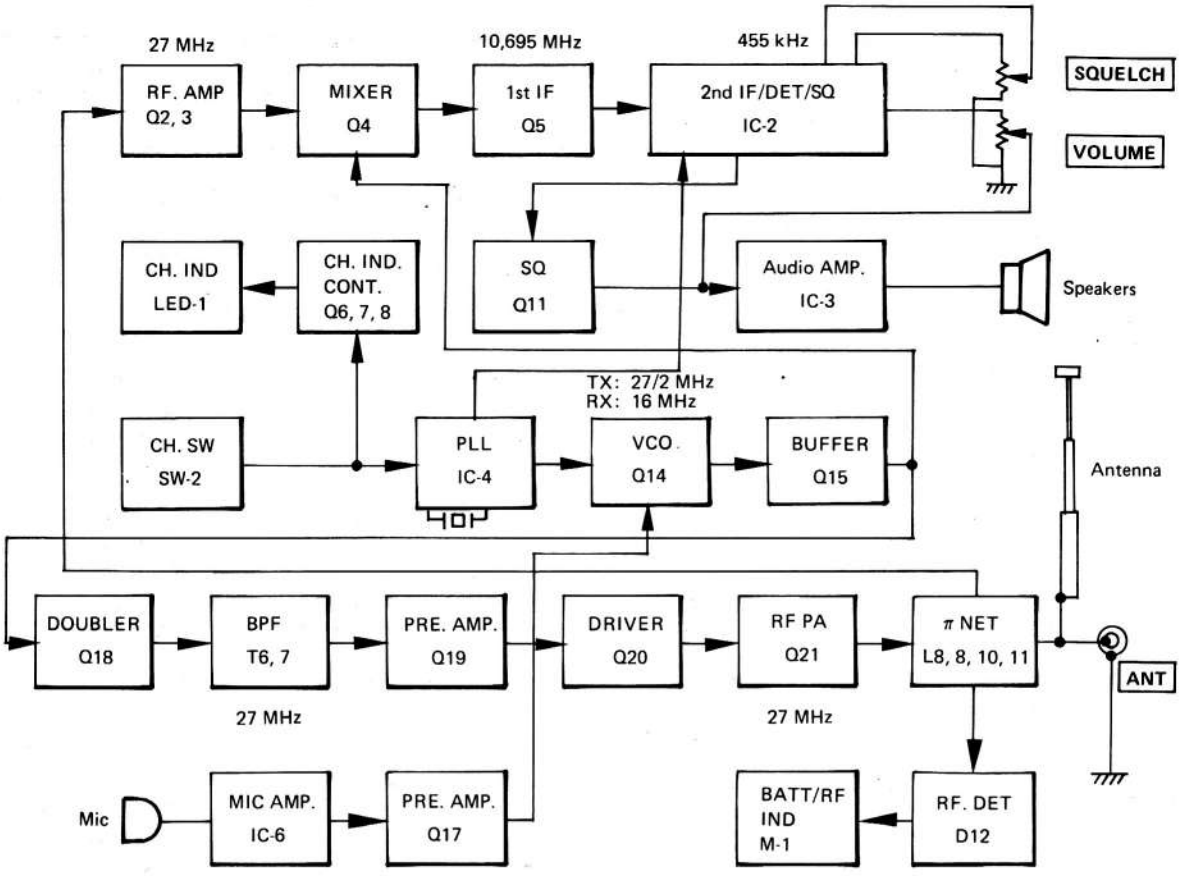
CONTENTS

SPECIFICATIONS

Description	Condition		Nominal	Limit
TRANSMITTER				
RF output power	12.5 V DC	POWER: Hi	3.5 W	3 W – 4W
		POWER: Low	0.25 W	0.1 – 0.4 W
Modulation level control	1.5 kHz dev. + 20 dB		1.7 kHz	1.5 – 2.0 kHz
Frequency tolerance			±540 Hz	±1,500 Hz
Spurious and harmonics			30 nW	0.25 μW
Current drain	12.5 V D.C.	POWER: Hi	700 mA	1,000 mA
		POWER: Low	250 mA	500 mA
RECEIVER				
Intermediate frequency	1st		10.695 ± 1 kHz	10.695 ± 2 kHz
	2nd		455 ± 1 kHz	455 ± 2 kHz
Sensitivity	500 mW output 10 dB (S+N)/N		0.5 μV	1 μV
Selectivity	±10 kHz		70 dB	60 dB
	–6 dB point		±4 kHz	5 ± 2 kHz
Squelch	Threshold		0.3 μV	0.5 μV
	Tight		(S+N)/N=18 dB	(S+N)/N=12 dB
Signal-to-noise ratio	RF input 1 mV 1.5 kHz dev.		55 dB	40 dB
Audio output	8Ω 10% T.H.D.		1.0 W	0.7 W
	Max. volume		1.5 W	1.0 W
Current drain	Squelched		55 mA	80 mA
	Max. volume		270 mA	400 mA
GENERAL				
Antenna impedance	50 Ω			
Frequency range	27.60125 to 27.99125 MHz			
Frequency control	P.L.L. frequency synthesizer, with One Crystal.			
Speaker	8 Ω 2-1/4" (57 mm) Dynamic Type			
Jacks	External speaker (3.5 mm) 8-16 Ω			
	External microphone (matched to 21-1172)			
	Battery charger (matched to 21-5-16)			
	External power (matched to 270-1533)			

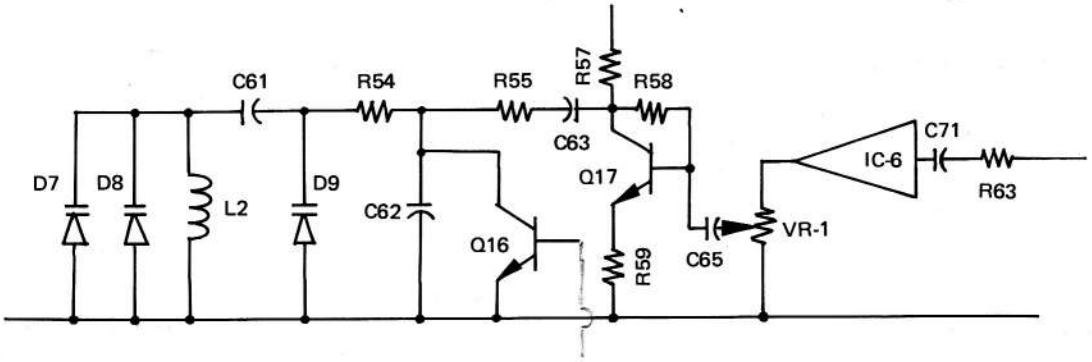
NOTE: *Nominal Specs represent the design specs; all units should be able to approximate these–some will exceed and some may drop slightly below these specs. Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.*

BLOCK DIAGRAM



PRINCIPLES OF OPERATION

FREQUENCY MODULATION CIRCUIT



Microphone output goes to Pin-1 of IC-6 and amplified to a constant level output, and again amplified by Q17 and fed to D9 (varactor) via C63, R54 and R55. Capacitance change of the D9 is applied to VCO coil via C61 to produce frequency modulation. VR-1 adjusts modulations level.

PLL CIRCUIT

The TRC-1001 uses a Digital Phase Lock Loop circuit to synthesize each of the channel frequencies using only one crystal. The PLL Circuit consists of a Phase Detector, Low Pass Filter (LPF) and a Voltage Controlled Oscillator (VCO), which uses a varicap diode as the frequency control device.

Refer to the Block Diagram of the PLL circuit as you go through the following description. A 10.24 MHz Crystal is used as a reference frequency. The Crystal Connected between Pins 11 and 12 of PLL IC Pin 12 is the output for 10.24 MHz and is processed by the PLL IC, as well as being used for the 2nd Mixer.

VCO frequencies (see Table on next page) are divided by "N" 3381 through 3459 as determined by the Channel Selector switch. Thus the resulting frequency is 5.0 kHz for receiving.

Also, the reference oscillator frequency, 10.24 MHz, is divided by 2048 (internally by the IC) resulting in another 5.0 kHz frequency.

These two 5.0 kHz signals are fed to the Phase Detector (internally by the IC). A DC error voltage is generated by the Phase Detector which is in proportion to the phase difference between these two 5.0 kHz signals. This error voltage appears at Pin 15. The error voltage which appears at Pin 15 is the result of the phase difference, plus effects of harmonics and extraneous noise. Pin 16 is the input to a LPF and Pin 17 is output, where the error voltage is integrated and harmonics and noises are filtered out. The resulting DC voltage is applied to the VCO (a varicap diode) whose capacity varies with applied DC voltage. With proper circuit design and precise adjustments, the VCO frequency is accurate and precise. When the Phase Detector senses no frequency or phase difference between the two 5.0 kHz signals, the system is "locked" and the VCO generates a frequency which is as accurate and stable as the reference crystal oscillator.

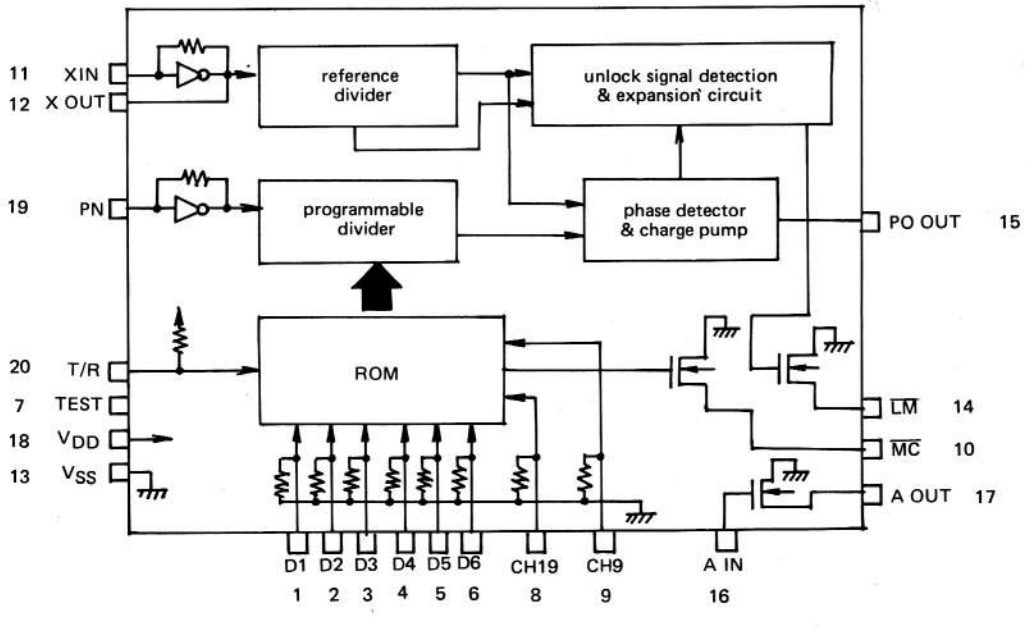
The Channel Selector switch provides a ROM code output which is connected to Pins 1 – 6, the IC converts these signals into BCD code. The resulting code determines "N", the divisor which produces the required output frequency for each channel (precisely spaced 10 kHz apart).

For Transmit, the same VCO is used, which oscillates in the 13.8 MHz band (see Table). These signals are divided by "N" (2760 through 2799) as determined by the Channel Selector switch. Thus; the circuits function in the same way, except for the method of dividing the VCO frequencies.

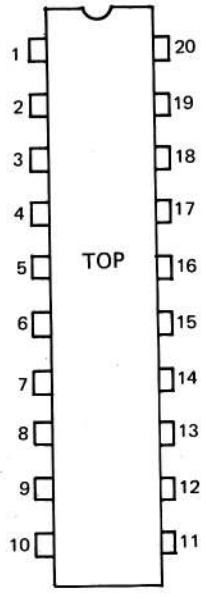
When the PLL is "unlocked", a inhibit signal is available at Pin 14. This signal is applied to Q19, to turn it off.

BLOCK DIAGRAM OF THE PLL IC

IC-4 LC-7137



Pin configuration



VCO OUTPUT FREQUENCY AND IC-4 INPUT CODE TABLE

CH. NO.	CH. Freq. (MHz)	PROGRAM CODE						Transmit		Receive	
		D1	D2	D3	D4	D5	D6	VCO (MHz)	N	VCO (MHz)	N
1	27.60125	1	0	0	0	0	0	13.800625	2760	16.90625	3381
2	27.61125	0	1	0	0	0	0	13.805625	2761	16.91625	3383
3	27.62125	1	1	0	0	0	0	13.810625	2762	16.92626	3385
4	27.63125	0	0	1	0	0	0	13.815625	2763	16.93625	3387
5	27.64125	1	0	1	0	0	0	13.820625	2764	16.94625	3389
6	27.65125	0	1	1	0	0	0	13.825625	2765	16.95625	3391
7	27.66125	1	1	1	0	0	0	13.830625	2766	16.96625	3393
8	27.67125	0	0	0	1	0	0	13.835625	2767	16.97625	3395
9	27.68125	1	0	0	1	0	0	13.840625	2768	16.98625	3397
10	27.69125	0	0	0	0	1	0	13.845625	2769	16.99625	3399
11	27.70125	1	0	0	0	1	0	13.850625	2770	17.00625	3401
12	27.71125	0	1	0	0	1	0	13.855625	2771	17.01625	3403
13	27.72125	1	1	0	0	1	0	13.860625	2772	17.02625	3405
14	27.73125	0	0	1	0	1	0	13.865625	2773	17.03625	3407
15	27.74125	1	0	1	0	1	0	13.870625	2774	17.04625	3409
16	27.75125	0	1	1	0	1	0	13.875625	2775	17.05625	3411
17	27.76125	1	1	1	0	1	0	13.880625	2776	17.06625	3413
18	27.77125	0	0	0	1	1	0	13.885625	2777	17.07625	3415
19	27.78125	1	0	0	1	1	0	13.890625	2778	17.08625	3417
20	27.79125	0	0	0	0	0	1	13.895625	2779	17.09625	3419
21	27.80125	1	0	0	0	0	1	13.900625	2780	17.10625	3421
22	27.81125	0	1	0	0	0	1	13.905625	2781	17.11625	3423
23	27.82125	1	1	0	0	0	1	13.910625	2782	17.12625	3425
24	27.83125	0	0	1	0	0	1	13.915625	2783	17.13625	3427
25	27.84125	1	0	1	0	0	1	13.920625	2784	17.14625	3429
26	27.85125	0	1	1	0	0	1	13.925625	2785	17.15625	3431
27	27.86125	1	1	1	0	0	1	13.930625	2786	17.16625	3433
28	27.87125	0	0	0	1	0	1	13.935625	2787	17.17625	3435
29	27.88125	1	0	0	1	0	1	13.940625	2788	17.18625	3437
30	27.89125	0	0	0	0	1	1	13.945625	2789	17.19625	2439
31	27.90125	1	0	0	0	1	1	13.950625	1790	17.20625	3441
32	27.91125	0	1	0	0	1	1	13.955625	2791	17.21625	3443
33	27.92125	1	1	0	0	1	1	13.960625	2792	17.22625	3445
34	27.93125	0	0	1	0	1	1	13.965625	2793	17.23625	3447
35	27.94125	1	0	1	0	1	1	13.970625	2794	17.24625	3449
36	27.95125	0	1	1	0	1	1	13.975625	2795	17.25625	3451
37	27.96125	1	1	1	0	1	1	13.980625	2796	17.26625	3453
38	27.97125	0	0	0	1	1	1	13.985625	2797	17.27625	3455
39	27.98125	1	0	0	1	1	1	13.990625	2798	17.28625	3457
40	27.99125	0	0	0	0	0	0	13.995625	2799	17.29625	3459

1: Logic high level
0: Logic low level

A.F. OPERATION CHECK BEFORE ALIGNMENT

START

CONNECTION

Connect POWER SUPPLY to plus(+) & minus(-) on Ext PWR Jack 2 through DC Current Meter as shown in Figure 1.

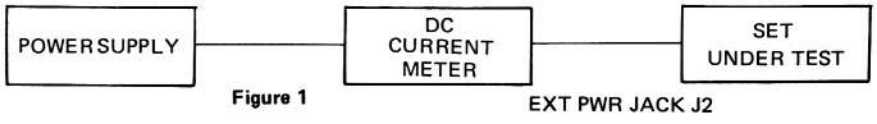


Figure 1

STEP 1

Check DC Current Drain (must be 45 – 80 mA)
Control Setting: VOLume (minimum), SQUELCH (fully counterclockwise).

REPAIR

See TROUBLESHOOTING 1), 3).

OK? — NG

DC Current Drain exceeds 80 mA or less than 45 mA.

OK

DC Current Drain is 45 – 80 mA.

CONNECTION

Connect AF Generator to "hot" end of VOLume control. Connect Oscilloscope, Distortion Meter and AC VTVM to Ext SPeaker Jack J1 across 8Ω Dummy Load as shown in Figure 2.

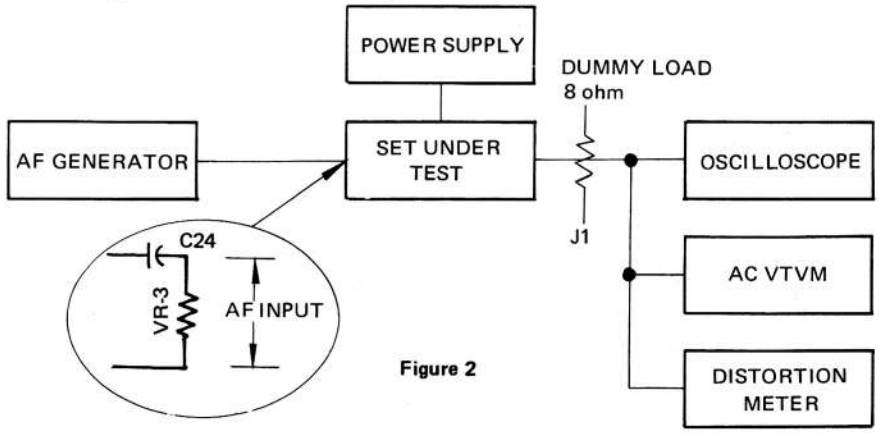


Figure 2

STEP 2

Check AF Output with 50 – 100 mV Input
Control Setting: VOLume (maximum), SQUELCH (fully counterclockwise).
Set A.F. GENERATOR Frequency to 1 kHz.

REFERENCE

A.F. Output Power is 0.7W with 50 – 100 mV Input. And Distortion is below 10%.

REPAIR

Check A.F. circuit. See TROUBLESHOOTING 4).

OK? — NG

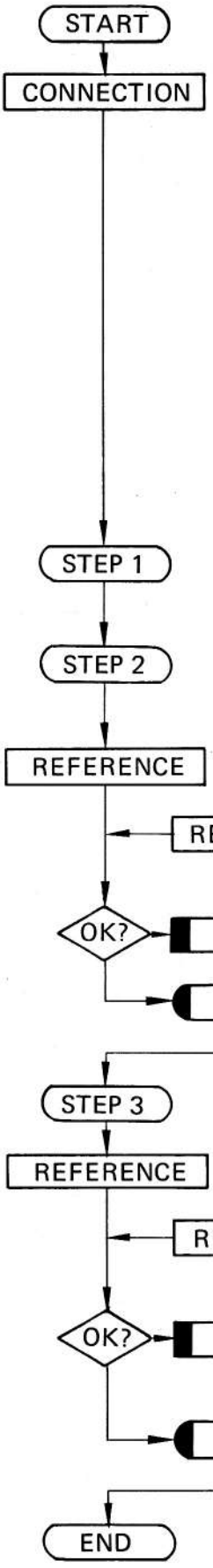
A.F. Output Power is not 0.7W with 50 – 100 mV Input. And/or Distortion exceeds 10%.

OK

A.F. Output Power is 0.7W with 50 – 100 mV Input. And Distortion is no more than 10%.

END

RECEIVER OPERATION CHECK BEFORE ALIGNMENT



Connect the instruments as shown in Figure 3.

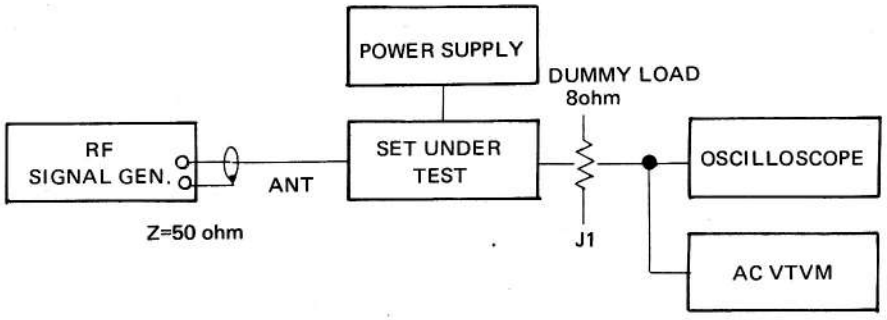


Figure 3

Set RF Generator to CH-20 (27.79125 MHz) 1.5 kHz deviation at 1 kHz and minimum output.
Control Setting: VOLume (output level for approx. 0.775V (0 dB))
SQUELCH (fully counterclockwise).

Turn off the modulation.

Nominal S/N should be 15 dB (over 10 dB is acceptable) with 1 μV input.

See TROUBLESHOOTING 5), 6).

S/N ratio is less than 10 dB.

S/N ratio is over 10 dB.

Turn SQUELCH control fully clockwise. Set RF Generator output to open squelch.

Squelch should turn on/off with output (S+N)/N over 12 dB.

See TROUBLESHOOTING 7).

Squelch action did not take place with output (S+N)/N over 12 dB.

Squelch action takes place at correct input level.

Proceed to TRANSMITTER OPERATION CHECK.

TRANSMITTER OPERATION CHECK BEFORE ALIGNMENT

START

CONNECTION

Connect the instruments as shown in Figure 4.

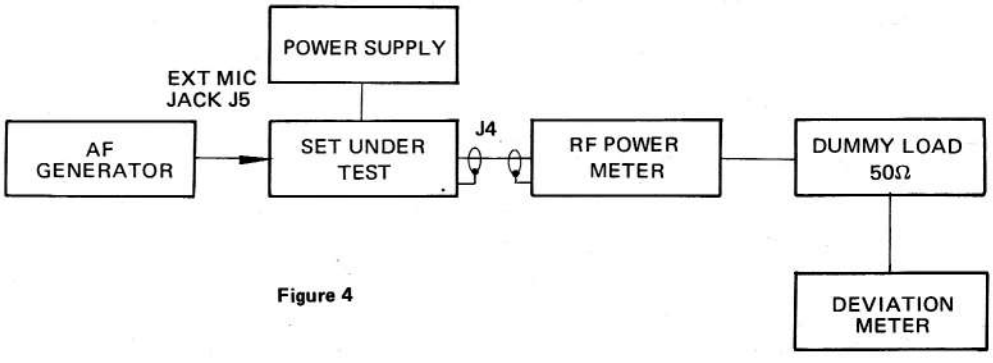


Figure 4

STEP 1

Set AF Generator frequency to 1 kHz. Increase level of AF Generator from approx. 5 mV to 63 mV. Set POWER switch position to HI.

REFERENCE

Nominal Modulation should be 1.5 – 2.0 kHz deviation with 5 – 63 mV input.
RF output power should be 3 – 4W.

REPAIR

See TROUBLESHOOTING 8), 9), 10).

OK? NG

Modulation is not 1.5 – 2.0 kHz deviation.
RF Output Power is not 3 – 4W.

OK

Modulation is 1.5 – 2.0 kHz deviation with 5 – 63 mV input.
RF Output Power is 3 – 4W.

STEP 2

Set AF Generator frequency to 1 kHz. Increase level of AF Generator from 5 mV to 63 mV. Set POWER switch position to LOW.

REFERENCE

Nominal Modulation should be 1.5 – 2.0 kHz with 5 – 63 mV input.
RF Output Power should be 0.1 – 0.4W.

REPAIR

Check POWER HI-LOW Switch and associated circuit.

OK? NG

Modulation is not 1.5 – 2.0 kHz with 5 – 63 mV input.
RF Output Power is not 0.1 – 0.4W.

OK

Modulation is 1.5 – 2.0 kHz deviation with 5 – 63 mV input.
RF Output Power is 0.1 – 0.4W.

END

TROUBLESHOOTING

Symptom	Possible Cause
1) Channel LED does not light and/or set fails to operate when Power is ON.	A) Weak Batteries B) Wrong Battery polarity C) Defective PoWeR switch D) Defective PoWeR Jack E) Defective LED, Q6, 7, 8 and associated circuit components
2) Channel LED remains on.	A) Defective LED driver circuit Q6, 7, 8 and/or associated circuit components
3) Batteries become hot and/or short circuit when EXT. power supply used.	A) Defective PoWeR Jack B) Defective IC-3
4) Battery meter indicator OK but no sound on any channel.	A) Defective Speaker and/or Ext. Speaker Jack B) Defective Talk switch and/or Mic jack switch C) Defective AF amplifier circuit, IC-3 and/or associated circuit components D) Defective Squelch circuit, Q11, IC-2 and/or circuit components E) Defective volume control associated circuit
5) Does not receive Transmitter: OK	A) Poor and/or wrong frequency PLL B) Defective IC-2 and/or associated circuit components. C) Defective Talk switch and/or Mic jack switch. D) Defective RF circuit Q1, 2, 3 and/or associated circuit components E) Defective speaker and/or Ext. Speaker jack
6) Poor Receive sensitivity	A) Weak batteries B) Poor and/or wrong frequency PLL C) Faulty RF amplifier Q2, 3 and/or mixer circuit Q4 components D) Faulty IF amplifier circuit IC-2 E) Defective ceramic filter CF-1 or XF-1
7) Squelch control does not operate. Receiver: OK	A) Defective Squelch control circuit Q11 B) Faulty VR-2
8) Does not transmit.	A) Weak batteries B) Poor and/or wrong frequency PLL C) Defective Talk switch and/or Mic jack switch D) Defective Q18–21, and/or associated circuit components
9) No modulation Receiver: OK	A) Faulty microphone unit and/or IC-6 circuit B) Defective Mic jack and/or Mic jack switch
10) Automatic Modulation Control does not operate.	A) Defective IC-6 and/or associated circuit
11) Self-oscillation on transmit	A) Faulty TX/RX control circuit Q9, 10
12) When Ext. mic used Receiver and/or Transmitter does not work.	A) Defective Ext. Microphone B) Defective Ext. Mic jack and/or Mic jack switch

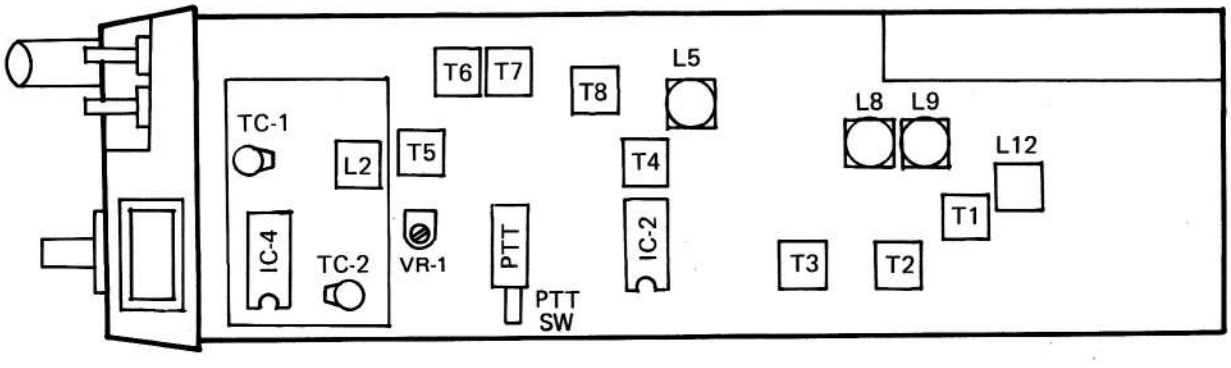
ALIGNMENT PREPARATION

Test instruments required

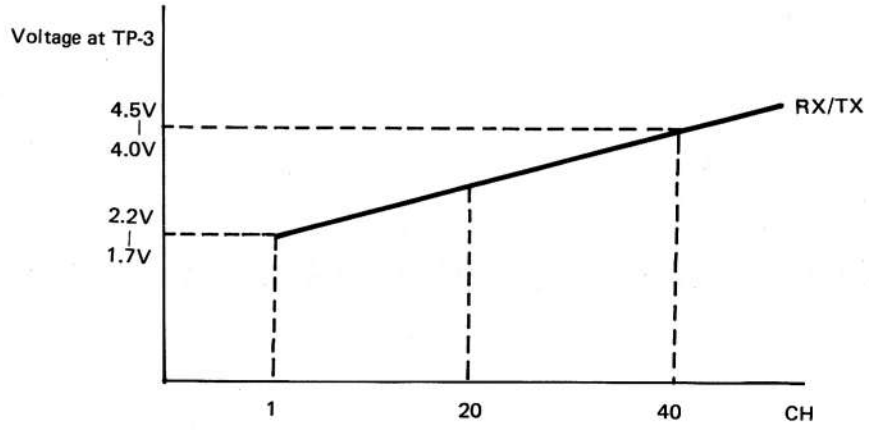
1. Oscilloscope
2. AC VTVM (RF)
3. DC VTVM
4. Frequency Counter
5. 8Ω dummy load
6. RF Signal Generator 455 kHz to 30 MHz
7. Power Meter (50Ω)
8. 50Ω 5W dummy load
9. Audio Signal Generator
10. Distortion Meter
11. DC Power Supply (12.5V 2A)
12. DC Current Meter
13. Deviation Meter

NOTE: *Use non-metallic tuning tools.*
Allow instruments and unit 15 minutes to warm-up prior to alignment. Maintain Generator output level at minimum necessary to obtain usable output readings (this will avoid saturation and clipping).

ALIGNMENT LOCATIONS AND POINTS



PLL SECTION ALIGNMENT CHART

Step	Control Setting	Test Instrument	Test Instrument Connection	Remarks
1	Power Switch: ON RX: ON CH: 20	DC VTVM	TP–3	Adjust L2 for 3 V
2	Power Switch: ON TX: ON CH: 20	DC VTVM	TP–3	Adjust TC-1 for 3 V
3	Power Switch: ON	Activate channel 1 through 40 and check that the PLL circuit will "lock" [use a frequency counter at TP–4 in RX-mode and TX-mode]. At the same time, check the VCO control voltage at TP–3. It should vary as shown in Figure 5. If necessary, repeat Steps 2 and 3.  **Figure 5**		
4	Power Switch: ON TX: ON CH: 20	Frequency Counter	TP–5	Adjust TC–2 for 27.79125 MHz

TRANSMITTER ALIGNMENT CHART

Step	Control Setting	Test Instruments Connection and Setting	Adjust	Remarks
1	Power Switch: ON CH: 20 Power Hi/Low SW: Hi Press-to-Talk Button: Push	Connect RF Power Meter, Dummy Load, and Diviation meter to ANT Jack on set. (Figure 6)	L5 T6 T7 T8 L8 L9	Alignment of Power Stage Adjust T6, T7, L5, L8 and L9 for max. indication on RF Power Meter.
2	Same as Step 1 Power Hi/Low Sw: Hi	Same as Step 1		Check that RF power output is between 3.0 and 4.0 watts.
3	Same as Step 1 Power Hi/Low SW: Low	Same as Step 1		Check that RF power output is between 0.1 and 0.4 watts.
4	Same as Step 1	Same instruments connection as for Step 1. Adjust AF Gen. output is 2 mV at EXT MIC jack J5.	VR-1	Adjustment of Deviation Adjust VR-1 for 1.5 kHz deviation.
5	Same as Step 5	Same instruments connection as for Step 4 Increase input level to EXT MIC jack J5 +20 dB from 1.5 kHz deviation.		Check deviation meter reading between 1.5K – 2.0 kHz
6	Same as Step 1	Same as Step 1	L12	Alignment of 2nd Harmonics Minimum output on 55 MHz Receiver.

NOTE: *If no output appears in Step 1, re-adjust T6 and T7 for max. output on RF VTVM or Oscilloscope at TP–5.*

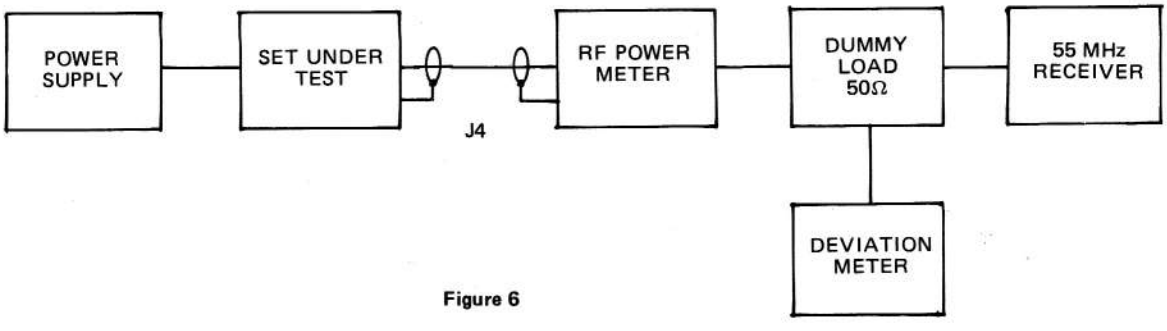


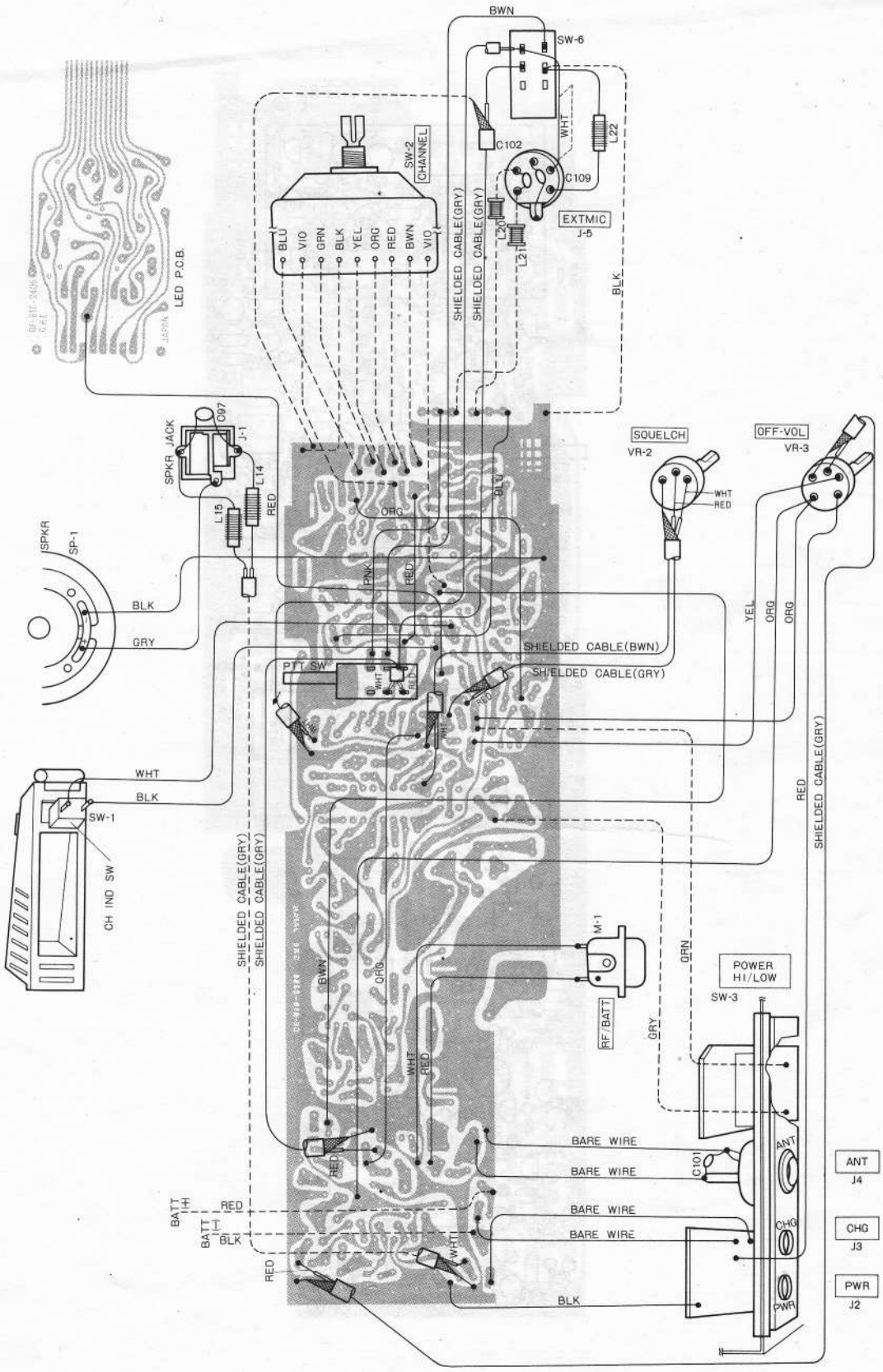
Figure 6

RECEIVER ALGNMENT CHART

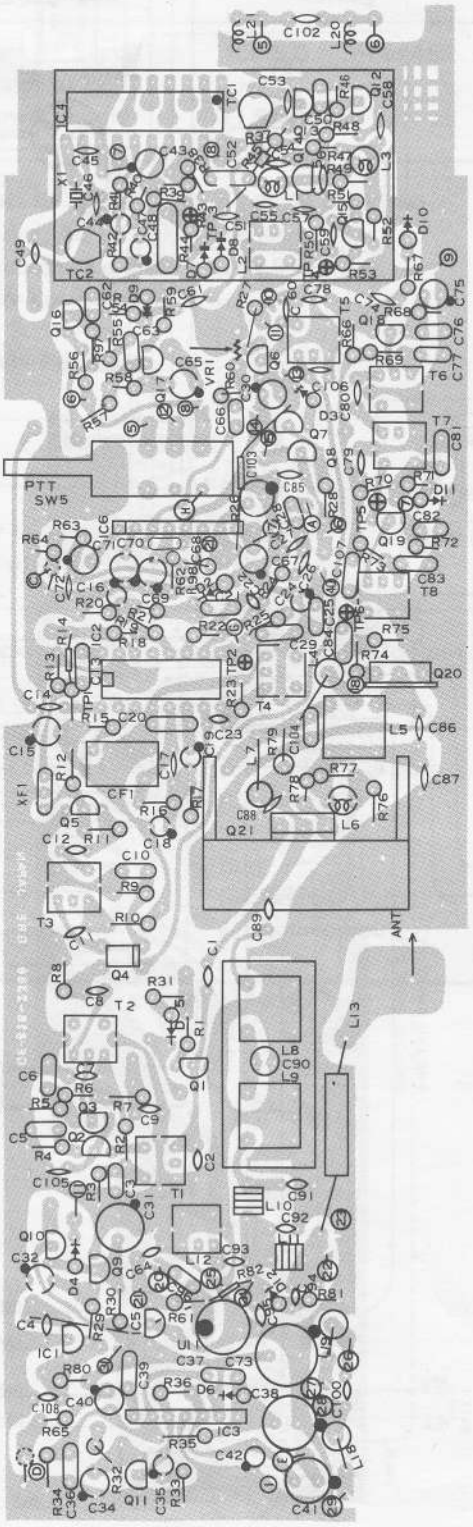
NOTE: *Alignment of Receiver Section must not be done until PLL and Transmitting Section Alignment is completed.*

Step	Control Setting	Test Instrument Connection	Signal Generator Setting	Adjust	Remarks
1	Power Switch: ON	Connect RF Signal Generator to TP-1 and Power Supply	R.F.S.G.: Set to 455 kHz. (1.5 kHz dev.)	T4	Best waveform.
2	VOLUME control: Fully clockwise SQUELCH control: Fully counter-clockwise CH: 20	Connect RF Signal Generator, AC VTVM, Oscilloscope, 8 ohm Dummy Load, and Power Supply as shown in Figure–3.	Freq. 27.79125 MHz (Channel 20) at 1.5 kHz dev.	T1 T2 T3 T5	Alignment of RF Adjust the core of T1, T2, T3 and T5 for max. indication on Oscilloscope and AC VTVM. Keep output of RF SG as low as possible and still obtain usable output.
3	Repeat Steps 1 and 2 as necessary to obtain maximum sensitivity. After final adjustments, seal the cores of T1, T2, T3, T4 and T5 (then check sensitivity once more).				
4	Turn SQUELCH control fully clockwise and check Squelch function (output should cease). Return SQUELCH to minimum.				
5	VOLUME control: set AF output level for approx. 0.775 V (0 dB) SQUELCH control: Fully clockwise CH: 20	Same as Step 2	Freq. 27.79125 MHz (Channel 20) at 1.5 kHz deviation Increase SG Output to get audio output.		Check squelch operation.

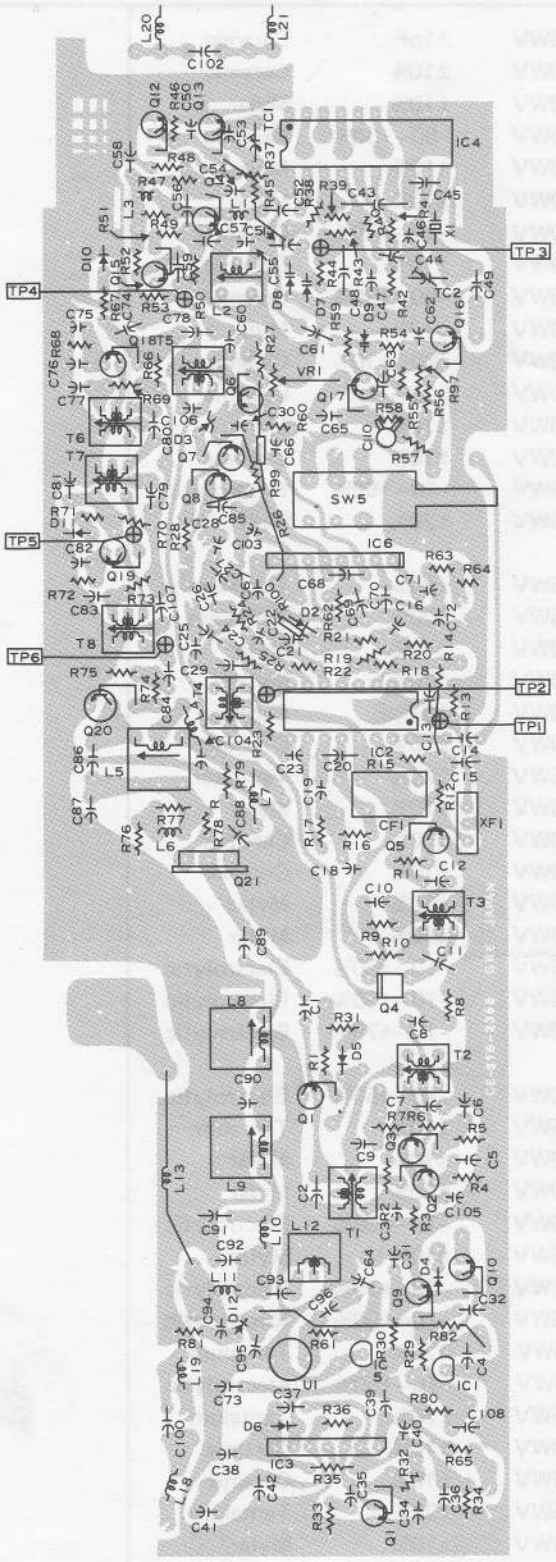
WIRING DIAGRAM



PRINTED CIRCUIT BOARD TOP VIEW



PRINTED CIRCUIT BOARD BOTTOM VIEW



ELECTRICAL PARTS LIST

Ref. No.	Description				RS Part Number	MFR's Part Number
			CAPACITORS			
C1	10pF	50WV	±1pF	Ceramic		HE40SJCH100F
C2	33pF	50WV	±10%	Ceramic		HE50SJRH330K
C3	0.01μF	50WV	±10%	Mylar		AMX103K50
C4	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C5	0.01μF	50WV	±10%	Mylar		AMX103K50
C6	0.01μF	50WV	±10%	Mylar		AMX103K50
C7	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C8	22pF	50WV	±10%	Ceramic		HE40SJCH220K
C9	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C10	0.01μF	50WV	±10%	Mylar		AMX103K50
C11	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C12	270pF	50WV	±10%	Ceramic		HE12SJCH271K
C13	0.001μF	50WV	±10%	Mylar		AMX102K50
C14	22pF	50WV	±10%	Ceramic		HE40SJCH220K
C15	10μF	16WV	-10–+50%	Electrolytic		CE04W1C100
C16	1μF	25WV	±20%	Tantalum		CS15E1E010MS
C17	Not used					
C18	0.1μF	35WV	±20%	Tantalum		CE15E1VOR1MS
C19	0.1μF	35WV	±20%	Tantalum		CE15E1VOR1MS
C20	0.047μF	50WV	±10%	Mylar		AMX473K50
C21	0.01μF	50WV	±10%	Mylar		AMX103K50
C22	3pF	50WV	±0.5pF	Ceramic		HE40SJCK030D
C23	22pF	50WV	±10%	Ceramic		HE40SJCH220K
C24	0.1μF	35WV	±20%	Tantalum		CE15E1VOR1MS
C25	0.015μF	50WV	±10%	Mylar		AMX153K50
C26	150pF	50WV	±10%	Ceramic		HE90SJCH151K
C27	27pF	50WV	±10%	Ceramic		HE50SJCH270K
C28	0.01μF	50WV	±10%	Mylar		AMX103K50
C29	0.001μF	50WV	±10%	Mylar		AMX102K50
C30	10μF	16WV	-10–+50%	Electrolytic		CE04W1C100C
C31	47μF	16WV	-10–+50%	Electrolytic		CE04W1C470B
C32	1μF	50WV	-10–+75%	Electrolytic		CE04W1H010
C33	Not used					
C34	47μF	10WV	-10–+50%	Electrolytic		CE04W1A470
C35	1μF	25WV	±20%	Tantalum		CS15E1E010MS
C36	0.01μF	50WV	±10%	Mylar		AMX103K50
C37	0.0033μF	50WV	±10%	Mylar		AMX332K50
C38	47μF	16WV	-10–+50%	Electrolytic		CE04W1C470B
C39	0.001μF	50WV	±10%	Mylar		AMX102K50
C40	1μF	50WV	-10–+75%	Electrolytic		CE04W1H010
C41	47μF	16WV	-10–+50%	Electrolytic		CE04W1C470B
C42	3.3μF	25WV	±20%	Tantalum		CS15E1E3R3MS
C43	10μF	16WV	-10–+50%	Electrolytic		CE04W1C100
C44	0.47μF	35WV	±20%	Tantalum		CS15E1VR47MS
C45	33pF	50WV	±10%	Ceramic		HE50SJRH330K
C46	33pF	50WV	±10%	Ceramic		HE50SJRH330K
C47	0.1μF	35WV	±20%	Tantalum		CS15E1V0R1MS
C48	0.068μF	50WV	±10%	Mylar		AMX683K50
C49	22pF	50WV	±10%	Ceramic		HE40SJCH220K

Ref. No.	Description				RS Part Number	MFR's Part Number
C50	0.01μF	50WV	±10%	Mylar		AMX103K50
C51	33pF	50WV	±10%	Ceramic		HE60SJCH470K
C52	0.01μF	50WV	±10%	Mylar		AMX103K50
C53	15pF	50WV	±10%	Ceramic		HE40SJCH150K
C54	47pF	50WV	±10%	Ceramic		HE60SJCH470K
C55	10pF	50WV	±10%	Ceramic		HE40SJRH100K
C56	47pF	50WV	±10%	Ceramic		HE60SJCH470K
C57	47pF	50WV	±10%	Ceramic		HE60SJCH470K
C58	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C59	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C60	10pF	50WV	±1pF	Ceramic		HE40SJCH100F
C61	3pF	50WV	±0.5pF	Ceramic		HE40SJCK30D
C62	0.0022μF	50WV	±10%	Mylar		AMX222K50
C63	0.01μF	50WV	±10%	Mylar		AMX103K50
C64	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C65	1μF	50WV	-10–+75%	Electrolytic		CE04W1H010
C66	0.022μF	50WV	±10%	Mylar		AMX223K50
C67	1μF	50WV	-10–+75%	Electrolytic		CE04W1H010
C68	0.01μF	50WV	±10%	Mylar		AMX103K50
C69	33μF	16WV	-10–+50%	Electrolytic		CE04W1C330
C70	10μF	16WV	-10–+50%	Electrolytic		CE04W1C100
C71	1μF	50WV	-10–+75%	Electrolytic		CE04W1H010
C72	330pF	50WV	±10%	Ceramic		HE40SJYB331K
C73	470μF	16WV	±20%	Electrolytic		CEUSM1C471
C74	150pF	50WV	±10%	Ceramic		HE90SJCH151K
C75	22μF	10WV	-10–+50%	Electrolytic		CE04W1A220B
C76	0.01μF	50WV	±10%	Mylar		AMX103K50
C77	0.01μF	50WV	±10%	Mylar		AMX103K50
C78	39pF	50WV	±10%	Ceramic		HE50SJCH390K
C79	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C80	2pF	50WV	±0.5pF	Ceramic		HE40SJCK020D
C81	0.01μF	50WV	±10%	Mylar		AMX103K50
C82	0.01μF	50WV	±10%	Mylar		AM103K50
C83	0.01μF	50WV	±10%	Mylar		AMX103K50
C84	0.001μF	50WV	±10%	Mylar		AMX102K50
C85	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C86	180pF	50WV	±10%	Ceramic		HE95SJCH181K
C87	220pF	50WV	±10%	Ceramic		HE11SJCH221K
C88	120pF	50WV	±10%	Ceramic		HE80SJCH121K
C89	150pF	50WV	±10%	Ceramic		HE90SJCH151K
C90	390pF	125WV	±5%	Polystyrene		C009S2B371J(S)
C91	270pF	50WV	±10%	Ceramic		HE12SJCH271K
C92	150pF	50WV	±10%	Ceramic		HE90SJCH151K
C93	56pF	50WV	±10%	Ceramic		HE60SJCH560K
C94	2pF	50WV	±0.5pF	Ceramic		HE40SJCK020D
C95	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C96	0.022μF	50WV	±10%	Mylar		AMX223K50
C97	0.001μF	50WV	±10%	Ceramic		HE50SJYB102K
C98	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C99	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C100	0.01μF	50WV	-80–+30%	Ceramic		HE11SJCH221K
C101	220pF	50WV	±10%	Ceramic		HE11SJCH221K
C102	0.01μF	50WV	-80–+30%	Ceramic		HE70SJYF103Z
C103	47μF	10WV	-10–+50%	Electrolytic		CE04W1A470

Ref. No.	Description				RS Part Number	MFR's Part Number
C104	0.01μF	50WV	±10%	Mylar		AMX103K50
C105	10pF	50WV	±1pF	Ceramic		HE40SJCH100F
C106	27pF	50WV	±10%	Ceramic		HE50SJCH270K
C107	0.01μF	50WV	±10%	Mylar		AM103K50
C108	0.01μF	50WV	-80—+30%	Ceramic		HE70SJYF103Z
C109	0.01μF	50WV	-80—+30%	Ceramic		HE70SJYF103Z
C110	470pF	50WV	±10%	Ceramic		HE40SJYB471K
COILS/FILTERS/CRYSTAL						
L1	Micro Inductor	3.3μH				LF4-3R3K
L2	Coil VCO					GRN-554 (T)
L3	Not used					
L4	Coil, Choke					4LNC-027
L5	Coil, Transmit driver					10PNP-028
L6	Micro Inductor	4.7μH				LF4-4R7K
L7	Coil, Transmit final					4LNC-027
L8	Coil, π net work				CA-3014	8SNF-064
L9	Coil, π net work				CA-2268	10PNP-028
L10	Coil, π net work				CA-3488	10LNC-092
L11	Coil, π net work				CA-3488	10LNC-092
L12	Coil, harmonic trap (2nd)					GRN-174
L13	Coil, loading					4LNC-027
L14	Coil, Choke					4LNC-095
L15	Coil, Choke					4LNC-095
L16	Coil, Choke					4LNC-162
L17	Coil, Choke					4LNC-162
L18	Coil, Choke					4LNC-054
L19	Coil, Choke					4LNC-054
L20	Coil, Choke					3B-037
L21	Coil, Choke					3B-037
L22	Coil, Choke					4LNC-162
T1	Coil, Antenna	27 MHz				2229
T2	Coil, RF	27 MHz				1624B
T3	Coil, 1st IF	10.695 MHz				GRA 470-033
T4	Coil, Discreminator	455 MHz				M452503N
T5	Coil, 1st Local	16 MHz			CA-3964	GR-N555
T6	Coil, 27 MHz B.P.F.				CA-4966	GR-N549
T7	Coil, 27 MHz B.P.F.				CA-4966	GR-N549
T8	Coil, 27 MHz Pre Amp.				CA-4966	GR-N549
CF-1	Ceramic Filter	455 kHz				CFW455G
XF-1	Crystal Filter	10.695 MHz				10M08A
X-1	Crystal				MX-2309	10.24 MHz
POTENTIOMETERS/TRIMMER CAPACITORS						
VR-1	Trimmer resistor	2 KΩ				SV-08-311 B2kΩ
VR-2	Squelch control	50 KΩ				V12M4-1N15FH 15C
VR-3	Volume control W/Power Switch	50 KΩ				V12M4-IS (SJ) 15FH 15A

Ref. No.	Description	RS Part Number	MFR's Part Number
TC-1	Trimmer Capacitor 20pF		ECV-1ZW20x53
TC-2	Trimmer Capacitor 20pF		ECV-1ZW20x53
	SEMICONDUCTORS		
Q1	Transistor, Silicon		2SC1923(0)
Q2	Transistor, Silicon		2SC1923(0)
Q3	Transistor, Silicon		2SC1923(0)
Q4	Transistor, Silicon		3SK77 (GR)
Q5	Transistor, Silicon		2SC1815(Y)
Q6	Transistor, Silicon		2SA1015
Q7	Transistor, Silicon		2SC1815 (GR)
Q8	Transistor, Silicon		2SC1959 (Y)
Q9	Transistor, Silicon		2SC1815 (GR)
Q10	Transistor, Silicon		2SC1959 (Y)
Q11	Transistor, Silicon		2SC1815 (GR)
Q12	Transistor, Silicon		2SC1815 (GR)
Q13	Transistor, Silicon		2SC1923 (O)
Q14	Transistor, Silicon		2SC1815 (Y)
Q15	Transistor, Silicon		2SC1815 (Y)
Q16	Transistor, Silicon		2SC1815 (GR)
Q17	Transistor, Silicon		2SC1815 (GR)
Q18	Transistor, Silicon		2SC1815 (Y)
Q19	Transistor, Silicon		2SC1815 (Y)
Q20	Transistor, Silicon		2SC2314
Q21	Transistor, Silicon		2SC2075
D1	Not used		
D2	Diode		IN60
D3	Zener Diode 5 Volts		HZ5C3
D4	Diode	DX-0270	1S1555
D5	Diode	DX-0270	1S1555
D6	Diode	DX-0270	1S1555
D7	Vari-Cap. Diode		ITT310
D8	Vari-Cap, Diode		ITT310
D9	Vari-Cap, Diode		ITT310
D10	Diode	DX-0161	1N60
D11	Diode	DX-0161	1N60
D12	Diode	DX-0161	1N60
D13	Diode		SR1K-2 or SIB-01-02
IC-1	Integrated Circuit		TA78L007AP or TA78L075AP
IC-2	Integrated Circuit		MC3357P or MPS5071
IC-3	Integrated Circuit		AN374P
IC-4	Integrated Circuit		LC7137
IC-5	Integrated Circuit		TA78L007AP or TA78L075AP
IC-6	Integrated Circuit		μPC1170H
LED-1	7 Segment LED	L-0932	SL-1271

Ref. No.	Description	RS Part Number	MFR's Part Number
	RESISTORS		
	NOTE: *All carbon film, ¼W, ±5% unless otherwise specified.*		
R1	2.2kΩ		ERD-14UJ-222
R2	22kΩ		ERD-14UJ-223
R3	4.7kΩ		ERD-14UJ-472
R4	56Ω		ERD-14UJ-560
R5	10kΩ		ERD-14UJ-103
R6	10kΩ		ERD-14UJ-103
R7	56Ω		ERD-14UJ-560
R8	47kΩ		ERD-14UJ-473
R9	1kΩ		ERD-14UJ-102
R10	100Ω		ERD-14UJ-101
R11	220kΩ		ERD-14UJ-224
R12	3.3kΩ		ERD-14UJ-332
R13	1kΩ		ERD-14UJ-102
R14	15kΩ		ERD-14PJ-153
R15	2.2kΩ		ERD-14UJ-222
R16	2.2kΩ		ERD-14UJ-222
R17	100kΩ		ERD-14UJ-104
R18	220kΩ		ERD-14UJ-224
R19	2.2kΩ		ERD-14UJ-222
R20	68kΩ		ERD-14UJ-683
R21	10kΩ		ERD-14UJ-103
R22	2.2MΩ		ERD-14UJ-225
R23	22kΩ		ERD-14UJ-223
R24	22kΩ		ERD-14UJ-223
R25	4.7kΩ		ERD-14UJ-472
R26	100kΩ		ERD-14PJ-104
R27	10kΩ		ERD-14UJ-103
R28	6.8kΩ		ERD-14UJ-682
R29	10kΩ		ERD-14UJ-103
R30	2.2kΩ		ERD-14UJ-222
R31	22kΩ		ERD-14UJ-223
R32	10kΩ		ERD-14UJ-103
R33	220Ω		ERD-14UJ-221
R34	27kΩ		ERD-14UJ-273
R35	33kΩ		ERD-14UJ-333
R36	33kΩ		ERD-14PJ-333
R37	10kΩ		ERD-14UJ-103
R38	100Ω		ERD-14UJ-101
R39	10kΩ		ERD-14UJ-103
R40	68Ω		ERD-14UJ-680
R41	2.2kΩ		ERD-14UJ-222
R42	47kΩ		ERD-14UJ-473
R43	4.7kΩ		ERD-14UJ-472
R44	15kΩ		ERD-14UJ-153
R45	2.2kΩ		ERD-14UJ-222
R46	10kΩ		ERD-14UJ-103
R47	22kΩ		ERD-14UJ-223
R48	33kΩ		ERD-14UJ-333
R49	1kΩ		ERD-14UJ-102
R50	2.2kΩ		ERD-14UJ-222

Ref. No.	Description	RS Part Number	MFR's Part Number
R51	2.2kΩ		ERD-14UJ-222
R52	100Ω		ERD-14UJ-101
R53	2.2kΩ		ERD-14UJ-222
R54	10kΩ		ERD-14UJ-103
R55	39kΩ		ERD-14UJ-393
R56	10kΩ		ERD-14UJ-103
R57	10kΩ		ERD-14UJ-103
R58	1.5MΩ		ERD-14UJ-155
R59	100Ω		ERD-14UJ-101
R60	4.7kΩ		ERD-14UJ-472
R61	2.2kΩ		ERD-14UJ-222
R62	100kΩ		ERD-14UJ-104
R63	22kΩ		ERD-14UJ-223
R64	1kΩ		ERD-14UJ-102
R65	10kΩ		ERD-14UJ-103
R66	12kΩ		ERD-14UJ-123
R67	6.8kΩ		ERD-14UJ-682
R68	470Ω		ERD-14UJ-471
R69	100Ω		ERD-14UJ-101
R70	18kΩ		ERD-14UJ-183
R71	1kΩ		ERD-14UJ-102
R72	22Ω		ERD-14UJ-220
R73	22Ω		ERD-14UJ-220
R74	10Ω (2.2Ω ~ 10Ω)		ERD-14UJ-100
R75	220Ω		ERD-14UJ-221
R76	10Ω		ERD-14UJ-100
R77	220Ω		ERD-14UJ-221
R78	8.2Ω (2.2Ω ~ 8.2Ω)		ERD-14UJ-8R2
R79	1kΩ ½W		ERD-12TJ-102
R80	220Ω		ERD-14UJ-221
R81	470Ω		ERD-14UJ-471
R82	15kΩ		ERD-14PJ-153
R83	1kΩ		ERD-14PJ-102
R84	1kΩ		ERD-14PJ-102
R85	1kΩ		ERD-14PJ-102
R86	1kΩ		ERD-14PJ-102
R87	1kΩ		ERD-14PJ-102
R88	1kΩ		ERD-14PJ-102
R89	1kΩ		ERD-14PJ-102
R90	1kΩ		ERD-14PJ-102
R91	1kΩ		ERD-14PJ-102
R92	1kΩ		ERD-14PJ-102
R93	1kΩ		ERD-14PJ-102
R94	1kΩ		ERD-14PJ-102
R95	470Ω		ERD-14PJ-471
R96	47Ω 2W		ERG-2W-470
R97	470kΩ		ERD-14UJ-474
R98	Not used		
R99	470K		ERD-14PJ-474
R100	470K		ERD-14PJ-474

Ref. No.	Description	RS Part Number	MFR's Part Number
	MISCELLANEOUS		
SW-5	P.T.T. Switch		MF0201AA2020
	PLL Shield Case		GE-81D-1878
	PLL Shield Cover (Top)		GE-81D-1879-2
	PLL Shield Cover (Bottom)		GE-81D-1880
	Heatsink, Final transistor Q21		GE-81D-2223
	Pi-net Shield		GE-81D-2543
	TX Shield (Bottom)		GE-81D-2544
U1	MIC Unit		WM-034 (AY)
	Test Pin		ERD14 TOA

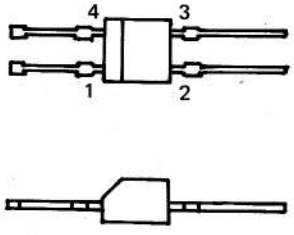
MECHANICAL PARTS LIST

Ref. No.	Description	RS Part Number	MFR's Part Number
①	OFF-VOL, SQUELCH knob		GE-81D-1868
VR-3/SW4 ②	OFF-VOL Control		V12M4-1S (SJ) 15FH15A50K
VR-2 ③	SQUELCH Control		V12M4-1N25FH 15C 50K
④	Top escutcheon ass'y	Z-4192	GE-23E-7202
	Escutcheon		
	Top panel (A)		
	Top panel (B)		
	EXT MIC jack cap		
	SP jack cap		
	LED window		
⑤	Antenna grommet	A-4424	GE-13C-907
⑥	Front case ass'y		GA-81D-2409
	Front case		
	Tandy mark		
	Model plate		
⑦	Rear case ass'y		GA-81D-2410
	Rear case		
	Side grille (S)		
	Side grille (L)		
	Battery pack		
	Cover for strap		
	Model Label		
⑧	Battery terminal A		GE-20D-5370
⑨	Battery terminal B		GE-20D-5371
⑩	Battery terminal E		GE-23D-7189
⑪	Battery terminal D		GE-20D-5373
⑫	Battery cover ass'y	DB-0240	GE-23D-6915
	Battery cover		
	Cover for Strap		
⑬	Strap		
SW2 ⑭	Channel selector switch		SR303 (U) #123
⑮	Channel knob	K-3054	GE-20D-5514
⑯	Speaker	S-4712	C060A20N1310
M1 ⑰	Meter		H-317-1750
⑱	Jack board	J-0743	XQ-6469
SW3	POWER HI/LOW Switch		
J4	ANT jack		
J2	PWR jack		
J3	CHG jack		
⑲	Jack board cap	HB-7946	GE-20D-5419
⑳	Chassis		GE-81B-1877
㉑	Main P.C.B. ass'y		GE-81D-2559
ANT-1 ㉒	Antenna		GS-3
㉓	Talk button with CHANNEL Indicator Switch	K-3050	GE-23D-7204
㉔	Antenna mounting Bracket		GE-81D-1881
㉕	Meter Pad		GE-81D-1885
J1 ㉖	SP jack	J-6385	SG-8022
J5 ㉗	EXT MIC jack with Switch	J-0964	D5-705B-10
㉘	Switch P.C.B. ass'y		GA-81D-2560
	Screws		
	Pan head screw		3mm x 4mm
	Flat counter sunk head screw		3mm x 8mm

SEMICONDUCTOR LEAD IDENTIFICATION

(A) : 3SK77
(B) : 2SA1015
(C) : 2SC1815 (GR), 2SC1815 (Y), 2SC1923 (O), 2SC1959 (Y)
(D) : 2SC2314
(E) : 2SC2075
(F) : SL-1271

(A)

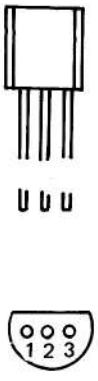


1. SOURCE
2. DRAIN
3. GATE 2
4. GATE 1

(B)

1. EMITTER
2. COLLECTOR
3. BASE

(C)



1. EMITTER
2. COLLECTOR
3. BASE

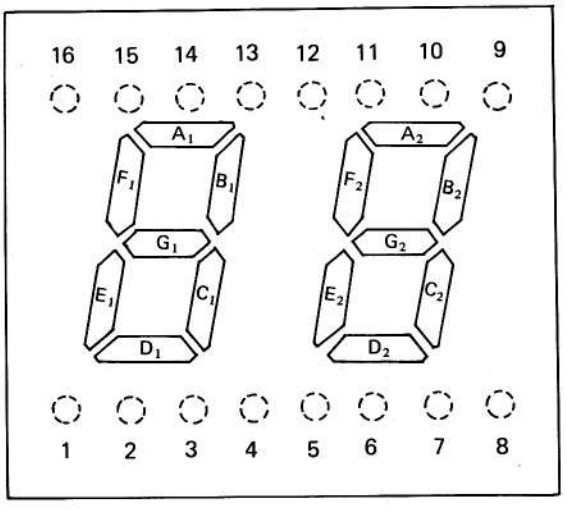
(D)

1. EMITTER
2. COLLECTOR
3. BASE

(E)

1. BASE
2. COLLECTOR
3. EMITTER

(F)



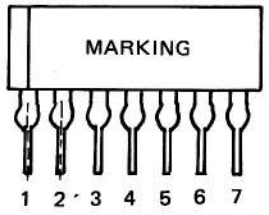
Front view

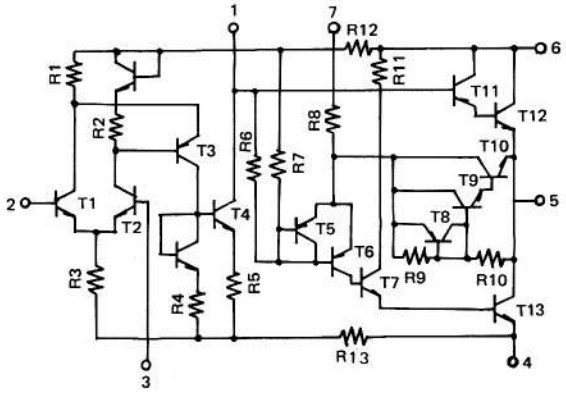
Pin No.	
1	Cathode E1
2	Cathode D1
3	Cathode C1
4	Anode common
5	No pin
6	Cathode E2
7	Cathode D2
8	Cathode C2
9	Cathode G2
10	Cathode B2
11	Cathode A2
12	Cathode F2
13	Cathode G1
14	Cathode B1
15	Cathode A1
16	Cathode F1

IC PIN CONFIGURATIONS

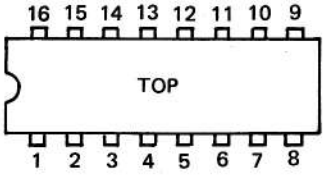
For LC-7137, see block diagram on page 3.

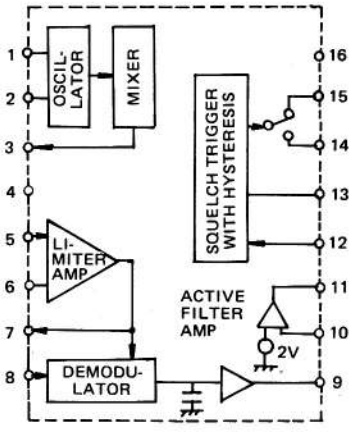
AN374P



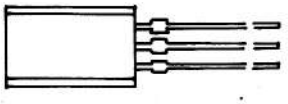


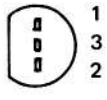
MC3357P



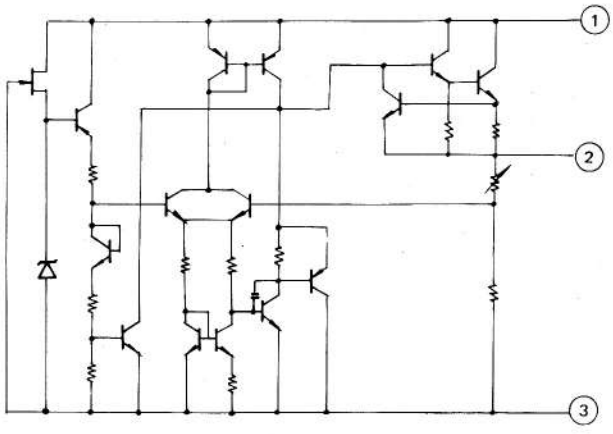


78L007P

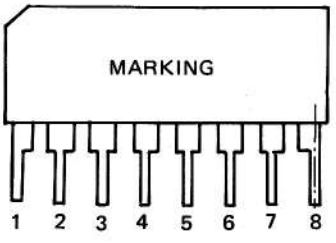


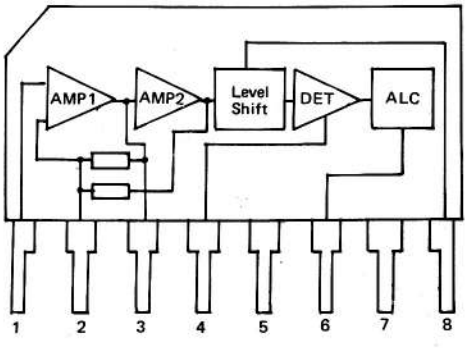


1. INPUT
2. OUTPUT
3. COMMON

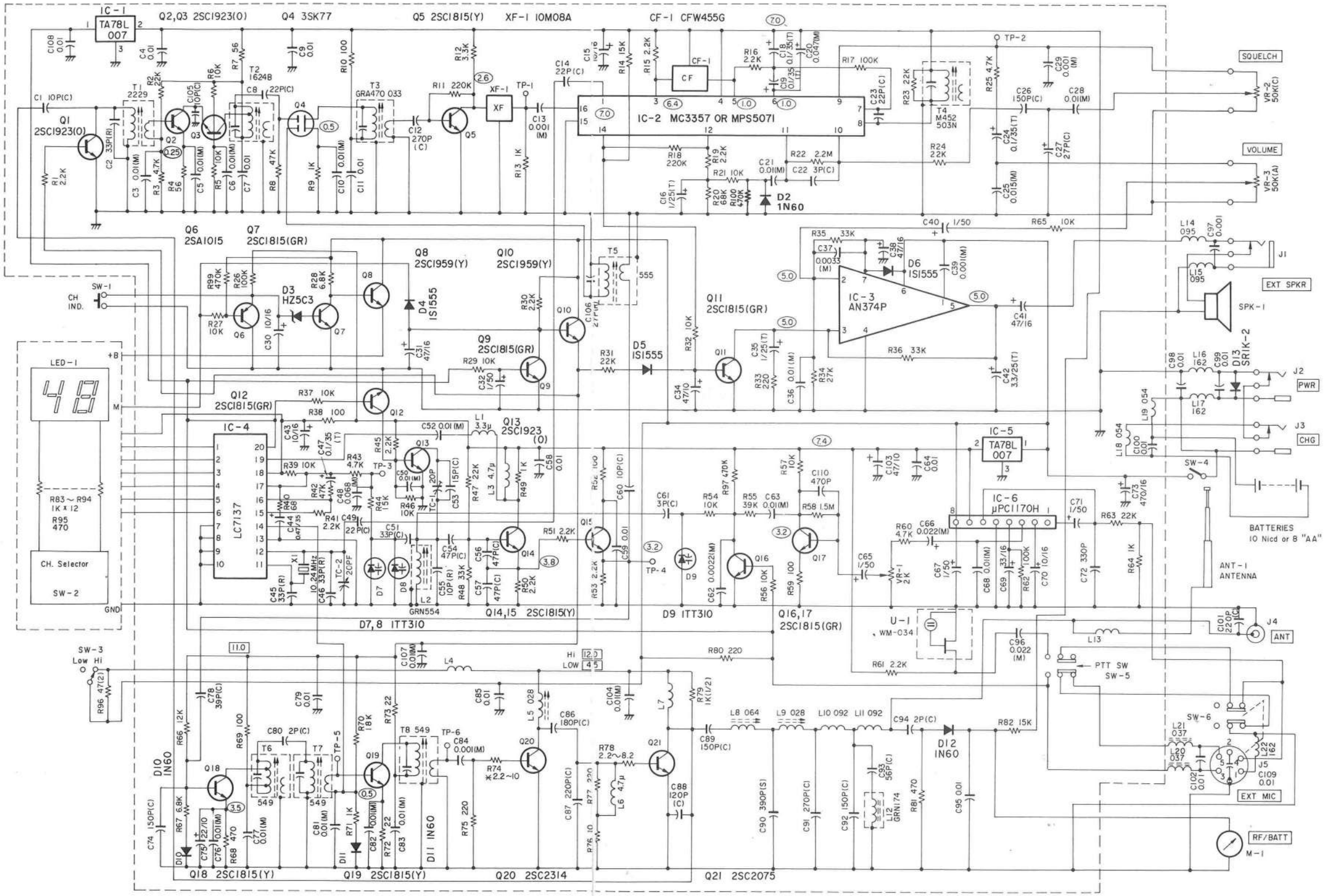


μPC1170H





SCHEMATIC DIAGRAM



NOTES

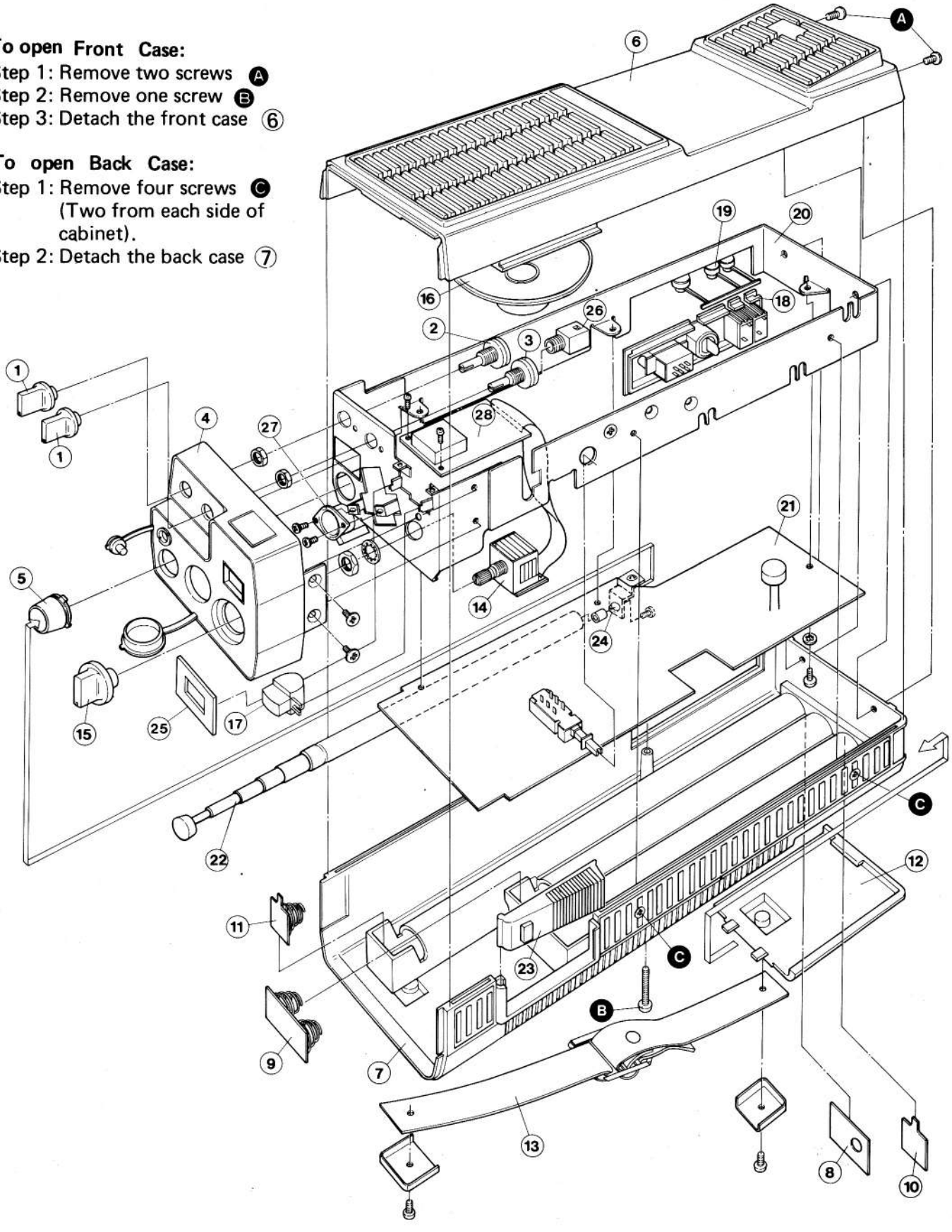
1. VR-2 SQUELCH CONTROL
2. VR-3 VOLUME CONTROL
3. SW-2 CHANNEL SELECTOR
4. SW-3 POWER HI/LOW SWITCH
5. J-1 SPEAKER JACK
6. J-5 EXT. MIC JACK
7. ALL RESISTANCE VALUES ARE SHOWN OHMS UNLESS OTHERWISE SPECIFIED. (K=1000, M=1000K)
8. ALL CAPACITANCE VALUES ARE SHOWN IN MICROFARADS UNLESS OTHERWISE SPECIFIED. (P=MICRO MICROFARADS)
9. RATING OR TYPE NUMBER OF COMPONENTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT NOTICE.
10. ◯ THIS SYMBOL INDICATES DC VOLTAGE MEASURED WITH V.T.V.M. UNDER THE FOLLOWING CONDITIONS:
    RECEIVE MODE, NO SIGNAL INPUT.
    VOLUME MINIMUM AND SQUELCH "OUT" ▭ THIS SYMBOL IS FOR TRANSMIT MODE VOLTAGES.

Realistic TRC-1001

DISASSEMBLY/EXPLODED VIEW

To open Front Case:
Step 1: Remove two screws Ⓐ
Step 2: Remove one screw Ⓑ
Step 3: Detach the front case ⑥

To open Back Case:
Step 1: Remove four screws Ⓒ
(Two from each side of cabinet).
Step 2: Detach the back case ⑦



NOTE: *Index numbers in this illustration are referenced by the MECHANICAL PARTS LIST on page 23.*

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