

*REALISTIC*<sup>®</sup>

# Service Manual

21-161

TRC - 61

## 23-CHANNEL MOBILE TRANSCEIVER

Catalog Number : 21 - 161



CUSTOM MANUFACTURED FOR RADIO SHACK  A TANDY CORPORATION COMPANY

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# SPECIFICATIONS

Description	Condition	Nominal	Limit
<b>TRANSMITTER</b>			
RF output	13.8V DC	4 W	3.0 W
Modulation	50% Mod. +16 dB	85%	100%
Frequency tolerance		0.002%	0.005%
Spurious and harmonic radiation	Ratio to fundamental	-55 dB	-50 dB
Current drain	Unmodulated	1.2A	1.5A
	Max. modulation	1.8A	2A
<b>RECEIVER</b>			
Intermediate Frequency	1st	10.595 to 10.635 MHz	
	2nd	455 ±1 kHz	455 ±2 kHz
Sensitivity	50 mW output 10 dB (S+N)/N	0.5 μV	1 μV
Selectivity	±10 kHz -6 dB	80 dB 6 kHz	60 dB 6 ±2 kHz
Cross modulation	At ± 100 kHz	55 dB	50 dB
Signal to noise ratio	At 1 mV input	45 dB	40 dB
Squelch sensitivity	Threshold	0.5 μV	1 μV
	Tight	500 μV	50 μV to 3 mV
Audio output	8Ω 10% T.H.D. at EXT. Sp.: Microphone/speaker	6 W	3 W
	10% T.H.D.	2 W	2.5 W
A.G.C. Range	-10 dB AF range	95 dB	80 dB
Current drain	Squelched	180 mA	250 mA
	Max. volume	1A	1.2A

**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.*

GENERAL	
Frequency range	26.965 to 27.255 MHz (All 23 CB channels)
Frequency control	Crystal control (Frequency synthesized)
Handset	Includes microphone/speaker, P.T.T. switch, Volume with power switch, Squelch control and Channel Selector switch (with indicator LED).
Jacks	External speaker 8 to 16 $\Omega$ Antenna jack (SO-239 type) 50 $\Omega$
Supply voltage	13.8V DC $\pm$ 15%
Size	1-1/2" H x 5-1/4" W x 7" D

## DISASSEMBLY DIAGRAM

Refer to figure 1.

- Step 1: Remove two bracket screws and the bracket.
- Step 2: Remove 4 cabinet mounting screws, two from each side.
- Step 3: Remove cabinet top and bottom.

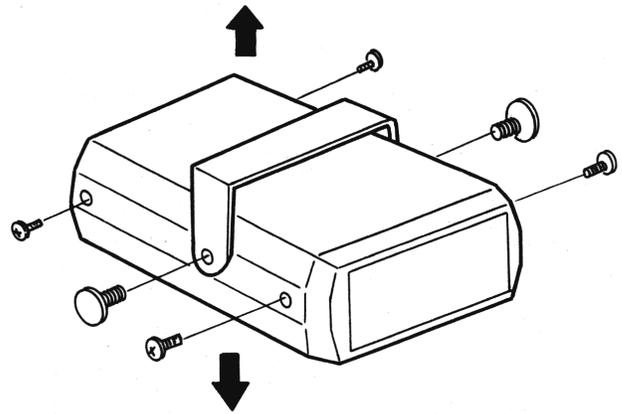


Figure 1 Disassembly

## ALIGNMENT PREPARATION

Test equipment required

- |                      |  |
|----------------------|--|
| 1. Oscilloscope      | 5. 8 $\Omega$ dummy load                 |
| 2. AC VTVM (RF)      | 6. RF Signal Generator 455 kHz to 30 MHz |
| 3. DC VTVM           | 7. Power meter (50 $\Omega$ )            |
| 4. Frequency counter | 8. 50 $\Omega$ 5 W dummy load            |
|                      | 9. Audio Signal Generator                |

**NOTE:** Use non-metallic tuning tools.

*The test equipment and receiver should be warmed up at least 10 minutes before proceeding with alignment. Input signal from the generator should be kept as low as possible and still obtain usable output.*

# ALIGNMENT LOCATIONS AND POINTS

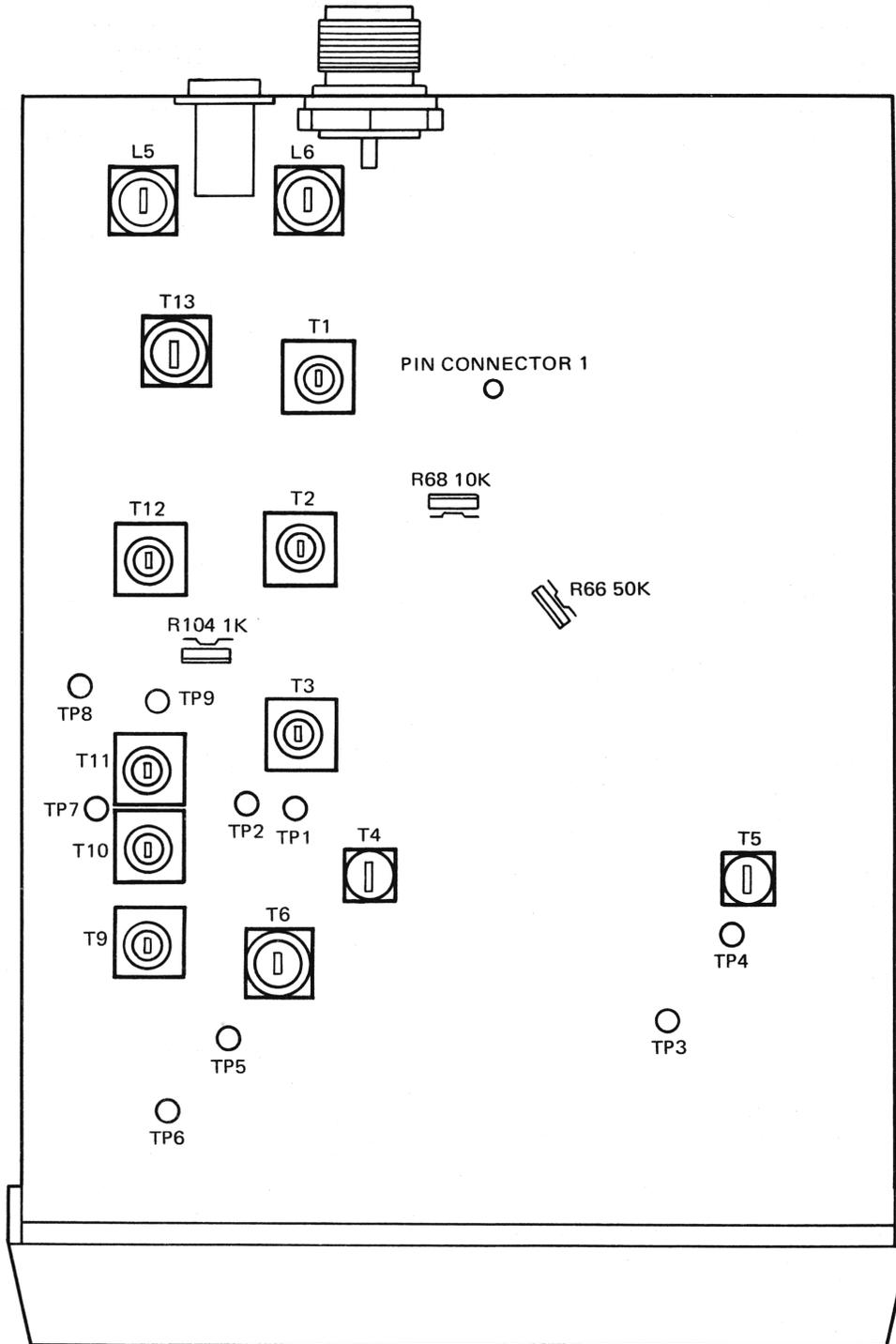


Figure 2

# TRANSMITTER ALIGNMENT CHART

Step	Control Setting	Test Equipment	Test Equipment Setting	Adjust	Ref. to
1 OSC	Power Switch: ON. CH1 ~ 23	Frequency counter		See NOTE 1 below.	Fig. 3 Table 1 and 2
2 BPF	Power Switch: ON. CH13	AC VTVM (RF)	Range 1V	T9, T10 and T11 Peak output	Fig. 4
3 TX	Power Switch: ON. CH13	RF power meter Monitor scope Frequency counter	Supply voltage 13.8V	L5, L6, T12, T13 for Max. output	Fig. 5
4 TX	Power Switch: ON. CH13	RF power meter Monitor scope	Supply voltage 13.8V	R-104 for $3.5 \pm 0.3$ watts	Fig. 5
5 AMC	Power Switch: ON. CH13	AF generator RF power meter Monitor scope	AF generator Frequency 2.5 kHz See NOTE 2 below	R68 (but not so that overmod. occurs) Mod. 90 ~ 100%	Fig. 5 Fig. 6

**NOTE 1:** Adjust the core of T-6 till oscillation drops out, then back up 1 full turn (so oscillator is on).

**2:** Set the generator output for 50% modulation then increase the output + 30 dB.

## CRYSTAL OSCILLATOR FREQUENCY CHECK

Connect the instruments as shown in Figure 3.

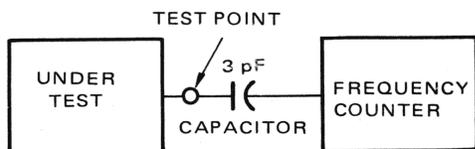


Figure 3

	TEST POINT
MASTER OSC	TP5
2ND OSC	Emitter of Q9
TRANSMIT OSC	TP6

Table 1

Item Channel	Receiving or Transmitting Frequency	Test point TP-5 Master Osc.	Test point TP-6 Transmit Osc.	Test point Emitter of Q9 RX 2nd Osc.
1	26.965 MHz	37.600 MHz	10.635 MHz	10.180 MHz
2	26.975	"	10.625	10.170
3	26.985	"	10.615	10.160
4	27.005	"	10.595	10.140
5	27.015	37.650	10.635	10.180
6	27.025	"	10.625	10.170
7	27.035	"	10.615	10.160
8	27.055	"	10.595	10.140
9	27.065	37.700	10.635	10.180
10	27.075	"	10.625	10.170
11	27.085	"	10.615	10.160
12	27.105	"	10.595	10.140
13	27.115	37.750	10.635	10.180
14	27.125	"	10.625	10.170
15	27.135	"	10.615	10.160
16	27.155	"	10.595	10.140
17	27.165	37.800	10.635	10.180
18	27.175	"	10.625	10.170
19	27.185	"	10.615	10.160
20	27.205	"	10.595	10.140
21	27.215	37.850	10.635	10.180
22	27.225	"	10.625	10.170
23	27.255	"	10.595	10.140

Table 2

## B.P.F. SECTION ALIGNMENT

Connect the instruments as shown in Figure 4.

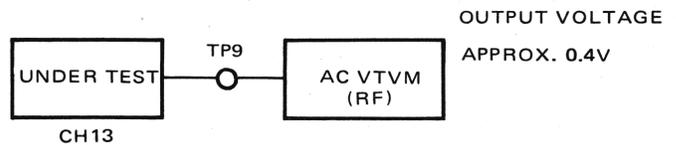


Figure 4

## TRANSMITTER ALIGNMENT CONNECTIONS

Connect the instruments as shown in Figure 5.

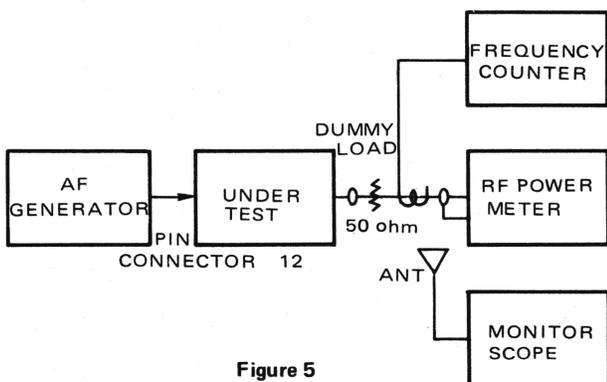


Figure 5

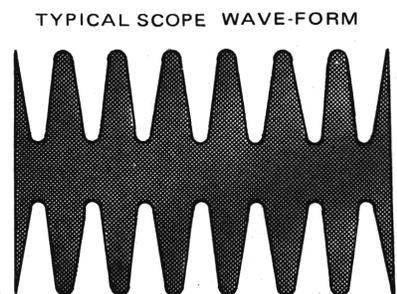


Figure 6

# RECEIVER ALIGNMENT CHART

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

Step	Control Setting	Test Equipment	Signal Generator Setting	Adjust	Ref. to
1 IF	Power Switch: ON. Blank Channel between CH22 ~ 23	RF Gen.  DC VTVM	Frequency 455 kHz, No Mod. Range 1.5V	T4, T5 Max.	Fig. 7
2 RX	Power Switch: ON. CH13 Vol. Max. SQ. Min.	RF Gen. Oscilloscope VTVM 8Ω dummy load	Frequency 27.115 MHz	T1 (for the best S/N)  T2, T3 (for the best sensitivity)	Fig. 8
3 SQ	Power Switch: ON. CH13 SQ. Max.	RF Gen.	Frequency 27.115 MHz	R66, (until SQ opens with 500 μV signal input)	Fig. 8

Table 2

## RECEIVER IF ALIGNMENT CONNECTIONS

Connect the instruments as shown in Figure 7.

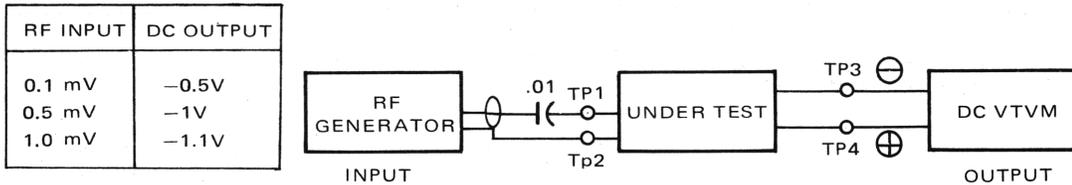


Figure 7

## RECEIVER RF ALIGNMENT CONNECTIONS

Connect the instruments as shown in Figure 8.

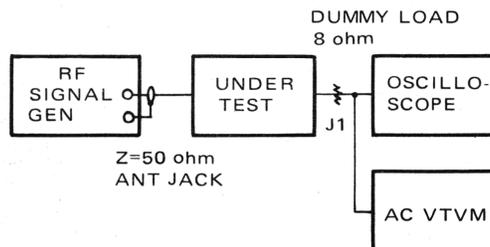
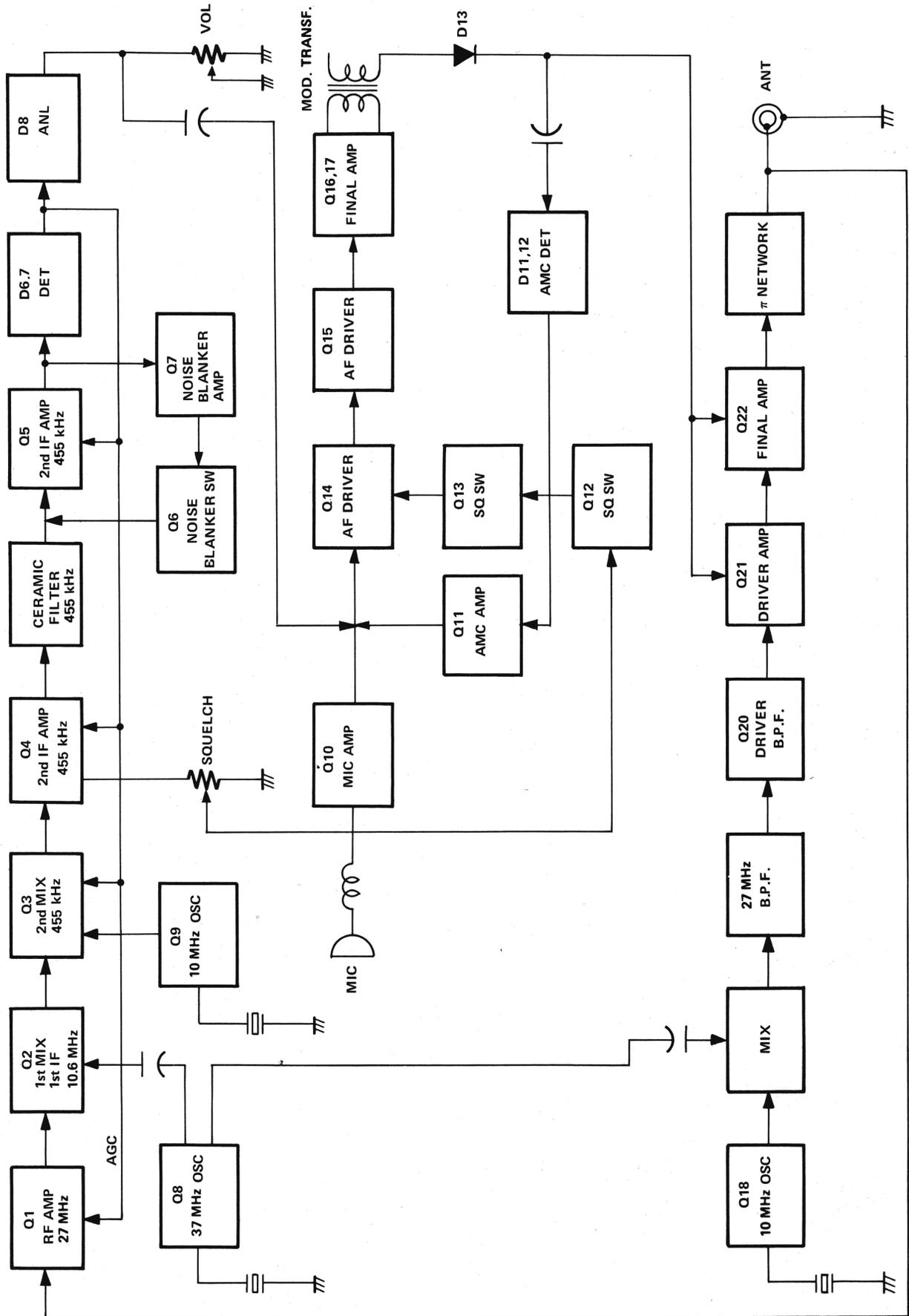
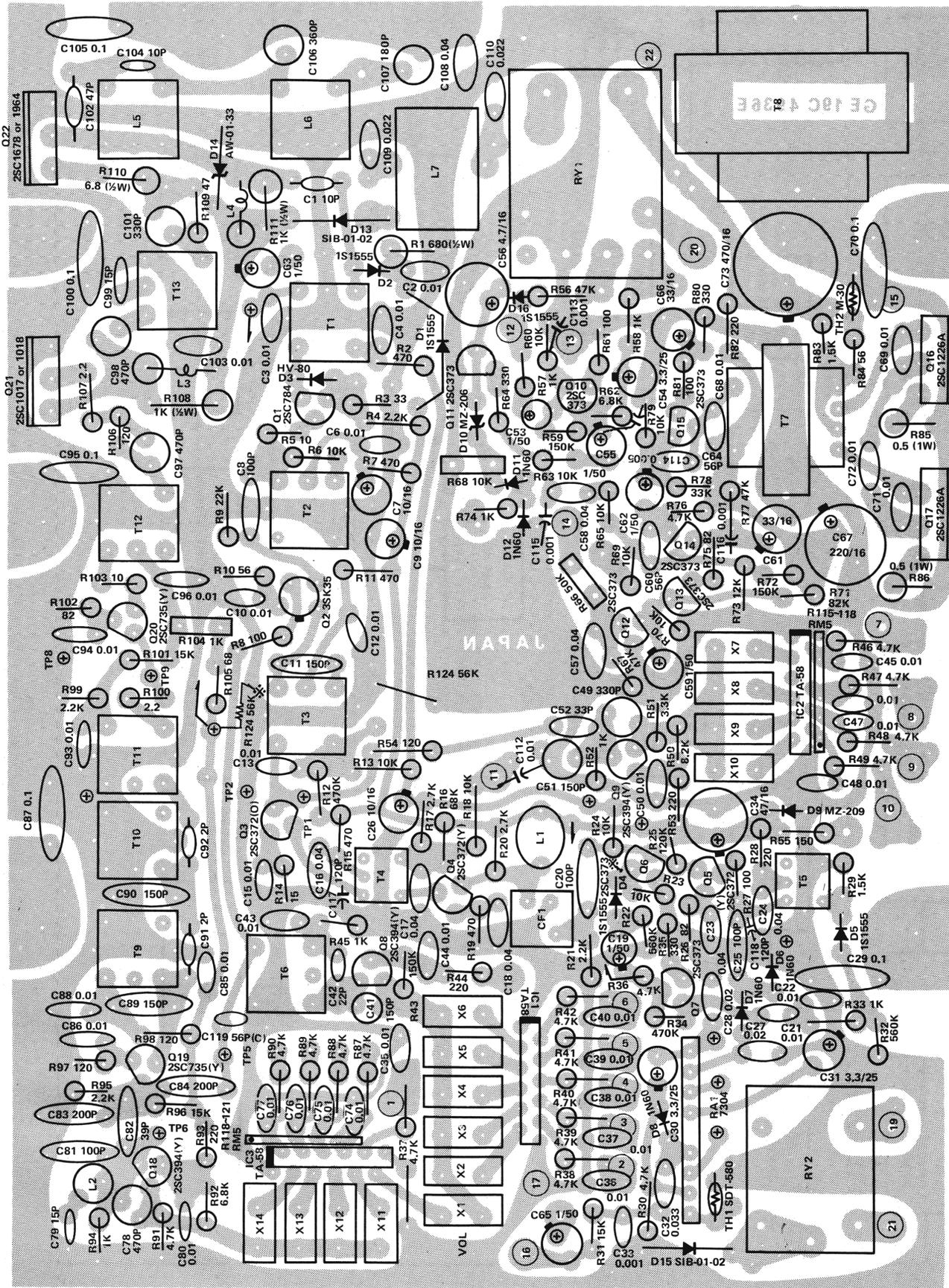


Figure 8

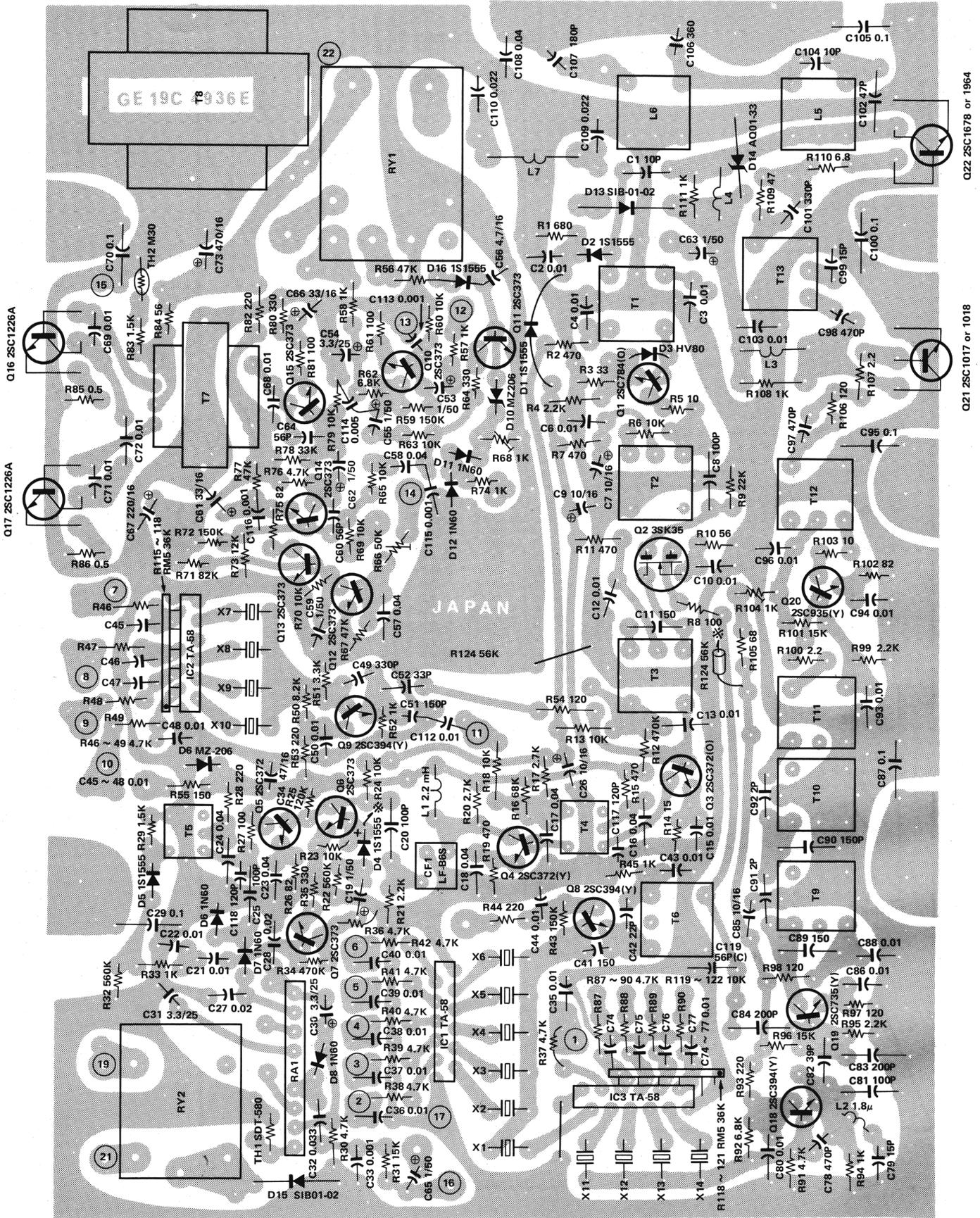
# BLOCK DIAGRAM



# PRINTED CIRCUIT BOARD TOP VIEW

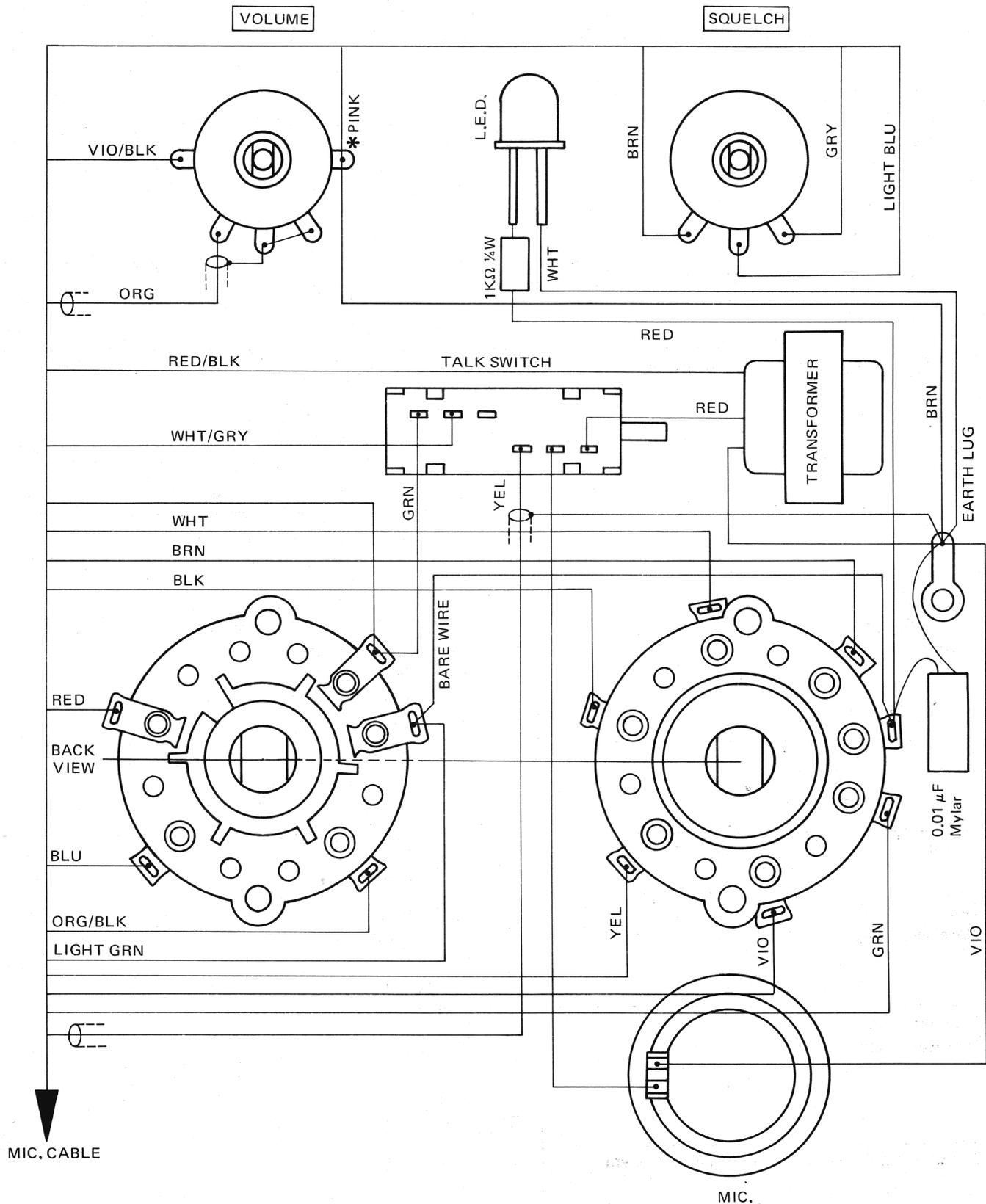


# PRINTED CIRCUIT BOARD BOTTOM VIEW





# MICROPHONE WIRING DIAGRAM



**NOTE 1:** The Pink wire \* is an extra, unused service wire, soldered where shown for convenience only. It is provided as a substitute wire for service work (in case another wire in the Mic cable is broken), thus eliminating the need for replacing the entire Mic cable just for one wire.

**2:** "TO M.C." refers to the Mic cable.

# TROUBLE SHOOTING

Symptom	Possible Cause
1) Channel lamp does not light and/or set fails to operate when Power is ON.	<ul style="list-style-type: none"> <li>A) Reverse connection of DC Power line.</li> <li>B) Faulty DC Power cord.</li> <li>C) Defective Power Switch, SW2.</li> <li>D) Fuse blown.</li> <li>E) Faulty Mic. cable.</li> <li>F) Defective Relay, RY2.</li> </ul>
2) Fuse blows when Power Switch is ON.	<ul style="list-style-type: none"> <li>A) Defective Q16 or Q17.</li> <li>B) Defective TX final Q22 and/or Driver Q21.</li> <li>C) Defective C73.</li> </ul>
3) Pilot lamp lights but no sound on any channel.	<ul style="list-style-type: none"> <li>A) Defective Speaker and/or defective REMOTE SPKR jack J1.</li> <li>B) Check if Speaker leads are broken. Also, check other leads.</li> <li>C) Defective AF amplifier circuit, Q14, Q15, Q16, Q17 and/or associated circuit components.</li> <li>D) Defective Q8, IC1 and/or associated circuit components.</li> <li>E) Defective SQ amplifier circuit, Q12, Q13 and/or associated circuit components.</li> <li>F) Faulty Mic. cable.</li> </ul>
4) Does not receive. Transmitter: OK	<ul style="list-style-type: none"> <li>A) Defective Q9, IC2 and/or associated circuit components.</li> <li>B) Faulty P.T.T. switch.</li> <li>C) Faulty Mic. cable.</li> <li>D) Defective IF amplifier circuit, Q4, Q5 and/or associated circuit components.</li> </ul>
5) Poor Receive sensitivity.	<ul style="list-style-type: none"> <li>A) Faulty RF amplifier or Mixer circuit components.</li> <li>B) Faulty IF amplifier circuit.</li> <li>C) Faulty Ceramic filter.</li> </ul>
6) Squelch control does not operate.	<ul style="list-style-type: none"> <li>A) Defective Q12 and/or Q13.</li> <li>B) Faulty R66 and/or R112.</li> </ul>
7) Does not transmit. Receiver: OK	<ul style="list-style-type: none"> <li>A) Faulty P.T.T. switch.</li> <li>B) Defective Q18, IC3 and/or associated circuit components.</li> <li>C) Faulty Mic. cable.</li> <li>D) Defective Relay, RY1.</li> </ul>
8) No modulation. Receiver: OK	<ul style="list-style-type: none"> <li>A) Defective Microphone.</li> <li>B) Faulty Mic. cable.</li> <li>C) Defective Mic. amplifier, Q10, Q11 and/or associated circuit components.</li> <li>D) Defective modulation transformer.</li> </ul>
9) Automatic Modulation Control does not operate.	<ul style="list-style-type: none"> <li>A) Defective Q11, D10, D11, D12 and/or associated components.</li> </ul>

Symptom	Possible Cause
10) Noise Blanker does not operate.	A) Defective Q6, Q7, D4, D5 and/or associated circuit components.
11) CH1 ~ 4, does not receive/transmit.	A) Defective X1, IC1 and/or Microphone cable.
12) CH5 ~ 8, does not receive/transmit.	A) Defective X2, IC1 and/or Microphone cable.
13) CH9 ~ 12, does not receive/transmit.	A) Defective X3, IC1 and/or Microphone cable.
14) CH13 ~ 16, does not receive/transmit.	A) Defective X4, IC1 and/or Microphone cable.
15) CH17 ~ 20, does not receive/transmit.	A) Defective X5, IC1 and/or Microphone cable.
16) CH21 ~ 23, does not receive/transmit.	A) Defective X6, IC3 and/or Microphone cable.
17) CH1, 5, 9, 13, 17, 21, does not receive.	A) Defective X7, IC2 and/or Microphone cable.
18) CH2, 6, 10, 14, 18, 22, does not receive.	A) Defective X8, IC2 and/or Microphone cable.
19) CH3, 7, 11, 15, 19, does not receive.	A) Defective X9, IC2 and/or Microphone cable.
20) CH4, 8, 12, 16, 20, 23, does not receive.	A) Defective X10, IC2 and/or Microphone cable.
21) CH1, 5, 9, 13, 17, 21, does not transmit.	A) Defective X11, IC3 and/or Microphone cable.
22) CH2, 6, 10, 14, 18, 22, does not transmit.	A) Defective X12, IC3 and/or Microphone cable.
23) CH3, 7, 11, 15, 19, does not transmit.	A) Defective X13, IC3 and/or Microphone cable.
24) CH4, 8, 12, 16, 20, 23, does not transmit.	A) Defective X14, IC3 and/or Microphone cable.

# MIC ASSEMBLY PARTS LIST

Ref. No.	Description	RS Part Number	MFR's Part Number
<b>CAPACITOR/TRANSFORMER/CONTROLS/RESISTORS</b>			
C111	Mylar 0.01 $\mu$ F 50WV $\pm$ 10%		
T14	Matching transformer	TA-0554	E-5501
R112	SQUELCH control 50K $\Omega$ (C)	P-1643	V 16M5-(6 x 5) N20T-15C-50K
R113	VOLUME control w/power switch 50K $\Omega$ (D)	P-1642	V 16M5-(6 x 5) S(SJ)20T-10A-50K
R123	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		
<b>SWITCHES</b>			
SW1	Channel switch P.T.T. switch	S-1207 S-7261	S-22BP. 2-3-4 T-507
<b>MISCELLANEOUS</b>			
	Microphone	M-2263	UD-27
	Sponge		
	Mic. chassis		GE-20D-5112
	Mic. cable	W-1870	HR-200C
	Mic. case		GE-20B-5106
	Mic. cover		GE-20B-5107
	LED		TLR-105 or 107
	VOL & Sq. knob	K-2133	GE-20D-5108
	CH. knob		GE-20D-5109
	CH. knob assembly		GE-20D-5110
	Talk button	K-2134	GE-20D-5111
	4 $\phi$ Speed nut	HN-0359	
	Mic. holder	HB-2520	GE-18D-4453
	Mic. hanger		
	Microphone cable bracket		
	Rubber bushing	HB-2522	

# P.C.BOARD ASSEMBLY PARTS LIST

Ref. No.	Description	RS Part Number	MFR's Part Number
<b>CAPACITORS</b>			
C1	Ceramic	10pF 50WV ±10%	FCC-50
C2~4	Ceramic	0.01μF 25WV -20% ~ +80%	MC-70
C5	Not used		
C6	Ceramic	0.01μF 25WV -20% ~ +80%	MC-70
C7	Electrolytic	10μF 16WV	
C8	Ceramic	100pF 50WV ±10%	FCC-120
C9	Electrolytic	10μF 16WV -10% ~ +75%	
C10	Mylar	0.01μF 50WV ±20%	
C11	Ceramic	150pF 50WV ±10%	FCR-120
C12,13	Ceramic	0.01μF 25WV -20% ~ +80%	MC-70
C14	Not used		
C15	Mylar	0.01μF 50WV ±20%	
C16~18	Mylar	0.04μF 50WV ±20%	
C19	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C20	Ceramic	100pF 50WV ±10%	FCC-120
C21,22	Mylar	0.01μF 50WV ±20%	
C23,24	Mylar	0.04μF 50WV ±20%	
C25	Ceramic	100pF 50WV ±10%	FCC-120
C26	Electrolytic	10μF 16WV -10% ~ +75%	CE04W1C100F
C27,28	Mylar	0.02μF 50WV ±20%	
C29	Ceramic	0.1μF 25WV -20% ~ +80%	MC-135
C30,31	Electrolytic	3.3μF 25WV	
C32	Mylar	0.033μF 50WV ±20%	
C33	Mylar	0.001μF 50WV ±20%	
C34	Electrolytic	47μF 16WV -10% ~ +75%	CE04W1C470B
C35~40	Mylar	0.01μF 50WV ±20%	
C41	Polystyrene	150pF 125WV ±20%	
C42	Ceramic	22pF 50WV ±10%	FFC-60
C43	Mylar	0.01μF 50WV ±20%	
C44	Ceramic	0.01μF 25WV -20% ~ +80%	MC-70
C45~48	Mylar	0.01μF 50WV ±20%	
C49	Polystyrene	330pF 125WV ±10%	
C50	Ceramic	0.01μF 25WV -20% ~ +80%	
C51	Polystyrene	150pF 125WV ±10%	
C52	Ceramic	33pF 50WV ±10%	FFC-80
C53	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C54	Electrolytic	3.3μF 25WV	
C55	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C56	Electrolytic	4.7μF 16WV	
C57	Ceramic	0.04μF 25WV -20% ~ +80%	MC-100
C58	Mylar	0.04μF 50WV ±20%	
C59	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C60	Ceramic	56pF 50WV ±10%	FC-60
C61	Electrolytic	33μF 16WV -10% ~ +75%	CE04W1C330C
C62	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C63	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C64	Ceramic	56pF 50WV ±10%	FC-60
C65	Electrolytic	1μF 50WV -10% ~ +100%	CE04W1H010
C66	Electrolytic	33μF 16WV -10% ~ +75%	CE04W1C330C
C67	Electrolytic	220μF 16WV -10% ~ +75%	CE04W1C221E

Ref. No.	Description				RS Part Number	MFR's Part Number
C68,69	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C70	Ceramic	0.1 $\mu$ F	25WV	-20% ~ +80%		MC-135
C71,72	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C73	Electrolytic	470 $\mu$ F	16WV	-10% ~ +75%		CE04W1C471B
C74-77	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C78	Polystyrene	470pF	125WV	$\pm 10\%$		
C79	Ceramic	15pF	50WV	$\pm 10\%$		FCC-60
C80	Ceramic	0.01 $\mu$ F	25WV			MC-70
C81	Ceramic	100pF	50WV	$\pm 10\%$		FCC-120
C82	Ceramic	39pF	50WV	$\pm 10\%$		FCC-60
C83,84	Ceramic	200pF	50WV	$\pm 10\%$		FCC-150
C85	Electrolytic	10 $\mu$ F	16WV			CE04W1C100F
C86	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C87	Ceramic	0.1 $\mu$ F	25WV	-20% ~ +80%		MC-135
C88	Ceramic	0.01 $\mu$ F	25WV	-20% ~ +80%		MC-70
C89,90	Ceramic	150pF	50WV	$\pm 10\%$		FCR-120
C91,92	Ceramic	2pF	50WV	$\pm 0.5$ pF		FCC-50
C93	Ceramic	0.01 $\mu$ F	25WV	-20% ~ +80%		MC-70
C94	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C95	Ceramic	0.1 $\mu$ F	25WV	-20% ~ +80%		MC-135
C96	Ceramic	0.01 $\mu$ F	25WV	-20% ~ +80%		MC-70
C97,98	Polystyrene	470pF	125WV	$\pm 10\%$		
C99	Ceramic	15pF	50WV	$\pm 10\%$		FCC-60
C100	Ceramic	0.1 $\mu$ F	25WV	-20% ~ +80%		MC-135
C101	Polystyrene	330pF	125WV	$\pm 10\%$		
C102	Ceramic	47pF	50WV	$\pm 10\%$		FCC-80
C103	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C104	Ceramic	10pF	50WV	$\pm 10\%$		FCC-50
C105	Ceramic	0.1 $\mu$ F	25WV	-20% ~ +80%		MC-135
C106	Polystyrene	360pF	125WV	$\pm 10\%$		
C107	Polystyrene	180pF	125WV	$\pm 10\%$		
C108	Ceramic	0.04 $\mu$ F	25WV	-20% ~ +80%		MC-100
C109,110	Mylar	0.022 $\mu$ F	50WV	$\pm 20\%$		
C112	Mylar	0.01 $\mu$ F	50WV	$\pm 20\%$		
C113	Mylar	0.001 $\mu$ F	50WV	$\pm 20\%$		
C114	Mylar	0.005 $\mu$ F	50WV	$\pm 20\%$		
C115,116	Mylar	0.001 $\mu$ F	50WV	$\pm 20\%$		
C117,118	Ceramic	120pF	50WV	$\pm 10\%$		FCC-120
C119	Ceramic	56pF	50WV	$\pm 10\%$		FCC-100

#### RESISTORS

R1	Carbon film	680 $\Omega$	1/2W	$\pm 10\%$		
R2	Carbon film	470 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-471
R3	Carbon film	33 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-330
R4	Carbon film	2.2K $\Omega$	1/4W	$\pm 5\%$		ELR-25J-222
R5	Carbon film	10 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-100
R6	Carbon film	10K $\Omega$	1/4W	$\pm 5\%$		ELR-25J-103
R7	Carbon film	470 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-471
R8	Carbon film	100 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-101
R9	Carbon film	22K $\Omega$	1/4W	$\pm 5\%$		ELR-25J-223
R10	Carbon film	56 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-560
R11	Carbon film	470 $\Omega$	1/4W	$\pm 5\%$		ELR-25J-471

Ref. No.	Description	RS Part Number	MFR's Part Number
R12	Carbon film 470K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-474
R13	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R14	Carbon film 15 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-150
R15	Carbon film 470 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-471
R16	Carbon film 68K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-683
R17	Carbon film 2.7K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-272
R18	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R19	Carbon film 470 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-471
R20	Carbon film 2.7K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-272
R21	Carbon film 2.2K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-222
R22	Carbon film 560K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-564
R23,24	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R25	Carbon film 120K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-124
R26	Carbon film 82 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-820
R27	Carbon film 100 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-101
R28	Carbon film 220 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-221
R29	Carbon film 1.5K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-152
R30	Carbon film 4.7K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-472
R31	Carbon film 15K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-153
R32	Carbon film 560K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-564
R33	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-102
R34	Carbon film 470K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-474
R35	Carbon film 330 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-331
R36~42	Carbon film 4.7K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-472
R43	Carbon film 68K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-683
R44	Carbon film 220 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-221
R45	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-102
R46~49	Carbon film 4.7K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-472
R50	Carbon film 8.2K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-822
R51	Carbon film 3.3K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-332
R52	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-102
R53	Carbon film 220 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-221
R54	Carbon film 120 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-121
R55	Carbon film 150 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-151
R56	Carbon film 47K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-473
R57,58	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-102
R59	Carbon film 150K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-154
R60	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R61	Carbon film 100 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-101
R62	Carbon film 6.8K 1/4W $\pm$ 5%		ELR-25J-682
R63	Carbon film 10K 1/4W $\pm$ 5%		ELR-25J-103
R64	Carbon film 330 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-331
R65	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R66	Potentiometer 50K $\Omega$	P-6333	EVN-J0A-A00B54
R67	Carbon film 47K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-473
R68	Potentiometer 10K $\Omega$	P-6334	EVN-J0A-A00B14
R69,70	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103
R71	Carbon film 82K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-823
R72	Carbon film 150K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-154
R73	Carbon film 12K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-123
R74	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-102
R75	Carbon film 82 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-820

Ref. No.	Description	RS Part Number	MFR's Part Number	
R76	Carbon film 4.7K $\Omega$ 1/4W $\pm$ 5%	P-6335	ELR-25J-472	
R77	Carbon film 47K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-473	
R78	Carbon film 33K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-333	
R79	Carbon film 10K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-103	
R80	Carbon film 330 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-331	
R81	Carbon film 100 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-101	
R82	Carbon film 220 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-221	
R83	Carbon film 1.5K $\Omega$ 1/4W $\pm$ 5%		ELR-25J-152	
R84	Carbon film 56 $\Omega$ 1/4W $\pm$ 5%		ELR-25J-560	
R85,86	Carbon film 0.5 $\Omega$ 1W			
R87~91	Carbon film 4.7K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-472
R92	Carbon film 6.8K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-682
R93	Carbon film 220 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-221
R94	Carbon film 1K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-102
R95	Carbon film 2.2K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-222
R96	Carbon film 15K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-153
R97,98	Carbon film 120 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-121
R99	Carbon film 2.2K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-222
R100	Carbon film 2.2 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-2R2
R101	Carbon film 15K $\Omega$ 1/4W $\pm$ 5%			ELR-25J-153
R102	Carbon film 82 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-820
R103	Carbon film 10 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-100
R104	Potentiometer 1K $\Omega$			EVN-J0A-A00B13
R105	Carbon film 68 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-680
R106	Carbon film 120 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-121
R107	Carbon film 2.2 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-2R2
R108	Carbon film 1K $\Omega$ 1/2W			
R109	Carbon film 47 $\Omega$ 1/4W $\pm$ 5%			ELR-25J-470
R110	Carbon film 6.8 $\Omega$ 1/2W			
R111	Carbon film 1K $\Omega$ 1/2W			
R114	Carbon film 8.2 $\Omega$ 1W			
R115~118	Resistor array 36K $\Omega$			RM5
R119~122	Resistor array 36K $\Omega$			RM5
R124	Carbon film 56K 1/4W $\pm$ 5%		ELR-25J-563	
CR1	Resistor array	RX-0017	7403	
<b>SEMICONDUCTORS</b>				
Q1	Transistor silicon		2SC784(O)	
Q2	Transistor silicon		3SK35	
Q3	Transistor silicon		2SC372(O)	
Q4,5	Transistor silicon		2SC372(Y)	
Q6,7	Transistor silicon		2SC373	
Q8,9	Transistor silicon		2SC394(Y) or 2SC380(Y)	
Q10~15	Transistor silicon		2SC373	
Q16,17	Transistor silicon		2SC1226A	
Q18	Transistor silicon		2SC394(Y) or 2SC380(Y)	
Q19,20	Transistor silicon		2SC735(Y) or 2SC734(Y)	
Q21	Transistor silicon		2SC1017	
Q22	Transistor silicon		or 2SC1018	
			2SC1678	
			or 2SC1964	
D1,2	Diode silicon		1S1555	

Ref. No.	Description	RS Part Number	MFR's Part Number
D3	Diode silicon		HV-80
D4,5	Diode silicon		1S1555
D6,7,8	Diode germanium		1N60
D9	Zener diode silicon (9V)		MZ209
D10	Zener diode silicon (6V)		MZ206
D11,12	Diode germanium		1N60
D13	Diode silicon		SIB01-02
D14	Zener diode silicon (33V)		AW01-33
D15	Diode silicon		SIB01-02
D16	Diode silicon		1S1555
IC1~3	Transistor array	TX-0018	TA-58
TH1	Thermistor	T-1173	SDT-500
TH2	Thermistor	T-1174	M-30
<b>COIL/TRANSFORMER/FILTER</b>			
T1	Transformer (27 MHz)	CA-4696	TKXN-23345X
T2	Transformer (27 MHz)	CA-4695	TKXN-17008N
T3	Transformer (10.6 MHz)	CA-4697	TKXN-17575N
T4	Transformer (455 kHz)	CA-4701	7MC-352203N9
T5	Transformer (455 kHz)	CA-3062	4202
T6	Transformer (37 MHz)	CA-7589	10PN0-091
T7	Transformer (INPUT)	TN-0081	E-6228
T8	Transformer (OUTPUT)	TB-0385	E-6436
T9,10	Transformer (27 MHz)		TKXN-23571Z
T11	Transformer (27 MHz)	CA-4699	TKXC-15950N
T12	Transformer (27 MHz)	CA-4698	TKXC-23343N
T13	Transformer (27 MHz)		7SND-061
L1	Choke coil	CB-0151	EL0610-202K
L2	Choke coil	CA-2909	LF4-1R8K
L3,4	Choke coil	CB-2195	4LNC-027
L5	Coil		8SNF-057
L6	Coil		10PNP-028
L7	Choke coil	CB-0152	SN-8D-500
L8	Coil		4LNC-092
CF-1	Ceramic filter (455 kHz)	C-0658	LF-B-6S
<b>CRYSTALS</b>			
X1	Crystal	CX-0194	37.600 MHz
X2	Crystal	CX-0195	37.650 MHz
X3	Crystal	CX-0196	37.700 MHz
X4	Crystal	CX-0197	37.750 MHz
X5	Crystal	CX-0198	37.800 MHz
X6	Crystal	CX-0199	37.850 MHz
X7	Crystal	CX-189	10.180 MHz
X8	Crystal	CX-188	10.170 MHz
X9	Crystal	CX-187	10.160 MHz
X10	Crystal	CX-186	10.140 MHz
X11	Crystal	CX-193	10.635 MHz
X12	Crystal	CX-192	10.625 MHz
X13	Crystal	CX-191	10.615 MHz
X14	Crystal	CX-190	10.595 MHz

Ref. No.	Description	RS Part Number	MFR's Part Number
<b>MISCELLANEOUS</b>			
RY1	P.C. Board		GE-19C-4936E
	Relay	R-8075	LC-1-C
RY2	Relay	R-8076	LC-2-C

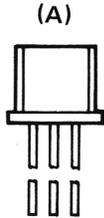
## CHASSIS ASSEMBLY PARTS LIST

<b>MISCELLANEOUS</b>			
	Chassis		GE-20B-5098
	Ant. connector	J-6384	SO-239
	Speaker jack 3.5φ	J-6385	SG8016 #1
	Escutcheon	Z-2710	GE-20C-5103
	Panel	Z-2711	GE-20D-5105
	Speaker switch	S-0681	SSH-1-3-08
	Slide switch knob	HB-2523	GE-20D-5104
	Case top	HB-2524	GE-20B-5101
	Case bottom		GE-20B-5102
	Speaker	S-4631	CO-80A
	Mounting bracket	MB-0144	GE-20D-5100
	Mounting bracket screw		GE-16D-3166
	Sponge		
	Speaker cloth		
	Wires 1 kit		
	Screws 1 kit	HS-2395	
	DC cord assembly	W-1871	GE-20D-5135 No.1
	Power cord		JIS
	Fuse	HF-0094	w/Fuseholder
	Fuse label		2A
	Test point	HB-2525	2A
	Square pin	HB-2526	2161

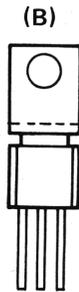
# SEMICONDUCTOR LEAD IDENTIFICATION

## (1) TRANSISTOR

- (A) 2SC372(O), 2SC372(Y), 2SC373, SC380(Y), 2SC394(Y), 2SC734(Y), 2SC735(Y), 2SC784(O)
- (B) 2SC1017/2SC1018
- (C) 2SC1226A/2SC1964
- (D) 2SC1678
- (E) 3SK35(GR)



- 1. Emitter
- 2. Collector
- 3. Base



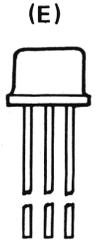
- 1. Collector
- 2. Base
- 3. Emitter



- 1. Base
- 2. Collector
- 3. Emitter

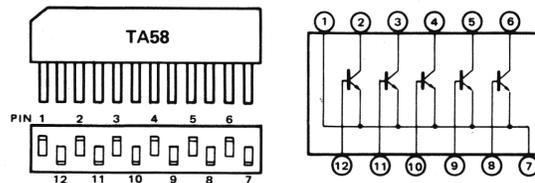


- 1. Base
- 2. Collector
- 3. Emitter

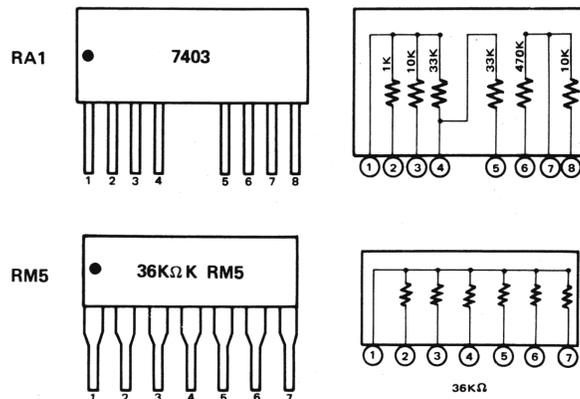


- 1. Drain
- 2. Gate 2
- 3. Gate 1
- 4. Source

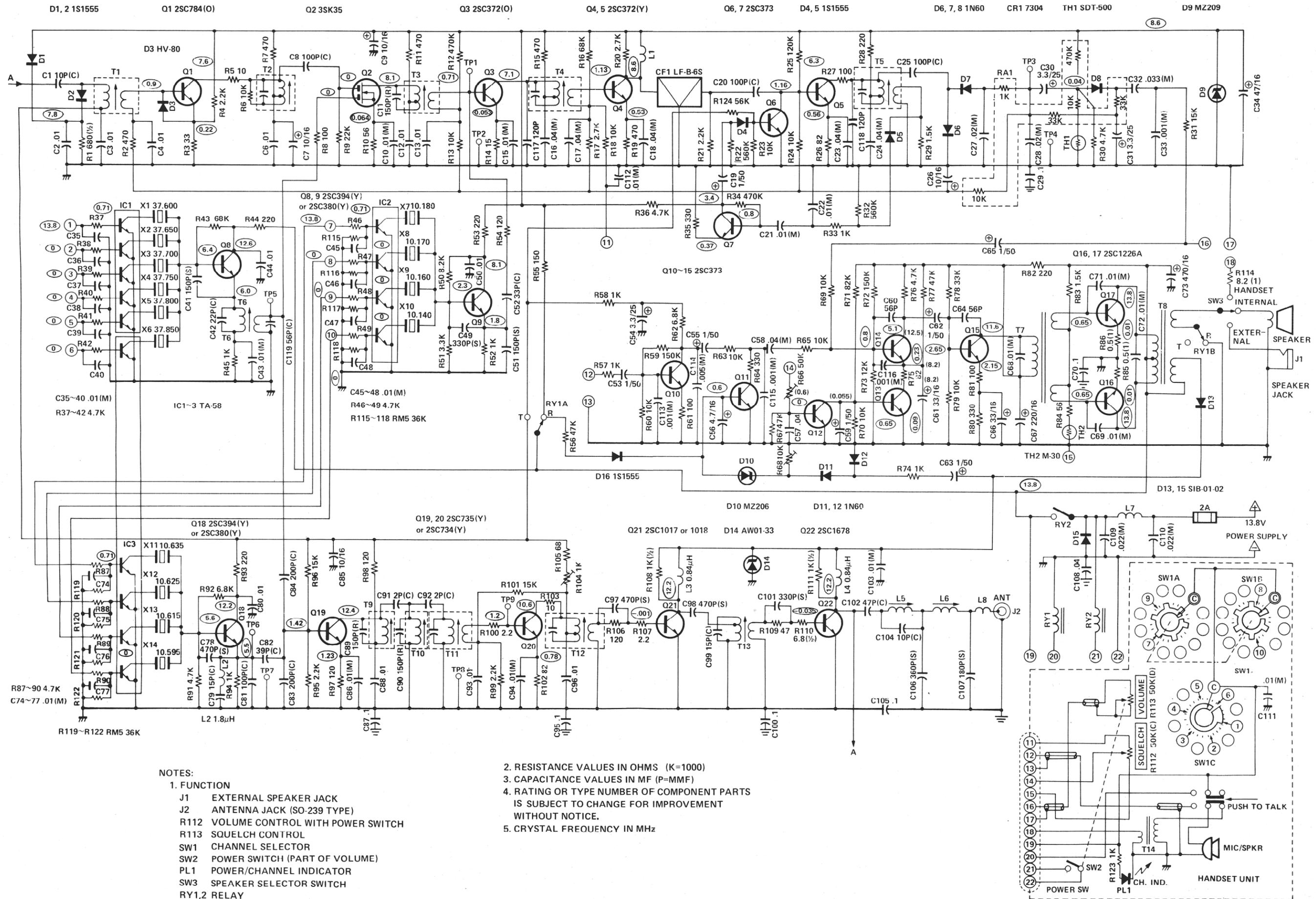
## (2) IC/TRANSISTOR ARRAY



# RESISTOR ARRAY LEAD IDENTIFICATION



# SCHEMATIC DIAGRAM



**NOTES:**

**1. FUNCTION**

- J1 EXTERNAL SPEAKER JACK
- J2 ANTENNA JACK (SO-239 TYPE)
- R112 VOLUME CONTROL WITH POWER SWITCH
- R113 SQUELCH CONTROL
- SW1 CHANNEL SELECTOR
- SW2 POWER SWITCH (PART OF VOLUME)
- PL1 POWER/CHANNEL INDICATOR
- SW3 SPEAKER SELECTOR SWITCH
- RY1,2 RELAY

2. RESISTANCE VALUES IN OHMS (K=1000)

3. CAPACITANCE VALUES IN MF (P=MMF)

4. RATING OR TYPE NUMBER OF COMPONENT PARTS IS SUBJECT TO CHANGE FOR IMPROVEMENT WITHOUT NOTICE.

5. CRYSTAL FREQUENCY IN MHz

**RADIO SHACK  A TANDY CORPORATION COMPANY**  
**U.S.A.: FORT WORTH, TEXAS 76107**  
**CANADA: BARRIE, ONTARIO, CANADA L4M 4W5**

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**TANDY CORPORATION**

**AUSTRALIA**

**280-316 VICTORIA ROAD  
RYDALMERE, N.S.W. 2116**

**BELGIUM**

**PARC INDUSTRIEL DE NANINNE  
5140 NANINNE**

**U. K.**

**BILSTON ROAD  
WEDNESBURY, STAFFS WF10 7JN**