Realistic TRC-453 Service Manual

REALISTIC®

Service Manual

21-1566

TRC-453
CB TRANSCEIVER
Catalog Number : 21-1566

CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

TABLE OF CONTENTS

SPECIFICATIONS . . . . . 3 – 6
DISASSEMBLY INSTRUCTIONS 7
BLOCK DIAGRAM. 8
ALIGNMENT PROCEDURE . . . . . 9 – 12
TROUBLESHOOTING HINTS. . . . . 13 – 16
PC BOARD (TOP AND BOTTOM VIEWS). . . . . 17 – 21
WIRING DIAGRAM 22
EXPLODED VIEW 23
ELECTRICAL PARTS LIST. . . . . 24 – 35
MECHANICAL PARTS LIST . . . . . 36 – 37
VOLTAGE CHART . . . . . 38 – 39
SEMICONDUCTOR LEAD IDENTIFICATION 40
IC INTERNAL DIAGRAMS. . . . . 41 – 43
SCHEMATIC DIAGRAM . . . . . 44 – 45

SPECIFICATIONS

GENERAL

Channels	:	40
Frequency Range	:	26.965 MHz to 27.405 MHz
Semiconductors	:	41 Transistors, 48 Diodes, 7 ICs, 7 LEDs
Crystals	:	2
Microphone	:	600 ohm Dynamic Type
Speaker	:	16 ohm 3W
Antenna Connector	:	M Type
Jacks & Connectors	:	Mic (5P DIN), EXT. SP (3.5 dia.), PA SP (3.5 dia.), DC Power (3P)
Controls	:	Channel Selector, Mode Selector (USB-AM-LSB), PA-CB Switch, Power ON/OFF-Volume Control, Clarifier, NB & ANL ON/OFF-SQUELCH Control, RF GAIN Control
Meter	:	S/RF Power Meter (5 Digits LED)
Indicators	:	Channel Number Indicator, TX Indicator
Size	:	6-1/16"(154mm)W x 2-3/64"(52mm)H x 7-1/2"(190mm)D
Weight	:	10 Pounds (4.5 kgs)
Accessories	:	DC Power Cord with in-line fuse, Microphone, Microphone Hanger, Mounting Bracket

MEASUREMENT CONDITIONS (90% Population)

Power Source	:	13.8V (DC)
Antenna Impedance	:	50 ohm
Test Temperature	:	77°F (25°C)
AM Modulation Frequency	:	1 kHz
SSB Modulation Frequency, Transmit	:	Two Tone: 500 Hz & 2400 Hz Single Tone: 1 kHz
Mean Signal Input Level	:	1000μV
Reference Audio Output Power	:	0.5W
Reference AM Modulation Percentage	:	1 kHz 30%
Audio Frequency, SSB Receive	:	1 kHz
Audio Output Load	:	8 ohm resistive

TRANSMITTER SECTION

ITEMS		UNIT	NOMINAL	LIMIT
Frequency Tolerance at 77° F (25° C)	AM	%	±0.0005	±0.003
(5 Minutes after switch on)	SSB	%	±0.0005	±0.003
Carrier Power at No Modulation	AM	W	3.8	3.5 – 4.4
PEP Power, Two Tone, SSB	SSB	W PEP	12	10 – 13.2
Modulation Distortion at 1 kHz, 80% Modulation	AM	%	3	8
Spurious Harmonic Suppression	AM	dB	–65	–60
	SSB	dB	–65	–60
Carrier Suppression	SSB	dB	–55	–40
Unwanted Sideband Suppression (at 2500 Hz 4W PEP 16 dB up)	SSB	dB	–55	–40
Battery Drain at No Modulation	AM	mA	2200	3000
	SSB	mA	500	1000
Battery Drain				
AM: Max Mod.		mA	2200	3000
SSB: Max Watt PEP, Two Tone		mA	2000	3000
Modulation Frequency Response (1 kHz, 0 dB Reference)				
Lower Frequency	AM	Hz	450	250 – 650
	SSB	Hz	450	250 – 650
Upper Frequency	AM	Hz	2500	2000 – 4000
	SSB	Hz	3500	2000 – 5000
Carrier Power Uniformity, CH to CH at No Modulation	AM	W	0.3	0.4
Mic Input Level Uniformity, CH to CH for 4 watts Output 2.5 kHz Single Tone –SSB	SSB	dB	2	3
Mic Input Level Uniformity, LSB to USB for 4 watts Output, 1.5 kHz Single Tone		dB	1	3
Microphone Sensitivity				
AM: For 50% Mod.		mV	0.4	1.0
SSB: For 4W P.E.P.		mV	0.4	1.0
AMC Range				
AM: 50 – 100% Mod.		dB	60	40
SSB: 10 – 13.2 Watts PEP		dB	60	40
Modulation Capability		%	95/95	80/85
Modulation Attack Time		m Sec	20	25
Modulation Release Time		m Sec	250	100 – 500
RF Meter (S-9) Indication 2.5 kHz Single Tone	SSB	W	3.8	2.5 – 5

RECEIVER SECTION

ITEMS		UNIT	NOMINAL	LIMIT
(ANL & Noise Blanker Switch Off)				
Max Sensitivity	AM	μV	0.5	1
	SSB	μV	0.25	0.5
Sensitivity for 10 dB S/N	AM	μV	0.5	1
	SSB	μV	0.25	0.5
AGC Figure of Merit 100mV for	AM	dB	90	80
10 dB Change in Audio Output	SSB	dB	90	80
Overload AGC Characteristics	AM	dB	±3	±5
from 100mV to 1000mV	SSB	dB	±3	±5
Overall Audio Fidelity at 6 dB Down				
Upper Frequency	AM	Hz	2100	1750 – 2500
	SSB	Hz	3500	2500 – 5000
Lower Frequency	AM	Hz	450	250 – 650
	SSB	Hz	450	250 – 650
Cross Modulations, RS Standard	AM	dB	60	50
Adjacent Channel Selectivity (±10 kHz)	AM	dB	70	60
	SSB	dB	70	60
Maximum Audio Output Power	AM	W	4	3
	SSB	W	4	3
Audio Output Power at 10% THD	AM	W	3	2
	SSB	W	3	2
THD at 500mW Audio Output				
AM: 1mV Input, 30%		%	3	6
80%		%	5	8
SSB: 1mV Input 1 kHz Single Tone		%	3	6
RF Gain Control Range at Max	AM	dB	40	30 – 60
Sensitivity Level	SSB	dB	40	30 – 60
S/N Ratio at Input 1mV	AM	dB	40	34
	SSB	dB	40	34
Squelch Sensitivity at Threshold	AM	μV	0.5	1
	SSB	μV	0.5	1
Squelch Sensitivity at Tight	AM	μV	1000	300 – 3000
	SSB	μV	1000	300 – 3000
Skirt Rejection (±20 kHz)	AM	dB	80	70
	SSB	dB	80	70
S Meter Sensitivity at "S-9"	AM	μV	100	50 – 200
(No Modulation AM)	SSB	μV	100	50 – 200
Image Rejection Ratio	AM	dB	76	66
(fo –2 x 10.695 MHz)	SSB	dB	76	66
1/2 IF Rejection Ratio	AM	dB	90	80
(fo –10.695 MHz/2)	SSB	dB	90	80
Adjacent Sideband Rejection	SSB	dB	60	40
IF Rejection Ratio 10.695 MHz	AM	dB	85	75
	SSB	dB	85	75
Oscillator Dropout Voltage	AM	V	9	11
	SSB	V	9	11
Battery Drain at No Signal	AM	mA	250	500
	SSB	mA	250	500
Battery Drain at Maximum				
Audio Output Power	AM	mA	1000	1500
	SSB	mA	1000	1500

ITEMS		UNIT	NOMINAL	LIMIT
Clarifier Range	AM	kHz	±1.25	±0.6 – ±2.5
	SSB	kHz	±1.25	±0.6 – ±2.5
Spurious Rejection Ratio				
In Band	AM	dB	65	56
	SSB	dB	65	56
Out of Band	AM	dB	60	50
	SSB	dB	60	50
Desensitivitization	AM	dB	60	50
(3 dB Desensitivity) at 100μV	SSB	dB	60	50
NB & ANL Performance	AM	dB	30	20
	SSB	dB	25	16
NB & ANL Loss	AM	dB	–4	–6
	SSB	dB	0	–6
Dynamic Range	SSB	dB	65	60

PUBLIC ADDRESS

Microphone Sensitivity for 3W Output Power at 1 kHz	mV	1.5	3
Power Output Maximum	W	4	3
10% Distortion	W	3	2
Audio Frequency Response at 6 dB Down			
Lower Frequency	Hz	450	250 – 650
Upper Frequency	Hz	4000	3000 – 7000
Battery Drain			
at No Signal	mA	250	500
at Max. AF Output	mA	1000	1500

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.

DISASSEMBLY INSTRUCTIDNS

To remove the Top and Bottom Cover (Figure 1)

1. Remove two mounting screws Ⓐ from each side.
2. Remove four screws Ⓑ from each side. Pull off the top and bottom covers.

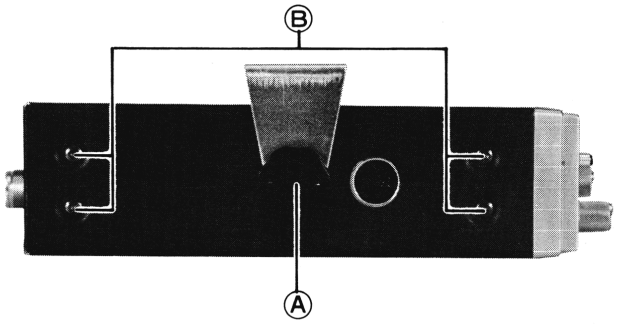


Figure 1

To remove the Front Panel Assmbly (Figures 2, 3 and 4)

1. Remove two knobs Ⓒ .
2. Remove two knobs Ⓓ and three nuts Ⓔ under these knobs.
3. Remove two screws Ⓕ from each side. Pull out the front panel.

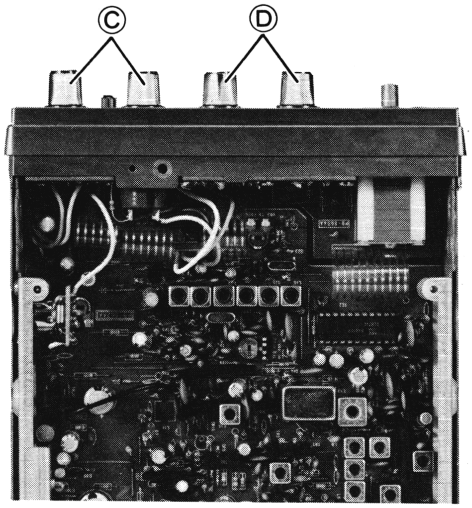


Figure 2

To remove Front P.C. Board (Figure 5)

1. Remove five screws Ⓖ from the front panel.
   Pull out the front P.C. Board.

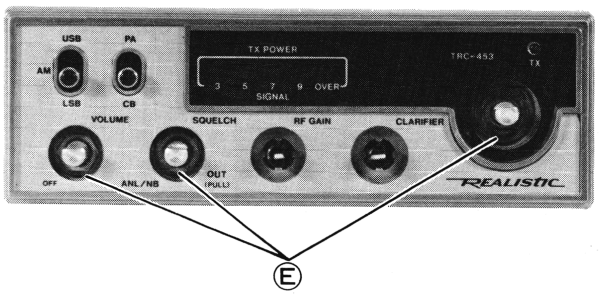


Figure 3

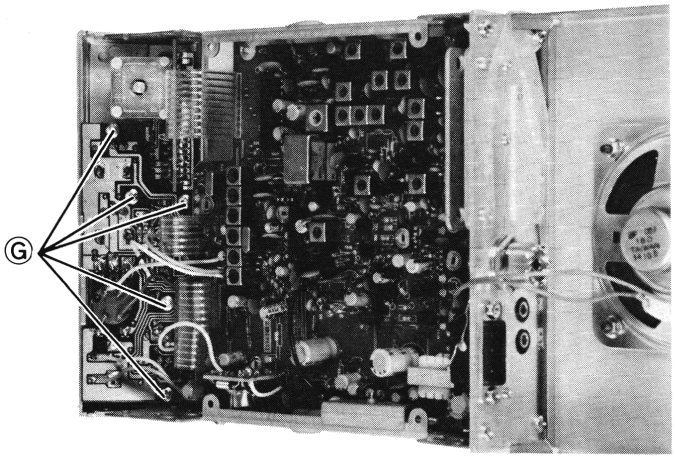


Figure 5

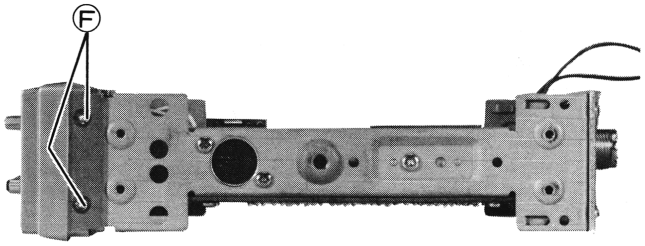
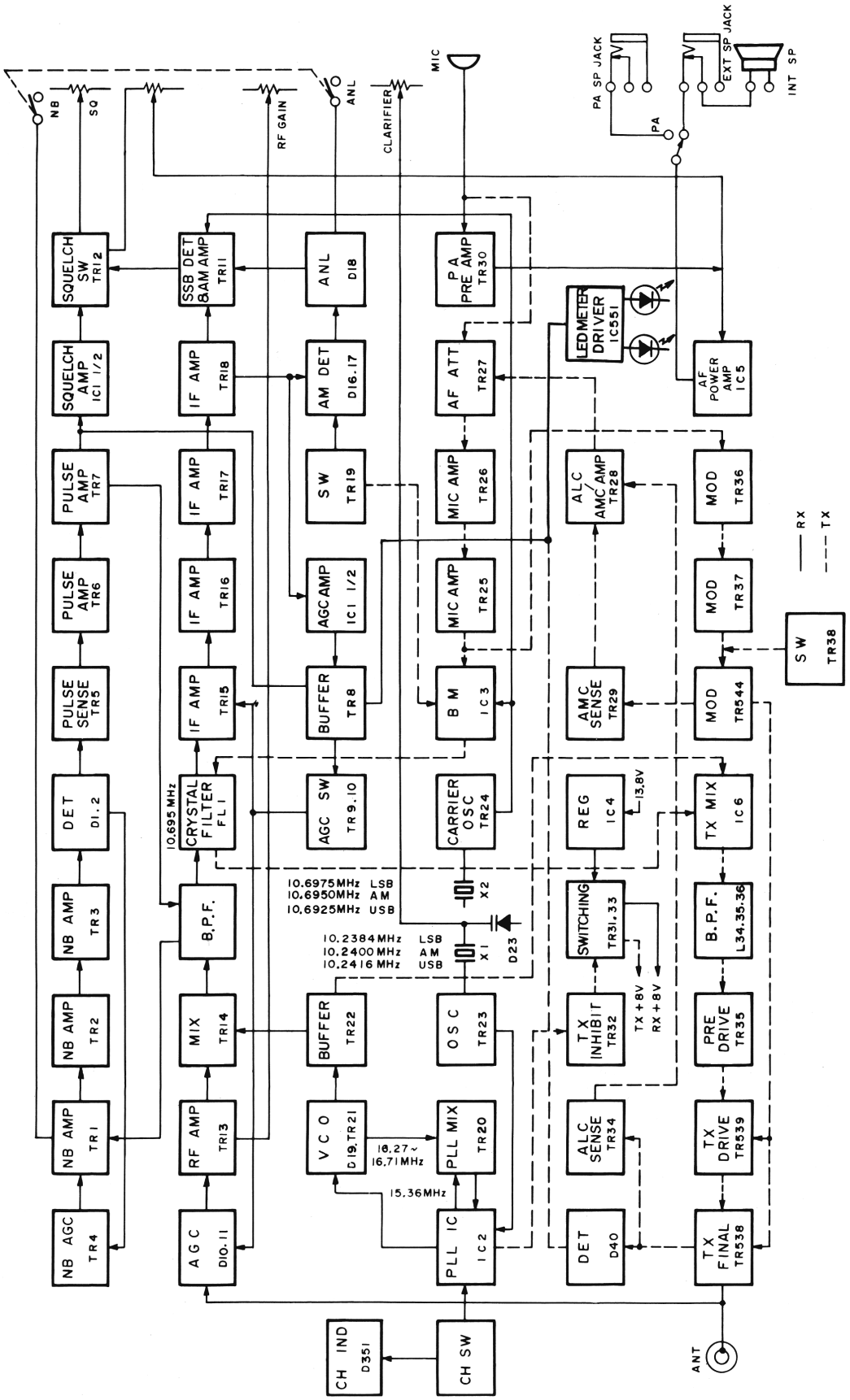


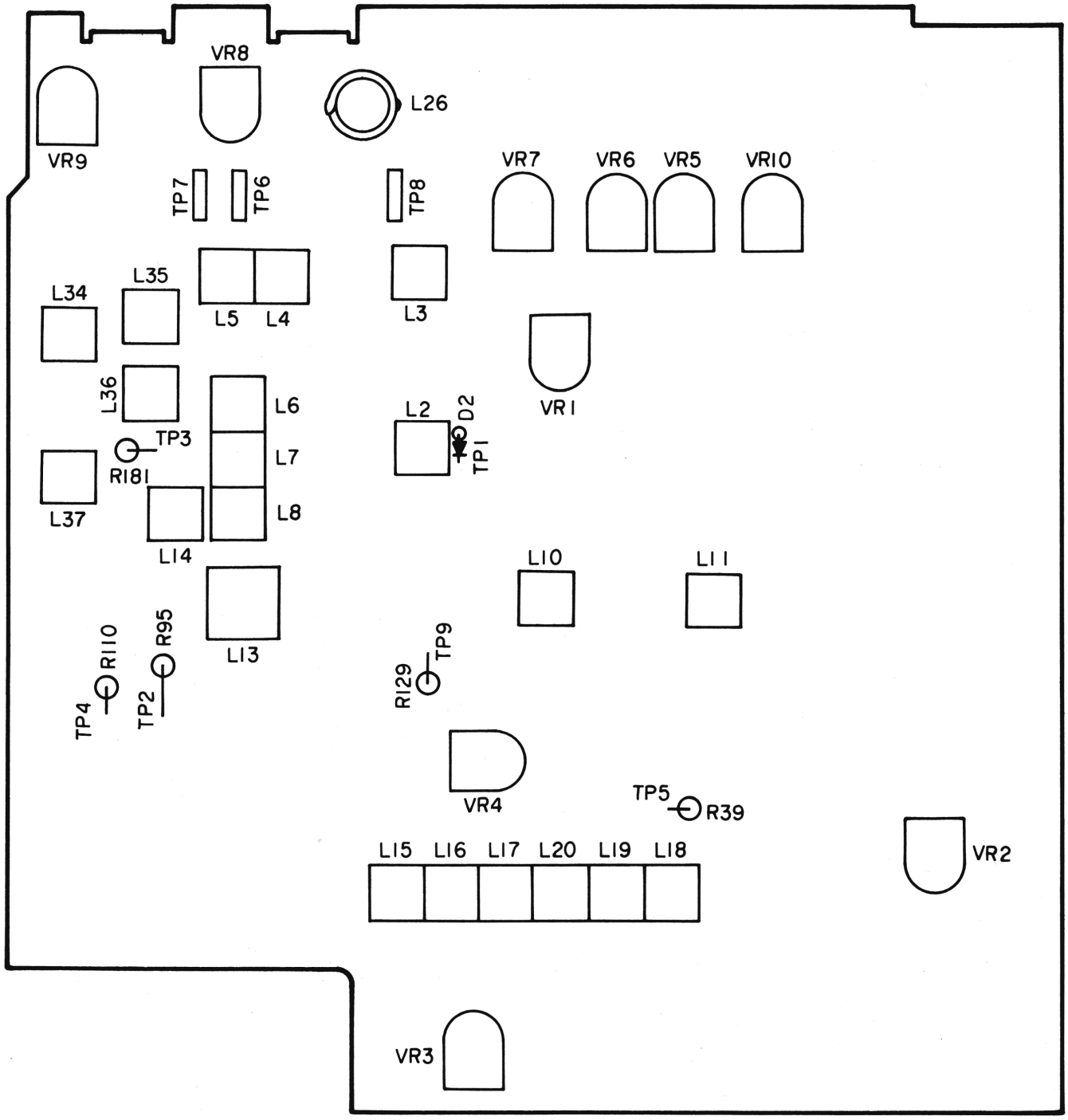
Figure 4

BLOCK DIAGRAM



ALIGNMENT PROCEDURES

ALIGNMENT POINTS



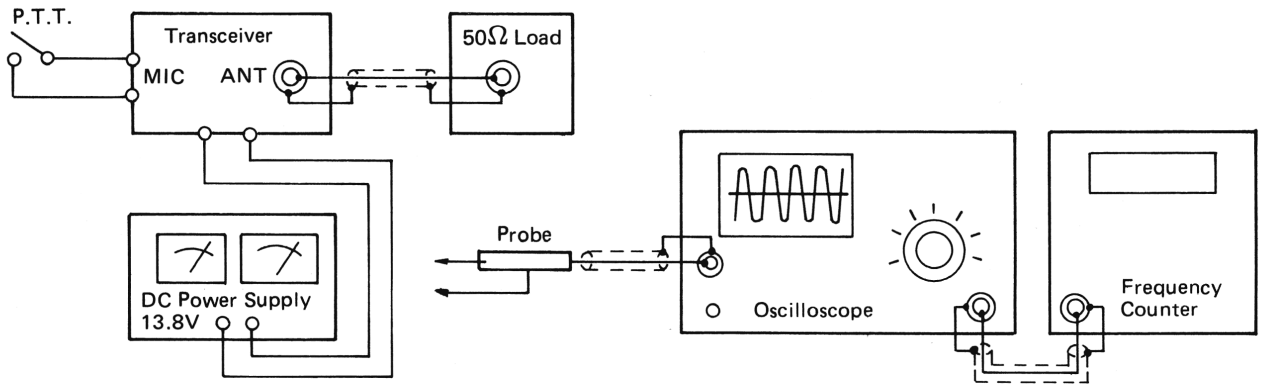
ALIGNMENT OF CARRIER OSCILLATOR (PLL) PORTION

(Refer to ALIGNMENT POINTS)

1. Test Equipment required

a. Oscilloscope (DC – 50 MHz)
b. Frequency Counter (0 – 30 MHz)
c. DC Power Supply
d. 50 ohm Load

2. Test Equipment Connection



3. Alignment Procedure

Connect test equipment as shown below.

STEP	PRESET TO	CONNECTION	ADJUSTMENT
1	CH: 40, AM, RX, Clarifier in center	TP2	Adjust L13 for 4.5V DC reading on Oscilloscope. (Oscilloscope in DC mode)
2	Same as step 1. CH: 1.	TP2	Check that the voltage is more than 2V DC on Oscilloscope.
3	Same as step 1. CH: 19, USB, RX	TP3	Adjust L14 for maximum reading on Oscilloscope.
4	Same as step 3.	TP3	Adjust L16 for 16.4925 MHz ±20 Hz.
5	Same as step 1. CH: 19, AM, RX	TP3	Adjust L15 for 16.4900 MHz ±20 Hz.
6	Same as step 1. CH: 19, LSB, RX	TP3	Adjust L17 for 16.4875 MHz ±20 Hz.
7	Same as step 1. CH: 19, LSB, TX	TP3	Adjust VR3 for 16.4875 MHz ±20 Hz.
8	Same as step 1. CH: 19, LSB, RX	TP5	Adjust L20 for 10.6925 MHz ±20 Hz.
9	Same as step 1. CH: 19, USB, RX	TP5	Adjust L19 for 10.6975 MHz ±20 Hz.
10	Same as step 1. CH: 19, TX, AM. Disconnect TP6, TP7, TP8	TP9	Adjust L18 for 10.6950 MHz ±5 Hz.

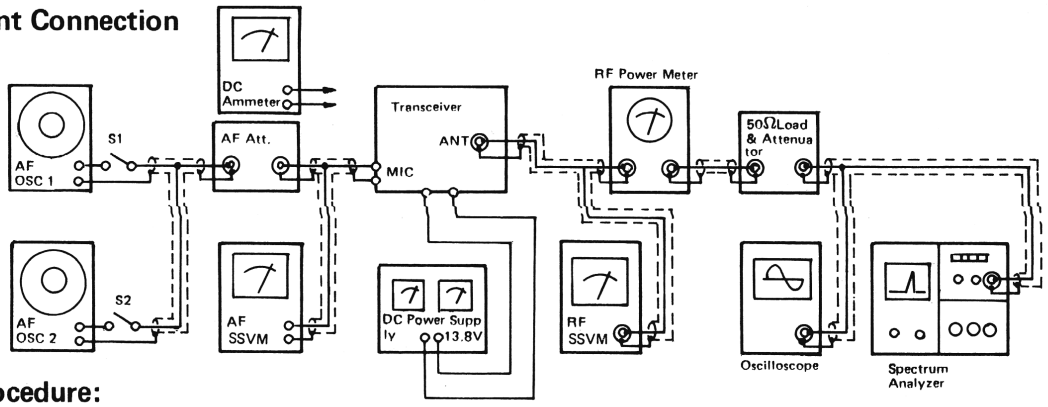
ALIGNMENT OF TRANSMITTER SECTION

(Refer to ALIGNMENT POINTS)

1. Equipment Required

a. AF Oscillator (two required)
b. AF SSVM (Full scale: 1V DC with RF probe)
c. DC Ammeter
d. RF Power Meter
e. 50 ohm load and Attenuator
f. Oscilloscope
g. RF SSVM
h. Monitor Receiver or Spectrum Analyzer
i. DC Power Supply (13.8 V/3 Amp.)

2. Test Equipment Connection



3. Alignment Procedure:

Connect test equipment as shown below.

STEP	PRESET TO	ADJUSTMENT	REMARKS
1	CH: 19, PA/CB: CB USB mode, TX S1 and S2: OFF	VR9	Break circuit at TP8 and TP7, place DC mA meter in series. Adjust for 40 mA.
2	Same as step 1	VR8	Break circuit at TP8 and TP6, place DC mA meter in series. Adjust for 30mA
	After step 1 and 2, restore circuit at TP8 and TP7.		
3	Same as step 1 OSC1: 500 Hz OSC2: 2400 Hz S1, S2: ON	L37, 36, 35, 34 and 26	Set VR6 to full clockwise rotation (ALC "off" condition). Keep the AF ATT for approx. 20V reading on RF SSVM. Then adjust coils for max. reading. Repeat this adjustment several times, reducing the AF input level to the microphone circuit.
4	Same as step 3	L34, 35 and 36	Adjust Coils for max. reading on RF SSVM. Check the power difference between CH1 and CH40. If it is over 1V on RF SSVM, readjust coils to obtain within 1V.
5	Same as step 1 AM mode OSC1: 1 kHz S1: ON, S2: OFF	L26	Adjust level of OSC1 for 5mV reading on AF SSVM, then adjust L26 for maximum reading on RF SSVM.
6	Same as step 1 S1, S2: OFF	VR4	Adjust for minimum carrier leakage for both USB and LSB on Spectrum Analyzer or Oscilloscope.
7	Same as step 3 OSC1: 500 Hz S1, S2: ON	VR6	Adjust OSC1 and OSC2 for 5mV reading on AF SSVM, then adjust VR6 for 24.5V reading on RF SSVM.
8	Same as step 1 AM mode S1, S2: OFF	VR10	Adjust for 4.0W reading on RF Power meter.
9	Same as step 8	VR7	Adjust so the 4 digits light on the Transceiver's meter.
10	Same as step 5	VR5	Adjust output of OSC1 for 200mV reading on AF SSVM then adjust VR5 for 95 to 98% modulation on Scope.

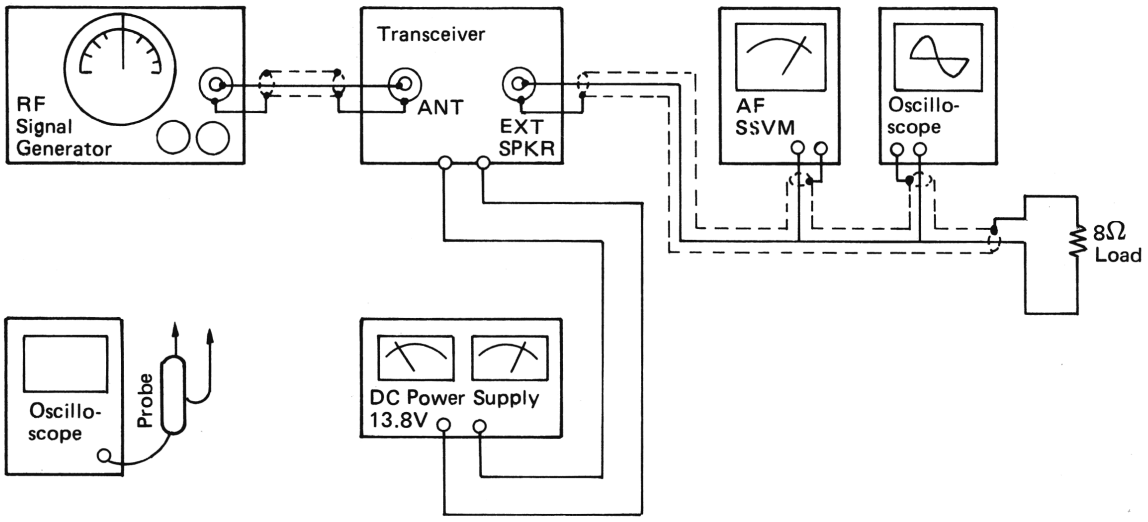
ALIGNMENT OF RECEIVER SECTION

(Refer to ALIGNMENT POINTS)

1. Equipment Required

a. RF Signal Generator (27 MHz Band, 50 ohm output impedance)
b. AF SSVM
c. Oscilloscope (For AF Signal)
d. DC Power Supply
e. 8 ohm Load
f. Oscilloscope (0 – 50 MHz)

2. Test Equipment Connection



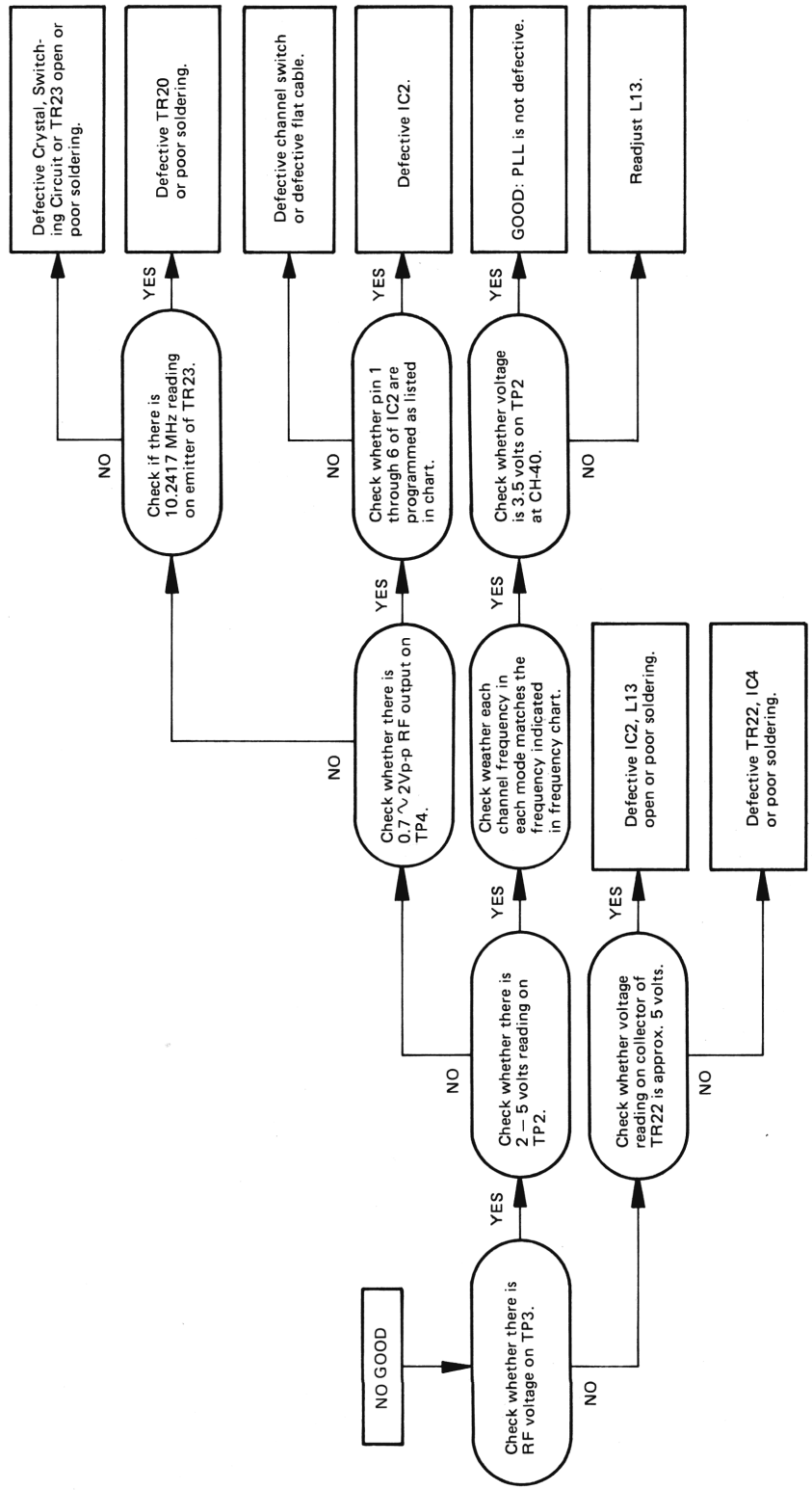
3. Procedure

Connect Test Equipment as shown below.

STEP	PRESET TO	ADJUSTMENT	PROCEDURE
1	Channel : 19 Clarifier : center Volume : fully clockwise RF GAIN : fully clockwise Squelch : fully counter-clockwise NB/ANL : off Mode : AM		Set the SG on channel 19,27.185 MHz with 1 kHz, 30% modulation.
2	Same as step 1	L11, 10, 8, 7, 6 5, 4, and 3	Adjust the level of SG to obtain 2V reading on AF SSVM. Then adjust coils for maximum reading on AF SSVM. Repeat this step reducing the SG output.
3	Same as step 1	L3	Adjust L3 for max. reading on AF SSVM. Check the sensitivity difference between CH1 and 40. If it is over 1 dB, re-adjust L3 to obtain within 1 dB.
4	Same as step 1 except squelch is fully clockwise.	VR2	Set the level of SG to 1000μV. Then adjust VR2 so that the AF signal will just appear on Oscilloscope.
5	Same as step 1	VR1	Set the level of SG to 100μV. Then adjust for "S-9" reading on Transceiver's meter.
6	Same as step 1 except NB/ANL switch is ON.	L2	Connect the Oscilloscope to TP1. Adjust the level of SG to approx. 1.6μV. Then adjust for max. DC reading.

TROUBLESHOOTING HINTS

PLL TROUBLESHOOTING HINTS



FREQUENCY TABLE OF PLL

CH	ANT. Frequency (MHz)	Divide Ratio "N"	1/N INPUT FREQUENCY (MHz)	PROGRAM CODE (PIN NO. OF IC2)						LOCAL OSC (MHz) OUTPUT FREQUENCY		
				1	2	3	4	5	6	AM.RX & TX	USB	LSB
1	26.965	91	0.91	1	0	0	0	0	0	16.270	16.2725	16.2675
2	26.975	92	0.92	0	1	0	0	0	0	16.280	16.2825	16.2775
3	26.985	93	0.93	1	1	0	0	0	0	16.290	16.2925	16.2875
4	27.005	95	0.95	0	0	1	0	0	0	16.310	16.3125	16.3075
5	27.015	96	0.96	1	0	1	0	0	0	16.320	16.3225	16.3175
6	27.025	97	0.97	0	1	1	0	0	0	16.330	16.3325	16.3275
7	27.035	98	0.98	1	1	1	0	0	0	16.340	16.3425	16.3375
8	27.055	100	1.00	0	0	0	1	0	0	16.360	16.3625	16.3575
9	27.065	101	1.01	1	0	0	1	0	0	16.370	16.3725	16.3675
10	27.075	102	1.02	0	0	0	0	1	0	16.380	16.3825	16.3775
11	27.085	103	1.03	1	0	0	0	1	0	16.390	16.3925	16.3875
12	27.105	105	1.05	0	1	0	0	1	0	16.410	16.4125	16.4075
13	27.115	106	1.06	1	1	0	0	1	0	16.420	16.4225	16.4175
14	27.125	107	1.07	0	0	1	0	1	0	16.430	16.4325	16.4275
15	27.135	108	1.08	1	0	1	0	1	0	16.440	16.4425	16.4375
16	27.155	110	1.10	0	1	1	0	1	0	16.460	16.4625	16.4575
17	27.165	111	1.11	1	1	1	0	1	0	16.470	16.4725	16.4675
18	27.175	112	1.12	0	0	0	1	1	0	16.480	16.4825	16.4775
19	27.185	113	1.13	1	0	0	1	1	0	16.490	16.4925	16.4875
20	27.205	115	1.15	0	0	0	0	0	1	16.510	16.5125	16.5075
21	27.215	116	1.16	1	0	0	0	0	1	16.520	16.5225	16.5175
22	27.225	117	1.17	0	1	0	0	0	1	16.530	16.5325	16.5275
23	27.255	120	1.20	1	1	0	0	0	1	16.560	16.5625	16.5575
24	27.235	118	1.18	0	0	1	0	0	1	16.540	16.5425	16.5375
25	27.245	119	1.19	1	0	1	0	0	1	16.550	16.5525	16.5475
26	27.265	121	1.21	0	1	1	0	0	1	16.570	16.5725	16.5675
27	27.275	122	1.22	1	1	1	0	0	1	16.580	16.5825	16.5775
28	27.285	123	1.23	0	0	0	1	0	1	16.590	16.5925	16.5875
29	27.295	124	1.24	1	0	0	1	0	1	16.600	16.6025	16.5975
30	26.305	125	1.25	0	0	0	0	1	1	16.610	16.6125	16.6075
31	27.315	126	1.26	1	0	0	0	1	1	16.620	16.6225	16.6175
32	27.325	127	1.27	0	1	0	0	1	1	16.630	16.6325	16.6275
33	27.335	128	1.28	1	1	0	0	1	1	16.640	16.6425	16.6375
34	27.345	129	1.29	0	0	1	0	1	1	16.650	16.6525	16.6475
35	27.355	130	1.30	1	0	1	0	1	1	16.660	16.6625	16.6575
36	27.365	131	1.31	0	1	1	0	1	1	16.670	16.6725	16.6675
37	27.375	132	1.32	1	1	1	0	1	1	16.680	16.6825	16.6775
38	27.385	133	1.33	0	0	0	1	1	1	16.690	16.6925	16.6875
39	27.395	134	1.34	1	0	0	1	1	1	16.700	16.7025	16.6975
40	27.405	135	1.35	0	0	0	0	0	0	16.710	16.7125	16.7075

0 = Low level (0 – 1.0 volt)
1 = High level (3.5 – 6 volts)

UNIT WILL NOT TURN ON

1. Broken/defective DC Power cable.
2. Fuse blown. Be sure you check for the cause.
3. Defective power switch.
4. Defective wires or poor soldering in power supply circuit.

NO SOUND RECEIVED

1. Defective RF circuit in receiver.
2. Defective Noise Blanker.
3. Defective audio power IC, IC5.
   Check Voltage at pin 6 of IC5; if approximately 6V, problem is not with this IC.
4. Squelch is "ON" all the time.
   If voltage at Base of TR12 is approx. 0V with Squelch Control in fully counterclockwise, problem is not with squelch circuit.
   Defective TR12.
5. Check whether the transceiver's signal strength meter deflects when a signal (27 MHz carrier with 1 kHz, 30% modulation, 100μV level) is applied to antenna.
   a. The meter indicates "S-9".
      You can assume that antenna through IF stage are OK.
      NO AM . . . . Checks should be made on Detector (D16 and 17) ANL circuit (D18), TR24 and AF stage (TR11, TR12, VR501 and IC5).
      NO SSB BUT AM OK . . . . Check frequency and level on TP5, if no signal, checks should be made on X-tals and TR24.
      NO SSB . . . . Checks should be made on Detector, TR11, TR12 and AF stage, VR501 and IC5.
   b. No deflecting of meter.
      Checks should be made on RF stage (TR13 and TR14), IF stage (TR15, TR16, TR17 and TR18) or AGC circuit (TP8, D7, D8 and IC1). Or trouble may be in PLL circuit. Check frequency on TP3; if it is as listed in the Table, problem is not with PLL circuit.
6. Defective AGC circuit.
7. Defective PLL circuit.
8. Defective antenna connector.

NO NOISE

1. Broken or bad contact in microphone connector and/or push-to-talk switch.
2. Defective RX power circuit.
3. Defective RX audio circuit.
4. Defective PLL circuit and/or channel switch.
5. Defective squelch.
6. Defective PA-CB switch.

NO TRANSMISSION

1. Broken or bad contact in microphone connector and/or push-to-talk switch.
2. Broken or bad contact in antenna connector.
3. Defect in power supply.
4. Defect in PLL and/or Carrier Oscillator (Improper adjustment).
5. Inoperative microphone amplifier and/or balanced modulator in SSB mode.
6. Check the frequency at TP3; carrier oscillation may have stopped; if no carrier, check TR24, D27, 28, 29 and X2.
7. Carrier is OK, but no TX; check the frequency at TP3. If not same as listed in Frequency Table, PLL circuit defective. If OK, check IC3, 6, TR35, 538 and 539.
8. If no TX on SSB modes and no modulation on AM mode, Mic amplifier or ALC/AMC section is defective. Check TR36, 37, 38 and 544.

NO MODULATION

1. Defective microphone.
2. Defective microphone connector.
3. Inoperative microphone amplifier, (both AM and SSB modes.)

NO NOISE BLANKER OPERATION

With NB Switch ON, apply a 27 MHz carrier signal to antenna. Then check DC voltage at TP1 varying the carrier signal from 1μV to 100μV.

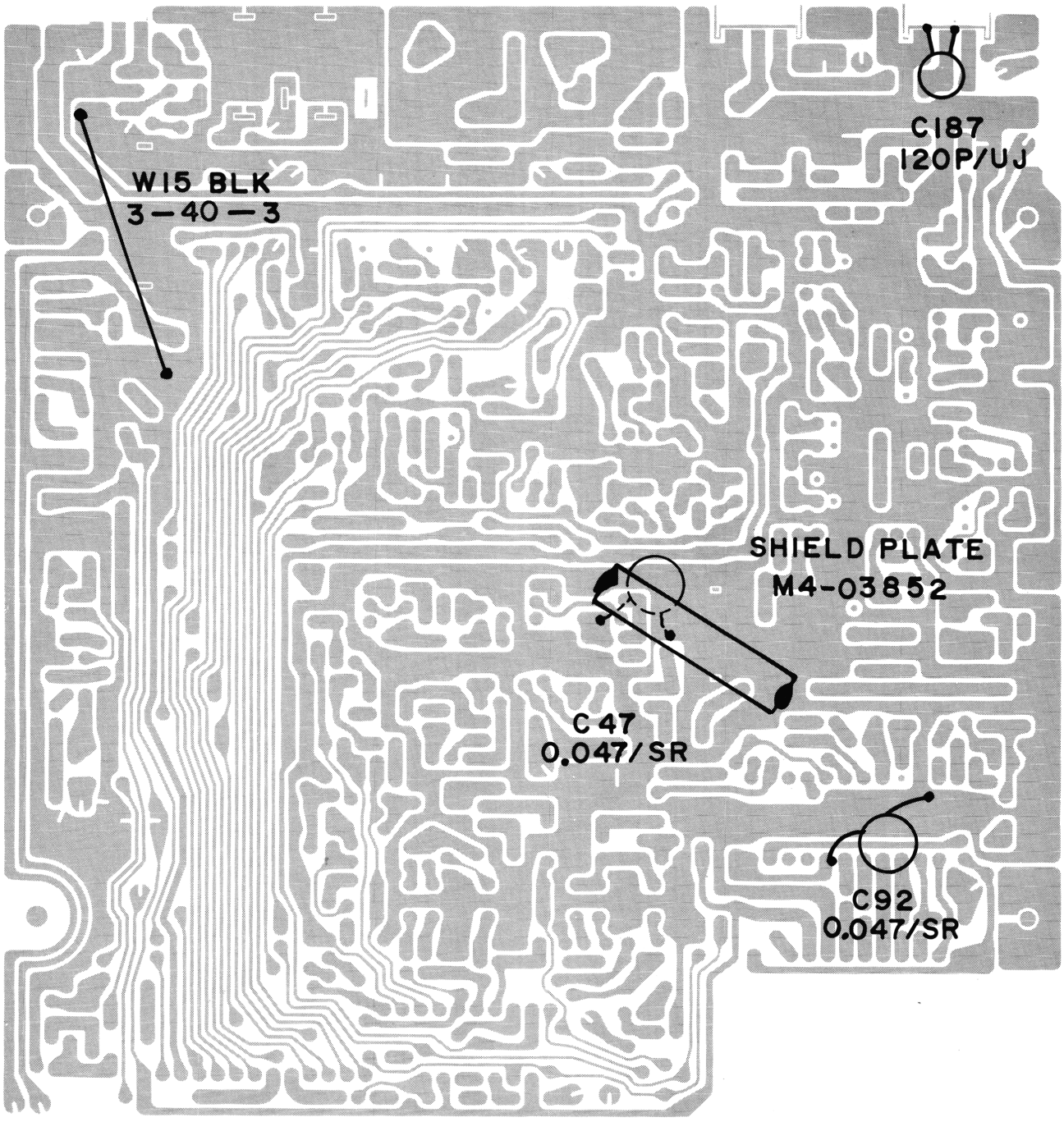
1. When TR1 voltage stays on and does not vary: Check TR1, 2, 3, 4, 5, D1 and D2.
2. When TP1 voltage varies from 0V to approx. 2V. Check TR6 and 7.
3. If (A) and (B) are alright, L2 may be misaligned; go to alignment procedure for adjusting L2.

CHANNEL LED DOES NOT LIGHT

When a specific segment fails to light, it is probable there is an open-circuit in the LED display or bad contact in the channel selector switch.

ADDITIONAL PARTS ON THE BOTTOM

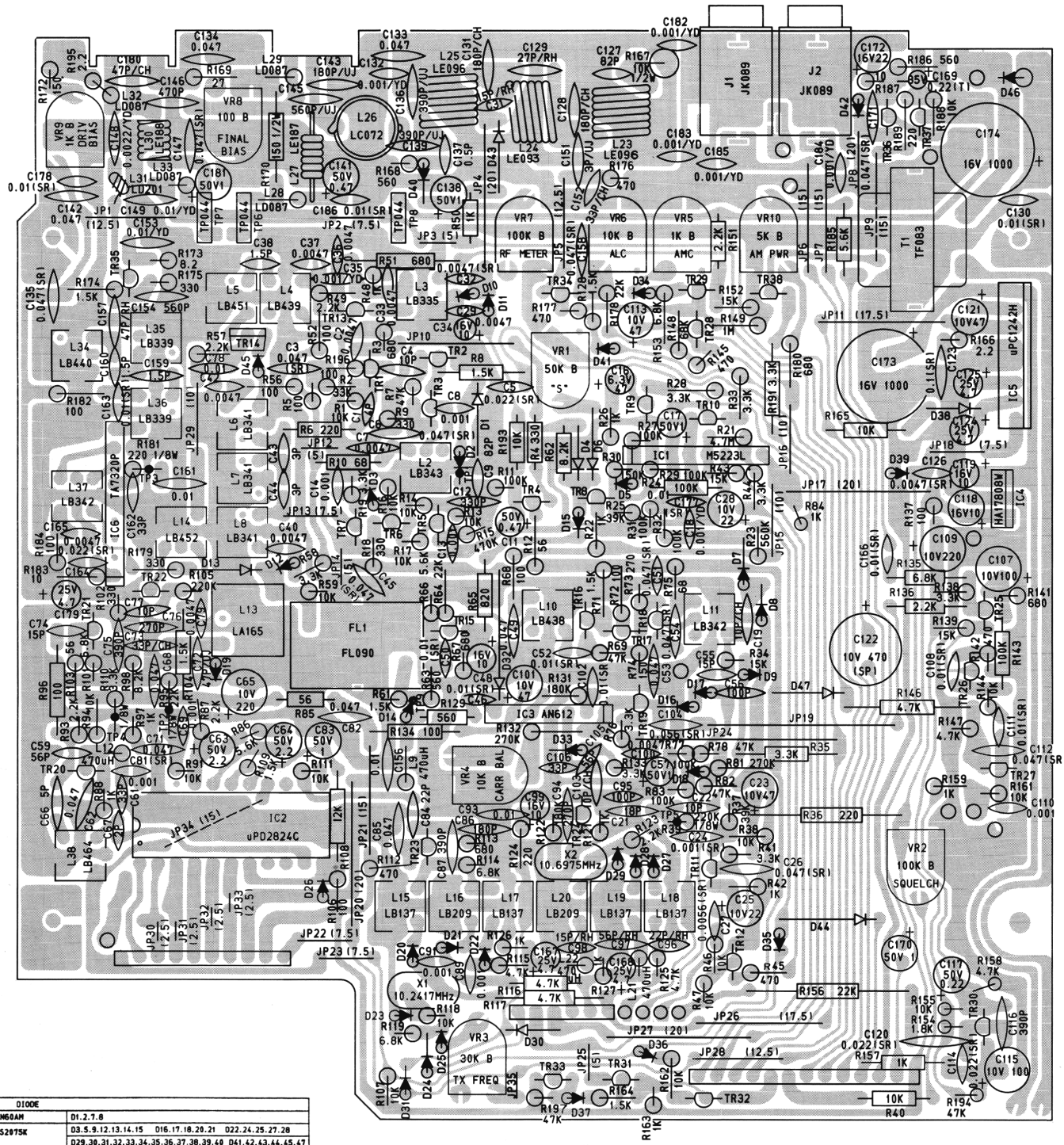
MAIN P.C. BOARD



Bottom View

P.C. BOARD (TOP AND BOTTOM VIEWS)

MAIN P.C. BOARD (TOP BOARD)

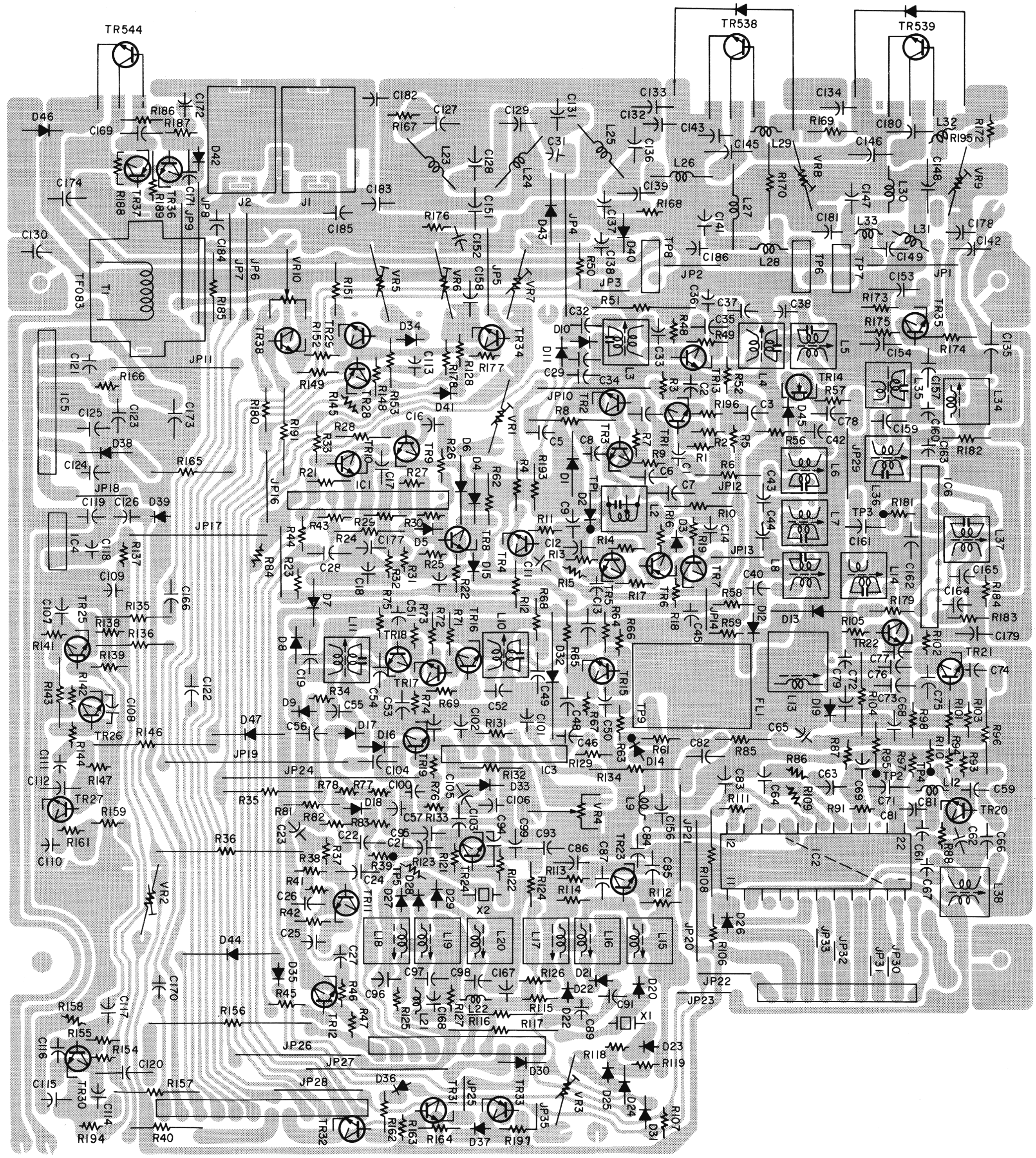


DIODE	
IN60AM	D1.2.7.8
1S2075K	D3.5.9.12.13.14.15 D16.17.18.20.21 D22.24.25.27.28 D29.30.31.32.33.34.35.36.37.38.39.40 D41.42.43.44.45.47
MC-301	D10.11
1SV73-EB	D19.23
HZ5C-1	D26
HZ3B3	D4.6
IN4003	D46
TRANSISTOR	
2SA733P	TR6.28
2SB525C	TR33.37
2SC945AQ	TR4.5.7.8.9.10.11.12. TR19.25.26.27.29.30.32.36
2SC1674L	TR13.15
2SC1675L	TR1.2.16.17.20.21.22.23.24.34
2SC1730L	TR3.18
2SC1973-55B	TR35
2SC3242AE	TR31.38
2SK192A-BL	TR14

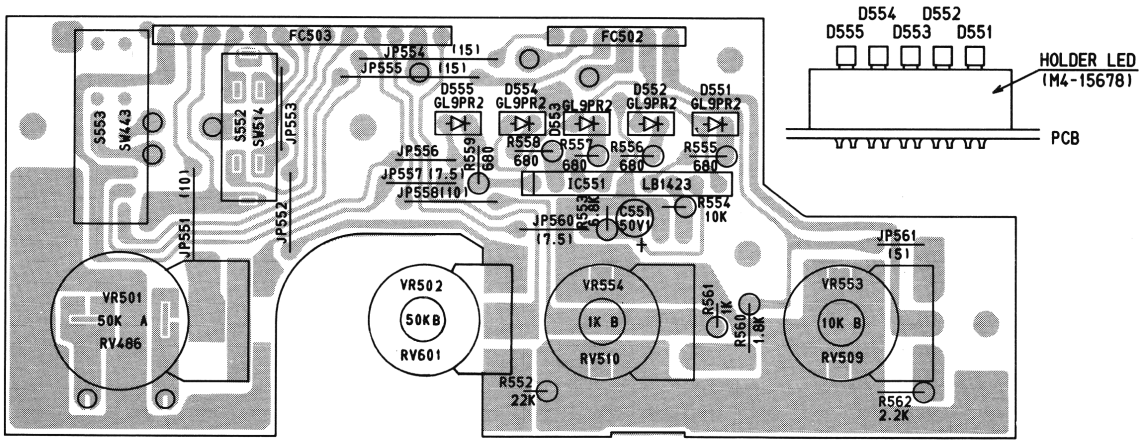
NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/6W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)
4. CAPACITORS TEMPERATURE CHARACTERISTICS TABLE

CAPACITANCE	TEMPERATURE CHARACTERISTICS
0.047	ZF
0.0047	YF
0.01	
0.001	
LESS THAN 1000PF	SL

MAIN P.C. BOARD (BOTTOM BOARD)

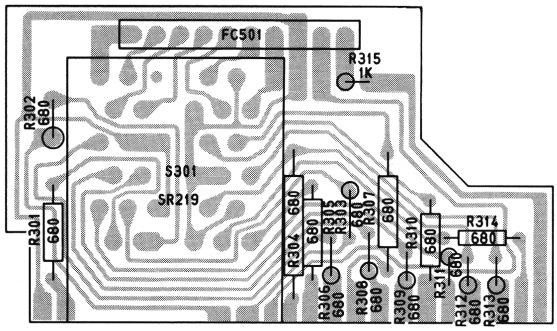


CONTROL P.C. BOARD (TOP VIEW)



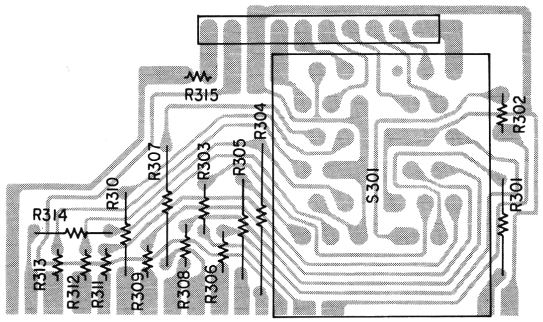
NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/6W UNLESS OTHERWISE NOTED.
3. CAPACITANCE VALUES ARE INDICATED IN MICRO FARADS UNLESS OTHERWISE NOTED.(P=MICRO-MICRO FARAD)

CH SW P.C. BOARD (TOP VIEW)

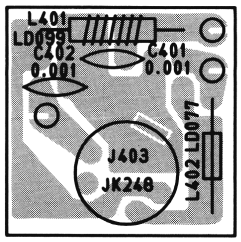


NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=KILO OHM. M=MEG OHM)
2. RESISTOR WATTAGES ARE 1/6W UNLESS OTHERWISE NOTED.

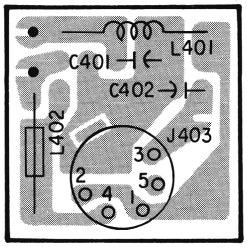
CH SW P.C. BOARD (BOTTOM VIEW)



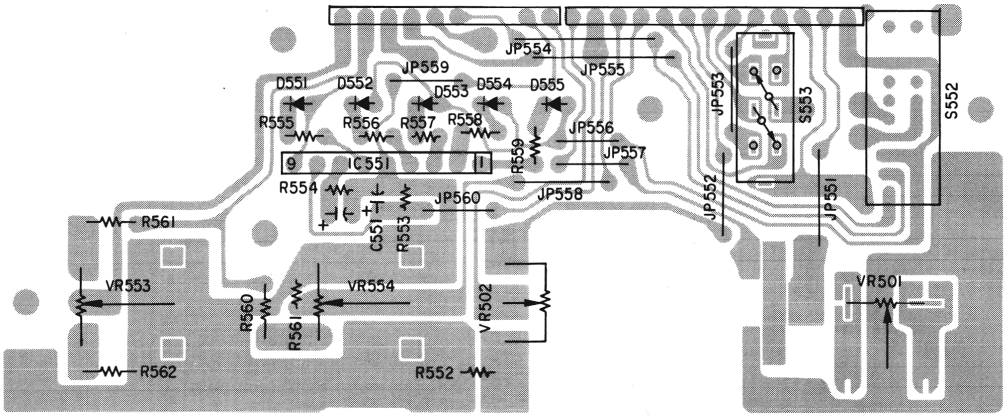
MIC P.C. BOARD (TOP VIEW)



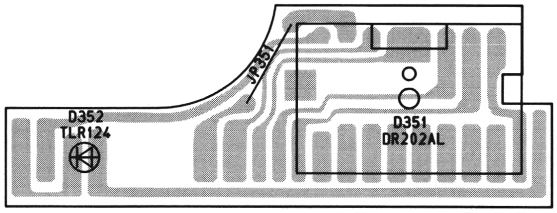
MIC P.C. BOARD (BOTTOM VIEW)

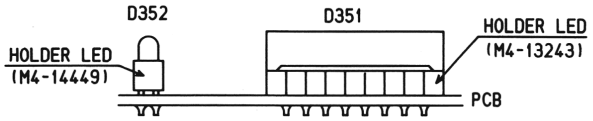


CONTROL P.C. BOARD (BOTTOM VIEW)

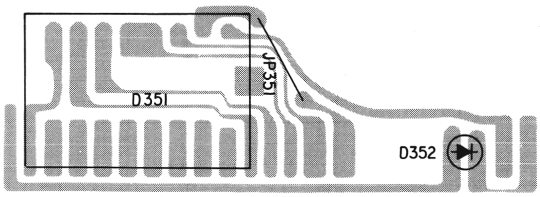


CH LED P.C. BOARD (TOP VIEW)

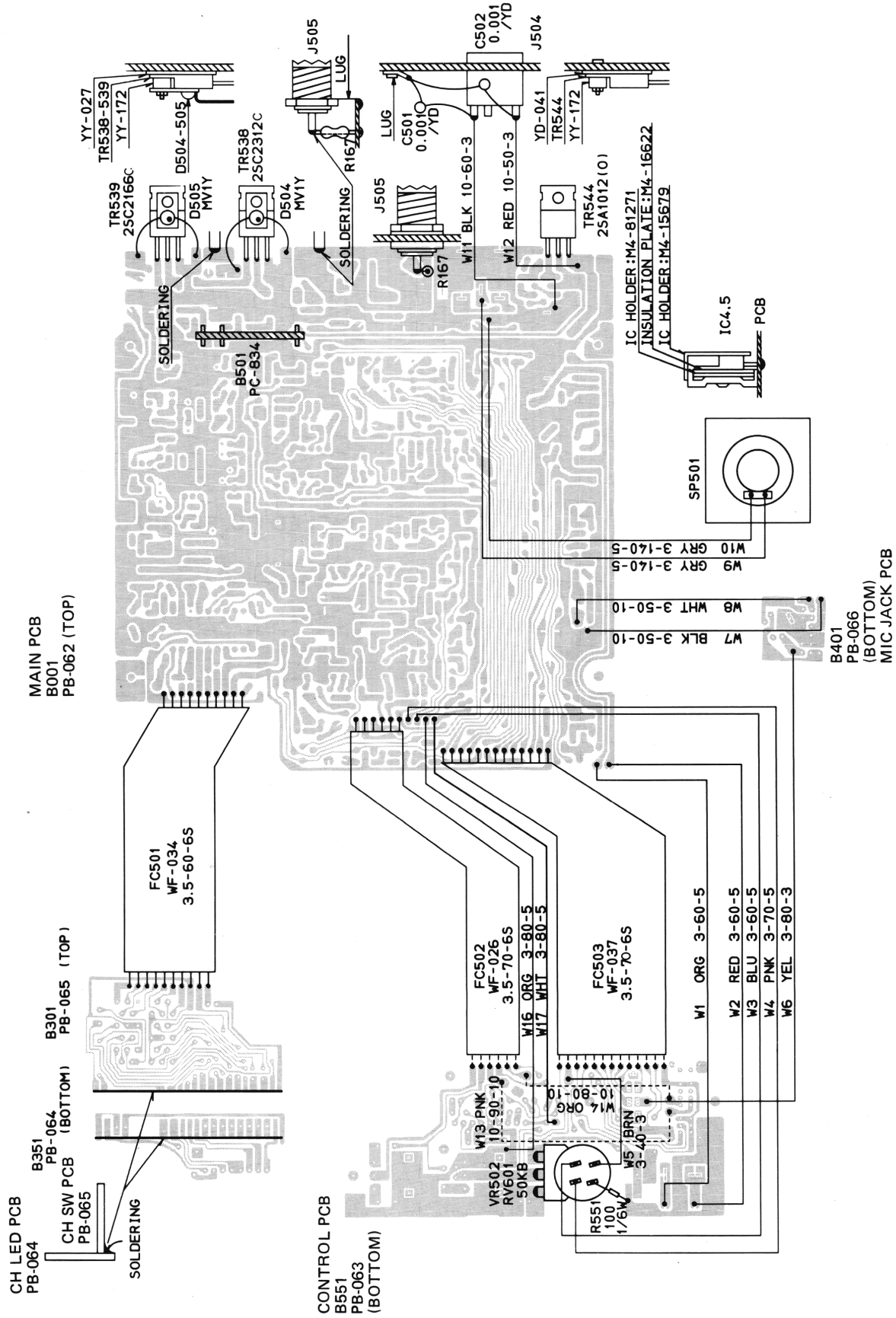




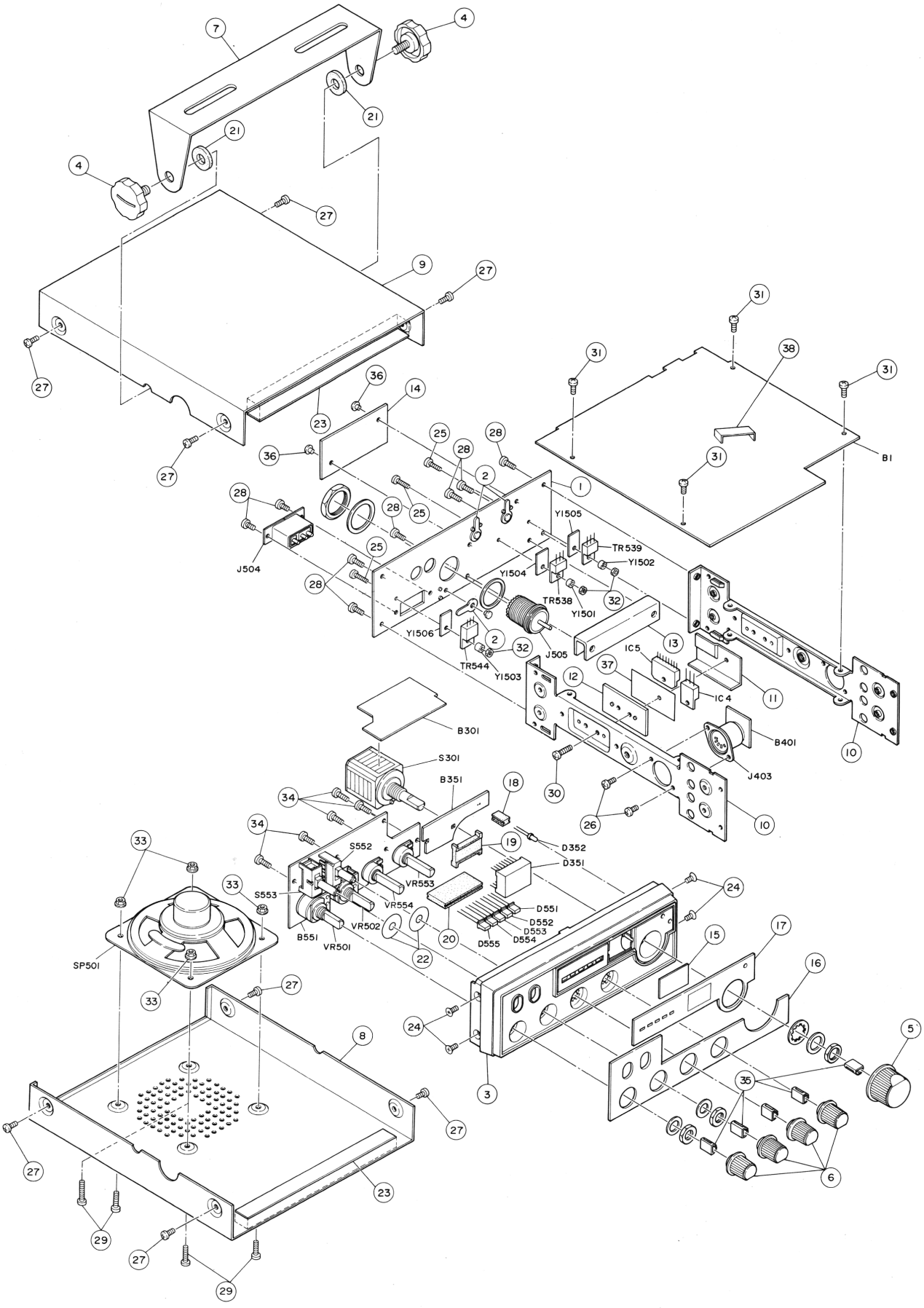
CH LED P.C. BOARD (BOTTOM VIEW)



WIRING DIAGRAM



EXPLODED VIEW



ELECTRICAL PARTS LIST

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	CAPACITORS		
	The following code indicates variation of capacitors against temperatures: **YB** = ±10%, **YD** = +20–30%, **YE** = +20–50% (–25 ~ +85°C), **ZF** = +30–80% (–10 ~ +70°C), **CH** = 0 ±60ppm/°C, **RH** = –220±60ppm/°C, **SL** = +350ppm/°C ~ 1000ppm/°C, **UJ** = –750 ±120ppm/°C		
C1	Ceramic 4pF 50V ±0.25 pF SL	CF-1089	BCCG814091Z
C2	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C3	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C4	Ceramic 10pF 50V ±0.5pF SL	CF-1815	BCCG811002Z
C5	Semi-Conductor (SR) 0.022μF 25V ±10%	CC-223KFZP	BCGG512235Z
C6	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C7	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C8	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C9	Ceramic 82pF 50V ±10% SL	CF-1847	BCCG818205Z
C10	– Not used –	Not used	Not used
C11	Electrolytic 0.47μF 50V ±20%	CC-474MJAP	BCER814786Z
C12	Ceramic 330pF 50V ±10% SL	CF-1514	BCCG813315Z
C13	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C14	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C15	– Not used –	Not used	Not used
C16	Electrolytic 47μF 6.3V ±20%	CC-476MBNP	BCER904706Z
C17	Electrolytic 1μF 50V ±20%	CC-105MJNP	BCER811096Z
C18	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C19	Ceramic 10pF 50V ±0.5pF CH	CF-1141	BCCC811002Z
C20	– Not used –	Not used	Not used
C21	Ceramic 18pF 50V ±10% SL	CF-1914	BCCG811805Z
C22	Ceramic 10pF 50V ±10% SL	CF-1815	BCCG811002Z
C23	Electrolytic 47μF 10V +80% –20%	CC-476ZCAP	BCEL114700Z
C24	Semi-conductor (SR) 0.001μF 25V ±10%	CC-102KFZP	BCGG511025Z
C25	Electrolytic 22μF 10V +80% –20%	CC-226ZCAP	BCEL112200Z
C26	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C27	Semi-Conductor (SR) 0.0056μF 25V ±10%	CC-562KFZP	BCGG515625Z
C28	Electrolytic 22μF 10V +80% –20%	CC-226ZCAP	BCEL112200Z
C29	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C30	– Not used –	Not used	Not used
C31	Ceramic 15pF 50V b10% RH	CF-1929	BCCR811505Z
C32	Semi-Conductor (SR) 0.0047μF 25V b10%	CC-472KFZP	BCGG514725Z
C33	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C34	Electrolytic 10μF 16V ±20%	CC-106ZDAP	BCER311006Z
C35	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C36	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C37	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C38	Ceramic 1.5pF 50V ±0.25pF SL	CF-1189	BCCG811591Z
C39	– Not used –	Not used	Not used
C40	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C41	– Not used –	Not used	Not used
C42	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C43	Ceramic 3pF 50V ±0.25pF SL	CF-1045	BCCG813091Z
C44	Ceramic 3pF 50V ±10% SL	CF-1045	BCCG813091Z
C45	Semi-Conductor (SR) 0.0047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C46	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C47	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C48	Electrolytic 10μF 16V ±20%	CC-106ZDAP	BCER311006Z
C49	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C50	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C51	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C52	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C53	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C54	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C55	Ceramic 15pF 50V ±10% SL	CF-1195	BCCG811505Z
C56	Ceramic 100pF 50V ±10% SL	CF-1425	BCCG811015Z
C57	Electrolytic 1μF 50V ±20%	CC-105MJMP	BCER811096Z
C58	– Not used –	Not used	Not used
C59	Ceramic 56pF 50V ±10% SL	CF-1373	BCCG815605Z
C60	– Not used –	Not used	Not used
C61	Ceramic 33pF 50V ±10% SL	CF-1315	BCCG813305Z
C62	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C63	Electrolytic 2.2μF 50V +80% –20%	CC-225ZJAP	BCEL812290Z
C64	Electrolytic 2.2μF 50V +80% –20%	CC-225ZJAP	BCEL812290Z
C65	Electrolytic 220μF 10V ±20%	CC-227ZCAP	BCAM112216Z
C66	Ceramic 5pF 50V ±0.25pF SL		BCCG815091Z
C67	Ceramic 2pF 50V ±0.25pF SL	CF-1815	BCCG812091Z
C68	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C69	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C70	– Not used –	Not used	Not used
C71	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C72	Ceramic 47pF 50V ±10% UJ	CF-1023	BCCU814705Z
C73	Ceramic 33pF 50V ±10% CH	CF-1310	BCCC813305Z
C74	Ceramic 15pF 50V ±10% SL	CF-1195	BCCG811505Z
C75	Ceramic 390pF 50V ±10% SL	CF-1934	BCCG813915Z
C76	Ceramic 270pF 50V ±10% SL	CF-1504	BCCG812715Z
C77	Ceramic 10pF 50V ±0.5pF SL	CF-1815	BCCG811002Z
C78	Ceramic 0.01μF 50V +80% –20% YF	CF-1751	BCKG811030Z
C79	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C80	– Not used –	Not used	Not used
C81	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C82	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C83	Electrolytic 1μF 50V ±20%	CC-105MJNP	BCER811096Z
C84	Ceramic 22pF 50V ±10% SL	CF-1891	BCCG812205Z
C85	Ceramic 0.047μF 25V +80% –20% ZF	CF-1794	BCKC514730Z
C86	Ceramic 180pF 50V ±10% SL	CF-1470	BCCG811815Z
C87	Ceramic 390pF 50V ±10% SL	CF-1934	BCCG813915Z
C88	– Not used –	Not used	Not used
C89	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C90	– Not used –	Not used	Not used
C91	Ceramic 0.001μF 50V +80% –20% YF	CF-6507	BCKG811020Z
C92	Semi-Conductor (SR) 0.047uF 25V ±10%	CC-473KFZP	BCGG514735Z
C93	Ceramic 0.01μF 50V +80% –20% YF	CF-1751	BCKG811030Z
C94	Ceramic 270pF 50V ±10% SL	CF-1504	BCCG812715Z
C95	Ceramic 100pF 50V ± 10% SL	CF-1425	BCCG811015Z
C96	Ceramic 22pF 50V ±10% RH	CF-1251	BCCR812205Z
C97	Ceramic 56pF 50V ±10% RH	CF-2083	BCCR815605Z
C98	Ceramic 15pF 50V ±10% RH	CF-1929	BCCR811505Z
C99	Electrolytic 10μF 16V ±20%	CC-106MDNP	BCER311006Z
C100	Ceramic 0.0047μF 50V +80% –20% YF	CF-7335	BCKG814720Z
C101	Electrolytic 47μF 10V +80% –20%	CC476ZCAP	BCEL114700Z
C102	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C103	Ceramic 10pF 50V ±0.5pF CH	CT-1141	BCCC811002Z
C104	Semi-Conductor (SR) 0.056μF 25V ±10%	CC-563KFZP	BCGG515635Z
C105	Ceramic 27pF 50V ±10% SL	CF-1269	BCCG812705Z

REF. NO.	DESCRIPTION				RS PART NO.	MFR'S PART NO.
C106	Ceramic	33pF	50V ±10%	SL	CF-1315	BCCG813305Z
C107	Electrolytic	100μF	10V +80% −20%		CC-107ZCAP	BCEL111010Z
C108	Semi-Conductor (SR)	0.01μF	25V ±10%		CC-103KFZP	BCGG511035Z
C109	Electrolytic	220μF	10V ±20%		CC-227ZCAP	BCAM112216Z
C110	Ceramic	0.001μF	50V +80% −20%	YF	CF-6507	BCKG811020Z
C111	Semi-Conductor (SR)	0.01μF	25V ±10%		CC-103KFZP	BCGG511035Z
C112	Semi-Conductor (SR)	0.047μF	25V ±10%		CC-473KFZP	BCGG514735Z
C113	Electrolytic	47μF	10V +80% −20%		CC-476ZCAP	BCEL114700Z
C114	Semi-Conductor (SR)	0.022μF	25V ±10%		CC-223KFZP	BCGG512235Z
C115	Electrolytic	100μF	10V +80% −20%		CC-107ZCAP	BCEL111010Z
C116	Ceramic	390pF	50V ±10%	SL	CF-1934	BCCG813915Z
C117	Electrolytic	0.22μF	50V +80% −20%		CC-224ZJAP	BCEL812280Z
C118	Electrolytic	10μF	16V +80% −20%		CC-106ZDAP	BCEL311000Z
C119	Electrolytic	10μF	16V ±20%		CC-106MDNP	BCER311006Z
C120	Semi-Conductor (SR)	0.022μF	25V ±10%		CC-223KFZP	BCGG512235Z
C121	Electrolytic	47μF	10V +80% −20%		CC-476ZCAP	BCEL114700Z
C122	Electrolytic	470μF	10V ±20%		CC-477MCAP	BCEK114716Z
C123	Semi-Conductor (SR)	0.1μF	25V ±10%		CC-104KFZP	BCGG511045Z
C124	Electrolytic	4.7μF	25V ±20%		CC-475MFNP	BCER514796Z
C125	Electrolytic	4.7μF	25V ±20%		CC-475MFNP	BCER514796Z
C126	Semi-Conductor (SR)	0.0047μF	25V ±10%		CC-477KFZP	BCGG514725Z
C127	Ceramic	82pF	50V ±10%	SL	CF-1847	BCCG818205Z
C128	Ceramic	180pF	50V ±10%	CH	CF-1952	BCCC811815Z
C129	Ceramic	27pF	50V ±10%	RH	CF-1009	BCCR812705Z
C130	Semi-Conductor (SR)	0.01μF	25V ±10%		CC-103KFZP	BCGG511035Z
C131	Ceramic	180pF	50V ±10%	CH	CF-1952	BCCC811815Z
C132	Ceramic	0.001μF	50V ±20%	YD	CF-6503	BCKD811026Z
C133	Ceramic	0.047μF	25V +80% −20%	ZF	CF-1794	BCKC514730Z
C134	Ceramic	0.047μF	25V +80% −20%	ZF	CF-1794	BCKC514730Z
C135	Semi-Conductor (SR)	0.047μF	25V ±10%		CC-473KFZP	BCGG514735Z
C136	Ceramic	390pF	50V ±10%	UJ	CF-1988	BCCU813915Z
C137	Ceramic	0.5pF	50V ±0.25pF	SL	CF-1848	BCCG815081Z
C138	Electrolytic	1μF	50V ±20%		CC-105MJNP	BCER811096Z
C139	Ceramic	390pF	50V ±10%	UJ	CF-1988	BCCU813915Z
C140	— Not used —				Not used	Not used
C141	Electrolytic	0.47μF	50V +80% −20%		CC-474ZJAP	BCEL814780Z
C142	Ceramic	0.047μF	25V +80% −20%	ZF	CF-1794	BCKC514730Z
C143	Ceramic	180pF	50V ±10%	UJ	CF-1019	BCCU811815Z
C144	— Not used —				Not used	Not used
C145	Ceramic	560pF	50V ±10%	UJ	CF-1024	BCCU815615Z
C146	Ceramic	470pF	50V ±10%	SL	CF-2340	BCCG814715Z
C147	Semi-Conductor (SR)	0.047μF	25V ±10%		CC-473KFZP	BCGG514735Z
C148	Ceramic	0.0022μF	50V ±20%	YD	CF-6505	BCKD812226Z
C149	Ceramic	0.01μF	50V ±20%	YD	CF-1709	BCKD811036Z
C150	— Not used —				Not used	Not used
C151	Ceramic	3pF	50V ±0.25pF	UJ	CF-2430	BCCU813091Z
C152	Ceramic	33pF	50V ±10%	CH	CF-1310	BCCC813305Z
C153	Ceramic	0.01μF	50V ±20%	YD	CF-1709	BCKD811036Z
C154	Ceramic	560pF	50V ±10%	SL	CF-2005	BCCG815615Z
C155	— Not used —				Not used	Not used
C156	Ceramic	0.01μF	50V +80% −20%	YF	CF-1751	BCKG811030Z
C157	Ceramic	47pF	50V ±10%	RH	CF-2023	BCCR814705Z
C158	Semi-Conductor (SR)	0.047μF	25V ±10%		CC-473KFZP	BCGG514735Z
C159	Ceramic	1.5pF	50V ±0.25pF	SL	CF-1189	BCCG811591Z
C160	Ceramic	1.5pF	50V ±0.25pF	SL	CF-1189	BCCG811591Z
C161	Ceramic	0.01μF	50V +80% −20%	YF	CF-1751	BCKG811030Z
C162	Ceramic	33pF	50V ±10%	SL	CF-1315	BCCG813305Z
C163	Semi-Conductor (SR)	0.01μF	25V ±10%		CC-103KFZP	BCGG511035Z

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
C164	Semi-Conductor (SR) 0.022μF 25V ±10%	CC-223KFZP	BCGG512235Z
C165	Ceramic 0.0047μF 50V +80% −20% YF	CF-7335	BCKG814720Z
C166	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C167	Electrolytic 4.7μF 25V ±20%	CC-475MFNP	BCER514796Z
C168	Electrolytic 4.7μF 25V ±20%	CC-475MFNP	BCER514796Z
C169	Tantalum 0.22μF 35V ±20%	CC-226MGTP	BCSE662286Z
C170	Electrolytic 1μF 50V +80% −20%	CC-105ZJAP	BCEL811090Z
C171	Semi-Conductor (SR) 0.047μF 25V ±10%	CC-473KFZP	BCGG514735Z
C172	Electrolytic 22μF 16V +80% −20%	CC-226ZDAP	BCEL312200Z
C173	Electrolytic 1000μF 16V ±20%	CC-108ZDAP	BCER311026Z
C174	Electrolytic 1000μF 16V ±20%	CC-108ZDAP	BCER311026Z
C175	— Not used —	Not used	Not used
C176	— Not used —	Not used	Not used
C177	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C178	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C179	Electrolytic 4.7μF 25V ±20%	CC-475MFNP	BCER514796Z
C180	Ceramic 47pF 50V ±10% CH	CF-1365	BCCC814705Z
C181	Electrolytic 0.1μF 50V ±20%	CC-104MJAP	BCER811086Z
C182	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C183	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C184	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C185	Ceramic 0.001μF 50V ±20% YD	CF-6503	BCKD811026Z
C186	Semi-Conductor (SR) 0.01μF 25V ±10%	CC-103KFZP	BCGG511035Z
C187	Ceramic 120pF 50V ±10% UJ	CC-103KFZP	BCCU811215Z
C401	Ceramic 0.001 μF 50V +80% −20% YF	CF-6507	BCKG811020Z
C402	Ceramic 0.001 μF 50V +80% −20% YF	CF-6507	BCKG811020Z
C501	Ceramic 0.001 μF 50V ±20% YD	CF-6503	BCKD811026Z
C502	Ceramic 0.001 μF 50V ±20% YD	CF-6503	BCKD811026Z
C551	Electrolytic 1 μF 50V ±20%	CC-105MJNP	BCER811096Z

DIODES

D1	Germanium	1N60 AM	DX-0681	BDAY0001001
D2	Germanium	1N60 AM	DX-0681	BDAY0001001
D3	Silicon	1S2075K	DX-1118	BDAY0063001
D4	Zener	HZ3B3	DX-1073	BDAY0269003
D5	Silicon	1S2075K	DX-1118	BDAY0063001
D6	Zener	HZ3B3	DX-1073	BDAY0269003
D7	Germanium	1N60 AM	DX-0681	BDAY0001001
D8	Germanium	1N60 AM	DX-0681	BDAY0001001
D9	Silicon	1S2705K	DX-1118	BDAY0063001
D10	Silicon	MC-301	DX-0985	BDAY0090001
D11	Silicon	MC-301	DX-0985	BDAY0090001
D12	Silicon	1S2075K	DX-1118	BDAY0063001
D13	Silicon	1S2075K	DX-1118	BDAY0063001
D14	Silicon	1S2075K	DX-1118	BDAY0063001
D15	Silicon	1S2075K	DX-1118	BDAY0063001
D16	Silicon	1S2075K	DX-1118	BDAY0063001
D17	Silicon	1S2075K	DX-1118	BDAY0063001
D18	Silicon	1S2075K	DX-1118	BDAY0063001
D19	Varicap	1SV73-EB	DX-2220	BDAY0220001
D20	Silicon	1S2075K	DX-1118	BDAY0063001
D21	Silicon	1S2075K	DX-1118	BDAY0063001

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
D22	Silicon 1S2075K	DX-1118	BDAY0063001
D23	Varicap 1SV73-EB	DX-2220	BDAY0220001
D24	Silicon 1S2075K	DX-1118	BDAY0063001
D25	Silicon 1S2075K	DX-1118	BDAY0063001
D26	Zener HZ5C-1	DX-1097	BDAY0269002
D27	Silicon 1S2075K	DX-1118	BDAY0063001
D28	Silicon 1S2075K	DX-1118	BDAY0063001
D29	Silicon 1S2075K	DX-1118	BDAY0063001
D30	Silicon 1S2075K	DX-1118	BDAY0063001
D31	Silicon 1S2075K	DX-1118	BDAY0063001
D32	Silicon 1S2075K	DX-1118	BDAY0063001
D33	Silicon 1S2075K	DX-1118	BDAY0063001
D34	Silicon 1S2075K	DX-1118	BDAY0063001
D35	Silicon 1S2075K	DX-1118	BDAY0063001
D36	Silicon 1S2075K	DX-1118	BDAY0063001
D37	Silicon 1S2075K	DX-1118	BDAY0063001
D38	Silicon 1S2075K	DX-1118	BDAY0063001
D39	Silicon 1S2075K	DX-1118	BDAY0063001
D40	Silicon 1S2075K	DX-1118	BDAY0063001
D41	Silicon 1S2075K	DX-1118	BDAY0063001
D42	Silicon 1S2075K	DX-1118	BDAY0063001
D43	Silicon 1S2075K	DX-1118	BDAY0063001
D44	Silicon 1S2075K	DX-1118	BDAY0063001
D45	Silicon 1S2075K	DX-1118	BDAY0063001
D46	Silicon 1N4003	DX-1118	BDAY0133001
D47	Silicon 1S2075K	DX-0207	BDAY0063001
D351	LED DR-202AL	L-1263	BDAY0175001
D352	LED, TLR-124	L-0963	BDAY0100001
D501	— Not used —	Not used	Not used
D502	— Not used —	Not used	Not used
D503	— Not used —	Not used	Not used
D504	Varistor MV-1Y	DX-1092	BDFY0020001
D505	Varistor MV-1Y	DX-1092	BDFY0020001
D551	LED GL-9PR2	L-1260	BDAY0242001
D552	LED GL-9PR2	L-1260	BDAY0242001
D553	LED GL-9PR2	L-1260	BDAY0242001
D554	LED GL-9PR2	L-1260	BDAY0242001
D555	LED GL-9PR2	L-1260	BDAY0242001
	FILTER		
FL001	Crystal FL-090 10.695 MHz	MX-1002	BFLY0090001
	INTEGRATED CIRCUITS		
IC1	M5223L, Silicon Monolithic SQ & AGC Amp.	MX-2265	BDEY0582001
IC2	μPD2824C, C-MOS P.L.L	MX-4694	BDEY0190001
IC3	AN612, Silicon Monolithic Balanced Modulator	MX-3916	BDEY0130001
IC4	HA17808W, Silicon Monolithic DC Power Regulator	MX-2242	BDEY0483001
IC5	μPC1242H, Silicon Monolithic AF Power Amp.	MX-2241	BDEY0471001
IC6	TA7320P, Silicon Monolithic TX Balanced Mixer	MX-3632	BDEY0364001
IC551	LB-1423, Silicon Monolithic LED Meter Driver	MX-6215	BDEY0430001

REF. NO.	DESCRIPTION		RS PART NO.	MFR'S PART NO.
	JACKS			
J1	JK-089 Phone (3, 5D)		J-1416	BJKY0089001
J2	JK-089 Phone (3, 5D)		J-1416	BJKY0089001
J403	JK-248 5 Pin DIN Type		J-5271	BJKY0248001
J504	JK-052, Black 3 Pin DC Power		J-5272	BJKY0052002
J505	JK-230, Ant, M Type		J-5273	BJKY0230001
	COILS			
L1	— Not used —		Not used	Not used
L2	10.695 MHz, RX NOISE BLANKER	LB-343	CA-2021	BLBY0343001
L3	27 MHz, RX RF	LB-335	CA-2017	BLBY0335001
L4	27 MHz, RX RF Band Pass	LB-439	CA-2023	BLBY0439001
L5	27 MHz, RX Band Pass	LB-451	CA-2025	BLBY0451001
L6	10.695 MHz, RX IF	LB-341	CA-2019	BLBY0341001
L7	10.695 MHz, RX IF	LB-341	CA-2019	BLBY0341001
L8	10.695 MHz, RX IF	LB-341	CA-2019	BLBY0341001
L9	470μH, Molded Inductor	LZ-035	CA-8752	BLZY0035471
L10	10.695 MHz, RX IF	LB-438	CA-2022	BLBY0438001
L11	10.695 MHz, RX IF, TX BUFFER	LB-342	CA-2020	BLBY0342001
L12	470μH, Molded Inductor	LZ-035	CA-8752	BLZY0035471
L13	V.C.O.	LA-165	CA-9180	BLAY0165001
L14	16 MHz, Local	LB-452	CA-2026	BLBY0452001
L15	10.24 MHz FREQ. ADJ.	LB-137	CA-2014	BLBY0137001
L16	10.24 MHz, FRQ ARD.	LB-209	CA-2015	BLBY0209001
L17	10.24 MHz FRQ. ADJ.	LB-137	CA-2014	BLBY0137001
L18	10.24 MHz FRQ. ADJ.	LB-137	CA-2014	BLBY0137001
L19	10.24 MHz FRQ. ADJ.	LB-137	CA-2014	BLBY0137001
L20	10.24 MHz, FRQ. ARD.	LB-209	CA-2015	BLBY0209001
L21	470μH, Molded Inductor	LZ-035	CA-8752	BLZY0035471
L22	470μH, Molded Inductor	LZ-035	CA-8752	BLZY0035471
L23	27 MHz, TX Low Pass Filter	LE-096	CA-2030	BLEY0096001
L24	27 MHz, TX Low Pass Filter	LE-093	CB-2612	BLEY0093001
L25	27 MHz, TX Low Pass Filter	LE-096	CA-2030	BLEY0096001
L26	27 MHz, Low Pass Filter	LC-072	CA-2027	BLCY0072001
L27	27 MHz, RX RF Choke	LE-187	CA-2031	BLEY0187001
L28	Ferrite Beads	LD-087	CA-8742	BLDY0087001
L29	Ferrite Beads	LD-087	CA-8742	BLDY0087001
L30	27 MHz, TX RF Choke	LE-188	CA-2032	BLEY0188001
L31	27 MHz, TX Buffer	LD-201	CA-2029	BLDY0201001
L32	Ferrite Beads	LD-087	CA-8742	BLDY0087001
L33	Ferrite Beads	LD-087	CA-8742	BLDY0087001
L34	27 MHz, TX Band Pass	LB-440	CA-2024	BLBY0440001
L35	27 MHz, TX Band Pass	LB-339	CA-2018	BLBY0339001
L36	27 MHz, TX Band Pass	LB-339	CA-2018	BLBY0339001
L37	10.695 MHz, RX IF, TX Buffer	LB-342	CA-2020	BLBY0342001
L38	15 MHz, Tuning	LB-464		BLBY0464001
L401	RF Choke	LD-099	CB-2611	BLDY0099001
L402	Ferrite Bead	LD-077	NS	BLDY0077001

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	RESISTORS		
R1	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R2	Carbon Film 33k ohm 1/6W ±5% Formed Vert	N-0324ECC	BRUB613334Z
R3	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R4	Carbon Film 330 ohm 1/6W ±5% Axial Lead	N-0159ECC	BRPB613314Z
R5	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R6	Carbon Film 220 ohm 1/6W ±5% Axial Lead	N-0149ECC	BRPB612214Z
R7	Carbon Film 47k ohm 1/6W ±5% Formed Vert	N-0340ECC	BRUB614734Z
R8	Carbon Film 1.5k ohm 1/6W ±5% Axial Lead	N-0206ECC	BRPB611524Z
R9	Carbon Film 330 ohm 1/6W ±5% Formed Vert	N-0159ECC	BRUB613314Z
R10	Carbon Film 68 ohm 1/6W ±5% Axial Lead	N-0111ECC	BRPB616804Z
R11	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611044Z
R12	Carbon Film 56 ohm 1/6W ±5% Formed Vert	N-0107ECC	BRUB615604Z
R13	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R14	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R15	Carbon Film 470k ohm 1/6W ±5% Formed Vert	N-0423ECC	BRUB614744Z
R16	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R17	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R18	Carbon Film 330 ohm 1/6W ±5% Formed Vert	N-0159ECC	BRUB613314Z
R19	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R20	— Not used —	Not used	Not used
R21	Carbon Film 4.7M ohm 1/6W ±5% Formed Vert	N-0463ECC	BRUB614754Z
R22	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R23	Carbon Film 560k ohm 1/6W ±5% Formed Vert	N-0429ECC	BRUB615644Z
R24	Carbon Film 100k ohm 1/6W ±5% Axial Lead	N-0371ECC	BRPB611044Z
R25	Carbon Film 39k ohm 1/6W ±5% Formed Vert	N-0330ECC	BRUB613934Z
R26	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R27	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R28	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R29	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R30	Carbon Film 150k ohm 1/6W ±5% Formed Vert	N-0384ECC	BRUB611544Z
R31	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R32	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R33	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R34	Carbon Film 15k ohm 1/6W ±5% Formed Vert	N-0297ECC	BRUB611534Z
R35	Carbon Film 3.3k ohm 1/6W ±5% Axial Lead	N-0230ECC	BRPB613324Z
R36	Carbon Film 220 ohm 1/6W ±5% Axial Lead	N-0149ECC	BRPB612214Z
R37	Carbon Film 39k ohm 1/6W ±5% Formed Vert	N-0330ECC	BRUB613934Z
R38	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R39	Carbon Film 220k ohm 1/8W ±5% Axial Lead	N-0396ECC	BRPB182244Z
R40	Carbon Film 10k ohm 1/6W ±5% Axial Lead	N-0281ECC	BRPB611034Z
R41	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R42	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R43	Carbon Film 15k ohm 1/6W ±5% Formed Vert	N-0297ECC	BRUB611534Z
R44	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R45	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB614714Z
R46	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R47	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R48	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R49	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z
R50	Carbon Film 1k ohm 1/6W ±5% Axial Lead	N-0196ECC	BRPB611024Z
R51	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R52	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R53	— Not used —	Not used	Not used
R54	— Not used —	Not used	Not used
R55	— Not used —	Not used	Not used

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R56	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R57	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z
R58	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R59	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R60	— Not used —	Not used	Not used
R61	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R62	Carbon Film 8.2k ohm 1/6W ±5% Axial Lead	N-0271ECC	BRPB618224Z
R63	Carbon Film 560 ohm 1/6W ±5% Formed Vert	N-0176ECC	BRUB615614Z
R64	Carbon Film 22k ohm 1/6W ±5% Formed Vert	N-0311ECC	BRUB612234Z
R65	Carbon Film 820 ohm 1/6W ±5% Axial Lead	N-0196ECC	BRPB618214Z
R66	Carbon Film 5.6 ohm 1/6W ±5% Formed Vert	N-0257ECC	BRUB615624Z
R67	Carbon Film 680 ohm 1/6W ±5%	N-0183ECC	BRUB616814Z
R68	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R69	Carbon Film 47k ohm 1/6W ±5% Formed Vert	N-0340ECC	BRUB614734Z
R70	— Not used —	Not used	Not used
R71	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R72	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R73	Carbon Film 270 ohm 1/6W ±5% Formed Vert	N-0155ECC	BRUB612714Z
R74	Carbon Film 150 ohm 1/6W ±5% Formed Vert	N-0142ECC	BRUB611514Z
R75	Carbon Film 68 ohm 1/6W ±5% Formed Vert	N-0111ECC	BRUB616804Z
R76	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R77	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R78	Carbon Film 47k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB614734Z
R79	— Not used —	N-0340ECC	BRUB614734Z
R80	— Not used —	Not used	Not used
R81	Carbon Film 270k ohm 1/6W ±5% Formed Vert	N-0402ECC	BRUB612744Z
R82	Carbon Film 47k ohm 1/6W ±5% Formed Vert	N-0340ECC	BRUB614734Z
R83	Carbon Film 100k ohm 1/6W ±5% Formed Vert	N-0371ECC	BRUB611044Z
R84	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R85	Carbon Film 56 ohm 1/6W ±5% Axial Lead	N-0107ECC	BRPB615604Z
R86	Carbon Film 560k ohm 1/6W ±5% Formed Vert	N-0257ECC	BRUB615624Z
R87	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z
R88	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R89	— Not used —	N-0196ECC	BRUB611024Z
R90	— Not used —	Not used	Not used
R91	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R92		N-0196ECC	BRUB611024Z
R93	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z
R94	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R95	Carbon Film 22k ohm 1/8W ±5% Axial Lead	N-0311ECC	BRPB182234Z
R96	Carbon Film 100 ohm 1/2W ±5% Axial Lead	N-0132ECC	BRPB611014Z
R97	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R98	Carbon Film 8.2k ohm 1/6W ±5% Formed Vert	N-0271ECC	BRUB618224Z
R99	— Not used —	Not used	Not used
R100	— Not used —	Not used	Not used
R101	Carbon Film 6.8 ohm 1/6W ±5% Formed Vert	N-0262ECC	BRUB616824Z
R102	Carbon Film 330 ohm 1/6W ±5% Formed Vert	N-0159ECC	BRUB613314Z
R103	Carbon Film 56 ohm 1/6W ±5% Formed Vert	N-0107ECC	BRUB615604Z
R104	Carbon Film 1.5k ohm 1/6W ±5% Axial Lead	N-0206ECC	BRPB611524Z
R105	Carbon Film 220k ohm 1/6W ±5% Formed Vert	N-0396ECC	BRUB612244Z
R106	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R107	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R108	Carbon Film 12k ohm 1/6W ±5% Axial Lead	N-0311ECC	BRPB611234Z
R109	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R110	Carbon Film 3.3k ohm 1/8W ±5% Axial Lead	N-0230ECC	BRPB183324Z
R111	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R112	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0169ECC	BRUB614714Z
R113	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R114	Carbon Film 6.8k ohm 1/6W ±5% Formed Vert	N-0262ECC	BRUB616824Z
R115	Carbon Film 4.7k ohm 1/6W ±5% Formed Vert	N-0247ECC	BRUB614724Z
R116	Carbon Film 4.7k ohm 1/6W ±5% Axial Lead	N-0427ECC	BRPB614724Z
R117	Carbon Film 4.7k ohm 1/6W ±5% Axial Lead	N-0427ECC	BRPB614724Z
R118	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R119	Carbon Film 6.8k ohm 1/6W ±5% Formed Vert	N-0262ECC	BRUB616824Z
R120	— Not used —	Not used	Not used
R121	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R122	Carbon Film 180k ohm 1/6W ±5% Formed Vert	N-0387ECC	BRUB611844Z
R123	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z
R124	Carbon Film 220 ohm 1/6W ±5% Formed Vert	N-0149ECC	BRUB612214Z
R125	Carbon Film 4.7k ohm 1/6W ±5% Formed Vert	N-0247ECC	BRUB614724Z
R126	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R127	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R128	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R129	Carbon Film 560 ohm 1/4W ±5% Axial Lead	N-0176ECC	BRPB615614Z
R130	— Not used —	Not used	Not used
R131	Carbon Film 180k ohm 1/6W ±5% Formed Vert	N-0387ECC	BRUB611844Z
R132	Carbon Film 270k ohm 1/6W ±5% Formed Vert	N-0402ECC	BRUB612744Z
R133	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R134	Carbon Film 100 ohm 1/2W ±5% Axial Lead	N-0132ECC	BRPB611014Z
R135	Carbon Film 6.8k ohm 1/6W ±5% Axial Lead	N-0262ECC	BRPB616824Z
R136	Carbon Film 2.2k ohm 1/6W ±5% Axial Lead	N-0237ECC	BRPB612224Z
R137	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R138	Carbon Film 3.3k ohm 1/6W ±5% Formed Vert	N-0230ECC	BRUB613324Z
R139	Carbon Film 15k ohm 1/6W ±5% Formed Vert	N-0297ECC	BRUB611534Z
R140	— Not used —	Not used	Not used
R141	Carbon Film 680 ohm 1/6W ±5%	N-0183ECC	BRUB616814Z
R142	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0169ECC	BRUB614714Z
R143	Carbon Film 100k ohm 1/6W ±5% Axial Lead	N-0371ECC	BRPB611044Z
R144	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R145	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0169ECC	BRUB614714Z
R146	Carbon Film 4.7k ohm 1/6W ±5% Axial Lead	N-0247ECC	BRPB614724Z
R147	Carbon Film 4.7k ohm 1/6W ±5% Formed Vert	N-0247ECC	BRUB614724Z
R148	Carbon Film 68k ohm 1/6W ±5% Formed Vert	N-0340ECC	BRUB616834Z
R149	Carbon Film 1M ohm 1/6W ±5% Formed Vert	N-0445ECC	BRUB611054Z
R150	— Not used —	Not used	Not used
R151	Carbon Film 2.2k ohm 1/6W ±5% Axial Lead	N-0216ECC	BRPB612224Z
R152	Carbon Film 15k ohm 1/6W ±5% Formed Vert	N-0297ECC	BRUB611534Z
R153	Carbon Film 6.8k ohm 1/6W ±5% Formed Vert	N-0262ECC	BRUB616824Z
R154	Carbon Film 1.8k ohm 1/6W ±5% Formed Vert	N-0210ECC	BRUB611824Z
R155	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R156	Carbon Film 22k ohm 1/6W ±5% Axial Lead	N-0311ECC	BRPB612234Z
R157	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R158	Carbon Film 4.7k ohm 1/6W ±5% Formed Vert	N-0247ECC	BRUB614724Z
R159	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R160	— Not used —	Not used	Not used
R161	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R162	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R163	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R164	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R165	Carbon Film 10k ohm 1/6W ±5% Axial Lead	N-0281ECC	BRPB611034Z
R166	Carbon Film 2.2 ohm 1/6W ±5% Formed Vert	N-0032ECC	BRUB612294Z
R167	Carbon Film 10k ohm 1/2W ±5% Axial Lead	N-0281ECC	BRPB121034Z
R168	Carbon Film 560 ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB615614Z
R169	Carbon Film 27 ohm 1/6W ±5% Formed Vert	N-0082ECC	BRUB612704Z
R170	Carbon Film 150 ohm 1/2W ±5% Axial Lead	N-0142EFC	BRPB121514Z
R171	— Not used —	Not used	Not used

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
R172	Carbon Film 150 ohm 1/6W ±5% Formed Vert	N-0142ECC	BRUB611514Z
R173	Carbon Film 8.2 ohm 1/6W ±5% Formed Vert	N-0058ECC	BRUB618294Z
R174	Carbon Film 1.5k ohm 1/6W ±5% Formed Vert	N-0206ECC	BRUB611524Z
R175	Carbon Film 330 ohm 1/6W ±5% Formed Vert	N-0159ECC	BRUB613314Z
R176	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0169ECC	BRUB614714Z
R177	Carbon Film 470 ohm 1/6W ±5% Formed Vert	N-0169ECC	BRUB614714Z
R178	Carbon Film 22k ohm 1/6W ±5% Formed Vert	N-0311ECC	BRUB612234Z
R179	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R180	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R181	Carbon Film 220 ohm 1/8W ±5% Axial Lead	N-0162ECC	BRPB182214Z
R182	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R183	Carbon Film 10 ohm 1/6W ±5% Formed Vert	N-0063ECC	BRUB611004Z
R184	Carbon Film 100 ohm 1/6W ±5% Formed Vert	N-0132ECC	BRUB611014Z
R185	Carbon Film 5.6k ohm 1/6W ±5% Axial Lead	N-0257ECC	BRPB615624Z
R186	Carbon Film 560 ohm 1/6W ±5% Formed Vert	N-0176ECC	BRUB615614Z
R187	Carbon Film 10 ohm 1/6W ±5% Formed Vert	N-0063ECC	BRUB611004Z
R188	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R189	Carbon Film 220 ohm 1/6W Formed Vert	N-0149ECC	BRUB612214Z
R190	— Not used —	Not used	Not used
R191	Carbon Film 3.3k ohm 1/6W ±5% Axial Lead	N-0230ECC	BRPB613324Z
R192	— Not used —	Not used	Not used
R193	Carbon Film 10k ohm 1/6W ±5% Axial Lead	N-0281ECC	BRPB611034Z
R194	Carbon Film 47k ohm 1/6W ±5% Formed Vert	N-0340ECC	BRUB614734Z
R195	Carbon Film 2.2 ohm 1/6W ±5% Formed Vert	N-0032ECC	BRUB612294Z
R196	Carbon Film 100 ohm 1/6W ±5% Axial Lead	N-0132ECC	BRPB611014Z
R197	Carbon Film 47k ohm 1/6W ±5% Format Vert	N-0340ECC	BRUB614734Z
R301	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R302	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R303	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R304	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R305	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R306	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R307	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R308	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R309	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R310	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R311	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R312	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R313	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R314	Carbon Film 680 ohm 1/6W ±5% Axial Lead	N-0183ECC	BRPB616814Z
R315	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R551	Carbon Film 100 ohm 1/6W ±5% Axial Lead	N-0132ECC	BRPB611014Z
R552	Carbon Film 22k ohm 1/6W ±5% Formed Vert	N-0311ECC	BRUB612234Z
R553	Carbon Film 6.8k ohm 1/6W ±5% Formed Vert	N-0262ECC	BRUB616824Z
R554	Carbon Film 10k ohm 1/6W ±5% Formed Vert	N-0281ECC	BRUB611034Z
R555	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R556	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R557	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R558	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R559	Carbon Film 680 ohm 1/6W ±5% Formed Vert	N-0183ECC	BRUB616814Z
R560	Carbon Film 1.8k ohm 1/6W ±5% Formed Vert	N-0210ECC	BRUB611824Z
R561	Carbon Film 1k ohm 1/6W ±5% Formed Vert	N-0196ECC	BRUB611024Z
R562	Carbon Film 2.2k ohm 1/6W ±5% Formed Vert	N-0216ECC	BRUB612224Z

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
	SWITCHES		
S301	Rotary Channel SR-219	S-1001	BSRY0219001
S552	Slide PA-CB SW-514	S-2002	BSWY0514001
S553	Slide USB-AM-SSB SW-443	S-1711	BSWY0443001
	TRANSFORMER		
T1	TF-083, AF Choke	TB-0522	BTFY0083001
	TRANSISTORS		
TR1	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR2	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR3	Silicon 2SC1730-L NPN	2SC1730L	BDBC1730111
TR4	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR5	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR6	Silicon 2SA733-P PNP	2SA-733P	BDBA0733115
TR7	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR8	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR9	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR10	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR11	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR12	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR13	Silicon 2SC1674-L NPN	2SC-1674	BDBC1674111
TR14	FET 2SK192A-BL	2SK-192	BDBC0192533
TR15	Silicon 2SC1674-L NPN	2SC-1674	BDBC1674111
TR16	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR17	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR18	Silicon 2SC1730-L NPN	2SC-1730L	BDBC1730111
TR19	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR20	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR21	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR22	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR23	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR24	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR25	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR26	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR27	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR28	Silicon 2SA733-P PNP	2SA-733D	BDBA0733115
TR29	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR30	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR31	Silicon 2SC3242A-E NPN	2SC-3242A-E	BDBC3242536
TR32	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR33	Silicon 2SB525-C PNP	2SB-525C	BDBB0525103
TR34	Silicon 2SC1675-L NPN	2SC-1675	BDBC1675111
TR35	Silicon 2SC1973-SSB NPN	2SC-1973	BDBC1973315
TR36	Silicon 2SC945A-Q NPN	2SC-945A	BDBC0945507
TR37	Silicon 2SB525-C PNP	2SB-525C	BDBB0525103
TR38	Silicon 2SC3242A-E NPN	2SC-3242A-E	BDBC3242536
TR538	Silicon 2SC2312-C NPN	2SC-2312C	BDBC2312103
TR539	Silicon 2SC1266-C NPN	2SC-2166	BDBC2166103
TR540	— Not used —	Not used	Not used
TR541	— Not used —	Not used	Not used

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
TR542	— Not used —	Not used	Not used
TR543	— Not used —	Not used	Not used
TR544	Silicon 2SA1012-O PNP	2SA-1012	BDBA1012114
	VARIABLE RESISTORS		
VR1	TT24R 50KΩB Semi-Fixed RT-182	P-6818	BRTY0182503
VR2	TT24R 100KΩB Semi-Fixed RT-182	P-6824	BRTY0182104
VR3	TT24R 30KΩB Semi-Fixed RT-182	P-6879	BRTY0182303
VR4	TT24R 10KΩB Semi-Fixed RT-182	P-6820	BRTY0182103
VR5	TT24R 1KΩB Semi-Fixed RT-182	P-6559	BRTY0182102
VR6	TT24R 10KΩB Semi-Fixed RT-182	P-6820	BRTY0182103
VR7	TT24R 100KΩB Semi-Fixed RT-182	P-6824	BRTY0182104
VR8	TT24R 100ΩB Semi-Fixed RT-182	P-6004	BRTY0182101
VR9	TT24R 1KΩB Semi-Fixed RT-182	P-6559	BRTY0182102
VR10	TT24R 5KΩB Semi-Fixed RT-182	P-6557	BRTY0182502
VR501	50KΩA Pot (Variable) RV-486	P-7039	BRVY0486001
VR502	50KΩB Pot (Variable) RV-601	P-7040	BRVY0601001
VR553	10KΩB Pot (Variable) RV-509	P-6005	BRVY0509001
VR554	1KΩB Pot (Variable) RV-510	P-6006	BRVY0510001
	CRYSTALS		
X1	QX-122 10.2417 MHz	MX-1003	BQXY0122001
X2	QX-122 10.6975 MHz	MX-1100	BQXY0122002
	MISCELLANEOUS		
B501	P.C. Board, Check Point PC-834AA	X-0019	BPCY0834AAZ
MC951	Microphone, MK-215	M-2369	BMKY0215001
SP501	Speaker, SP-057 16 ohm 3W	SP-5166	BSPY0057001
YI501	Bushing, Tight Ceramic For TR538, TR539, TR544	NS	BYYY0172001
YI502	Bushing, Tight Ceramic For TR538, TR539, TR544	NS	BYYY0172001
YI503	Bushing, Tight Ceramic For TR538, TR539, TR544	NS	BYYY0172001
YI504	Insulation Sheet, Almina For TR538, 539	NS	BYYY0027001
YI505	Insulation Sheet, Almina For TR538, 539	NS	BYYY0027001
YI506	Insulation Sheet, YD-041 For TR544	NS	BYDY0041001
F951	Fuse, FS-014 3A	HF-1258	BFSY0014309
FC501	Flat Cable, WF-034	W-1024	BWFY0340602
FC502	Flat Cable, WF-026	W-1023	BWFY0260702
FC503	Flat Cable, WF-037	W-1026	BWFY0370702
WA951	Cord, DC Power W-070234 1500mm with plug	W-1027	CZDZ070234Z
	P.C. BOARD ASSEMBLIES		
	P.C. Board Ass'y, Main PB-062	XB-0640	AT549ZTBEA
	P.C. Board Ass'y, Control PB-063	XB-0706	AT549ZTBEB
	P.C. Board Ass'y, Channel Switch PB-065	XB-0707	AT549ZTBEC
	P.C. Board Ass'y, Channel LED PB-064	XB-0708	AT549ZTBED
	P.C. Board Ass'y, MIC Jack PB-066	XB-0709	AT549ZTBEE

MECHANISM PARTS LIST

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
1	Chassis, Rear ALP 2.0T		ECSR315676Z
2	Terminal, Lug Solder D3.2 x 14		TSTD0150007
3	Panel, Front, ABS Satin CR		GCMF215677Z
4	Screw, Mounting, ABS INST CLR Black	HD-1939	GMSC405736Z
5	Knob, Channel, ABS CR		GNBC415682Z
6	Knob, ABS CR		GNBY415683Z
7	Mounting Bracket SPCC 1.6T ZMC-3	MB-0291	HBCT314529Z
8	Cover, Bottom, Vinytop SB-K08		HCMB315681A
9	Cover, Top, Vinytop SB-K08 Black		HCMT314531A
10	Chassis, Side, SPCC, 1.0T		HCSS381270Z
11	Holder, IC (B) SECC 1T Oilless		HHDE415679Z
12	Holder, IC (A) ALP 2T Oilless		HHDE481271Z
13	Heat Sink, ALP 2T		HHSK415680Z
14	Plate, FCC ALP 1T (for USA Model)		JDPF416602Z
	Plate, DOC ALP 1T (for Canada Model)		JDPF416632Z
	Plate, DOC ALP 1T (for Australia Model)		JDPF416635Z
15	Optical Filter, Display Acryl, 1.0T, Purple	G-0576	KDPC405265Z
16	Plate, Control, Polycarbonate 0.5T Silver		KDPT416595Z
17	Plate, Display, Polycarbonate 0.5T Black		KDPT416596Z
18	Holder, LED, EPT Black		LHDL413243Z
19	Holder, LED, EPT Black H = 9.5		LHDL414936Z
20	Holder, LED, Rubber		LHDL415678Z
21	Washer, Rubber, Neoprene, Black 7 x 15 x 2.0T		LWSR400638Z
22	Bind, Himelon, 0.3T, Black		RBLD413766Z
23	Wool-Coated Paper, Wool Tack, 100 x 10 x 0.3T		RUTC403305Z
24	Screw, Machine Flat HD M3 x 5 NI	HD-4018	SSCW133005N
25	Screw, Machine Bind HD M2 x 12 NI	HD-0079	SSCW192012N
26	Screw, Machine Bind HD M2.6 x 4 NI	HD-4012	SSCW192604N
27	Screw, Machine Bind HD M3 x 6 BNI		SSCW193006B
28	Screw, Machine Bind HD M3 x 6 NI	HD-2055	SSCW193006N
29	Screw, Machine Bind HD M3 x 8 BNI	HD-2057	SSCW193008B
30	Screw, Machine Bind HD M3 x 12 NI	HD-0080	SSCW193012N
31	Screw, Taptight Bind HD M3 x 6 NI	HD-0082	SSCW343006N
32	Nut, Hex, M2 NI	HD-7009	SSCW430020N
33	Nut, Flange, M3 ZMC	HD-7080	SSCW480030Z
34	Screw, P Tight Bind HD D3 x 8 NI	HD-3109	SSCW803008N
35	Spring Plate, Knob D6		TSTD0200003
36	Rivet, AL, ID Plate D3.2 x 3.2		TSTD0213232
37	Insulation Plate, Mylar 0.1T		RZEB416622Z
38	Shield Plate, SPTE 0.3T Oilless		HSDP403852Z
ACC1	Hanger, Microphone	M-3105	HHMG402919Z
ACC2	Screw, Tapping Round HD D3.5 x 8 NI	HD-3043	SSCW293508N
ACC3	Screw, Tapping Round HD D5 x 10 NI	HD-0081	SSCW295010N
ACC4	Washer, Lock, D3.5 NI	HD-8018	SSCW530035N

REF. NO.	DESCRIPTION	RS PART NO.	MFR'S PART NO.
ACC5	Washer, Star, D5 NI	HD-8020	SSCW540050N
	Label, Warning, DC Cord Paper Print		PLBC402800Z
	Label, Production Date Paper, Print	HB-2567	PLBS402854Z
	Label, Fuse (3A) Tetron Film 0.05T		PLBZ416603Z
	Panel Ass'y, Front (Ref. No. 3, 16 & 17)	Z-0072	FPNL549ZASY
	Bracket Ass'y, Mounting (Ref. No. 4, 7 & 21)		BRKT549ZASY
	Case Ass'y, Bottom (Ref. No. 8 & 23)	Z-0073	CVBM549ZASY
	Case Ass'y, Top (Ref. No. 9 & 23)	Z0074	CVTP549ZASY
	Chassis Ass'y, Rear (Ref. No. 1 & 2)		CHSS549ZASY
	Knob Ass'y, Channel (Ref. No. 5 & 35)	K-0065	CNOB549ZASY
	Knob Ass'y, Volume (Ref. No. 6 & 35)	K-0066	NBVL549ZASY
	Knob Ass'y, Clarifier (Ref. No. 6 & 35)	K-0067	NBCL549ZASY
	Knob Ass'y, RF Gain (Ref. No. 6 & 35)	K-0068	NBRF549ZASY
	Knob Ass'y, Squelch (Ref. No. 6 & 35)	K-0069	NBSQ549ZASY
	Hardware Kit (Ref. No. 27 & 28)	HW-2101566	HDWR549 KIT

VOLTAGE CHART

Symbol No.	Name	T/RX	Base Gate	Collector Drain	Emitter Source
TR1		RX NB ON	0.8	5.3	0
TR2		RX NB ON	0.8	2.6	0
TR3		RX NB ON	2.6	6.8	1.9
TR4		RX NB ON	0.8	7.2	0.2
TR5		RX NB ON	0.4	1.3	0.9
TR6		RX NB ON	6.6	0	7.2
TR7		RX NB ON	0	0	0
TR8		RX	0.4	8.1	0
TR9		RX SSB	0.7	0	0
TR10		RX	0.7	0	0
TR11		RX	1.6	4.7	1
TR12			0 0.7	0 0	0 0
TR13		RX	2.1	6.8	1.4
TR14		RX	0	6.5	2.8
TR15		RX	1.5	8	0.7
TR16		RX	0.7	3.3	0
TR17		RX	3.3	6.3	2.6
TR18		RX	2.6	6.4	1.8
TR19		RX AM SSB	0.7 0	0 3	0 6
TR20		RX TX	0.7	5.7	0.5
TR21		RX TX	3	6.9	2.5
TR22		RX TX	0.7	4.4	0

Symbol No.	Name	T/RX	Base Gate	Collector Drain	Emitter Source
TR23		RX TX	4.3	5.6	3.6
TR24		RX TX	0.4 2.9	0.5 6.8	0 2.3
TR25		TX	1.7	3.2	1
TR26		TX	0.8	1.7	0.3
TR27		TX	0.6	0	0
TR28		TX	7.5	1.3	8
TR29		TX	1.1	7.5	4.4
TR30		PA	2.4	4.6	1.8
TR31		RX TX	7.8 0.2	8 8.1	7.2 0.7
TR32		RX TX	4.9 0.8	7.8 0.2	4.7 0
TR33		RX TX	8 8.1	0 7.9	7.9 7.3
TR34		TX SSB	0	7.5	1.4
TR35		TX	1.3	7.9	0.6
TR36		TX	5.6	12.3	5.1
TR37		TX	13	5	12.3
TR38		TX AM SSB	0 0.7	13.1 0	0 0
TR538		TX AM SSB	0.5 0.6	5 13.5	0 0
TR539		TX AM SSB	0.7 0.7	5 13.6	0 0
TR544		TX AM SSB	13 13	5 13.6	13.8 13.9

Measurement Conditions:
Power supply voltage: 13.8V
Test equipment: Digital voltmeter HP3476A
Measurement channel: 190H
Unless otherwise specified, set controls as follows:
MODE: AM
SQ: MIN
ANL/NB: OFF
RF GAIN: MAX.
CLARIFIER: CENTER

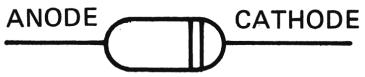
Symbol No.	T/RX	Pin No.	
IC1	RX	1	–
		2	0.2
		3	0.1
		4	0.1
		5	0
		6	1.2
		7	1.5
		8	0
		9	8
IC2	RX/TX	1	5.1
		2	0
		3	0
		4	5.1
		5	5.1
		6	0
		7	5.1
		8	–
		9	–
		10	1.7
		11	5.2
		12	2.5
		13	2.5
		14	–
		15	5.2
		16	5.1
		17	1.6
		18	1.6
		19	3.5
		20	–
		21	0
		22	2.3

Symbol No.	T/RX	Pin No.	
IC3	RX/TX	1	0
		2	3.3
		3	3.2
		4	0
		5	5.8
		6	7.3
		7	3.7
IC4	RX/TX	1	8.1
		2	0
		3	13.6
IC5	RX	1	0.1
		2	1.9
		3	1.3
		4	0
		5	0
		6	7
		7	12.7
		8	13.8
IC6	TX	1	7.8
		2	–
		3	–
		4	–
		5	0
		6	2.8
		7	4.1
		8	4.1
		9	7.5

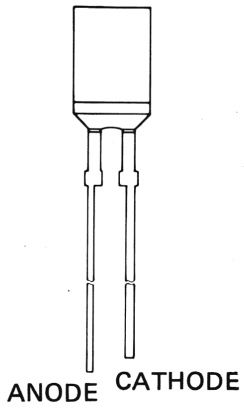
Symbol No.	T/RX	Pin No.	
IC551	RX/TX	1	1.5
		2	1.5
		3	1.5
		4	1.5
		5	0
		6	1.7
		7	2.9
		8	0.4
		9	8.0

SEMICONDUCTOR LEAD IDENTIFICATION

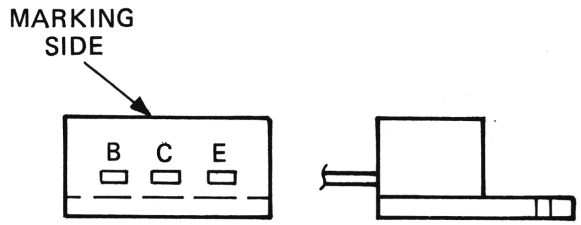
1N60AM
2N4003
MC-301
1SV73-EB
HZ3B-3
HZ5C-1
1S2075K



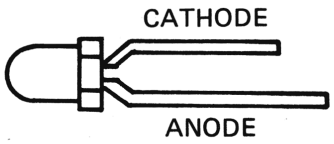
LED GL-9PR2



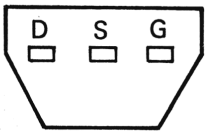
2SA1012-O
2SC2166-C
2SC2312-C



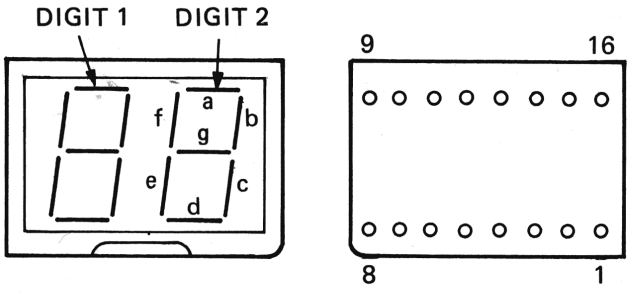
TLR124



2SK192A

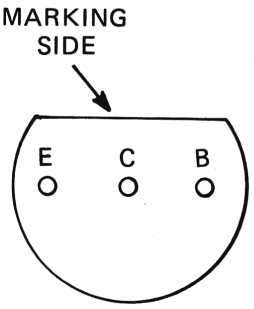


DR-202AL

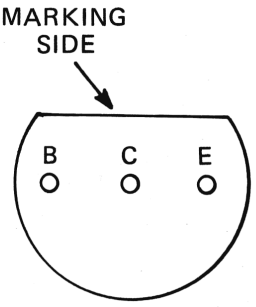


Pin No.		Pin No.	
1	c-1	9	g-2
2	e-1	10	a-2
3	d-1	11	f-2
4	common-1	12	b-2
5	common-2	13	b-1
6	d-2	14	f-1
7	e-2	15	a-1
8	c-2	16	g-1

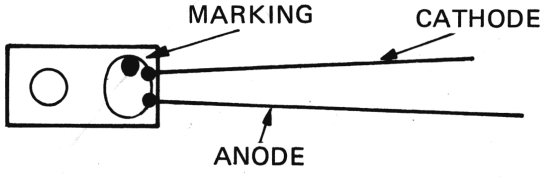
2SA733-P
2SC945A-Q
2SC1674-L
2SC1675-L
2SC1730-L
2SC1973-SSB
2SC3242A-E



2SB525-C

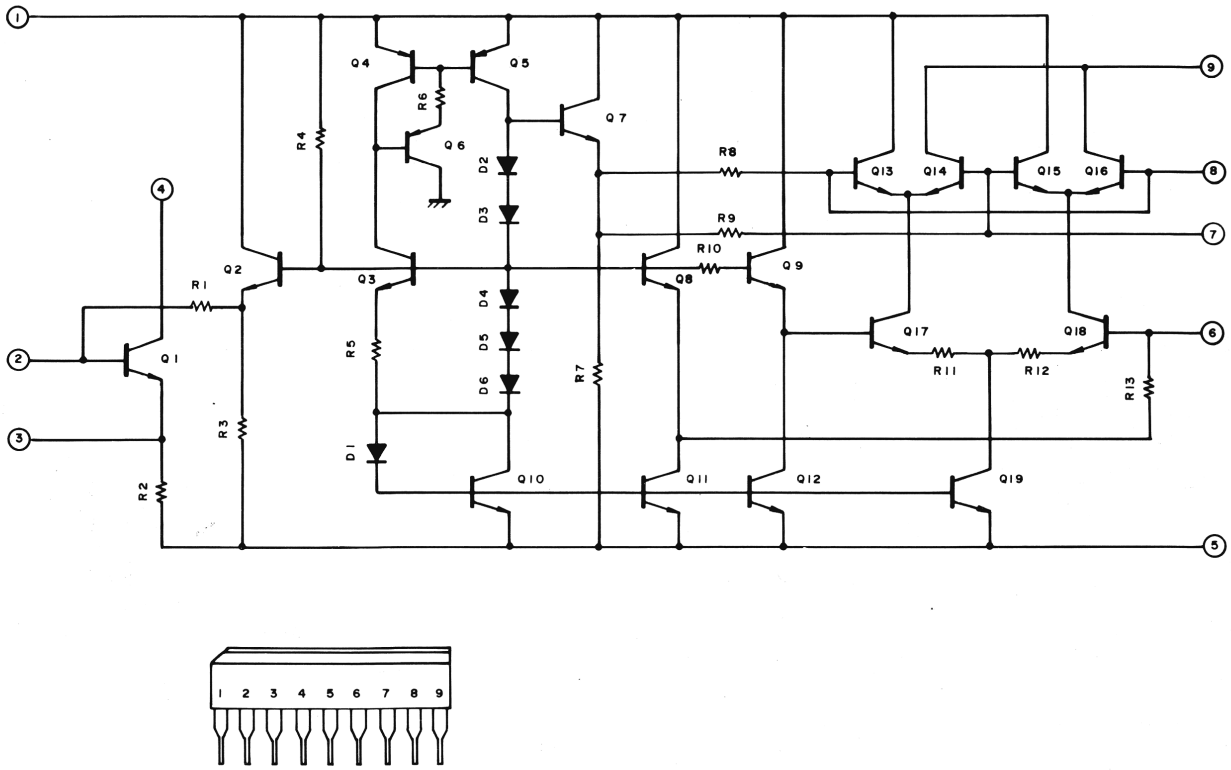


MV-1Y

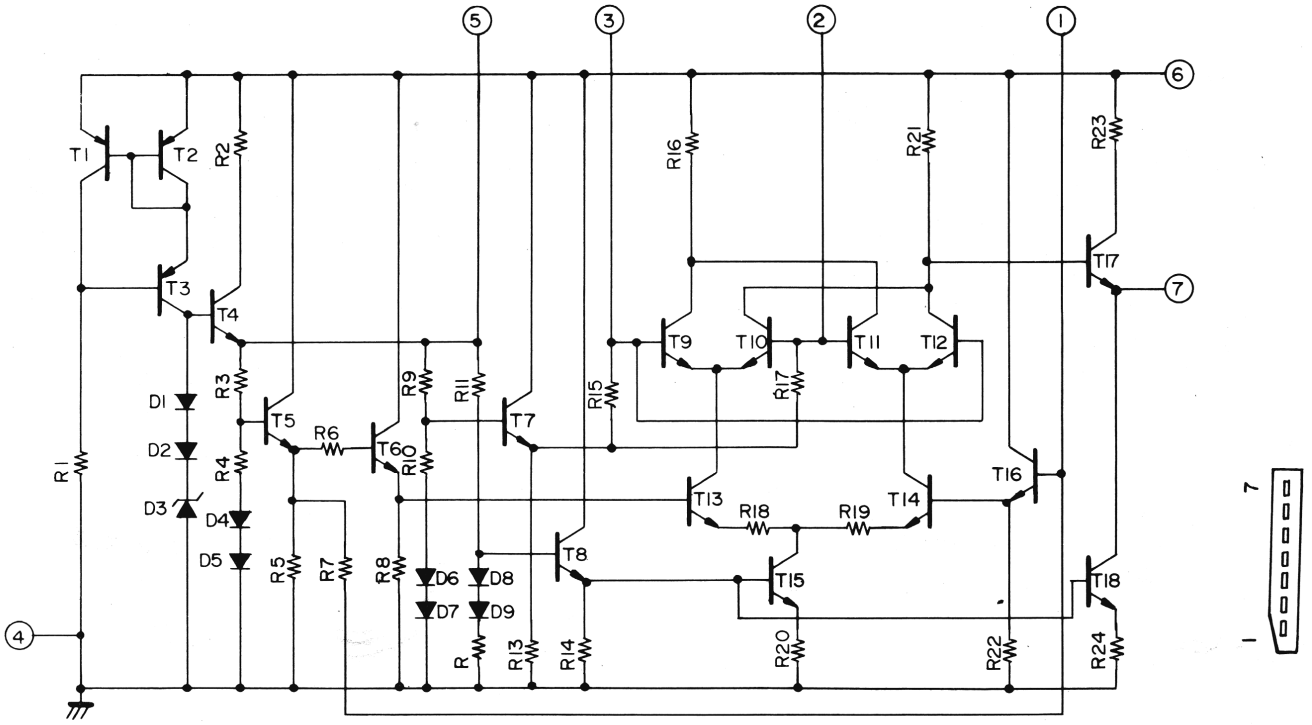


IC INTERNAL DIAGRAMS

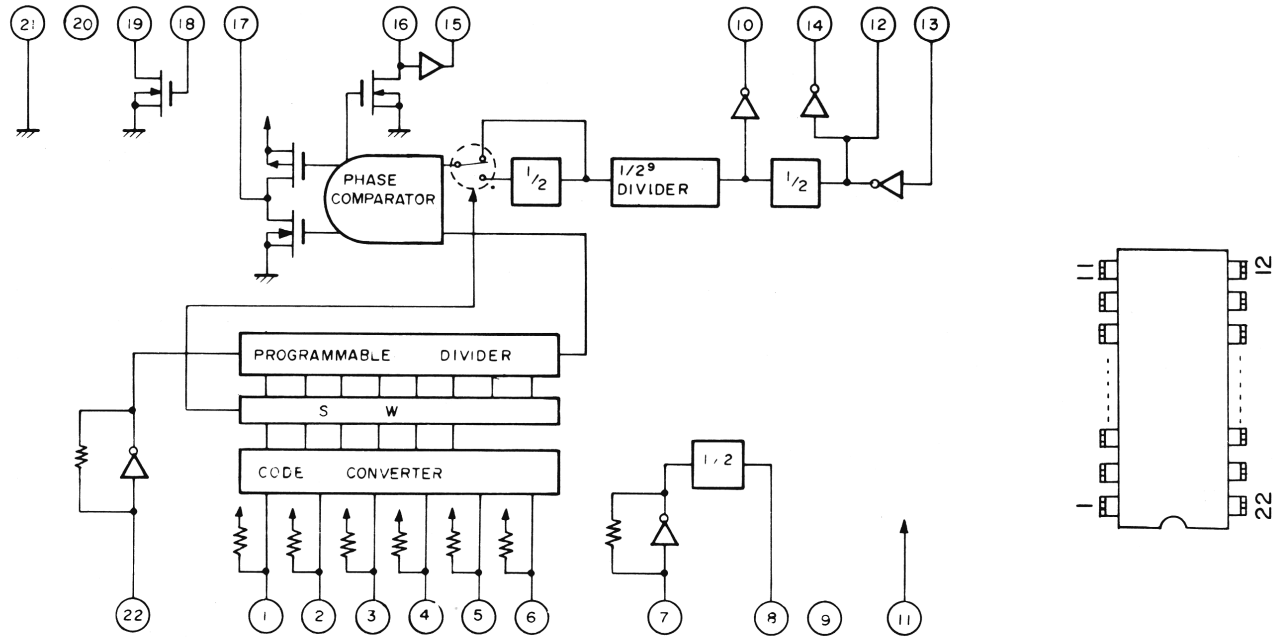
IC6, TA7320P



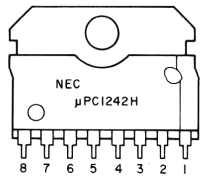
IC3, AN612



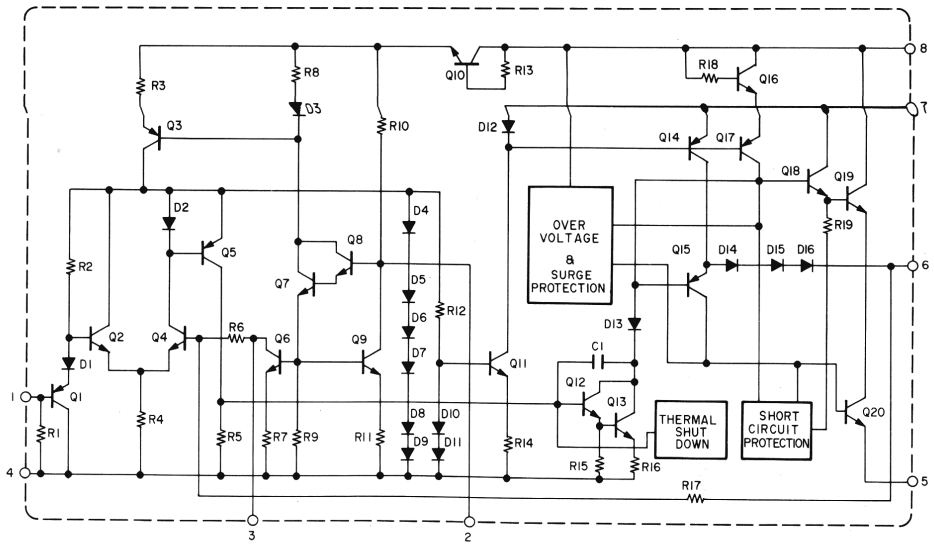
IC2, μPD2824C



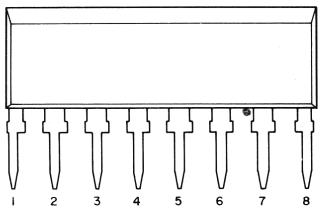
IC5, μPC1242H

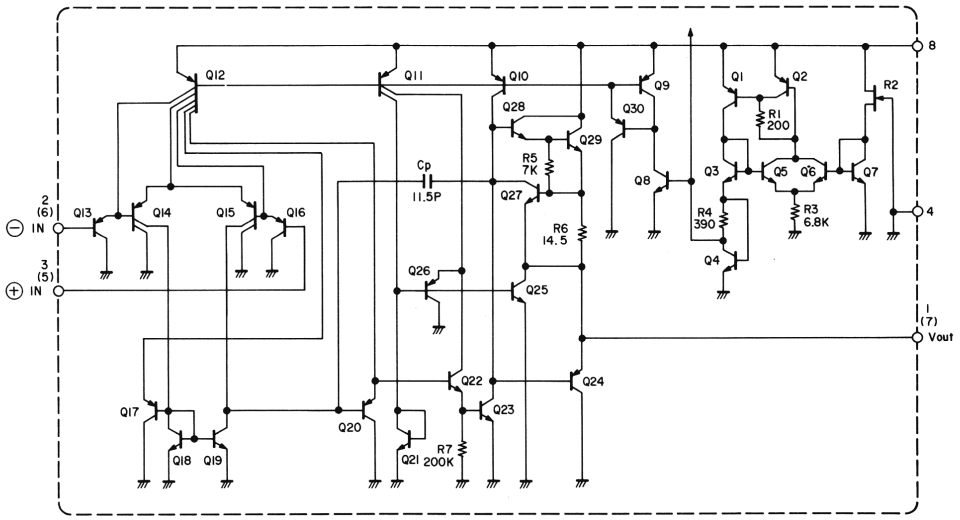


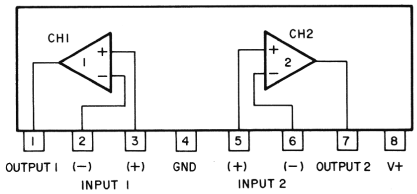
NO	μPC1242H
1	INPUT
2	RIPPLE FILTER
3	N.F.B.
4	GND
5	GND
6	OUTPUT
7	BOOTSTRAP
8	V+



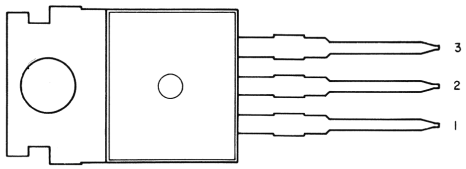
IC1, M5223L

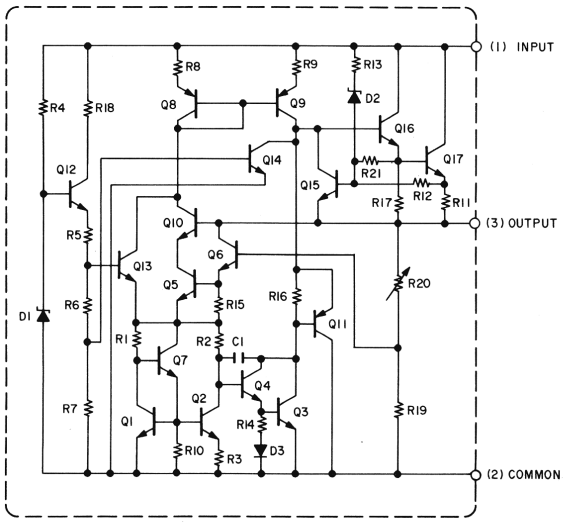




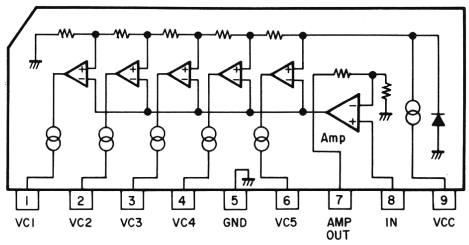


IC4, HA17808W





IC551, LB1423



RADIO SHACK, A DIVISION OF TANDY CORPORATION

U.S.A.: FORT WORTH, TEXAS 76102
CANADA: BARRIE, ONTARIO L4M 4W5

TANDY CORPORATION

AUSTRALIA	BELGIUM	U.K.
91 KURRAJONG AVENUE MOUNT DRUITT, N.S.W. 2770	PARC INDUSTRIEL 5140 NANINNE (NAMUR)	BILSTON ROAD WEDNESBURY WEST MIDLANDS WS10 7JN

4A5

Printed in Japan