

REALISTIC[®]

Service Manual

20-114

PRO-2010
PROGRAMMABLE
AM / FM SCANNING RECEIVER
Catalog Number: 20-114



CUSTOM MANUFACTURED FOR RADIO SHACK, A DIVISION OF TANDY CORPORATION

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PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by a ⚠ in the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

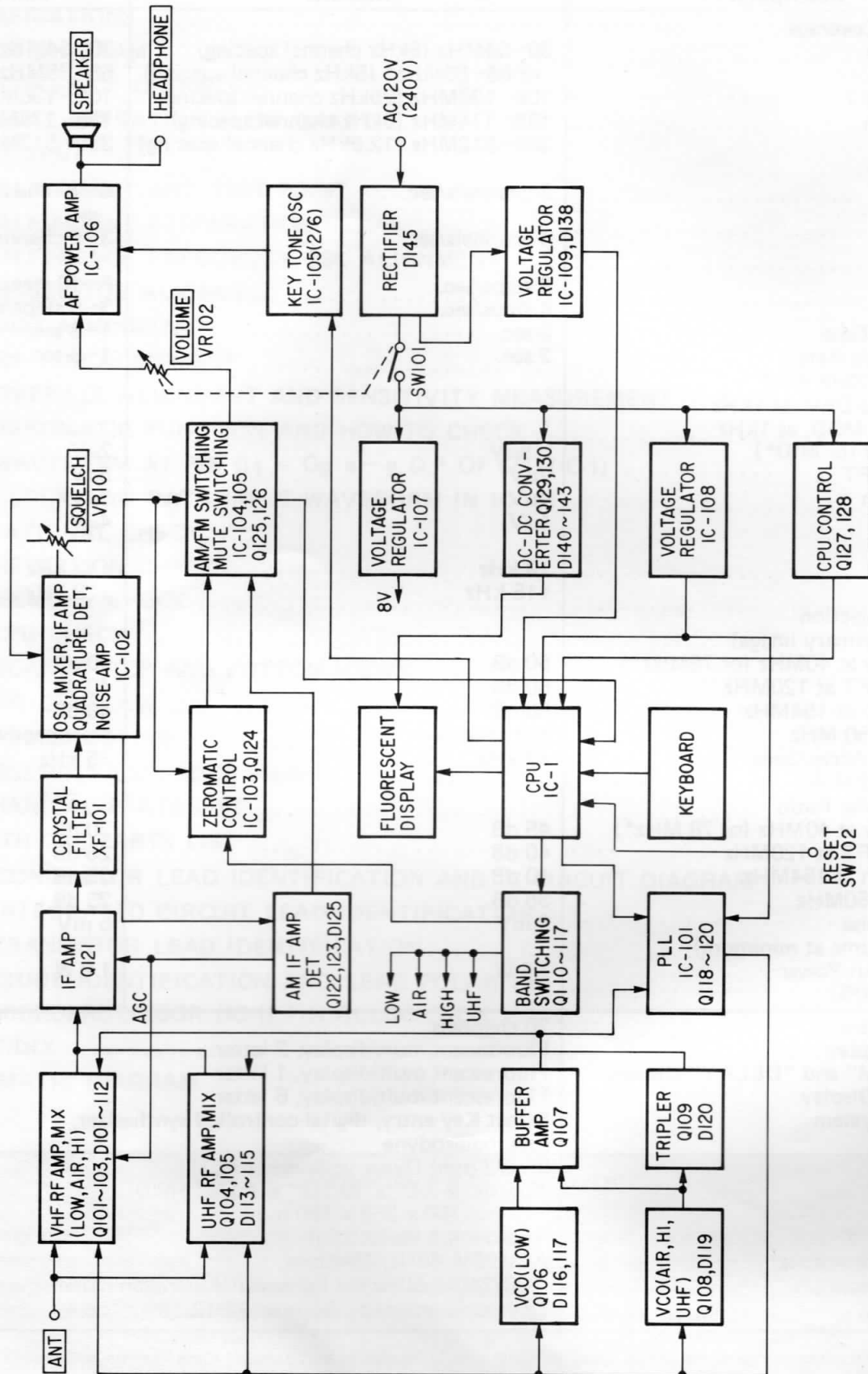
SPECIFICATIONS

Description	Nominal	Limit
Frequency Coverage		
VHF Low	30~54MHz (5kHz channel spacing)	30~54MHz
AIRCRAFT	or 68~88MHz* (5kHz channel spacing)	68~88MHz
VHF High	108~136MHz (25kHz channel spacing)	108~136MHz
UHF	138~174MHz (5kHz channel spacing)	138~174MHz
	380~512MHz (12.5kHz channel spacing)	380~512MHz
Scan Rate		
Fast	8 channels/sec.	6~10 channels/sec.
Slow	4 channels/sec.	3~5 channels/sec.
Search Rate		
Fast	8 steps/sec.	6~10 steps/sec.
Slow	4 steps/sec.	3~5 steps/sec.
Scan Delay Time	2 sec.	1~3 sec.
Priority Cycle Rate	2 sec.	1~3 sec.
Sensitivity (20dB S/N)		
FM: 3kHz DEV. at 1kHz		
AM: 60% MOD. at 1kHz		
VHF Low (or MID*)	0.5 μ V	2 μ V
AIRCRAFT	2 μ V	5 μ V
VHF High	1 μ V	3 μ V
UHF	1 μ V	4 μ V
Selectivity		
-6 dB	$\pm$ 9 kHz	$\pm$ 12 kHz
-50 dB	$\pm$ 15 kHz	$\pm$ 18 kHz
Spurious Rejection		
(except primary image)		
VHF Low at 40MHz (or 78MHz*)	50 dB	40 dB
AIRCRAFT at 120MHz	50 dB	40 dB
VHF High at 154MHz	50 dB	40 dB
UHF at 450 MHz	Not specified	Not specified
Modulation Acceptance	$\pm$ 7 kHz	$\pm$ 5 kHz
(EIA RS-204-A)		
Signal to Noise Ratio		
VHF Low at 40MHz (or 78 MHz*)	45 dB	30 dB
AIRCRAFT at 120MHz	40 dB	25 dB
VHF High at 154MHz	40 dB	25 dB
UHF at 450MHz	35 dB	25 dB
Residual Noise	3 mV	5 mV
(with volume at minimum)		
Audio Output Power	1.5 W	1.0 W
(T.H.D. 10%)		
Program Channels	20 channels	
Channel Display	Fluorescent multidisplay, 2 letter	
"PROGRAM" and "DELAY" Display	Fluorescent multidisplay, 1 letter	
Frequency Display	Fluorescent multidisplay, 6 letter	
Receiving System	Direct Key entry, digital-controlled synthesizer, superheterodyne	
Speaker	3" (77 mm) Dynamic Speaker (8 Ω)	
Dimensions	Approx. 2-3/8" x 10-1/2" x 7-1/2" HWD (60 x 268 x 190 mm)	
Weight	Approx. 4.4 lbs (2.0 kg)	
Power Requirements	AC 120V, 60Hz, 15W max. (220/240V, 50Hz for European/Australian models)	
Accessory	Telescopic antenna Approx. 24-13/16" (63 cm)	

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 that still might be considered acceptable; in no case should a unit perform to less than within any limit specs.

* VHF MID range (68 ~ 88 MHz) is for European and Australian models only.

BLOCK DIAGRAM



PRINCIPLES OF OPERATION

The PRO-2010 is a PLL Synthesized VHF/UHF AM/FM Receiver, controlled by a Central Processing Unit (CPU).

The VHF Low Band (30 ~ 54 MHz) or Mid Band (68 ~ 88 MHz) and High Band (138 ~ 174 MHz) are received in 5 kHz increments. Aircraft Band (108 ~ 136 MHz) is set up for 25 kHz increments, and the UHF Band (380 ~ 512 MHz) for 12.5 kHz increments.

Receiving frequency range, frequency determination, etc., are all functions controlled by the CPU. (The CPU is designed only for the specific functions required for the PRO-2010, and modification of the CPU is not feasible.)

The following paragraphs explain the operation of the circuits in terms of the functional blocks:

Variable capacitor diode tuning ("Automatic Tuning System") is employed on all bands.

Field-effect transistors (FET) are used in the RF/MIX circuits of Low (Mid) and High Bands, to achieve optimum mix-modulation and mutual-modulation characteristics. Transistor Q121 amplifies the 10.7 MHz IF. A 10.7 MHz monolithic Crystal Filter is incorporated for better selectivity.

Integrated circuit IC-102 contains a Local Oscillator, Mixer, IF Amplifier, Quadrature, Noise Amplifier and Detector. A Crystal Oscillator produces 10.245 MHz, which when mixed with 10.7 MHz, results in 455 kHz IF. A 455 kHz Ceramic Filter is provided to increase selectivity. The 455 kHz IF is amplified in the IF Amp stage, and a Quadrature FM Detector detects it to an audio signal. A portion of the detector output is picked up as a noise product to control the squelch signal level. Integrated circuit IC-106 is an AF Power Amplifier.

Integrated circuit IC-1 is the Central Processing Unit (CPU). The CPU accomplishes the data processing, performs calculations, etc. Unstable supply voltage (V_{DD}) to the CPU can produce CPU malfunctions, such as wrong data processing, wrong data transfer, etc. To overcome the malfunctions, C7 and R5 "initialize" the CPU. In case a Program Backup battery is not connected or is discharged, the CPU may not be initialized by connecting the AC power cord to line power. In such a case, turn Power switch to ON and push the Reset Switch SW-102 on rear panel to initialize the CPU. Figure 1 shows initializing waveform.

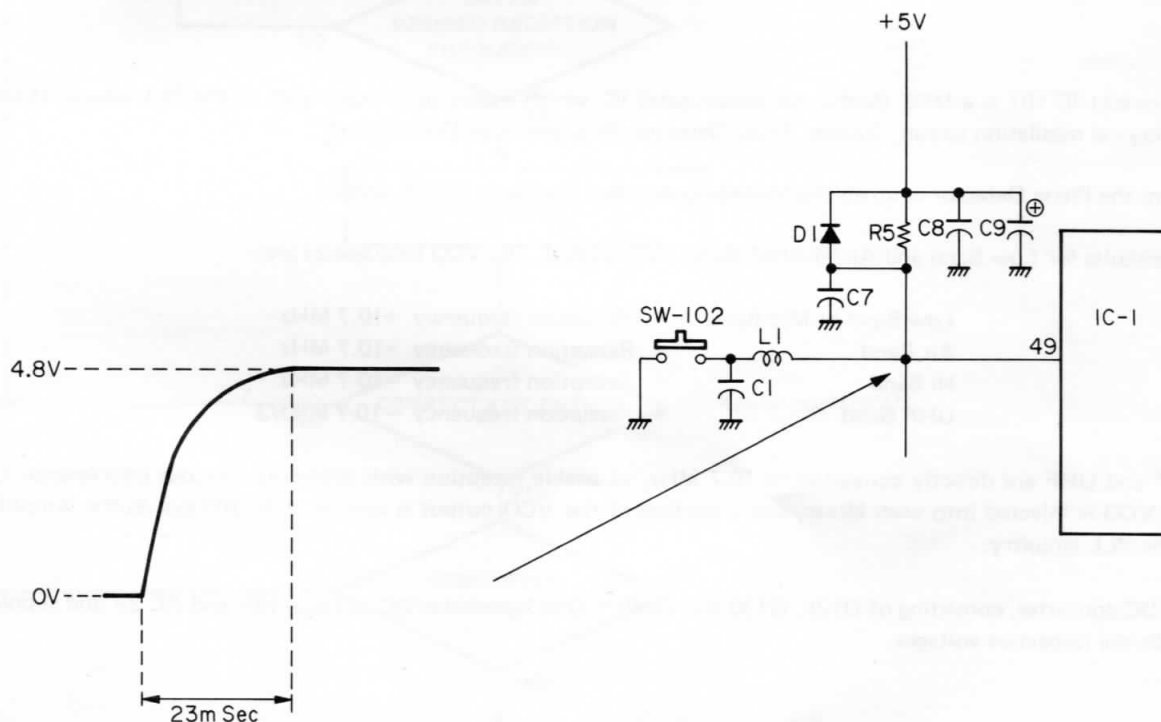


Figure 1. CPU Initialization Waveform

The CPU incorporates input terminals and output terminals. The Input and Output terminals, along with the Keyboard, form a coding network or matrix. The Fluorescent Display is driven by the output terminals. (See Page 45.)

The CPU Clock waveform is shown in Figure 2.

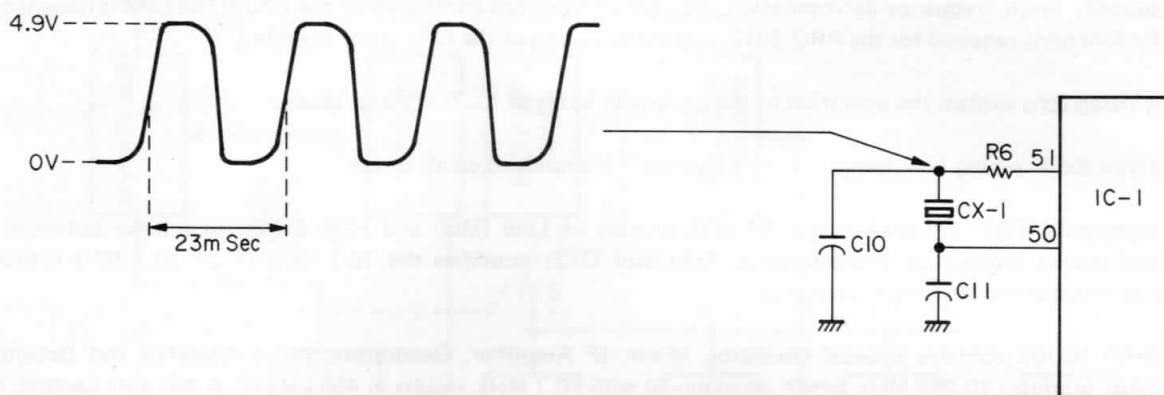


Figure 2. CPU Clock Waveform

Integrated circuit IC-101 is a MOS (N-channel silicon-gate) IC, which makes up a major part of the PLL circuit. It contains a 6.4 MHz crystal oscillation circuit, Divider, Phase Detector, Programmable Counter, etc.

Output from the Phase Detector controls the Voltage Controlled Oscillator (VCO) circuit.

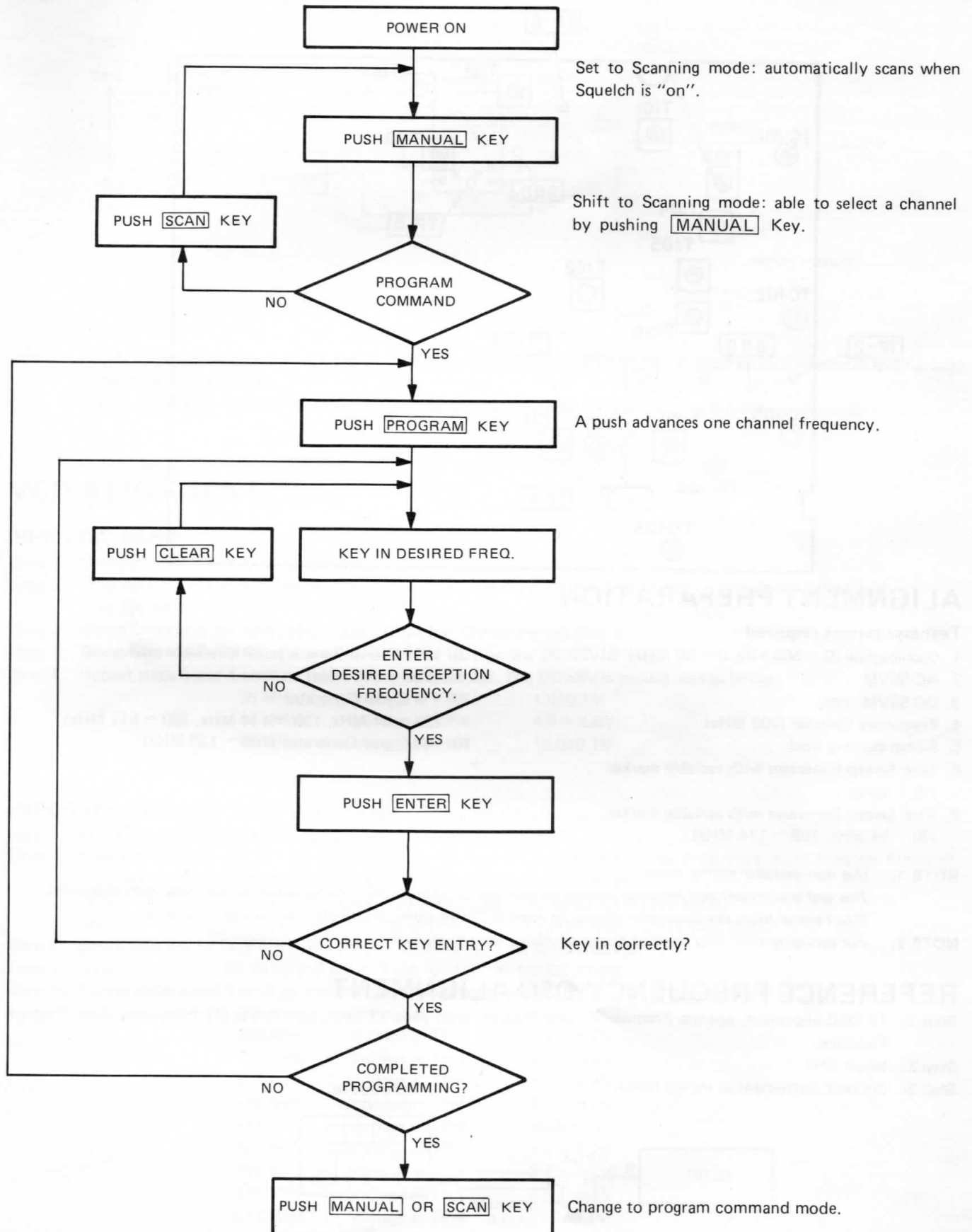
Two VCO circuits for Low Band and Air/Hi/UHF Band are provided. The VCO frequencies are:

Low Band or Mid Band	= Reception frequency +10.7 MHz
Air Band	= Reception frequency +10.7 MHz
Hi Band	= Reception frequency -10.7 MHz
UHF Band	= Reception frequency -10.7 MHz/3

Thus, VHF and UHF are directly converted to 10.7 MHz, to enable reception with minimum spurious interference. Output from each VCO is injected into each Mixer, and a portion of the VCO output is applied to IC-101 (via Buffer Amplifier) to compose the PLL circuitry.

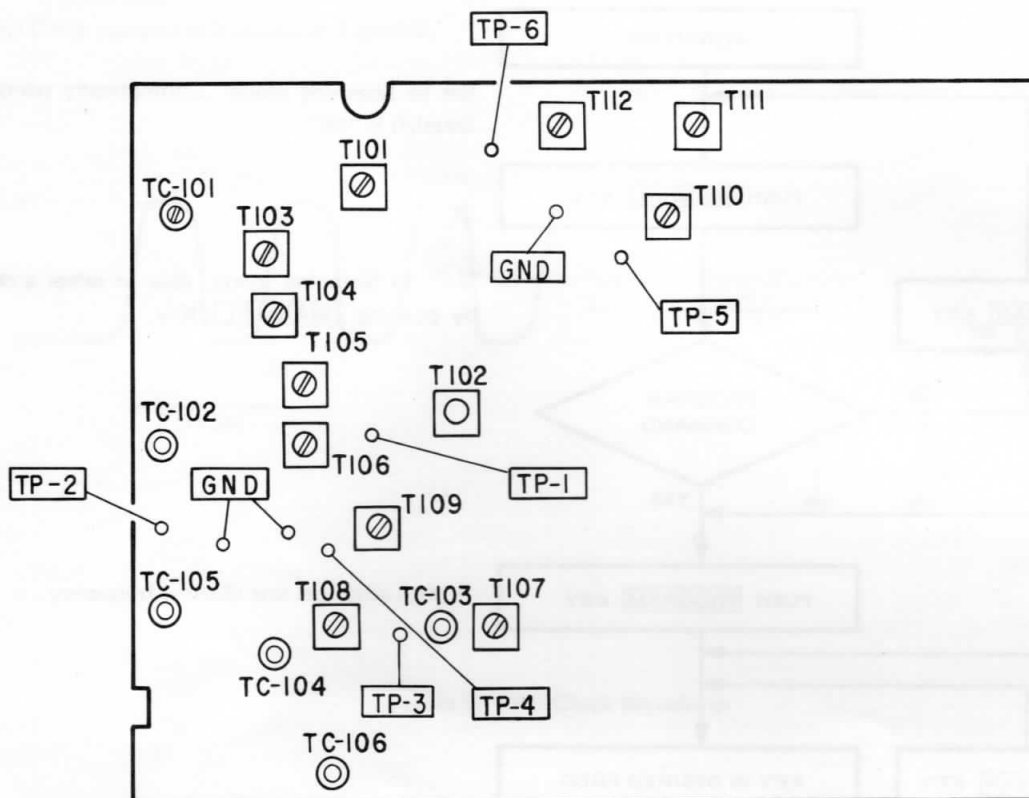
The DC - DC converter, consisting of Q129, Q130 and D140 ~ D143 generates DC +22V, -19V and AC 3V and supplies the Display with the respective voltages.

GENERAL OPERATION FLOW CHART



ALIGNMENT

ALIGNMENT AND TEST POINTS



ALIGNMENT PREPARATION

Test equipment required

1. Oscilloscope (0 ~ 500 kHz, 0 ~ 50 MHz)
2. AC SSVM
3. DC SSVM
4. Frequency Counter (200 MHz)
5. 8-ohm dummy load
6. Slow Sweep Generator with variable marker (10.7 MHz)
7. VHF Sweep Generator with variable marker (30 ~ 54 MHz, 108 ~ 174 MHz)
8. UHF Sweep Generator with variable marker (380 ~ 512 MHz)
9. FM Signal Generator (30 ~ 54 MHz, 138 ~ 174 MHz, 380 ~ 512 MHz)
10. AM Signal Generator (108 ~ 136 MHz)

NOTE 1: Use non-metallic tuning tools.

The test equipment and Receiver should be warmed up at least 30 minutes before proceeding with alignment. Input signal from the Generator should be kept as low as possible and still obtain usable output.

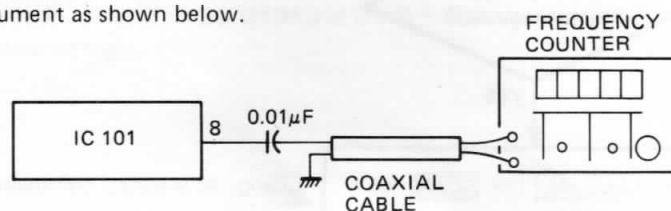
NOTE 2: For servicing VHF Mid band of European/Australian models, see Appendix on pages 46.

REFERENCE FREQUENCY OSC ALIGNMENT

Step 1: To OSC alignment, operate Frequency Auto Program with page 12 Important Notes (2). Frequency Auto Program Function.

Step 2: Select CH1.

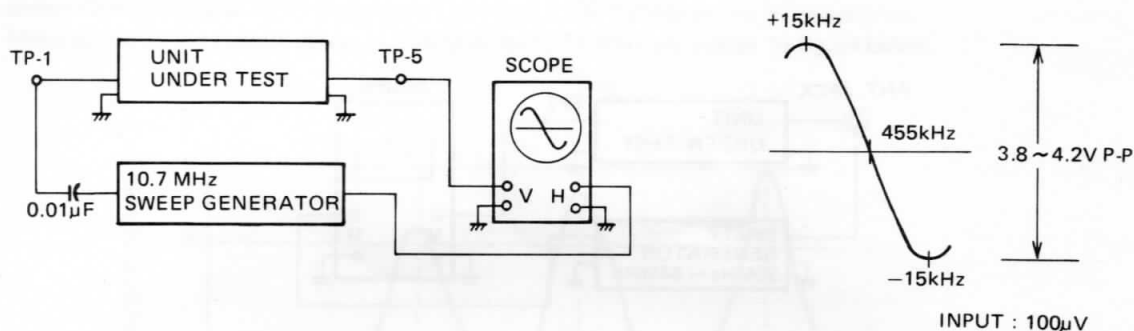
Step 3: Connect instrument as shown below.



Step 4: Adjust TC-106 so that the frequency is 6.4 MHz/2 (3.200000 MHz).

IF SECTION ALIGNMENT

Step 1: Connect instruments as shown below.



Step 2: Adjust T110 for maximum output so that the 455 kHz marker is in the center of the discriminator curve and for best linearity, as shown above.

During alignment, maintain Sweep Generator output at the lowest level possible to prevent overloading.

VCO ALIGNMENT

VHF LOW BAND

Step 1: Connect a DC SSVM to TP-4 and ground.

Step 2: Program CH2, 3 and 4 as follows (Use Frequency Auto Program Function on page 12 to simply program.):
CH2 (30 MHz), CH3 (41 MHz), CH4 (54 MHz).

Step 3: Select Channel 4 (54 MHz) and adjust TC103 for 13V on the DC SSVM.

Step 4: Select Channel 2 (30 MHz) and adjust T107 for 1.0V on the DC SSVM.

Step 5: Repeat steps 3 and 4 until no improvement is observed. The DC SSVM should read as below.

30 MHz	Voltage at TP-4	1.0±0.1V
41 MHz	Voltage at TP-4	4.5 ~ 5.0V
54 MHz	Voltage at TP-4	13.0±0.1V

AIRCRAFT, HI BAND AND UHF BAND

Step 1: Connect a DC SSVM to TP-4 and ground.

Step 2: Program CH5, 6, and 7 ~ 14 as follows (In the case of programming with Frequency Auto Program Function, re-programming is necessary for CH8, CH9, CH10 as following frequency.):

CH5 (108 MHz), CH6 (120 MHz), CH7 (136 MHz), CH8 (138 MHz), CH9 (154 MHz),
CH10 (174 MHz), CH11 (380 MHz), CH12 (451 MHz), CH13 (475 MHz), CH14 (512 MHz)

Step 3: Select Channel 14 (512 MHz) and adjust TC104 for 13V on the DC SSVM.

Step 4: Select Channel 5 (108 MHz) and adjust T108 for 1.0V on the DC SSVM.

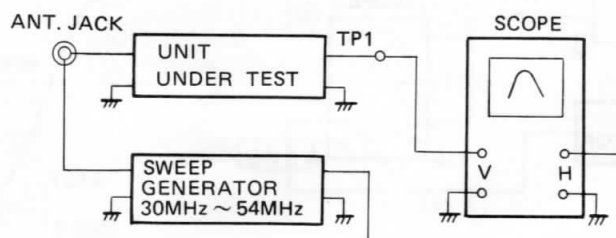
Step 5: Repeat steps 3 and 4 until no improvement is observed. The DC SSVM should read as below.

108 MHz	Voltage at TP-4	1.0±0.1V
120 MHz	Voltage at TP-4	2.2 ~ 2.7V
136 MHz	Voltage at TP-4	5.3 ~ 5.8V
138 MHz	Voltage at TP-4	1.7 ~ 2.2V
154 MHz	Voltage at TP-4	4.7 ~ 5.2V
174 MHz	Voltage at TP-4	10.3 ~ 10.9V
380 MHz	Voltage at TP-4	1.2 ~ 1.7V
451 MHz	Voltage at TP-4	5.4 ~ 6.0V
475 MHz	Voltage at TP-4	7.6 ~ 8.1V
512 MHz	Voltage at TP-4	13.0±0.1V

RF AMP ALIGNMENT

VHF LO BAND

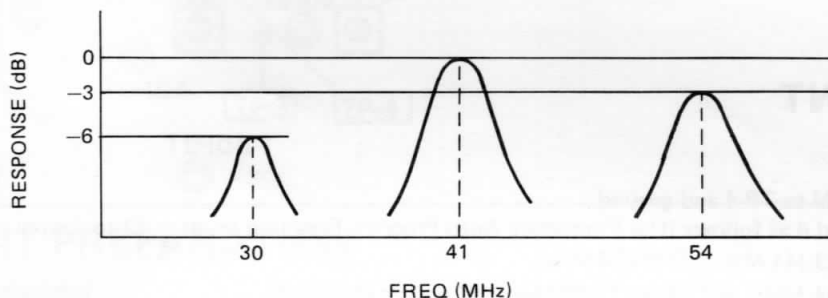
Step 1: Connect instruments as shown below.



Step 2: Program 30 MHz (CH1), 41 MHz (CH2) and 54 MHz (CH3).

Step 3: Select Channel 1 (30 MHz) and adjust T101 and T102 for maximum RF waveform.

Step 4: Make sure that the output curves at 30 MHz and 54 MHz are similar to figure below.



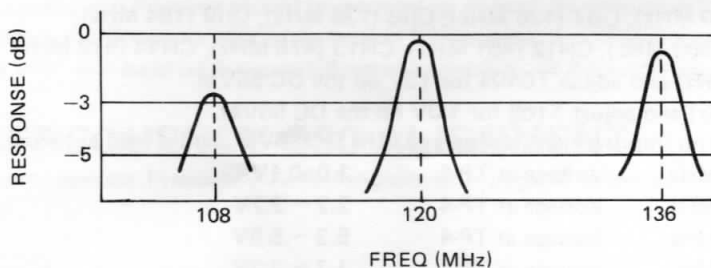
AIRCRAFT BAND

Step 1: Connect instruments: Same connection as VHF Lo band except Sweep Generator frequency, change to 108 MHz to 136 MHz.

Step 2: Program 108 MHz (CH1), 120 MHz (CH2), 136 MHz (CH3).

Step 3: Select Channel 2 (120 MHz) and adjust T103 and T105 for maximum RF waveform.

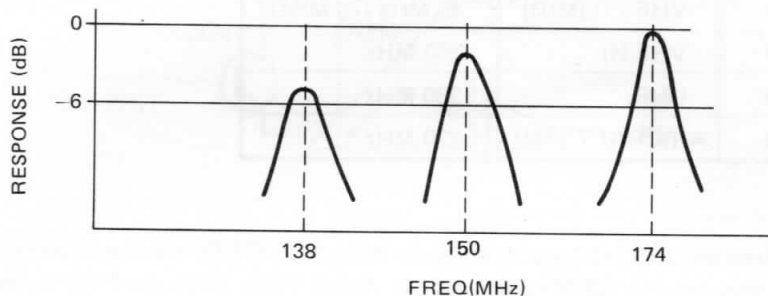
Step 4: Make sure that the output curves at 108 MHz and 136 MHz are similar to figure below.



NOTE: Perform AIRCRAFT BAND RF AMP ALIGNMENT before VHF-HI BAND. If this procedure is not followed, alignment may be impossible and/or inaccurate.

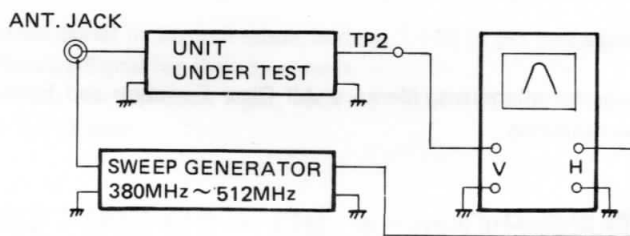
VHF-HI BAND

- Step 1: Connect instruments: Same connection as VHF Lo band except Sweep Generator frequency, change to 138 MHz to 174 MHz.
- Step 2: Program 138 MHz (CH1), 150 MHz (CH2), 174 MHz (CH3).
- Step 3: Select Channel 1 (138 MHz) and adjust T104 and T106 for maximum RF waveform.
- Step 4: Make sure that the output curves at 138 MHz and 174 MHz are similar to figure below.

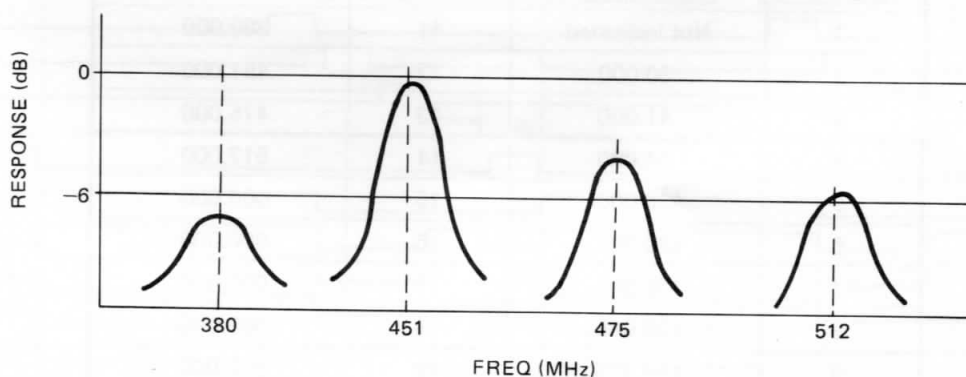


UHF BAND

- Step 1: Connect instruments as shown below:



- Step 2: Program 380 MHz (CH1), 451 MHz (CH2), 475 MHz (CH3) and 512 MHz (CH4).
- Step 3: Select Channel 1 (380 MHz) and adjust TC-101 and TC-102 for maximum RF waveform.
- Step 4: Make sure that the output curves at 451 MHz, 475 MHz and 512 MHz are similar to figure below.



OVERALL ALIGNMENT AND SENSITIVITY MEASUREMENT

- Step 1: Connect Signal Generator (SSG) to ANTenna jack and AC SSVM to speaker terminals.
 Step 2: Turn SQUELCH fully counterclockwise. Set for reception of the channels noted in the following chart.
 (See the SSG to the center of each band.)

CH	BAND	FREQ.
1	VHF LO (MID)	40 MHz (78 MHz)
2	VHF HI	150 MHz
3	UHF	380 MHz
4	AIRCRAFT (AM)	120 MHz

- Step 3: Set the Signal Generator frequency to 380 MHz (channel 3). Adjust TC-105 for maximum sensitivity.
 Step 4: Set the Signal Generator frequency to 120 MHz (channel 4). Adjust T109, T111 and T112 for maximum sensitivity.
 Step 5: For each frequency/channel, set Signal Generator to each frequency (FM: 3 kHz deviation, AM: 60% modulation, set VOLUME control for 0 dB (0.775 V) reading on the SSVM.
 Step 6: Turn off the modulation and measure the (S + N)/N ratio.
NOTE 1: R239 (270 ohms) must be shorted if you connected the SSVM to the Headphone jack.
NOTE 2: Use TP-3 for checking oscillating frequency and TP-6 for AM detective output.

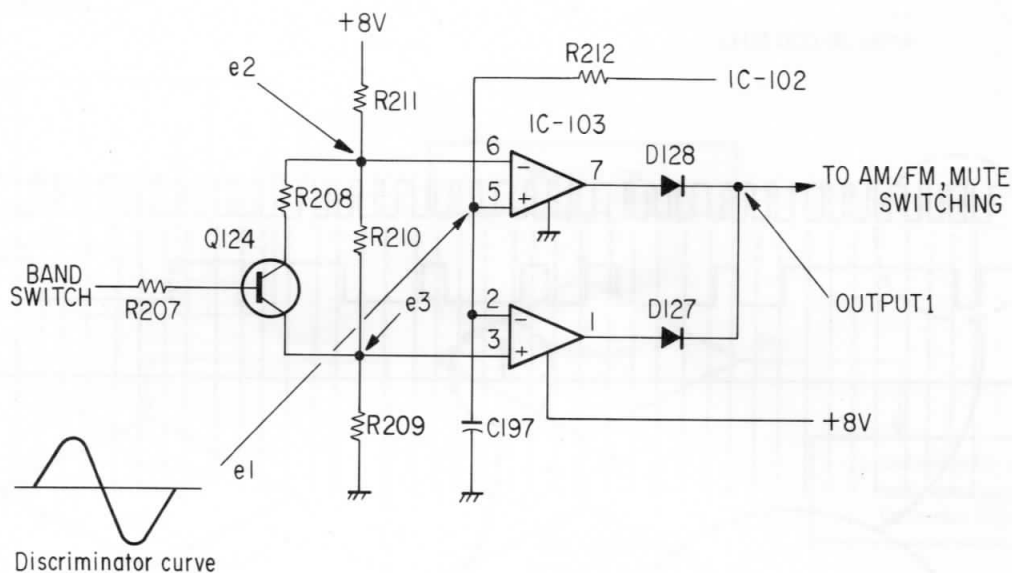
IMPORTANT NOTES:

The PRO-2010 has special functions to use for alignment. Memory All Clear Function and Frequency Auto Program are available. To use these functions, operate as following.

- (1) Memory All Clear Function
 Power switch ON with pressing **CLEAR** and **0** Keys.
 All channels are cleared and Display indicates **000.000**.
- (2) Frequency Auto Program Function
 Power switch ON with pressing **ENTER** and **1** Keys.
 Below Frequencies are programmed.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	Not indicated	11	380.000
2	30.000	12	451.000
3	41.000	13	475.000
4	54.000	14	512.000
5	108.000	15	000.000
6	120.000	16	000.000
7	136.000	17	000.000
8	138.065	18	000.000
9	154.375	19	000.000
10	173.900	20	000.000

ZEROMATIC FUNCTION AND HOW TO CHECK



* Zeromatic functions when OUTPUT 1 is in "H" level.

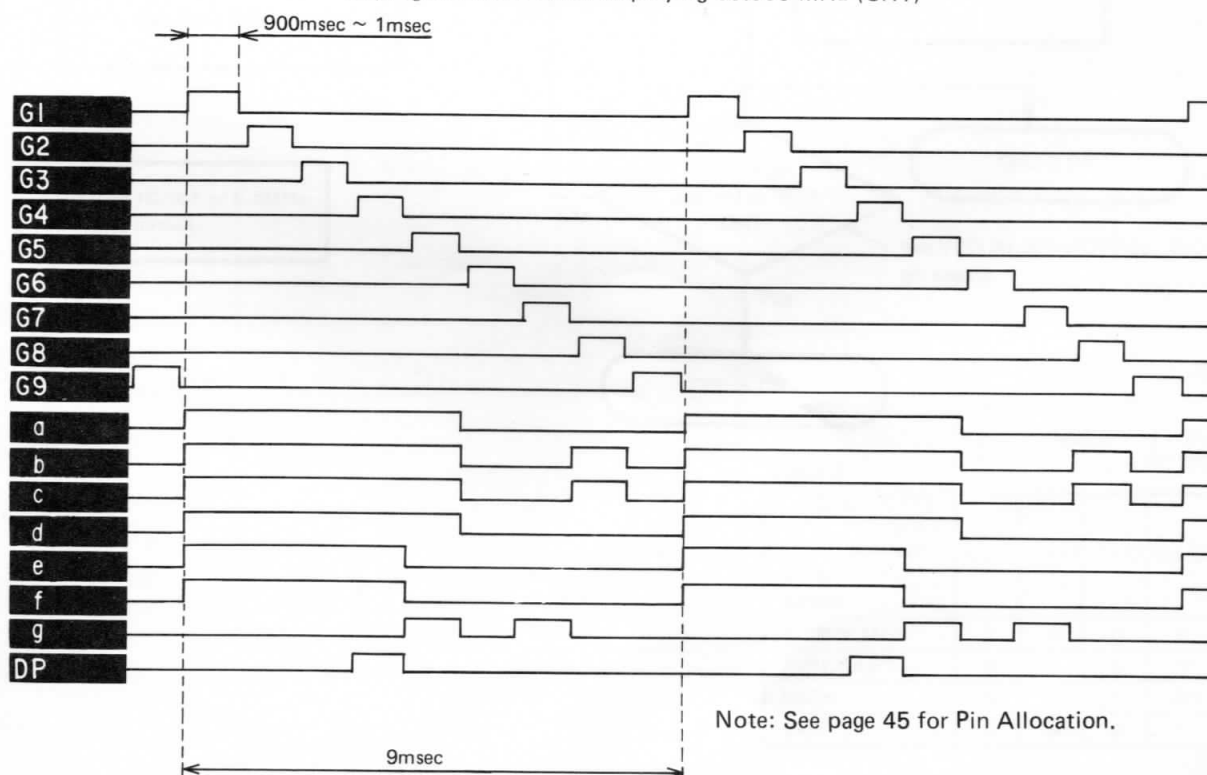
e_1	$0 < e_1 < e_3$	$e_3 < e_1 < e_2$	$e_2 < e_1 < V_{cc}$
OUTPUT 1	L	H	L

To adjust e_1 voltage, receive signal in Manual mode, and set T-110 to get half supply voltage (IC-102, 4 pin). It is convenient to use National Weather Service Signal for the adjustment.

In the event Zeromatic does not function right, refer to "REFERENCE FREQUENCY OSC ALIGNMENT" and check 6.4 MHz, and then adjust T-110 again.

WAVEFORM AT PINS G1 ~ G9, a ~ g D.P OF CPU (IC-1)

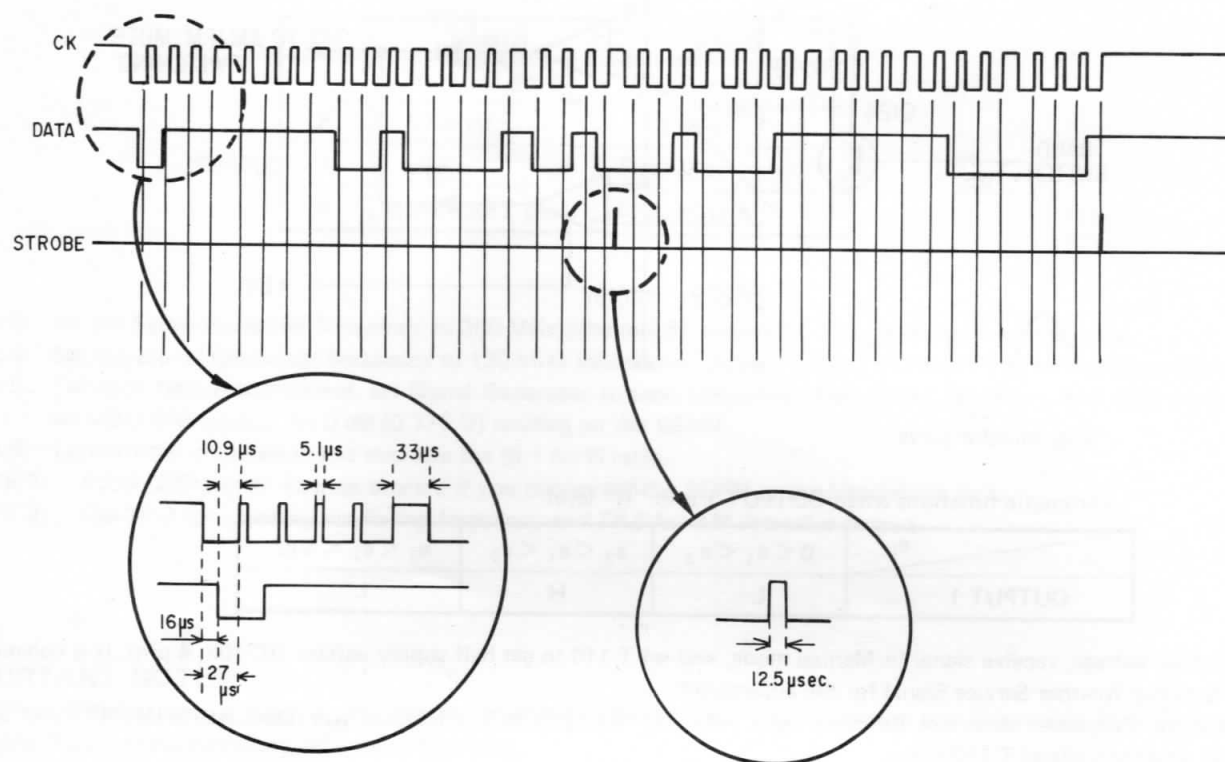
in program mode when displaying 30.000 MHz (CH1)



Note: See page 45 for Pin Allocation.

CLOCK AND DATA INPUT WAVEFORM IN IC-101

enter 30.000 MHz



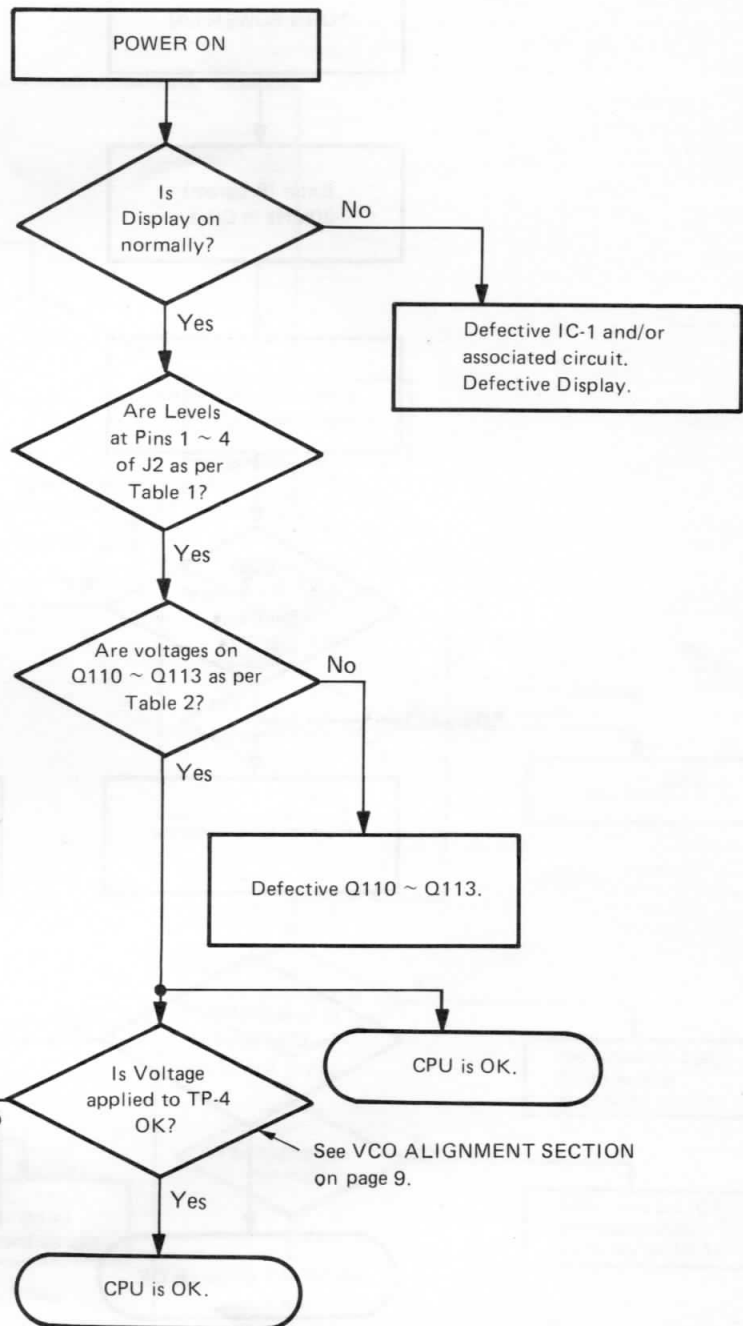
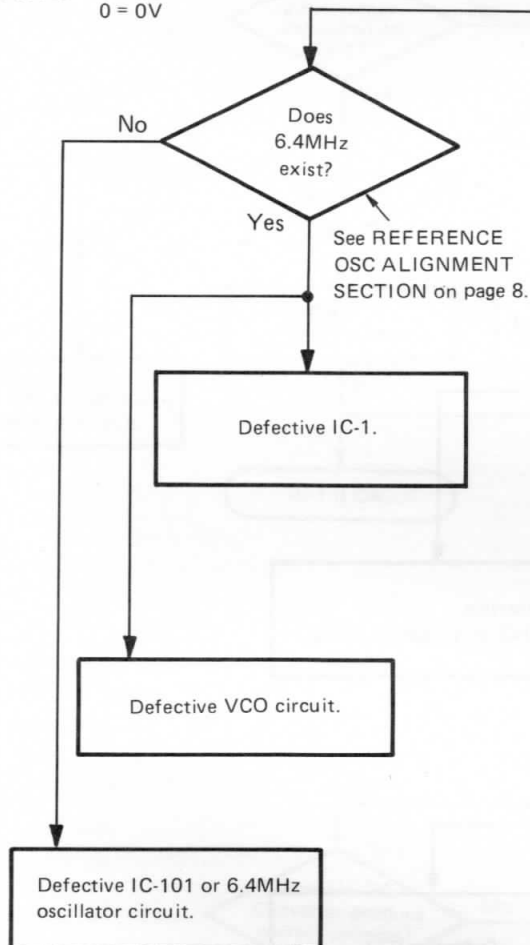
OPERATIONAL CHECK

RECEPTION CHECK

Table-1

J2 PIN No.	1	2	3	4
FREQ. BAND				
LOW or MID	0	0	0	1
AIRCRAFT	0	0	1	0
HIGH	0	1	0	0
UHF	1	0	0	0

NOTE: 1 = 5V
0 = 0V

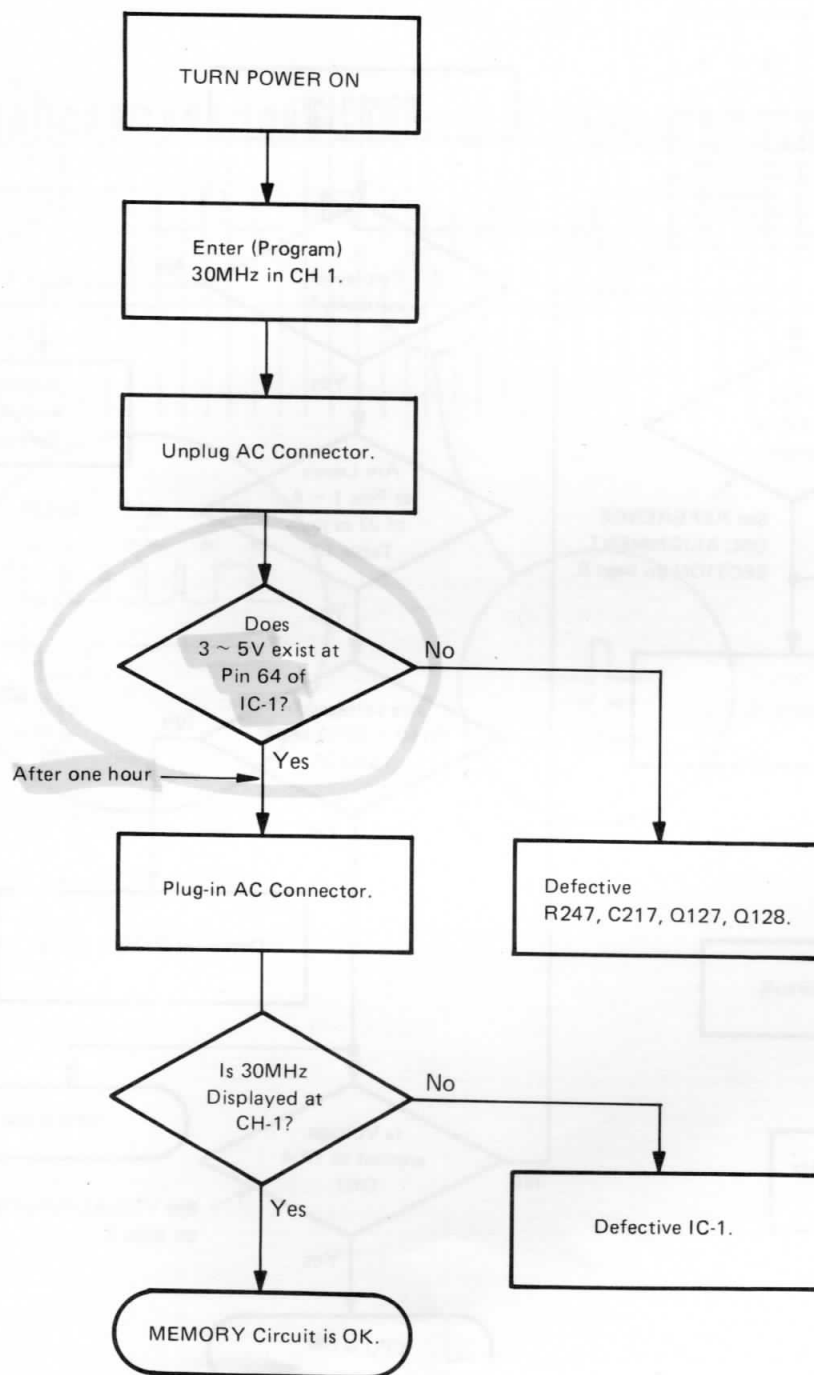


NOTE: 1 = 8V
0 = 0V

Table-2

Q110~Q113 Collector Voltage	Q110	Q111	Q112	Q113
FREQ. BAND				
LOW or MID	1	0	0	0
AIRCRAFT	0	1	0	0
HIGH	0	0	1	0
UHF	0	0	0	1

MEMORY CHECK

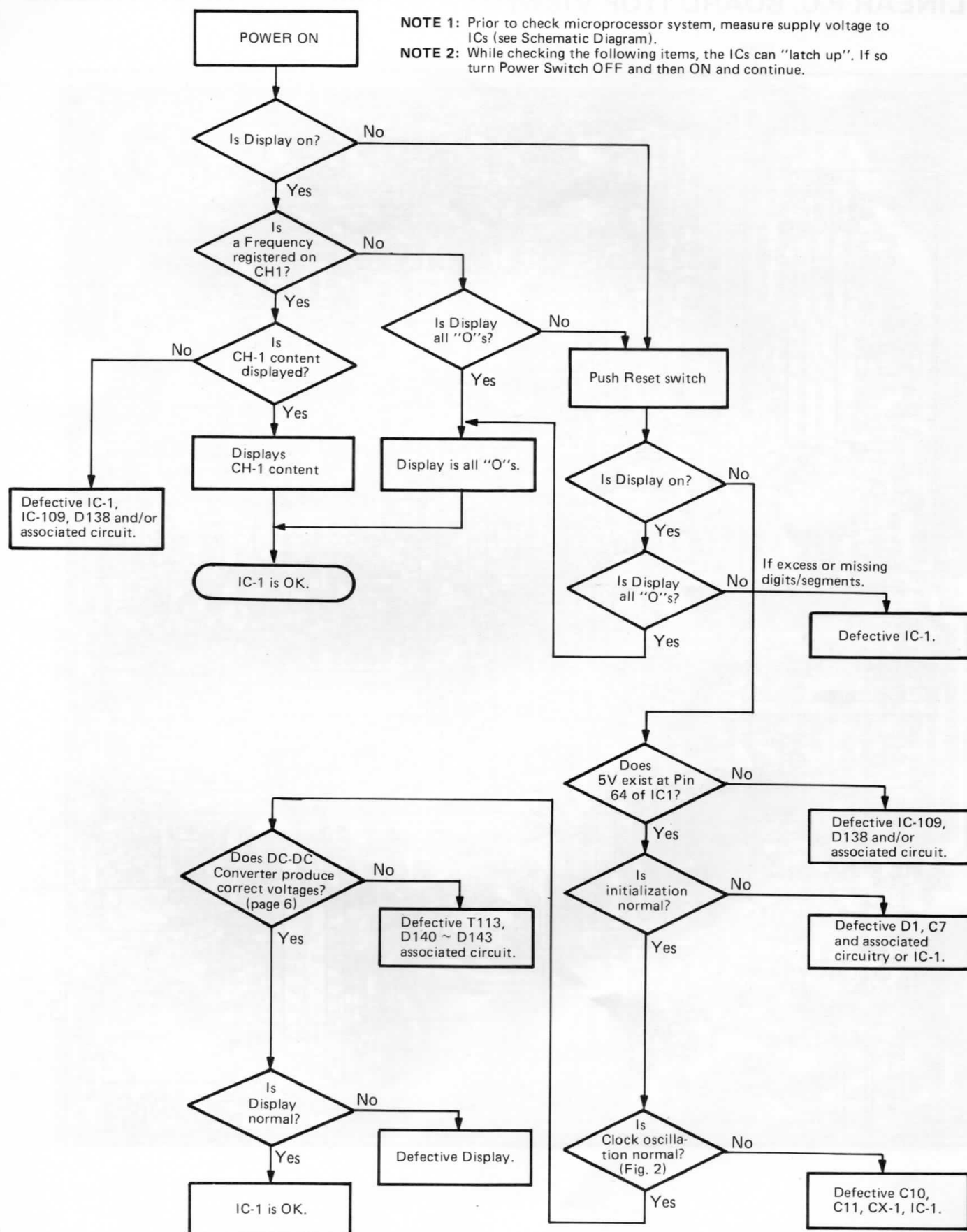


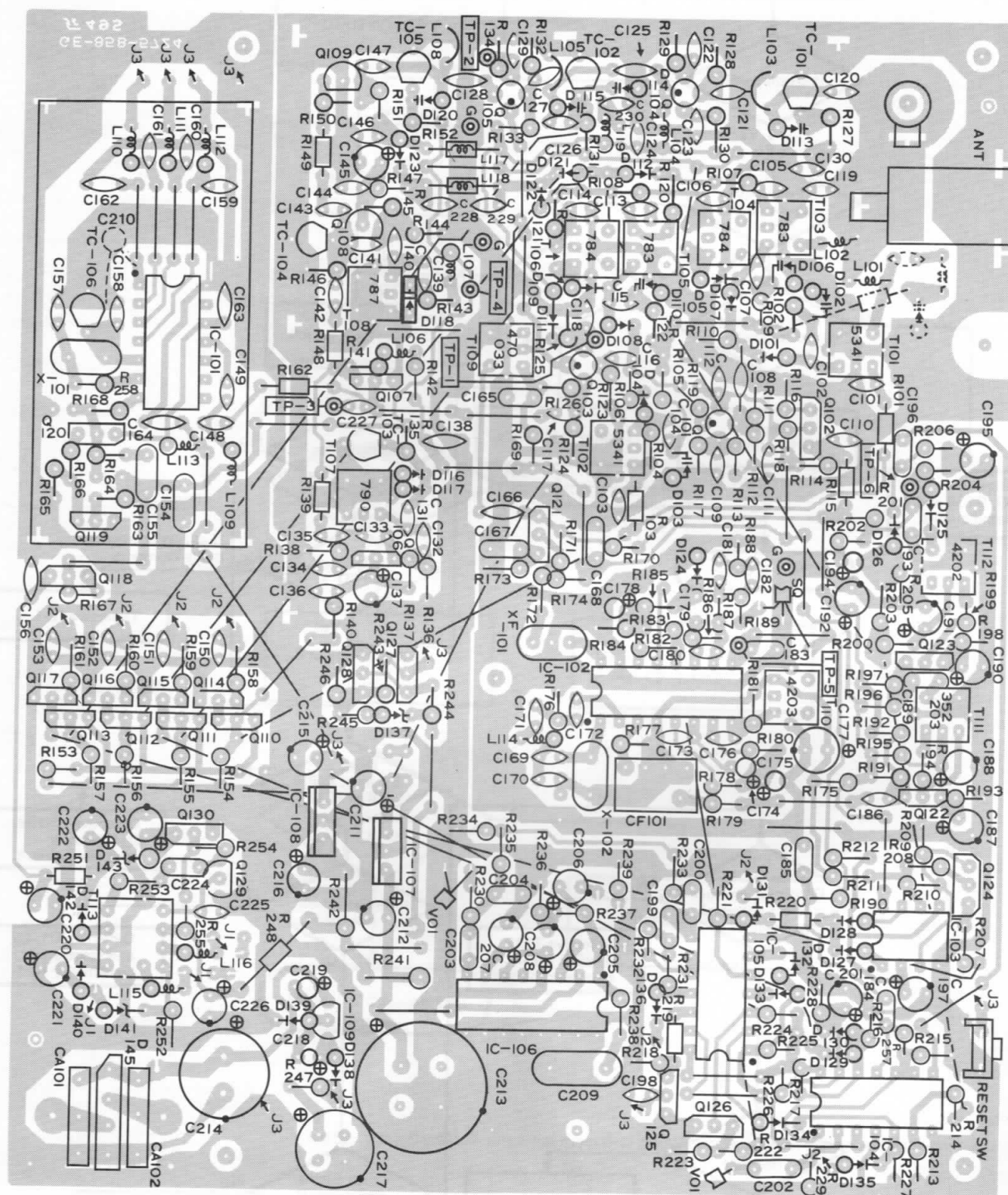
NOTE: Use a DC SSVM which has more than 100k Ω internal resistance for voltage measurement.

CPU CHECK

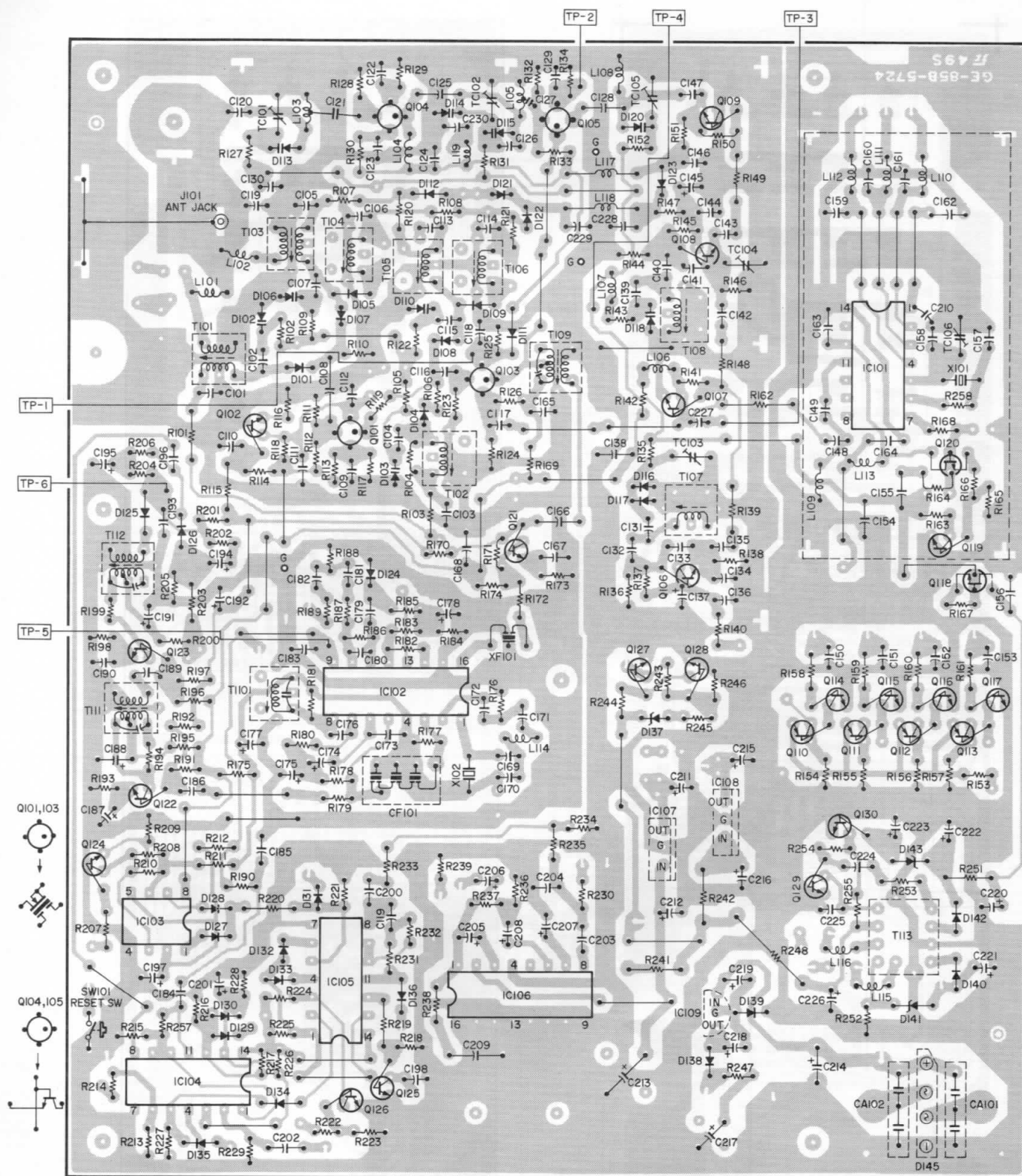
NOTE 1: Prior to check microprocessor system, measure supply voltage to ICs (see Schematic Diagram).

NOTE 2: While checking the following items, the ICs can "latch up". If so turn Power Switch OFF and then ON and continue.



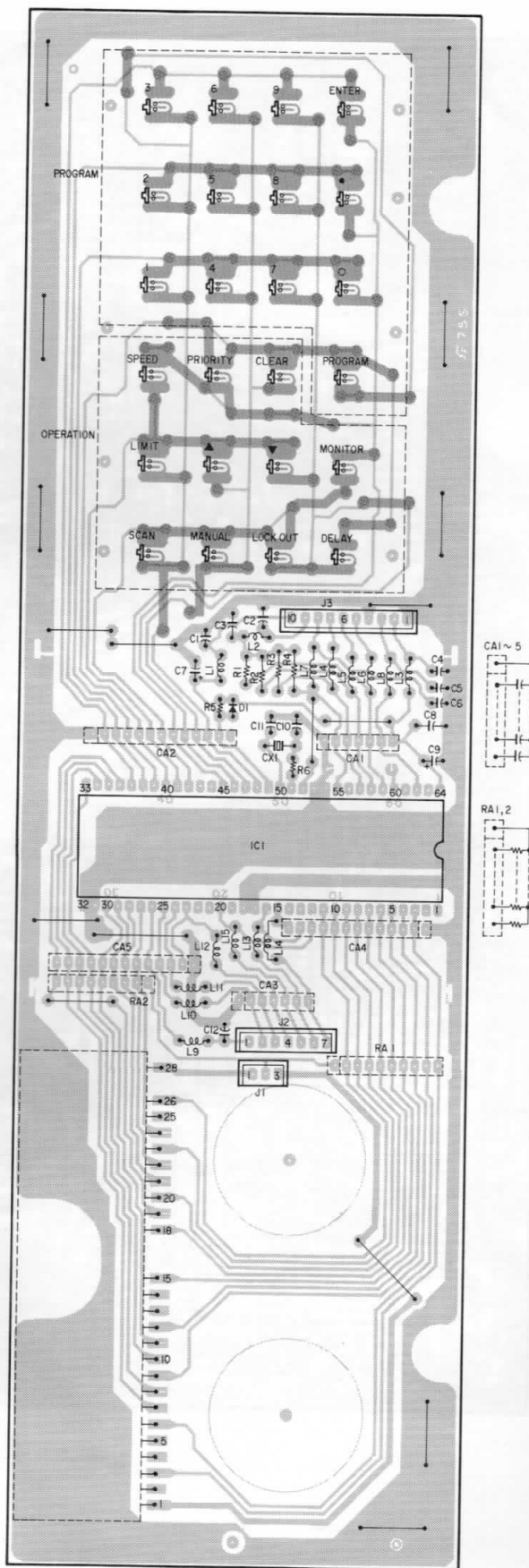
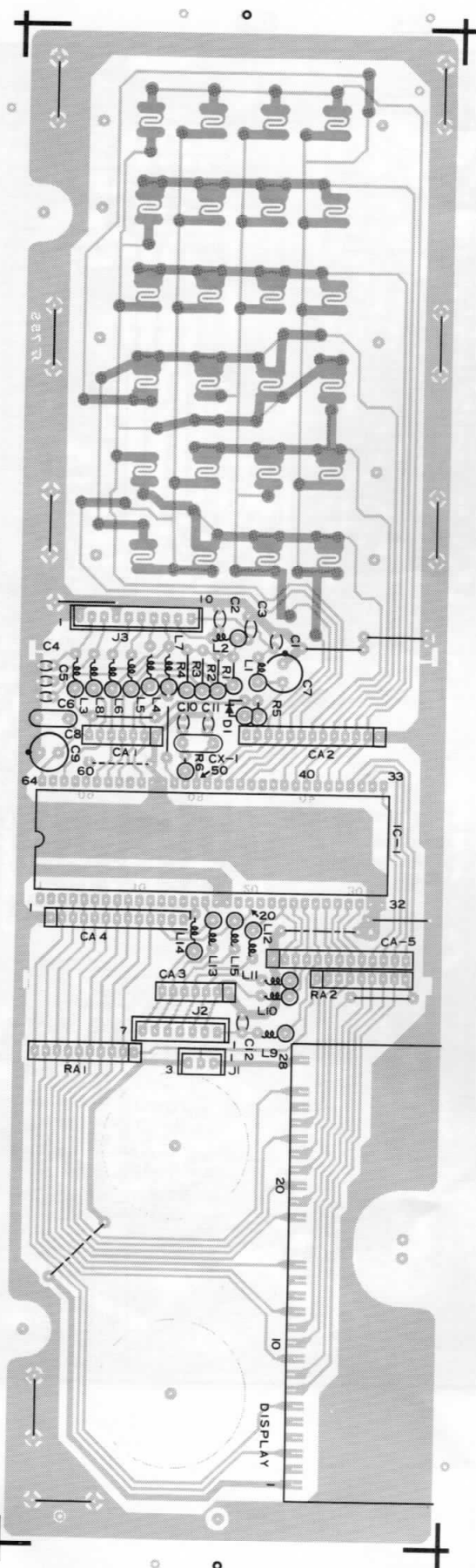


LINEAR P.C. BOARD (BOTTOM VIEW)

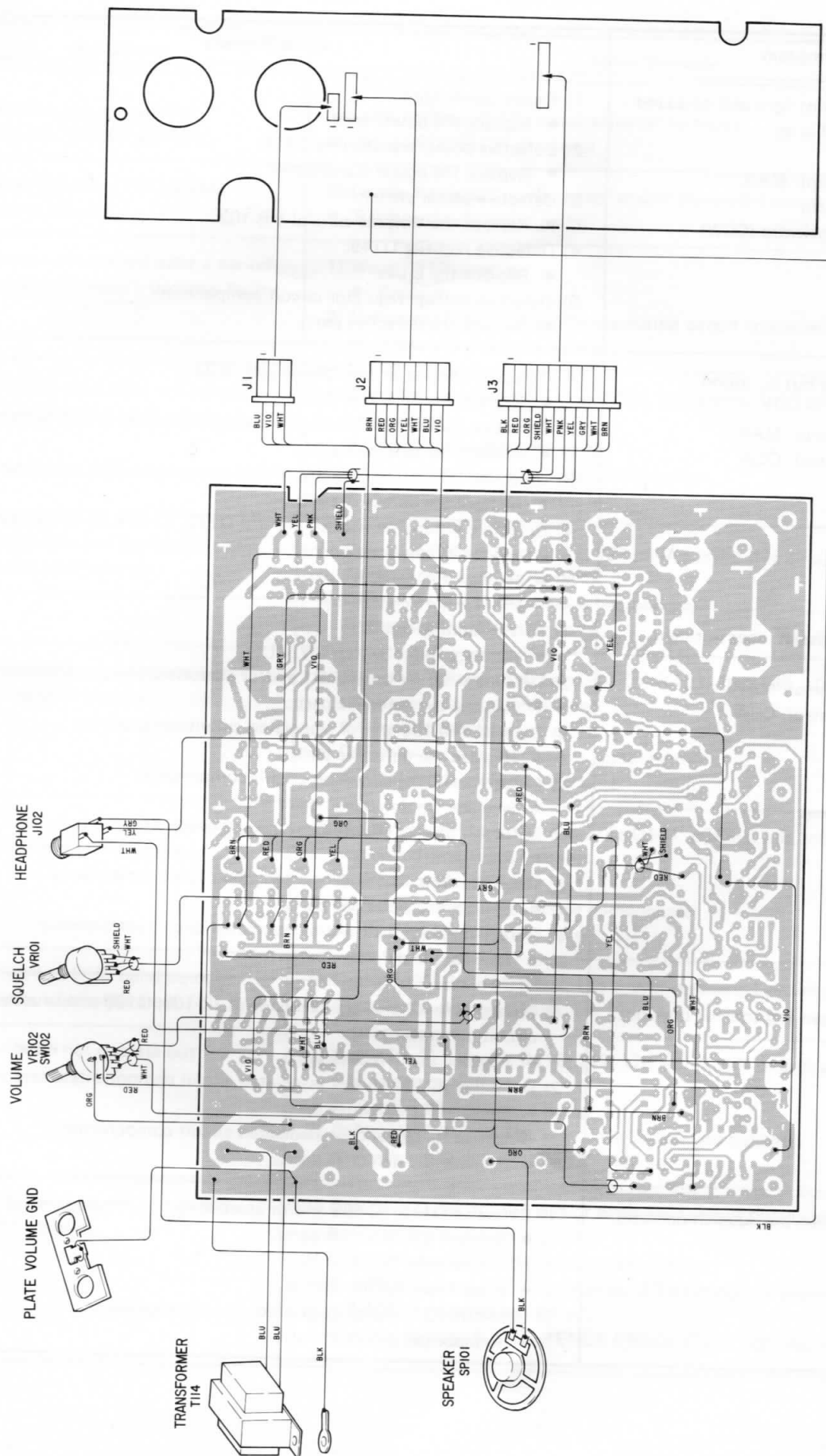


LOGIC P.C. BOARD (TOP VIEW)

(BOTTOM VIEW)



WIRING DIAGRAM



LOGIC P.L. BOARD

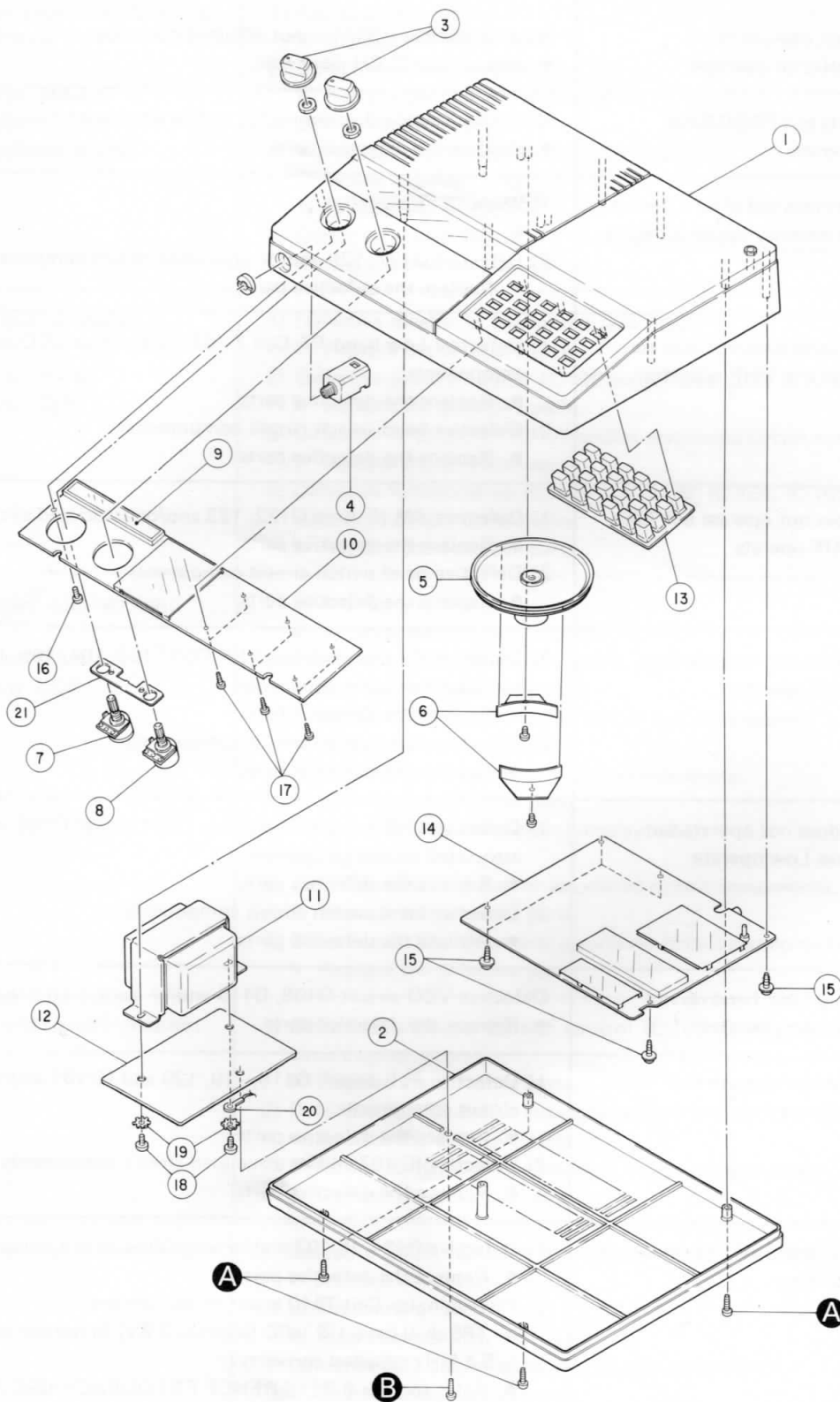
TROUBLESHOOTING

Symptom	Cause/Remedy
1) Display does not light and no sound when POWER is on Volume Control: MAX. Squelch Control: Counterclockwise (CCW)	1) Faulty power cord: ● Replace the power cord. 2) Defective power transformer T114: ● Replace the power transformer. 3) Defective power switch: ● Replace the Volume control VR-102. 4) Defective rectifier D145: ● Replace the D145. 5) Defective voltage regulator circuit components: ● Replace the defective parts.
2) Display lights but no sound Volume Control: MAX. Squelch Control: CCW	1) Defective speaker or headphone jack J102: ● Replace the defective parts. 2) Defective audio amplifier IC-106 and/or associated circuit components: ● Replace the defective parts. 3) Defective IF amplifier IC-102 and/or associated circuit components: ● Replace the defective parts. 4) Defective functional squelch control Q126, IC-104, IC-105 and/or associated circuit components: ● Replace the defective parts.
3) Sound but display does not light Volume Control: MAX. Squelch Control: CCW	1) IC-1 is running "wild": ● Activate Reset Switch SW101. 2) Defective initiate control D1 and/or associated circuit components: ● Replace the defective parts. 3) Defective IC-109 and/or associated circuit components: ● Replace the defective parts. 4) Defective DC-DC converter circuit components: ● Replace the defective parts. 5) Defective display (fluorescent display tube): ● Replace. 6) Defective CPU IC-1 and/or associated circuit components: ● Replace the defective parts. 7) Defective Q127, 128 and/or associated circuit components: ● Replace the defective parts.
4) Does not scan and squelch does not operate	1) Defective functional squelch control IC-105, Q126 and/or associated circuit components: ● Replace the defective parts. 2) Defective IC-102 and/or associated circuit components: ● Replace the defective parts. 3) Defective IC-107 and/or associated circuit components: ● Replace the defective parts.
5) Does not scan but squelch operates	1) Defective Q125, IC-105 and/or associated circuit components: ● Replace the defective parts. 2) IC-1 is running "wild": ● Press Reset Switch SW101. 3) Defective IC-1 and/or associated circuit components: ● Replace the defective parts.

Symptom	Cause/Remedy
6) Scan does not operate but MANUAL selector operates	Squelch control VR101 is not adjusted correctly: ● Adjust SQUELCH clockwise.
7) Display lights but PROGRAM does not operate	Defective Keyboard or connector and/or associated circuit components: ● Replace the defective parts.
8) Memory operates but after a period the readout memory becomes faulty	1) Weak C217 capacity: ● Replace. 2) Defective Q127, 128 and/or associated circuit components: ● Replace the defective parts.
9) Low (Mid) band does not operate but Air, High and UHF operates	1) Defective Low band RF Coil T-101, 102 and/or VCO circuit components: ● Replace the defective parts. 2) Defective band switch circuit components: ● Replace the defective parts.
10) Air band does not operate but Low, High and UHF operate	1) Defective AM IF Amp Q122, 123 and/or associated circuit components: ● Replace the defective parts. 2) Defective band switch circuit components: ● Replace the defective parts.
11) High band does not operate but Low and UHF operate	1) Defective Air and High band RF Coil T103, 104, 105, 106 and/or associated circuit components: ● Replace the defective parts. 2) Defective band switch circuit components: ● Replace the defective parts.
12) UHF band does not operate but Air, High and Low operate	1) Defective UHF band RF amplifier Q104, mixer Q105, multiplier and/or associated circuit components: ● Replace the defective parts. 2) Defective band switch circuit components: ● Replace the defective parts.
13) Air, High and UHF band do not operate but Low operates	Defective VCO circuit Q108, D118 and/or associated circuit components: ● Replace the defective parts.
14) All bands do not operate but display appears	1) Defective PLL circuit Q118, 119, 120 and IC-101 and/or associated circuit components: ● Replace the defective parts. 2) Defective IC-107 and/or associated circuit components: ● Replace the defective parts.
15) Searches but does not halt on the correct frequency	1) Defective Q124, IC-103 and/or associated circuit components: ● Replace the defective parts. 2) Discriminator Coil T110 is out of adjustment: ● TP5 shall have 1/2 VCC (approx. 3.8V) in normal receiving mode. 3) Is 6.4 MHz adjusted correctly?: ● Refer to page 8 REFERENCE FREQUENCY OSC ALIGNMENT.

DISASSEMBLY/EXPLODED VIEW

Remove screws **A** and **B**, then pull the top of the case off.



MECHANICAL PARTS LIST

Ref. No.	Description	RS Part Number	MFR's Part Number
①	Case, Assembly	Z-0744	GA-85D-5789
②	Cover, Bottom	Z-0746	GE-85B-5785
③	Knob, Volume/Squelch	K-6371	GE-19D-4631
④ J102	Jack, Headphone	J-5823	SG-8022 #2
⑤ SP101	Speaker, 8 ohm 2W	SP-5220	C080A20G0310
⑥	Holder, Speaker		GE-84D-4580
⑦ VR102	Potentiometer, Volume w/Switch 50k ohm (A) (SW-101)	P-7787	5M1411-50KA-20A
⑧ VR101	Potentiometer, Squelch 10k ohm (C)	P-7878	K1611008TE
⑨	Display, Fluorescent	L-1953	FIP9D7B
⑩	P.C.B. Assembly, Logic	XB-1140	GA-85D-6056
⑪ T114	Transformer, Power	TA-0790	GE-84D-5158
⑫	Plate, Transformer Protector		GE-86D-6211
⑬	Rubber, Keyboard	K-0592	GE-85D-5788
⑭	P.C.B. Assembly, Linear	XB-1141	GA-85B-6055
⑮	Screw, 3x8 Panhead Tapping w/Washer		P Tyght 3x8 w/Washer
⑯	Screw, 3x6 Panhead Tapping		P Tyght 3x6
⑰	Screw, 2x6 Panhead Tapping		P Tyght 2x6
⑱	Screw, 4x8 Panhead Machine		PM 4x8
⑲	Washer, External Toothed Lock, 4m/m		ETW 4m/m
⑳	Plate, Lug		GE-85D-6142
㉑	Plate, Volume GND		GE-85D-6023
Ⓐ	Screw, 3x12 Panhead Tapping		P Tyght 3x12
Ⓑ	Screw, 3x10 Bind Tapping (Blk)		BT 3x10

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a Δ have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice of this service manual. Don't degrade the safety of the product through improper servicing.

CAPACITORS						
Ref. No.	Description				RS Part Number	MFR's Part Number
C1	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C2	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C3	Ceramic	100pF	50WV	$\pm 10\%$	CC101KJCP	HE40SJYB101K
C4	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C5	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C6	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C7	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HSS010
C8	Mylar*	0.1 μ F	50WV	$\pm 10\%$	CC104KJMP	AMZ-104K50
C9	Electrolytic	47 μ F	10WV	$\pm 20\%$	CC476MCAP	ECEA1AU470
C10	Ceramic	33pF	50WV	$\pm 10\%$	CC330KJCP	HE40SJSL330K
C11	Ceramic	33pF	50WV	$\pm 10\%$	CC330KJCP	HE40SJSL330K
C12	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C101	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C102	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C103	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C104	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C105	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C106	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C107	Ceramic	470pF	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C108	Ceramic	22pF	50WV	$\pm 10\%$	CC471KJCP	HE40SJYB471K
C109	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC220KJCP	HE40SJSL220K
C110	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C111	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C112	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C113	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C114	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C115	Ceramic	470pF	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C116	Ceramic	10pF	50WV	$\pm 0.5pF$	CC471KJCP	HE40SJYB471K
C117	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC100DJCP	HE40SJSL100D
C118	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C119	Ceramic	2pF	50WV	$\pm 0.5pF$	CC102KJCP	HE50SJYB102K
C120	Ceramic	5pF	50WV	$\pm 0.5pF$	CC020DJCP	HE40SJSL020D
C121	Ceramic	5pF	50WV	$\pm 0.5pF$	CC020DJCP	HE40SJSL050D
C122	Ceramic	33pF	50WV	$\pm 10\%$	CC020DJCP	HE40SJSL050D
C123	Ceramic	100pF	50WV	$\pm 10\%$	CC330KJCP	HE40SJSL330K
C124	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC101KJCP	HE40SJYB101K
C125	Ceramic	10pF	50WV	$\pm 0.5\%$	CC102KJCP	HE50SJYB102K
C126	Ceramic	2pF	50WV	$\pm 0.5pF$	CC100DJCP	HE40SJSL100D
C127	Ceramic	10pF	50WV	$\pm 0.5pF$	CC020DJCP	HE40SJSL020D
C128	Ceramic	2pF	50WV	$\pm 0.5pF$	CC100DJCP	HE40SJSL100D
C129	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC020DJCP	HE40SJSL020D
C130	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C131	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C132	Ceramic	33pF	50WV	$\pm 10\%$	CC330KJCP	HE40SJSL330K
C133	Ceramic	68pF	50WV	$\pm 10\%$	CC680KJCP	HE40SJSL680K
C134	Ceramic	33pF	50WV	$\pm 10\%$	CC330KJCP	HE40SJSL330K

* Mylar is a registered trademark of E.I. Du Pont de Nemours and Company.

Ref. No.	Description				RS Part Number	MFR's Part Number
C135	Ceramic	10pF	50WV	±0.5pF	CC100DJCP	HE40SJSL100D
C136	Ceramic	0.001μF	50WV	±10%	CC102KJCP	HE50SJYB102K
C137	Electrolytic	10μF	16WV	±20pF	CC106MDAP	ECEA1CU100
C138	Ceramic	0.01μF	50WV	+80%—20%	CC103ZJCP	HE70SJYF103Z
C139	Ceramic	470pF	50WV	±10%	CC471KJCP	HE40SJYB471K
C140	Ceramic	47pF	50WV	±10%	CC470KJCP	HE40SJSL470K
C141	Ceramic	10pF	50WV	±0.5pF	CC100DJCP	HE40SJSL100D
C142	Ceramic	5pF	50WV	±0.5pF	CC050DJCP	HE40SJSL050D
C143	Ceramic	5pF	50WV	±0.5pF	CC050DJCP	HE40SJSL050D
C144	Ceramic	0.001μF	50WV	±10%	CC102KJCP	HE50SJYB102K
C145	Electrolytic	10μF	16WV	±20%	CC106MDAP	ECEA1CU100
C146	Ceramic	0.001μF	50WV	±10%	CC102KJCP	HE50SJYB102K
C147	Ceramic	22pF	50WV	±10%	CC220KJCP	HE40SJSL220K
C148	Ceramic	39pF	50WV	±10%	CC390KJCP	HE40SJSL390K
C149	Ceramic	39pF	50WV	±10%	CC390KJCP	HE40SJSL390K
C150	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C151	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C152	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C153	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C154	Mylar	0.1μF	50WV	±10%	CC104KJMP	AMZ-104K50
C155	Mylar	0.056μF	50WV	±10%	CC563KJMP	AMZ-563K50
C156	Ceramic	0.01μF	50WV	+80%—20%	CC103ZJCP	HE70SJYF103Z
C157	Ceramic	39pF	50WV	±10%	CC390KJCP	HE40SJSL390K
C158	Ceramic	47pF	50WV	±10%	CC470KJCP	HE40SJSL470K
C159	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C160	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C161	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C162	Ceramic	0.1μF	50WV	±20%	CC105MTCP	DSFC80SJY5U104M
C163	Ceramic	0.01μF	50WV	+80%—20%	CC104ZJCP	HE70SJYF103Z
C164	Ceramic	0.01μF	50WV	+80%—20%	CC104ZJCP	HE70SJYF103Z
C165	Mylar	0.001μF	50WV	±10%	CC102KJMP	AMZ-102K50
C166	Ceramic	0.001μF	50WV	±10%	CC102KJCP	HE50SJYB102K
C167	Mylar	0.01μF	50WV	±10%	CC103KJMP	AMZ-103K50
C168	Mylar	0.01μF	50WV	±10%	CC103KJMP	AMZ-103K50
C169	Ceramic	39pF	50WV	±10%	CC390KJCP	HE40SJSL390K
C170	Ceramic	100pF	50WV	±10%	CC101KJCP	HE40SJYB101K
C171	Ceramic	22pF	50WV	±10%	CC220KJCP	HE40SJSL220K
C172	Ceramic	0.001μF	50WV	±10%	CC102KJCP	HE50SJYB102K
C173	Ceramic	0.047μF	50WV	+80%—20%	CC473ZFCP	HC10SJYF473Z
C174	Tantalum	0.47μF	35WV	±20%	CC474MGTP	DN1VR47M1S
C175	Tantalum	0.47μF	35WV	±20%	CC474MGTP	DN1VR47M1S
C176	Ceramic	10pF	50WV	±0.5pF	CC100DJCP	HE40SJSL100D
C177	Electrolytic	220μF	10WV	±20%	CC226MCAP	ECEA1AU221
C178	Tantalum	0.22μF	35WV	±20%	CC224MGTP	DN1VR22M1S
C179	Mylar	0.01μF	50WV	±10%	CC103KJMP	AMZ-103K50
C180	Ceramic	5pF	50WV	±0.5pF	CC050DJCP	HE40SJSL050D
C181	Ceramic	470pF	50WV	±10%	CC471KJCP	HE40SJYB471K
C182	Ceramic	470pF	50WV	±10%	CC471KJCP	HE40SJYB471K
C183	Mylar	0.001μF	50WV	±10%	CC102KJMP	AMZ-102K50
C184	Mylar	0.0047μF	50WV	±10%	CC472KJMP	AMZ-472K50
C185	Mylar	0.022μF	50WV	±10%	CC223KJMP	AMZ-223K50
C186	Ceramic	470pF	50WV	±10%	CC471KJCP	HE40SJYB471K

Ref. No.	Description				RS Part Number	MFR's Part Number
C187	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C188	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C189	Mylar	0.01 μ F	50WV	$\pm 10\%$	CC103KJMP	AMZ-103K50
C190	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C191	Electrolytic	10 μ F	50WV	$\pm 20\%$	CC106MDAP	ECEA1CU100
C192	Electrolytic	47 μ F	10WV	$\pm 20\%$	CC476MCAP	ECEA1AU470
C193	Mylar	0.033 μ F	50WV	$\pm 10\%$	CC333KJMP	AMZ-333K50
C194	Tantalum	0.1 μ F	35WV	$\pm 20\%$	CC104MGTP	DN1V0R1M1S
C195	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C196	Mylar	0.022 μ F	50WV	$\pm 10\%$	CC223KJMP	AMZ-223K50
C197	Electrolytic	0.1 μ F	50WV	$\pm 20\%$	CC104MJAP	ECEA1HUR10
C198	Ceramic	330pF	50WV	$\pm 10\%$	CC331KJCP	HE40SJYB331K
C199	Mylar	0.01 μ F	50WV	$\pm 10\%$	CC103KJMP	AMZ-103K50
C200	Mylar	0.001 μ F	50WV	$\pm 10\%$	CC103KJMP	AMZ-102K50
C201	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C202	Mylar	0.056 μ F	50WV	$\pm 10\%$	CC563KJMP	AMZ-563K50
C203	Mylar	0.01 μ F	50WV	$\pm 10\%$	CC103KJMP	AMZ-103K50
C204	Mylar	0.015 μ F	50WV	$\pm 10\%$	CC153KJMP	AMZ-153K50
C205	Electrolytic	47 μ F	16WV	$\pm 20\%$	CC476MDAP	ECEA1CU470
C206	Electrolytic	47 μ F	16WV	$\pm 20\%$	CC476MDAP	ECEA1CU470
C207	Electrolytic	10 μ F	16WV	$\pm 20\%$	CC106MDAP	ECEA1CU100
C208	Electrolytic	10 μ F	16WV	$\pm 20\%$	CC106MJAP	ECEA1CU100
C209	Mylar	0.22 μ F	50WV	$\pm 10\%$	CC224KJMP	AMZ-224K50
C210	Ceramic	120pF	50WV	$\pm 10\%$	CC121KJCP	HE50SJYB121K
C211	Electrolytic	100 μ F	16WV	$\pm 20\%$	CC107MDAP	ECEA1CU101
C212	Electrolytic	0.1 μ F	50WV	$\pm 20\%$	CC104MJAP	ECEA1HUR10
C213	Electrolytic	2200 μ F	16WV	$\pm 20\%$		ECEA1CSS222
C214	Electrolytic	1000 μ F	25WV	$\pm 20\%$		ECEA1EU102
C215	Electrolytic	0.47 μ F	50WV	$\pm 20\%$	CC474MJAP	ECEA1HUR47
C216	Electrolytic	47 μ F	16WV	$\pm 20\%$	CC476MDAP	ECEA1CU470
C217	Electrolytic	470 μ F	6.3WV	$\pm 20\%$	CC477MBAP	ECEA0JM471T
C218	Tantalum	0.47 μ F	35WV	$\pm 20\%$	CC474MGTP	DN1VR47M1S
C219	Tantalum	0.47 μ F	35WV	$\pm 20\%$	CC474MGTP	DN1VR47M1S
C220	Electrolytic	1 μ F	50WV	$\pm 20\%$	CC105MJAP	ECEA1HU010
C221	Electrolytic	4.7 μ F	50WV	$\pm 20\%$	CC475MJAP	ECEA1HU4R7
C222	Electrolytic	10 μ F	35WV	$\pm 20\%$	CC106MGAP	ECEA1VU100
C223	Electrolytic	10 μ F	16WV	$\pm 20\%$	CC106MDAP	ECEA1CU100
C224	Mylar	0.001 μ F	50WV	$\pm 10\%$	CC102KJMP	AMZ-102K50
C225	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C226	Electrolytic	47 μ F	16WV	$\pm 20\%$	CC476MDAP	ECEA1CU470
C227	Ceramic	10pF	50WV	$\pm 0.5pF$	CC100DJCP	HE40SJSL100D
C228	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C229	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K
C230	Ceramic	0.001 μ F	50WV	$\pm 10\%$	CC102KJCP	HE50SJYB102K

CAPACITOR ARRAYS					
Ref. No.	Description			RS Part Number	MFR's Part Number
CA1	100pF x 6	50WV	±20%	C-1814	EXF-P6101MF
CA2	100pF x 11	50WV	±20%	C-1815	EXF-P12101MF
CA3	0.001μF x 6	50WV	+80%—20%	C-1813	EXF-P6102ZF
CA4	100pF x 12	50WV	±20%	C-1815	EXF-P12101MF
CA5	100pF x 12	50WV	±20%	C-1815	EXF-P12101MF
CA101	0.01μF x 2	250V	+80%—20%	C-1816	EXR-FS203ZS
CA102	0.01μF x 2	250V	+80%—20%	C-1816	EXR-FS203ZS

CRYSTALS & FILTERS				
Ref. No.	Description			MFR's Part Number
CX-1	Resonator, ceramic	(4 MHz)	C-1812	CSA4.00 MG
X-101	Crystal	HC-18U type 6.400 MHz	MX-1247	6.400 MHz
X-102	Crystal	TR-11 type 10.245 MHz	MX-1281	H5717/T5717
XF101	Filter, crystal	(10.7 MHz)	C-1149	H5718/T5718
CF101	Filter, ceramic	(455 kHz)	C-1685	CFW455D

DIODES				
Ref. No.	Description			MFR's Part Number
D1		1S2076A (Silicon)	DX-1056	1S2076A
D101		1SS85 (Silicon)	DX-1462	1SS85
D102	Varactor	BB329 (Silicon)	DX-1739	BB329
D103	Varactor	BB329 (Silicon)	DX-1739	BB329
D104		1SS85 (Silicon)	DX-1462	1SS85
D105		1SS85 (Silicon)	DX-1462	1SS85
D106	Varactor	1SV136B (Silicon)	DX-2504	1SV136B
D107		1SS85 (Silicon)	DX-1462	1SS85
D108		1SS85 (Silicon)	DX-1462	1SS85
D109		1SS85 (Silicon)	DX-1462	1SS85
D110	Varactor	1SV136B (Silicon)	DX-2504	1SV136B
D111		1S2076A (Silicon)	DX-1056	1S2076A
D112		1S2076A (Silicon)	DX-1056	1S2076A
D113	Varactor	1SV145B (Silicon)	DX-2512	1SV145B
D114	Varactor	1S2090 (Silicon)	DX-1031	1S2090
D115	Varactor	1SV145B (Silicon)	DX-2512	1SV145B

Ref. No.	Description			RS Part Number	MFR's Part Number
D116	Varactor	BB329	(Silicon)	DX-1739	BB329
D117	Varactor	BB329	(Silicon)	DX-1739	BB329
D118	Varactor	1SV145B	(Silicon)	DX-2512	1SV145B
D119	Not used				
D120	Varactor	1SV145B	(Silicon)	DX-2512	1SV145B
D121		1S2076A	(Silicon)	DX-1056	1S2076A
D122		1S2076A	(Silicon)	DX-1056	1S2076A
D123		1S2076A	(Silicon)	DX-1056	1S2076A
D124		1K261	(Germanium)	DX-1325	1K261
D125		1K261	(Germanium)	DX-1325	1K261
D126		1K261	(Germanium)	DX-1325	1K261
D127		1S2076A	(Silicon)	DX-1056	1S2076A
D128		1S2076A	(Silicon)	DX-1056	1S2076A
D129		1S2076A	(Silicon)	DX-1056	1S2076A
D130		1S2076A	(Silicon)	DX-1056	1S2076A
D131		1S2076A	(Silicon)	DX-1056	1S2076A
D132		1S2076A	(Silicon)	DX-1056	1S2076A
D133		1S2076A	(Silicon)	DX-1056	1S2076A
D134		1S2076A	(Silicon)	DX-1056	1S2076A
D135		1S2076A	(Silicon)	DX-1056	1S2076A
D136		1S2076A	(Silicon)	DX-1056	1S2076A
D137	Zener	HZ7A1-L	(Silicon)	DX-2514	HZ7A1-L
D138		1S2076A	(Silicon)	DX-1056	1S2076A
D139		1S2076A	(Silicon)	DX-1056	1S2076A
D140		1S2076A	(Silicon)	DX-1056	1S2076A
D141	Zener	HZ5A1	(Silicon)	DX-1622	HZ5A1
D142		1S2076A	(Silicon)	DX-1056	1S2076A
D143	Zener	HZ22-1	(Silicon)	DX-2515	HZ22-1
D144	Not used				
D145	Rectifier	1B4B41		DX-2513	1B4B41

ICs				
Ref. No.	Description			MFR's Part Number
IC-1	GRE-0433A	(CPU) (C-Mos)	MX-6976	GRE-0433A
IC-101	CX7925B	(PLL/Pre-Scaler) (Mos)	MX-6977	CX7925B
IC-102	TK10420	(IF Amp/Quad/Det.) (Bipolar)	MX-4012	TK10420
IC-103	MC358 or LM358	(Zeromatic Cont.) (Bipolar)	MX-6978	MC358 or LM358
IC-104	TC-4066BP	(Mute/Band Selector) (C-Mos)	MX-6046	TC-4066BP
IC-105	TC-4069UBP	(SQ. Cont./Ref OSC/Beep Tone Gen.) (Mos)	MX-5514	TC-4069 μ BP
IC-106	TDA1905	(Audio Amp.) (Bipolar)	MX-6439	TDA1905
IC-107	TA78DL08P	(Voltage Regulator) (Bipolar)	MX-6979	TA78DL08P
IC-108	TA78005AP or HD178005	(Voltage Regulator) (Bipolar)	MX-4475	TA78005AP or HD178005
IC-109	TA78L005AP	(Voltage Regulator) (Bipolar)	MX-5532	TA78L005AP

COILS & TRANSFORMER

Ref. No.	Description	RS Part Number	MFR's Part Number
L1	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L2	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L3	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L4	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L5	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L6	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L7	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L8	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L9	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L10	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L11	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L12	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L13	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L14	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L15	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L101	Coil, Choke	CA-3488	4LNC092
L102	Coil, Choke	CB-2673	4LNC122
L103	Coil, RF (UHF)	CA-9506	8LNR093
L104	Coil, Choke	CB-2673	4LNC122
L105	Coil, RF (UHF)	CA-9506	8LNR093
L106	Coil, Choke (0.22 μ H)	CB-2074	LAL03NAR22K
L107	Coil, Choke (100 μ H)	CB-2077	LAL03NAR101K
L108	Coil, RF (UHF)	CA-9506	8LNR093
L109	Coil, Choke (0.82 μ H)	CB-2075	LAL03VSR82K
L110	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L111	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L112	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L113	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
L114	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L115	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L116	Coil, Choke (10 μ H)	CB-2076	LAL03VS100K
L117	Coil, Choke (100 μ H)	CB-2070	LAL03NA101K
L118	Coil, Choke (100 μ H)	CB-2070	LAL03NA101K
L119	Coil, Choke (100 μ H)	CB-2077	LAL03VS101K
T101	Coil, RF (Low)	CA-2092	GR-N5341
T102	Coil, RF (Low)	CA-2092	GR-N5341
T103	Coil, RF (Aircraft/Hi)	CA-9876	GR-N783
T104	Coil, RF (Hi)	CA-9880	GR-N784
T105	Coil, RF (Aircraft/Hi)	CA-9876	GR-N783
T106	Coil, RF (Hi)	CA-9880	GR-N784
T107	Coil, VCO (Low)		GR-N790
T108	Coil, VCO (Low/Hi/UHF)	CA-9890	GR-C787
T109	Coil, IFT (10.7 MHz)	CA-7246	GR-A470033
T110	Coil, Detector (455 kHz)	CA-9499	GR-P4203
T111	Coil, IFT (455 kHz)	CA-8183	GR-P352203
T112	Coil, IFT (455 kHz)	CA-7884	GR-P4202
T113	Coil, DC-DC Convertor	CA-9891	10PS0-248
⚠ T114	Transformer, Power	TA-0790	GE-84D-5158

TRANSISTORS					
Ref. No.	Description			RS Part Number	MFR's Part Number
Q101	FET	3SK101(Y)		3SK101Y	3SK101(Y)
Q102		2SC2458(Y)	(NPN)	2SC2458Y	2SC2458(Y)
Q103		3SK101(Y)		3SK101Y	3SK101(Y)
Q104		2SC2464	(NPN)	2SC2464	2SC2464
Q105		2SC2466	(NPN)	2SC2466	2SC2466
Q106		2SC2668(O)	(NPN)	2SC2668O	2SC2668(O)
Q107		2SC2668(O)(Y)	(NPN)	2SC2668O	2SC2668(O)(Y)
Q108		2SC2347	(NPN)	2SC2347	2SC2347
Q109		2SC2498	(NPN)	2SC2498	2SC2498
Q110	FET	UN4111/RN2202	(PNP) w/Resistor	UN4111	UN4111/RN2202
Q111	FET	UN4111/RN2202	(PNP) w/Resistor	UN4111	UN4111/RN2202
Q112	FET	UN4111/RN2202	(PNP) w/Resistor	UN4111	UN4111/RN2202
Q113	FET	UN4111/RN2202	(PNP) w/Resistor	UN4111	UN4111/RN2202
Q114	FET	2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q115		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q116		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q117		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q118		2SK184(Y)		2SK184Y	2SK184(Y)
Q119		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q120		2SK184(Y)		2SK184Y	2SK184(Y)
Q121		2SC2668(O)	(NPN)	2SC2668O	2SC2668(O)
Q122		2SC2458(Y)	(NPN)	2SC2458Y	2SC2458(Y)
Q123		2SC2458(Y)	(NPN)	2SC2458Y	2SC2458(Y)
Q124	FET	2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q125		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q126		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q127		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q128		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)
Q129		2SC1627A(Y)	(NPN)	2SC1627A	2SC1627A(Y)
Q130		2SC2458(GR)	(NPN)	2SC2458GR	2SC2458(GR)

RESISTORS						
Ref. No.	Description				RS Part Number	MFR's Part Number
R1	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R2	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R3	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R4	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R5	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R6	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R101	Carbon film	220 ohm	1/6W	±5%	N0149ECC	RD16S221J
R102	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R103	Carbon film	220 ohm	1/6W	±5%	N0149ECC	RD16S221J
R104	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R105	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J

Ref. No.	Description				RS Part Number	MFR's Part Number
R106	Carbon film	10 ohm	1/6W	±5%	N0063ECC	RD16U100J
R107	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R108	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R109	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R110	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R111	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R112	Carbon film	150k ohm	1/6W	±5%	N0384ECC	RD16U154J
R113	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R114	Carbon film	150k ohm	1/6W	±5%	N0384ECC	RD16U154J
R115	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R116	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16U470J
R117	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R118	Carbon film	100k ohm	1/6W	±5%	N0371ECC	RD16U104J
R119	Carbon film	10 ohm	1/6W	±5%	N0063ECC	RD16U100J
R120	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R121	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R122	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R123	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R124	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R125	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R126	Carbon film	470k ohm	1/6W	±5%	N0423ECC	RD16U474J
R127	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R128	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R129	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R130	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R131	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R132	Carbon film	470k ohm	1/6W	±5%	N0423ECC	RD16U474J
R133	Carbon film	1M ohm	1/6W	±5%	N0445ECC	RD16U105J
R134	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R135	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R136	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R137	Carbon film	15k ohm	1/6W	±5%	N0297ECC	RD16U153J
R138	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R139	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16S471J
R140	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R141	Carbon film	150k ohm	1/6W	±5%	N0384ECC	RD16U154J
R142	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R143	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R144	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R145	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R146	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R147	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R148	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16S470J
R149	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16S470J
R150	Carbon film	220k ohm	1/6W	±5%	N0396ECC	RD16U224J
R151	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R152	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R153	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16U470J
R154	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R155	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R156	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R157	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J

Ref. No.	Description				RS Part Number	MFR's Part Number
R158	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R159	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R160	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R161	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R162	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16S471J
R163	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R164	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R165	Carbon film	3.3k ohm	1/6W	±5%	N0230ECC	RD16U332J
R166	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R167	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R168	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R169	Carbon film	100 ohm	1/6W	±5%	N0132ECC	RD16U101J
R170	Carbon film	2.7k ohm	1/6W	±5%	N0224ECC	RD16U272J
R171	Carbon film	220k ohm	1/6W	±5%	N0396ECC	RD16U224J
R172	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R173	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R174	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R175	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16U470J
R176	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R177	Carbon film	1.5k ohm	1/6W	±5%	N0206ECC	RD16U152J
R178	Carbon film	1.5k ohm	1/6W	±5%	N0206ECC	RD16U152J
R179	Carbon film	3.3k ohm	1/6W	±5%	N0230ECC	RD16U332J
R180	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R181	Carbon film	22k ohm	1/6W	±5%	N0311ECC	RD16U223J
R182	Carbon film	27k ohm	1/6W	±5%	N0316ECC	RD16U273J
R183	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R184	Carbon film	100k ohm	1/6W	±5%	N0371ECC	RD16U104J
R185	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R186	Carbon film	1M ohm	1/6W	±5%	N0445ECC	RD16U105J
R187	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R188	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R189	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R190	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R191	Carbon film	220k ohm	1/6W	±5%	N0396ECC	RD16U224J
R192	Carbon film	15k ohm	1/6W	±5%	N0297ECC	RD16U153J
R193	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R194	Carbon film	22k ohm	1/6W	±5%	N0311ECC	RD16U223J
R195	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R169	Carbon film	220k ohm	1/6W	±5%	N0396ECC	RD16U224J
R197	Carbon film	15k ohm	1/6W	±5%	N0297ECC	RD16U153J
R198	Carbon film	470 ohm	1/6W	±5%	N0167ECC	RD16U471J
R199	Carbon film	47 ohm	1/6W	±5%	N0099ECC	RD16U470J
R200	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R201	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R202	Carbon film	2.2k ohm	1/6W	±5%	N0216ECC	RD16U222J
R203	Carbon film	220k ohm	1/6W	±5%	N0396ECC	RD16U224J
R204	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R205	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R206	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R207	Carbon film	100k ohm	1/6W	±5%	N0371ECC	RD16U104J
R208	Carbon film	2.7k ohm	1/6W	±5%	N0224ECC	RD16U272J
R209	Carbon film	5.1k ohm	1/6W	±5%	N0252ECC	RD16U512J

Ref. No.	Description				RS Part Number	MFR's Part Number
R210	Carbon film	8.2k ohm	1/6W	±5%		RD16U822J
R211	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R212	Carbon film	100k ohm	1/6W	±5%	N0371ECC	RD16U104J
R213	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R214	Carbon film	33k ohm	1/6W	±5%	N0324ECC	RD16U333J
R215	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R216	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R217	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R218	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R219	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16S103J
R220	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16S103J
R221	Carbon film	22k ohm	1/6W	±5%	N0311ECC	RD16U223J
R222	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R223	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R224	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R225	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R226	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R227	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R228	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R229	Carbon film	100k ohm	1/6W	±5%	N0371ECC	RD16U104J
R230	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R231	Carbon film	47k ohm	1/6W	±5%	N0340ECC	RD16U473J
R232	Carbon film	22k ohm	1/6W	±5%	N0311ECC	RD16U223J
R233	Carbon film	470k ohm	1/6W	±5%	N0423ECC	RD16U474J
R234	Carbon film	22k ohm	1/6W	±5%	N0311ECC	RD16U223J
R235	Carbon film	470k ohm	1/6W	±5%	N0423ECC	RD16U474J
R236	Carbon film	33 ohm	1/6W	±5%		RD16U330J
R237	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R238	Carbon film	1 ohm	1/6W	±5%	N0022ECC	RD16U010J
R239	Carbon film	270 ohm	1/6W	±5%	N0155ECC	RD16U271J
R240	Not used					
R241	Metal film	8.2 ohm	1/2W	±5%		ESP1/2U8R2J
R242	Metal film	22 ohm	1/2W	±5%		RD12U220J
R243	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R244	Carbon film	4.7k ohm	1/6W	±5%	N0247ECC	RD16U472J
R245	Carbon film	3.3k ohm	1/6W	±5%	N0230ECC	RD16U332J
R246	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16U102J
R247	Carbon film	470 ohm	1/6W	±5%	N0169ECC	RD16U471J
R248	Carbon film	22 ohm	1/2W	±5%		RD12S220J
R249	Not used					
R250	Not used					
R251	Carbon film	1k ohm	1/6W	±5%	N0196ECC	RD16S102J
R252	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J
R253	Carbon film	220 ohm	1/6W	±5%	N0149ECC	RD16U221J
R254	Carbon film	120 ohm	1/6W	±5%	N0136ECC	RD16U121J
R255	Carbon film	15k ohm	1/6W	±5%	N0297ECC	RD16U153J
⚠ R256	Solid	1.8M ohm	1/2W	±10%	N0521FFB	ERC-12GK185
R257	Carbon film	330k ohm	1/6W	±5%	N0410ECC	RD16U334J
R258	Carbon film	10k ohm	1/6W	±5%	N0281ECC	RD16U103J

RESISTOR ARRAYS			
Ref. No.	Description	RS Part Number	MFR's Part Number
RA1	100k ohm x 9 1/10W ±5%	RX-0201	EXB-Z10E104J
RA2	100k ohm x 8 1/10W ±5%	RX-0199	EXB-Z9E104J

CAPACITORS, TRIMMER			
Ref. No.	Description	RS Part Number	MFR's Part Number
TC101	Trimmer 10pF	C-1743	ECV-1ZW10x53T
TC102	Trimmer 10pF	C-1743	ECV-1ZW10x53T
TC103	Trimmer 10pF	C-1743	ECV-1ZW10x53T
TC104	Trimmer 10pF	C-1743	ECV-1ZW10x53T
TC105	Trimmer 10pF	C-1743	ECV-1ZW10x53T
TC106	Trimmer 30pF	C-1811	ECV-1ZW30x53T

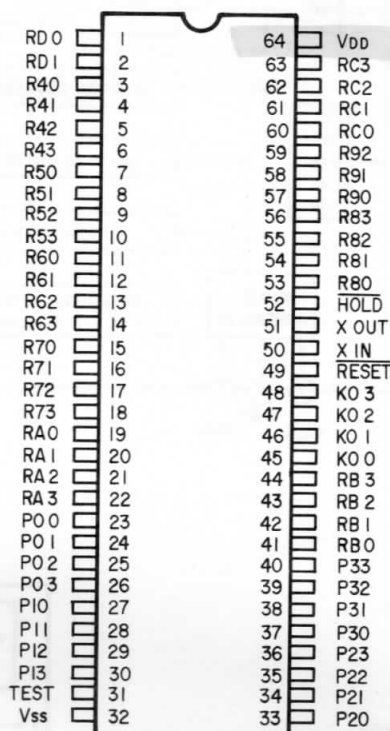
VARIABLE RESISTORS			
Ref. No.	Description	RS Part Number	MFR's Part Number
VR101	Pot. Squelch 10k ohm (C)	P-7878	K1611008TE-10KC -20
VR102	Pot. Volume w/Switch 50k ohm (A)	P-7787	5M1411-50KA-20A

MISCELLANEOUS			
Ref. No.	Description	RS Part Number	MFR's Part Number
J101	Antenna, rod	A-0530	T-1170
SW102	Jack, Antenna	J-1544	PC-7
	Switch, Push (Reset)	S-7041	SKHHLA
	Connector, Housing Assembly (3 Pin Female)	J-5820	GA-85D-6050
	Connector, Housing Assembly (7 Pin Female)	J-5821	GA-85D-6051
	Connector, Housing Assembly (10 Pin Female)	J-5822	GA-85D-6052
J1	Connector, Pin (3 Pin Male)		PI22A03M
J2	Connector, Pin (7 Pin Male)		PI22A07M
J3	Connector, Pin (10 Pin Male)		PI22A10M
	Wire Kit		#531(A)
	Hardware Kit	HW2000114	#531(B)
	Foot	F0446	SJ-5027(BLK)
	Cord, AC	W-3388	UP-953-J01
	Strain Relief, Line Cord	HC-1789	SR-3L-1
	Jumper, Short (12.5m/m Pitch)		ERD25TC0A
	Jumper, Short (10.0m/m Pitch)		ERD25TC0B
TP1~61	Pin, Test		ERD25TC0

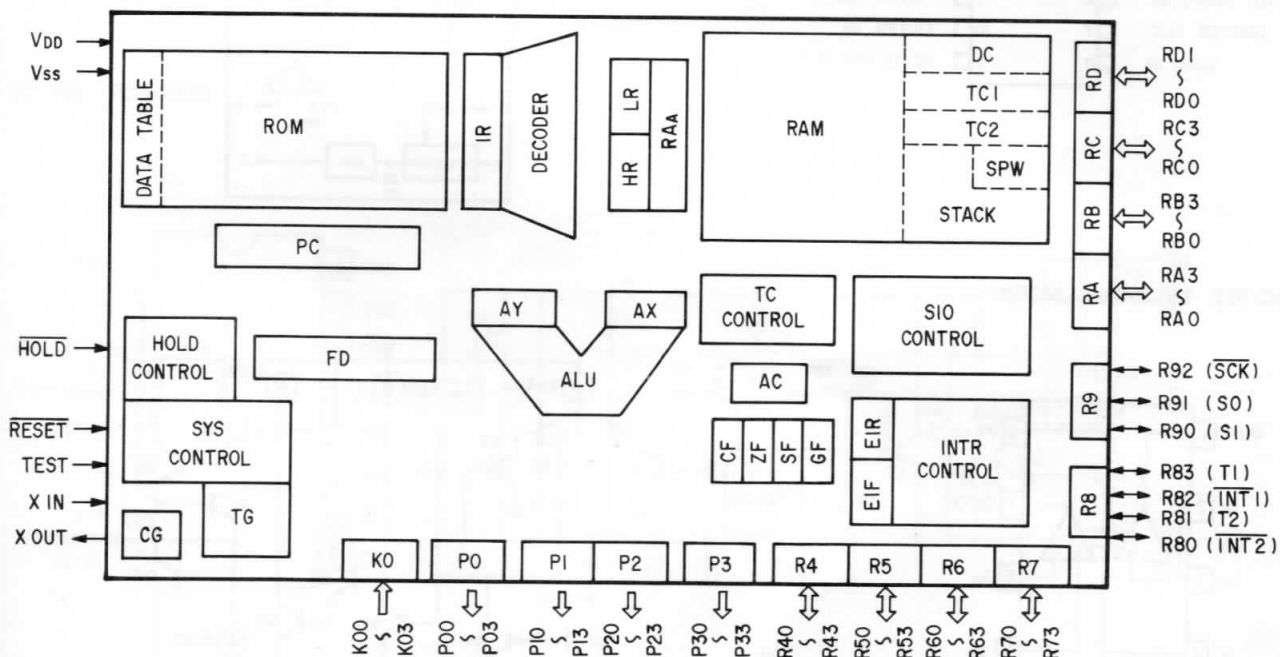
SEMICONDUCTOR LEAD IDENTIFICATION AND IC CIRCUIT DIAGRAM

INTEGRATED CIRCUIT LEAD IDENTIFICATION

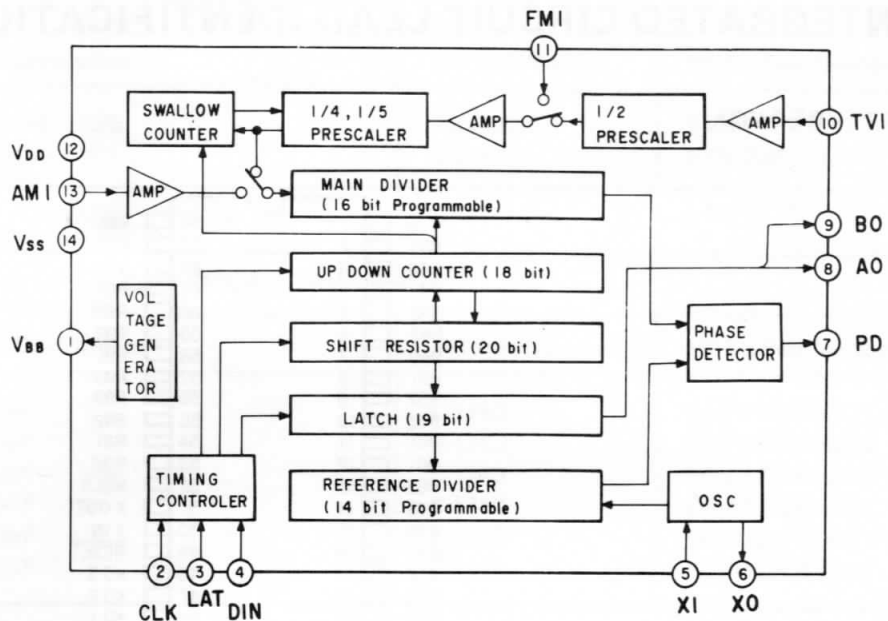
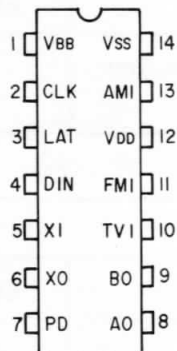
IC-1 GRE-0433A



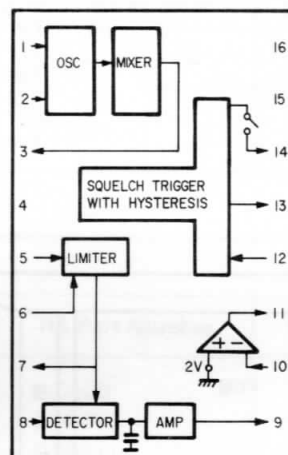
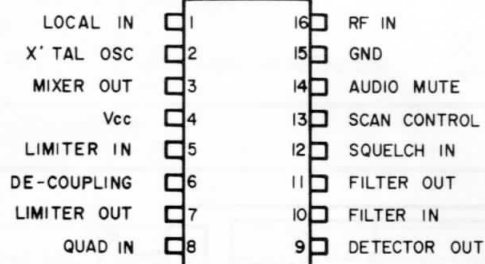
3-5V *P.16*
P.45



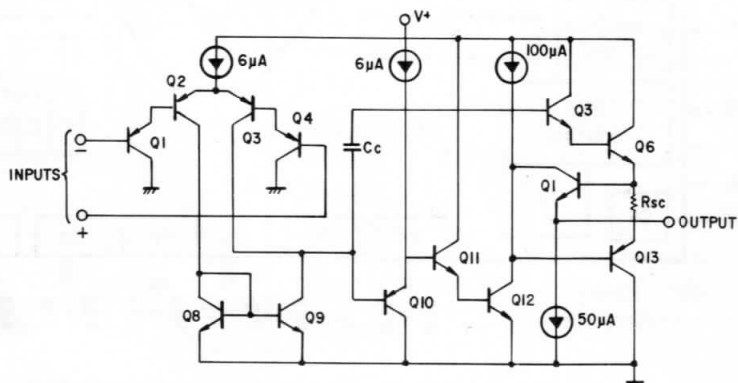
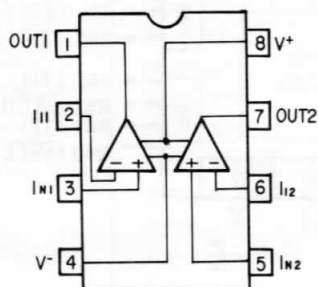
IC-101 CX7925B



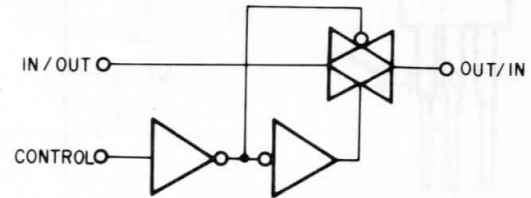
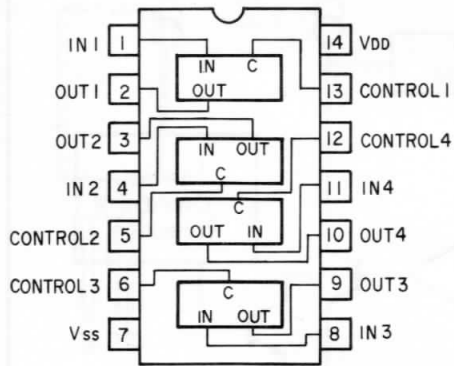
IC-102 TK10420



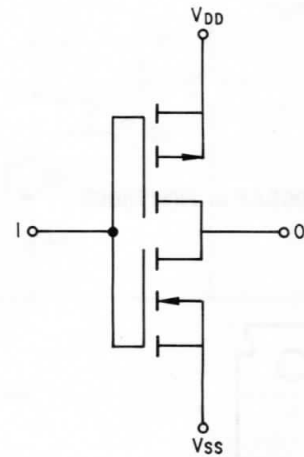
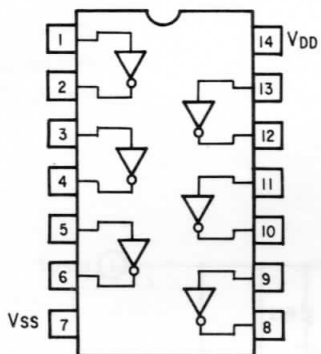
IC-103 MC358 or LM358



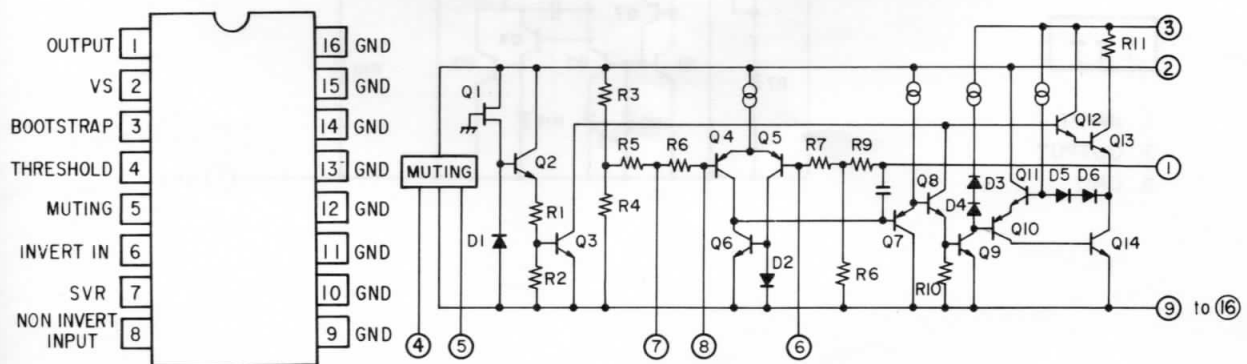
IC-104 TC4066BP



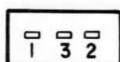
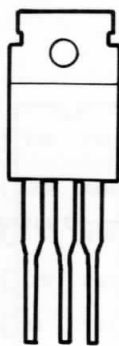
IC-105 TC4069UBP



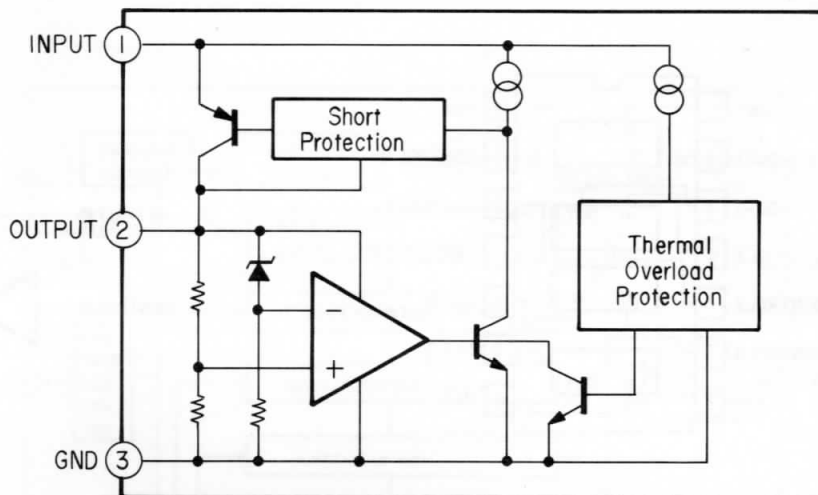
IC-106 TDA1905



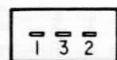
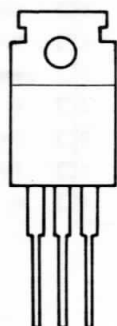
IC-107 TA78DL08P



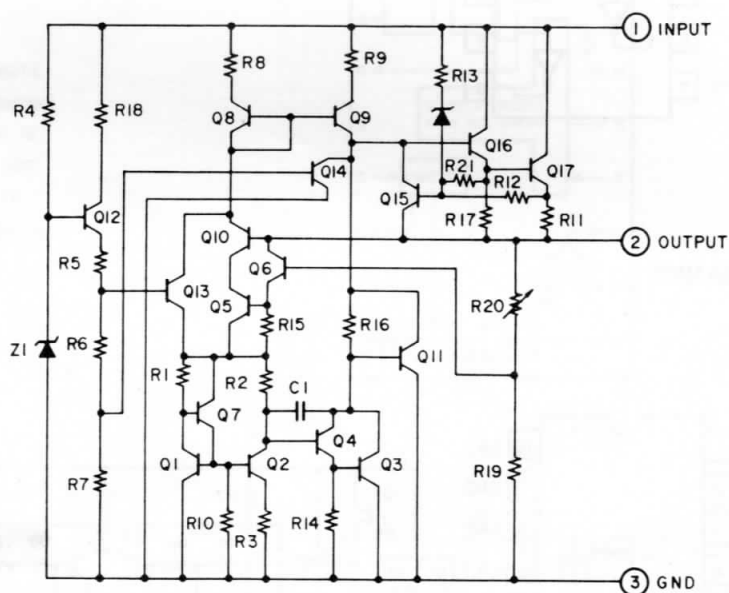
- 1. INPUT
- 2. OUTPUT
- 3. GND



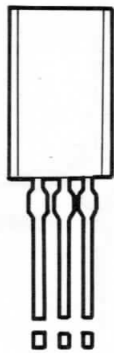
IC-108 TA78005AP or HD178005



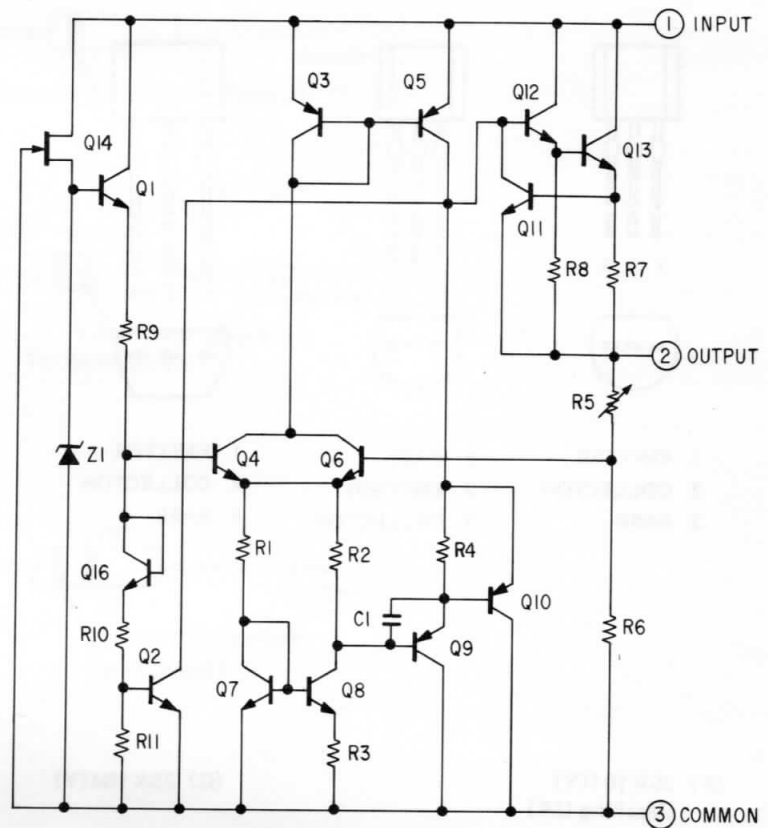
- 1. INPUT
- 2. OUTPUT
- 3. GND



IC-109 TA78L005AP

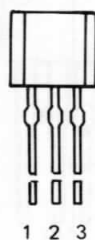


- 1. INPUT
- 2. OUTPUT
- 3. COMMON



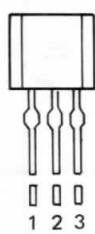
TRANSISTOR LEAD IDENTIFICATION

(A) 2SC2347



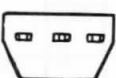
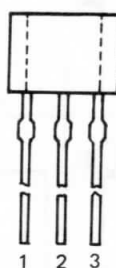
1. EMITTER
2. COLLECTOR
3. BASE

(B) 2SC2498



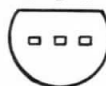
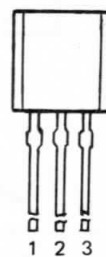
1. BASE
2. EMITTER
3. COLLECTOR

(C) 2SC2458(Y)(GR)
2SC2668(O)
RN2202



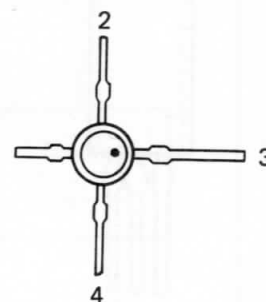
1. EMITTER
2. COLLECTOR
3. BASE

(D) 2SC1627A(Y)



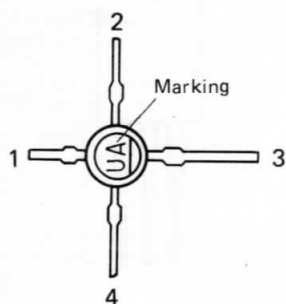
1. EMITTER
2. COLLECTOR
3. BASE

(E) 2SC2464
2SC2466



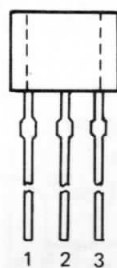
1. EMITTER
2. BASE
3. COLLECTOR
4. BASE

(F) 3SK101(Y)
(Marking UA)



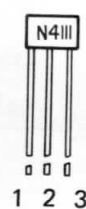
1. GATE 1
2. GATE 2
3. DRAIN
4. SOURCE

(G) 2SK184(Y)



1. DRAIN
2. GATE
3. SOURCE

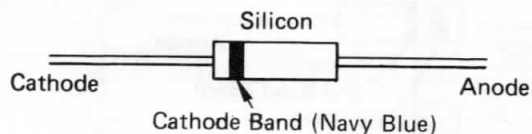
(H) UN4111



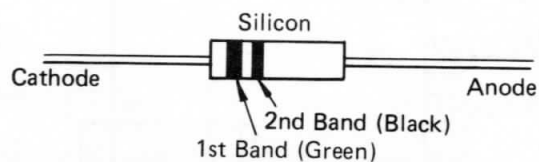
1. EMITTER
2. COLLECTOR
3. BASE

DIODE IDENTIFICATION AND LEAD POLARITY

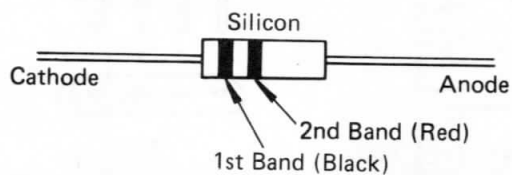
A) 1S2076A



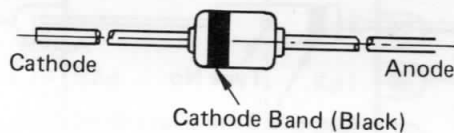
B) 1S85



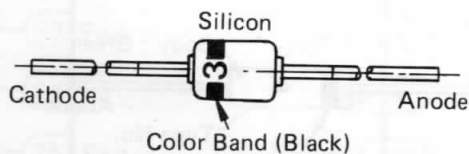
C) 1S2090



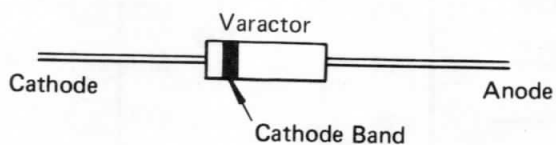
D) 1SV136



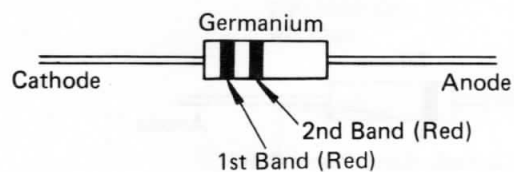
E) 1SV145B



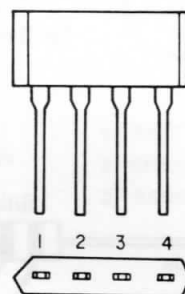
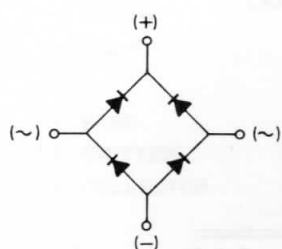
F) BB329



G) 1K261

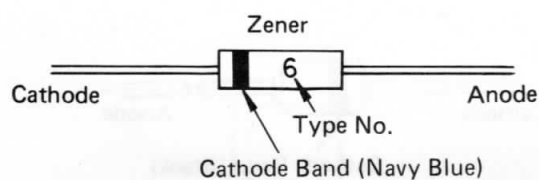


H) 1B4B41

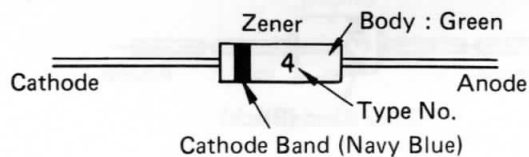


- 1. (+)
- 2. (~)
- 3. (~)
- 4. (-)

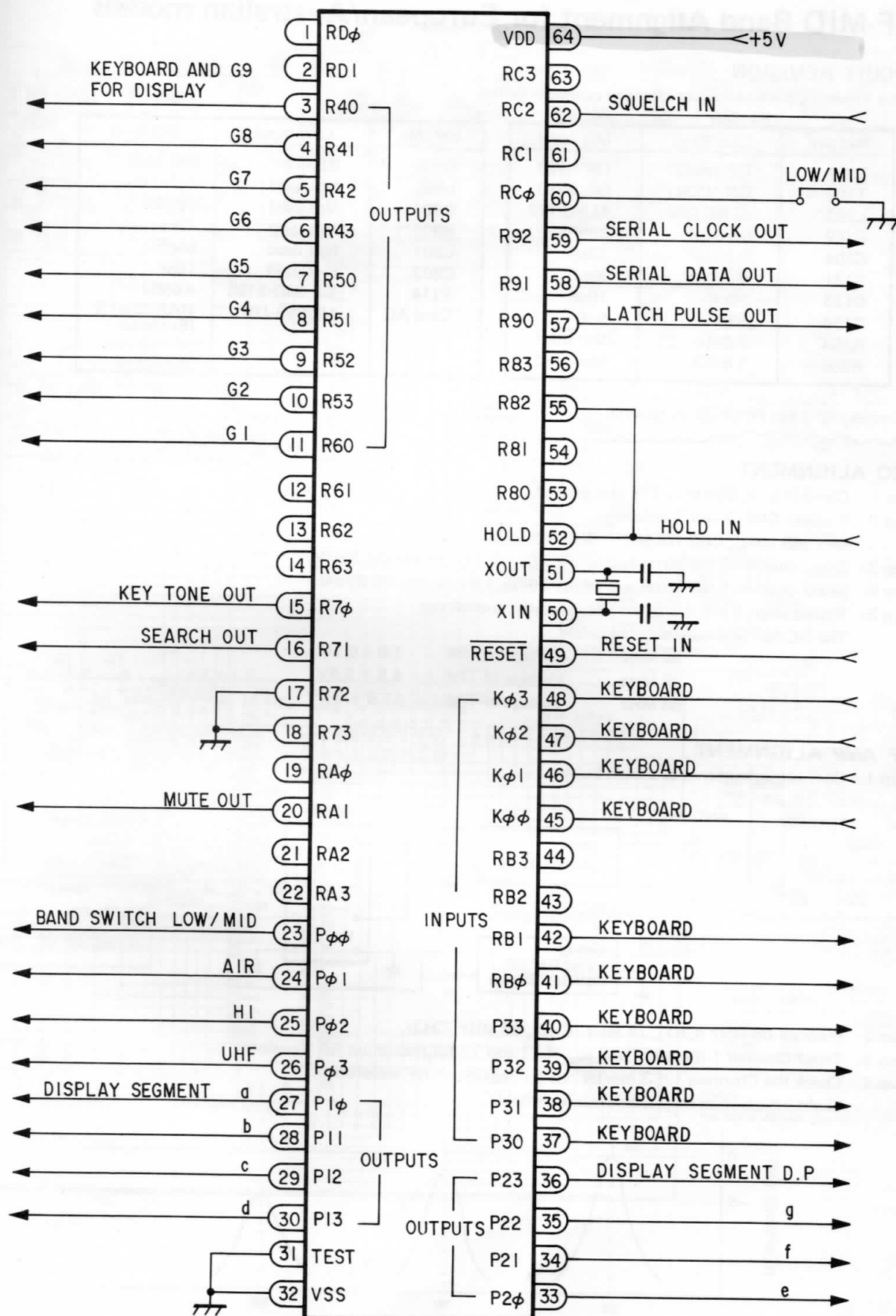
I) HZ5A1, HZ22-1



J) HZ7A1L



MICROPROCESSOR (IC-1) PIN ALLOCATION



APPENDIX

VHF-MID Band Alignment for European/Australian models

CIRCUIT REVISION

1. The following parts should be changed as shown below.

Ref. No.	Low Band	Mid band	Ref. No.	Low band	Mid band
T101	GR-N5431	GR-N791	D116	BB329	Not used
T102	GR-N5341	GR-N791	L901	Not used	4LNC 092
L101	4LNC 092	4LNC 122	D901	Not used	BB329
C102	0.001 μ F	33pF	R901	Not used	47k Ω
C104	0.001 μ F	33pF	C901	Not used	56pF
C131	0.001 μ F	39pF	C902	Not used	18pF
C133	68pF	10pF	T114	GE-84D-5185	K6862
C134	33pF	5pF	Cord AC	UP-953-J101	HAR Class II (European)
R104	2.2k Ω	Not used			SP-150-J10 (Australia)
R256	1.8M Ω	Not used			

2. Connect IC 1 pin 60 (RC0) to ground.

VCO ALIGNMENT

Step 1: Connect a DC SSVM to TP4 and ground.

Step 2: Program CH1, 2 and 3 as follows:

CH1 (68 MHz), CH2 (78 MHz), CH3 (88 MHz)

Step 3: Select channel 3 (88 MHz) and adjust TC3 for 11V on the DC SSVM.

Step 4: Select channel 1 (68 MHz) and adjust T6 for 1.5V on the DC SSVM.

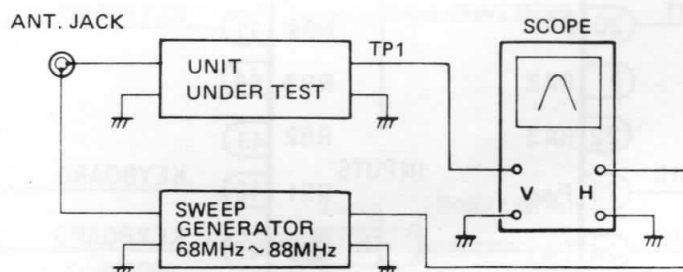
Step 5: Repeat steps 3 and 4 until no improvement is observed.

The DC SSVM should show as below.

68 MHz	Voltage of TP4	1.0 $\pm$ 0.1V
78 MHz	Voltage of TP4	4.8 ~ 5.8V
88 MHz	Voltage of TP4	11.0 $\pm$ 0.1V

RF AMP ALIGNMENT

Step 1: Connect instruments as shown below.

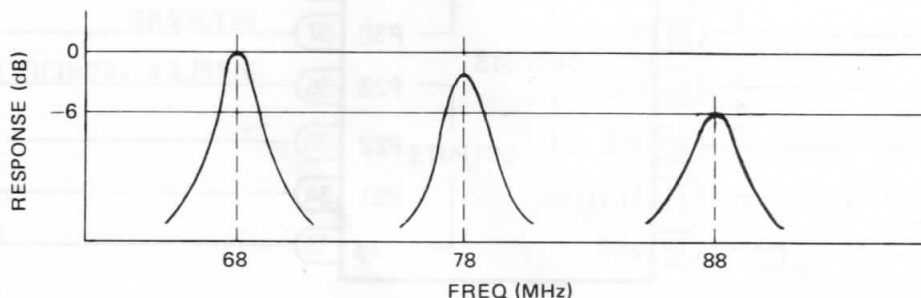


Step 2: Program 68 MHz (CH1), 78 MHz (CH2), 88 MHz (CH3).

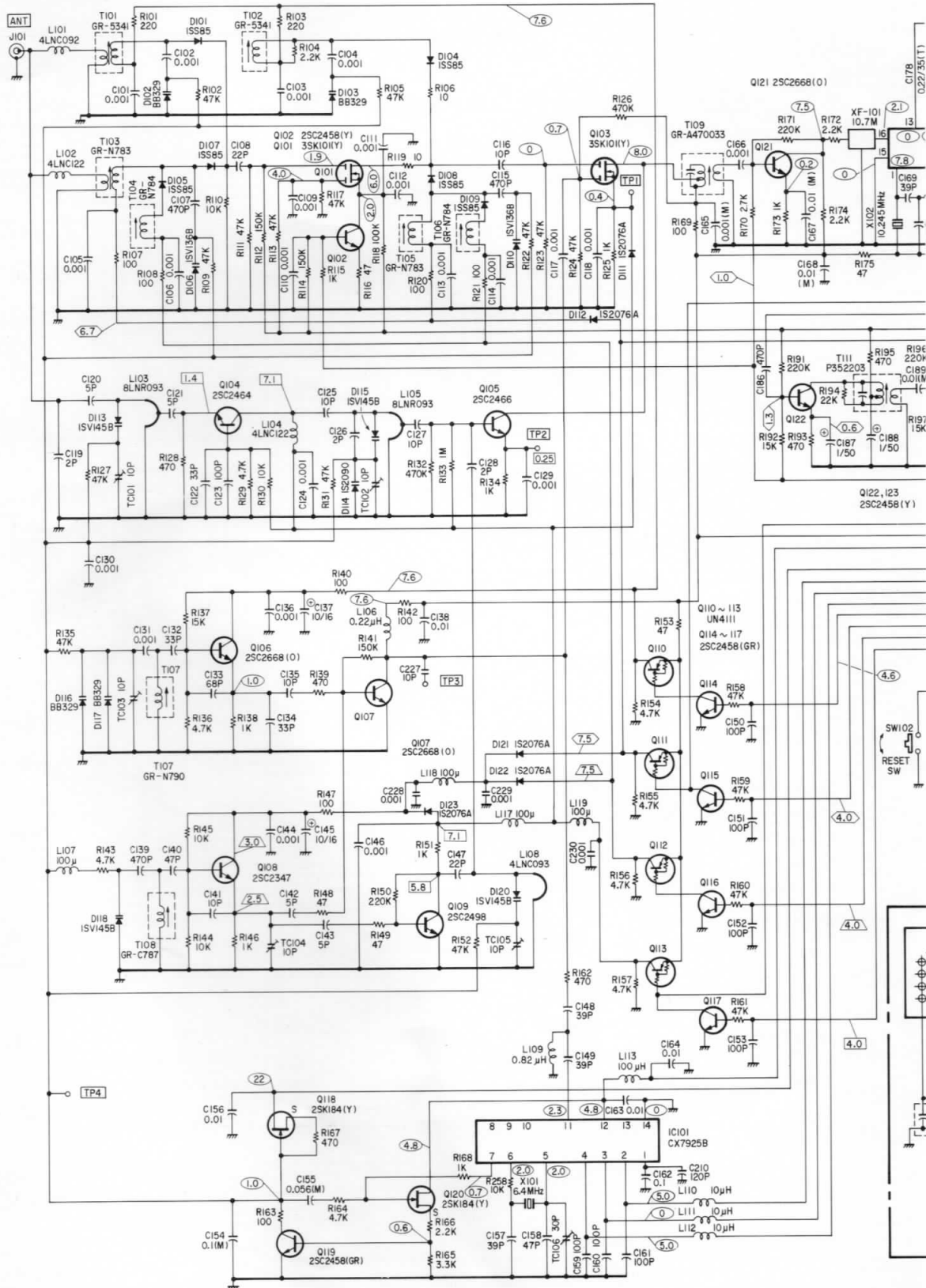
Step 3: Select Channel 1 (68 MHz) and adjust T1 and T2 for maximum RF waveform.

Step 4: Check the Channels 1 ~ 3 one by one for maximum RF waveform.

Slight deviation as shown below is acceptable.



SCHEMATIC DIAGRAM



NOTES:

1. RESISTANCE VALUES IN OHMS (K=1000, M=1000000)
2. CAPACITANCE VALUES IN μF (P= μF)
3. (T): TANTALUM CAPACITOR
4. (M): MYLAR CAPACITOR
5. NO SUFFIXED CERAMIC CAPACITOR
6. DENOTES DC VOLTAGE MEASURED WITH DC VOLTMETER (100K Ω /V) UNDER FOLLOWING CONDITIONS CH I LOW BAND AT 30MHz MANUAL OPERATION, VOLUME AT MINIMUM AND SQUELCH CCW.

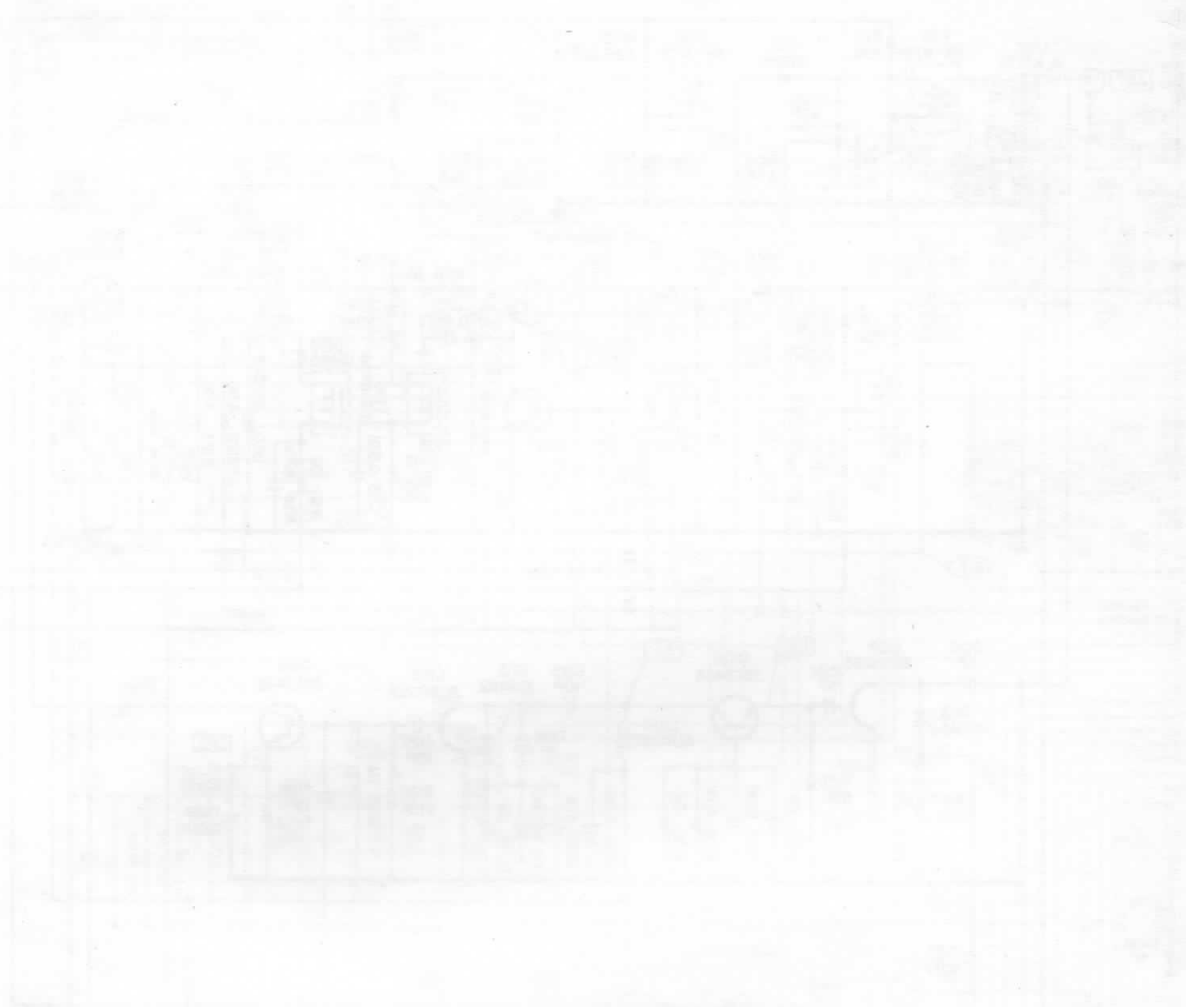
7. DENOTES VOLTAGE FOR AIRCRAFT BAND OPERATION
8. DENOTES VOLTAGE FOR HIGH BAND OPERATION
9. DENOTES VOLTAGE FOR UHF BAND OPERATION

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FIG. 1

CAUTION: SINCE THE COMPONENTS MARKED BY A ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.

MARGID BAND SCHEMATIC DIAGRAM
FOR EUROPEAN/AUSTRALIAN MODELS



U.S. PATENT NOS.

3,794,925
3,801,914
3,961,261
3,962,644
4,027,251
4,092,594
4,123,715
4,245,348

CUSTOM MANUFACTURED FOR RADIO SHACK
A Division of Tandy Corporation

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

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