

REALISTIC[®]

ServiceManual

20-300/9300-07

PRO-43 PROGRAMMABLE SCANNER

Catalog Number: 20-300/9300

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SPECIFICATIONS

Frequency Coverage	VHF LOW	*1 30 MHz - 54 MHz	5 kHz steps
	VHF AIRCRAFT	118 MHz - 136.975 MHz	25 kHz steps
	VHF HIGH-1	137 MHz - 174 MHz	5 kHz steps
	VHF HIGH-2	220 MHz - 225 MHz	5 kHz steps
	VHF HIGH-3	225.0125 MHz - 350 MHz	12.5 kHz steps
	UHF LOW	350.0125 MHz - 512 MHz	12.5 kHz steps
	UHF HIGH	*2 806 MHz - 823.9375 MHz	12.5 kHz steps
		851 MHz - 868.9375 MHz	12.5 kHz steps
		896 MHz - 999.9875 MHz	12.5 kHz steps
*1 68 - 88 MHz for 20-9300			
*2 806 - 960 MHz for 20-9300			

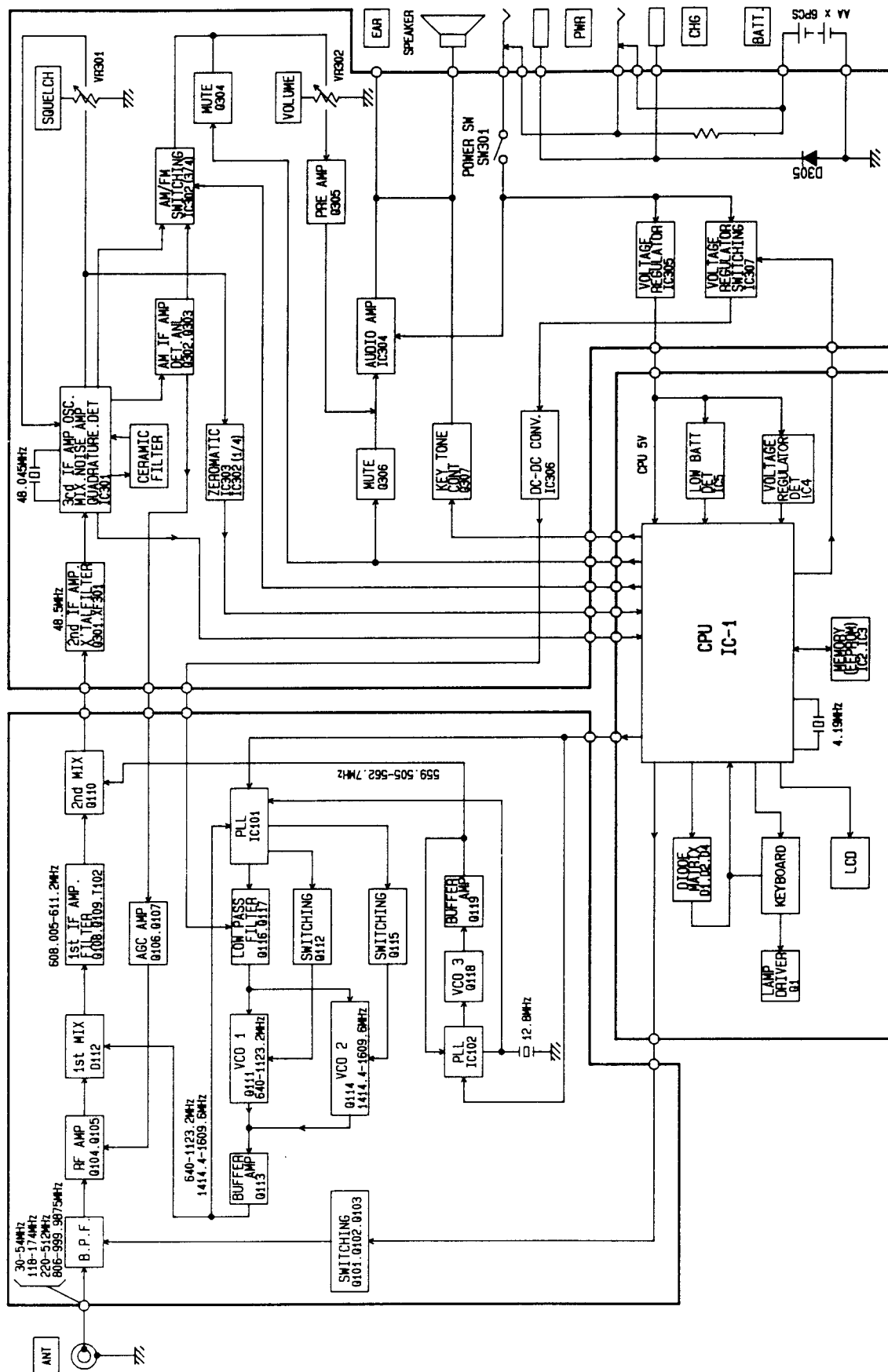
		Unit	Nominal	Limit
Sensitivity FM: (S+N)/N=20 dB DIV.: 3 kHz at 1 kHz	30 MHz - 54 MHz	μV	1.0	2.0
	118 MHz - 136.975 MHz	μV	1.0	2.0
	137 MHz - 174 MHz	μV	1.0	2.0
	220 MHz - 225 MHz	μV	1.0	3.0
	225.0125 MHz - 350 MHz	μV	1.0	3.0
	350.0125 MHz - 512 MHz	μV	1.0	3.0
	806 MHz - 999.9875 MHz	μV	1.0	3.0
AM: (S+N)/N=20 dB MOD.: 60% at 1 kHz	30 MHz - 54 MHz	μV	2.0	5.0
	118 MHz - 136.975 MHz	μV	2.0	5.0
	137 MHz - 174 MHz	μV	2.0	5.0
	220 MHz - 225 MHz	μV	2.0	5.0
	225.0125 MHz - 350 MHz	μV	2.0	5.0
	350.0125 MHz - 512 MHz	μV	2.0	5.0
	806 MHz - 999.9875 MHz	μV	2.0	5.0
Squelch Sensitivity	at threshold	μV	1.0	3.0
	at tight (S+N)/N (FM)	dB	30	15
	at tight (S+N)/N (AM)	dB	20	10
	at 328 MHz (FM)	dB	40	30
Spurious Rejection (except primary image)				
Modulation Acceptance (EIA RS-204-A)		kHz	±8	±5
Signal to Noise Ratio				
FM:	30 MHz - 54 MHz	dB	40	30
	118 MHz - 136.975 MHz	dB	40	30
	137 MHz - 174 MHz	dB	40	30
	220 MHz - 225 MHz	dB	40	30
	225.0125 MHz - 350 MHz	dB	40	30
	350.0125 MHz - 512 MHz	dB	35	25
	806 MHz - 999.9875 MHz	dB	35	25
AM:	30 MHz - 54 MHz	dB	40	30
	118 MHz - 136.975 MHz	dB	40	30
	137 MHz - 174 MHz	dB	40	30
	220 MHz - 225 MHz	dB	40	30
	225.0125 MHz - 350 MHz	dB	40	30
	350.0125 MHz - 512 MHz	dB	35	25
	806 MHz - 999.9875 MHz	dB	35	25

Note: RF Input 100 μV, Mod. 60% at 1 kHz

Residual Noise	(Vol. Min., Squelched)	mV	3	5
Scanning Rate		channels/sec	25	22 - 28
Search Rate		steps/sec	50	47 - 53
Priority Sampling		sec	2	1 - 3
Scan Delay Time		sec	2	1 - 3
Audio Output	T.H.D. 10%	mW	180	150
	Max. Power	mW	250	180
T.H.D. at 50 mW		%	3	8
Current Drain	Squelched	mA	85	100
Channels of Operation	Any 200 channels in any band combination			
Channels, Frequency, and Mode Display	Liquid Crystal Display			
Receiving System	Direct Key Entry Digital-Controlled Synthesizer, Superheterodyne			
	1st IF: 608.005 MHz - 611.2 MHz			
	2nd IF: 48.5 MHz			
	3rd IF: 455 kHz			
Power Source	9 Volt DC negative ground only			
	6 AA Batteries or a suitable adapter			
Temperature Range	Test to specification between +64°F and +95°F (+18°C and +35°C)			
Dimensions	5 3/4(H) × 2 3/4(W) × 1 5/8(D) inches (145 × 58 × 42 mm)			
Weight	8.8 oz. (250 g) without antenna and batteries			

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 represents the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet limit specs.

BLOCK DIAGRAM



PRINCIPLES OF OPERATION

The PRO-43 is a Phase Locked Loop (PLL) synthesized VHF/UHF, AM/FM receiver, controlled by a Central Processing Unit (CPU) via a keyboard.

Receiving mode and search step are initially set to correspond with the frequencies entered. When a frequency in active radio band, police, fire, ham radio, etc. is keyed in, the mode is set to FM and when a frequency in aircraft band is keyed in, the mode is set to AM. The mode can also be changed by the AM/FM key.

All functions, such as the receiving frequency range, frequency determination, scanning and delay time, etc. are controlled by the CPU (IC1). The CPU is able to do only the assigned functions and no modification of the CPU is feasible.

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

Varactor (variable capacitance diode) tuning ("automatic tuning system") is employed on all bands.

The RF input circuit consists of bandpass filters (B.P.F.). A signal generated by VCO1 or VCO2 is applied to the 1st mixer and mixed with the RF signal. The 1st mixer is employed to facilitate 30 MHz to 999.9875 MHz mixing.

The 1st IF (Q108, Q109) is 608.005 - 611.2 MHz, and the signal is mixed with VCO3 frequency at the 2nd mixer (Q110) to produce a 48.5 MHz signal, which is applied to the 2nd IF (Q301). Corresponding with input from the keyboard, the CPU selects VCO1 or VCO2 and determines the AM/FM data of the PLL circuit that will function; then it outputs the necessary data.

A signal entered to IF is mixed with a crystal oscillation frequency of 48.045 MHz at the 3rd mixer (IC301) and converted to a 455 kHz signal. The signal is further amplified to be detected as an AF signal.

The AF signal of AM and FM is CPU-controlled and applied to the AF power amplifier (IC304) via a switching circuit. Squelch signals are comprised of noise products from detector output, and amplified by IC301 through a switching signal, which controls the AF mute and CPU.

CX1 (4.19 MHz) is a clock which controls the CPU. Figure B shows the clock waveform at Pin58 of IC1.

The unit has battery-saving control in manual mode. When the unit is in operation, Pin61 of IC1 (CPU) is "H" and IC307 is on. If there has been no signal input or no key input for more than 5 seconds in manual mode with squelch on, Pin74 goes "L" (Figure A), turning off IC307 to shut off the power supply for most of the circuits (except the CPU and audio circuit). In this battery-saving mode, the unit uses only about 30% of the power required for normal operation.

Any unstable supply voltage to the CPU can produce a CPU malfunction, such as wrong data processing, wrong data transfer, etc. To overcome this, the CPU can be initialized when necessary. To initialize the CPU, press and hold [CLEAR] and [0] and then turn on the power.

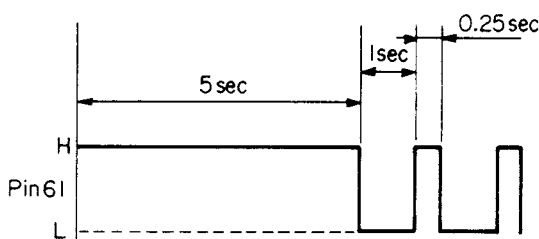


Figure A

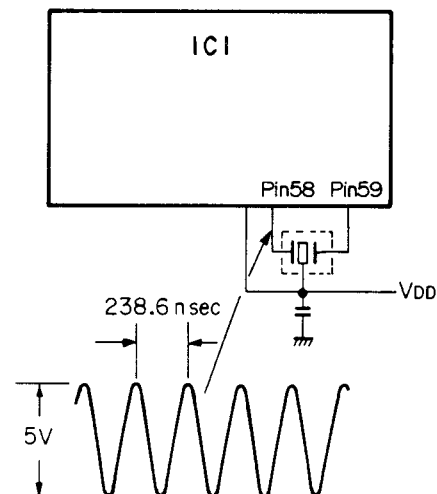
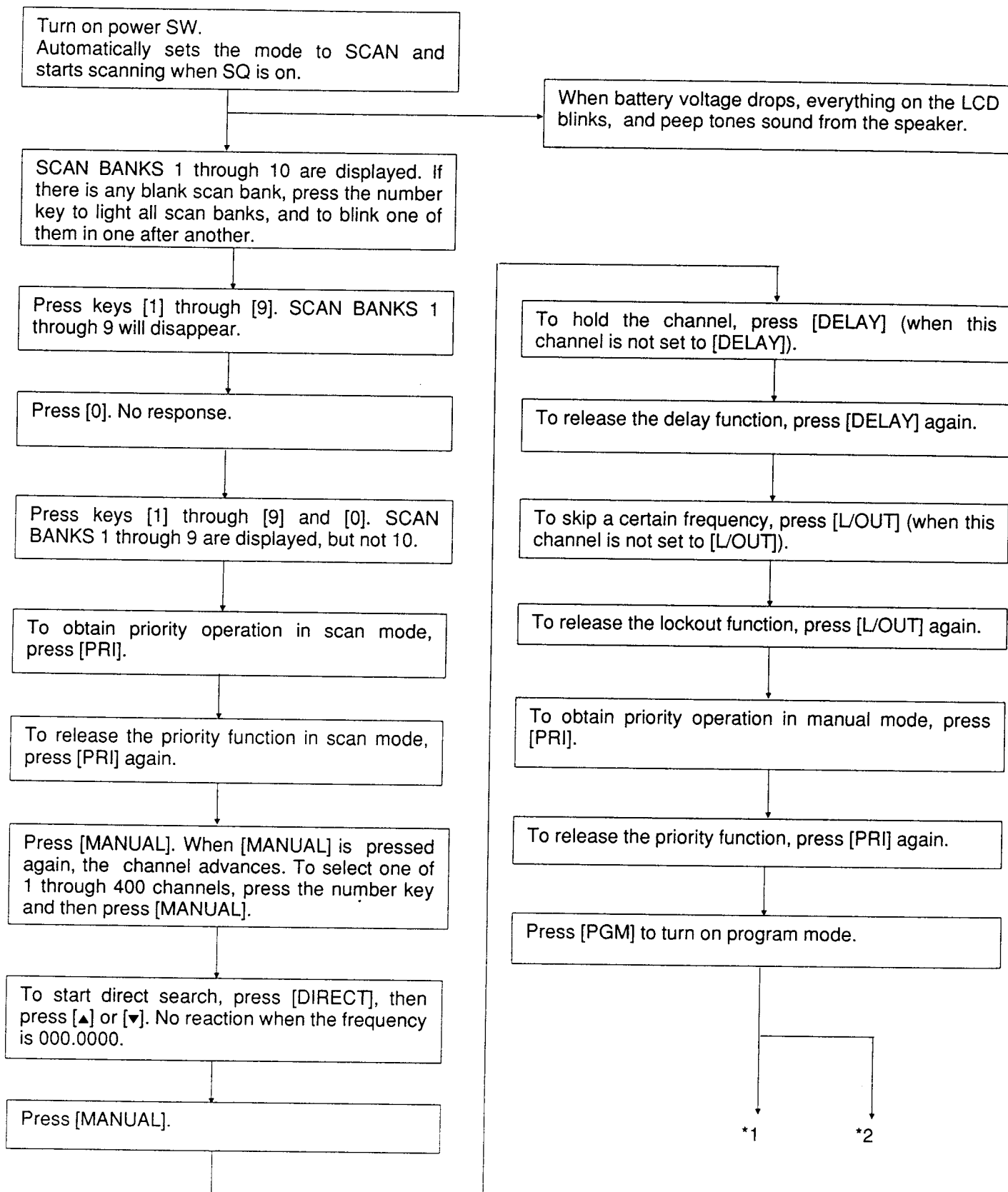
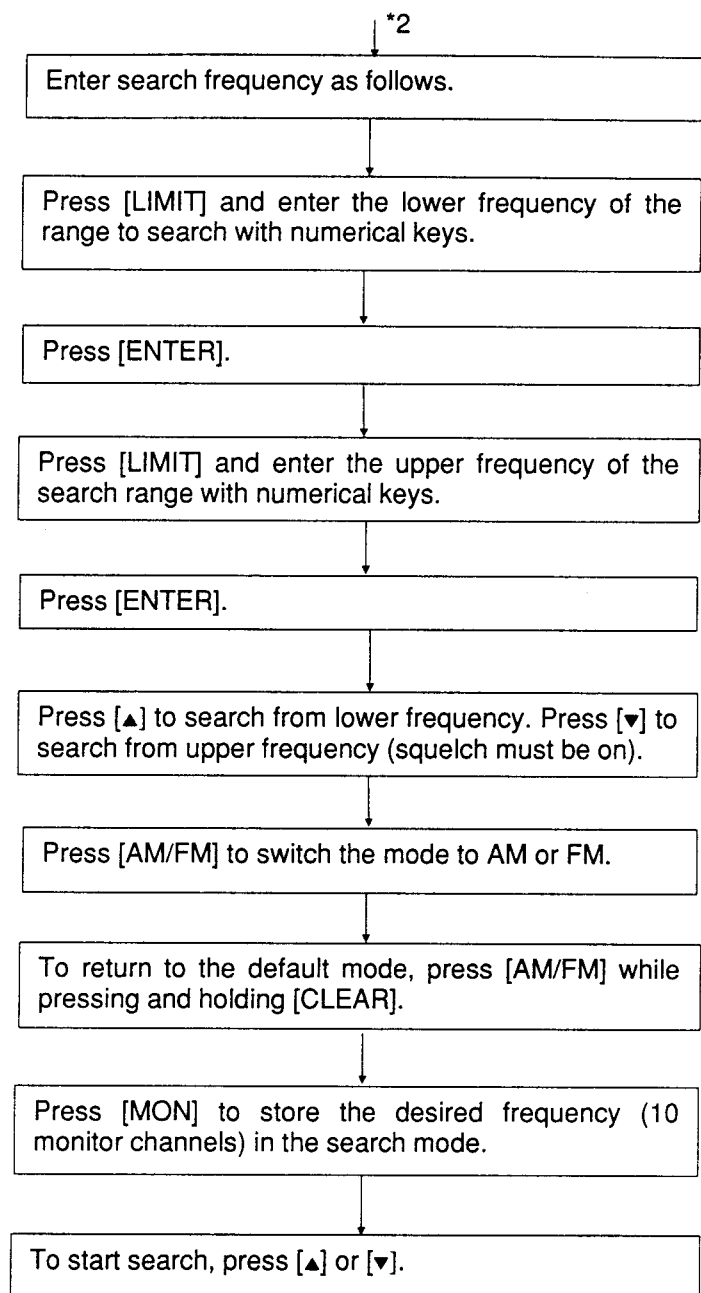
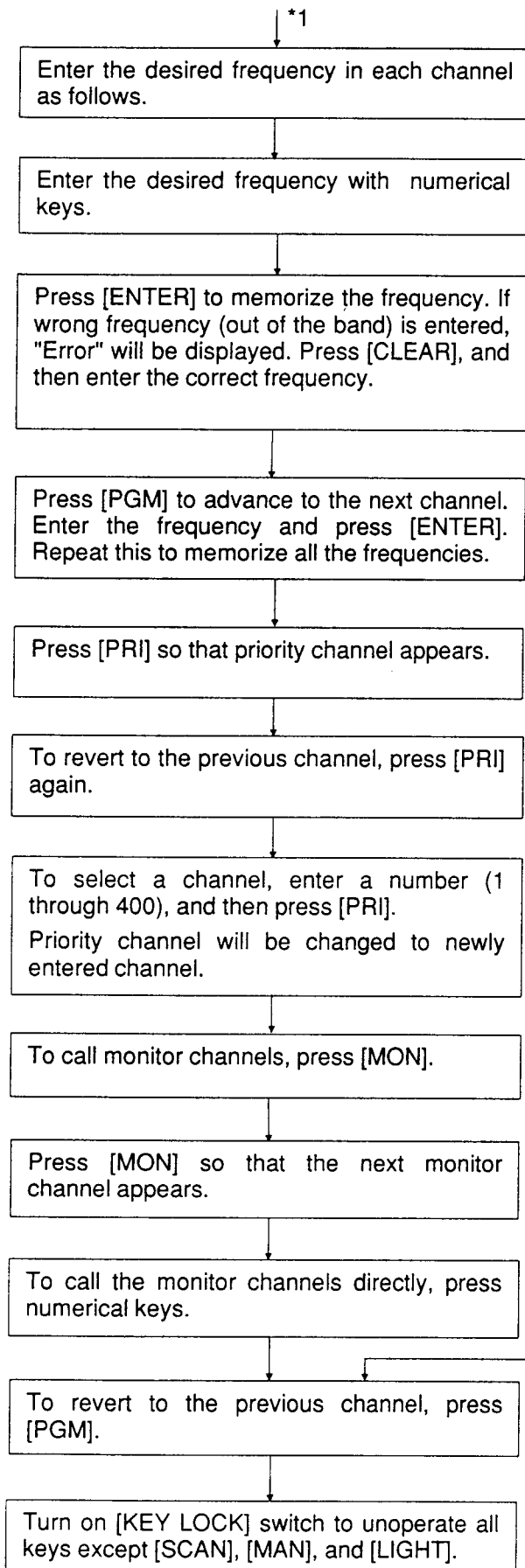


Figure B

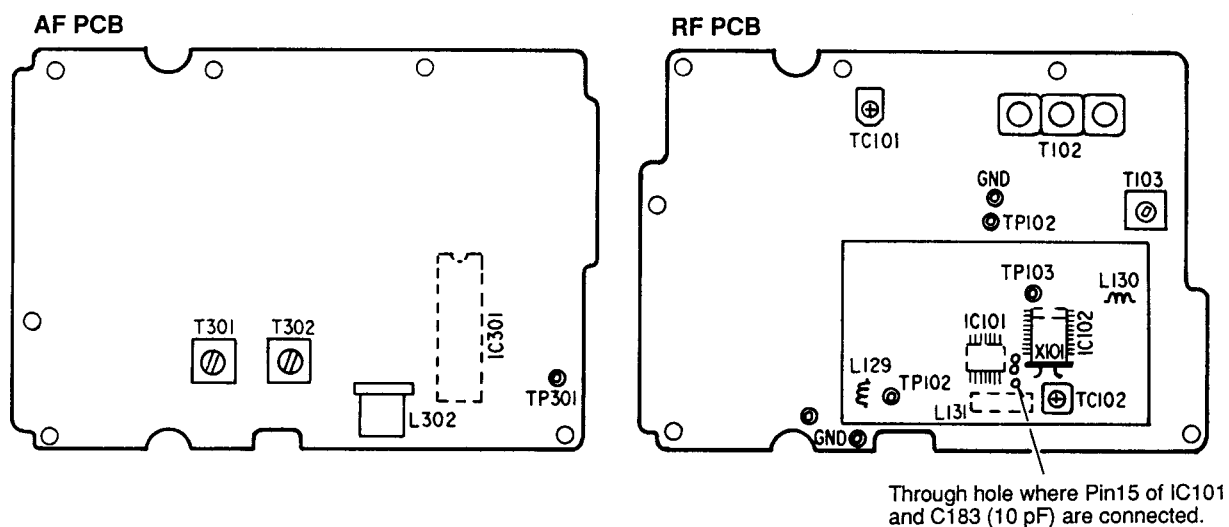
GENERAL OPERATION OUTLINE





ALIGNMENT/ADJUSTMENT

Alignment and Test Point Locations



Test equipment required:

- Oscilloscope
- AC SSVM
- DC SSVM
- 8-ohm dummy load
- AM/FM signal generator (30 to 1000 MHz)
- Distortion meter
- Frequency counter (1200 MHz)

Note:

- Use non-metallic tuning tools.
- The test equipment and the receiver should be warmed up for at least 30 minutes before proceeding to alignment.
- The signal level from the generator should be kept as low as possible to obtain a usable output.

Program CH1 to CH7 as follows:

Channel	Frequency(MHz)	(FM/AM Mode)
1	30.0000	(FM)
2	512.0000	(FM)
3	999.9875	(FM)
4	287.0000	(AM)
5	510.4000	(FM)
6	31.9950	(FM)
7	32.0000	(FM)

Table 1

Alignment Procedures

Alignment of VCO (PLL 2)

Step	Control Setting Channel Programming	Test Instrument Connection	Adjust	Remarks
1	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW (counterclockwise). Select Channel 1.	Connect DC SSVM to TP103 and GND as shown in Figure 1.	L130	Adjust L130 to 2.4 volts on the DC SSVM, as shown in Table 3.

Alignment of VCO (PLL 1)

Step	Control Setting Channel Programming	Test Instrument Connection	Adjust	Remarks
2	OFF/VOLUME Control: ON. SQUELCH Control: CCW. Select Channels 2 and 3.	Connect DC SSVM to TP102 and GND as shown in Fig. 2.	L129	1) Select Channel 2 and adjust L129 to 25.5 volts on the DC SSVM, as shown in Table 2. 2) Select Channel 3 and be sure the DC SSVM shows 9.5-12 volts. (No adjustments are necessary for the coil.)

Note: Repeat Step 1 and Step 2 until no further improvement is obtained. See Table 3.

Figure 1

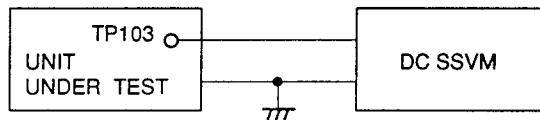


Figure 2

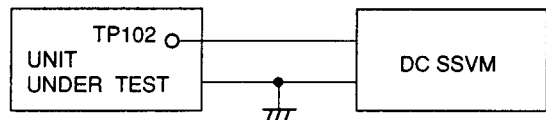


Table 2

Coil L129, L130	Coil Alignment (Open)	Coil Alignment (Closed)
Figure 3	Figure 4	Figure 5
Note: - Be very careful when doing coil interval alignment because it greatly affects the frequency. - Secure the coil with glue after alignment. Be sure the glue is dry and the coil is secure. Also, be sure that the environmental temperature is normal. Then, repeat Step 1 and Step 2 above.		
	Open the coil as shown above by using a non-metallic tuning tool when the measuring voltage at TP102 or TP103 is higher than the setting voltage.	Close the coil as shown above by using a non-metallic tuning tool when the measuring voltage at TP102 or TP103 is lower than the setting voltage.

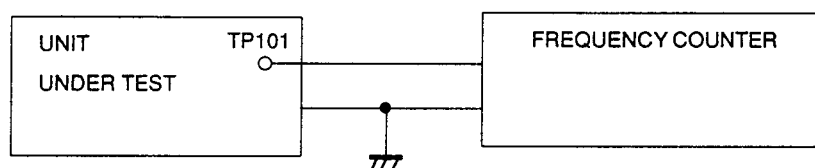
Table 3

CH	Frequency	Voltage
CH1	30 MHz	Voltage at TP103: 2.3–2.5 volts
CH2	512 MHz	Voltage at TP102: 2.5–2.6 volts
CH3	999.9875 MHz	Voltage at TP102: 9.5–12 volts

Reference Frequency OSC Alignment

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
3	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 2.	Connect Frequency counter to TP101 and GND, as shown in Figure 3.	TC102	Adjust TC102 so that the frequency is 1123.200000 ± 300 Hz.

Figure 3



Note: If no frequency counters capable of measuring 1200 MHz are available, use a frequency counter capable of measuring 20 MHz. Follow the instructions below and the frequency counter can do an approximate adjustment.

1. The frequency counter for measurement should be accurate within 1 Hz.
2. Be sure a 2 pF capacitor is connected to the end of the cable of the signal line. The unit would be destroyed if you did not use this capacitor.

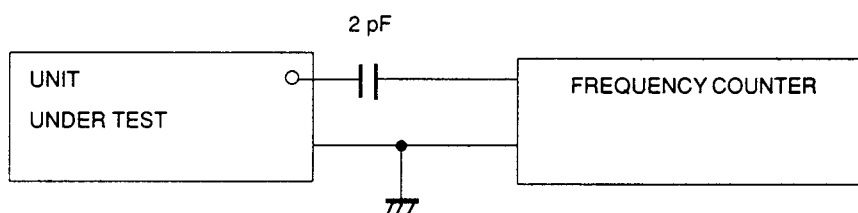
If a capacitor other than the 2 pF capacitor is used, or if the capacitor is connected anywhere other than the end of the measurement cable, correct measurement will never be obtained because of the effects on the oscillator.

3. Be sure the coaxial cable for measurement is as short as possible (shorter than 1 meter) to avoid stray capacitance effects.

4. Test point locations and adjustment frequency range:

Pin15 of IC101 and C183 (10 pF) are connected to a through hole, as shown in "Alignment and Test Point Locations" (Page 8). Connect a 2 pF capacitor at the through hole pattern location and then adjust TC102 so that the frequency range is $12.799937 \text{ MHz} \pm 2 \text{ Hz}$.

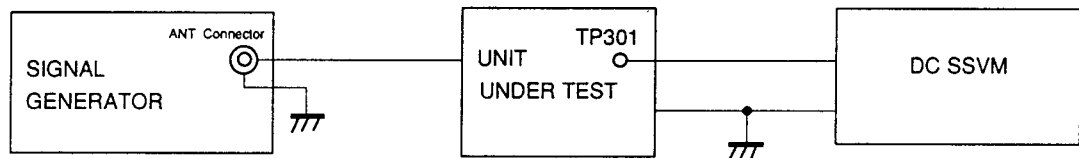
Figure 4



Alignment of 455 kHz FM Discriminator Coil

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
4	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 1.	Connect signal generator to ANT connector and DC SSVM to TP301, as shown in Figure 5.	L302	Set the signal generator frequency to 30 MHz, 100 μ V output (NO MOD), and adjust L302 to 2.3 V (± 0.1 V) on the DC SSVM.

Figure 5



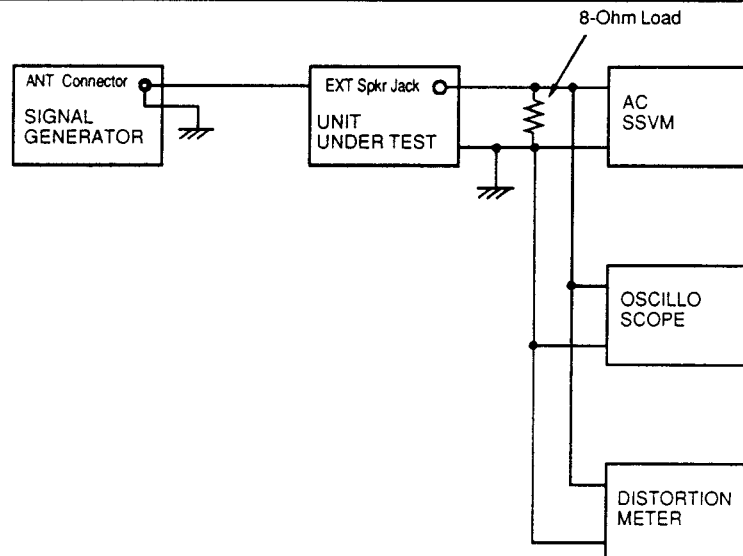
Alignment of 48.5 kHz 2nd IF Coil

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
5	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 4.	Connect signal generator to ANT connector, and oscilloscope, AC SSVM, distortion meter, and 8-ohm load to EXT speaker jack, as shown in Figure 6.	T103	1) Set the signal generator frequency to 287 MHz. AM: 60% modulation at 1 kHz and output at S/N 20 dB point. 2) Adjust T103 for maximum sensitivity.

Alignment of IF TRAP Trimmer Capacitor

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
6	Channel Programming OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 5.	Same as Step 5	TC101	1) Set the signal generator frequency to 609.6 MHz. FM: 3 kHz deviation, 1 kHz modulation, and output approx. 300 μ V. 2) Adjust TC101 to minimum sensitivity.

Figure 6



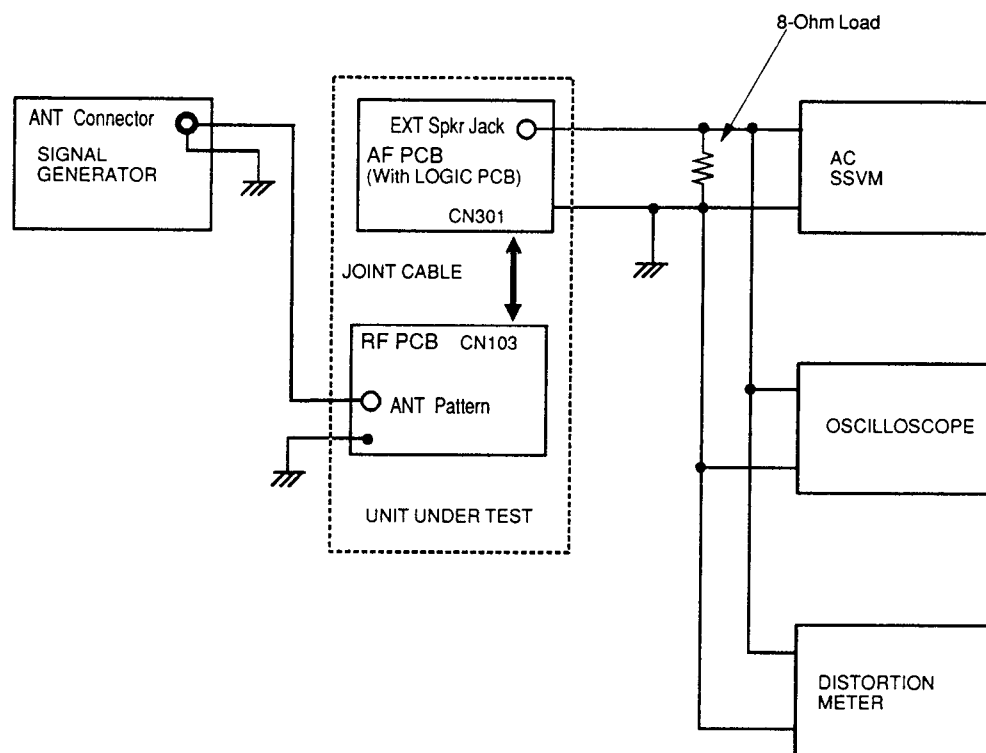
Alignment of 455 kHz IF Coil

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
7	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 4.	Remove RF PCB and connect CN301 (AF PCB) and CN103 (RF PCB) with joint cable. Connect Signal Generator and RF PCB's ANT pattern with coaxial cable. Connect oscilloscope, AC SSVM, distortion meter, and 8-ohm dummy load to EXT speaker jack, as shown in Figure 7.	T301	1) Set the signal generator frequency to 287 MHz. AM: 60% Mod. at 1 kHz and output at S/N 20 dB point. 2) Adjust T301 for maximum sensitivity.

Alignment of 455 kHz AM Det. Coil

Step	Control Setting	Test Instrument Connection	Adjust	Remarks
8	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channel 5.	Same as Step 7.	T302	1) Set the signal generator frequency to 287 MHz. AM: 60% Mod. at 400 Hz and output at 100 μ V. 2) Adjust T302 to minimum T.H.D. point.

Figure 7



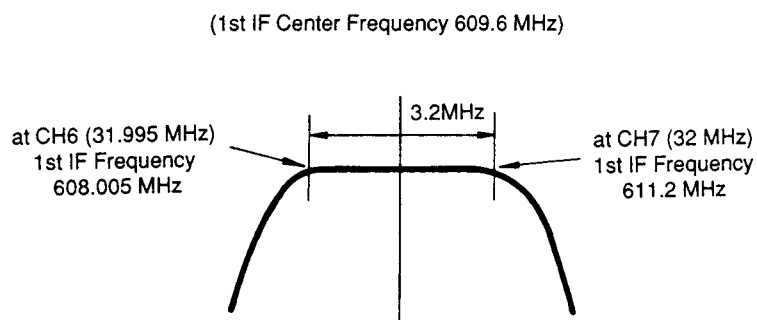
Note: Alignment of T102 (B.P. F. coil)

Do not adjust this coil because T102 is already adjusted at the factory. If the coil is moved by mistake, adjust it as indicated below. Characteristics of this bandpass filter (B.P.F.) are shown in Figure 7.

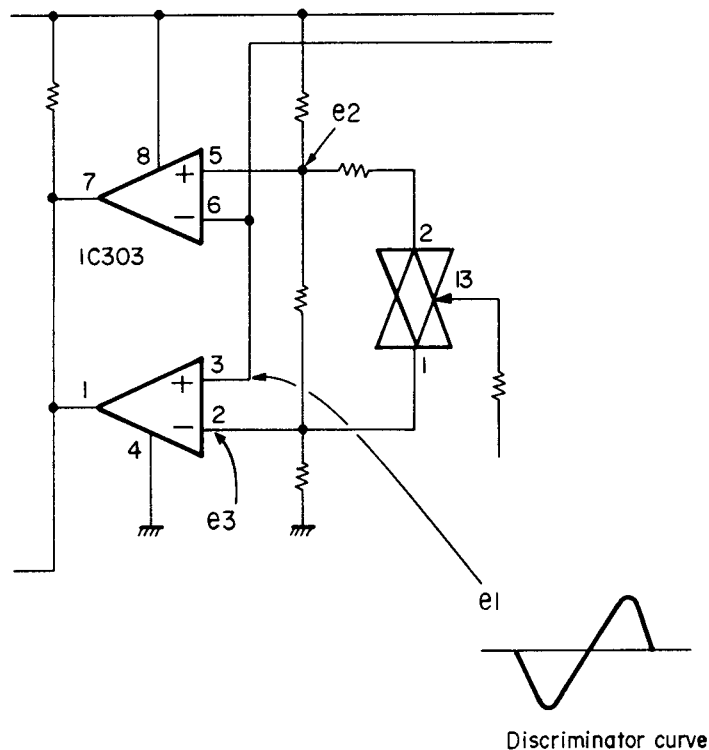
Alignment of 1st IF (608.005 to 611.2 MHz) B.P.F. Coil

Step	Control Setting Channel Programming	Test Instrument Connection	Adjust	Remarks
9	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Select Channels 6 and 7.	Same as Step 5.	T102	1) Select Channel 6 and set the Signal Generator frequency to 31.995 MHz. FM: 3 kHz deviation, 1 kHz modulation, and 0.5 microvolt output. 2) Adjust T102 to maximum sensitivity. 3) Select Channel 7 and set the signal generator frequency to 32 MHz. FM: 3 kHz deviation at 1 kHz and 0.5 microvolt output. 4) Readjust T102 to maximum sensitivity. Note: Align the balance of CH6 and CH7 sensitivity to the same.

Figure 8



Zeromatic Function Test Procedure



(Zeromatic function operates when OUTPUT is "H".)

	$0 < e1 < e3$	$e3 < e1 < e2$	$e2 < e1 < VCC$
OUTPUT (IC303 Pin1 or Pin7)	L	H	L

To adjust $e1$ voltage, receive the signal in manual mode and set L302 to obtain 2.3 volts (+0.1 volt) at TP301. It is convenient to use the National Weather Service signal for adjustment.

If Zeromatic function does not work correctly, refer to "Reference Frequency OSC Alignment" (Page 10), adjust TC102 so that the frequency is 1123.200000 MHz $\pm$ 300 Hz, and adjust L302 again to 2.3 volts DC while a signal is being received.

**VHF-Mid Band Alignment for 20-9300:
Circuit Revision**

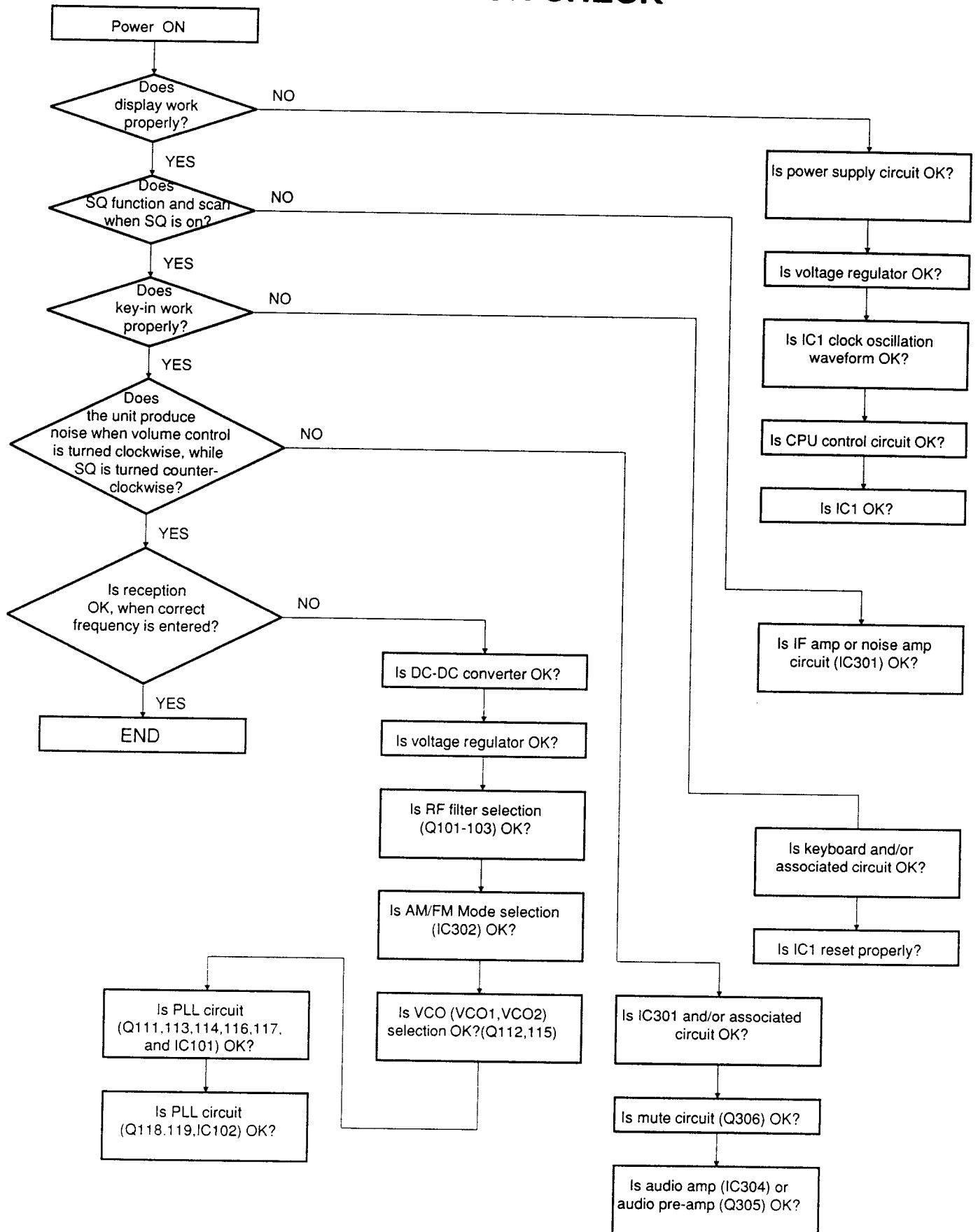
The following parts should be changed as shown below.

Ref.No.	Lo Band	Mid Band	Ref.No.	Lo Band	Mid Band
C134	68 pF	39 pF	L115	0.22 μ H	100 nH
C135	68 pF	39 pF	L116	0.22 μ H	64 nH
C136	47 pF	68 pF	L117	0.22 μ H	64 nH
C137	2pF	10 pF	D2	MA110 or 1SS352	Not Used.
C138	100 pF	150 pF	D3	Not Used. MA110 or 1SS352	
C205	Not Used.	68 pF	D4	MA110 or 1SS352	Not Used.
			D5	Not Used. MA110 or 1SS352	

VCO (PLL-2) Alignment:

Step	Control Setting Channel Programming	Test Instrument Connection	Adjust	Remarks
1	OFF/VOLUME Control: ON. SQUELCH Control: Fully CCW. Program Channel 1 as 68.4 MHz.	Connect DC SSVM to TP103 and GND, as shown in Figure 1.	L130	Adjust L130 to 2.4 volts on the DC SSVM.

RECEPTION CHECK

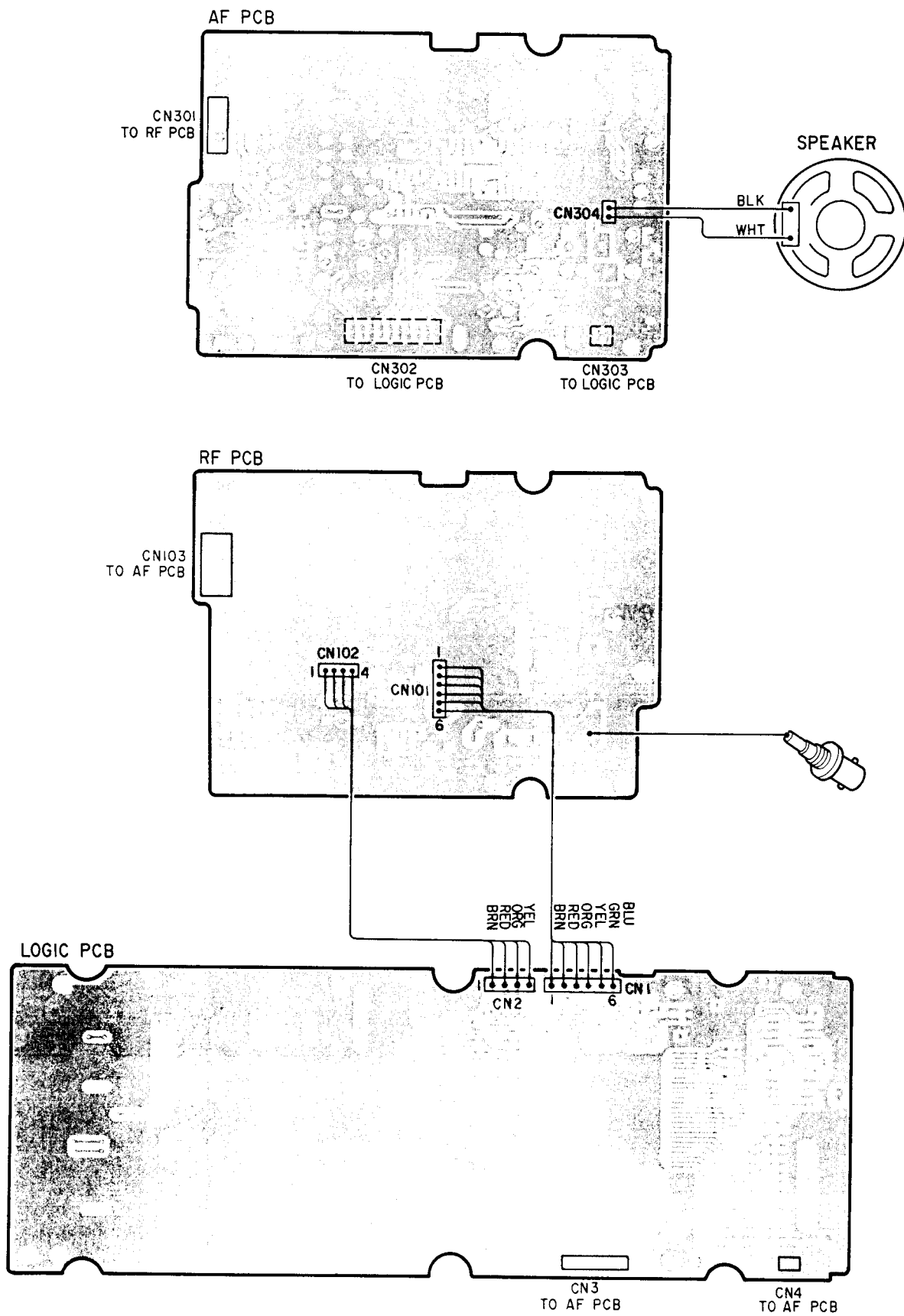


TROUBLESHOOTING

Symptom	Cause/Remedy
1) Display does not light and no sound comes out when POWER is on. Volume control: MAX. Squelch control: counterclockwise (CCW).	1) Defective batteries: Change batteries. 2) Wrong polarity of batteries: Correct the polarity of batteries. 3) Defective power jack or charge jack: Replace. 4) Defective On/Off switch on volume control: Replace.
2) Displays but no sound.	1) Defective speaker or EXT Speaker jack: Replace. 2) Defective audio amplifier circuit which consists of IC304: Replace the defective components. 3) Defective IF amplifier circuit which consists of IC301: Replace the defective components. 4) Defective squelch control (VR301) and/or associated circuit components: Replace the defective components. 5) Defective AF pre-amp. circuit which consists of Q305: Replace the defective components. 6) Defective audio mute switching circuit which consists of Q306 and Q304: Replace the defective components. 7) Defective switching circuit which consists of IC302: Replace the defective components.
3) Sound comes out but display does not light.	1) Defective LCD or rubber connector: Replace the defective parts. 2) Defective CPU circuit which consists of IC1: Replace the defective components.
4) Does not scan and squelch does not operate.	Defective IC301 squelch control output terminal: Replace IC301.
5) Squelch operates but does not scan.	Defective CPU circuit: Replace the defective components.
6) Shows correct display at the time of programming, but after scanning, shows fault display.	Defective CPU (IC1) and/or associated circuit components: Replace the defective components.
7) Operates in MANUAL but does not operate in SCAN.	Squelch control is not adjusted correctly: Adjust squelch (VR301).
8) In AM mode no sound comes out, but FM operates.	1) Defective switching circuit which consists of IC302: Replace the defective parts. 2) Defective AM IF DET circuit which consists of Q302 and 303: Replace the defective parts.
9) In FM mode no sound comes out, but AM operates.	Defective switching circuit which consists of IC302: Replace the defective parts.
10) Low sensitivity between 30.0000 and 54.0000 MHz.	1) Defective decoder switching circuit which consists of Q101: Replace the defective components. 2) Defective Bandpass Filter (B.P.F.): Replace the defective components.

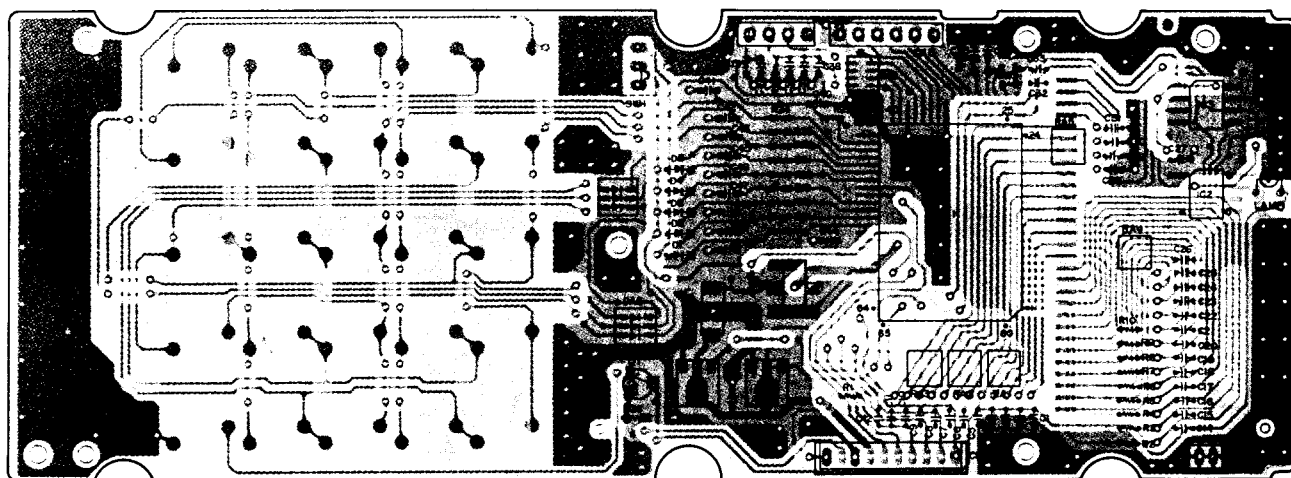
Symptom	Cause/Remedy
11)Low sensitivity between 118.0000 and 174.0000 MHz.	1) Defective switching circuit which consists of Q102: Replace the defective components. 2) Defective B.P.F.: Replace the defective components.
12)Low sensitivity between 220.0000 and 350.0000 MHz.	1) Defective switching circuit which consists of Q102: Replace the defective components. 2) Defective B.P.F.: Replace the defective components.
13)Low sensitivity between 350.0000 and 512.0000 MHz.	1) Defective switching circuit which consists of Q103: Replace the defective components. 2) Defective B.P.F.: Replace the defective components.
14)Low sensitivity between 806.0000 and 999.9875 MHz.	1) Defective switching circuit which consists of Q103: Replace the defective components. 2) Defective B.P.F.: Replace the defective components.
15)Does not operate between 30.0000 and 512.000 MHz.	Defective Q112 and/or VCO1 circuit: Replace the defective components.
16)Does not operate between 806.000 and 999.9875 MHz.	Defective Q115 and/or VCO2 circuit: Replace the defective components.
17)All bands do not operate but display is OK.	Defective PLL circuit IC101, IC102, IC1 and/or associated circuit: Replace the defective components.
18)Searches but does not halt on the correct frequency.	1) Defective IC302 and/or 303: Replace. 2) Discriminator Coil L302 is out of adjustment: Readjust. TP301 should have 1/2 VCC (approx. 2.3 V) in normal receiving. 3) Refer to "Reference Frequency OSC Alignment" on Page 10.
19)Does not make peep tone.	1) Defective Q307 and/or associated circuit: Replace the defective parts. 2) Defective IC1 and/or associated circuit: Replace the defective parts.
20)Does not blink nor make peep tone when battery voltage has gone down.	Defective IC5 and/or associated circuit: Replace the defective parts.

WIRING DIAGRAM

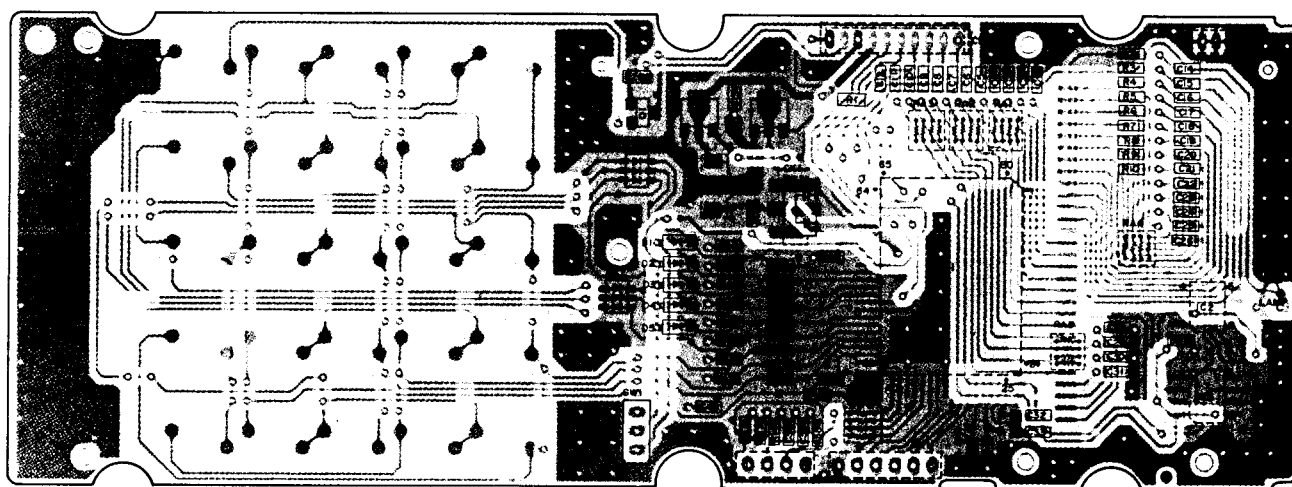


PRINTED CIRCUIT BOARDS

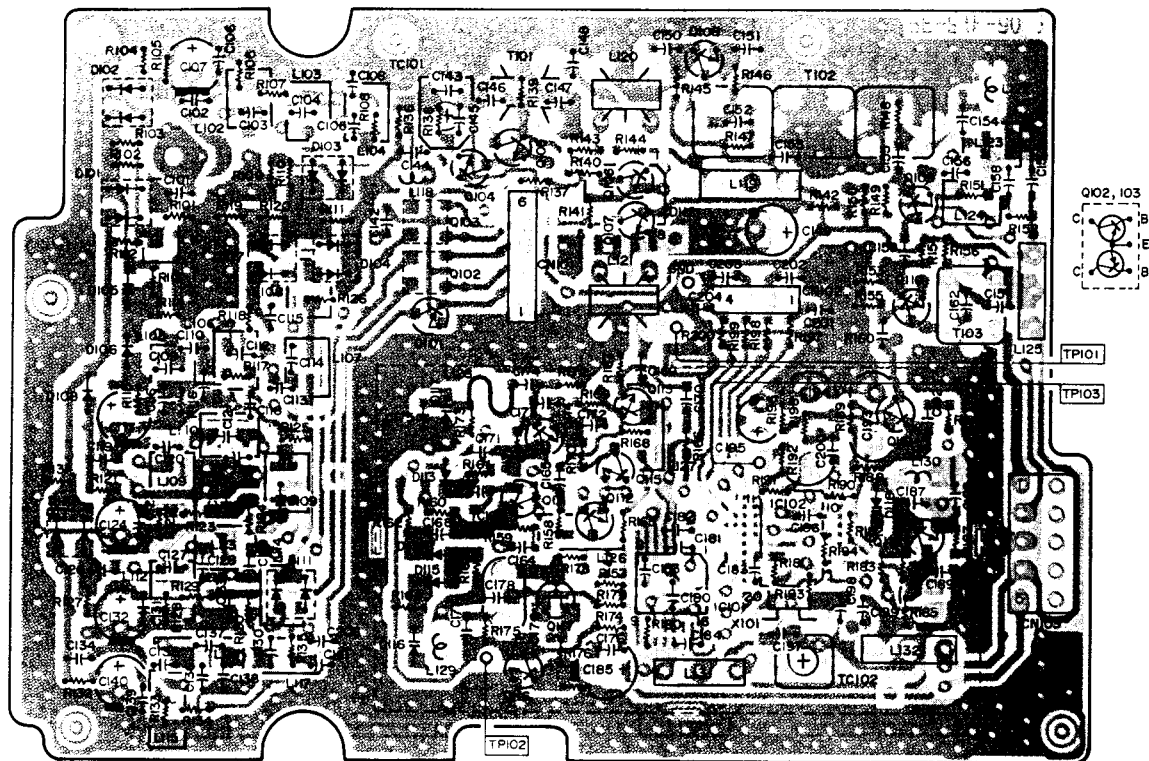
LOGIC PCB (Top View)



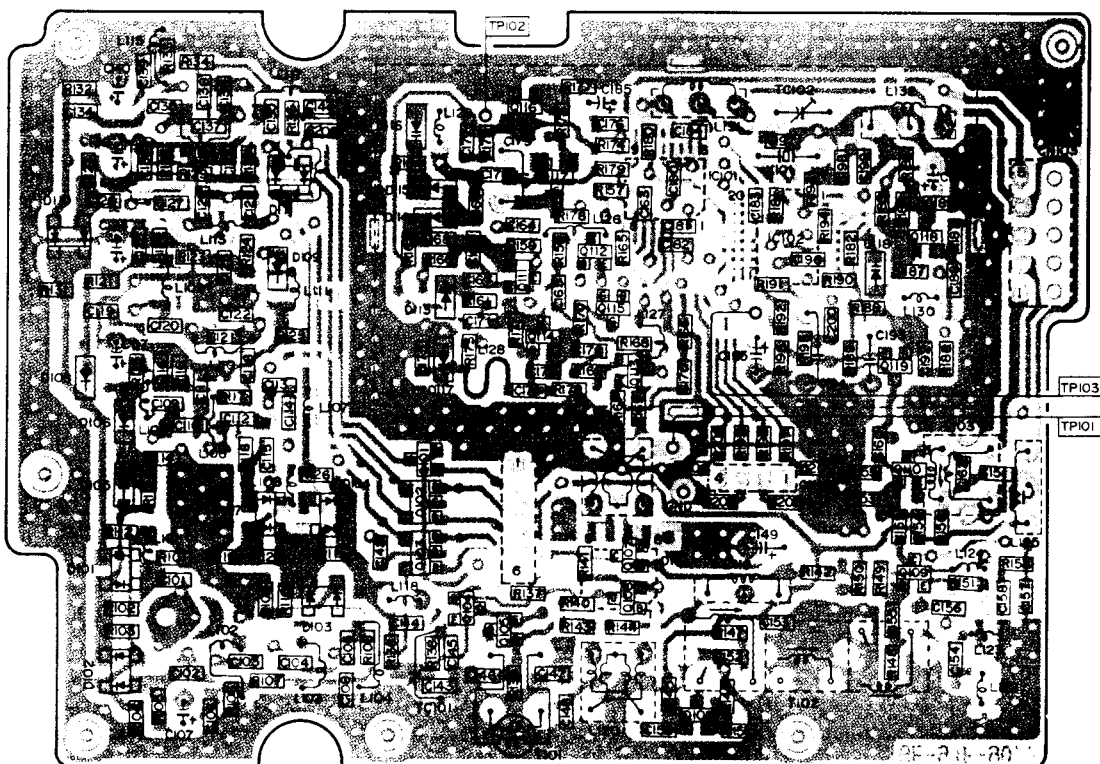
LOGIC PCB (Bottom View)



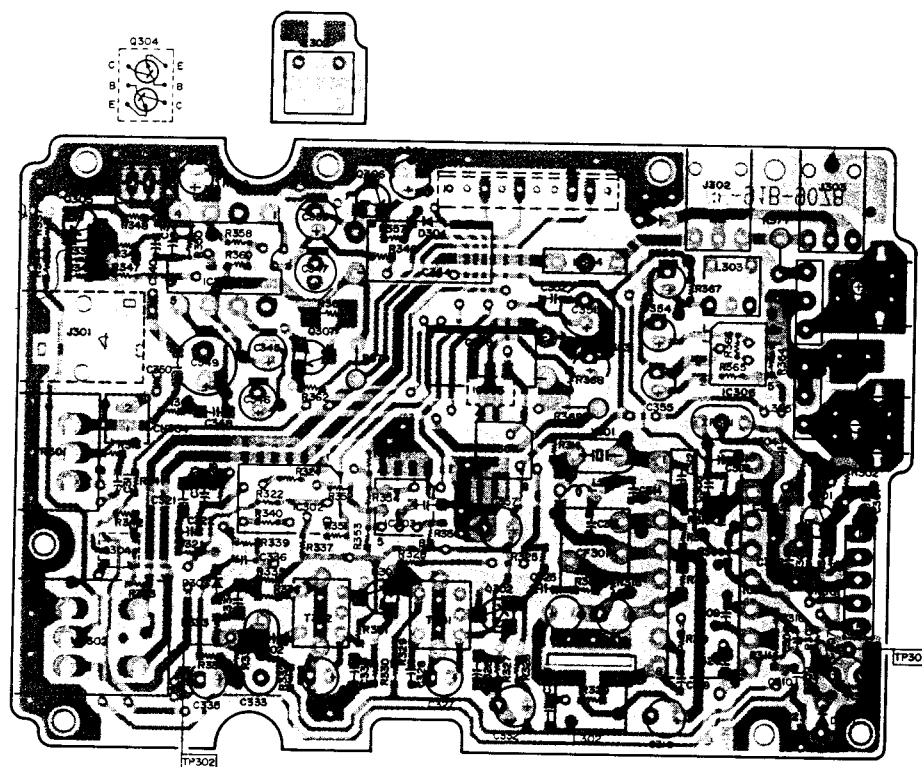
RF PCB (Top View)



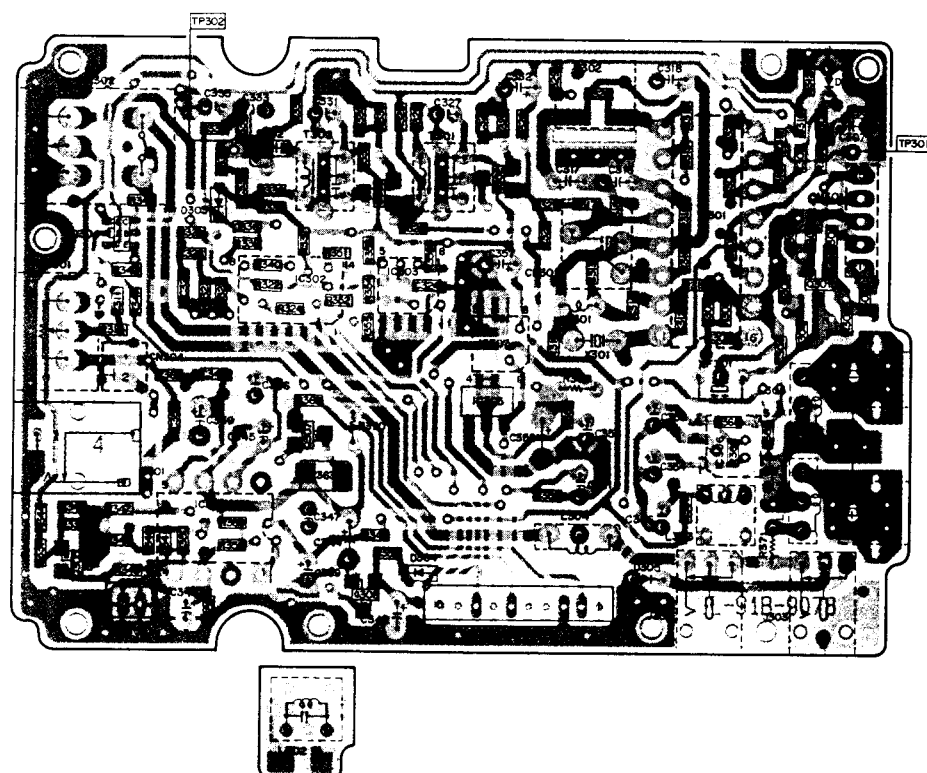
RF PCB (Bottom View)



AF PCB (Top View)



AF PCB (Bottom View)



ELECTRICAL PARTS LIST

LOGIC PCB ASSEMBLY

Ref. No.	Description					RS Part No.	Mfr's Part No.
(21)	PCB Assembly, Logic Consists of the Following:					GA-92D-9491	
CAPACITORS							
C1	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C2	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C3	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C4	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C5	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C6	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C7	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C8	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C9	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C10	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C11	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C12	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C13	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C14	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C15	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C16	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C17	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C18	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C19	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C20	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C21	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C22	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C23	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C24	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C25	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C26	Ceramic	0.001 μF	50 V	±10%	0805		ECU-V1H102K
C27	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C28	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C29	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C30	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C31	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C32	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C33	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C34	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C35	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C36	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C37	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C38	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C39	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C40	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C41	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C42	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C43	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C44	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C45	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K

Ref. No.	Description						RS Part No.	Mfr's Part No.
C46	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K	
C47	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K	
C48	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K	
C49	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K	
C50	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K	
CERAMIC RESONATOR								
CX1	4.19 MHz						EFO-V4194E5	
DIODES								
D1	MA110	Marked 1A		(Silicon)			MA110	
	or 1SS352	Marked C1		(Silicon)			or 1SS352	
D2	MA110	Marked 1A		(Silicon)			MA110	
	or 1SS352	Marked C1		(Silicon)			or 1SS352	
D3	Not Used.							
D4	MA110	Marked 1A		(Silicon)			MA110	
	or 1SS352	Marked C1		(Silicon)			or 1SS352	
DA1	MA121	Marked M2D		(Silicon)			MA121	
DA2	MA121	Marked M2D		(Silicon)			MA121	
INTEGRATED CIRCUITS								
IC1	CPU		CMOS	SMT			GRE-915	
IC2	Memory		CMOS	SMT			AK93C67F	
IC3	Memory		CMOS	SMT			AK93C67F	
IC4	Voltage Regulator		CMOS	SMT			S80737AL-A1	
IC5	Low Battery Detector		CMOS	SMT			S80744AL-A8	
FILTER, EMI								
L1	Filter, EMI	Suppression					NFM41R10C223B1	
RESISTORS								
R1	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473	
R2	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R3	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R4	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R5	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R6	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R7	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R8	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	
R9	Metal Glaze	1 kohm	1/16 W	±5%	0603		ERJ-3GEYJ102	

Ref. No.	Description	RS Part No.	Mfr's Part No.
R10	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R11	Not Used.		
R12	Metal Glaze 15 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ153
R13	Metal Glaze 100 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ104
R14	Metal Glaze 100 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ104
R15	Metal Glaze 47 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ473
R16	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R17	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R18	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R19	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R20	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R21	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R22	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R23	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R24	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R25	Metal Glaze 1 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ102
R26	Metal Glaze 82 ohm 1/10 W $\pm 5\%$ 0603		RCM820J50
RESISTOR ARRAYS			
RA1	Metal Glaze 1 kohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C102J5
RA2	Metal Glaze 1 kohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C102J5
RA3	Metal Glaze 1 kohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C102J5
RA4	Metal Glaze 1 kohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C102J5
RA5	Metal Glaze 1 kohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C102J5
RA6	Metal Glaze 470 ohm $\times$ 4 1/16 W $\pm 5\%$		RCB8C471J5
TRANSISTOR			
Q1	UN2111 Marked 6A PNP or RN2402 Marked YB		UN2111 or RN2402
MISCELLANEOUS			
CN3	Connector, 10 Pin Male		53022-1010
CN4	Connector, 2 Pin Male		53022-0210
	Lamp 6 V 35 mA		T1-6V35MA-WT
SW1	Switch, Slide (Key Lock)		SSSS7-12-ZA
	Plate, Logic Shield		GE-91D-9220
	Fiber, Logic Shield		GE-91D-9338
②④	PLL Shield (Cushion).		GE-91D-9473
②⑤	Cushion, Logic Shield		GE-91D-9472

RF PCB ASSEMBLY

Ref. No.	Description					RS Part No.	Mfr's Part No.
PCB Assembly, RF Consists of the Following:						GA-92D-9489	
CAPACITORS							
C101	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C102	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C103	Ceramic	1 pF	50 V	± 0.25 pF	0603		ECU-V1H010C
C104	Ceramic	1 pF	50 V	± 0.25 pF	0603		ECU-V1H010C
C105	Ceramic	3 pF	50 V	± 0.25 pF	0603		ECU-V1H030C
C106	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C107	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKS010
C108	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C109	Ceramic	5 pF	50 V	± 0.25 pF	0603		ECU-V1H050C
C110	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C111	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C112	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C113	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C114	Ceramic	7 pF	50 V	± 0.5 pF	0603		ECU-V1H070D
C115	Ceramic	5 pF	50 V	± 0.25 pF	0603		ECU-V1H050C
C116	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C117	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKS010
C118	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C119	Ceramic	10 pF	50 V	± 0.5 pF	0603		ECU-V1H100D
C120	Ceramic	4 pF	50 V	± 0.25 pF	0603		ECU-V1H040C
C121	Ceramic	3 pF	50 V	± 0.25 pF	0603		ECU-V1H030C
C122	Ceramic	6 pF	50 V	± 0.5 pF	0603		ECU-V1H060D
C123	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C124	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKS010
C125	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C126	Ceramic	22 pF	50 V	$\pm 10\%$	0603		ECU-V1H220K
C127	Ceramic	12 pF	50 V	$\pm 10\%$	0603		ECU-V1H120K
C128	Ceramic	10 pF	50 V	± 0.5 pF	0603		ECU-V1H100D
C129	Ceramic	39 pF	50 V	$\pm 10\%$	0603		ECU-V1H390K
C130	Ceramic	10 pF	50 V	± 0.5 pF	0603		ECU-V1H100D
C131	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C132	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKS010
C133	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C134	Ceramic	68 pF	50 V	$\pm 10\%$	0603		ECU-V1H680K
C135	Ceramic	68 pF	50 V	$\pm 10\%$	0603		ECU-V1H680K
C136	Ceramic	47 pF	50 V	$\pm 10\%$	0603		ECU-V1H470K
C137	Ceramic	2 pF	50 V	± 0.25 pF	0603		ECU-V1H020C
C138	Ceramic	100 pF	50 V	$\pm 10\%$	0603		ECU-V1H101K
C139	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C140	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKS010
C141	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C142	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C143	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C144	Ceramic	100 pF	50 V	$\pm 10\%$	0603		ECU-V1H101K
C145	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K

Ref. No.	Description					RS Part No.	Mfr's Part No.
C146	Ceramic	10 pF	50 V	±0.5 pF	0603		ECU-V1H100D
C147	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K
C148	Ceramic	3 pF	50 V	±0.25 pF	0603		ECU-V1H030C
C149	Tantalum	2.2 µF	25 V	±20%			DN1E2R2M1S
C150	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C151	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C152	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C153	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C154	Ceramic	4 pF	50 V	±0.25 pF	0603		ECU-V1H040C
C155	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C156	Ceramic	2 pF	50 V	±0.25 pF	0603		ECU-V1H020C
C157	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C158	Ceramic	5 pF	50 V	±0.25 pF	0603		ECU-V1H050C
C159	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C160	Ceramic	10 pF	50 V	±0.5 pF	0603		ECU-V1H100D
C161	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C162	Ceramic	18 pF	50 V	±10%	0603		ECU-V1H180K
C163	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C164	Ceramic	100 pF	50 V	±10%	0603		ECU-V1H101K
C165	Ceramic	1 pF	50 V	±0.25 pF	0603		ECU-V1H010C
C166	Ceramic	1 pF	50 V	±0.25 pF	0603		ECU-V1H010C
C167	Ceramic	2 pF	50 V	±0.25 pF	0603		ECU-V1H020C
C168	Ceramic	47 pF	50 V	±10%	0603		ECU-V1H470K
C169	Ceramic	22 pF	50 V	±10%	0603		ECU-V1H220K
C170	Ceramic	22 pF	50 V	±10%	0603		ECU-V1H220K
C171	Ceramic	22 pF	50 V	±10%	0603		ECU-V1H220K
C172	Ceramic	2 pF	50 V	±0.25 pF	0603		ECU-V1H020C
C173	Ceramic	1 pF	50 V	±0.25 pF	0603		ECU-V1H010C
C174	Ceramic	22 pF	50 V	±10%	0603		ECU-V1H220K
C175	Ceramic	1 pF	50 V	±0.25 pF	0603		ECU-V1H010C
C176	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C177	Ceramic	150 pF	50 V	±10%	0603		ECU-V1H151K
C178	Ceramic	0.082 µF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25
C179	Mylar*	0.01 µF	50 V	±10%			NNM-103K
C180	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C181	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C182	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C183	Ceramic	10 pF	50 V	±0.5 pF	0603		ECU-V1H100D
C184	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C185	Electrolytic	10 µF	16 V	±20%			ECEA1CKS100
C186	Ceramic	12 pF	50 V	±10%	0603		ECU-V1H120K
C187	Ceramic	10 pF	50 V	±0.5 pF	0603		ECU-V1H100D
C188	Ceramic	6 pF	50 V	±0.5 pF	0603		ECU-V1H060D
C189	Ceramic	0.001 µF	50 V	±10%	0603		ECU-V1H102K
C190	Electrolytic	10 µF	16 V	±20%			ECEA1CKS100
C191	Not Used.						
C192	Ceramic	5 pF	50 V	±0.25 pF	0603		ECU-V1H050C

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

Ref. No.	Description					RS Part No.	Mfr's Part No.
C193	Mylar	0.022 μ F	50 V	$\pm 10\%$			AMC223K50V
C194	Mylar	0.047 μ F	50 V	$\pm 10\%$			AMC473K50V
C195	Tantalum	0.47 μ F	35 V	$\pm 20\%$			DN1VR47M1S
C196	Ceramic	0.001 μ F	50 V	$\pm 10\%$	0603		ECU-V1H102K
C197	Ceramic	18 pF	50 V	$\pm 10\%$	0603		ECU-V1H180K
C198	Ceramic	27 pF	50 V	$\pm 10\%$	0603		ECU-V1H270K
C199	Ceramic	0.01 μ F	50 V	$\pm 10\%$	0603		ECU-V1H103K
C200	Ceramic	100 pF	50 V	$\pm 10\%$	0603		ECU-V1H101K
C201	Ceramic	47 pF	50 V	$\pm 10\%$	0603		ECU-V1H470K
C202	Ceramic	47 pF	50 V	$\pm 10\%$	0603		ECU-V1H470K
C203	Ceramic	47 pF	50 V	$\pm 10\%$	0603		ECU-V1H470K
C204	Ceramic	47 pF	50 V	$\pm 10\%$	0603		ECU-V1H470K
DIODES							
D101	MA862	Marked M11	(Silicon)				MA862
D102	MA862	Marked M11	(Silicon)				MA862
D103	MA862	Marked M11	(Silicon)				MA862
D104	MA862	Marked M11	(Silicon)				MA862
D105	MA77	Marked 4B	(Silicon)				MA77
D106	MA77	Marked 4B	(Silicon)				MA77
D107	MA862	Marked M11	(Silicon)				MA862
D108	MA77	Marked 4B	(Silicon)				MA77
D109	MA77	Marked 4B	(Silicon)				MA77
D110	MA862	Marked M11	(Silicon)				MA862
D111	MA862	Marked M11	(Silicon)				MA862
D112	ND433G	Schottky Barrier	(Silicon)				ND433G
D113	HVU306A	Marked 3	(Silicon) Varactor				HVU306A
D114	HVU306A	Marked 3	(Silicon) Varactor				HVU306A
D115	HVU306A	Marked 3	(Silicon) Varactor				HVU306A
D116	HVU306A	Marked 3	(Silicon) Varactor				HVU306A
D117	HVU12	Marked A	(Silicon) Varactor				HVU12
D118	HVU308	Marked 8	(Silicon) Varactor				HVU308
INTEGRATED CIRCUITS							
IC101	CXA1356N	PLL	Bipolar	SMT			CXA1356N
IC102	MB1512PFV-G	PLL	CMOS	SMT			MB1512PFV-G
COILS							
L101	Coil, Choke 1 μ H						LQH1N1R0M04
L102		B.P.F. (806 - 999.9875 MHz)					LQN2A10NK04
L103							LQN2A10NK04
L104							LQN2A10NK04
L105							LQ2A22NK04
L106		B.P.F. (350 - 512 MHz)					LQ2A22NK04
L107							LQN2A33NK04
L108							LQN2A33NK04

Ref. No.	Description	RS Part No.	Mfr's Part No.
L109	□ B.P.F. (220 - 350 MHz)		LQN2A39NK04
L110			LQN2A39NK04
L111			LQN2A39NK04
L112	□ B.P.F. (118 - 174 MHz)		LQN2A68NK04
L113			LQN2A68NK04
L114			LQN2A47NK04
L115	□ B.P.F. (30 - 54 MHz)		LQH1NR22M04
L116			LQH1NR22M04
L117			LQH1NR22M04
L118	Coil, Trap First I.F.		2LNB-253
L119	Filter, EMI Suppression		LC103N-1R0
L120	Coil, D.B.M.		2LNM-258
L121	Coil, D.B.M.		2LNM-258
L122	Coil, Choke		2LNB-253
L123	Coil, Choke 22 nH		LQN2A22NK04
L124	Coil, Choke 22 nH		LQN2A22NK04
L125	Filter, EMI Suppression		LC103N-1R0
L126	Coil, Choke 0.22 μH		LQH1NR22M04
L127	Coil, Choke 0.22 μH		LQH1NR22M04
L128	Stripline on PCB (VCO)		
L129	Coil, VCO		2LNB-253
L130	Coil, VCO		2LNO-254
L131	Filter, EMI Suppression		LC103N-1R0
L132	Filter, EMI Suppression		LC103N-1R0
TRANSISTORS			
Q101	UN5111 Marked 6A	PNP	UN5111
Q102	XN1111 Marked 9S	PNP	XN1111
Q103	XN1111 Marked 9S	PNP	XN1111
Q104	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q105	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q106	2SC4116(Y) Marked LY	NPN	2SC4116(Y)
Q107	2SD1979(T) Marked 3WT	NPN	2SD1979(T)
Q108	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q109	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q110	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q111	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q112	UN5214 Marked 8D	NPN	UN5214
Q113	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q114	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q115	UN5214 Marked 8D	NPN	UN5214
Q116	2SC2712(GR) Marked LG	NPN	2SC2712(GR)
Q117	2SK209(GR) Marked XG	FET MOS	2SK209(GR)
Q118	2SC4226(R25) Marked R25	NPN	2SC4226(R25)
Q119	2SC4226(R25) Marked R25	NPN	2SC4226(R25)

Ref. No.	Description	RS Part No.	Mfr's Part No.
RESISTORS			
R101	Metal Glaze 3.3 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ332
R102	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R103	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R104	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R105	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R106	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R107	Metal Glaze 220 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ221
R108	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R109	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R110	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R111	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R112	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R113	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R114	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R115	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R116	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R117	Metal Glaze 220 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ221
R118	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R119	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R120	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R121	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R122	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R123	Metal Glaze 220 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ221
R124	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R125	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R126	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R127	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R128	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R129	Metal Glaze 220 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ221
R130	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R131	Metal Glaze 470 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ474
R132	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R133	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R134	Metal Glaze 220 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ221
R135	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R136	Metal Glaze 1.5 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ152
R137	Metal Glaze 100 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ104
R138	Metal Glaze 100 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ101
R139	Metal Glaze 10 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ103
R140	Metal Glaze 2.2 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ222
R141	Metal Glaze 22 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ223
R142	Metal Glaze 15 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ153
R143	Metal Glaze 4.7 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ472
R144	Metal Glaze 100 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ101
R145	Metal Glaze 100 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ104
R146	Metal Glaze 470 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ471
R147	Metal Glaze 330 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ331
R148	Metal Glaze 56 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ560
R149	Metal Glaze 47 kohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ473

Ref. No.	Description					RS Part No.	Mfr's Part No.
R150	Metal Glaze	100 kohm	1/16 W	±5%	0603		ERJ-3GEYJ104
R151	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R152	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R153	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R154	Metal Glaze	220 kohm	1/16 W	±5%	0603		ERJ-3GEYJ224
R155	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R156	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R157	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R158	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R159	Metal Glaze	4.7 kohm	1/16 W	±5%	0603		ERJ-3GEYJ472
R160	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R161	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R162	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R163	Metal Glaze	100 kohm	1/16 W	±5%	0603		ERJ-3GEYJ104
R164	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R165	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R166	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R167	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R168	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R169	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R170	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R171	Metal Glaze	4.7 kohm	1/16 W	±5%	0603		ERJ-3GEYJ472
R172	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R173	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R174	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R175	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R176	Metal Glaze	3.3 kohm	1/16 W	±5%	0603		ERJ-3GEYJ332
R177	Metal Glaze	1.2 kohm	1/16 W	±5%	0603		ERJ-3GEYJ122
R178	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R179	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R180	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R181	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R182	Metal Glaze	3.3 kohm	1/16 W	±5%	0603		ERJ-3GEYJ332
R183	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R184	Metal Glaze	15 kohm	1/16 W	±5%	0603		ERJ-3GEYJ153
R185	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R186	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R187	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R188	Metal Glaze	150 kohm	1/16 W	±5%	0603		ERJ-3GEYJ154
R189	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R190	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R191	Metal Glaze	1.5 kohm	1/16 W	±5%	0603		ERJ-3GEYJ152
R192	Metal Glaze	6.8 kohm	1/16 W	±5%	0603		ERJ-3GEYJ682
R193	Metal Glaze	680 ohm	1/16 W	±5%	0603		ERJ-3GEYJ681
R194	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R195	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R196	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R197	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R198	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R199	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471

Ref. No.	Description	RS Part No.	Mfr's Part No.
R200	Metal Glaze 470 ohm 1/16 W $\pm 5\%$ 0603		ERJ-3GEYJ471
TRANSFORMERS			
T101 T102 T103	Coil, RF Coil, IF (1st) Helical Filter Coil, IF (2nd)		2LNR-316 GR-D840 5SSI-317
TRIMMERS			
TC101 TC102	Trimmer 6 pF Chip Trimmer 30 pF		ECR-KN006A21X ECR-LA030E11
CRYSTAL			
X101	12.8 MHz		TR1-12.8MHz
MISCELLANEOUS			
CN101 CN102 CN103 GND TP101 TP102 TP103	Connector, 6 Pin Connector, 4 Pin Connector, 5 Pin Pin, Test Pin, Test Pin, Test Pin, Test Shield, PLL (Top) Shield, PLL (Case) Shield, PLL (Bottom) Shield, PLL (Cushion)	Male Male Male	IL-Y-6P-S15T2-EF IL-Y-4P-S15T2-EF 174074-5 GE-87D-7290 GE-87D-7290 GE-87D-7290 GE-87D-7290 GE-91D-9221 GE-91D-9222 GE-91D-9223 GE-91D-9473

AF PCB ASSEMBLY

Ref. No.	Description					RS Part No.	Mfr's Part No.
22	PCB Assembly, AF Consists of the Following:						GA-92D-9490
CAPACITORS							
C301	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C302	Ceramic	0.01 μF	50 V	±10%	0603		ECU-V1H103K
C303	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C304	Ceramic	5 pF	50 V	±0.25 pF	0603		ECU-V1H050C
C305	Ceramic	2 pF	50 V	±0.25 pF	0603		ECU-V1H020C
C306	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C307	Tantalum	0.1 μF	35 V	±20%			DN1V0R1M1S
C308	Ceramic	0.01 μF	50 V	±10%	0603		ECU-V1H103K
C309	Ceramic	8 pF	50 V	±0.5 pF	0603		ECU-V1H080D
C310	Ceramic	470 pF	50 V	±10%	0603		ECU-V1H471K
C311	Ceramic	470 pF	50 V	±10%	0603		ECU-V1H471K
C312	Ceramic	10 pF	50 V	±5pF	0603		ECU-V1H100D
C313	Ceramic	33 pF	50 V	±10%	0603		ECU-V1H330K
C314	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C315	Ceramic	0.047 μF	25 V	±10%	0805		C3K21N1EB473K
C316	Tantalum	0.47 μF	35 V	±20%			DN1VR47M1S
C317	Tantalum	0.47 μF	35 V	±20%			DN1VR47M1S
C318	Tantalum	33 μF	10 V	±20%			DN1A330M1S
C319	Ceramic	10 pF	50 V	±0.5 pF	0603		ECU-V1H100D
C320	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C321	Ceramic	0.033 μF	50 V	±10%	0805		C3K21N1HB333K
C322	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C323	Ceramic	0.015 μF	50 V	±10%	0603		ECU-V1H153K
C324	Ceramic	0.082 μF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25PB
C325	Ceramic	0.001 μF	50 V	±10%	0603		ECU-V1H102K
C326	Ceramic	0.082 μF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25
C327	Electrolytic	10 μF	16 V	±20%			ECEA1CKA100
C328	Ceramic	0.01 μF	50 V	±10%	0603		ECU-V1H103K
C329	Ceramic	0.082 μF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25
C330	Ceramic	0.082 μF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25
C331	Electrolytic	10 μF	16 V	±20%			ECEA1CKA100
C332	Tantalum	33 μF	10 V	±20%			DN1A330M1S
C333	Mylar	0.056 μF	50 V	±10%			NNM-563K
C334	Ceramic	0.082 μF	25 V	±10%	0805		C3K21N1EB823K or GRM40B823K25
C335	Electrolytic	1 μF	50 V	±20%			ECEA1HKA010
C336	Ceramic	0.01 μF	50 V	±10%	0603		ECU-V1H103K
C337	Ceramic	0.0015 μF	50 V	±10%	0603		ECU-V1H152K
C338	Ceramic	680 pF	50 V	±10%	0603		ECU-V1H681K
C339	Electrolytic	10 μF	16 V	±20%			ECEA1CKA100
C340	Ceramic	0.01 μF	50 V	±10%	0603		ECU-V1H103K

Ref. No.	Description					RS Part No.	Mfr's Part No.
C341	Ceramic	0.015 μ F	50 V	$\pm 10\%$	0805		ECU-V1H153K
C342	Tantalum	0.1 μ F	35 V	$\pm 20\%$			DN1V0R1M1S
C343	Electrolytic	1 μ F	50 V	$\pm 20\%$			ECEA1HKA010
C344	Electrolytic	470 μ F	16 V	$\pm 20\%$			ECA1CM471
C345	Electrolytic	4.7 μ F	35 V	$\pm 20\%$			ECEA1VKA4R7
C346	Electrolytic	10 μ F	16 V	$\pm 20\%$			ECEA1CKA100
C347	Electrolytic	2.2 μ F	50 V	$\pm 20\%$			ECEA1HKA2R2
C348	Ceramic	0.082 μ F	25 V	$\pm 10\%$	0805		C3K21N1EB823K or GRM40B823K25
C349	Electrolytic	100 μ F	16 V	$\pm 20\%$			ECEA1CKA101
C350	Ceramic	0.082 μ F	25 V	$\pm 10\%$	0805		C3K21N1EB823K or GRM40B823K25
C351	Electrolytic	100 μ F	6.3 V	$\pm 20\%$			ECEA0JKA101
C352	Ceramic	0.1 μ F	16 V	$+80\% - 20\%$	0805		ECU-V1C104ZF
C353	Electrolytic	10 μ F	16 V	$\pm 20\%$			ECEA1CKA100
C354	Electrolytic	0.22 μ F	50 V	$\pm 20\%$			ECEA1HKAR22
C355	Electrolytic	4.7 μ F	35 V	$\pm 20\%$			ECEA1VKA4R7
C356	Electrolytic	33 μ F	10 V	$\pm 20\%$			ECEA1AKA330
C357	Tantalum	10 μ F	16 V	$\pm 20\%$			DN1C100M1S
C358	Electrolytic	470 μ F	16 V	$\pm 20\%$			ECA1CM471
CERAMIC FILTER							
CF301	455 kHz						CFU455D2
DIODES							
D301	SD103		(Silicon)	Schottky Barrier			SD103
D302	MA728	Marked 2A	(Silicon)				MA728
D303	MA728	Marked 2A	(Silicon)				MA728
D304	MA110	Marked 1A	(Silicon)				MA110
	or 1SS352	Marked C1					or 1SS352
D305	S5566B		(Silicon)				S5566B
INTEGRATED CIRCUITS							
IC301	TK10427		(Bipolar)				TK10427
	or TK10420	IF Amp./Osc./Mixer/Noise Amp./Quad.					or TK10420
IC302	TC4066BF	Switch/Zeromatic	(CMOS)	SMT			TC4066BF
IC303	BA10393F	Zeromatic	(Bipolar)	SMT			BA10393F
	or NJM2903M						or NJM2903M
IC304	LM386N-1	Audio Amp.	(Bipolar)				LM386N-1
IC305	S-81250HG-RD	Voltage Regulator	(CMOS)	SMT			S-81250HG-RD
IC306	TK11806M	DC-DC Conv.	(Bipolar)	SMT			TK11806M
IC307	TK10682M	Voltage Regulator	(Bipolar)	SMT			TK10682M

Ref. No.	Description	RS Part No.	Mfr's Part No.
COILS			
L301	Coil, Choke 1.0 μ H		LAL03NA1R0M
L302	Assembly, Quadrature/Det. with PCB Coil PCB		GR-E796PCB GR-E796
L303	Coil, Choke		GR-D835
L304	Filter, EMI Suppression		LC103N-1R0
L305	Filter, EMI Suppression		LC103N-1R0
L306	Filter, EMI Suppression		LC103N-1R0
TRANSISTORS			
Q301	2SC2714(O/Y)Marked QO/QY NPN		2SC2714(O/Y)
Q302	2SC2712(GR) Marked LG		NPN2SC2712(GR)
Q303	2SC2712(GR) Marked LG		NPN2SC2712(GR)
Q304	XN4501 Marked 5H NPN		XN4501
Q305	2SC2712(GR) Marked LG		NPN2SC2712(GR)
Q306	2SC2712(GR) Marked LG		NPN2SC2712(GR)
Q307	2SC2712(GR) Marked LG		NPN2SC2712(GR)
RESISTORS			
R301	Metal Glaze 3.9 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ392
R302	Metal Glaze 220 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ224
R303	Metal Glaze 1 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ102
R304	Metal Glaze 2.2 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ222
R305	Metal Glaze 560 ohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ561
R306	Metal Glaze 220 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ224
R307	Metal Glaze 15 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ153
R308	Metal Glaze 100 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ104
R309	Metal Glaze 10 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ103
R310	Metal Glaze 1 Mohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ105
R311	Metal Glaze 2.2 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ222
R312	Metal Glaze 6.8 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ682
R313	Metal Glaze 1 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ102
R314	Metal Glaze 47 ohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ470
R315	Metal Glaze 15 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ153
R316	Metal Glaze 1.5 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ152
R317	Metal Glaze 3.3 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ332
R318	Metal Glaze 1.5 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ152
R319	Metal Glaze 100 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ104
R320	Metal Glaze 27 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ273
R321	Metal Glaze 10 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ103
R322	Metal Glaze 100 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ104
R323	Metal Glaze 470 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ474
R324	Metal Glaze 47 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ473
R325	Metal Glaze 150 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ154
R326	Metal Glaze 4.7 kohm 1/16 W $\pm$ 5% 0603		ERJ-3GEYJ472

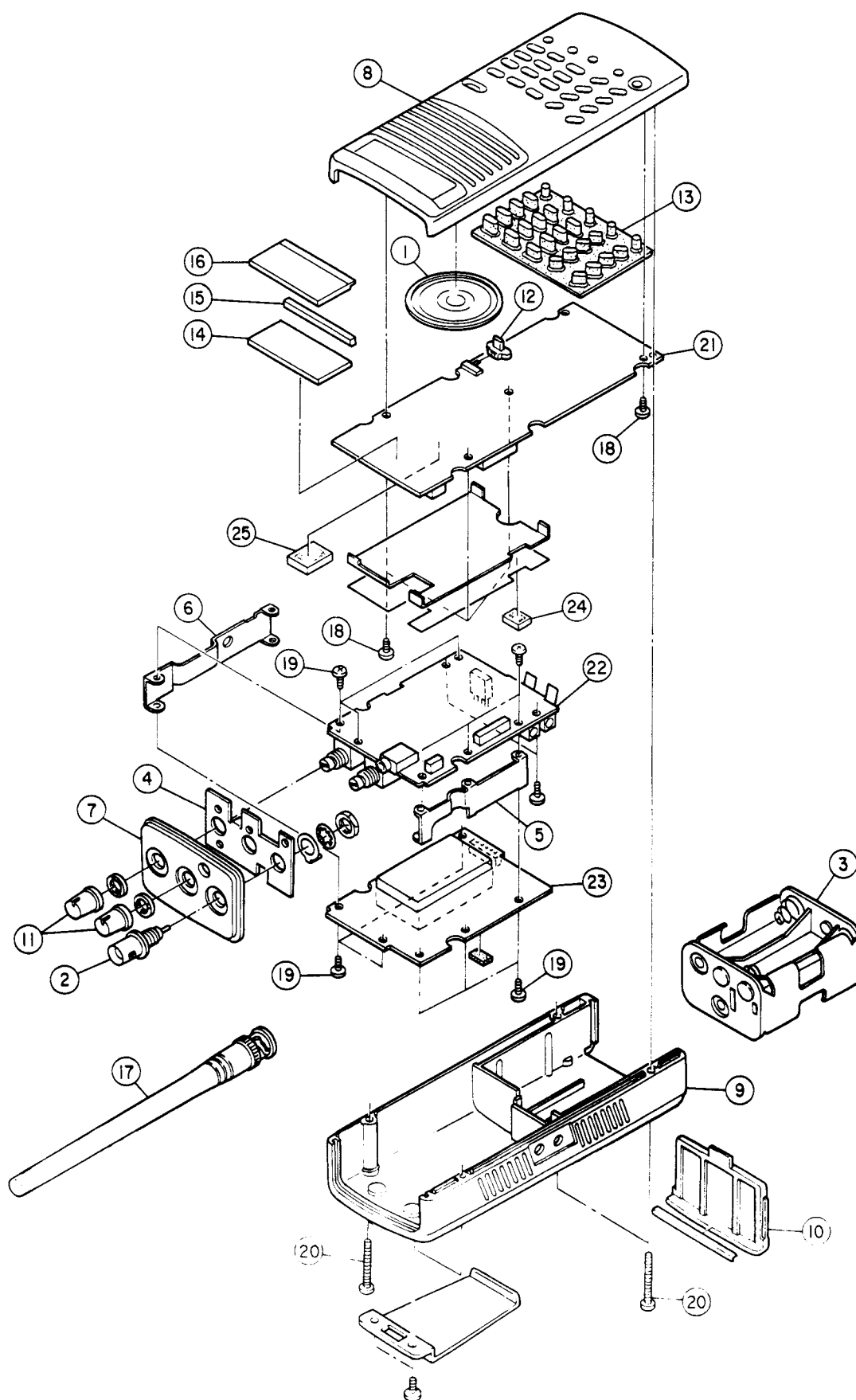
Ref. No.	Description					RS Part No.	Mfr's Part No.
R327	Metal Glaze	470 ohm	1/16 W	±5%	0603		ERJ-3GEYJ471
R328	Metal Glaze	180 kohm	1/16 W	±5%	0603		ERJ-3GEYJ184
R329	Metal Glaze	5.6 kohm	1/16 W	±5%	0603		ERJ-3GEYJ562
R330	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R331	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R332	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R333	Metal Glaze	4.7 kohm	1/16 W	±5%	0603		ERJ-3GEYJ472
R334	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R335	Metal Glaze	100 kohm	1/16 W	±5%	0603		ERJ-3GEYJ104
R336	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R337	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R338	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R339	Metal Glaze	470 kohm	1/16 W	±5%	0603		ERJ-3GEYJ474
R340	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R341	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R342	Metal Glaze	100 kohm	1/16 W	±5%	0603		ERJ-3GEYJ104
R343	Metal Glaze	100 kohm	1/16 W	±5%	0603		ERJ-3GEYJ104
R344	Metal Glaze	33 kohm	1/16 W	±5%	0603		ERJ-3GEYJ333
R345	Metal Glaze	1 Mohm	1/16 W	±5%	0603		ERJ-3GEYJ105
R346	Metal Glaze	2.7 kohm	1/16 W	±5%	0603		ERJ-3GEYJ272
R347	Metal Glaze	4.7 kohm	1/16 W	±5%	0603		ERJ-3GEYJ472
R348	Metal Glaze	270 ohm	1/16 W	±5%	0603		ERJ-3GEYJ271
R349	Metal Glaze	33 kohm	1/16 W	±5%	0603		ERJ-3GEYJ333
R350	Metal Glaze	33 kohm	1/16 W	±5%	0603		ERJ-3GEYJ333
R351	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R352	Metal Glaze	3.3 kohm	1/16 W	±5%	0603		ERJ-3GEYJ332
R353	Metal Glaze	3.9 kohm	1/16 W	±5%	0603		ERJ-3GEYJ392
R354	Metal Glaze	8.2 kohm	1/16 W	±5%	0603		ERJ-3GEYJ822
R355	Metal Glaze	3.3 kohm	1/16 W	±5%	0603		ERJ-3GEYJ332
R356	Metal Glaze	47 kohm	1/16 W	±5%	0603		ERJ-3GEYJ473
R357	Metal Glaze	22 kohm	1/16 W	±5%	0603		ERJ-3GEYJ223
R358	Metal Glaze	56 kohm	1/16 W	±5%	0603		ERJ-3GEYJ563
R359	Metal Glaze	27 kohm	1/16 W	±5%	0603		ERJ-3GEYJ273
R360	Metal Glaze	56 kohm	1/16 W	±5%	0603		ERJ-3GEYJ563
R361	Metal Glaze	10 ohm	1/16 W	±5%	0603		ERJ-3GEYJ100
R362	Metal Glaze	10 kohm	1/16 W	±5%	0603		ERJ-3GEYJ103
R363	Metal Glaze	470 ohm	1/4 W	±5%	1210		RCP-471J50
R364	Metal Glaze	470 kohm	1/16 W	±5%	0603		ERJ-3GEYJ474
R365	Metal Glaze	220 ohm	1/16 W	±5%	0603		ERJ-3GEYJ221
R366	Metal Glaze	820 ohm	1/16 W	±5%	0603		ERJ-3GEYJ821
R367	Metal Glaze	47 ohm	1/16 W	±5%	0603		ERJ-3GEYJ470
R368	Metal Glaze	100 ohm	1/16 W	±5%	0603		ERJ-3GEYJ101
R369	Carbon Film	4.7 ohm	1/4 W	±5%			ERD25VJ4R7
R370	Carbon Film	33 ohm	1/4 W	±5%			ERD25VJ330
R371	Carbon Film	22 ohm	1/4 W	±5%			ERD25VJ220

Ref. No.	Description	RS Part No.	Mfr's Part No.
TRANSFORMERS			
T301 T302	Coil, IF (455 kHz) AM Band Coil, Det (455 kHz)		5SSI-292 5SSI-309
CRYSTAL			
X301	48.045 MHz		TR1-48.045MHz
CRYSTAL FILTER			
XF301	48.5 MHz		48R48.5MHz
MISCELLANEOUS			
CN301	Connector, 5 Pin	Female	174075-5
CN302	Connector, 10 Pin	Male	52024-1010
CN303	Connector, 2 Pin	Male	52024-0210
CN304	Connector, 2 Pin	Male	IL-Y-2P-S15T2-EF
J301	Jack, Earphone		HSJ0836-01-500
J302	Jack, Power		HEC2711-01-620
J303	Jack, Charge		HEC2711-01-620
TP301	Pin, Test		GE-87D-7290
TP302	Pin, Test		GE-87D-7290
	Assembly, Squelch		GA-92D-9487
VR301	Pot., Squelch	10 kohm(C)	RK0971110-10KC-10
	Nut	7 m/m	GE-89D-8343-1
	Assembly, Volume		GA-92D-9486
VR302	Pot., Volume W/Switch	50 kohm(A)	RK0971111-50KA-10
	Nut	7 m/m	GE-89D-8343-1
	Terminal, Battery		GE-91D-9218

MECHANICAL PARTS LIST

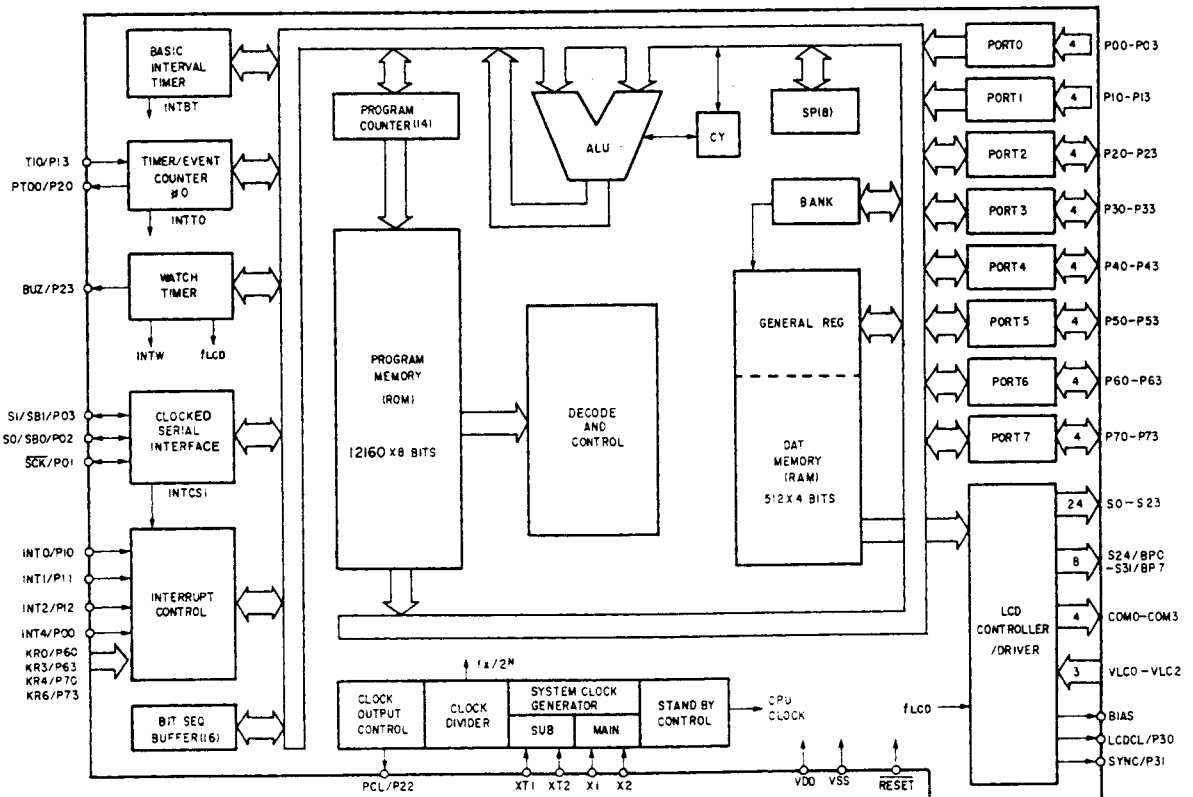
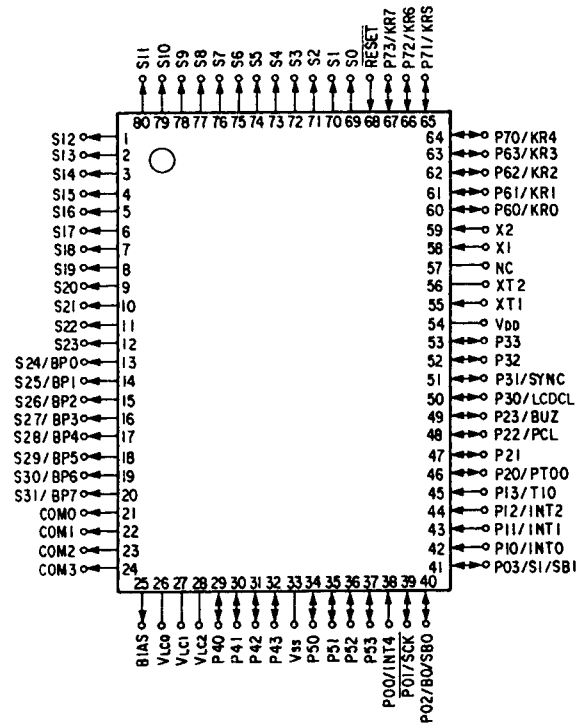
Ref. No.	Description	RS Part No.	Mfr's Part No.
①	Speaker 8 ohm 200 mW		EAS-3P123A
②	Jack, Antenna		GE-85D-5383
③	Case, Battery		GE-91D-9339
④	Chassis, Top		GE-91D-9213
⑤	Bracket, PCB (Antenna Side)		GE-91D-9214
⑥	Bracket, PCB (Volume Side)		GE-91D-9215
⑦	Escutcheon, Top		GE-91C-9205
⑧	Assembly, Case, Front		GA-91D-9416
	Case, Front		GE-91A-9207
	Window, LCD		GE-91C-9208
⑨	Assembly, Case, Rear for USA		GA-92D-9488
	Case, Rear		GE-91A-9216
	Clip, Belt		GE-90D-8957
	Label, Model for USA		GE-91D-9433
	Screw, Bindinghead Machine BLK (Zn)		BM3x5BLK(Zn)
⑩	Cover, Battery		GE-91C-9217
⑪	Knob, Volume/Squelch		GE-91D-9206
⑫	Knob, Key Lock		GE-91D-9211
⑬	Key, Top		GE-91C-9212
⑭	Reflector, LCD		GE-91D-9209
⑮	Interconnector, LCD		GE-91D-9210
⑯	LCD		EDD042ZX1A4
⑰	Antenna, Rubber		GE-91D-9447
	Wire Kit		#915(A)
	Hardware Kit		#915(B)
⑱	Screw, 2x3 Panhead Machine BLK (Zn)		PM2x3(Zn)
⑲	Screw, 2x4 Panhead Machine (Ni)		PM2x4(Ni)
⑳	Screw, 2.6x25 Panhead Machine BLK (Zn)		PM2.6x25BLK(Zn)

DISASSEMBLY/EXPLODED VIEW

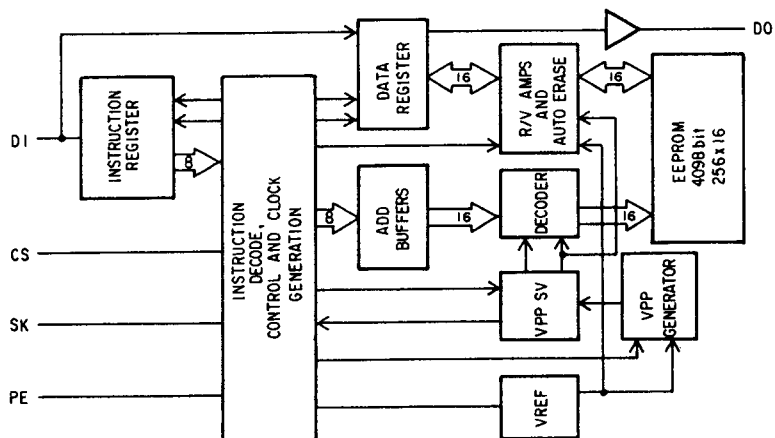
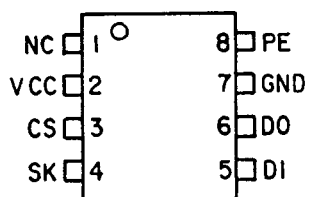


SEMICONDUCTOR LEAD IDENTIFICATION AND IC BLOCK DIAGRAM

INTEGRATED CIRCUIT IDENTIFICATION IC1 GRE-915

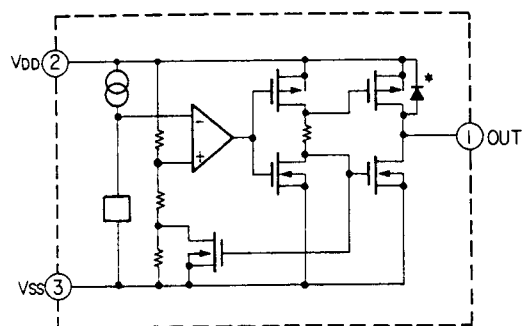
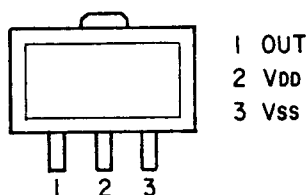


IC2, IC3 AK93C67F

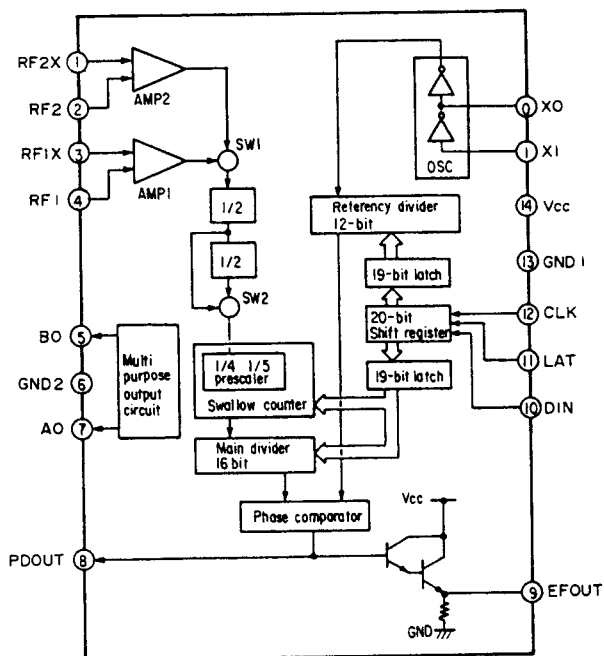
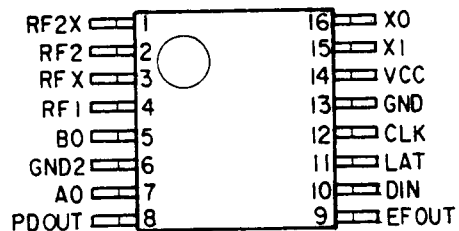


IC4 SB80737AL-A1

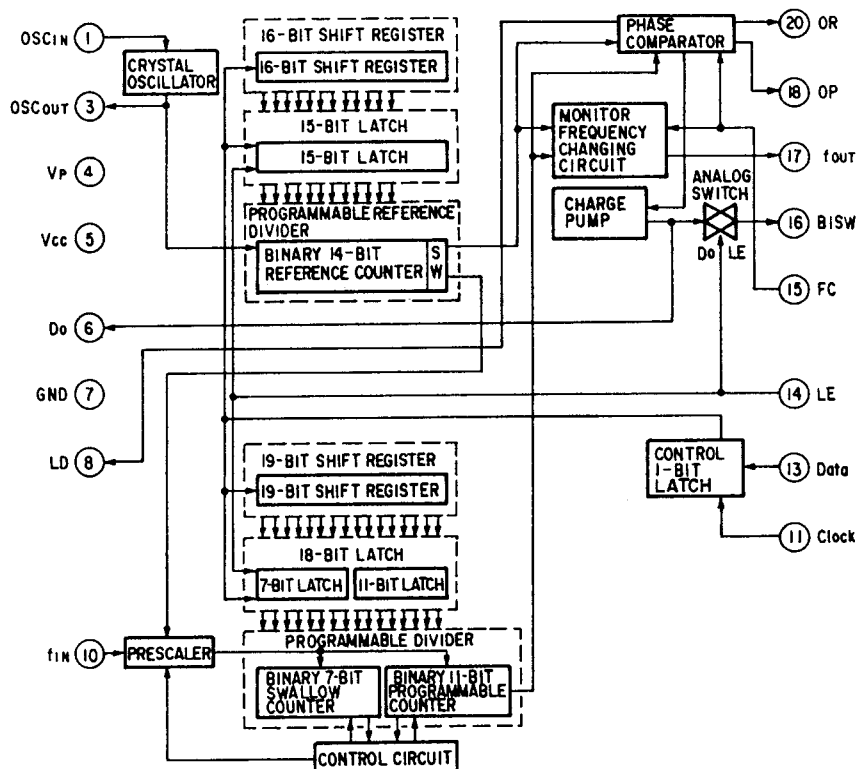
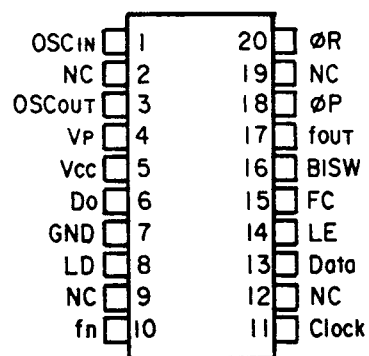
IC5 SB80744AL-A8



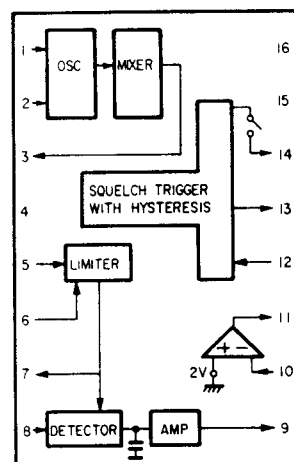
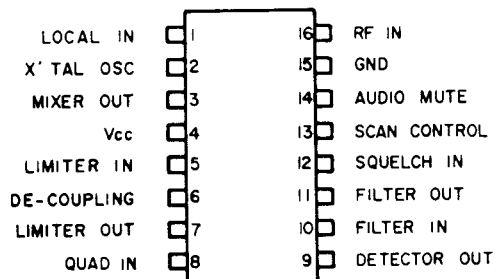
IC101 CXA1356N



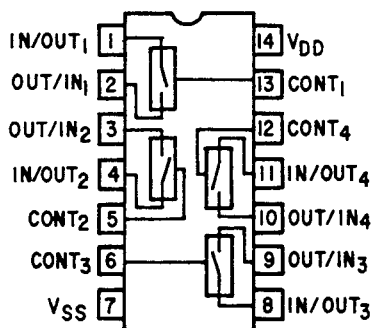
IC102 MB1512



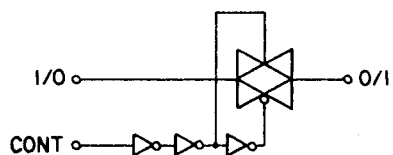
IC301 TK10427, TK10420



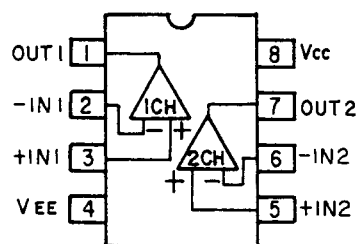
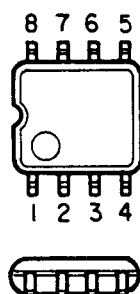
IC302 TC4066BF



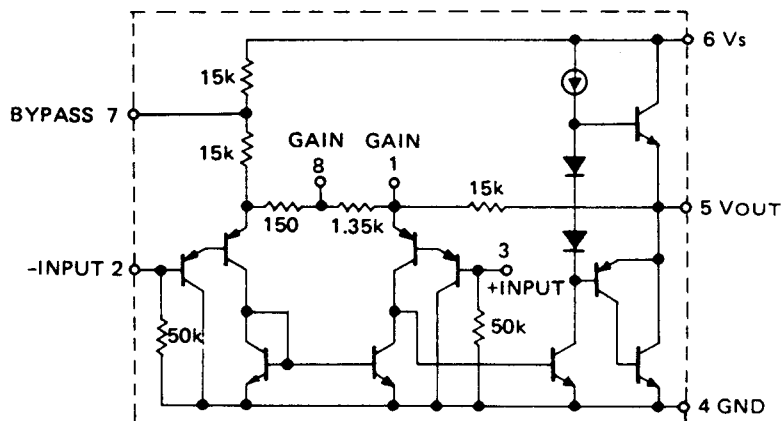
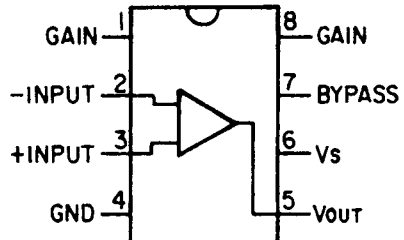
(1/4 TC4066BF)



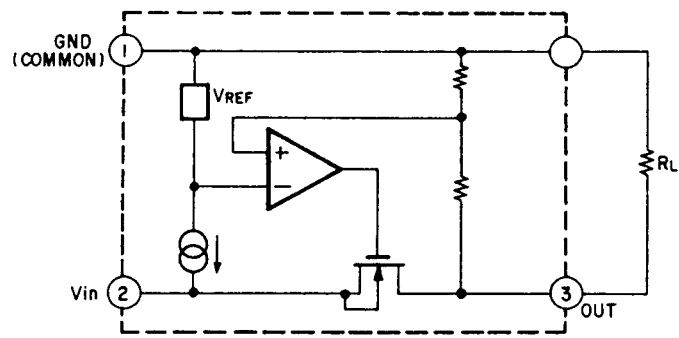
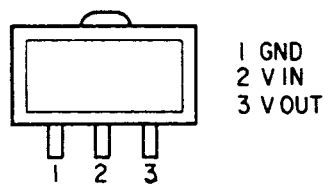
IC303 BA10993F, NJM2903M



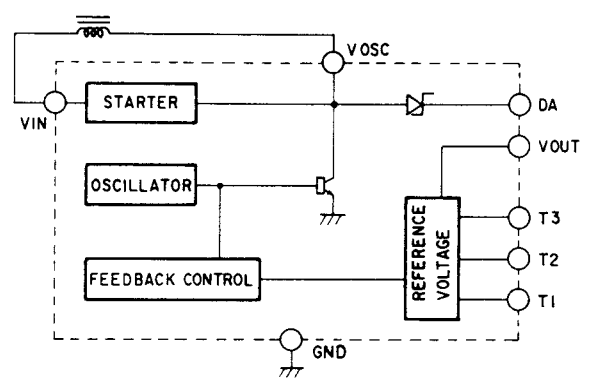
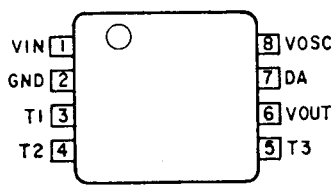
IC304 LM386N-1



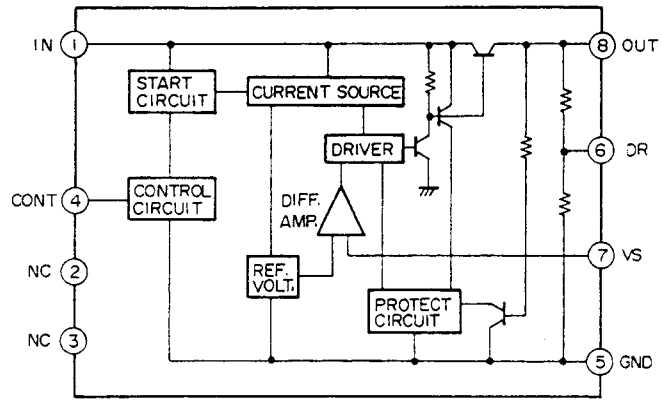
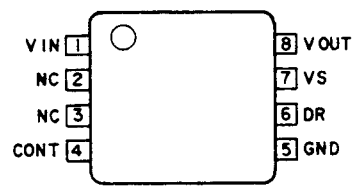
IC305 S-81250HG-RD



IC306 TK11806M

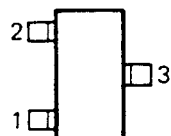


IC307 TK10682M



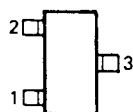
TRANSISTOR LEAD IDENTIFICATION

(A) 2SC2712 (GR)
2SC2714 (O/Y)
RN2402
UN2111



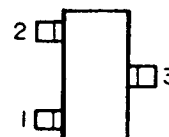
1. Emitter
2. Base
3. Collector

(B) 2SC4116 (Y)
2SC4226 (R25)
2SD1979 (T)
UN5111
UN5214



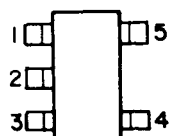
1. Emitter
2. Base
3. Collector

(C) 2SK209 (GR)



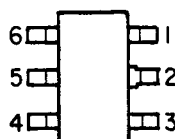
1. Drain
2. Source
3. Gate

(D) XN1111

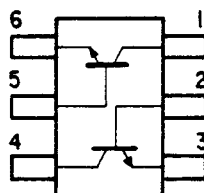
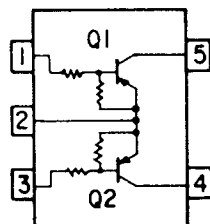


1:Base 1 (B1)
2:Emitter (E)
3:Base 2 (B2)
4:Collector 2 (C2)
5:Collector 1 (C1)

(E) XN4501



1:Collector (Tr1)
2:Base (Tr2)
3:Emitter (Tr2)
4:Collector (Tr2)
5:Base (Tr1)
6:Emitter (Tr1)



DIODE LEAD IDENTIFICATION

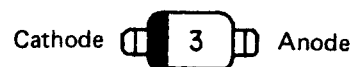
(A) 1SS352



(B) HVU12



(C) HVU306A



(D) HVU308



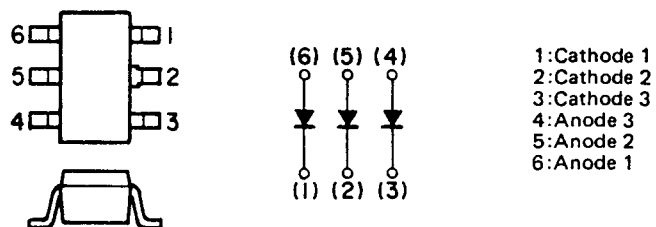
(E) MA77



(F) MA110



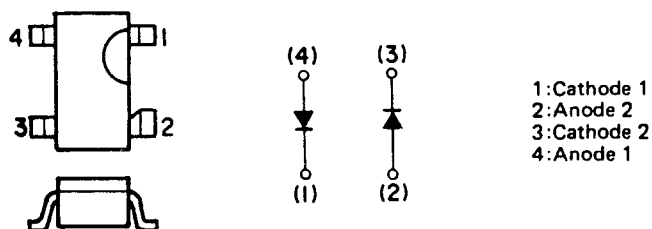
(G) MA121



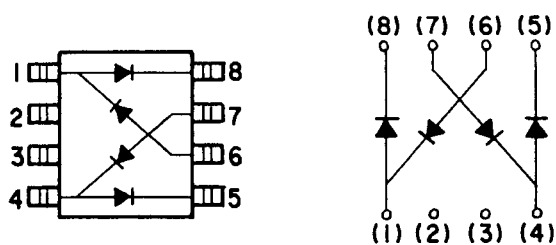
(H) MA728



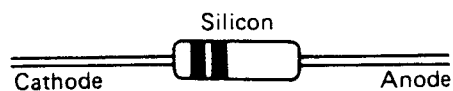
(I) MA862



(J) ND433G



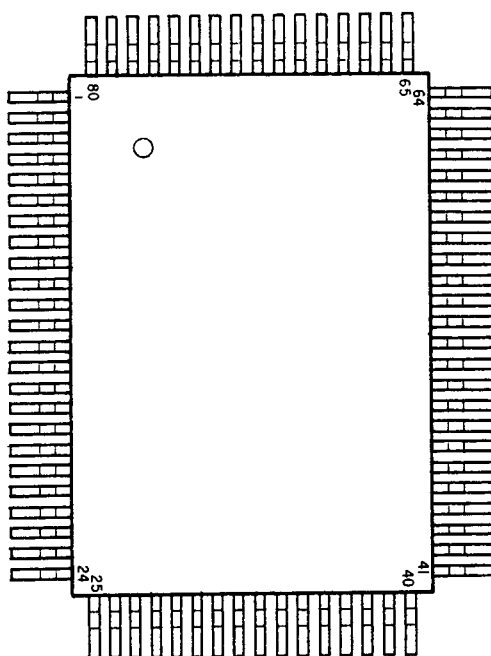
(K) S5566B



(L) SD103

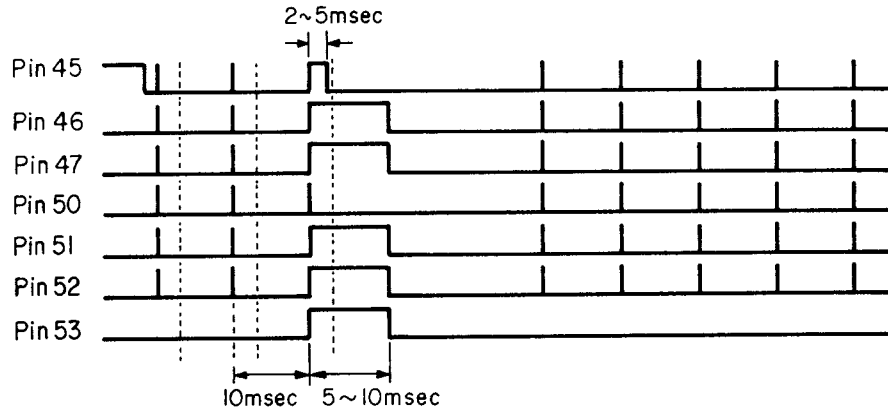


MICROPROCESSOR (IC1) PORT FORMAT



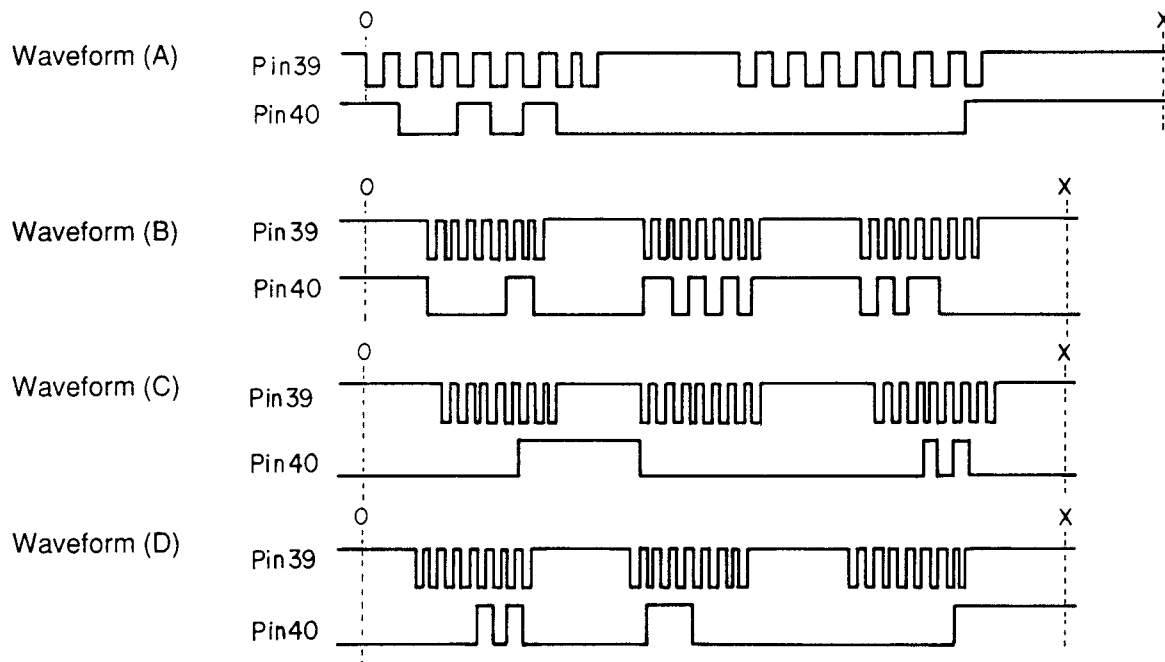
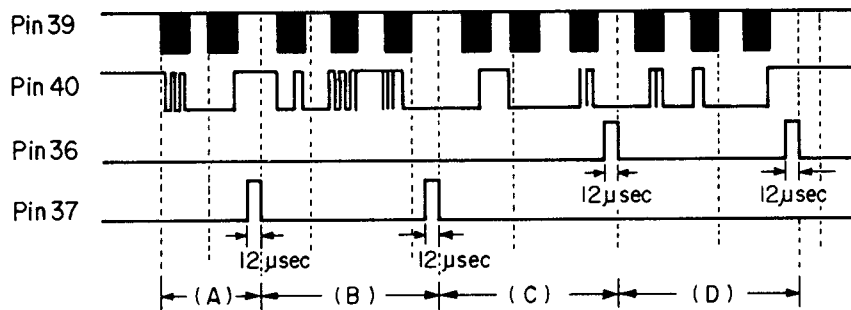
Pin No.		Pin No.	
1	LCD segment driver output	41	GND
2	LCD segment driver output	42	Key input
3	LCD segment driver output	43	Key input
4	LCD segment driver output	44	Key input
5	LCD segment driver output	45	Key input
6	LCD segment driver output	46	Key output
7	LCD segment driver output	47	Key output
8	LCD segment driver output	48	AM/FM output
9	LCD segment driver output	49	Peep output
10	LCD segment driver output	50	Key output
11	LCD segment driver output	51	Key output
12	LCD segment driver output	52	Key output
13	LCD segment driver output	53	Key output
14	NC	54	VDD
15	NC	55	+B
16	NC	56	NC
17	Memory serial data output	57	NC
18	Memory chip select	58	Resonator connection terminal
19	Memory chip select	59	Resonator connection terminal
20	Memory serial data clock	60	Band select
21	LCD common driver output	61	Power control
22	LCD common driver output	62	Mute output
23	LCD common driver output	63	Zeromatic control
24	LCD common driver output	64	Zeromatic input
25	LCD bias control	65	Squelch input
26	LCD drive power supply	66	Low Battery input
27	LCD drive power supply	67	Memory data input
28	LCD drive power supply	68	HOLD input
29	NC	69	LCD segment driver output
30	BAND 5 output	70	LCD segment driver output
31	BAND 4 output	71	LCD segment driver output
32	BAND 3 output	72	LCD segment driver output
33	VSS	73	LCD segment driver output
34	BAND 2 output	74	LCD segment driver output
35	BAND 1 output	75	LCD segment driver output
36	PLL latch 1 output	76	LCD segment driver output
37	PLL latch 2 output	77	LCD segment driver output
38	GND	78	LCD segment driver output
39	PLL serial clock output	79	LCD segment driver output
40	PLL serial data output	80	LCD segment driver output

KEYS ACCESS PULSE OUTPUT (IC1)



Note: Use a signal at Pin45 of IC1 as a trigger and then observe the key access pulse outputs when [PGM] is pressed.

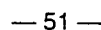
PLL DATA WAVEFORM (IC1)



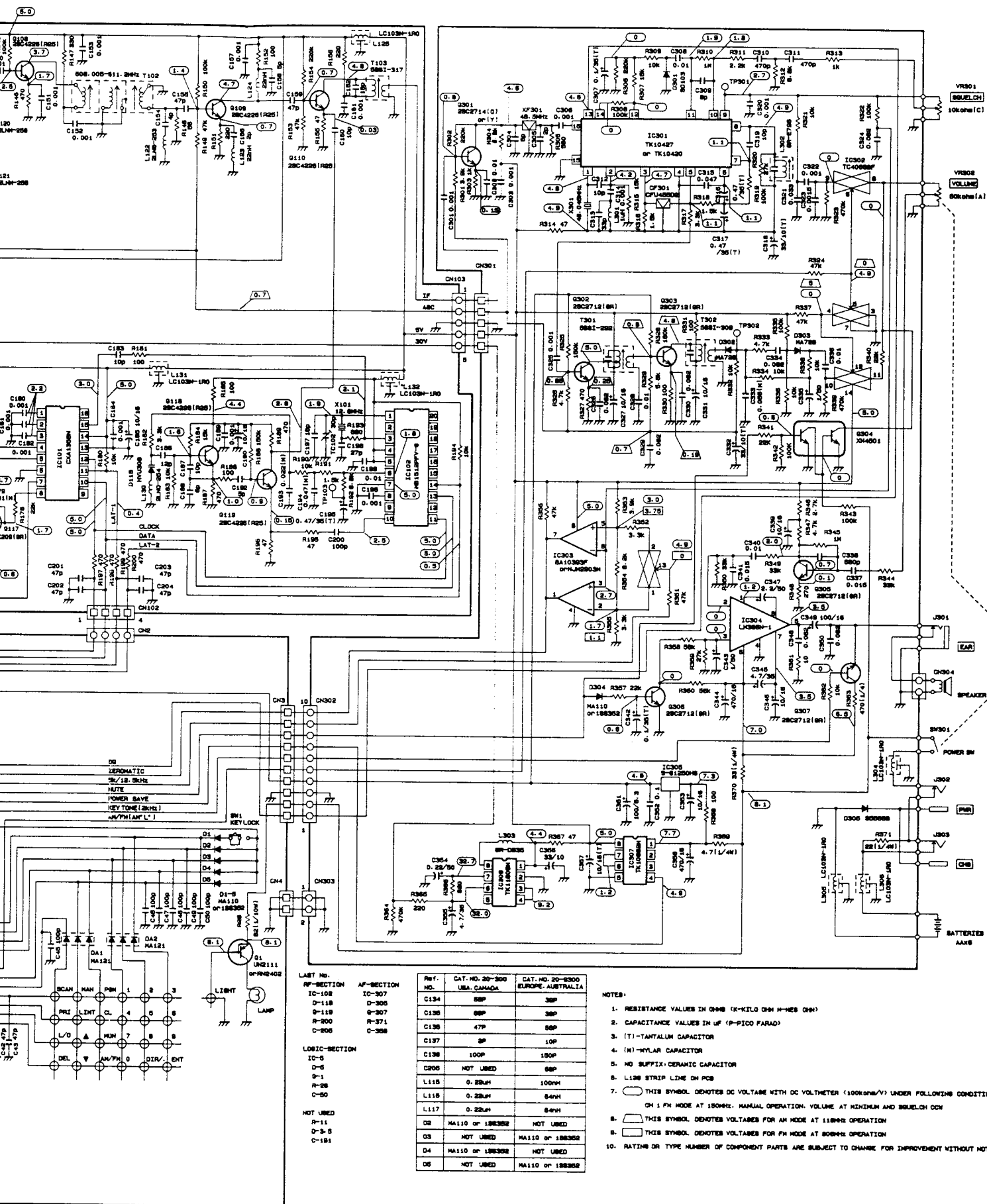
Note: Enter 150.000 MHz to Channel 1 and lockout all the other channels. Observe the waveforms while scanning.

NOTE

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SCHEMATIC DIAGRAM



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