



**RadioShack®**

# ServiceManual

20-522

**PRO-92**

**500-Channel Portable Trunking Scanner**

**Catalog Number: 20-522**

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# SPECIFICATIONS

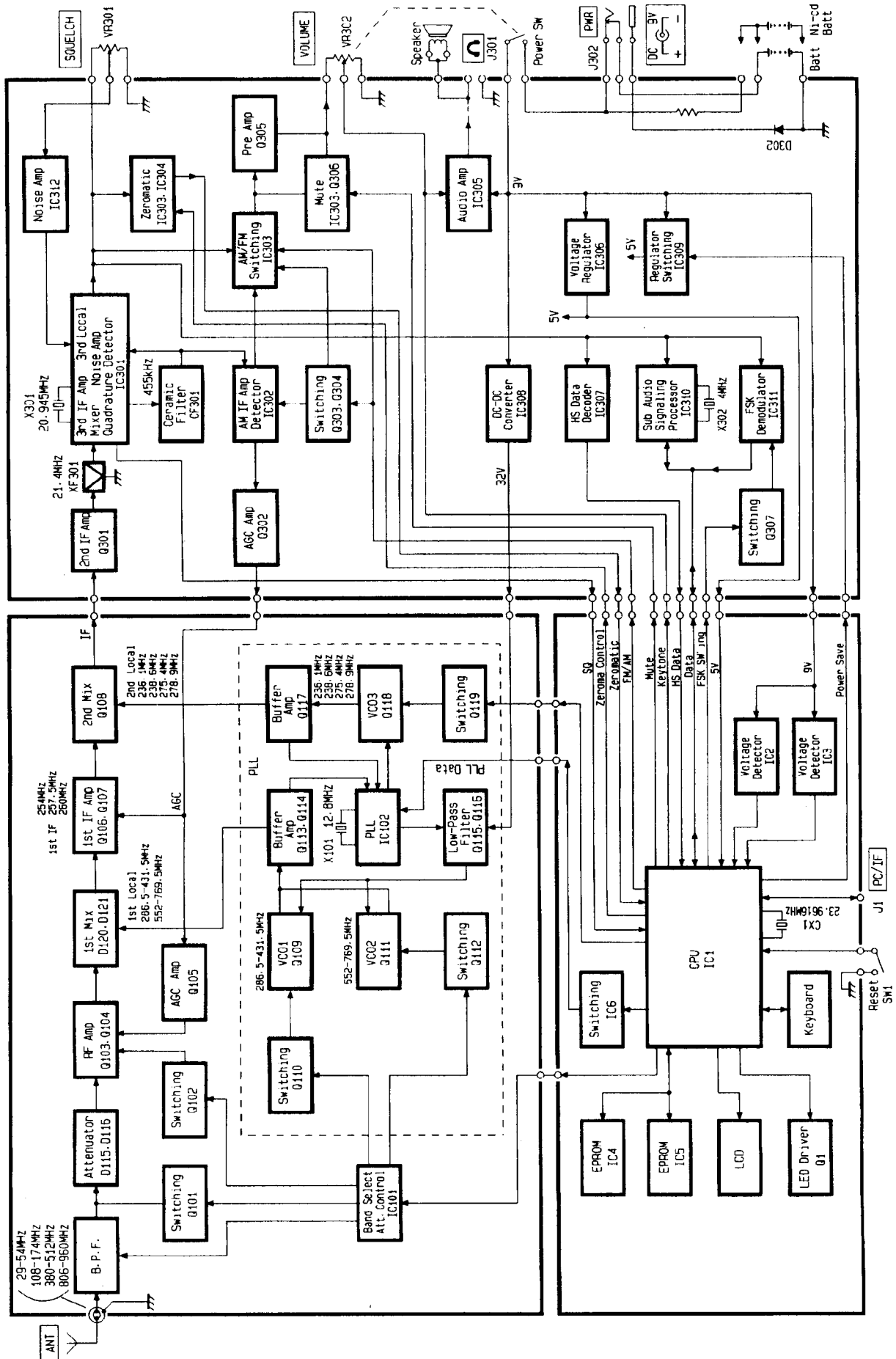
Frequency coverage	29 MHz-54 MHz	5 kHz steps
	108 MHz-136.9875 MHz	12.5 kHz steps
	137 MHz-174 MHz	5 kHz steps
	380 MHz-512 MHz	12.5 kHz steps
	806 MHz-823.9875 MHz	12.5 kHz steps
	849 MHz-868.9875 MHz	12.5 kHz steps
	894 MHz-960 MHz	12.5 kHz steps

		Unit	Nominal Limit	
<b>Sensitivity</b>				
FM: (S+N)/N=20dB Div.: 3 kHz at 1 kHz	29-54 MHz	μV	0.3	1.0
	108-136.9875 MHz	μV	0.3	1.0
	137-174 MHz	μV	0.5	2.0
	380-512 MHz	μV	0.5	2.0
	806-960 MHz	μV	0.7	3.0
AM: (S+N)/N=20dB Mod.: 60% at 1 kHz	29-54 MHz	μV	1.0	3.0
	108-136.9875 MHz	μV	1.0	3.0
	137-174 MHz	μV	1.5	5.0
	380-512 MHz	μV	2.0	5.0
	806-960 MHz	μV	2.0	7.0
<b>Data decode sensitivity</b>				
PL, DL 350 Hz dev. at 41, 154, 450, 860 MHz	PL	μV	0.5	2.0
	DL	μV	0.5	2.0
LT, MO 350 Hz dev. at 450, 860 MHz	LT	μV	0.8	3.0
	MO	μV	0.5	2.0
ED at 450, 860 MHz	ED	μV	2.0	4.0
1050 Hz Mod. 4 kHz dev. at 162.4 MHz	(WX alert)	μV	0.7	2.0
SAME 4 kHz dev. at 162.4 MHz	(WX SAME)	μV	0.5	2.0
<b>Squelch sensitivity</b>				
at threshold		μV	0.5	2.0
at tight (FM)		dB	25	15
at tight (AM)		dB	20	10
Spurious rejection (except primary image)	at 154 MHz (FM)	dB	40	30
Acceptable radio frequency displacement (EIA RS-204-D)		kHz	±6	±3

		Unit	Nominal	Limit
Signal to noise ratio (FM and AM)				
RF input: 100 $\mu$ V	29-54 MHz	dB	40	30
Dev.: 3 kHz at 1 kHz	108-136.9875 MHz	dB	40	30
Mod.: 60% at 1 kHz	137-174 MHz	dB	40	30
	380-512 MHz	dB	35	25
	806-960 MHz	dB	35	25
Residual noise	Volume control, set to its minimum, squelched	mV	1	3
Scanning rate		channels/sec	25	20-28
Search rate		steps/sec	50	40-55
Scan delay time		sec.	2	1-3
Audio output power	10% THD	mW	240	180
Current drain	Squelched	mA	90	110
Channels of operation	Any 500 channels in any band combination			
Channels, frequency, and mode display	Liquid crystal display			
Receiving system	Direct key entry digital-controlled synthesizer, 1st IF: 257.5 MHz 2nd IF: 21.4 MHz 3rd IF: 455 kHz			
Power source	9V DC negative ground only 6AA batteries or a suitable adapter			
Jacks	Antenna, earphone, PC/IF, and external power			
Dimensions (HWD)	6 5/16 x 2 3/8 x 1 3/4 inches (160 x 61 x 45 mm)			
Weight	9.9 oz (280 g) without antenna and batteries			

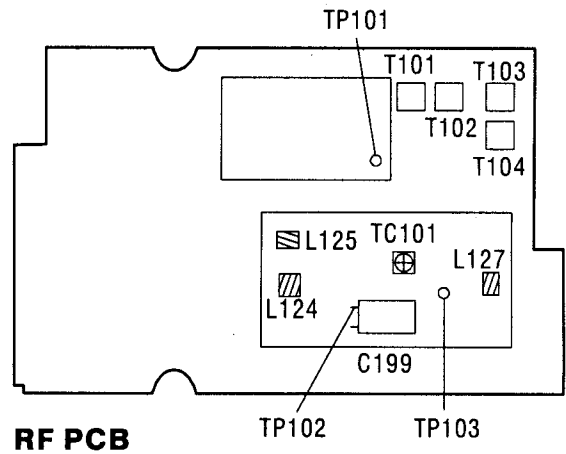
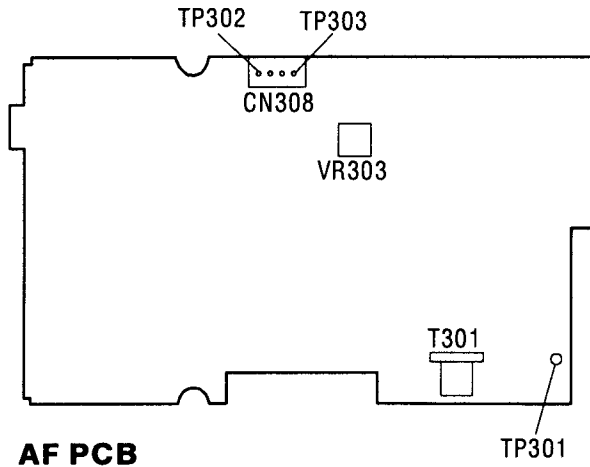
**Note:** Nominal specs represent the design specs. All units should be able to approximate these — some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit fail to meet limit specs.

# BLOCK DIAGRAM



# ALIGNMENT AND ADJUSTMENT

## ALIGNMENT AND TEST POINTS



## ALIGNMENT PREPARATION

### Test Equipment Required

- Oscilloscope
- DC SSVM
- 8-ohm dummy load
- AM/FM signal generator (29 to 1000 MHz)
- Frequency counter (800 MHz)

### Notes:

- Use non-metallic tuning tools.
- The test equipment and receiver should be warmed up for at least 10 minutes before proceeding with alignment.
- The signal level from the generator should be kept as low as possible to obtain an usable output.
- The memory backup circuit can hold the programmed channel memories for about one hour.

Program Channels 000 through 005 as follows:

Channel	Frequency and Band Mode	Channel	Frequency and Band Mode
000	174.000 MHz (FM)	003	806.000 MHz (FM)
001	29.000 MHz (FM)	004	960.000 MHz (FM)
002	512.000 MHz (FM)	005	124.000 MHz (AM)

Table 1

# ALIGNMENT PROCEDURES

## PLL2 VCO Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: Fully counterclockwise (CCW). Select channel 004.	Connect DC SSVM to TP103. See Figure 1.	L127	Adjust L127 to 2.5 volts on the DC SSVM. See Tables 2 and 3.

## PLL1 VCO1 Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW. Select channels 000 and 001.	Connect DC SSVM to TP102. See Figure 2.	L124	1. Select channel 000 and adjust L124 to 18.0 volts on the DC SSVM.  2. Select channel 001 and be sure the DC SSVM reads 1.0-5.0 volts. (No adjustments are necessary for the coil.) See Table 2.

## PLL1 VCO2 Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW. Select channels 002 and 003.	Connect DC SSVM to TP102. See Figure 2.	L125	1. Select channel 002 and adjust L125 to 20.0 volts on the DC SSVM.  2. Select channel 003 and be sure the DC SSVM reads 1.0-6.0 volts. (No adjustments are necessary for the coil.) See Table 2.

Channel	Frequency	Voltage
000	960.000 MHz	2.3-2.7 volts at TP103
001	174.000 MHz	17.0-19.0 volts at TP102
002	29.000 MHz	1.0-5.0 volts at TP102
003	512.000 MHz	19.0-21.0 volts at TP102
004	806.000 MHz	1.0-6.0 volts at TP102

Table 2

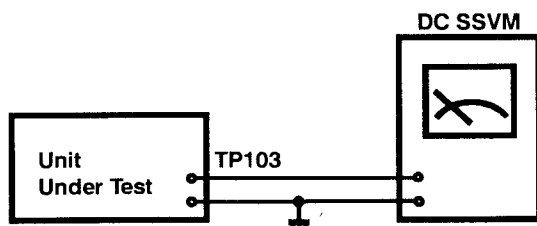


Figure 1

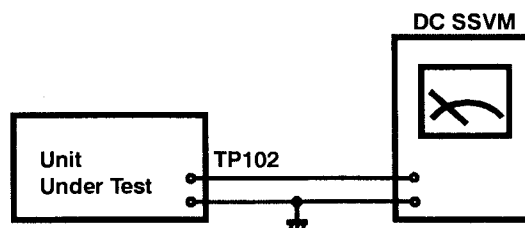
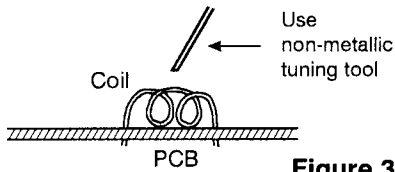


Figure 2

### Adjustment of Coils L124, L125 and L127



**Notes:**

- Be very careful when doing coil pitch adjustment because it greatly affects the frequency.
- Secure the coil with glue after alignment. Be sure the glue is dry and the coil is secured. Also, be sure that the environmental temperature is normal. Then, repeat VCO (PLL2 and PLL1) alignments on Page 6.

Each coil should be adjusted carefully by changing the pitch of the coil little by little using a non-metallic tuning tool as shown in Figure 3.

Increase the pitch of the coil when the measured voltage at TP102 or TP103 is higher than the voltage listed in Table 2 for the PLL2 VCO alignment, PLL1 VCO1 alignment, and PLL1 VCO2 alignment.

Decrease the pitch of the coil when the measured voltage at TP102 or TP103 is lower than the voltage listed in Table 2 for the PLL2 VCO alignment, PLL1 VCO1 alignment, and PLL1 VCO2 alignment.

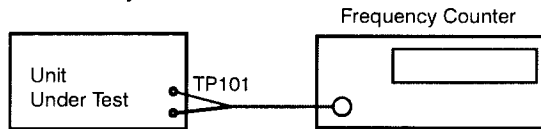
**Figure 3**

**Table 3**

### Reference Frequency Osc. Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW Select channel 002.	Connect frequency counter to TP101. See Figure 4.	TC101	Adjust TC101 so the frequency is 769.500MHz +/-200Hz.

**Note:** Care should be taken not to make any contact between TP101 and the shield case.



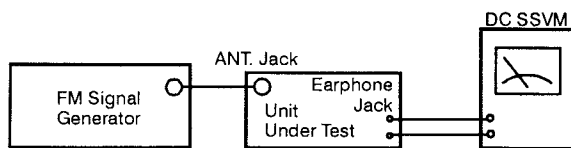
**Figure 4**

### 455 kHz FM Discriminator Coil Alignment

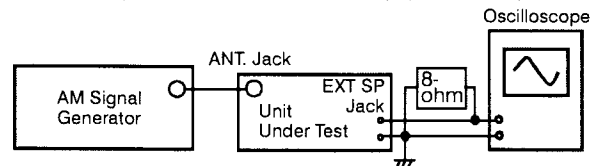
Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW. Select channel 001.	Connect the signal generator to the ANT jack and the DC SSVM to TP301. See Figure 5.	T301	Set the signal generator frequency to 29 MHz, 100 uV output (3 kHz at 1 kHz Dev.) and adjust T301 for 2 +/-0.05 volt on the DC SSVM.

### 1st IF (257.5 MHz) Coil Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW. Select channel 005.	Connect the signal generator to the ANT jack, and the oscilloscope and an 8-ohm dummy load to the headphone jack. See Figure 6.	T101 T102 T103 T104	1. Set the signal generator frequency to 124 MHz. AM: 60% modulation at 1 kHz and RF output under 1 uV.  2. Adjust T101, T102, T103 and T104 for maximum sensitivity.



**Figure 5**



**Figure 6**

# FSK Alignment

Control Setting	Test Instrument Connection	Adjust	Result
OFF/VOLUME control: ON. SQUELCH control: CCW. Select WX channel.	Connect the frequency counter to TP302 and connect DC SSVM to TP303. In this alignment, connect pin 2 and pin 3 of CN308. See Figure 7.	VR303	1. Check the voltage at TP303 if it reads 0 volt (L level). If the voltage is H level (about 5V), short the TP303 to GND at once.  2. Adjust VR303 so the frequency is 1822 +/- 20 Hz.

**Note:** You must adjust FSK alignment while TP303 is "L" level.

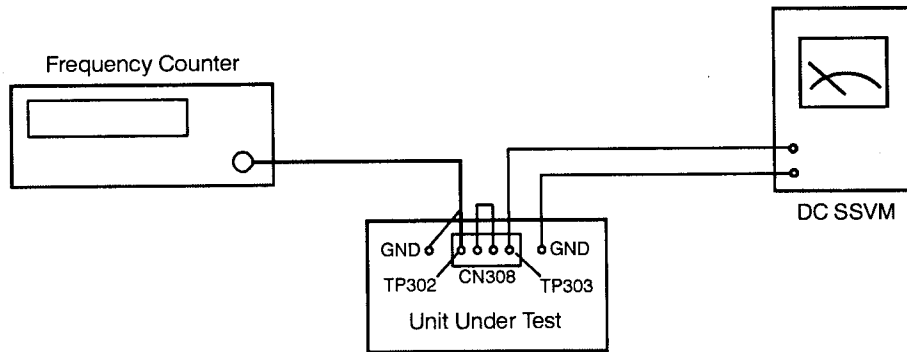
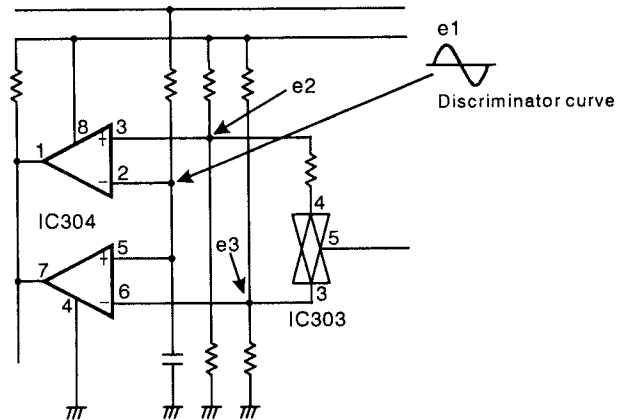


Figure 7

# Zeromatic Function Test Procedure



(Zeromatic functions when output is "H")

	$0 < e1 < e3$	$e3 < e1 < e2$	$e2 < e1 < V_{cc}$
Output (IC303 pins 1 and 7)	L	H	L

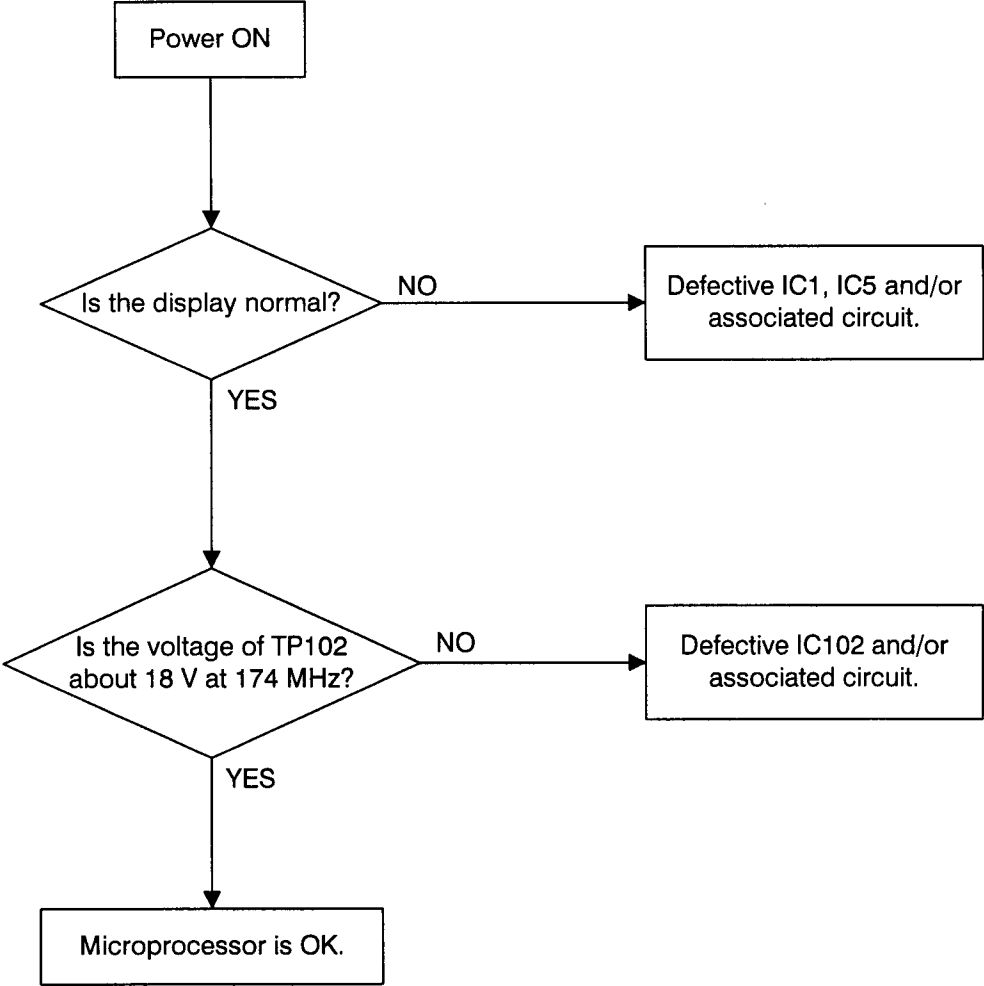
Table 3

To adjust the e1 voltage, receive a signal in the manual mode and set T301 to obtain 2.0 volts at TP301. It is convenient to use the National Weather Service Signal for this adjustment.

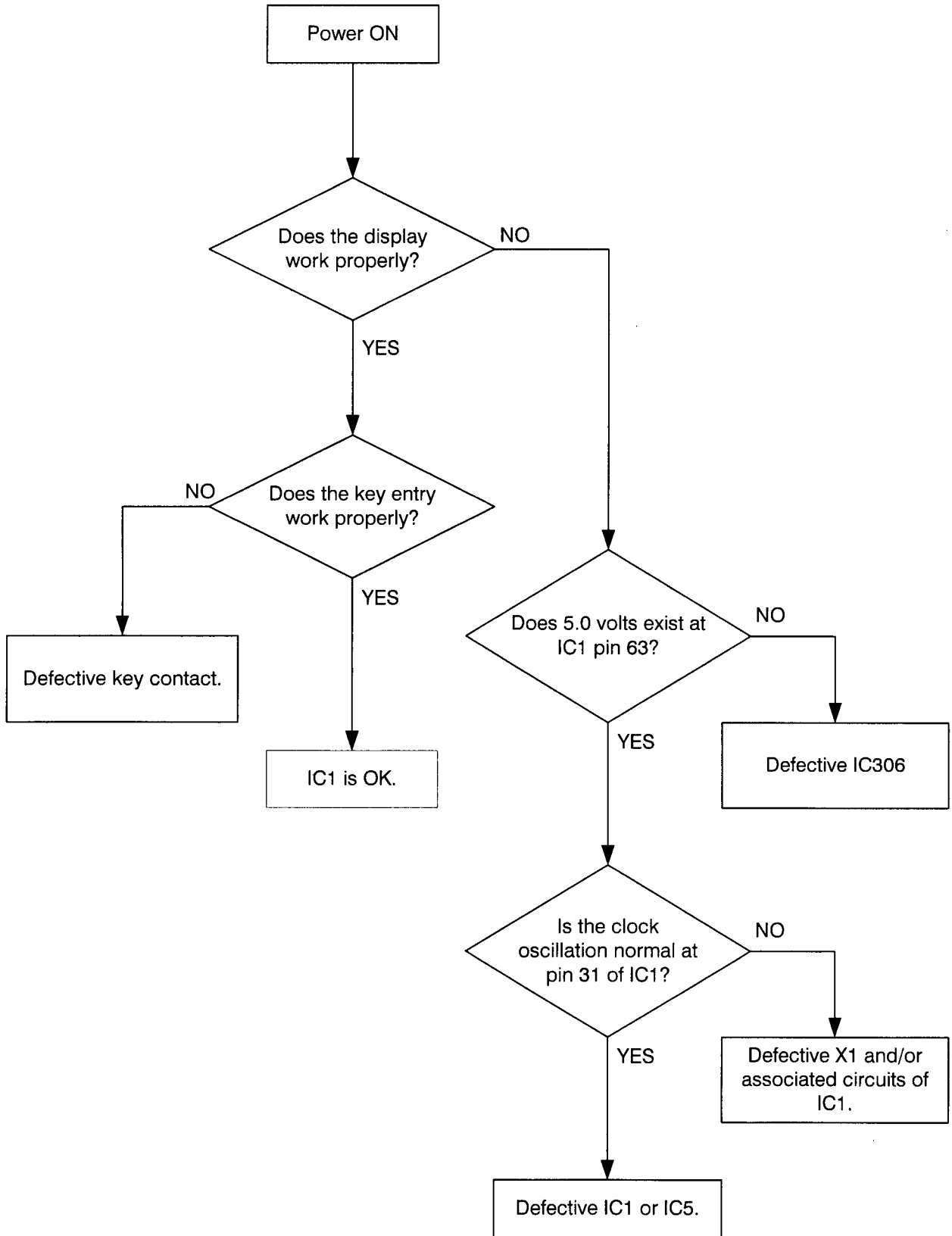
If Zeromatic does not function correctly, refer to "Reference Frequency OSC Alignment" (page 7), check that the frequency is  $769.500000\text{MHz} \pm 200\text{Hz}$ , and adjust T301 again to 2.0 VDC while a signal is being received.

# TROUBLESHOOTING

## Reception Check

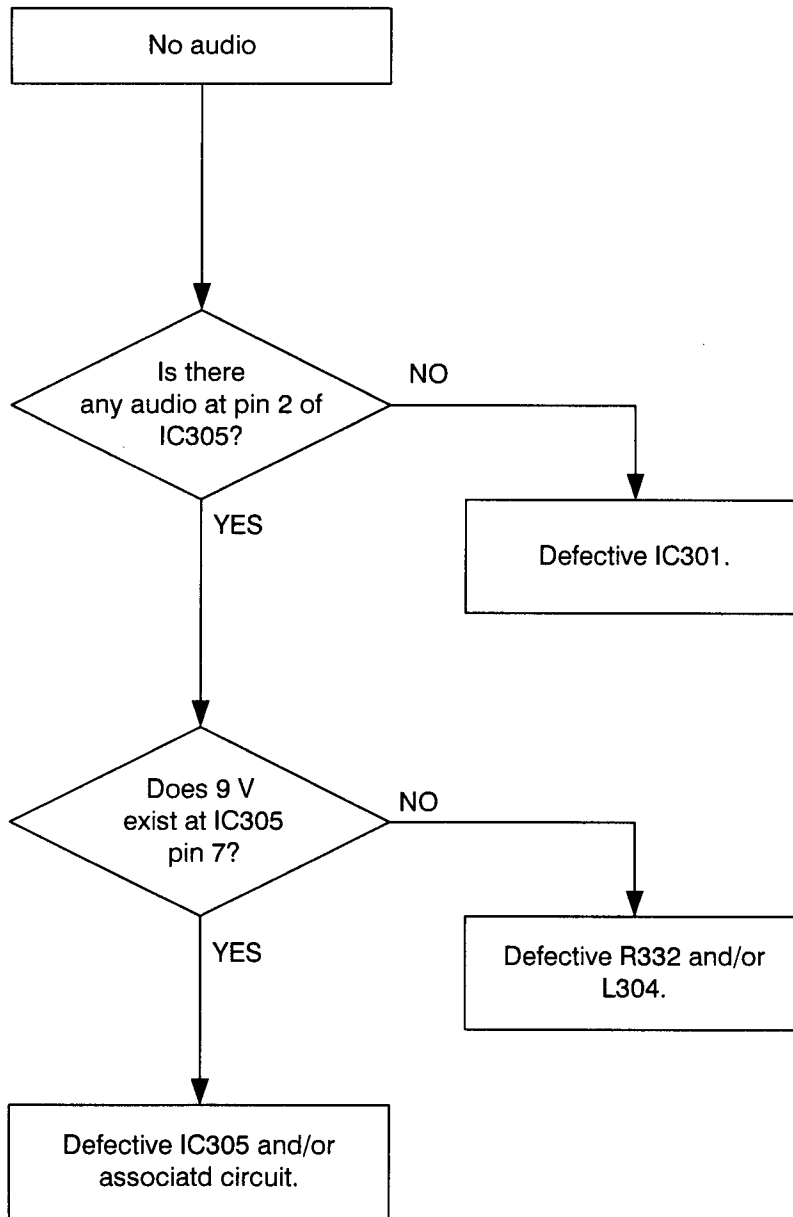


# Microprocessor Check

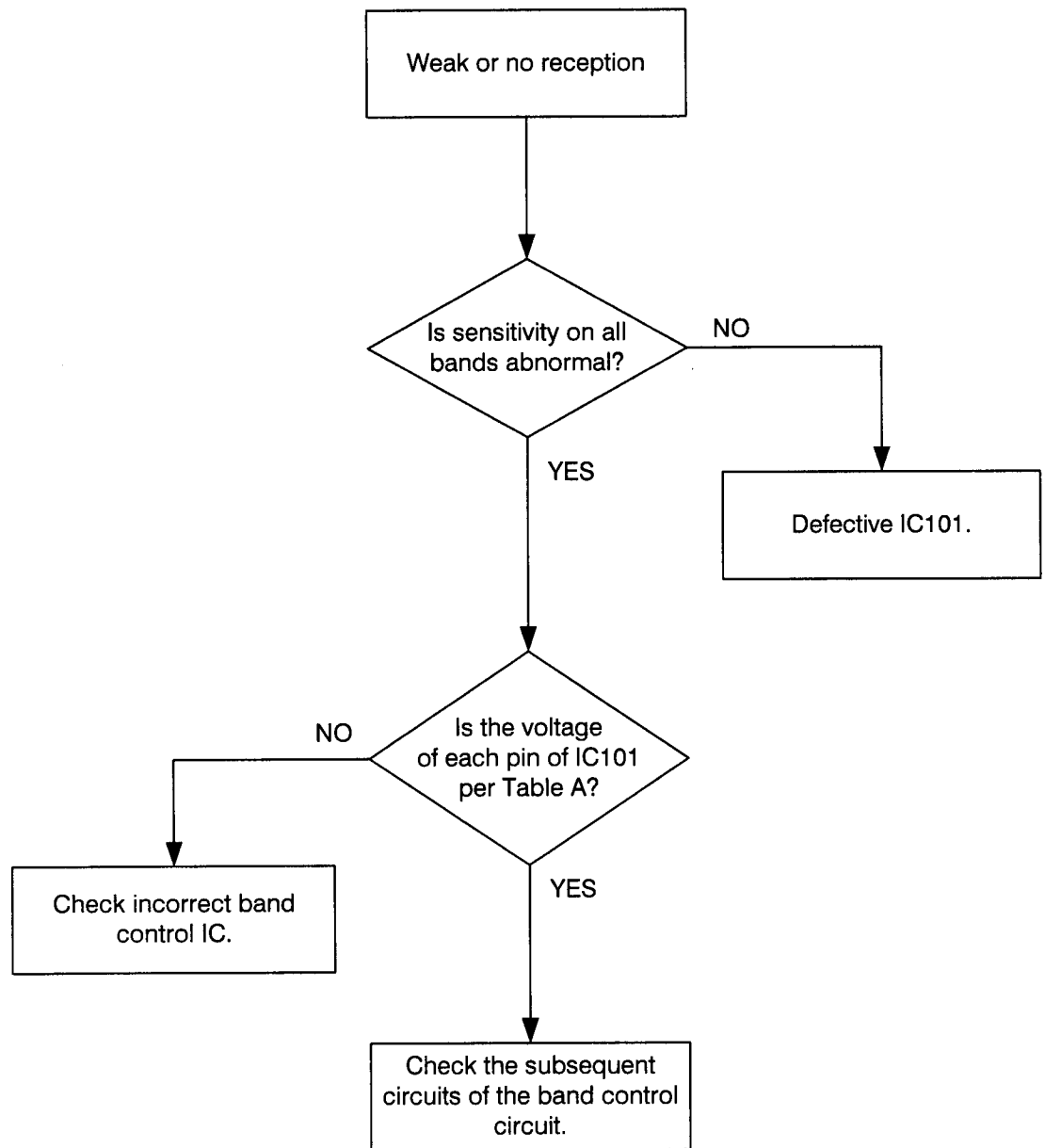


**Note:** While checking the above items, the microprocessor might "lock up." If so, turn the power switch OFF and then ON and restart to check.

# Audio Section



# RF Section



**Figure A**

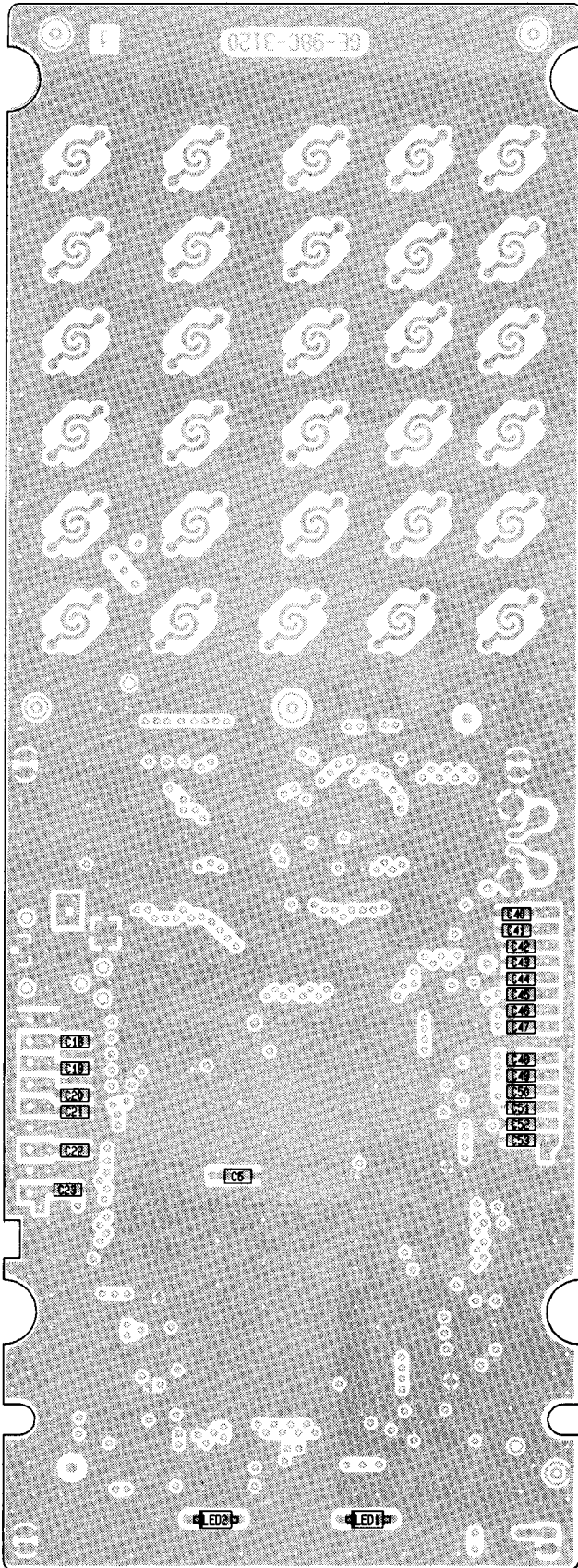
Unit: V

IC101 Pin No.	3	4	5	6
RF Freq.				
29-54 MHz	0	7.5	7.5	7.5
108-174 MHz	7.5	0	7.5	7.5
406-512 MHz	7.5	7.5	7.5	0
806-960 MHz	7.5	7.5	7.5	7.5

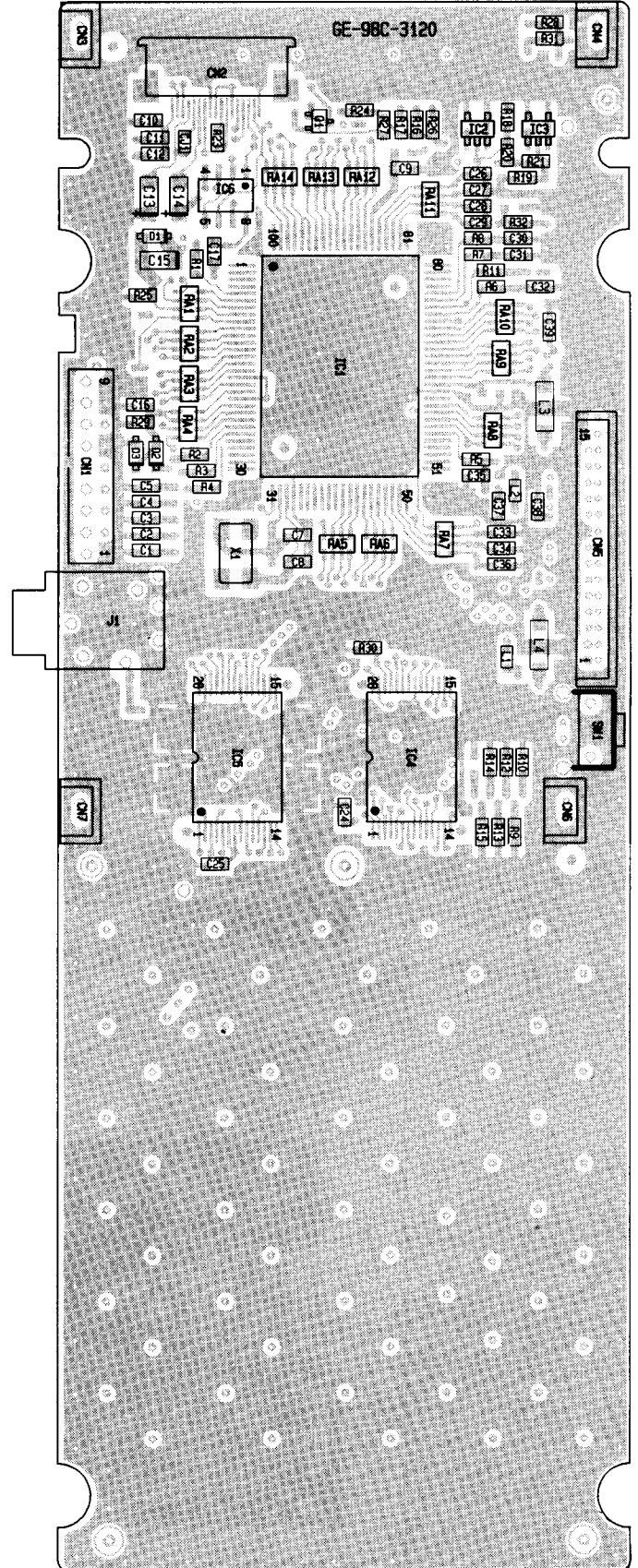




# LOGIC

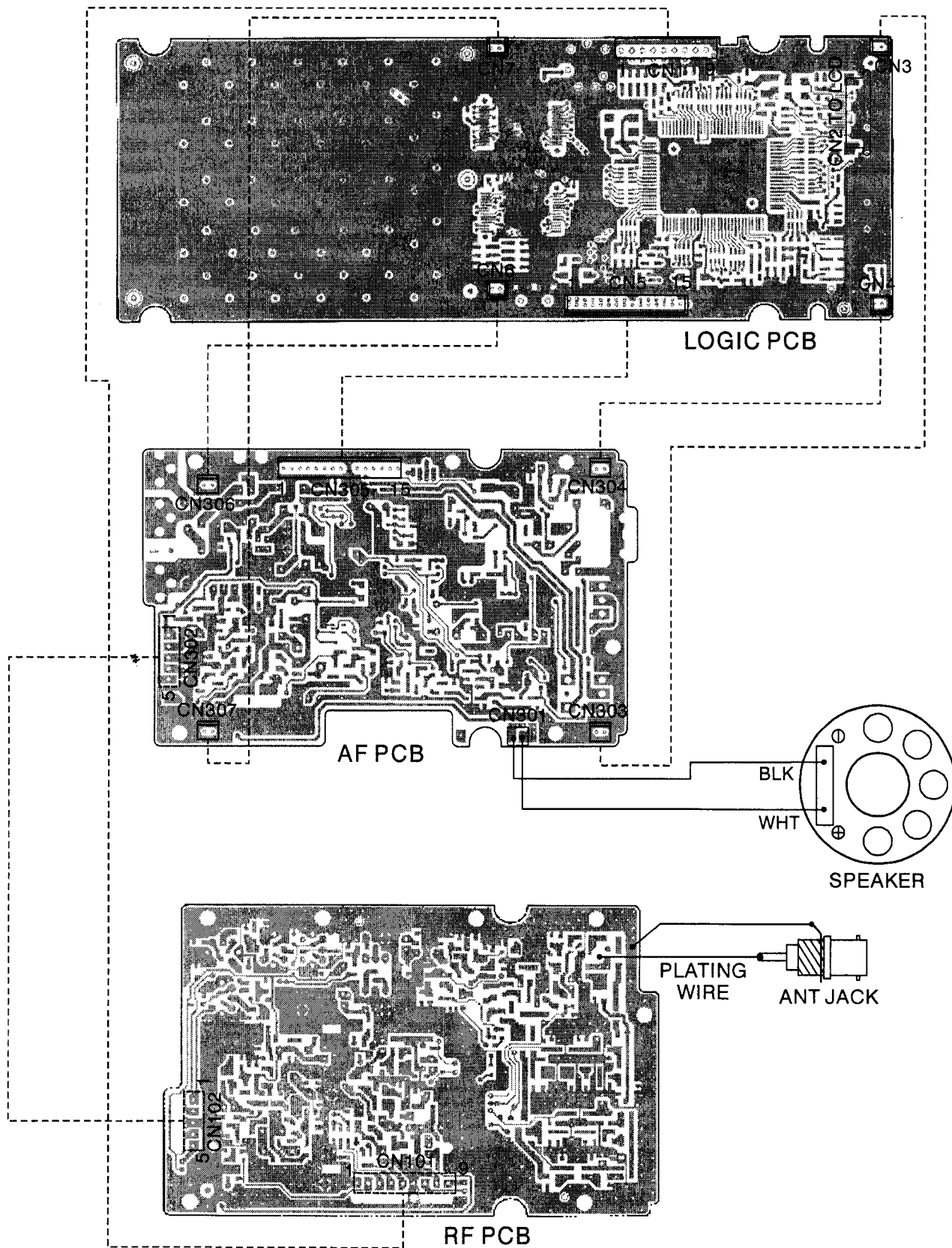


Top View



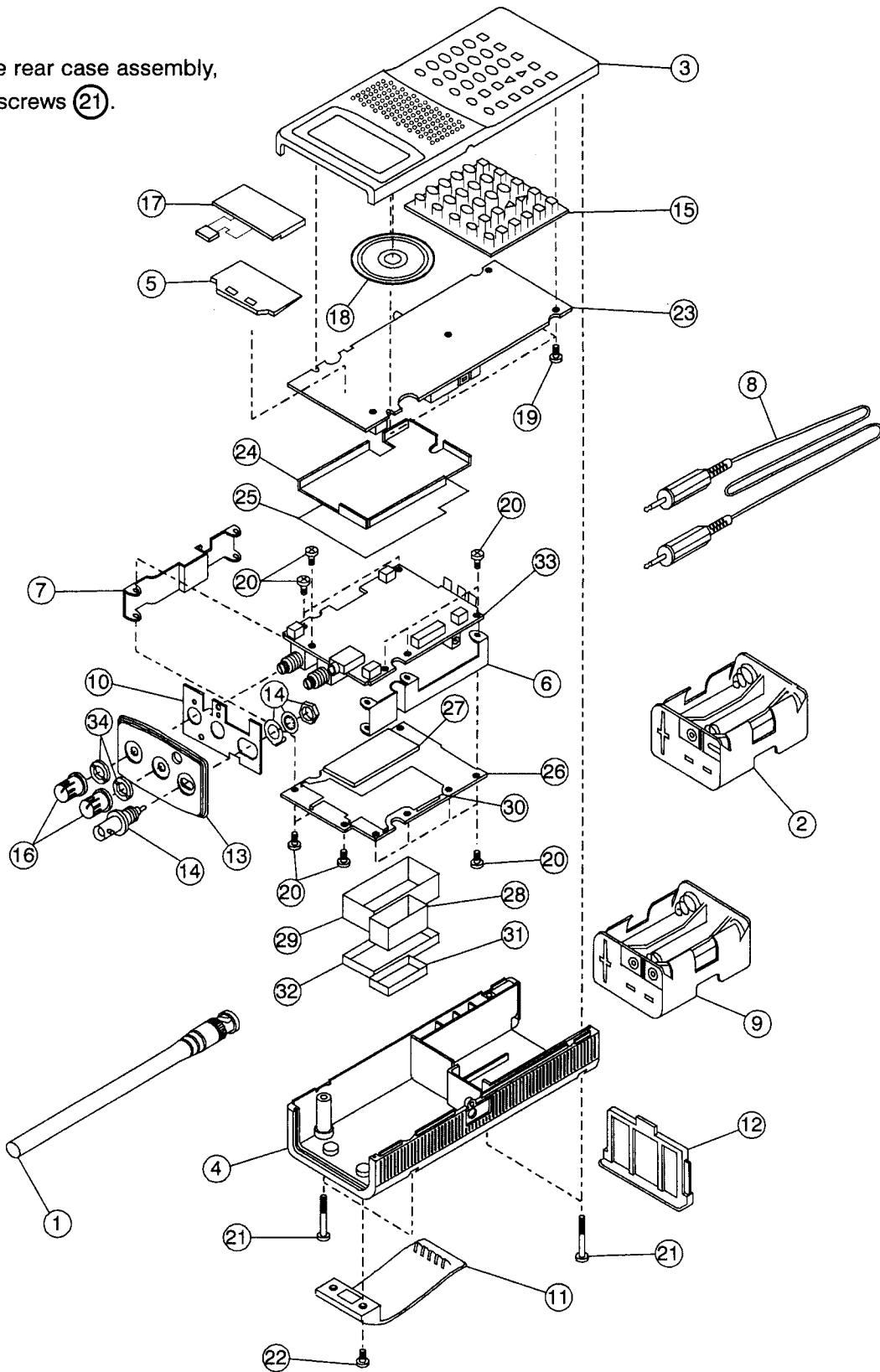
Bottom View

# WIRING DIAGRAM



# EXPLODED VIEW

To remove the rear case assembly,  
unscrew four screws (21).



## MECHANICAL PARTS LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.
1	Antenna, Rubber		GE-91D-9447
2	Assembly, Case Battery Ni-Cd Case, Battery (Yellow) Label		GA-98D-3176 GA-98D-3109 GE-98D-3111
3	Assembly, Case Front (Non-Repairable) Case, Front Window, LCD Tape, Adhesive LCD Himelon, Speaker		GA-99D-3284 GE-98D-3177 GE-98D-3178 GE-98D-3179 GE-95D-1429
4	Assembly, Case Rear (Non-Repairable) Case, Rear Label, Model		GA-99D-3331 GE-98D-3184 GE-99D-3321
5	Assembly, Reflector LCD Reflector, LCD Spacer, LCD		GA-99D-3332 GE-95D-1621 GE-98D-3180
6	Bracket, PCB Antenna Side		GE-99D-3297
7	Bracket, PCB Volume Side		GE-98D-3181
8	Cable, Clone		GE-99D-3309
9	Case, Battery (Black)		GA-97D-2661
10	Chassis, Top		GE-95D-1628
11	Clip, Belt		GE-94C-1158
12	Cover, Battery		GE-98D-3185
13	Escutcheon, Top		GE-98D-3183
14	Jack, Antenna		GE-85D-5383
15	Key Top		GE-98D-3182
16	Knob, Volume/Squelch		GE-91D-9206A
17	LCD		LN124L05
18	Speaker, 8-ohm, 1W (Max)		TS-3608B
	Assembly, Wire/Housing		#9803(A)
	Hardware Kit		#9803(B)
19	Screw, 2.6x5 Pan Head P Tight, BLK, Zn		P tight 2.6x5 BLK (Zn)
20	Screw, 2x4 Pan Haed Machine, Ni		PM 2x4 (Ni)
21	Screw, 2.6x25 Pan Head P Tight, BLK, Zn		P tight 2.6x25 BLK (Zn)
22	Screw, 3x5 Binding Head Machine, BLK, Zn		BM 3x5 BLK (Zn)
23	PCB Assembly, Logic (See Electrical Parts List on page 19.)		
24	Shield, Logic PCB (See Miscellaneous on page 24.)		
25	Insulation, Logic PCB (See Miscellaneous on page 24.)		
26	PCB Assembly, RF (See Electrical Parts List on page 25.)		
27	Bottom, Shield PLL (See Miscellaneous on page 39.)		
28	Case, Shield Mix (See Miscellaneous on page 39.)		
29	Case, Shield PLL (See Miscellaneous on page 39.)		
30	Plate, Shield RF (See Miscellaneous on page 39.)		
31	Top, Shield Mix (See Miscellaneous on page 39.)		
32	Top, Shield PLL (See Miscellaneous on page 39.)		
33	PCB Assembly, AF (See Electrical Parts List on page 40.)		
34	Nut (See Miscellaneous on page 48.)		

# ELECTRICAL PARTS LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.
<b>23</b>	<b>PCB Assembly, Logic Consists of the following</b>		<b>GA-99D-3282</b>
<b>Capacitors</b>			
C1	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C2	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C3	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C4	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C5	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C6	Ceramic 0.082 µF 50 V or 25 V ±10%		ECJ2XB1H823K or GRM40B823K25PB
C7	Ceramic 18 pF 50 V ±5% or ±10%		ECUX1H180JCV or GRM39CH180K50PB or CM105CH180K50A
C8	Ceramic 18 pF 50 V ±5% or ±10%		ECUX1H180JCV or GRM39CH180K50PB or CM105CH180K50A
C9	Ceramic 0.082 µF 50 V or 25 V ±10%		ECJ2XB1H823K or GRM40B823K25PB
C10	Ceramic 0.22 µF 10 V ±10%		LMK107BJ224KA-B or GRM39B224K10PB
C11	Ceramic 0.22 µF 10 V ±10%		LMK107BJ224KA-B or GRM39B224K10PB
C12	Ceramic 0.22 µF 10 V ±10%		LMK107BJ224KA-B or GRM39B224K10PB
C13	Tantalum 1 µF 16 V ±20%		ECST1CY105R or MSVC0J105M1-8R
C14	Tantalum 1 µF 16 V ±20%		ECST1CY105R or MSVC0J105M1-8R
C15	Tantalum 10 µF 6.3 V ±20%		ECST0JY106R or MSVC0J106M1-8R
C16	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C17	Ceramic 0.082 µF 50 V or 25 V ±10%		ECJ2XB1H823K or GRM40B823K25PB
C18	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C19	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C20	Ceramic 47 pF 50 V ±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C21	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C22	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C23	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C24	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C25	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C26	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C27	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C28	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C29	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C30	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C31	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C32	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C33	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C34	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C35	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C36	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C37	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C38	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or CM105SL102J50A or CM105CH102J50A or GRM39SL102J25PB or GRM39CH102J25PB
			or 25 V			

Ref. No.	Description				RS Part No.	Mfr's Part No.
C39	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or CM105SL102J50A or CM105CH102J50A or GRM39SL102J25PB or GRM39CH102J25PB
			or 25 V			
C40	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C41	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C42	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C43	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C44	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C45	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C46	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C47	Ceramic	470 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C48	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C49	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C50	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C51	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C52	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C53	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A

Ref. No.	Description			RS Part No.	Mfr's Part No.
<b>Connectors</b>					
CN1	Connector	9-pin, Male			174161-9
CN2	Connector	17-pin, Female			52745-1790
CN3	Connector	2-pin, Male			53022-0210
CN4	Connector	2-pin, Male			53022-0210
CN5	Connector	15-pin, Male			53022-1510
CN6	Connector	2-pin, Male			53022-0210
CN7	Connector	2-pin, Male			53022-0210
<b>Diodes</b>					
D1	1SS355	Marked A	Silicon		1SS355
D2	1SS355	Marked A	Silicon		1SS355
D3	1SS355	Marked A	Silicon		1SS355
<b>Integrated Circuits</b>					
IC1	W78C438CF-24	Microcontroller, 8-bit, MOS	SMT		W78C438CF-24
IC2	S-80745SN-D9	Voltage Detector	MOS	SMT	S-80745SN-D9
IC3	S-80745SN-D9	Voltage Detector	MOS	SMT	S-80745SN-D9
IC4	HN58V256AT-12	EP-ROM	MOS	SMT	HN58V256AT-12
IC5	GRE-9803	EP-ROM	MOS	SMT	GRE-9803
IC6	TC7W32F	Switching	MOS	SMT	TC7W32F
<b>Jack</b>					
J1	Jack, PC/IF				HSJ1493-01-050
<b>EMI Filters</b>					
L1	Z=1 kohm at f=100MHz				BK1608HM102-T
L2	Z=1 kohm at f=100MHz				BK1608HM102-T
L3	0.022 $\mu$ F	100 V			NFM41R12C223B1
L4	0.022 $\mu$ F	100 V			NFM41R12C223B1
<b>LEDs</b>					
LED1	LN1371G(H)/6U	Green			LN1371G(H)/6U
LED2	LN1371G(H)/6U	Green			LN1371G(H)/6U
<b>Transistor</b>					
Q1	DTC144EUA	Marked 26	NPN		DTC144EUA

Ref. No.	Description				RS Part No.	Mfr's Part No.
<b>Resistors</b>						
R1	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R2	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R3	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R4	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R5	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R6	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R7	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R8	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R9	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R10	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R11	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R12	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R13	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R14	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R15	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R16	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R17	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R18	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R19	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R20	Chip, Metal Glaze	15 kohm	±5%	1/16 W		RK73K1J153J or CR10-153J
R21	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R22	Not used.					
R23	Chip, Metal Glaze	180 kohm	±5%	1/16 W		RK73K1J184J or CR10-184J
R24	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R25	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R26	Chip, Metal Glaze	56 ohm	±5%	1/16 W		RK73K1J560J or CR10-560J
R27	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R28	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J

Ref. No.	Description				RS Part No.	Mfr's Part No.
R29	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R30	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R31	Chip, Metal Glaze	1 Mohm	±5%	1/16 W		RK73K1J105J or CR10-105J
R32	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
<b>Resistor Arrays</b>						
RA1	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA2	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA3	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA4	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA5	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA6	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA7	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA8	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA9	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA10	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA11	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA12	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA13	1 kohm x 4	1/16 W	±5%			CN1J4102J
RA14	1 kohm x 4	1/16 W	±5%			CN1J4102J
<b>Switch</b>						
SW1	Switch, Reset					SKHLLD
<b>Crystal</b>						
X1	23.9616 MHz					GE-99D-3312
<b>Miscellaneous</b>						
24 25	Shield, Logic PCB Insulation, Logic Board Jumper, Chip					GE-98D-3229 GE-98D-3230 RK73Z1J or CJ10-000

Ref. No.	Description				RS Part No.	Mfr's Part No.
26	PCB Assembly, RF Consists of the following					GA-99D-3280
<b>Capacitors</b>						
C101	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C102	Ceramic	3 pF	50 V	$\pm$ 0.25 pF		ECUX1H030CCV or GRM39CJ030C50PB or CM105CJ030C50A
C103	Ceramic	10 pF	50 V	$\pm$ 0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C104	Ceramic	2 pF	50 V	$\pm$ 0.25 pF		ECUX1H020CCV or GRM39CK020C50PB or CM105CK020C50A
C105	Ceramic	3 pF	50 V	$\pm$ 0.25 pF		ECUX1H030CCV or GRM39CJ030C50PB or CM105CJ030C50A
C106	Ceramic	100 pF	50 V	$\pm$ 5% or $\pm$ 10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C107	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C108	Electrolytic	1 $\mu$ F	50V	$\pm$ 20%		50UTCX010M or SSK1H1R0M-LC or UMA1H010MDA
C109	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C110	Ceramic	2 pF	50 V	$\pm$ 0.25 pF		ECUX1H020CCV or GRM39CK020C50PB or CM105CK020C50A
C111	Ceramic	10 pF	50 V	$\pm$ 0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C112	Ceramic	6 pF	50 V	$\pm$ 0.5 pF		ECUX1H060DCV or GRM39CH060D50PB or CM105CH060D50A
C113	Ceramic	10 pF	50 V	$\pm$ 0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C114	Ceramic	5 pF	50 V	$\pm$ 0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C115	Ceramic	7 pF	50 V	±0.5 pF		ECUX1H070DCV or GRM39CH070D50PB or CM105CH070D50A
C116	Ceramic	0.5 pF	50 V	±0.25 pF		ECUX1H0R5CCV or GRM39CK0R5C50PB or CM105CK0R5C50A
C117	Ceramic	7 pF	50 V	±0.5 pF		ECUX1H070DCV or GRM39CH070D50PB or CM105CH070D50A
C118	Ceramic	5 pF	50 V	±0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A
C119	Ceramic	10 pF	50 V	±0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C120	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C121	Electrolytic	1 µF	50V	±20%		50UTCX010M or SSK1H1R0M-LC or UMA1H010MDA
C122	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C123	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C124	Ceramic	8 pF	50 V	±0.5 pF		ECUX1H080DCV or GRM39CH080D50PB or CM105CH080D50A
C125	Ceramic	12 pF	50 V	±5% or ±10%		ECUX1H120JCV or GRM39CH120K50PB or CM105CH120K50A
C126	Ceramic	39 pF	50 V	±5% or ±10%		ECUX1H390JCV or GRM39CH390K50PB or CM105CH390K50A
C127	Ceramic	12 pF	50 V	±5% or ±10%		ECUX1H120JCV or GRM39CH120K50PB or CM105CH120K50A
C128	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C129	Electrolytic	1 µF	50V	±20%		50UTCX010M or SSK1H1R0M-LC or UMA1H010MDA

Ref. No.	Description				RS Part No.	Mfr's Part No.
C130	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C131	Ceramic	68 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H680JCV or GRM39CH680K50PB or CM105CH680K50A
C132	Ceramic	68 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H680JCV or GRM39CH680K50PB or CM105CH680K50A
C133	Ceramic	56 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H560JCV or GRM39CH560K50PB or CM105CH560K50A
C134	Ceramic	6 pF	50 V	$\pm 0.5$ pF		ECUX1H060DCV or GRM39CH060D50PB or CM105CH060D50A
C135	Ceramic	100 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C136	Ceramic	12 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H120JCV or GRM39CH120K50PB or CM105CH120K50A
C137	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C138	Electrolytic	1 $\mu$ F	50V	$\pm 20\%$		50UTCX010M or SSK1H1ROM-LC or UMA1H010MDA
C139	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C140	Ceramic	0.047 $\mu$ F	50 V	$\pm 10\%$		ECJ2XB1H473K or GRM40B473K50PB or CM21B473K50A
C141	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C142	Ceramic	47 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C143	Ceramic	33 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H330JCV or GRM39CH330K50PB or CM105CH330K50A
C144	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		

Ref. No.	Description				RS Part No.	Mfr's Part No.
C145	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C146	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C147	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C148	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C149	Ceramic	10 pF	50 V	$\pm 0.5$ pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C150	Ceramic	100 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C151	Ceramic	100 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C152	Ceramic	100 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C153	Ceramic	0.001 $\mu$ F	50 V	$\pm 5\%$		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm 5\%$		
			or 50 V	$\pm 10\%$		
C154	Ceramic	10 pF	50 V	$\pm 0.5$ pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C155	Ceramic	10 pF	50 V	$\pm 0.5$ pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C156	Ceramic	6 pF	50 V	$\pm 0.5$ pF		ECUX1H060DCV or GRM39CH060D50PB or CM105CH060D50A
C157	Ceramic	100 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C158	Ceramic	22 pF	50 V	$\pm 5\%$ or $\pm 10\%$		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C159	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C160	Ceramic	5 pF	50 V	$\pm$ 0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A
C161	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C162	Ceramic	1.5 pF	50 V	$\pm$ 0.25 pF		ECUX1H1R5CCV or GRM39CK1R5C50PB or CM105CK1R5C50A
C163	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C164	Ceramic	1.5 pF	50 V	$\pm$ 0.25 pF		ECUX1H1R5CCV or GRM39CK1R5C50PB or CM105CK1R5C50A
C165	Ceramic	4 pF	50 V	$\pm$ 0.25 pF		ECUX1H040CCV or GRM39CH040C50PB or CM105CH040C50A
C166	Ceramic	12 pF	50 V	$\pm$ 5% or $\pm$ 10%		ECUX1H120JCV or GRM39CH120K50PB or CM105CH120K50A
C167	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C168	Ceramic	1.5 pF	50 V	$\pm$ 0.25 pF		ECUX1H1R5CCV or GRM39CK1R5C50PB or CM105CK1R5C50A
C169	Ceramic	0.001 $\mu$ F	50 V	$\pm$ 5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	$\pm$ 5%		
			or 50 V	$\pm$ 10%		
C170	Ceramic	100 pF	50 V	$\pm$ 5% or $\pm$ 10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C171	Ceramic	10 pF	50 V	$\pm$ 0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C172	Ceramic	10 pF	50 V	$\pm$ 0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C173	Ceramic	10 pF	50 V	±0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C174	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C175	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C176	Ceramic	33 pF	50 V	±5% or ±10%		ECUX1H330JCV or GRM39CH330K50PB or CM105CH330K50A
C177	Ceramic	470 pF	50 V	±5% or ±10%		ECUX1H471JCV or GRM39CH471K50PB or CM105CH471K50A
C178	Ceramic	12 pF	50 V	±5% or ±10%		ECUX1H120JCV or GRM39CH120K50PB or CM105CH120K50A
C179	Ceramic	5 pF	50 V	±0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A
C180	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C181	Ceramic	5 pF	50 V	±0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A
C182	Electrolytic	47 µF	6.3 V	±20%		6.3UTCX470M or SSK0J470M-LC or UMA0J470MDA
C183	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C184	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C185	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C186	Ceramic	7 pF	50 V	±0.5 pF		ECUX1H070DCV or GRM39CH070D50PB or CM105CH070D50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C187	Ceramic	3 pF	50 V	±0.25 pF		ECUX1H030CCV or GRM39CJ030C50PB or CM105CJ030C50A
C188	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C189	Ceramic	2 pF	50 V	±0.25 pF		ECUX1H020CCV or GRM39CK020C50PB or CM105CK020C50A
C190	Ceramic	10 pF	50 V	±0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C191	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C192	Ceramic	100 pF	50 V	±5% or ±10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C193	Ceramic	100 pF	50 V	±5% or ±10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C194	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C195	Electrolytic	4.7 µF	35 V	±20%		35UTCX4R7M or SSK1V4R7M-LC or UMA1V4R7MDA
C196	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C197	Polyester	0.0047 µF	50 V	±10%		AMC50K472 or QYS1H472K
C198	Polyester	0.01 µF	50 V	±10%		AMC50K103 or QYS1H103K
C199	Polypropylene	0.033 µF	100 V	±5%		APS100J333
C200	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C201	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C202	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C203	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C204	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C205	Ceramic	0.082 µF	50 V or 25 V	±10% ±10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C206	Ceramic	0.001 µF	50 V  or 25 V  or 50 V	±5%  ±5%  ±10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C207	Ceramic	0.001 µF	50 V  or 25 V  or 50 V	±5%  ±5%  ±10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C208	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C209	Ceramic	33 pF	50 V	±5% or ±10%		ECUX1H330JCV or GRM39CH330K50PB or CM105CH330K50A
C210	Polyester	0.047 µF	50 V	±10%		AMC50K473 or QYP1H473K
C211	Polyester	0.01 µF	50 V	±10%		AMC50K103 or QYS1H103K
C212	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C213	Ceramic	100 pF	50 V	±5% or ±10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C214	Ceramic	0.001 µF	50 V  or 25 V  or 50 V	±5%  ±5%  ±10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C215	Ceramic	0.001 µF	50 V  or 25 V  or 50 V	±5%  ±5%  ±10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C216	Ceramic	5 pF	50 V	±0.25 pF		ECUX1H050CCV or GRM39CH050C50PB or CM105CH050C50A
C217	Ceramic	27 pF	50 V	±5% or ±10%		ECUX1H270JCV or GRM39CH270K50PB or CM105CH270K50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C218	Ceramic	7 pF	50 V	±0.5 pF		ECUX1H070DCV or GRM39CH070D50PB or CM105CH070D50A
C219	Electrolytic	10 µF	16 V	±20%		16UTCX100M or SSK1C100M-LC or UMA1C100MDA
C220	Ceramic	47 pF	50 V	±5% or ±10%		ECUX1H470JCV or GRM39CH470K50PB or CM105CH470K50A
C221	Ceramic	22 pF	50 V	±5% or ±10%		ECUX1H220JCV or GRM39CH220K50PB or CM105CH220K50A
C222	Ceramic	10 pF	50 V	±0.5 pF		ECUX1H100DCV or GRM39CH100D50PB or CM105CH100D50A
C223	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C224	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±5%		
			or 50 V	±10%		
C225	Ceramic	1 pF	50 V	±0.25 pF		ECUX1H010CCV or GRM39CK010C50PB or CM105CK010C50A

### Connectors

CN101	Connector	9-pin, Female				174074-9
CN102	Connector	5-pin, Female				174074-5

### Diodes

D101	HVU131	Marked PI	Silicon	Varactor		HVU131
D102	HSU277	Marked 3	Silicon			HSU277
D103	HSU277	Marked 3	Silicon			HSU277
D104	HSU277	Marked 3	Silicon			HSU277
D105	HSU277	Marked 3	Silicon			HSU277
D106	HSU277	Marked 3	Silicon			HSU277
D107	HSU277	Marked 3	Silicon			HSU277
D108	HSU277	Marked 3	Silicon			HSU277

Ref. No.	Description				RS Part No.	Mfr's Part No.
D109	HSU277	Marked 3	Silicon			HSU277
D110	HSU277	Marked 3	Silicon			HSU277
D111	HSU277	Marked 3	Silicon			HSU277
D112	HSU277	Marked 3	Silicon			HSU277
D113	HSM2693A	Marked B4	Silicon			HSM2693A
D114	HSM2693A	Marked B4	Silicon			HSM2693A
D115	HVM131	Marked PI	Silicon	Varactor		HVM131
D116	HVM131	Marked PI	Silicon	Varactor		HVM131
D117	HSU277	Marked 3	Silicon			HSU277
D118	HSU277	Marked 3	Silicon			HSU277
D119	1SS355	Marked A	Silicon			1SS355
D120	1SS351	Marked CH	Silicon			1SS351
	or 1SS295	Marked BH				or 1SS295
D121	1SS351	Marked CH	Silicon			1SS351
	or 1SS295	Marked BH				or 1SS295
D122	HVM300A	Marked O	Silicon	Varactor		HVM300A
D123	HVM300A	Marked O	Silicon	Varactor		HVM300A
D124	HVM300A	Marked O	Silicon	Varactor		HVM300A
D125	HSU277	Marked 3	Silicon			HSU277
D126	HSU277	Marked 3	Silicon			HSU277
D127	HSU277	Marked 3	Silicon			HSU277
<b>Integrated Circuits</b>						
IC101	TC74HC164AF, Band Select/Attenuator Control, MOS SMT					TC74HC164AF
IC102	M64074GP-601C	PLL	MOS	SMT		M64074GP-601C
<b>Coils</b>						
L101	Choke	1 $\mu$ H				LQH1N1R0M04
L102	BPF, (806-960 MHz)	4.7 nH				HK1608 4N7S-T or LL1608-FH4N7S
L103	BPF, (806-960 MHz)	4.7 nH				HK1608 4N7S-T or LL1608-FH4N7S
L104	BPF, (806-960 MHz)	4.7 nH				HK1608 4N7S-T or LL1608-FH4N7S
L105	BPF, (380-512 MHz)	10 nH				HK1608 10NJ-T or LL1608-FH10NJ
L106	BPF, (380-512 MHz)	10 nH				HK1608 10NJ-T or LL1608-FH10NJ
L107	BPF, (380-512 MHz)	22 nH				HK1608 22NJ-T or LL1608-FH22NJ
L108	BPF, (380-512 MHz)	33 nH				HK1608 33NJ-T or LL1608-FH33NJ
L109	BPF, (380-512 MHz)	22 nH				HK1608 22NJ-T or LL1608-FH22NJ
L110	BPF, (108-174 MHz)	82 nH				HK1608 82NJ-T or LL1608-FH82NJ
L111	BPF, (108-174 MHz)	47 nH				HK1608 47NJ-T or LL1608-FH47NJ
L112	BPF, (108-174 MHz)	82 nH				HK1608 82NJ-T or LL1608-FH82NJ

Ref. No.	Description			RS Part No.	Mfr's Part No.
L113	BPF, (108-174 MHz)	47 nH			HK1608 47NJ-T or LL1608-FH47NJ
L114	BPF, (29-54 MHz)	0.22 $\mu$ H			LK1608R22K-T
L115	BPF, (29-54 MHz)	0.22 $\mu$ H			LK1608R22K-T
L116	BPF, (29-54 MHz)	0.22 $\mu$ H			LK1608R22K-T
L117	RF				2LNR-316
L118	1st IF Trap				2LNB-253
L119	DBM				2LNM-258
L120	DBM				2LNM-258
L121	Choke	10 $\mu$ H			LAL02NA100K or AL02NA100K
L122	Choke	22 $\mu$ H			HK1608 22NJ-T or LL1608-FH22NJ
L123	LPF	47 nH			HK1608 47NJ-T or LL1608-FH47NJ
L124	VCO				3LNB-251
L125	VCO				2LNO-254
L126	Choke	10 $\mu$ H			LAL02NA100K or AL02NA100K
L127	VCO				2LNB-253

### Transistors

Q101	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q102	DTA144EUA	Marked 16	PNP		DTA144EUA
Q103	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q104	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q105	2SD1979(T)	Marked 3WT	NPN		2SD1979(T)
Q106	2SC4250	Marked HE	NPN		2SC4250
Q107	2SC4250	Marked HE	NPN		2SC4250
Q108	2SC4250	Marked HE	NPN		2SC4250
Q109	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q110	DTC114YUA or UN5214	Marked 64 Marked 8D	NPN		DTC114YUA or UN5214
Q111	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q112	DTC114YUA or UN5214	Marked 64 Marked 8D	NPN		DTC114YUA or UN5214
Q113	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q114	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)
Q115	2SC2712(GR)	Marked LG	NPN		2SC2712(GR)
Q116	2SK209(Y)	Marked XY	MOS	FET	2SK209(Y)
Q117	2SC4250	Marked HE	NPN		2SC4250
Q118	2SC4251	Marked HF	NPN		2SC4251
Q119	2SC4226(R25)	Marked R25	NPN		2SC4226(R25)

### Resistors

R101	Chip, Metal Glaze	3.3 kohm	$\pm$ 5%	1/16 W	RK73K1J332J or CR10-332J
R102	Chip, Metal Glaze	4.7 kohm	$\pm$ 5%	1/16 W	RK73K1J472J or CR10-472J
R103	Chip, Metal Glaze	4.7 kohm	$\pm$ 5%	1/16 W	RK73K1J472J or CR10-472J

Ref. No.	Description				RS Part No.	Mfr's Part No.
R104	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R105	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R106	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R107	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R108	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R109	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R110	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R111	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R112	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R113	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R114	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R115	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R116	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R117	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R118	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R119	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R120	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R121	Chip, Metal Glaze	470 ohm	±5%	1/16 W		RK73K1J471J or CR10-471J
R122	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R123	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R124	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R125	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R126	Chip, Metal Glaze	10 ohm	±5%	1/16 W		RK73K1J100J or CR10-100J
R127	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R128	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R129	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R130	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R131	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J

Ref. No.	Description				RS Part No.	Mfr's Part No.
R132	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R133	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R134	Chip, Metal Glaze	27 kohm	±5%	1/16 W		RK73K1J273J or CR10-273J
R135	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R136	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
R137	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R138	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R139	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R140	Chip, Metal Glaze	330 ohm	±5%	1/16 W		RK73K1J331J or CR10-331J
R141	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R142	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R143	Chip, Metal Glaze	68 ohm	±5%	1/16 W		RK73K1J680J or CR10-680J
R144	Chip, Metal Glaze	220 kohm	±5%	1/16 W		RK73K1J224J or CR10-224J
R145	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R146	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R147	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R148	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R149	Chip, Metal Glaze	15 kohm	±5%	1/16 W		RK73K1J153J or CR10-153J
R150	Chip, Metal Glaze	6.8 kohm	±5%	1/16 W		RK73K1J682J or CR10-682J
R151	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R152	Chip, Metal Glaze	330 ohm	±5%	1/16 W		RK73K1J331J or CR10-331J
R153	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R154	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R155	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R156	Chip, Metal Glaze	15 kohm	±5%	1/16 W		RK73K1J153J or CR10-153J
R157	Chip, Metal Glaze	6.8 kohm	±5%	1/16 W		RK73K1J682J or CR10-682J
R158	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R159	Chip, Metal Glaze	330 ohm	±5%	1/16 W		RK73K1J331J or CR10-331J

Ref. No.	Description				RS Part No.	Mfr's Part No.
R160	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R161	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R162	Chip, Metal Glaze	470 ohm	±5%	1/16 W		RK73K1J471J or CR10-471J
R163	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R164	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R165	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R166	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R167	Chip, Metal Glaze	22 kohm	±5%	1/16 W		RK73K1J223J or CR10-223J
R168	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
R169	Chip, Metal Glaze	1.5 kohm	±5%	1/10 W		RK73K2A152J or CR21-152J
R170	Chip, Metal Glaze	1 kohm	±5%	1/10 W		RK73K2A102J or CR21-102J
R171	Chip, Metal Glaze	3.3 kohm	±5%	1/16 W		RK73K1J332J or CR10-332J
R172	Chip, Metal Glaze	18 kohm	±5%	1/16 W		RK73K1J183J or CR10-183J
R173	Chip, Metal Glaze	18 kohm	±5%	1/16 W		RK73K1J183J or CR10-183J
R174	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
R175	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R176	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R177	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R178	Chip, Metal Glaze	3.3 kohm	±5%	1/16 W		RK73K1J332J or CR10-332J
R179	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
R180	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R181	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R182	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R183	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R184	Chip, Metal Glaze	150 kohm	±5%	1/16 W		RK73K1J154J or CR10-154J
R185	Chip, Metal Glaze	220 ohm	±5%	1/16 W		RK73K1J221J or CR10-221J
R186	Chip, Metal Glaze	100 ohm	±5%	1/16 W		RK73K1J101J or CR10-101J
R187	Chip, Metal Glaze	470 ohm	±5%	1/16 W		RK73K1J471J or CR10-471J

Ref. No.	Description	RS Part No.	Mfr's Part No.
R188	Chip, Metal Glaze 6.8 kohm ±5% 1/16 W		RK73K1J682J or CR10-682J
R189	Chip, Metal Glaze 15 kohm ±5% 1/16 W		RK73K1J153J or CR10-153J
R190	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R191	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R192	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R193	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R194	Chip, Metal Glaze 4.7 kohm ±5% 1/16 W		RK73K1J472J or CR10-472J
R195	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
<b>Transformers</b>			
T101	IF (1st)		5SSI-349
T102	IF (1st)		5SSI-349
T103	IF (1st)		5SSI-349
T104	IF (2nd)		5SSI-380
<b>Trimmer Capacitor</b>			
TC101	20 pF		ECRLA020E12
<b>Test Pins</b>			
TP101	Pin, Test		GE-87D-7290
TP102	Not used.		
TP103	Pin, Test		GE-87D-7290
GND	Pin, Test		GE-87D-7290
<b>Crystal</b>			
X101	12.8 MHz		GE-99D-3292 or H2270(UM-5 12.8MHz)
<b>Miscellaneous</b>			
27	Bottom, Shield PLL		GE-97D-2773
28	Case, Shield Mix		GE-96D-2282
29	Case, Shield PLL		GE-91D-9222
30	Plate Shield RF		GE-99D-3296
31	Top, Shield Mix		GE-96D-2283
32	Top, Shield PLL		GE-91D-9221

Ref. No.	Description	RS Part No.	Mfr's Part No.
33	PCB Assembly, AF Consists of the following	GA-99D-3281	
<b>Capacitors</b>			
C301	Ceramic	0.001 $\mu$ F 50 V $\pm$ 5% or 25 V $\pm$ 10% or 50 V $\pm$ 10%	ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C302	Ceramic	0.001 $\mu$ F 50 V $\pm$ 5% or 25 V $\pm$ 10% or 50 V $\pm$ 10%	ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C303	Ceramic	0.082 $\mu$ F 50 V $\pm$ 10% or 25 V $\pm$ 10%	ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C304	Ceramic	0.047 $\mu$ F 50 V $\pm$ 10%	ECJ2XB1H473K or GRM40B473K50PB or CM21B473K50A
C305	Ceramic	8 pF 50 V $\pm$ 0.5 pF	ECUX1H080DCV or GRM39CH080D50PB or CM105CH080D50A
C306	Ceramic	560 pF 50 V $\pm$ 5% or 25 V $\pm$ 10% or 50 V $\pm$ 10%	ECUX1H561JCV or GRM39CH561K25PB or CM105CH561K50A
C307	Ceramic	330 pF 50 V $\pm$ 5% or $\pm$ 10%	ECUX1H331JCV or GRM39CH331K50PB or CM105CH331K50A
C308	Ceramic	0.001 $\mu$ F 50 V $\pm$ 5% or 25 V $\pm$ 10% or 50 V $\pm$ 10%	ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C309	Ceramic	120 pF 50 V $\pm$ 5% or $\pm$ 10%	ECUX1H121JCV or GRM39CH121K50PB or CM105CH121K50A
C310	Ceramic	150 pF 50 V $\pm$ 5% or $\pm$ 10%	ECUX1H151JCV or GRM39CH151K50PB or CM105CH151K50A
C311	Ceramic	0.01 $\mu$ F 50 V $\pm$ 10%	ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C312	Ceramic	0.001 $\mu$ F 50 V $\pm$ 5% or 25 V $\pm$ 10% or 50 V $\pm$ 10%	ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C313	Ceramic	0.082 $\mu$ F 50 V $\pm$ 10% or 25 V $\pm$ 10%	ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C314	Ceramic	0.082 $\mu$ F	50 V or 25 V	$\pm$ 10% $\pm$ 10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C315	Ceramic	0.082 $\mu$ F	50 V or 25 V	$\pm$ 10% $\pm$ 10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C316	Electrolytic	47 $\mu$ F	6.3 V	$\pm$ 20%		6.3UTCX470M or SSK0J470M-LC or UMA0J470MDA
C317	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C318	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C319	Electrolytic	4.7 $\mu$ F	35 V	$\pm$ 20%		35UTCX4R7M or SSK1V4R7M-LC or UMA1V4R7MDA
C320	Electrolytic	10 $\mu$ F	16 V	$\pm$ 20%		16UTCX100M or SSK1C100M-LC or UMA1C100MDA
C321	Ceramic	0.082 $\mu$ F	50 V or 25 V	$\pm$ 10% $\pm$ 10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C322	Ceramic	0.001 $\mu$ F	50 V or 25 V or 50 V	$\pm$ 5% $\pm$ 10% $\pm$ 10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C323	Ceramic	0.015 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H153K or GRM39B153K50PB or CM105B153K50A
C324	Ceramic	0.0082 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H822K or GRM39B822K50PB or CM105B822K50A
C325	Ceramic	0.082 $\mu$ F	50 V or 25 V	$\pm$ 10% $\pm$ 10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C326	Electrolytic	470 $\mu$ F	16 V	$\pm$ 20%		16UTES471M or SC1C471M-LC or UVR1C471MDA
C327	Ceramic	0.033 $\mu$ F	50 V	$\pm$ 10%		ECJ2XB1H333K or GRM40B333K50PB or CM21B333K50A
C328	Electrolytic	10 $\mu$ F	16 V	$\pm$ 20%		16UTCX100M or SSK1C100M-LC or UMA1C100MDA
C329	Electrolytic	100 $\mu$ F	16 V	$\pm$ 20%		16UTCM101M or SS1C101M-LC or USR1C101MDA
C330	Ceramic	0.22 $\mu$ F	10 V	$\pm$ 10%		LMK107BJ224KA-B or GRM39B224K10PB
C331	Electrolytic	47 $\mu$ F	6.3 V	$\pm$ 20%		6.3UTCX470M or SSK0J470M-LC or UMA0J470MDA

Ref. No.	Description				RS Part No.	Mfr's Part No.
C332	Ceramic	0.0033 $\mu$ F	50V	$\pm$ 10%		ECJ1XB1H332K or GRM39B332K50PB or CM105B332K50A
C333	Electrolytic	10 $\mu$ F	16 V	$\pm$ 20%		16UTCX100M or SSK1C100M-LC or UMA1C100MDA
C334	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C335	Ceramic	680 pF	50 V or 25 V or 50 V	$\pm$ 5% $\pm$ 10% $\pm$ 10%		ECUX1H681JCV or GRM39CH681K25PB or CM105CH681K50A
C336	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C337	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C338	Ceramic	0.001 $\mu$ F	50 V or 25 V or 50 V	$\pm$ 5% $\pm$ 10% $\pm$ 10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C339	Ceramic	0.01 $\mu$ F	50 V	$\pm$ 10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C340	Ceramic	0.0033 $\mu$ F	50V	$\pm$ 10%		ECJ1XB1H332K or GRM39B332K50PB or CM105B332K50A
C341	Electrolytic	47 $\mu$ F	6.3 V	$\pm$ 20%		6.3UTCX470M or SSK0J470M-LC or UMA0J470MDA
C342	Electrolytic	1 $\mu$ F	50 V	$\pm$ 20%		50UTCX010M or SSK1H1R0M-LC or UMA1H010MDA
C343	Electrolytic	4.7 $\mu$ F	35 V	$\pm$ 20%		35UTCX4R7M or SSK1V4R7M-LC or UMA1V4R7MDA
C344	Electrolytic	220 $\mu$ F	6.3 V	$\pm$ 20%		6.3UTCM221M or SS0J221M-LC or USR0J221MDA
C345	Ceramic	0.082 $\mu$ F	50 V or 25 V	$\pm$ 10% $\pm$ 10%		ECJ2XB1H823K or GRM40B823K25PB or CM21B823K25A
C346	Electrolytic	220 $\mu$ F	16 V	$\pm$ 20%		16UTES221M or SC1C221M-LC or UVR1C221MEA
C347	Ceramic	0.001 $\mu$ F	50 V or 25 V or 50 V	$\pm$ 5% $\pm$ 10% $\pm$ 10%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
C348	Ceramic	33 pF	50 V	$\pm$ 5% or $\pm$ 10%		ECUX1H330JCV or GRM39CH330K50PB or CM105CH330K50A

Ref. No.	Description				RS Part No.	Mfr's Part No.
C349	Ceramic	33 pF	50 V	±5% or ±10%		ECUX1H330JCV or GRM39CH330K50PB or CM105CH330K50A
C350	Electrolytic	1 µF	50 V	±20%		50UTCX010M or SSK1H1R0M-LC or UMA1H010MDA
C351	Tantalum	1 µF	16 V	±20%		ECST1CY105R or MSVA1C105M1-8R
C352	Tantalum	1 µF	16 V	±20%		ECST1CY105R or MSVA1C105M1-8R
C353	Tantalum	15 µF	6.3 V	±20%		ECST0JY156R or MSVC0J156M1-8R
C354	Electrolytic	2.2 µF	50 V	±20%		50UTCX2R2M or SSK1H2R2M-LC or UMA1H2R2MDA
C355	Ceramic	0.0047 µF	50 V	±10%		ECJ1XB1H472K or GRM39B472K50PB or CM105B472K50A
C356	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C357	Ceramic	0.001 µF	50 V	±5%		ECUX1H102JV or ECUX1H102JCV or GRM39SL102J25PB or GRM39CH102J25PB or CM105SL102K50A or CM105CH102K50A
			or 25 V	±10%		
			or 50 V	±10%		
C358	Ceramic	0.022 µF	25 V	±10%		ECJ1XB1E223K or GRM39B223K25PB or CM105B223K25A
C359	Ceramic	0.1 µF	50 V or 25 V	±10% ±10%		ECJ2XB1H104K or GRM40B104K25PB or CM21B104K25A
C360	Ceramic	0.0056 µF	50 V	±10%		ECJ1XB1H562K or GRM39B562K50PB or CM105B562K50A
C361	Ceramic	0.0082 µF	50 V	±10%		ECJ1XB1H822K or GRM39B822K50PB or CM105B822K50A
C362	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C363	Ceramic	330 pF	50 V	±5% or ±10%		ECUX1H331JCV or GRM39CH331K50PB or CM105CH331K50A
C364	Ceramic	100 pF	50 V	±5% or ±10%		ECUX1H101JCV or GRM39CH101K50PB or CM105CH101K50A
C365	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A
C366	Ceramic	0.01 µF	50 V	±10%		ECJ1XB1H103K or GRM39B103K50PB or CM105B103K50A

Ref. No.	Description	RS Part No.	Mfr's Part No.
<b>Connectors</b>			
CN301	Connector 2-pin, Male		IL-Y-2P-S15T2-EF
CN302	Connector 5-pin Male		174075-5
CN303	Connector 2-pin Male		52024-0210
CN304	Connector 2-pin Male		52024-0210
CN305	Connector 15-pin, Male		52024-1510
CN306	Connector 2-pin Male		52024-0210
CN307	Connector 2-pin Male		52024-0210
CN308	Connector 4-pin Male (TP302/TP303)		53048-0410
<b>Ceramic Filter</b>			
CF301	455 kHz		CFU455D2 or LT455D2U
<b>Diodes</b>			
D301	1SS357 Marked S3 Silicon		1SS357
D302	RL1N4002 Silicon		RL1N4002
D303	or S5566B DA204U Marked K Silicon		or S5566B DA204U
<b>Integrated Circuits</b>			
IC301	KA3361BD, 3rd IF Amp/3rd Local Mixer/Noise Amp/ or KA3361CD, Quadrature Detector Bipolar SMT		KA3361BD or KA3361CD
IC302	TA2003F AGC Amp Bipolar SMT		TA2003F
IC303	TC74HC4066AFT, Switching/Zeromatic MOS SMT or TC74HC4066AFS		TC74HC4066AFT or TC74HC4066AFS
IC304	NJM2903M Zeromatic Bipolar SMT or BA10393F		NJM2903M or BA10393F
IC305	NJM2070M Audio Amp Bipolar SMT		NJM2070M
IC306	S-81350HG-KD, Voltage Regulator MOS SMT		S-81350HG-KD
IC307	NJM2406F, HS Data Decoder Bipolar SMT or TA75S393F		NJM2406F or TA75S393F
IC308	TK11819M, DC-DC Converter Bipolar SMT		TK11819M
IC309	TK11250BMCL, Regulator Switching Bipolar SMT		TK11250BMCL
IC310	MX805ALH, Sub Audio Signaling Processor, MOS SMT		MX805ALH
IC311	NJM2211M FSK Bipolar SMT		NJM2211M
IC312	NJM2130F Noise Amp Bipolar SMT		NJM2130F
<b>Transistors</b>			
Q301	2SC4215(O) Marked QO NPN		2SC4215(O)
Q302	2SC4116(GR) Marked LG NPN		2SC4116(GR)
Q303	UMC2N Marked C2 NPN or UMC2		UMC2N or UMC2
Q304	DTC144EUA Marked 26 NPN		DTC144EUA
Q305	2SC4116(GR) Marked LG NPN		2SC4116(GR)

Ref. No.	Description				RS Part No.	Mfr's Part No.
Q306 Q307	DTC144EUA DTA144EUA	Marked 26 Marked 16	NPN PNP			DTC144EUA DTA144EUA
<b>Jacks</b>						
J301 J302	Jack, Earphone Jack, Power					HSJ1493-01-010 HEC2711-01-620
<b>Coils</b>						
L301	Choke	100 $\mu$ H				LAL02NA101K or AL02TB101K
L302	Choke	1 $\mu$ H				LAL02NA1R0K or AL02TB1R0K
L303	Choke	1 $\mu$ H				LAL02NA1R0K or AL02TB1R0K
L304	Choke	1 $\mu$ H				LAL02NA1R0K or AL02TB1R0K
L305	Choke	1 $\mu$ H				LAL02NA1R0K or AL02TB1R0K
L306	Choke	10 $\mu$ H				LAL02NA100K or AL02TB100K
<b>Resistors</b>						
R301	Chip, Metal Glaze	220 kohm	$\pm$ 5%	1/16 W		RK73K1J224J or CR10-224J
R302	Chip, Metal Glaze	1 kohm	$\pm$ 5%	1/16 W		RK73K1J102J or CR10-102J
R303	Chip, Metal Glaze	1 kohm	$\pm$ 5%	1/16 W		RK73K1J102J or CR10-102J
R304	Chip, Metal Glaze	1.8 kohm	$\pm$ 5%	1/16 W		RK73K1J182J or CR10-182J
R305	Chip, Metal Glaze	100 kohm	$\pm$ 5%	1/16 W		RK73K1J104J or CR10-104J
R306	Chip, Metal Glaze	47 kohm	$\pm$ 5%	1/16 W		RK73K1J473J or CR10-473J
R307	Chip, Metal Glaze	22 kohm	$\pm$ 5%	1/16 W		RK73K1J223J or CR10-223J
R308	Chip, Metal Glaze	10 kohm	$\pm$ 5%	1/16 W		RK73K1J103J or CR10-103J
R309	Chip, Metal Glaze	10 kohm	$\pm$ 5%	1/16 W		RK73K1J103J or CR10-103J
R310	Chip, Metal Glaze	1 Mohm	$\pm$ 5%	1/16 W		RK73K1J105J or CR10-105J
R311	Chip, Metal Glaze	2.2 kohm	$\pm$ 5%	1/16 W		RK73K1J222J or CR10-222J
R312	Chip, Metal Glaze	22 kohm	$\pm$ 5%	1/16 W		RK73K1J223J or CR10-223J
R313	Chip, Metal Glaze	33 kohm	$\pm$ 5%	1/16 W		RK73K1J333J or CR10-333J

Ref. No.	Description	RS Part No.	Mfr's Part No.
R314	Chip, Metal Glaze 27 kohm ±5% 1/16 W		RK73K1J273J or CR10-273J
R315	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R316	Chip, Metal Glaze 22 kohm ±5% 1/16 W		RK73K1J223J or CR10-223J
R317	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R318	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R319	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R320	Chip, Metal Glaze 4.7 kohm ±5% 1/16 W		RK73K1J472J or CR10-472J
R321	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R322	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R323	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R324	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
R325	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
R326	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
R327	Chip, Metal Glaze 15 kohm ±5% 1/16 W		RK73K1J153J or CR10-153J
R328	Chip, Metal Glaze 22 kohm ±5% 1/16 W		RK73K1J223J or CR10-223J
R329	Chip, Metal Glaze 39 kohm ±5% 1/16 W		RK73K1J393J or CR10-393J
R330	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R331	Chip, Metal Glaze 12 kohm ±5% 1/16 W		RK73K1J123J or CR10-123J
R332	Chip, Metal Glaze 39 ohm ±5% 1/2 W		RK73K2H390J
R333	Chip, Metal Glaze 22 kohm ±5% 1/16 W		RK73K1J223J or CR10-223J
R334	Chip, Metal Glaze 270 kohm ±5% 1/16 W		RK73K1J274J or CR10-274J
R335	Chip, Metal Glaze 1 ohm ±5% 1/16 W		RK73M1J1R0J or CR10-1R0J
R336	Chip, Metal Glaze 100 ohm ±5% 1/4 W		RK73K2E101J
R337	Carbon Film 150 ohm ±5% 1/4 W		ERDS2TJ151 or RD25S151J
R338	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
R339	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R340	Chip, Metal Glaze 10 kohm ±5% 1/16 W		RK73K1J103J or CR10-103J
R341	Chip, Metal Glaze 470 ohm ±5% 1/16 W		RK73K1J471J or CR10-471J
R342	Chip, Metal Glaze 1 kohm ±5% 1/16 W		RK73K1J102J or CR10-102J
R343	Chip, Metal Glaze 470 kohm ±5% 1/16 W		RK73K1J474J or CR10-474J

Ref. No.	Description				RS Part No.	Mfr's Part No.
R344	Chip, Metal Glaze	3.3 kohm	±5%	1/16 W		RK73K1J332J or CR10-332J
R345	Chip, Metal Glaze	22 kohm	±5%	1/16 W		RK73K1J223J or CR10-223J
R346	Chip, Metal Glaze	2.2 kohm	±5%	1/16 W		RK73K1J222J or CR10-222J
R347	Chip, Metal Glaze	4.7 kohm	±5%	1/16 W		RK73K1J472J or CR10-472J
R348	Chip, Metal Glaze	33 kohm	±5%	1/16 W		RK73K1J333J or CR10-333J
R349	Chip, Metal Glaze	1 Mohm	±5%	1/16 W		RK73K1J105J or CR10-105J
R350	Chip, Metal Glaze	22 kohm	±5%	1/16 W		RK73K1J223J or CR10-223J
R351	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R352	Chip, Metal Glaze	47 ohm	±5%	1/16 W		RK73K1J470J or CR10-470J
R353	Chip, Metal Glaze	1 kohm	±5%	1/16 W		RK73K1J102J or CR10-102J
R354	Chip, Metal Glaze	3.3 kohm	±5%	1/16 W		RK73K1J332J or CR10-332J
R355	Chip, Metal Glaze	470 kohm	±5%	1/16 W		RK73K1J474J or CR10-474J
R356	Chip, Metal Glaze	3.3 ohm	±5%	1/4 W		RK73M2E3R3J
R357	Chip, Metal Glaze	1 Mohm	±5%	1/16 W		RK73K1J105J or CR10-105J
R358	Chip, Metal Glaze	15 kohm	±5%	1/16 W		RK73K1J153J or CR10-153J
R359	Chip, Metal Glaze	150 kohm	±5%	1/16 W		RK73K1J154J or CR10-154J
R360	Chip, Metal Glaze	360 kohm	±5%	1/16 W		RK73K1J364J or CR10-364J
R361	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R362	Chip, Metal Glaze	150 kohm	±5%	1/16 W		RK73K1J154J or CR10-154J
R363	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R364	Chip, Metal Glaze	47 kohm	±5%	1/16 W		RK73K1J473J or CR10-473J
R365	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R366	Chip, Metal Glaze	470 kohm	±5%	1/16 W		RK73K1J474J or CR10-474J
R367	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R368	Chip, Metal Glaze	100 kohm	±5%	1/16 W		RK73K1J104J or CR10-104J
R369	Chip, Metal Glaze	22 kohm	±5%	1/16 W		RK73K1J223J or CR10-223J
R370	Carbon Film	12 ohm	±5%	1 W		RSS1 120J
R371	Chip, Metal Glaze	10 kohm	±5%	1/16 W		RK73K1J103J or CR10-103J
R372	Chip, Metal Glaze	330 kohm	±5%	1/16 W		RK73K1J334J or CR10-334J

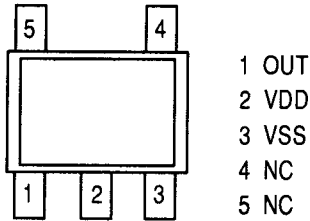
Ref. No.	Description	RS Part No.	Mfr's Part No.
R373	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R374	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
R375	Chip, Metal Glaze 4.7 kohm ±5% 1/16 W		RK73K1J472J or CR10-472J
R376	Chip, Metal Glaze 47 kohm ±5% 1/16 W		RK73K1J473J or CR10-473J
R377	Chip, Metal Glaze 100 kohm ±5% 1/16 W		RK73K1J104J or CR10-104J
<b>Transformers</b>			
T301 T302	See "Assembly, PCB Detector Coil" on this page Choke		GR-D835
<b>Test Pin</b>			
TP301	Pin, Test		GE-87D-7290
<b>Volume</b>			
VR301 VR302 VR303	See Assembly, Volume on this page See Assembly, Squelch on this page Semi-Fixed Resistor 10 kohm		RH0422C14J
<b>Crystals</b>			
X301 X302	20.945 MHz 4 MHz		HC-49/U(20.945MHz) or 20-15520 GE-99D-3291 or TR-49 MR-4000
<b>Crystal Filter</b>			
XF301	21.4 MHz		GE-99D-3293 or 20-18926 (MF21R TR-1-6(3))
<b>Miscellaneous</b>			
VR301 34 VR302 34 T301	Assembly, Squelch Potentiometer, Squelch, 10 kohm (C) Nut, Assembly, Volume Potentiometer, Volume, 50 kohm (A) with Switch Nut, Assembly, PCB Detector Coil PCB, Detector Transformer, Detector (455 kHz) Terminal, Battery		GA-92D-9487 RK0971110-10KC-10 GE-89D-8343-1 GA-92D-9486 RK0971111-50KA-10 GE-89D-8343-1 GA-99D-3283 GE-98C-3119-1 GR-E852 GE-91D-9218

# SEMICONDUCTOR LEAD IDENTIFICATION

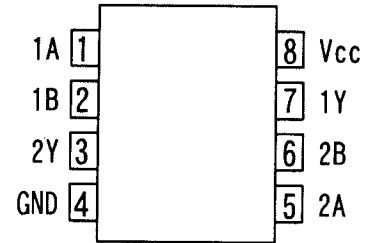
## Integrated Circuits

IC1 W78C438CF-24 See "Microprocessor (IC1) Port Format" on page 55.

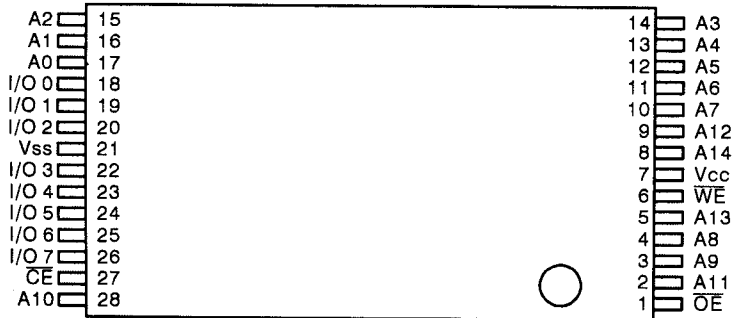
IC2, 3 S-80745SN-D9



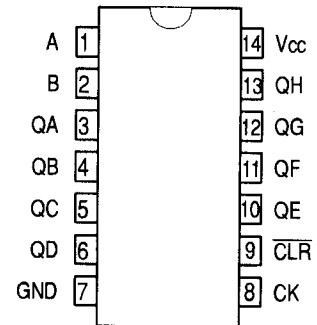
IC6 TC7W32F



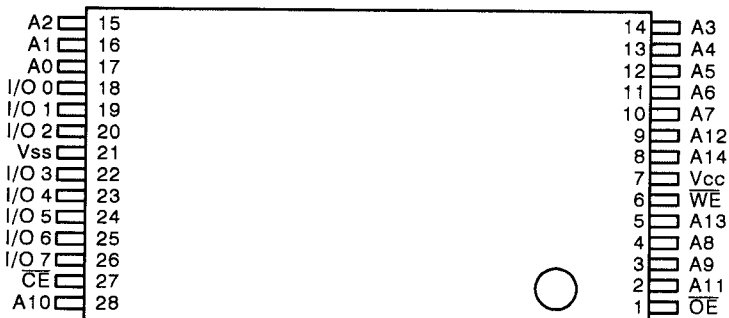
IC4 HN58V256AT-12



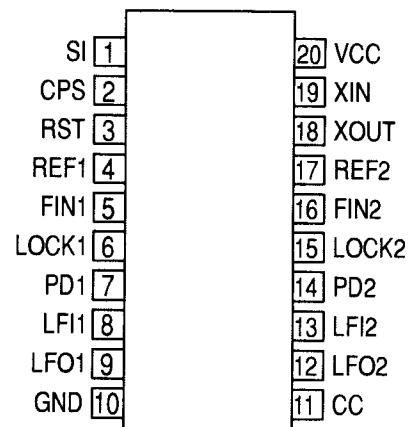
IC101 TC74HC164AF



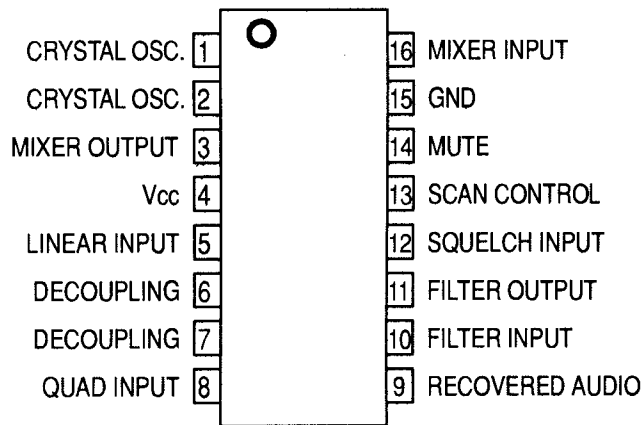
IC5 GRE-9803



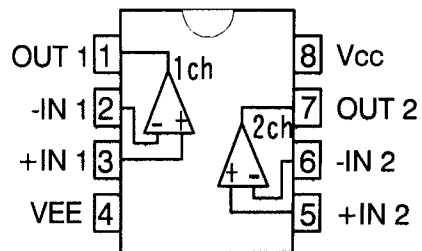
IC102 M64074GP-601C



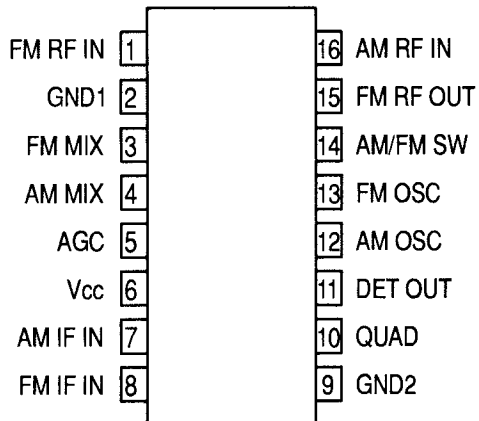
IC301 KA3361BD  
or KA3361CD



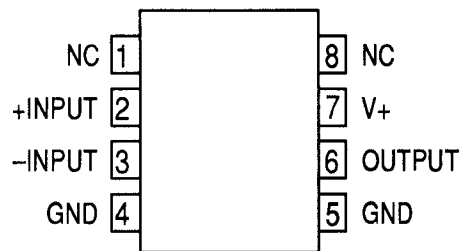
IC304 NJM2903M  
or BA10393F



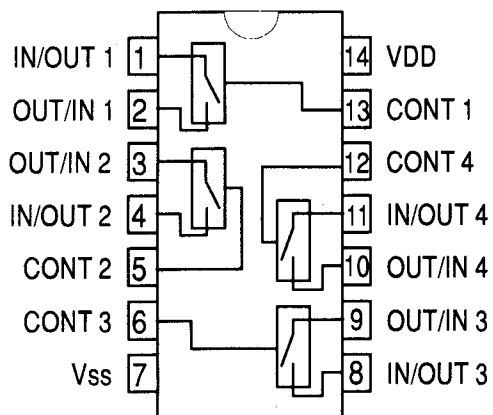
IC302 TA2003F



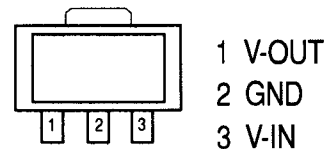
IC305 NJM2070M



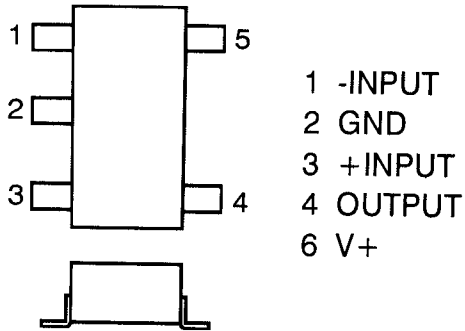
IC303 TC74HC4066AFT  
or TC74HC4066AFS



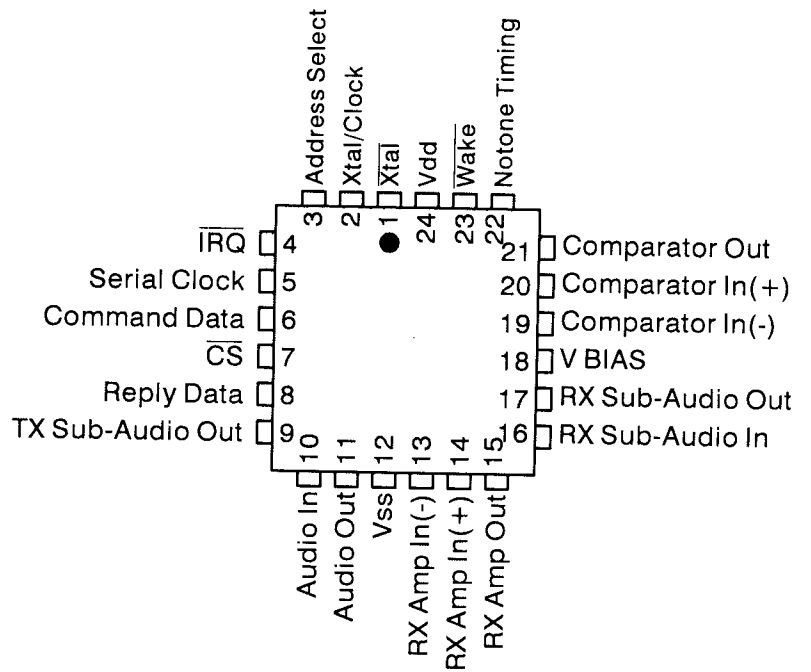
IC306 S-81350HG-KD



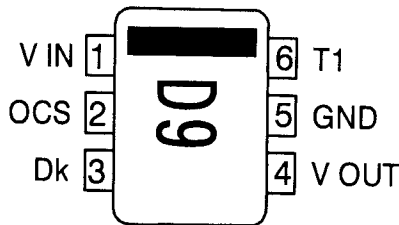
IC307 NJM2406F  
or TA75S393F



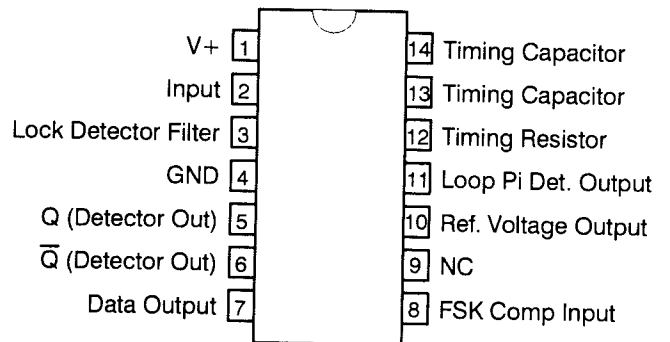
IC310 MX805ALH



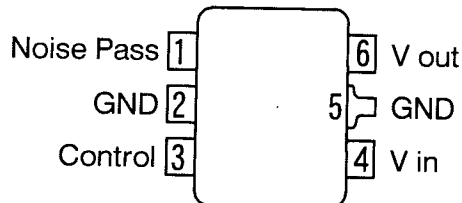
IC308 TK11819M



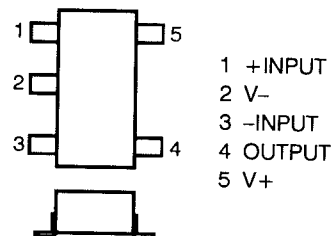
IC311 NJM2211M



IC309 TK11250BUCB

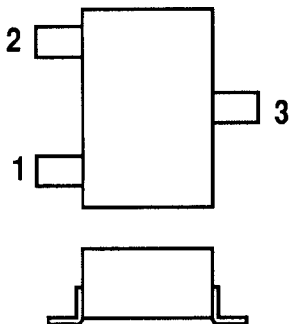


IC312 NJM2130F



# Transistors

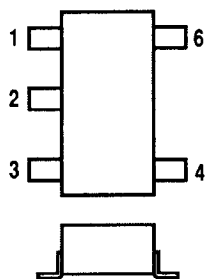
2SC2712GR (Marked LG)



- 1 Emitter
- 2 Base
- 3 Collector

UMC2N (Marked C2)

or UMC2



- 1 Tr1 Emitter
- 2 Tr1 Base
- 3 Tr2 Emitter
- 4 Tr2 Collector
- 6 Tr1 Collector/Tr2 Base

2SC4116GR (Marked LG)

2SC4215O (Marked QO)

2SC4226R25 (Marked R25)

2SC4250 (Marked HE)

2SC4251 (Marked HF)

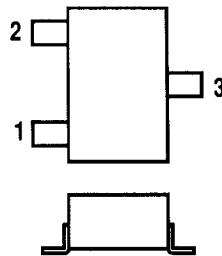
2SD1979T (Marked 3WT)

DTA144EUA (Marked 16)

DTC114YUA (Marked 64)

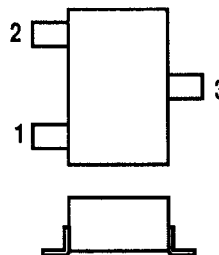
or UN5214 (Marked 8D)

DTC144EUA (Marked 26)



- 1 Emitter
- 2 Base
- 3 Collector

2SK209Y (Marked XY)

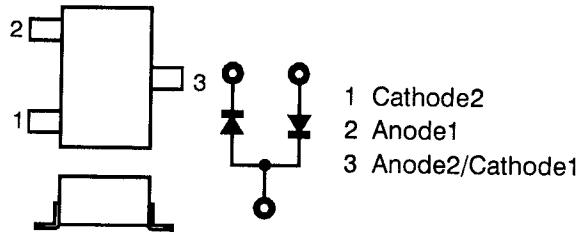


- 1 Drain
- 2 Source
- 3 Gate

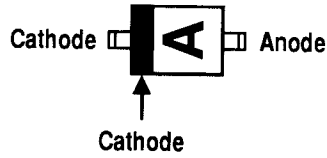
# Diodes

1SS351

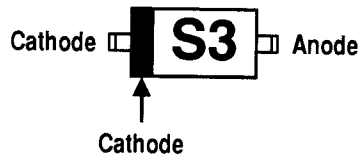
or 1SS295



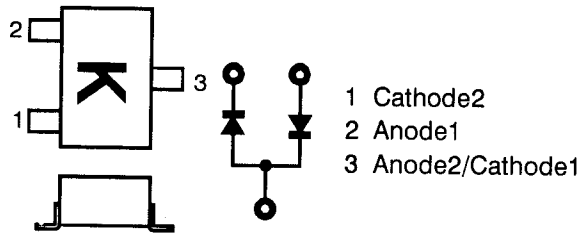
1SS355



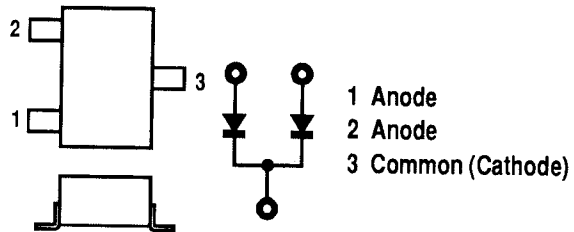
1SS357



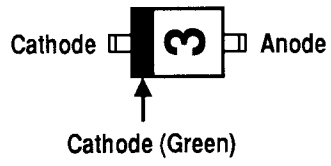
DA204U



HSM2693A



HSU277



HVU131



HVU300A

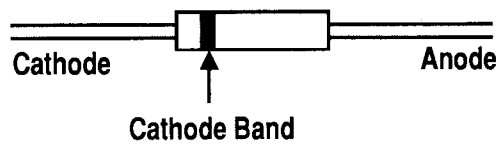


LN1371G(H)/6U

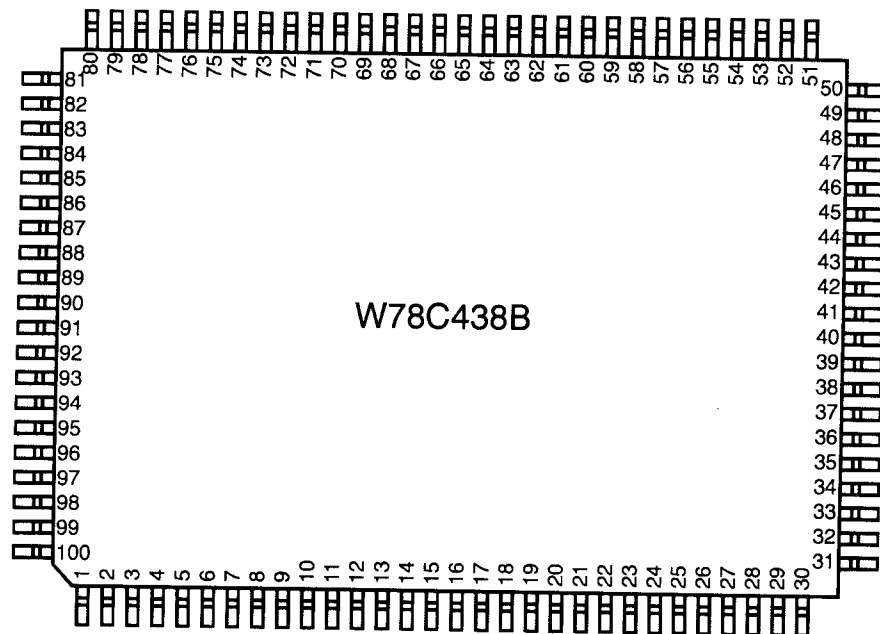


RL1N4002

or S5566B

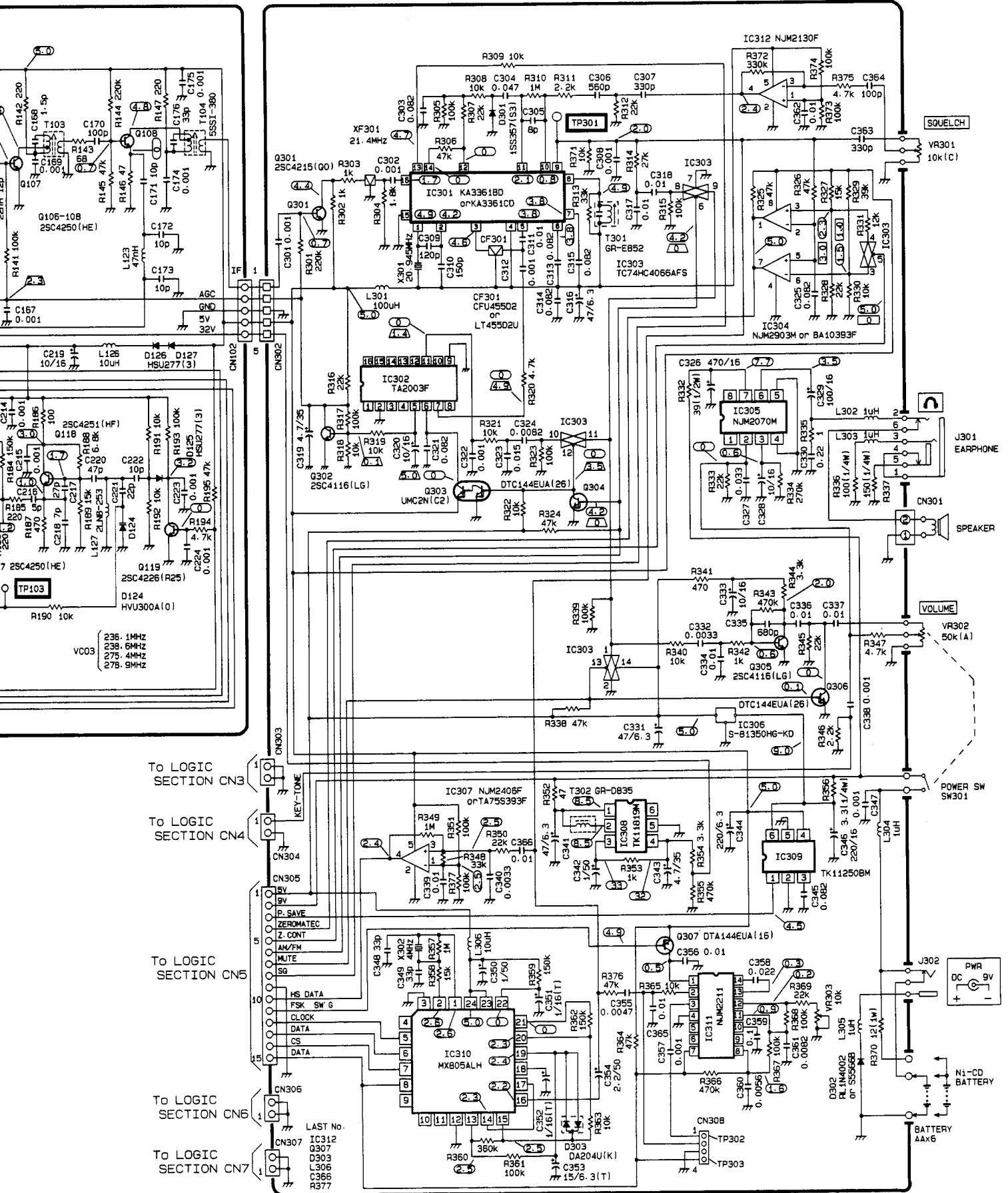


# MICROPROCESSOR (IC1) PORT FORMAT

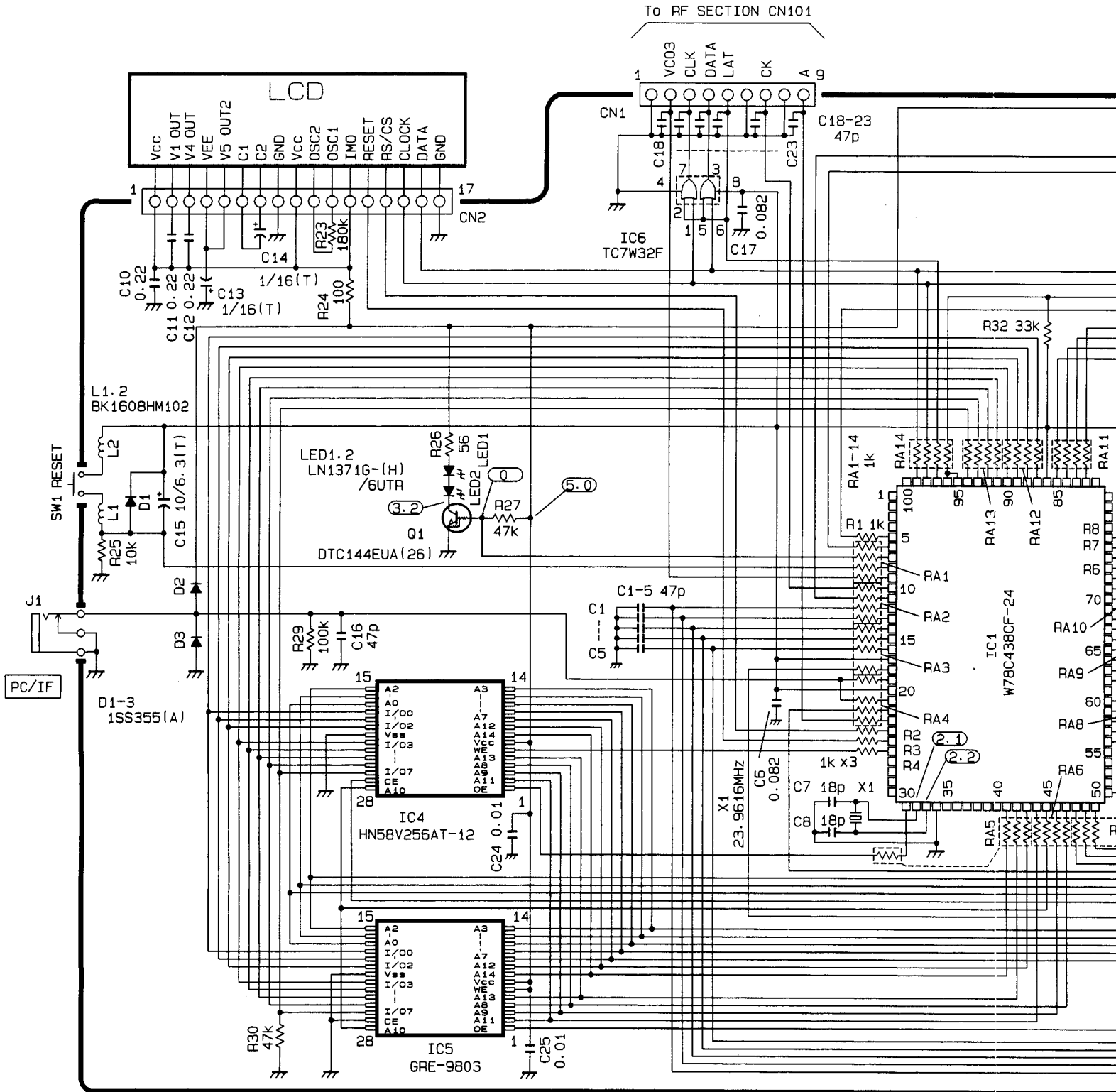


Pin Number	Function	Pin Number	Function	Pin Number	Function
1	NC	35	NC	68	Memory A3 (HN58V256AT) output
2	NC	36	NC	69	Memory A2 (HN58V256AT) output
3	NC	37	NC	70	Memory A1 (HN58V256AT) output
4	NC	38	NC	71	Memory A0 (HN58V256AT) output
5	MX805 reply data input	39	NC	72	GND
6	Low battery input	40	NC	73	Squelch input
7	Back light on/off output	41	Memory A14 (HN58V256AT) output	74	WX alert tone output
8	Reset input	42	Memory A13 (HN58V256AT) output	75	Keyboard 6 (Read)
9	VCO3 output	43	Memory A12 (HN58V256AT) output	76	Keyboard 5 (Read)
10	Sift register clock (TC74HC164) out.	44	Memory A11 (HN58V256AT) output	77	NC
11	PWR hold input	45	Memory A10 (HN58V256AT) output	78	NC
12	Keyboard (drive)	46	Memory A9 (HN58V256AT) output	79	NC
13	Keyboard (drive)	47	Memory A8 (HN58V256AT) output	80	NC
14	Keyboard (drive)	48	Mute output	81	NC
15	Keyboard (drive)	49	Power save output	82	Keyboard 4 (Read)
16	Keyboard (drive)	50	AM/FM control output	83	Keyboard 3 (Read)
17	VDD	51	Key tone output	84	Keyboard 2 (Read)
18	FSK switching input	52	NC	85	Keyboard 1 (Read)
19	PC/IF RX (input)	53	NC	86	VDD
20	VDD	54	NC	87	Memory I/O 0 (HN58V256AT)
21	PC/IF TX (output)	55	NC	88	Memory I/O 1 (HN58V256AT)
22	Zeromatic control output	56	Zeromatic input	89	Memory I/O 2 (HN58V256AT)
23	Sift register A (TC74HC164)	57	MX805 (CS) output	90	Memory I/O 3 (HN58V256AT)
24	LCD (RS/CS)	58	Memory CE (HN58V256AT) output	91	Memory I/O 4 (HN58V256AT)
25	LCD (reset)	59	FSK Switching input	92	Memory I/O 5 (HN58V256AT)
26	Memory WE (HN58V256AT)	60	EPROM OE output (debug only)	93	Memory I/O 6 (HN58V256AT)
27	NC	61	NC	94	Memory I/O 7 (HN58V256AT)
28	NC	62	GND	95	HS data input (data comparator)
29	NC	63	VDD	96	HS data input (data comparator)
30	NC	64	Memory A7 (HN58V256AT) output	97	M6407GP LAT (PLL)
31	Memory OE (HN58V256AT)	65	Memory A6 (HN58V256AT) output	98	Clock (LCD, MX805, M64074GP)
32	Xtal 2 (23.9616 MHz)	66	Memory A5 (HN58V256AT) output	99	Data (LCD, MX805, M64074GP)
33	Xtal 1	67	Memory A4 (HN58V256AT) output	100	NC
34	GND				





# SCHEMATIC DIAGRAM (LOGIC)



- NOTES:
1. RESISTANCE VALUES ARE IN OHMS[k=1000 M=1000000].
  2. CAPACITANCE VALUES ARE IN  $\mu$ F[p= $\mu$  F].
  3. [T]-TANTALUM CHIP CAPACITOR.
  4. NO SUFFIX: CERAMIC CHIP CAPACITOR.
  5.  $\circ$  THIS SYMBOL DENOTES THE DC VOLTAGE ON VHF HI BAND. WITH SQUELCH CONTROL SET TO CCW POSITION.
  6. ALL DC VOLTAGES ARE MEASURED WITH A 100KOHM/V DC VOLTMETER. WITH VOLUME CONTROL SET TO MINIMUM.

# GRAM (LOGIC PCB SECTION)

Cat. No. 20-522

