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Midland 75-779 Service Manual

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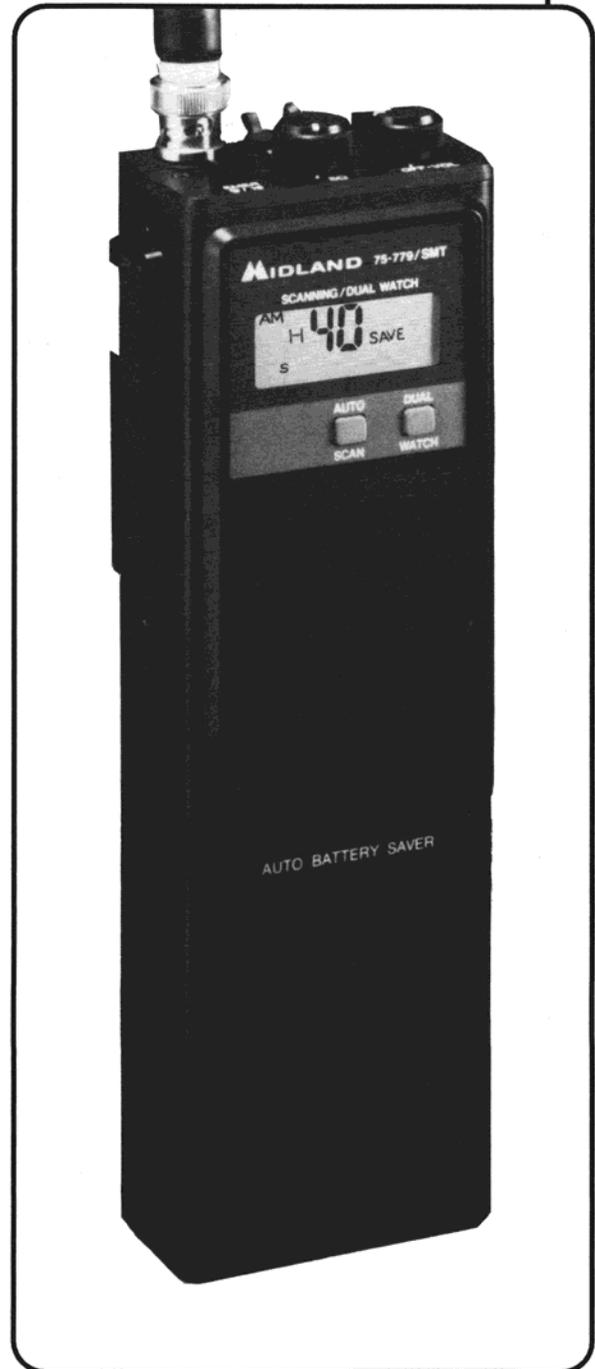
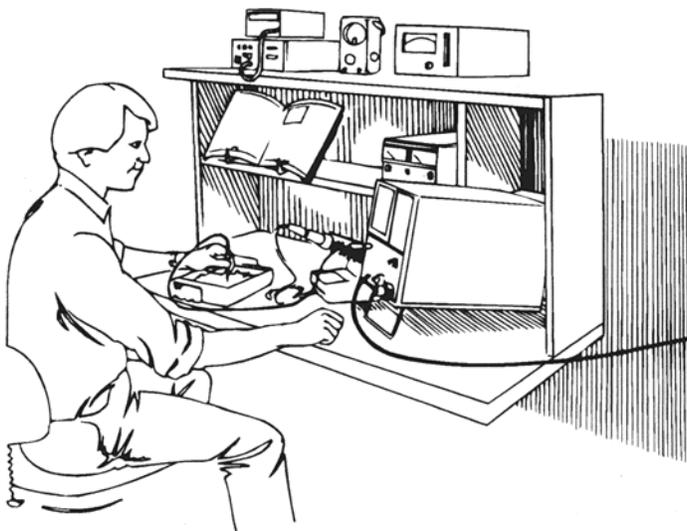
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# MIDLAND

## SERVICE MANUAL

### 75-779

**40 CHANNEL  
HANDHELD  
CITIZENS BAND  
TRANSCEIVER**



75-779000  
05-75779-SM-6/93

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## SPECIFICATIONS

### GENERAL

**CHANNELS:** 40 AM Channels  
**FREQUENCY RANGE:** 29.965 MHz — 27.405 MHz  
**FREQUENCY CONTROL:** Phase locked loop (PLL) Synthesizer  
**FREQUENCY TOLERANCE:** Battery to 0.005% max.  
**OPERATING TEMPERATURE RANGE:** -20°C to +55°C  
**DC INPUT VOLTAGE:** 12 V DC  $\pm$  15%  
**DIMENSIONS:** 64(W) x 200(H) x 41(D)mm  
**WEIGHT:** 320 g (without antenna)

### RECEIVER

**RECEIVING SYSTEM:** AM dual conversion superheterodyne  
**INTERMEDIATE FREQUENCY:**  
1st IF: 10.695 MHz  
2nd IF: 455 kHz  
**SENSITIVITY:** AM: 0.7 $\mu$ V FOR 10dB (S+N/N)  
**SQUELCH SENSITIVITY:** 0.5  $\mu$ V—2 mV  
**AUDIO OUTPUT POWER @ 10% THD:** 500 mW @ 8  $\Omega$  load  
**AUDIO DISTORTION:** Less than 4% @ 1 kHz  
**IMAGE REJECTION:** 65 dB typical  
**ADJACENT CHANNEL SENSITIVITY:** 65 dB typical  
**HUM/NOISE:** 45 dB typical  
**CURRENT DRAIN @ STAND BY:**  
Save mode off: 42 mA  
Save mode on: 5 mA

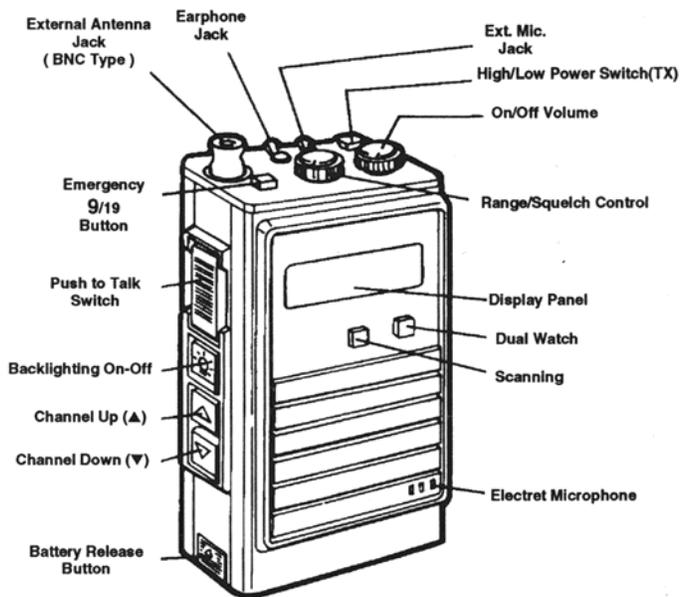
### TRANSMITTER

**RF POWER OUTPUT:** 3.6 W to 4 W at 13.2 V DC  
**MODULATION:** 2.0 kHz max.  
**FREQUENCY RESPONSE:** 300 Hz to 3 kHz  
**RF OUTPUT IMPEDANCE:** 50  $\Omega$  unbalanced  
**HARMONICS:** Up to 20  $\mu$ W  
**SPURIOUS:** Up to 20  $\mu$ W  
**CURRENT DRAIN:** 500—800 mA (From Low to Hi power position)

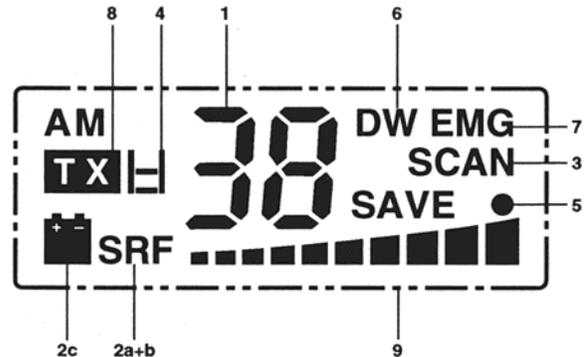
# CONTROLS AND INDICATORS

75-779

## CONTROLS AND INDICATORS



75-779 Radio



Display Panel

**DISPLAY PANEL:** The display panel of your 75-779 provides you with a visual command center of information. It includes:

1. Channel of Operation indicator. The display has been designed to operate in direct sunlight.
2. a. Incoming signal strength level indicator.  
b. Transmitter relative output indicator.  
c. Battery Condition meter
3. Scan mode indicator.
4. High/Low power indicator.
5. Battery save mode indicator.
6. Dual watch mode indicator.
7. Memory channel 9 or 19 indicator.
8. Transmit mode indicator.
9. Signal/RF Output meter.

# CONTROLS AND INDICATORS

75-779

**LAMP/BATTERY CONDITION BUTTON:** This button is located directly below the PTT button. It performs two functions. When pressed, it provides backlighting to the display for nighttime viewing. It also brings up the battery condition meter on the LCD panel display.

This is a ten segment meter showing you the condition of the batteries. It is located on the lower section of the LCD. A diagram of a battery and a group of segments will appear. A brand new set of batteries will read 8—10 segments on the meter. As you use the unit, the number of segments will reduce. When only 1 or 2 segments remain, battery life has almost expired.

**BATTERY SAVE FEATURE:** Your 75-779 incorporates a battery save circuit to extend the life of your batteries. When you first turn the unit on, the word "SAVE" will appear on the right hand side of the channel display. If you are on a specific channel and no one is transmitting on it for five seconds, a dot(•) will start blinking to the right of the word SAVE. Every so often your channel dial will BLINK. This is normal. What is happening is the receiver is being turned on and off electronically, to conserve batteries. If a signal appears, the receiver will go back to normal operation. The SAVE button is also overridden when you operate other controls such as scan or dual watch.

**EMERGENCY \*MEMORY\*:** Your 75-779 has a memory button for instant access to emergency channel 9 or trucker channel 19. This is a touch "ON"-touch "OFF" button.

To access Channel 9, press the memory button once.

To access Channel 19, press the memory button and "UP" button at the same time.

To change from channel 19 back to channel 9, press the "DOWN" button.

**CHANNEL SELECTION:** Your 75-779 has an ETR channel selection system.

To select a higher number channel, press the "UP" button. To select a lower number channel, press the "DOWN" button.

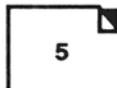
**NOTE:** These buttons will not operate normally if the Emergency Memory button has been engaged.

**SQUELCH:** This control allows a quiet standby operation and controls your receiving range. For maximum range, when no signals are present, rotate the squelch control until the receiver background noise disappears.

Incoming signals above the noise will overcome the squelch circuit. To reduce range, continue advancing the control. It will take stronger and stronger signals to overcome the squelch circuit.

**VOLUME/POWER ON-OFF:** This control turns your 75-779 on and off, and adjusts the sound level.

**HIGH/LOW POWER:** There are two levels of power available on your 75-779, "HIGH" for long range and "LOW" for short range. The High/Low button is on the top of the unit. To the left of the channel display the letter "H" or "L" will appear when you turn the unit on. To change from High to Low power simply press this button. Press the button again to reverse this function.



# CONTROLS AND INDICATORS

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**SCAN:** Your 75-779 incorporates a scanning feature. The 75-779 will scan through all 40 channels. It will stop at any BUSY channel. It will stay on that channel until three seconds after conversation has ceased and then it will resume scanning.

To activate this feature, turn on the power and adjust the volume. Adjust squelch. Depress the SCAN button to start scanning. The word "SCAN" will appear in the LCD display window and the unit will start scanning. To stop scanning, press the scan button or PTT.

If the unit is scanning and stops on a channel that you want to talk to the other party, simply press PTT. This will shut off the scanning function and transmit on that channel.

**DUAL WATCH:** This feature is like having two receivers in your 75-779. It gives you the ability to monitor any two different channels in the 40 channel range. You can also monitor emergency channel 9 and trucker channel 19.

The channel which you frequently want to monitor and establish communications on will be called the MAIN channel. The other channel which will be monitored momentarily will be called the SUB channel. For example, to monitor Channel 19 (as the MAIN channel) and also receive channel 9 (as the SUB channel), follow the steps below.

**NOTE:** Always set "SUB" channel first.

1. Turn the unit on. Adjust the volume and squelch controls.
2. Using the channel up or down button, select channel 9.
3. Press the dual watch button once (the DW symbol will be shown on the display).
4. Using the channel up button, select channel 19.
5. Wait three seconds and the display will start flashing 9 then 19, indicating the unit is monitoring each channel.

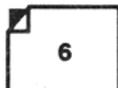
Any two channels can be selected for dual watch. If you want to transmit, Press the push to talk button. Your unit will transmit on the sub or main channel ONLY if a signal was received on that channel.

To disable dual watch simply press the dual watch button again.

**MIC:** Your 75-779 is equipped with an electrostatic condenser microphone. This gives you a high level of talk-power. Simply hold the 75-779 two to four inches from your mouth and speak into the "MIC" microphone in a normal voice.

**SIGNAL/RF OUTPUT METER:** Your 75-779 incorporates a ten segment incoming signal "S" and power output "RF" meter in the LCD display panel.

In receive mode, the letter "S" will appear on the display panel. When a signal is received, the "S" meter will indicate how strong the signal is. A very weak signal will be indicated by one or two segments while a very strong signal will have 9 or 10 segments.



# CONTROLS AND INDICATORS/ALIGNMENT

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In transmit mode, the letters "RF" will appear on the display. If you are transmitting at LOW power, only 1 or 2 segments will light. If you are transmitting at HIGH power, 5—10 segments will light, depending on the condition of your batteries or your power source.

**"REMOVE" LATCH:** This latch is located on the left side of your 75-779. It releases the battery pack.

If you do not hold this latch in the "UP" position, you cannot remove the battery pack.

**DC 12 VOLT JACK:** This jack is used to power your 75-779 from a 12 V automotive, boat, RV, truck, tractor, etc. battery.

A cigarette lighter plug power cord is supplied with your unit.

**PHONE/MIC:** These jacks allow you to connect an optional earphone or an optional external microphone or speaker/mic.

**PTT:** This button engages the transmit mode.

Simply depress it to transmit.

The letters "TX" will appear in the LCD display.

**EXTERNAL ANTENNA JACK(EXT ANT):** This jack allows you to connect an external antenna to your 75-779. It also accepts the flexible antenna.

## ALIGNMENT

### REQUIRED TEST EQUIPMENT

Frequency Counter	RF Attenuator
DC Power Supply, 12 V, 3 A (For PLL, CPU and RX)	Audio Generator
DC Power Supply, 13.8 V, 3 A (For TX)	Spectrum Analyzer
DC Voltmeter	Coupler
Oscilloscope	RF Signal Generator
RF Power Meter	ACVM
50 $\Omega$ Load (non-inductive)	Distortion Meter

# ALIGNMENT

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75-779

## PLL AND CPU ALIGNMENT

### • Frequency Adjustment

1. Select receive mode. Connect frequency counter to TP301.
2. Adjust TC301 for 10.240 MHz  $\pm$ 50 Hz.

### • RX VCO

3. Select Channel 1. Connect DC Voltmeter between GND and R104.
4. Adjust T101 for 2.2 V.

### • TX VCO

5. Select transmit mode. Select Channel 1.
6. Connect DC Voltmeter between GND and R104.
7. Adjust T101 for 2—2.4 V.

### • Battery Level

8. Press the Lamp/Battery Condition button.
9. Adjust VR801 so that the ninth segment of the Battery Level indicator lights.

### • CPU Frequency Check

10. Connect frequency counter to IC801 pin 80.
11. Adjust TS801 for 4.5 MHz  $\pm$ 200 Hz.

## TRANSMITTER ALIGNMENT

### • RF Power Stage

1. Select transmit mode. Select Channel 19.
2. Connect non-inductive 50  $\Omega$  load to the external antenna jack.
3. Adjust T201, T202 and T203 for maximum indication on RF power meter.

### • Modulation

4. Use audio generator to connect a 1 kHz at 100 mV<sub>rms</sub> signal to external mic jack.
5. Adjust VR601 for High Modulation 85%—95%, Low Modulation 80%—90%.

### • Second Harmonic Check.

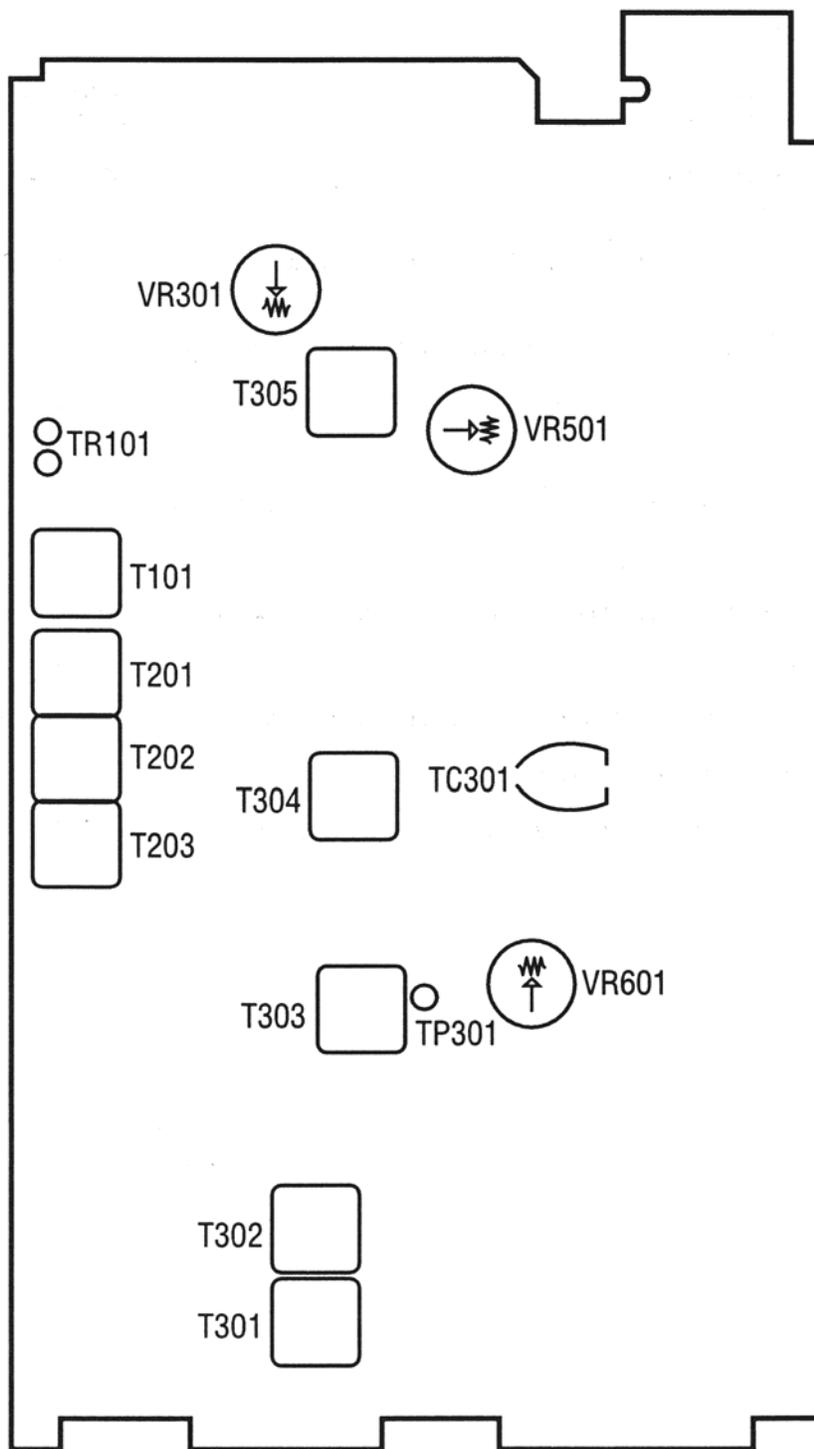
6. Connect RF power meter with dummy load to spectrum analyzer through coupler/–20 dB attenuator to the external antenna jack.
7. Suppression of the second harmonic frequency level must be lower than 60 dB. Check the other channels.

## RECEIVER SECTION

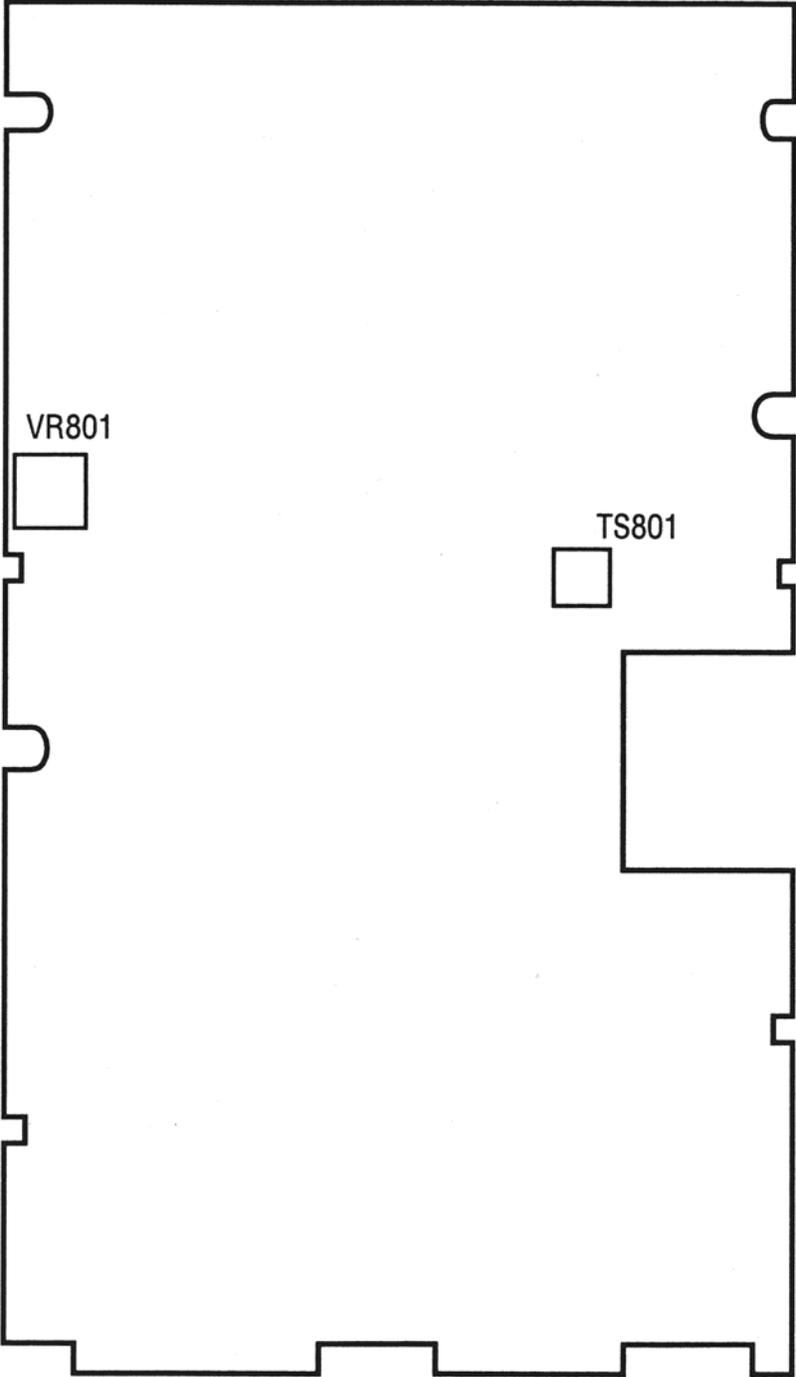
1. Select the receive mode. Turn the volume fully clockwise. Turn squelch fully counterclockwise. Select Channel 19. Set the RF signal generator for 27.185 MHz at 1 kHz, 30% modulation.
  2. Connect the signal generator to the external antenna jack. Connect ACVM across external speaker jack with 8  $\Omega$  dummy load.
  3. Adjust T301, T302, T303, T304 and T305 for maximum indication on ACVM. Adjust RF signal level until audio output becomes about 0.6 V.
  4. Set the signal generator for 27.185 MHz at 1 kHz, 1 mV, 30% modulation.
  5. Adjust T303, T304, and T305 for minimum indication on distortion meter (3%—5%).
- **Squelch**
6. Set the signal generator for 27.185 MHz at 1 kHz, 1 mV, 30% modulation.
  7. Turn squelch fully clockwise.
  8. Adjust VR501 for SSG AMPLITUDE CHANGE 55—65 dBuV AUDIO WAVE TURN ON/OFF CHECK.
- **RF Signal Meter**
9. Set the signal generator for 27.185 MHz at 1 kHz, 100  $\mu$ V (40 dBuV), 30% modulation.
  10. Turn squelch fully counterclockwise.
  11. Adjust VR301 so the desired levels indicate S-1, S-9, S-10 on the LEVEL METER.

# ALIGNMENT

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Adjustment Map — RF Board



**Adjustment Map — CPU Board**

# CIRCUIT DESCRIPTION

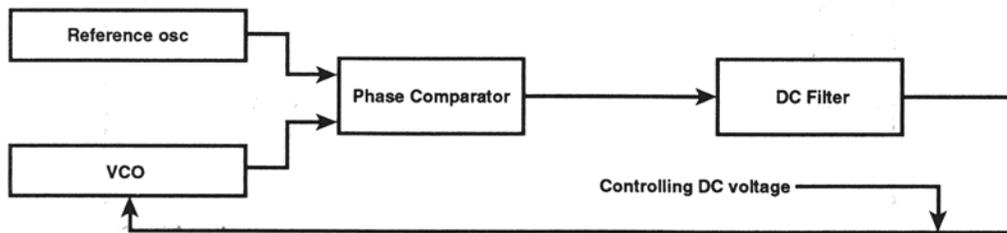
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## CIRCUIT DESCRIPTION

### FUNDAMENTAL THEORY OF PLL CIRCUITRY

The purpose of a PLL (Phase Locked Loop) circuit is to generate multiple number programmable frequencies from a signal reference frequency with quartz accuracy. A basic PLL circuitry consists of reference oscillator, VCO, phase comparator and DC filter (low pass filter). This will effectively lock the VCO (Voltage Controlled Oscillator) Frequency to the reference oscillator, and its accuracy is as good as the reference oscillator.

Since the CB radio's adjacent channel spacing is 10 kHz (or multiple of 2.5 kHz), our purpose should be to produce multiple of programmable frequencies that are spaced apart by 10 kHz.

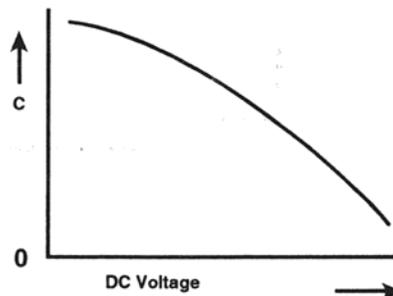
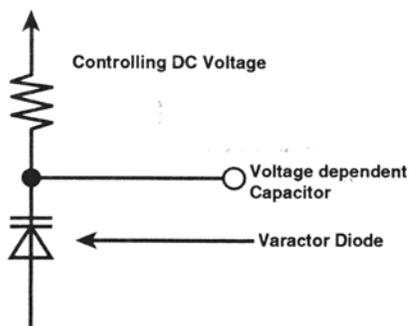


Note in the following that the reference frequency of 2.5 kHz is obtained by dividing the 4.5 MHz by 1800 times. (2.5 kHz reference is used instead of 10 kHz for division convenience).

### TRANSMITTER CIRCUIT

The VCO frequency selected by the channel selector button is doubled to generate desired transmit frequency. The doubling is done by the Q201. The resulting transmit frequency is filtered by T201 and T202.

Q205 is a button circuit. When VCO frequency is out of "Lock" condition pin 24 of IC801 pulls down bias voltage of Q205 to ground disabling Q205 from passing possible illegal frequencies. Q202 is an RF power driver circuit, and Q203 is the final RF power amplifier. The most important part of VCO circuitry is a voltage controlled variable capacitor called vari-cap or varactor diode whose capacitance depends on DC voltage applied to its cathode.



# CIRCUIT DESCRIPTION

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The varactor diode is responsible for setting VCO frequency, and once set it regulates the VCO frequency against the reference.

The VCO frequencies are chosen in the 13 to 16 MHz range as shown in **Table 1**. To obtain transmit signal the VCO is doubled. For example, the frequency for Channel 1:  $13.4825 \times 2 = 26.965$  MHz. For receiver mode, the VCO is used as a first local oscillator. For Channel1 :  $26.965 - 16.27 = 10.695$  MHz.

The first IF of 10.695 MHz is mixed again with 10.24 MHz crystal oscillator frequency which serves as the second local oscillator.

$$10.695 - 10.24 = 0.455 \text{ MHz}$$

As can be seen in **Table 1** the VCO frequency shifts from 13.485 to 16.27 MHz when changed from transmit to receive for the same Channel 1.

The shift is accomplished by "read only memory" incorporated inside the CPU IC between the selector button and the VCO divider (programmable). When transmit logic signal is applied to the IC801 through pin 3, the programmable divider will divide incoming VCO frequency by 5394 to produce 2.5 kHz sampling signal.

$$13.485 / 5394 = 2.5 \text{ kHz}$$

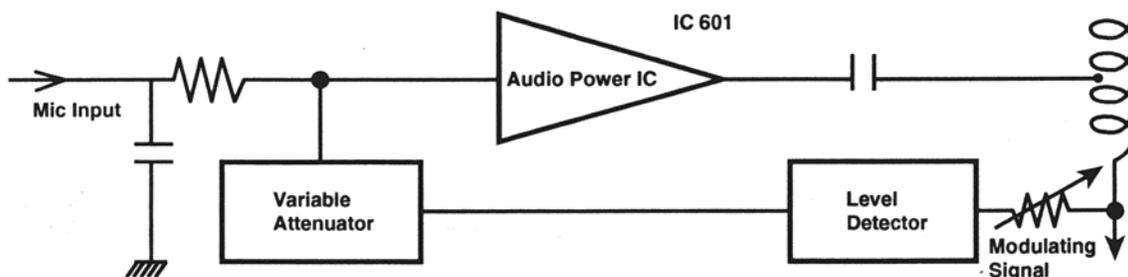
For the receiver mode the programmable divider will automatically change to divide the VCO frequency by 3254.

$$16.27 / 3254 = 5 \text{ kHz}$$

A modulating audio signal is applied to the collectors of Q203 and Q204 through an audio power transformer OPT.

The audio signal (mic input) is amplified by the AF power amplifier, IC601.

The modulation limiting is accomplished by an automatic level control circuit button is as shown below.



C214 and L205 are series resonator, and L206, L207, C217 and C218 make up a pi-type low pass filter. C22 is factory selected and limits the RF output power level to within the FCC limit of 4 W.

# CIRCUIT DESCRIPTION

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Table 1

Channel No.	Channel Freq (MHz)	Crystal Osc (MHz)	VCO	
			TX (MHz)	RX (MHz)
1	26.965	4.5	13.4825	16.27
2	26.975	4.5	13.4875	16.28
3	26.985	4.5	13.4925	16.29
4	27.005	4.5	13.5025	16.31
5	27.015	4.5	13.5075	16.32
6	27.025	4.5	13.5125	16.33
7	27.035	4.5	13.5175	16.34
8	27.055	4.5	13.5275	16.36
9	27.065	4.5	13.5325	16.37
10	27.075	4.5	13.5375	16.38
11	27.085	4.5	13.5425	16.39
12	27.105	4.5	13.5525	16.41
13	27.115	4.5	13.5575	16.42
14	27.125	4.5	13.5625	16.43
15	27.135	4.5	13.5675	16.44
16	27.155	4.5	13.5775	16.46
17	27.165	4.5	13.5825	16.47
18	27.175	4.5	13.5875	16.48
19	27.185	4.5	13.5925	16.49
20	27.205	4.5	13.6025	16.51
21	27.215	4.5	13.6075	16.52
22	27.225	4.5	13.6125	16.53
23	27.255	4.5	13.6275	16.56
24	27.235	4.5	13.6175	16.54
25	27.245	4.5	13.6225	16.55
26	27.265	4.5	13.6325	16.57
27	27.275	4.5	13.6375	16.58
28	27.285	4.5	13.6425	16.59
29	27.295	4.5	13.6475	16.60
30	27.305	4.5	13.6525	16.61
31	27.315	4.5	13.6575	16.62
32	27.325	4.5	13.6625	16.63
33	27.335	4.5	13.6675	16.64
34	27.345	4.5	13.6725	16.65
35	27.355	4.5	13.6775	16.66
36	27.365	4.5	13.6825	16.67
37	27.375	4.5	13.6875	16.68
38	27.385	4.5	13.6925	16.69
39	27.395	4.5	13.6975	16.70
40	27.405	4.5	13.7025	16.71

## RECEIVER CIRCUIT

In the receiver mode of operation, transistor Q402 is turned off, transistor Q405 is turned on. Also bias voltage is applied to Q304 and a proper bias and AGC voltage is established to Q301, Q302 and Q303.

Q301 is a 27 MHz RF input amplifier and any excessive input signal is limited by diode D301.

The amplified 27 MHz is mixed with VCO frequency selected by channel button. For Channel 1 VCO is set at 16.27 MHz. The resulting first IF is  $26.965 - 16.27 = 10.695$  MHz.

Q302 is the first converter, and the 10,695 MHz is filtered by T303, and a ceramic filter CF1. Q307 is a second local oscillator for 10.24 MHz.

# CIRCUIT DESCRIPTION/VOLTAGE CHARTS

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The first IF is again mixed with a second local oscillator of 10.24 MHz.

$$10.695 - 10.24 = 0.445 \text{ MHz.}$$

Q303 is the second converter and the 455 MHz second IF is filtered by a ceramic filter CF2 coupled with T304. Q304 AND Q305 are first IF 455 MHz amplifiers.

D305 is a detector diode which produces audio signal as well as a negative DC voltage for AGC action. The negative voltage also provides forward biasing to the cathode of ANL clipping diode of Q306. The biasing voltage has a time constant determined by R326 and C319.

## VOLTAGE CHARTS

**Table 2 — Intergrated Circuit Voltage Table (In V DC)**

REF NO.	MODE	PIN NO.									
		1	2	3	4	5	6	7	8	9	10
IC501	RX	0.0	0.0	0.54	0.0	0.0	0.0	5.14	11.5	---	---
	TX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---
IC601	RX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TX	13.1	11.88	3.76	7.8	1.42	2.9	3.26	1.18	0.0	6.6

**Table 3 — Transistors**

REF NO.	MODE	EMITTER (V)	BASE (V)	COLLECTOR (V)
Q101	RX	0.6	1.04	2.44
	TX	0.6	1.02	2.5
Q102	RX	0.0	0.6	2.44
	TX	0.0	0.6	2.4
Q103	RX	0.0	0.73	2.8
	TX	0.0	0.7	2.7
Q104	RX	4.28	4.95	7.38
	TX	4.27	4.94	7.36
Q105	RX	0.0	0.0	0.9
	TX	0.0	0.7	0.0
Q201	RX	0.0	0.0	0.0
	TX	1.63	2.24	7.5
Q202	RX	0.0	0.0	0.0
	TX	0.8	1.3	7.6
Q203	RX	0.0	0.0	0.0
	TX	0.0	-0.1	10.0
Q204	RX	0.0	0.0	0.0
	TX	0.0	0.0	10.6
Q205	RX	0.0	0.0	0.0
	TX	0.0	4.4	0.0
Q301	RX	0.39	1.3	7.4
	TX	0.3	0.6	5.3
Q302	RX	0.36	1.04	10.3
	TX	0.6	0.5	8.15
Q303	RX	7.37	0.81	0.19
	TX	0.07	0.65	6.1
Q304	RX	0.7	1.4	6.35
	TX	0.22	0.87	5.8

# VOLTAGE CHARTS

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Table 2 — Transistors (Continued)

REF NO.	MODE	EMITTER (V)	BASE (V)	COLLECTOR (V)
Q305	RX	0.67	1.38	11.0
	TX	0.46	1.1	9.4
Q306	RX	0.24	0.05	0.0
	TX	0.15	0.09	0.0
Q307	RX	6.2	6.7	7.6
	TX	6.2	5.6	5.1
Q401	RX	7.62	8.3	11.2
	TX	7.6	8.3	9.7
Q402	RX	7.62	7.62	0.0
	TX	7.6	0.6	7.5
Q403	RX	0.0	11.7	11.3
	TX	12.5	0.0	9.7
Q404	RX	0.0	3.73	0.0
	TX	0.0	3.75	0.0
Q405	RX	7.6	7.6	7.56
	TX	7.6	7.0	5.6
Q501	RX	0.03	0.6	1.02
	TX	0.0	0.0	0.0
Q502	RX	0.0	4.3	0.0
	TX	0.0	0.0	13.0
Q503	RX	11.5	10.9	11.5
	TX	13.0	13.0	0.0
Q504	RX	0.0	0.2	0.2
	TX	0.0	0.0	0.8
Q505	RX	0.0	0.0	11.5
	TX	0.0	7.5	0.0
Q601	RX	12.0	12.0	0.0
	TX	13.0	12.4	13.0
Q602	RX	0.0	0.0	12.0
	TX	0.0	7.5	0.0
Q603	RX	12.0	12.0	0.0
	TX	12.4	11.7	12.2
Q604	RX	0.0	0.0	12.0
	TX	0.0	3.6	0.0
Q605	RX	7.27	7.31	0.0
	TX	3.6	0.0	3.6
Q606	RX	0.0	6.0	0.0
	TX	1.8	6.5	0.0
Q607	RX	0.0	0.0	0.0
	TX	0.0	0.0	0.0
Q801	RX	5.0	7.75	0.0
	TX	5.0	7.75	0.0
Q802	RX	0.0	0.0	0.0
	TX	0.0	0.0	0.0
Q803	RX	5.0	5.6	12.0
	TX	5.0	5.6	12.0
Q804	RX	2.2	4.3	0.0
	TX	2.2	4.3	0.0
Q805	RX	12.0	12.0	0.0
	TX	12.0	12.0	0.0
Q806	RX	0.0	0.0	12.0
	TX	0.0	0.0	12.0
Q807	RX	0.0	0.6	0.0
	TX	0.0	0.6	0.0
Q808	RX	0.0	0.06	5.0
	TX	0.0	0.06	5.0

## MECHANICAL PARTS

REF.NO	DESCRIPTION	PART NO.
1	CASE FRONT	75-010014
2	RUBBER PTT	75-157056
3	SPRING REMOVE	75-152006
4	KNOB REMOVE	75-110012
5	KNOB STOPPER	75-158026
6	SCREW-T/P-2 SLOT, PAN (+) M2xL4 FNW	75-151075
7	RUBBER SPACER	75-157052
8	TERMINAL BATTERY	75-152007
9	SCREW-T/P,PAN (+) M2xL5 FNW	75-151076
10	WINDOW LCD	75-020018
11	PLATE AL	75-020019
12	FELT SPEAKER	75-157050
13	SPEAKER 8 Ω	75-060006
14	CHASSIS	75-015002
15	RF PCB	75-070009
16	SCREW-W/WASHER,PAN (+) M2xL4, FNW	75-151074
17	HEAT SINK	75-089014
18	SCREW-M/C, BND (+)M2.6xL5, FZY	75-151068
19	SHIELD PLATE A-1	70-089016
20	HEAT SINK TR	75-089015
21	INSULATOR NYLON, TO-220	75-157048
22	SCREW-M/C,FLT (+)M2.6x10,FZY	75-151073
23	NUT M2.6 MBsBD1	75-151077
24	SHIELD PLATE B-1	75-089017
25	CPU PCB	75-070011
26	HOLDER MIC	75-158025
27	C-MIC	75-038006
28	SPACER LCD	75-156005
29	LCD	75-202007
30	PANEL TOP	75-010013
31	KNOB PUSH	75-110011
32	RUBBER PUSH C	75-157057
33	RUBBER PUSH B	75-157051
34	CAP ANTENNA	75-157053
35	CAP JACK	75-157054
36	CHASSIS TOP	75-015001
37	ANTENNA JACK	75-153008
38	BRACKET JACK	75-158024
39	SCREW-M/C, BND (+) M2xL4 FNW	75-151067
40	VR-SQUELCH	75-160010
41	VR-OFF/VOLUME	75-160011
42	JACK PCB	75-070010
43	SPACER JACK	75-157047
44	SCREW-M/C,FLT (+) M2xL6 FZB	75-151072
45	KNOB VOLUME	75-110010
46	O-RING	75-157046
47	SCREW-M/C, FLT (+) M2xL4, FNW	75-151071
48	KNOB DW	75-110013
49	CAP DC	70-157055
50	CASE REAR	75-013007
51	SCREW-M/C,PAN (+) M2xL4 FZB	75-151066
52	HOLDER BATTERY	75-030008
53	SCREW-M/C,RND (-) M2xL4 FNW	75-151069
54	SCREW-M/C,RND (-) M2xL5 FNW	75-151070
55	LUG	75-151078
56	SPRING BATTERY (D)	75-152004
57	SPRING BATTERY (S)	75-152005
58	DUMMY BATTERY	75-030007
59	CASE BATTERY	75-030006
60	LABEL SERIAL NO	75-023013
	PVC404, 1.2M CORD-CIGARETTE	75-034003
	13W*18L*0.3T*3.5PI W/BOND RUBBER-SILICON	75-157045
	BNC-RB JACK-ANT	75-153008
	40-8BB SPEAKER	75-060006
	HA-27-SB ANTENNA	75-040009
	HDL-7406 LCD	75-202007
	WM034CY C-MIC	75-038006

# PARTS

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## ELECTRICAL PARTS

REF NO.	DESCRIPTION	PART NO.
<b>CAPACITORS</b>		
C101	0.47 $\mu$ F, 50 V, TANTAL	75-138007
C102	1000 pF, 50 V, CERAMIC CHIP	70-138255
C103	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C104	47 pF, 50 V, CERAMIC CHIP	70-138344
C105	5 pF, 50 V, CERAMIC CHIP	70-138166
C106	330 pF, 50 V, CERAMIC CHIP	70-138228
C107	18 pF, 50 V, CERAMIC CHIP	70-138206
C108	22 pF, 50 V, CERAMIC CHIP	70-133062
C109	47 pF, 50 V, CERAMIC CHIP	70-138344
C110	33 pF, 50 V, CERAMIC CHIP	70-138188
C111	24 pF, 50 V, CERAMIC CHIP	70-133049
C112	560 pF, 50 V, CERAMIC CHIP	73-138407
C113	120 pF, 50 V, CERAMIC CHIP	70-138303
C114	0.022 $\mu$ F, 50 V, CERAMIC CHIP	70-138162
C115	0.47 $\mu$ F, 16 V, CERAMIC CHIP	75-138005
C201	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C202	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C203	4 pF, 50 V, CERAMIC CHIP	70-133157
C204	68 pF, 50 V, CERAMIC CHIP	70-138127
C205	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C206	0.022 $\mu$ F, 50 V, CERAMIC CHIP	70-138162
C207	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C208	470 pF, 50 V, CERAMIC CHIP	70-138404
C209	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C210	200 pF, 50 V, CERAMIC CHIP	75-138001
C211	240 pF, 50 V, CERAMIC CHIP	75-138010
C212	120 pF, 50 V, CERAMIC CHIP	70-138303
C213	18 pF, 50 V, CERAMIC CHIP	70-138206
C214	150 pF, 50 V, CERAMIC CHIP	70-138231
C215	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C216	330 pF, 50 V, CERAMIC CHIP	70-138228
C217	39 pF, 50 V, CERAMIC CHIP	70-138233
C218	220 pF, 50 V, CERAMIC CHIP	70-138176
C219	39 pF, 50 V, CERAMIC CHIP	70-138233
C222	120 pF, 50 V, CERAMIC CHIP	70-138303
C301	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C302	20 pF, 50 V, CERAMIC CHIP	70-133050
C303	0.022 $\mu$ F, 50 V, CERAMIC CHIP	70-138162
C304	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C306	33 pF, 50 V, CERAMIC CHIP	70-138188
C307	0.022 $\mu$ F, 50 V, CERAMIC CHIP	70-138162
C308	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C309	0.022 $\mu$ F, 50 V, CERAMIC CHIP	70-138162
C310	1000 pF, 50 V, CERAMIC CHIP	70-138255
C311	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C312	1000 pF, 50 V, CERAMIC CHIP	70-138255
C314	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C315	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C316	6800 pF, 50 V, CERAMIC CHIP	70-138565
C317	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C318	4.7 $\mu$ F, 35 V, ELECT	78-135005
C319	1 $\mu$ F, 50 V, ELECT	77-135023
C322	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C323	120 pF, 50 V, CERAMIC CHIP	70-138303
C324	470 pF, 50 V, CERAMIC CHIP	70-138404
C325	22 pF, 50 V, CERAMIC CHIP	70-133062
C326	22 pF, 50 V, CERAMIC CHIP	70-133062
C327	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C328	10 $\mu$ F, 16 V, ELECT	75-131017
C329	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C330	10 $\mu$ F, 16 V, ELECT	75-131017
C331	4.7 $\mu$ F, 35 V, ELECT	78-135005
C332	0.047 $\mu$ F, 50 V, CERAMIC CHIP	70-138391
C333	10 pF, 50 V, CERAMIC CHIP	70-131435
C401	22 $\mu$ F, 16 V, ELECT	75-135002
C502	470 pF, 50 V, CERAMIC CHIP	70-138404
C503	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C504	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168

## ELECTRICAL PARTS (Continued)

REF NO.	DESCRIPTION	PART NO.
<b>CAPACITORS (Continued)</b>		
C505	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C506	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C507	5600 pF, 50 V, CERAMIC CHIP	75-138002
C508	10 $\mu$ F, 16 V, TANTAL	75-138006
C509	220 $\mu$ F, 16 V, ELECT	75-135003
C510	220 $\mu$ F, 16 V, ELECT	75-135003
C511	4.7 $\mu$ F, 16 V, TANTAL	75-138009
C602	1 $\mu$ F, 50 V, ELECT	75-135006
C603	0.015 $\mu$ F, 50 V, CERAMIC CHIP	70-138390
C605	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C606	3.3 $\mu$ F, 50 V, ELECT	75-135007
C607	47 $\mu$ F, 16, ELECT	77-135005
C608	6800 pF, 50 V, CERAMIC CHIP	70-138565
C609	3.3 $\mu$ F, 16 V, TANTAL	75-138008
C610	68 pF, 50 V, CERAMIC CHIP	70-138127
C611	150 pF, 50 V, CERAMIC CHIP	70-138231
C612	68 pF, 50 V, CERAMIC CHIP	70-138127
C613	33 $\mu$ F, 16 V, ELECT	77-135026
C614	220 $\mu$ F, 16 V, ELECT	75-135003
C616	0.068 $\mu$ F, 50 V, CERAMIC CHIP	75-138004
C617	22 $\mu$ F, 16 V, ELECT	75-135002
C618	0.068 $\mu$ F, 50 V, CERAMIC CHIP	75-138004
C619	470 $\mu$ F, 16 V, ELECT	75-135004
C620	470 $\mu$ F, 16 V, ELECT	75-135004
C621	1 $\mu$ F, 50 V, ELECT	77-135023
C622	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C623	22 $\mu$ F, 16 V, ELECT	75-135002
C701	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C702	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C703	3300 pF, 50 V, CHIP CERAMIC	70-138564
C801	10 $\mu$ F, 16 V, ELECT	75-135001
C802	10 $\mu$ F, 16 V, TANTAL	75-138006
C803	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C804	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C805	0.47 $\mu$ F, 50 V, ELECT	75-135005
C807	22 pF, 50 V, CERAMIC CHIP	70-133062
C808	18 pF, 50 V, CERAMIC CHIP	70-138206
C809	1000 pF, 50 V, CERAMIC CHIP	70-138255
C810	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C811	0.1 $\mu$ F, 50 V, CERAMIC CHIP	70-138568
C812	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C813	0.01 $\mu$ F, 50 V, CERAMIC CHIP	70-138168
C814	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C815	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C816	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C817	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C818	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C819	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C820	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C821	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C822	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C823	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C824	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C825	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C826	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C827	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C828	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C829	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C830	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C831	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C832	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C833	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003
C834	0.022 $\mu$ F, 50 V, CERAMIC CHIP	75-138003

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## ELECTRICAL PARTS (Continued)

REF NO.	DESCRIPTION	PART NO.
<b>CERAMIC FILTERS</b>		
CF1	MS3(10.7 MHz)	75-179006
CF2	455 kHz	75-179005
<b>JACKS AND CONNECTORS</b>		
CN1	7 PIN 2M/M PITCH	75-159007
CN2	7 PIN 40M/M AWG 26, 30	75-034004
CN3	7 PIN 2M/M PITCH	75-159007
CN4	7 PIN 40M/M AWG30	75-034005
CN5	TDH2-12SG	75-159008
CN6	TDH2-12SG	75-159008
CN7	TDH2-4SG	75-159006
CN8	GDH2-12DBC	75-159010
CN9	GDH2-12DBC	75-159010
CN10	GDH2-4DBC	75-159009
CN11	4PIN, 60/90MM, AWG28/30	75-034006
J701	01J0182 JACK-DC	75-153007
J901	HSJ0837-01-010 JACK-MIC	75-153005
J902	HSJ0838-01-010 JACK-EARPHONE	75-153006
<b>DIODES</b>		
D201	BA282	75-085009
D203	1N4002	05-174002
D204	1N4002	05-174002
D301	MA153A	75-085003
D304	MA150(1N4148)	05-330150
D305	1K261	75-085008
D401	KDS190	75-085006
D402	MA150(1N4148)	05-330150
D501	KDS190	75-085006
D502	KDS187	75-085005
D601	MA153A	75-085003
D602	MA153A	75-085003
D701	16 V, 2W	75-085010
D801	KDS187	75-085005
D802	KDS187	75-085005
D803	KDS190	75-085006
D804	KDS187	75-085005
D806	KDS187	75-085005
D807	MA151WA	75-085004
D807	KDS196	75-085007
<b>INTEGRATED CIRCUITS</b>		
IC501	KIA6278(F)	75-076003
IC601	KIA 7217AP	02-437217
IC801	LC7232	75-076002
<b>COILS AND INDUCTORS</b>		
L201	1/4 W, 2.2 UH COIL-INDUCTOR	75-178019
L202	3.5PI*11.5T*0.7 COIL-SPRING	75-178015
L203	1/4 W, 6.8 UH COIL-INDUCTOR	75-178020
L204	5PI*12.5T*0.5 COIL-SPRING	75-178017
L205	4PI*17.5T*0.5 COIL-SPRING	75-178018
L206	4PI*9.5T*0.5 COIL-SPRING	75-178016
L207	4PI*9T*0.5 COIL-SPRING	75-178014
L301	1/4 W, 6.8 UH COIL-INDUCTOR	75-178020
L302	1/4 W, 100 UH COIL-INDUCTOR	75-178013
T101	VCO COIL 5 mm W/CORE COIL-VCO	75-090057
T201	TX DOUBLER COIL-IFT	75-090050
T202	TX TUNE, COIL-IFT	75-090051
T203	TX TUNE, COIL-IFT	75-090052
T301	5M/M, W/CORE, ANT COIL-IFT	75-090053
T302	5M/M, W/CORE, RF COIL-IFT	75-090054
T303	5M/M, W/CORE, 1ST MIXER COIL-IFT	75-090055
T304	5M/M, W/CORE, 2ND MIXER COIL-IFT	75-090056
T305	T6 T401 CAN-TYPE COIL-IFT	75-090058

## ELECTRICAL PARTS (Continued)

REF NO.	DESCRIPTION	PART NO.
<b>TRANSISTORS</b>		
Q101	KTC3911(G)	75-080009
Q102	KTC3911(G)	75-080009
Q103	KTC3880S(AQY'Y)	75-080008
Q104	KTC3880S(AQY'Y)	75-080008
Q105	KTC3875STI	75-080007
Q201	KTC3880S(AQY'Y)	75-080008
Q202	KTC3880S(AQY'Y)	75-080008
Q203	KTC1006	75-080006
Q204	2SC1974	01-031974
Q205	KTA1504 Y, G	75-080004
Q301	KTC3880S(AQY'Y)	75-080008
Q302	KTC3880S(AQY'Y)	75-080008
Q303	KTC3880S(AQY'Y)	75-080008
Q304	KTC3880S(AQY'Y)	75-080008
Q305	KTC3880S(AQY'Y)	75-080008
Q306	KTA1504 Y, G	75-080004
Q307	KTC3880S(AQY'Y)	75-080008
Q401	KTC3875STI	75-080007
Q402	KRA101S	75-080010
Q403	DTA124EK	75-080013
Q404	KRC102S	75-080012
Q405	KTA1504 Y, G	75-080004
Q501	KTC3875STI	75-080007
Q502	KRC102S	75-080012
Q503	KTA1663(Y)	75-080005
Q504	KTC3875STI	75-080007
Q505	KRC101S	75-080011
Q601	KTA1663(Y)	75-080005
Q602	KRC102S	75-080012
Q603	KTA1663(Y)	75-080005
Q604	KRC101S	75-080011
Q605	DTA124EK	75-080013
Q606	KTA1504 Y, G	75-080004
Q607	KTC3875STI	75-080007
Q801	KTA1504 Y, G	75-080004
Q802	DTA144EK	75-076001
Q803	KTC3875STI	75-080007
Q804	DTA124EK	75-080013
Q805	KTA1504 Y, G	75-080004
Q806	KTC3875STI	75-080007
Q807	KTC3875STI	75-080007
Q808	KTC3875STI	75-080007
<b>RESISTORS</b>		
R101	47 k $\Omega$ , 1/10 W, CHIP	70-144400
R102	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R103	82 k $\Omega$ , 1/10 W, CHIP	70-144561
R104	22 k $\Omega$ , 1/8 W, CARBON	79-141001
R105	1.2 k $\Omega$ , 1/10 W, CHIP	70-144385
R106	220 k $\Omega$ , 1/10 W, CHIP	70-144403
R107	220 k $\Omega$ , 1/10 W, CHIP	70-144403
R108	2.7 k $\Omega$ , 1/10 W, CHIP	70-144159
R109	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R110	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R111	47 $\Omega$ , 1/10 W, CHIP	70-145130
R201	150 k $\Omega$ , 1/10 W, CHIP	70-140234
R202	390 $\Omega$ , 1/10 W, CHIP	75-144002
R203	6.8 k $\Omega$ , 1/10 W, CHIP	70-144392
R205	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R206	68 $\Omega$ , 1/10 W, CHIP	70-144114
R207	100 $\Omega$ , 1/10 W, CHIP	70-145113
R208	220 $\Omega$ , 1/10 W, CHIP	70-144194
R209	10 $\Omega$ , 1/10 W, CHIP	70-144373
R210	100 $\Omega$ , 1/10 W, CHIP	70-145113
R211	3.3 $\Omega$ , 1/10 W, CHIP	70-144334
R213	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R301	270 $\Omega$ , 1/10 W, CHIP	70-144116

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## ELECTRICAL PARTS (Continued)

REF NO.	DESCRIPTION	PART NO.
<b>RESISTORS (Continued)</b>		
R302	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R303	18 $\Omega$ , 1/10 W, CHIP	70-144171
R304	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R305	100 $\Omega$ , 1/10 W, CHIP	70-145113
R306	27 k $\Omega$ , 1/10 W, CHIP	70-144163
R307	220 $\Omega$ , 1/10 W, CHIP	70-144194
R308	470 $\Omega$ , 1/10 W, CHIP	70-144381
R309	330 $\Omega$ , 1/10 W, CHIP	70-144380
R310	330 $\Omega$ , 1/10 W, CHIP	70-144380
R311	2.7 k $\Omega$ , 1/10 W, CHIP	70-144159
R312	100 $\Omega$ , 1/10 W, CHIP	70-145113
R313	100 $\Omega$ , 1/10 W, CHIP	70-145113
R314	560 $\Omega$ , 1/10 W, CHIP	70-144281
R315	22 k $\Omega$ , 1/10 W, CHIP	70-144397
R316	820 k $\Omega$ , 1/10 W, CHIP	70-141222
R317	680 $\Omega$ , 1/10 W, CHIP	70-144382
R318	1.2 k $\Omega$ , 1/10 W, CHIP	70-144385
R320	56 k $\Omega$ , 1/10 W, CHIP	70-141201
R321	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R322	300 $\Omega$ , 1/10 W, CHIP	75-144001
R323	47 $\Omega$ , 1/10 W, CHIP	70-145130
R324	22 k $\Omega$ , 1/10 W, CHIP	70-144397
R325	62 k $\Omega$ , 1/10 W, CHIP	75-144003
R326	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R327	100 k $\Omega$ , 1/10 W, CHIP	70-144402
R328	75 k $\Omega$ , 1/10 W, CHIP	75-144004
R329	47 $\Omega$ , 1/10 W, CHIP	70-145130
R330	62 k $\Omega$ , 1/10 W, CHIP	75-144003
R331	27 k $\Omega$ , 1/10 W, CHIP	70-144163
R332	220 k $\Omega$ , 1/10 W, CHIP	70-144403
R333	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R334	27 k $\Omega$ , 1/10 W, CHIP	70-144163
R401	10 $\Omega$ , 1/10 W, CHIP	70-144373
R402	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R403	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R501	820 k $\Omega$ , 1/10 W, CHIP	70-141222
R502	270 $\Omega$ , 1/10 W, CHIP	70-144116
R503	100 k $\Omega$ , 1/10 W, CHIP	70-144402
R504	22 k $\Omega$ , 1/10 W, CHIP	70-144397
R505	470 k $\Omega$ , 1/10 W, CHIP	70-144199
R506	75 k $\Omega$ , 1/10 W, CHIP	75-144004
R507	47 $\Omega$ , 1/10 W, CHIP	70-145130
R508	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R509	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R510	18 k $\Omega$ , 1/10 W, CHIP	70-144396
R511	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R512	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R513	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R514	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R601	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R602	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R603	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R604	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R605	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R606	68 $\Omega$ , 1/10 W, CHIP	70-144114
R607	820 $\Omega$ , 1/10 W, CHIP	70-144383
R608	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R609	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R610	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R611	4.7 k $\Omega$ , 1/10 W, CHIP	70-144390
R612	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R613	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R614	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R615	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R616	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R617	3.9 k $\Omega$ , 1/10 W, CHIP	70-145132

## ELECTRICAL PARTS (Continued)

REF NO.	DESCRIPTION	PART NO.
<b>RESISTORS (Continued)</b>		
R801	10 $\Omega$ , 1/10 W, CHIP	70-144373
R802	33 k $\Omega$ , 1/10 W, CHIP	70-144398
R803	1 k $\Omega$ , 1/10 W, CHIP	70-144384
R804	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R805	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R806	470 k $\Omega$ , 1/10 W, CHIP	70-144199
R807	220 k $\Omega$ , 1/10 W, CHIP	70-144403
R808	100 k $\Omega$ , 1/10 W, CHIP	70-144402
R809	1.5 k $\Omega$ , 1/10 W, CHIP	70-144386
R810	22 k $\Omega$ , 1/10 W, CHIP	70-144397
R811	2.2 k $\Omega$ , 1/10 W, CHIP	70-144388
R812	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R813	15 k $\Omega$ , 1/10 W, CHIP	70-144395
R814	100 k $\Omega$ , 1/10 W, CHIP	70-144402
R815	820 k $\Omega$ , 1/10 W, CHIP	70-141222
R816	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R817	47 k $\Omega$ , 1/10 W, CHIP	70-144400
R818	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R819	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R820	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R821	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R822	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R823	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R824	47 k $\Omega$ , 1/10 W, CHIP	70-144400
R825	47 k $\Omega$ , 1/10 W, CHIP	70-144400
R827	10 k $\Omega$ , 1/10 W, CHIP	70-144394
R828	47 k $\Omega$ , 1/10 W, CHIP	70-144400
R832	47 k $\Omega$ , 1/10 W, CHIP	70-144400
<b>VARIABLE RESISTORS</b>		
VR1001	ROTARY 50K-A	75-160011
VR1002	ROTARY 10K-B	75-160010
VR301	47KB VOL-SEMI	75-160013
VR501	10KB VOL-SEMI	75-160012
VR601	4.7KB(H-TYPE)	75-160009
VR801	20KB G4C TYPE	75-160008
<b>SWITCHES</b>		
TS701	WITH B/K SW-TACT	75-183011
TS702	WITH B/K SW-TACT	75-183011
TS703	WITH B/K SW-TACT	75-183011
TS704	WITH B/K SW-TACT	75-183011
TS705	SKHLLA(V-TYPE) SW-TACT	75-183014
TS801	NO B/K SW-TACT	75-183012
TS802	NO B/K SW-TACT	75-183012
TS901	KHH17920 SW-TACT	75-183013
<b>MISCELLANEOUS</b>		
TC301	20 pF, 5PI TRIMMER CAP	75-123004
TC801	20 pF, CV38 TYPE TRIMMER CAP	75-123005
TH501	500 $\Omega$ , YEL THERMISTOR	75-086001
VD101	SVC251Y(SPA)	75-085001
XT301	10.24 MHz, 32 pF, CRYSTAL	75-128004
XT801	4.5 MHz 16 pF, CRYSTAL	75-128003
ZD401	ZD8.2VC 500MW	75-085013
ZD801	ZD5.6VC 500MW	75-085012
ZD802	ZD5.1VC 500MW	75-085011
LAMP801	PI2.0 14 V 30MA	75-201001
LAMP802	PI2.0 14 V 30MA	75-201001
OPT	19M/M, JC-1101 OPT	75-096006

# PARTS

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75-779

## REPLACEMENT PARTS ORDERING

To speed delivery and avoid errors, always include the following information when ordering replacement parts:

1. Best identification of the parts.
  - A. MIDLAND part number, or
  - B. Model and Serial numbers of equipment in which the part is used, with
  - C. Part description, and
  - D. Schematic reference designator, and,
  - E. If necessary, return the old part as sample.
2. Specify quantity desired of each part.
3. Ship-to address (and billing address if different).

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