



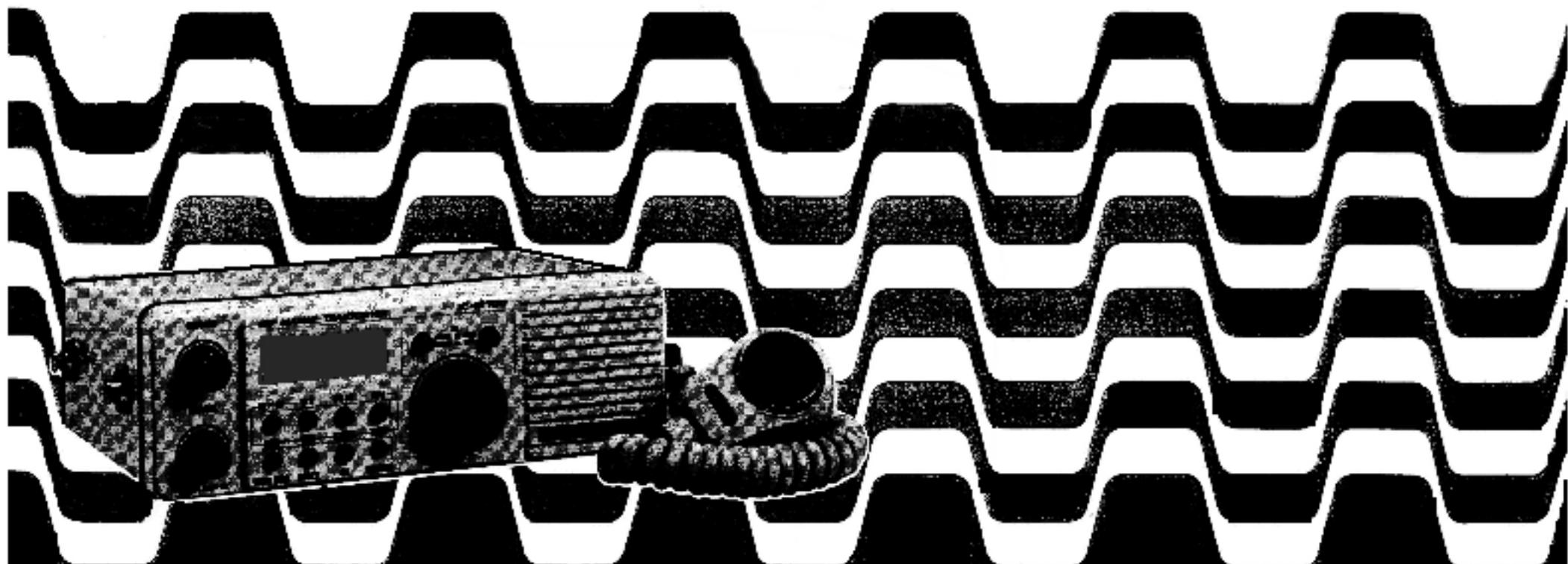
**ICOM**

**Service Manual**

**IC-M100**

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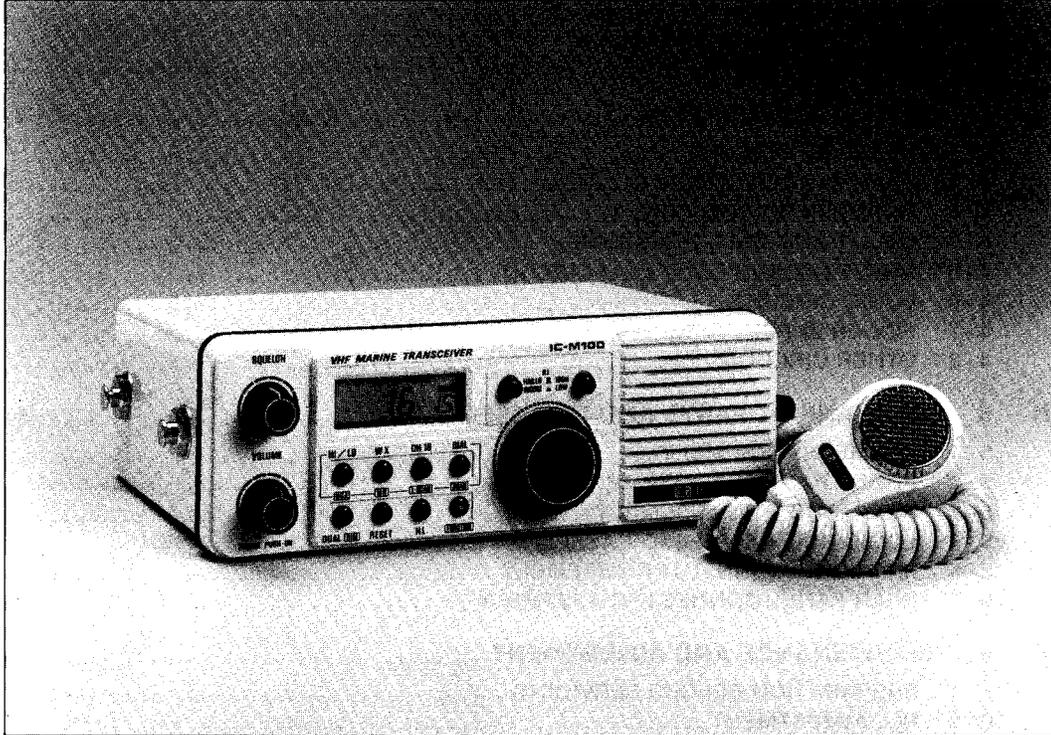
***VHF MARINE  
TRANSCEIVER***



***ICOM INCORPORATED***

## INTRODUCTION

This service manual contains information relative to the theoretical, physical, mechanical and electrical characteristics of the IC-M100 VHF MARINE TRANSCEIVER.



## ASSISTANCE

If you require assistance or further information regarding the operation and capabilities of the IC-M100, please contact your nearest authorized ICOM Dealer or ICOM Service Center.

## ORDERING PARTS

For the fastest service, supply all of the following information when ordering parts from your dealer or ICOM Service Center:

1. Equipment model and serial number
2. Schematic part identifier (e.g., IC103, Q102)
3. Printed circuit board name and number (e.g., MAIN UNIT/B-1258B)
4. Part number and name (e.g., 3SK48 FET)
5. Quantity required

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## SECTION 1 SPECIFICATIONS

### ■ GENERAL

Dimensions	: 228 mm(W) × 78 mm(H) × 208 mm(D)
Weight	: 2.1 kg
Number of channels	: All U.S.A. and international channels 16 Memory channels 10 Weather channels
Frequency stability	: 0.0005%
Temperature range	: -20°C ~ +60°C
Channel spacing	: 25 kHz
Power supply requirement	: 13.8 V DC (Negative ground)
Antenna impedance	: 50Ω
Type of emission	: 16K0G3E

### ■ TRANSMITTER

Frequency range	: 156~157.5 MHz
Maximum deviation	: ±5 kHz (16K0G3E)
RF output power	: High 25W Low 1W
Spurious emissions	: 70 dB below carrier output power
Harmonic emissions	: 70 dB below carrier output power
Microphone	: 600Ω microphone
Current drain	: High power 5.5 A Low power 1.7 A

### ■ RECEIVER

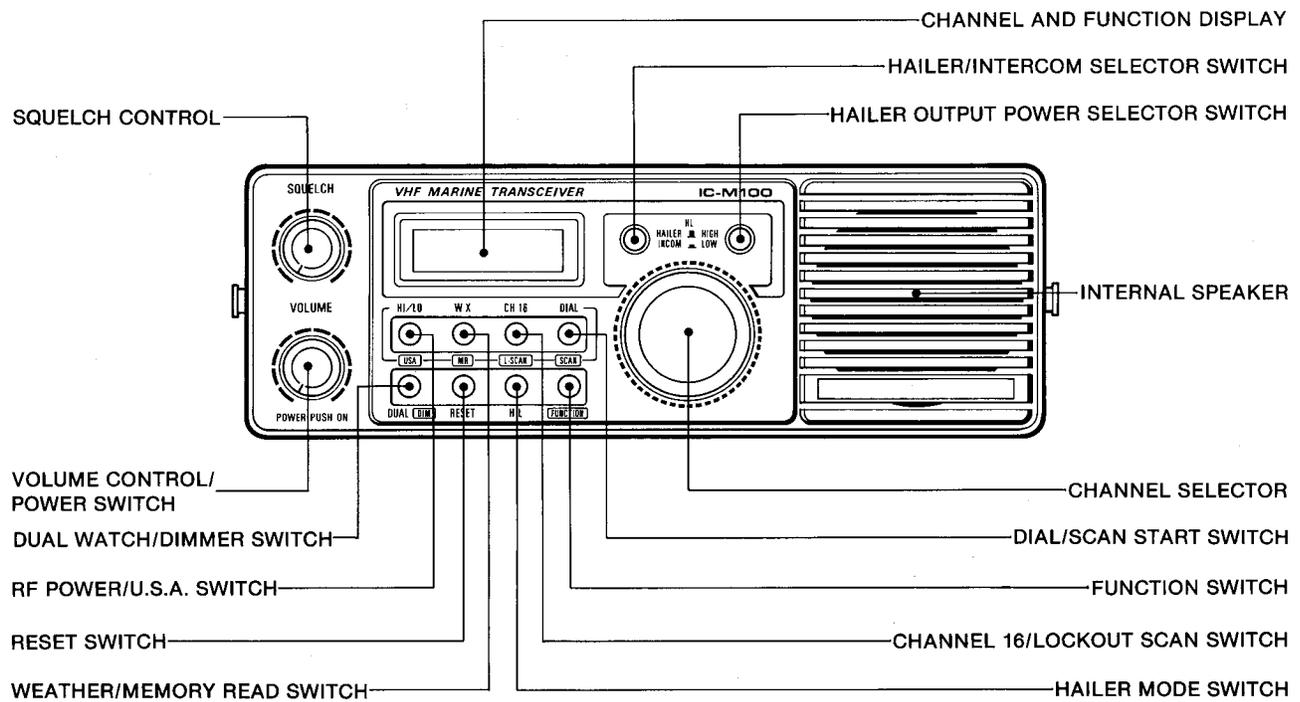
Frequency range	: 156~163 MHz
Sensitivity	: Less than 0.35 μV (-137.5 dBm) for 12 dB SINAD
Threshold squelch sensitivity	: 0.3 μV (-137.5 dBm)
Tight squelch sensitivity	: 1 μV (-107 dBm)
Intermediate frequencies	: 1st IF 21.4 MHz 2nd IF 455 kHz
Audio output	: More than 5W at 10% distortion
Current drain	: Audio max. 0.8 A Standby 0.2 A

## MARINE VHF TRANSCEIVER CHANNEL CHART

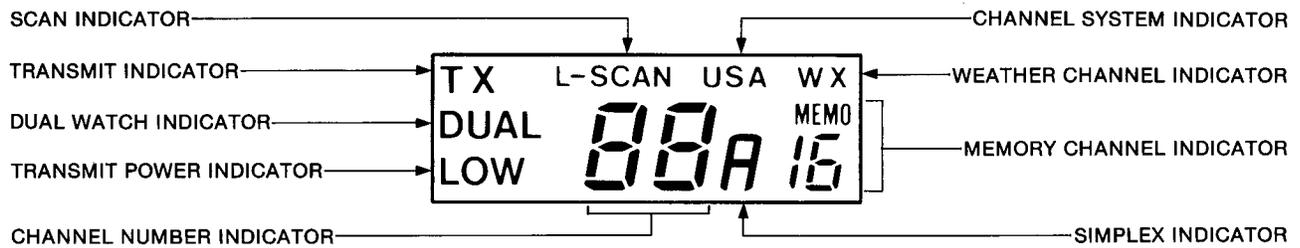
Channel No.	Frequency (MHz)		Transmitter output power	Channel No.	Frequency (MHz)		Transmitter output power
	Transmitter	Receiver			Transmitter	Receiver	
01	156.050	160.650	25W & 1W	65	156.275	160.875	25W & 1W
01A	156.050	156.050	25W & 1W	65A	156.275	156.275	25W & 1W
02	156.100	160.700	25W & 1W	66	156.325	160.925	25W & 1W
02A	156.100	156.100	25W & 1W	66A	156.325	156.325	25W & 1W
03	156.150	160.750	25W & 1W	67	156.375	156.375	25W & 1W
03A	156.150	156.150	25W & 1W	68	156.425	156.425	25W & 1W
04	156.200	160.800	25W & 1W	69	156.475	156.475	25W & 1W
04A	156.200	156.200	25W & 1W	70	156.525	156.525	25W & 1W
05	156.250	160.850	25W & 1W	71	156.575	156.575	25W & 1W
05A	156.250	156.250	25W & 1W	72	156.625	156.625	25W & 1W
06	156.300	156.300	25W & 1W	73	156.675	156.675	25W & 1W
07	156.350	160.950	25W & 1W	74	156.725	156.725	25W & 1W
07A	156.350	156.350	25W & 1W	75	—	—	Guard
08	156.400	156.400	25W & 1W	76	—	—	Guard
09	156.450	156.450	25W & 1W	77	156.875	156.875	25W & 1W
10	156.500	156.500	25W & 1W	78	156.925	161.525	25W & 1W
11	156.550	156.550	25W & 1W	78A	156.925	156.925	25W & 1W
12	156.600	156.600	25W & 1W	79	156.975	161.575	25W & 1W
13	156.650	156.650	25W & 1W	79A	156.975	156.975	25W & 1W
14	156.700	156.700	25W & 1W	80	157.025	161.625	25W & 1W
15	156.750	156.750	1W only	80A	157.025	157.025	25W & 1W
16	156.800	156.800	25W & 1W	81	157.075	161.675	25W & 1W
17	156.850	156.850	1W only	81A	157.075	157.075	25W & 1W
18	156.900	161.500	25W & 1W	82	157.125	161.725	25W & 1W
18A	156.900	156.900	25W & 1W	82A	157.125	157.125	25W & 1W
19	156.950	161.550	25W & 1W	83	157.175	161.775	25W & 1W
19A	156.950	156.950	25W & 1W	83A	157.175	157.175	25W & 1W
20	157.000	161.600	25W & 1W	84	157.225	161.825	25W & 1W
20A	157.000	157.000	25W & 1W	84A	157.225	157.225	25W & 1W
21	157.050	161.650	25W & 1W	85	157.275	161.875	25W & 1W
21A	157.050	157.050	25W & 1W	85A	157.275	157.275	25W & 1W
22	157.100	161.700	25W & 1W	86	157.325	161.925	25W & 1W
22A	157.100	157.100	25W & 1W	86A	157.325	157.325	25W & 1W
23	157.150	161.750	25W & 1W	87	157.375	161.975	25W & 1W
23A	157.150	157.150	25W & 1W	87A	157.375	157.375	25W & 1W
24	157.200	161.800	25W & 1W	88	157.425	162.025	25W & 1W
25	157.250	161.850	25W & 1W	88A	157.425	157.425	25W & 1W
26	157.300	161.900	25W & 1W	WX1	—	162.550	RX. only
27	157.350	161.950	25W & 1W	WX2	—	162.400	RX. only
28	157.400	162.000	25W & 1W	WX3	—	161.650	RX. only
60	156.025	160.625	25W & 1W	WX4	—	162.475	RX. only
60A	156.025	156.025	25W & 1W	WX5	—	162.425	RX. only
61	156.075	160.675	25W & 1W	WX6	—	162.500	RX. only
61A	156.075	156.075	25W & 1W	WX7	—	162.525	RX. only
62	156.125	160.725	25W & 1W	WX8	—	162.450	RX. only
62A	156.125	156.125	25W & 1W	WX9	—	161.775	RX. only
63	156.175	160.775	25W & 1W	WX0	—	163.275	RX. only
63A	156.175	156.125	25W & 1W				
64	156.225	160.825	25W & 1W				
64A	156.225	156.225	25W & 1W				

**SECTION 2 OUTSIDE AND INSIDE VIEWS**

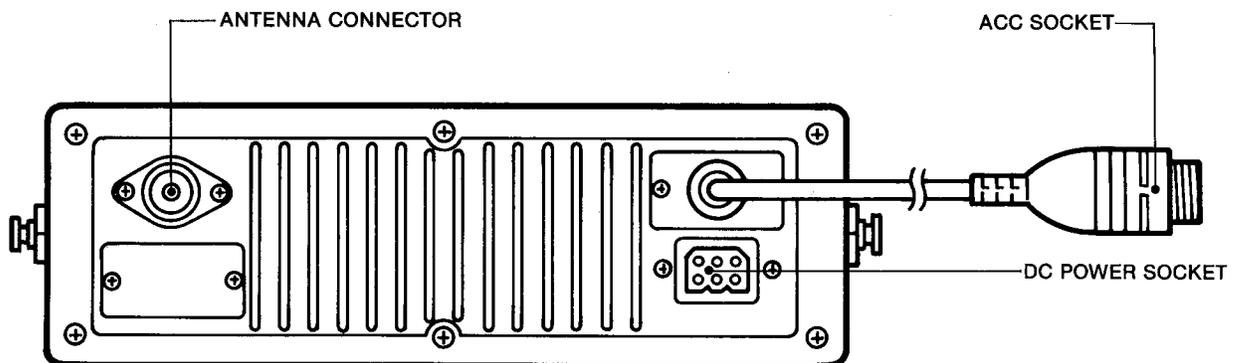
**2-1 FRONT VIEW**



— CHANNEL AND FUNCTION DISPLAY —

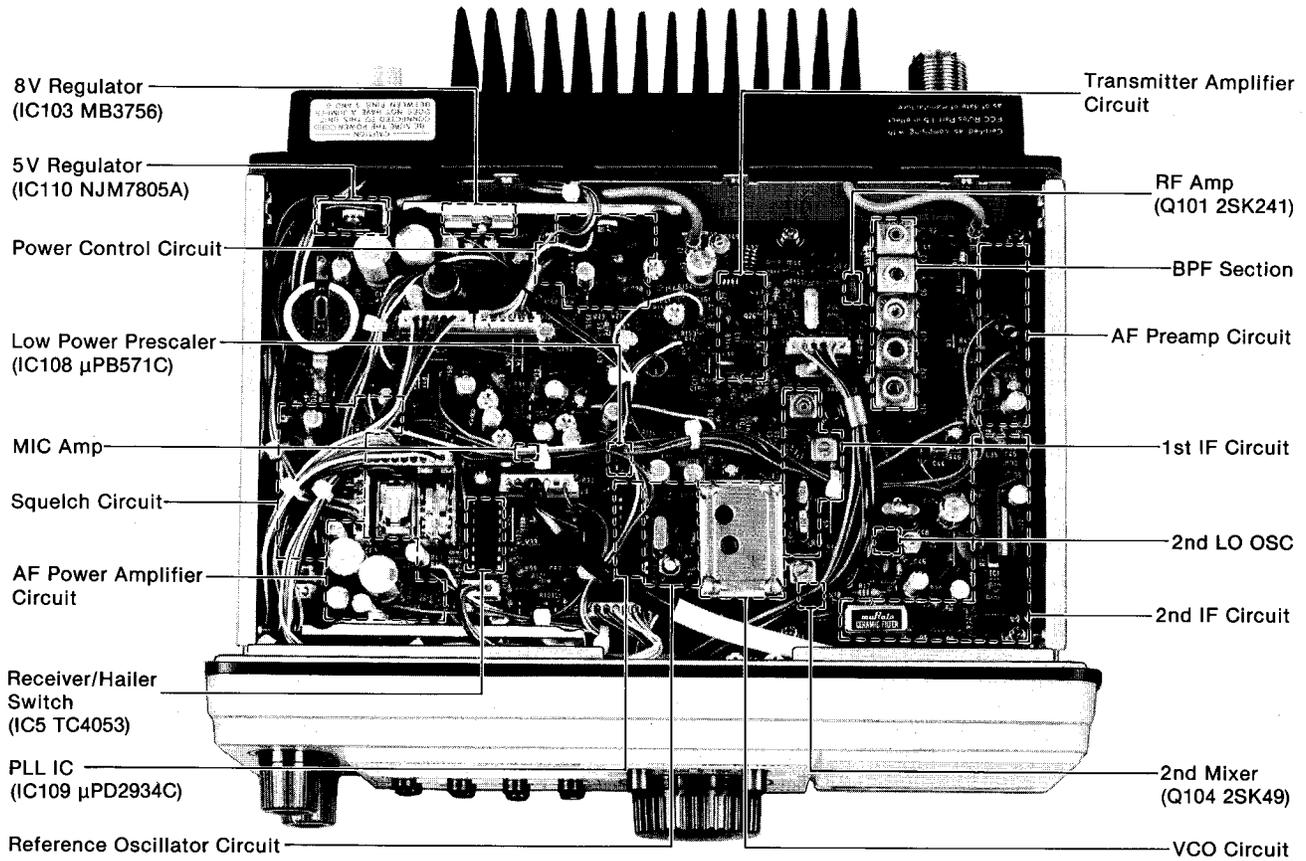


**2-2 REAR VIEW**

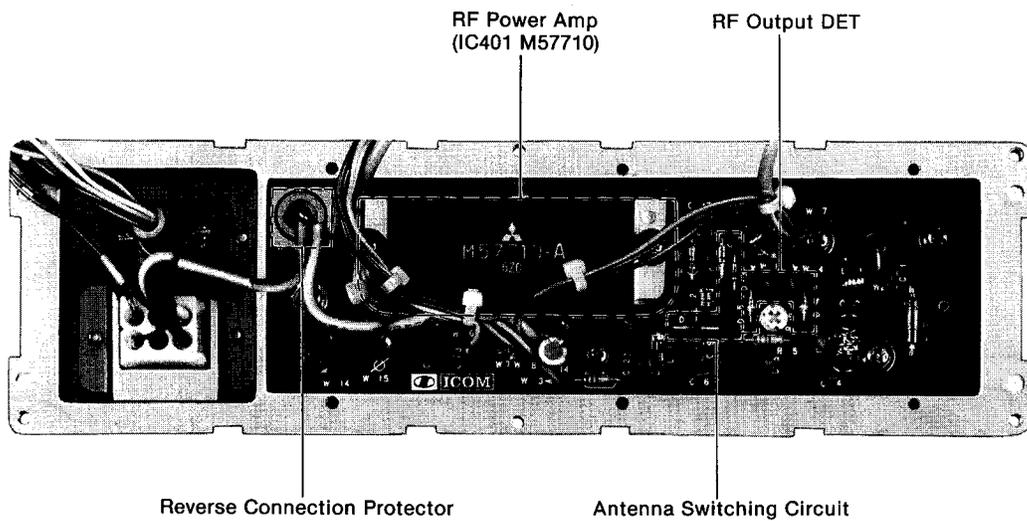


## 2-3 INSIDE VIEWS

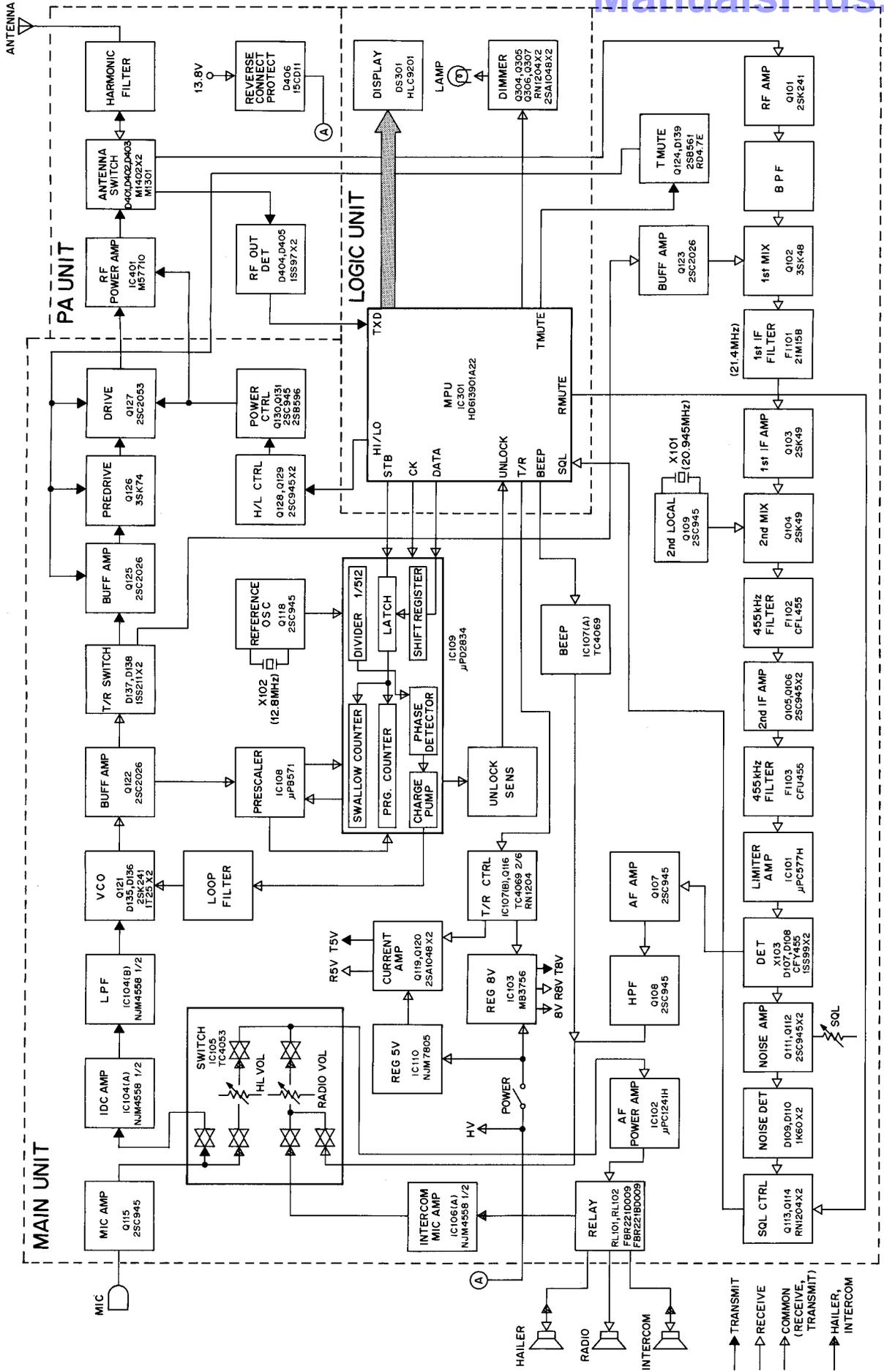
### • MAIN UNIT



### • PA UNIT



SECTION 3 BLOCK DIAGRAM



## SECTION 4 CIRCUIT DESCRIPTION

### 4-1 RECEIVER CIRCUITS

The receiver section of the IC-M100 is equipped with a heterodyning 1st mixer (Mixing occurs via the LO signal in the PLL circuit) and a heterodyning 2nd mixer, so the section has very stable operations.

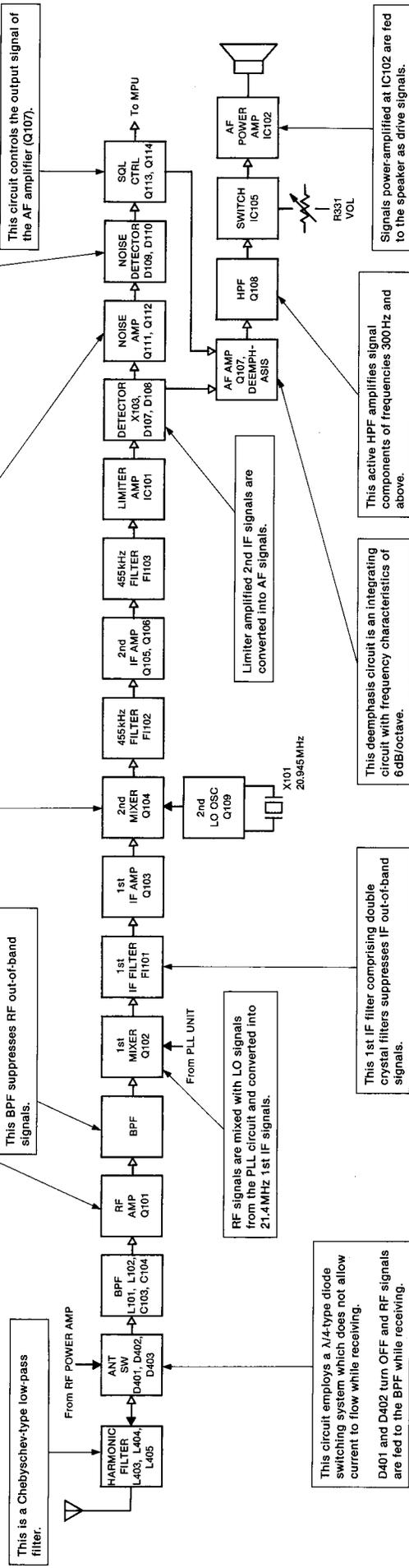


Fig. 1

### 4-2 TRANSMITTER CIRCUITS

The transmitter section of the IC-M100 is equipped with an RF power amp IC, ensuring that the section transmits with high power (25W or more) and stable signals.

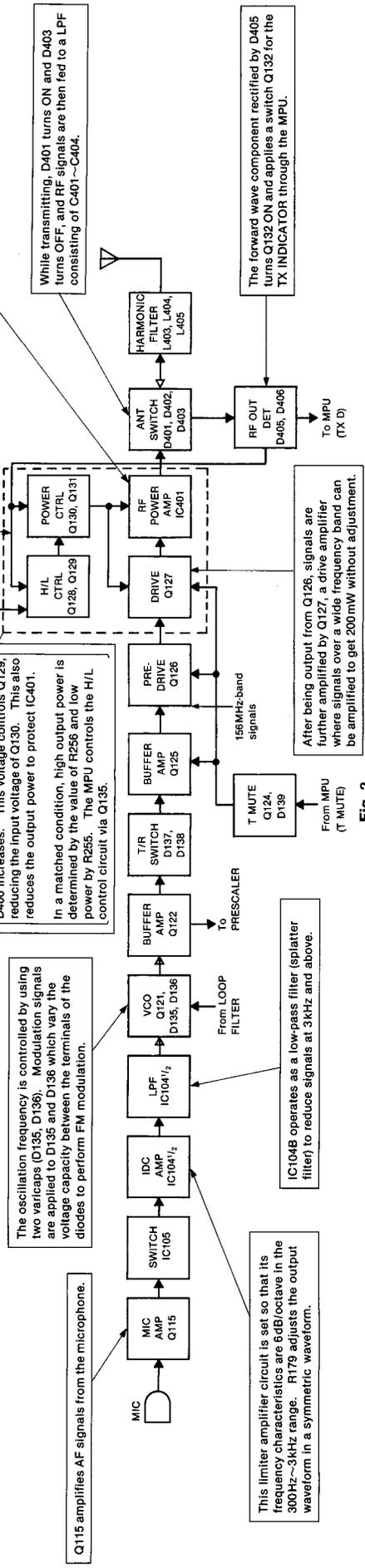


Fig. 2

### 4-3 HAILER/INTERCOM CIRCUITS

The HAILER/INTERCOM circuit is alternately activated and cancelled each time the [HL] SWITCH (S308) is pressed. IC105, the analog switch IC, switches the connections between the microphone and three speakers (SPEAKER, HAILER/SPEAKER, INTERCOM/SPEAKER).

The mode changeovers are executed as shown in the charts below.

#### Chart A: "Normal mode" -> "HL mode"

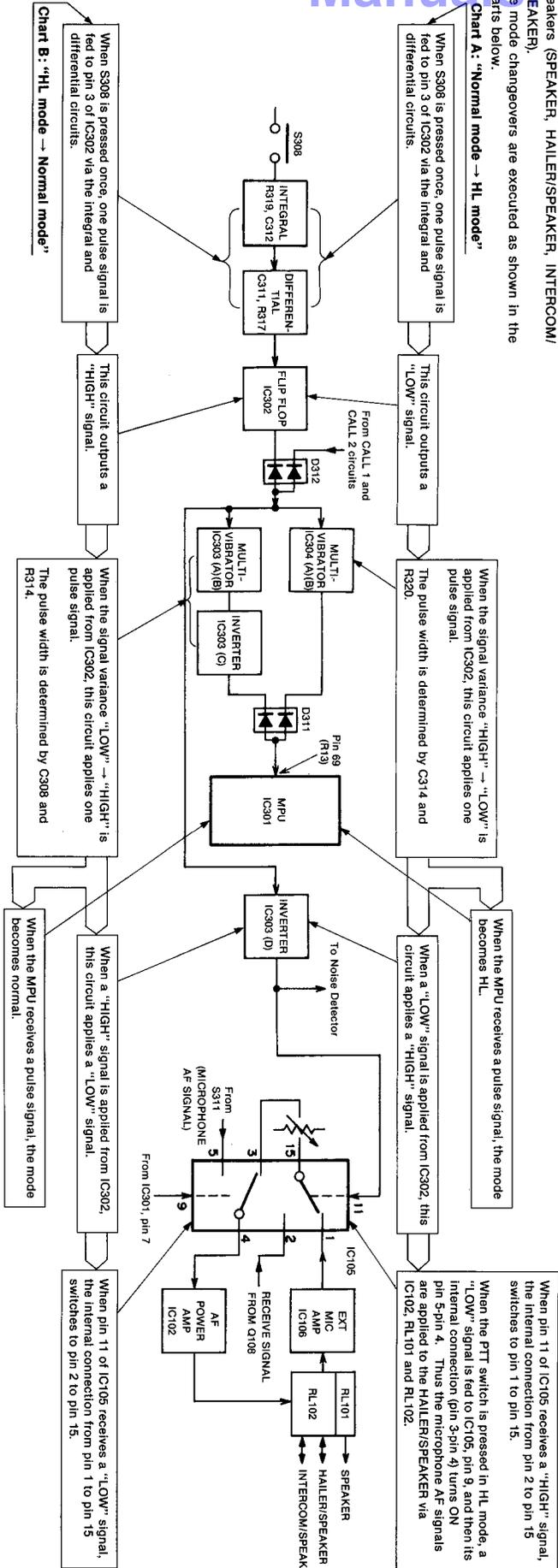


Fig. 3

### 4-4 CALL 1 AND CALL 2 CIRCUITS

In HAILER/INTERCOM mode, the CALL 1 and CALL 2 circuits are activated. When the CALL 1 switch is pressed the INTERCOM/SPEAKER is used as a microphone. The HAILER/SPEAKER is also used as a microphone when the CALL 2 switch is pressed.

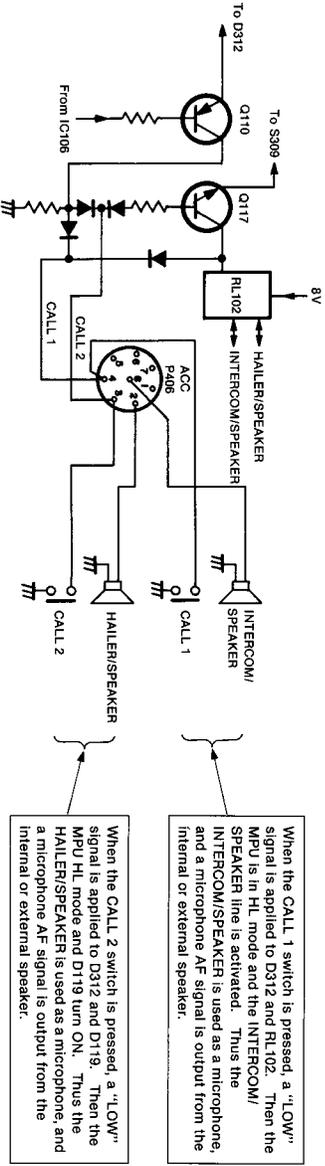


Fig. 4

## 4-5 PHASE-LOCKED LOOP (PLL) CIRCUIT

The PLL circuit is designed so the desired frequency is generated directly by the VCO, adopting the dual modulus prescaler system. The PLL is composed of prescaler IC108 and a PLL IC, IC109. These circuits receive N-DATA from the MPU in order to determine the operating frequency. N-DATA is the number of times the desired frequency (the transmit frequency in transmit mode and the first local oscillator frequency in receive mode) is divided by the reference frequency.

$$N = \frac{\text{Desired frequency}}{\text{Reference frequency}}$$

The 25kHz reference frequency is obtained by dividing the Q118 oscillator output (crystal X102) by IC109.

The signal from the VCO that is amplified by buffer Q122 is divided N times by IC108 and IC109. The signal is phase-detected and the detected signal is applied to varactor diodes D135 and D136 of the VCO via the loop filter to control the VCO frequency.

### 4-5-1 DUAL MODULUS PRESCALER

IC108 is a dual modulus prescaler that divides the RF signal generated by the VCO by a factor of 64 or 65. IC109 is a CMOS LSI circuit which incorporates a 6-bit swallow counter, an 11-bit programmable counter, a phase comparator, a charge pump, and a frequency divider for the reference frequency. The reference frequency is obtained from crystal oscillator Q118 with crystal X102, and is fed to IC109 (pin 17). It divides the frequency by a factor of 512 to obtain the 25kHz reference frequency that is fed to IC109 (pin 8).

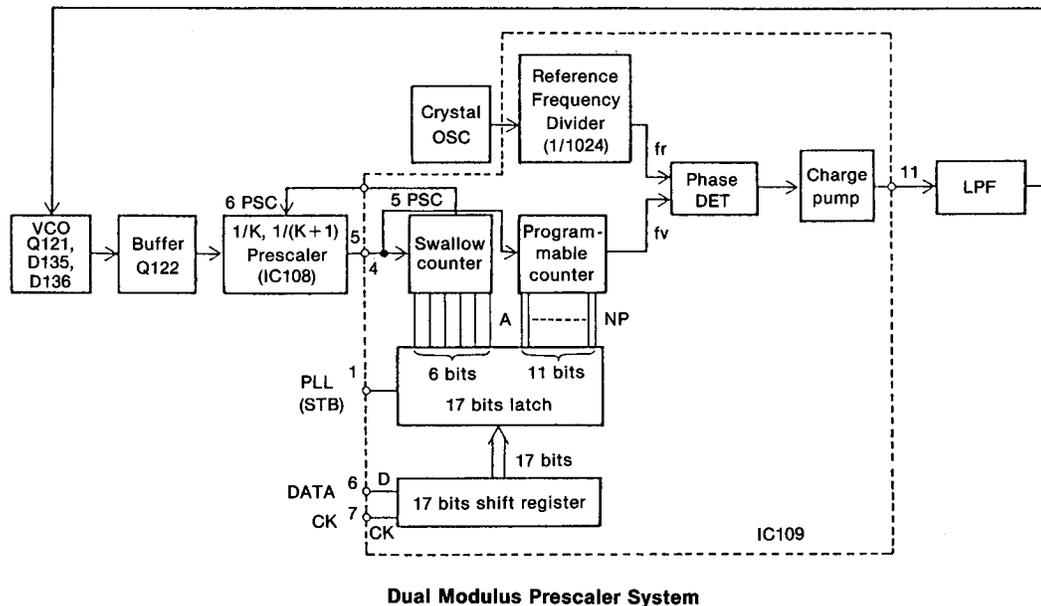


Fig. 5

### 4-5-2 UNLOCK CIRCUIT

When the PLL is unlocked, IC109 (pin 10) is LOW and the unlocked signal is fed to pin 70 of the MPU through the R209 and C196 time constant circuit. The MPU inhibits the transmitter, preventing spurious signals from being transmitted, and also changes the LCD indicator to “- -” in transmit mode.

### 4-5-3 LOOP FILTER CIRCUIT

The output from IC109 (pin 11) determines the characteristics of the PLL through a lag lead-type loop filter consisting of R219, R220 and C205, and controls varactor diodes D135 and D136 through the R222 and C206 integrator circuit.

### 4-5-4 VCO CIRCUIT

The VCO, Q121, employs a Clapp oscillator circuit. VCO free-run frequency is shifted by induction reactance which is changed by C220 and C221, and is then

controlled by a varactor diode. Thus a stable oscillation is achieved over a wide frequency range.

While transmitting, modulation signals are applied to the anode of D113, and then the VCO performs frequency modulation. This deviation is adjusted by R186.

While transmitting, Q120 turns ON and 5V is applied to the cathode of D132~D133. Q119 and D133 turn OFF. Thus L114 is connected in series with C220 and C221, resulting in a VCO free-run frequency that is shifted higher than the receive frequency.

While receiving, Q119 turns ON, and 5V is applied to the anode of D131~D133, then Q120 turns OFF. Thus D133 turns OFF and C220 and C221 are shorted, resulting in a VCO free-run frequency that is shifted lower than the transmit frequency.

## 4-6 LOGIC CIRCUITS

The major component is a single-chip microprocessor which includes a 4kB ROM, a 256-bit RAM and a driver for the LCD (Liquid Crystal Display). The following is a summary of MPU operation.

The RAM section in the MPU can memorize 16 channels.

### 4-6-1 D0 (pin 78) HIGH/LOW CONTROL

This is an output port which selects either high or low RF power. When this port is "LOW", high RF power is selected.

### 4-6-2 D1 (pin 79) TX MUTE

This is an output port which is "HIGH" for about 40msec., inhibiting transmitting when changing from receive to transmit mode. When the transmit inhibition channel is selected, this port is "HIGH".

### 4-6-3 D2 (pin 80) CK

This port outputs clock pulses for serial data which are transferred simultaneously with N-DATA for the PLL.

### 4-6-4 D3 (pin 1) DATA

This is an output port for serial N-DATA. The serial transfer begins with the most significant bit (MSB) and ends with the least significant bit (LSB). The data transfer is in binary code. For example, N-DATA for 156MHz are:

$$N-DATA = \frac{156}{0.025} = 6240$$

This number in hexadecimal is 1860.

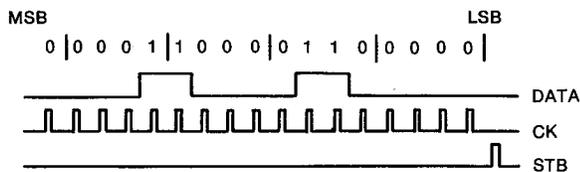


Fig. 6

### 4-6-5 D4 (pin 2) STROBE

This is an output port for a pulse which latches the N-DATA after these data are transferred to the PLL.

### 4-6-6 D5 (pin 3) RX MUTE

This is an output port used while the transceiver is in SEA (DUAL WATCH) mode. The D5 port outputs a pulse at approximately 5msecs. beginning 1msec. before N-DATA is sent. This signal mutes the pop noise of the squelch caused by frequency changes.

### 4-6-7 D6 (pin 4) HALT CONTROL

This is an output port for a short LOW pulse to store the MPU program execution address when the user turns the transceiver OFF. This address is used again when the transceiver is turned ON.

### 4-6-8 D7 (pin 5) EXTERNAL CONTROL

This is an output port for RAM data. Memory channel data, inhibit data, and low power channel data are output from this port.

### 4-6-9 D8 (pin 6) AF MUTE

This is an output port for controlling the AF amplifier.

### 4-6-10 D9 (pin 7) TX/RX CONTROL

This is an output port for switching between transmit mode and receive mode. When the mode changes to the opposite one, this signal is delayed 20msecs. for stabilization of the VCO.

### 4-6-11 D10 (pin 8) SEND

This is an input port which the MPU pulls up. A LOW input selects transmit mode and inhibits any input from the key entry.

### 4-6-12 D11 to D15 (pins 9 to 13), R00 to R03 (pins 14 to 17) MPU INPUT MATRIX

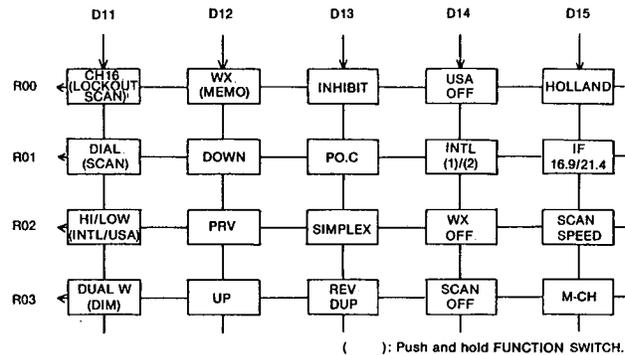


Fig. 7

#### D11-R00

Selects channel 16 or the lock-out scan mode with the FUNCTION SWITCH.

#### D11-R02

Changes the RF output power, or the channel mode (international—U.S.A.) with the FUNCTION SWITCH.

#### D11-R03

Selects dual watch (sea watch), or switches the dimmer with the FUNCTION SWITCH.

**D12-R00**  
Selects WX mode or memory mode with the FUNCTION SWITCH.

**D12-R01**  
Decrements the operating channel.

**D12-R02 (S105)**  
Allows private channel programming.

**D12-R03**  
Increments the operating channel.

**D13-R00 (S104)**  
Writes the operating channel to RAM as an inhibited channel.

**D13-R01 (S103)**  
Reduces RF output to low power.

**D13-R02 (S101)**  
Changes the transceiver to simplex mode.

**D13-R03 (S102)**  
Changes the transceiver to reverse duplex mode.

**D14-R00**  
Inhibits transmitting on all U.S.A. channels and disables the INTL/USA SWITCH.

**D14-R01**  
Selects the International (1) version of the transceiver.

**D14-R02**  
Inhibits receiving of the WX channels.

**D14-R03**  
Inhibits the scan function.

**D15-R00**  
Selects the HOLLAND version of the transceiver.

**D15-R01**  
Sets the IF to 21.4 MHz from 16.9 MHz.

**D15-R02**  
Shifts the scan speed between 150 msec. and 200 msec.

**D15-R03**  
Switches the number of memories between 10 and 16 channels.

**4-6-13 R10 (pin 66) SQL**

This is an active LOW input port which the MPU pulls up. It provides the scan stop signal for DUAL WATCH and other modes.

**4-6-14 R11 (pin 67) TX DISPLAY**

This is an active LOW input port which the MPU pulls up. It activates an output pulse for the "TX" indicator on the LCD display.

**4-6-15 R12 (pin 68) FUNCTION**

This is an input port which the MPU pulls up. It becomes LOW when the FUNCTION SWITCH is pressed, and the secondary functions of the keypad become operational.

**4-6-16 R13 (pin 69) HAILER**

This is an active LOW input port which the MPU pulls up. It inhibits the transmit mode and enables the hailer mode.

**4-6-17 R20 (pin 70) UNLOCK**

This is an input port which the MPU pulls up. During transmitting, a "LOW" signal causes the MPU to force the D1 port to "HIGH" until the PTT switch is turned OFF. This port detects the unlock operation of the PLL.

**4-6-18 R21 (pin 71) SET/RESET**

This is an input port which controls the output port, D8 (AF MUTE).

**4-6-19 R22 (pin 72) SET**

This is also an input port which controls D8 (AF MUTE).

**4-6-20 R23 (pin 73) CH16**

This is an input port which the MPU pulls up. The trailing edge of an input signal selects channel 16.

**4-6-21 R31 and R32 (pin 75 and 76) DIMMER**

These are output ports which control the LCD lamp intensity.

INTENSITY PORT	1	2	3	4
R31	L	H	L	H
R32	L	L	H	H

**4-6-22 R33 (pin 77) BEEP**

This is an output port for a 50 msec. HIGH pulse after a key is pressed.

**4-6-23 INT 0 (pin 64) HALT**

This port is active when "LOW". The MPU follows a backup procedure when the transceiver is turned OFF or the power supply voltage drops. It sets the HALT CONT terminal at "HIGH" and the MPU resets in the HALT state.

**4-6-24 INT 1 (pin 65) EXTERNAL CONTROL**

This is an input port for writing data to the RAM.

**4-6-25 RESET (pin 18)**

This terminal is active when "HIGH". The reset switch resets the MPU if pressed while the squelch switch is ON.

**4-6-26 COM 1, SEG 1 to 32  
(pin 29, pins 31 to 62)**

These are output terminals for driving the LCD display.

**4-6-27 OSC 1, OSC 2 (pins 20, 21)**

These are output terminals for driving the LCD display.

**4-7 POWER SUPPLY CIRCUITS****4-7-1 8V REGULATOR CIRCUIT**

IC103 is an 8V regulator with a built-in over-current protector and thermal protector, and controls transmit 8V, receive 8V, and constant 8V with the switching signal at pin 5 of IC103.

While in receive mode, the MPU generates a "LOW" signal to Q116, making pin 5 of IC103 "HIGH", and IC103 generates R8V from pin 6. While transmitting, the MPU generates a "HIGH" signal to Q116, making pin 5 of IC103 "LOW", and IC103 generates T8V from pin 8. Pin 1 of IC103 generates a constant 8V without affecting the level of pin 5. Pin 2 of IC103 is supplied 13.8V DC power for this regulator.

**4-7-2 5V REGULATOR CIRCUIT**

IC110 is a 5-volt regulator which supplies a regulated 5 volts to IC108, IC109 and the VCO circuit. The necessary voltages for the VCO (TS5V, RS5V) are switched by Q119 and Q120.

**4-7-3 MPU POWER SUPPLY**

The MPU requires many memory elements to store frequencies, memory channels, etc. Removal of the MPU power source normally erases this information. Therefore, the MPU has a lithium battery to supply backup power when the power source fails or is removed. A new battery maintains the memories for about 5 years.

**4-8 OTHER CIRCUITS****4-8-1 LAMP CIRCUIT**

The output from the MPU (R31 and R32) is transformed by a D/A converter consisting of Q304 to Q305, and R328 to R329. The analog signal varies the intensity of the lamp.

**4-8-2 BEEP CIRCUIT**

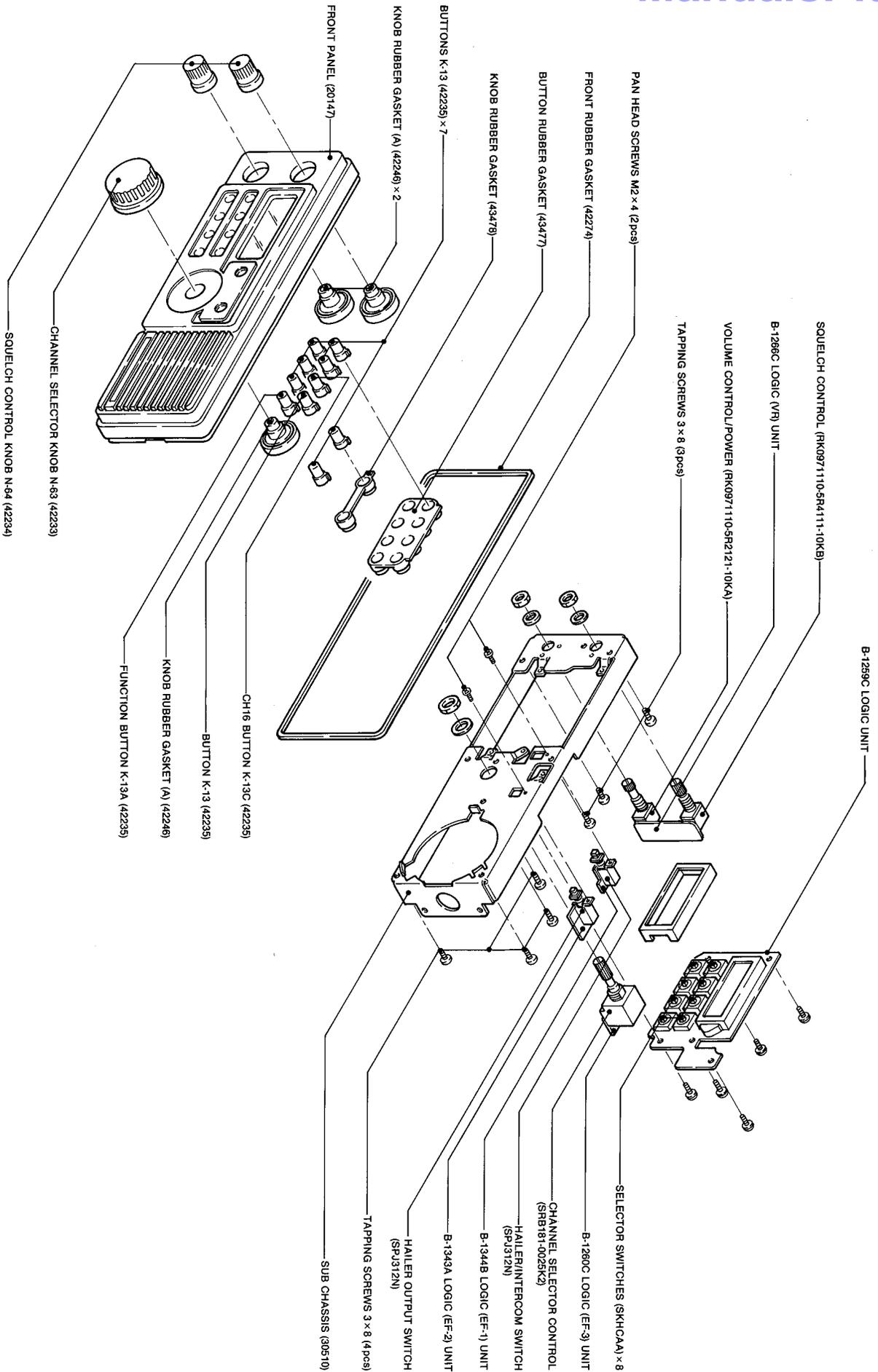
This is a phase shift oscillator consisting of IC107, R205 to R207, and C190 to C192. The circuit begins oscillating when a HIGH voltage appears at the cathode of D126. The frequency is about 2500Hz.

**4-8-3 TRANSMIT/RECEIVE SWITCHING  
CIRCUIT**

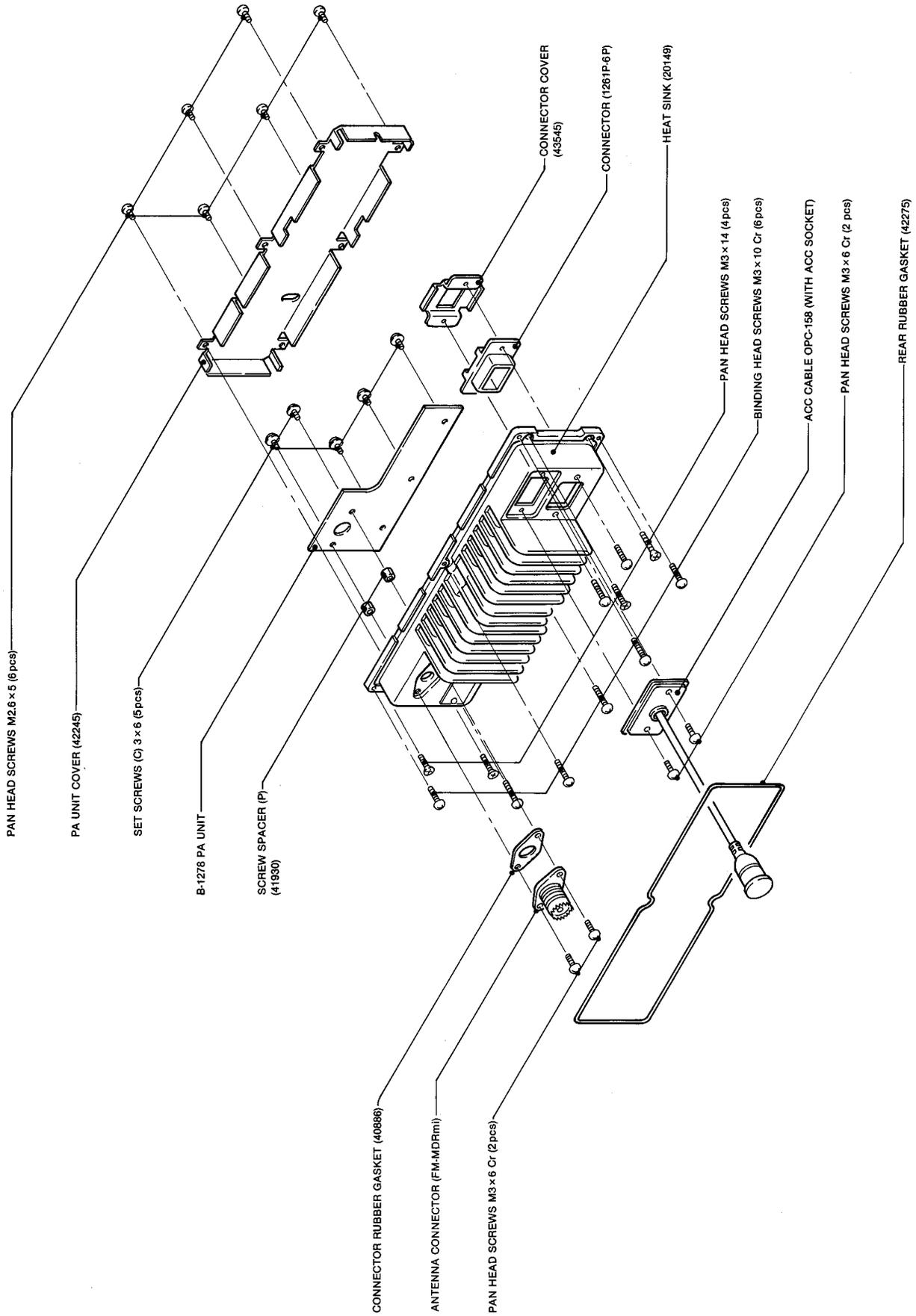
Pushing the PTT (push-to-talk) switch causes D10 (pin 8) of the MPU to go "LOW", and D9 (pin 7) changes to "HIGH". This D9 port voltage controls power supply IC105 which supplies the signal to shift to transmit mode.

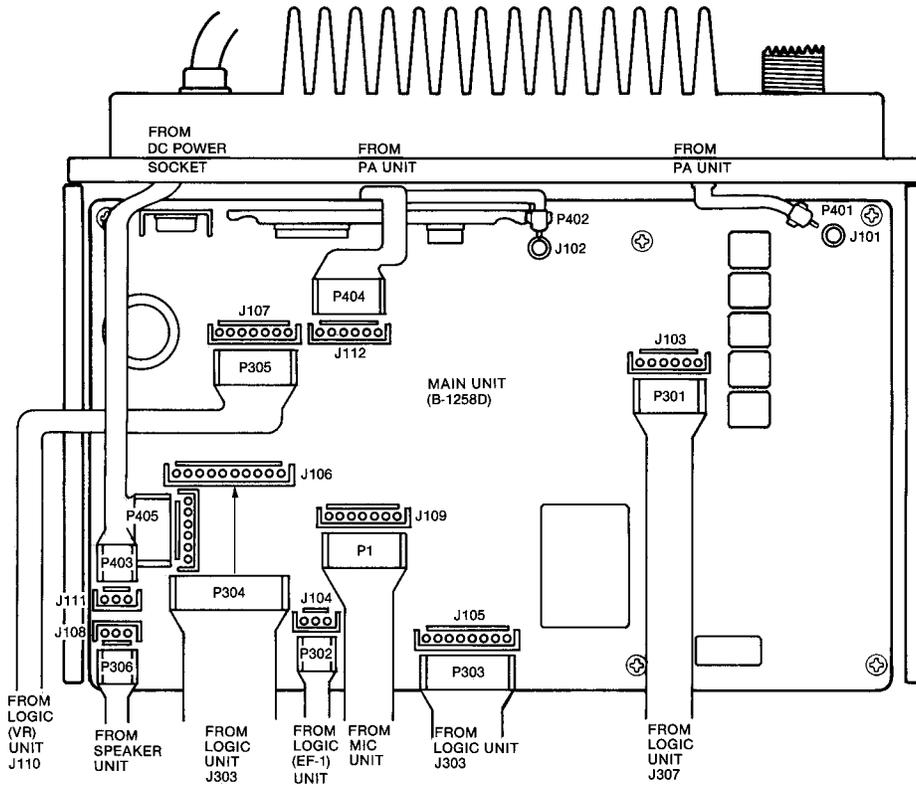
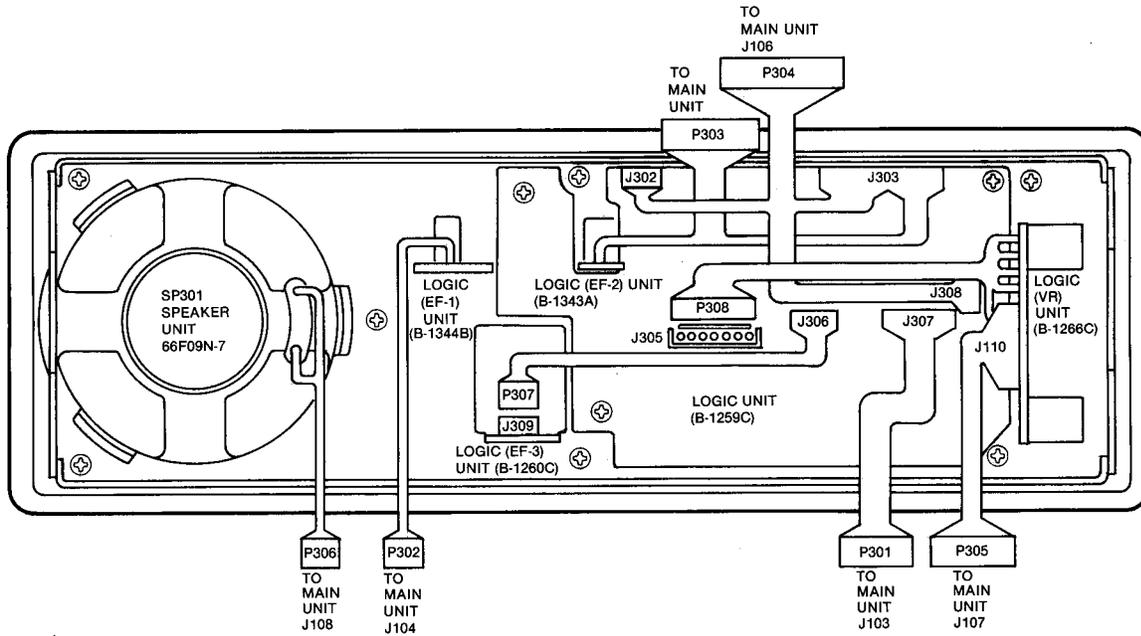


5-2 FRONT PANEL DISASSEMBLY

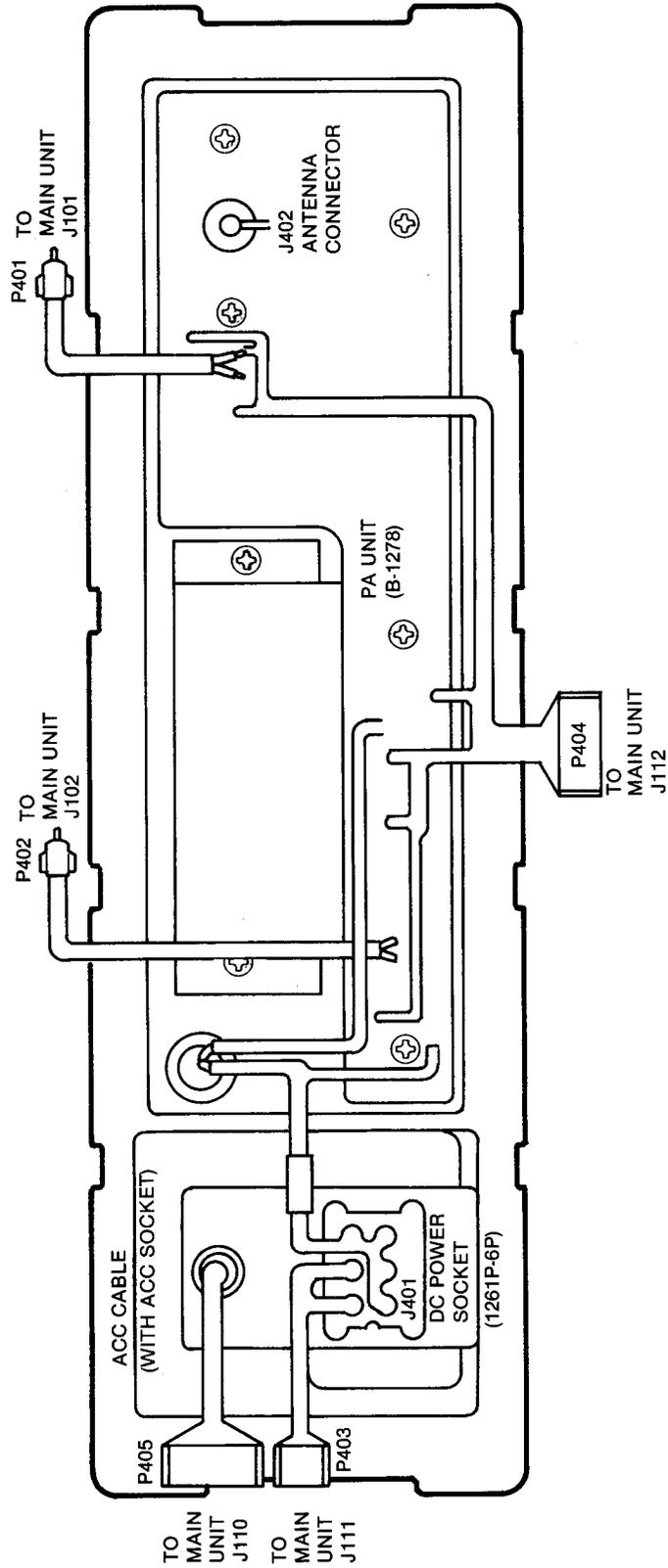


5-3 REAR PANEL DISASSEMBLY





5-6 REAR PANEL CONNECTOR ASSEMBLY



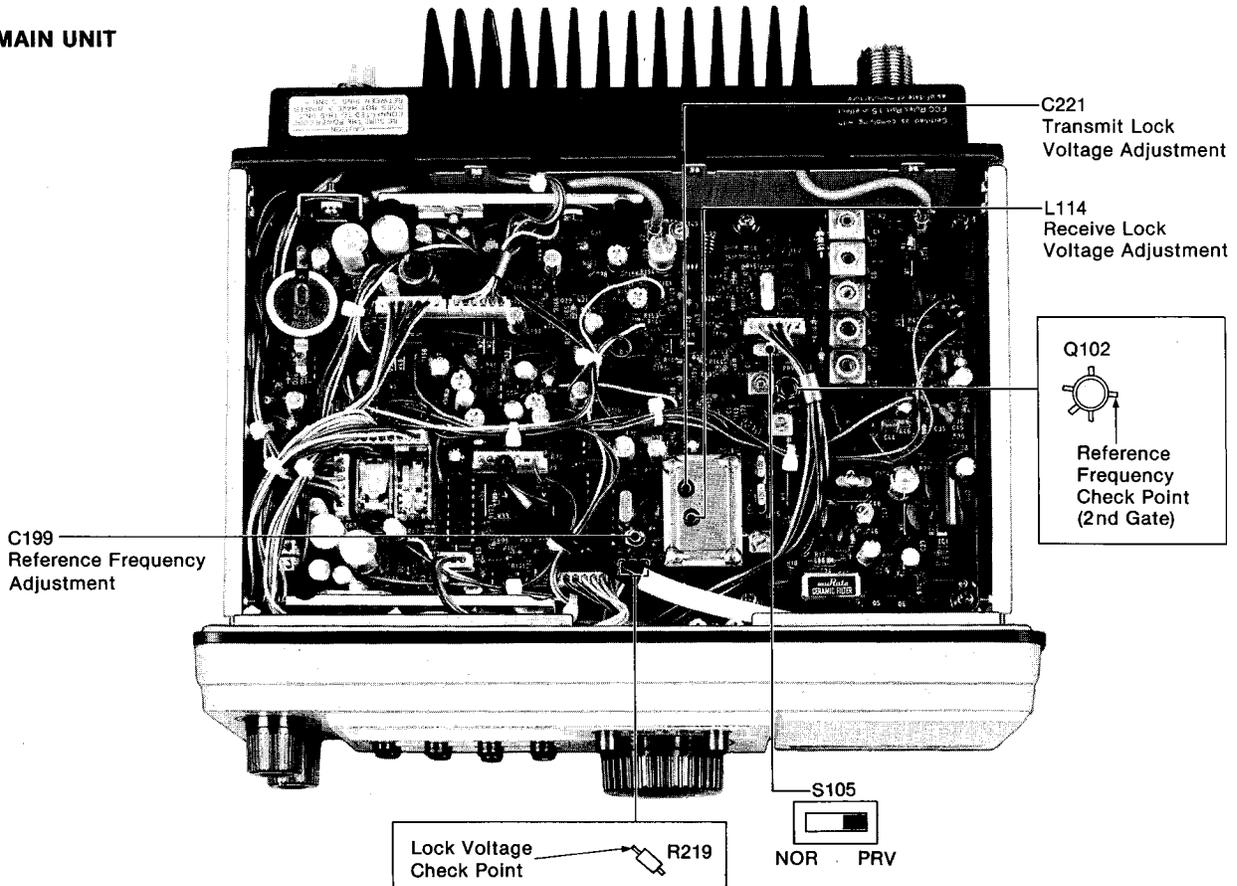
**SECTION 6 MAINTENANCE AND ADJUSTMENT****6-1 PREPARATION BEFORE SERVICING**

1. Detach the power cable and turn OFF the POWER SWITCH before performing any work on the transceiver.
2. DO NOT short circuit components while making adjustments.
3. Use an insulated tuning tool for all adjustments.
4. DO NOT force any of the variable components. Tune them slowly and smoothly.
5. Follow the instructions exactly. If an indicated result is not obtained, repeat the instruction until the correct result is obtained.
6. Check the condition of connectors, solder joints and screws when adjustments are complete. Confirm that components do not touch each other.
7. Confirm defective operation of the transceiver first when checking an out-of-service unit.
8. Use the correct tools and test equipment.
9. To remove the transceiver covers, refer to SECTION 5-1 and 5-3.
10. Connect a 13.6V DC external power source to the power supply connector. Be sure to check the polarity.
11. For transmission problems, connect a 50 $\Omega$  dummy load to the ANTENNA CONNECTOR. For reception problems, connect an antenna or signal generator to the ANTENNA CONNECTOR. DO NOT transmit into the signal generator.
12. Re-check for the suspected malfunction with the POWER SWITCH ON.
13. Check the defective circuit. Measure the DC voltages of the collector, base and emitter of each transistor.

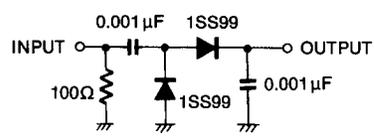
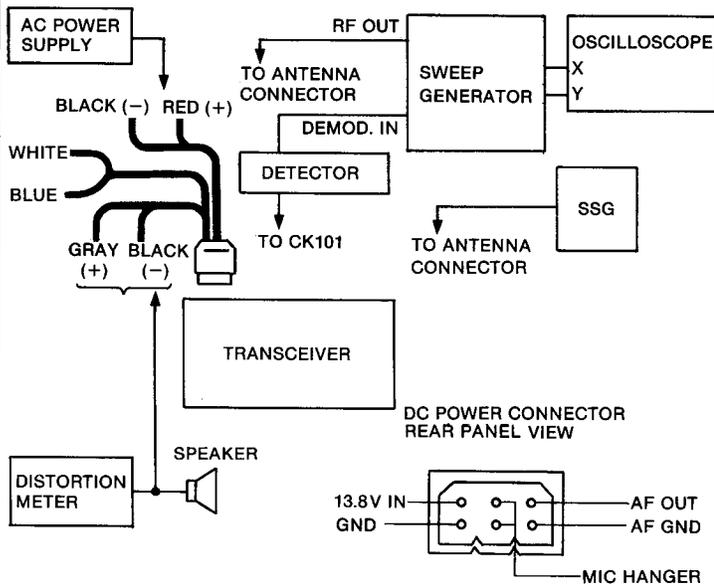
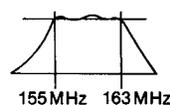
6-2 PLL ADJUSTMENT

TEST INSTRUMENTS REQUIRED		MEASUREMENT CONNECTION LOCATION					
(1) AC POWER SUPPLY • Output voltage : 13.8V DC • Current capacity : 10A or more (2) FREQUENCY COUNTER • Frequency range : 0.1 MHz~200 MHz • Accuracy : ±1 ppm or better • Sensitivity : 100mV or better (3) DC VOLTMETER • Input impedance : 50kΩ/DC or better							
ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
LOCK VOLTAGE	1 • S105: PRV • Display channel: F6 • Receive mode	MAIN	Connect a DC voltmeter to R219.	1.9V	MAIN	L114	
	2 • Transmit mode					2.1V	C221
	3 • Display channel: 16 • Receive mode					4.2~4.7V	Verify
	4 • Transmit mode					4.9~5.3V	Verify
REFERENCE FREQUENCY	1 • Display channel: 16 • Receive mode	MAIN	Connect a frequency counter to 2nd gate of Q102.	135.4MHz	MAIN	C199	
	2 • Transmit mode					156.8MHz	

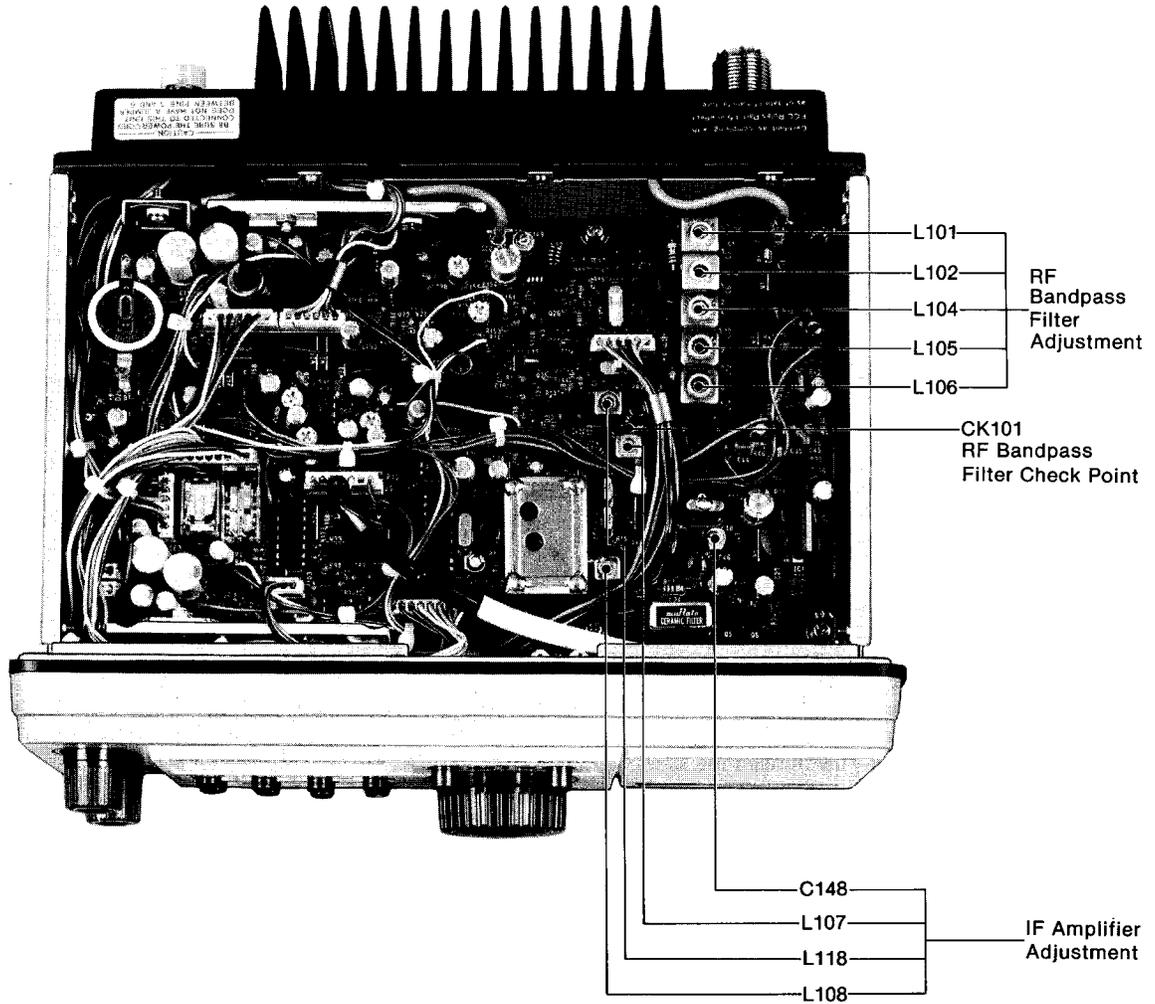
MAIN UNIT



### 6-3 RECEIVER ADJUSTMENT

TEST INSTRUMENTS REQUIRED		MEASUREMENT CONNECTION LOCATION							
<p>(1) AC POWER SUPPLY</p> <ul style="list-style-type: none"> <li>• Output voltage : 13.8V DC</li> <li>• Current capacity : 10A or more</li> </ul> <p>(2) FREQUENCY COUNTER</p> <ul style="list-style-type: none"> <li>• Frequency range : 0.1MHz~90MHz</li> <li>• Accuracy : <math>\pm 1</math> ppm or better</li> <li>• Sensitivity : 100mV or better</li> </ul> <p>(3) STANDARD SIGNAL GENERATOR (SSG)</p> <ul style="list-style-type: none"> <li>• Frequency range : 0.1~200MHz</li> <li>• Output level : <math>-127 \sim -17</math> dBm (0.1<math>\mu</math>~31mV)</li> </ul> <p>(4) SWEEP GENERATOR</p> <ul style="list-style-type: none"> <li>• Frequency range : 0.1~200MHz</li> <li>• Sweep bandwidth : At least 30MHz</li> </ul> <p>(5) DISTORTION METER</p> <ul style="list-style-type: none"> <li>• Frequency range : 1kHz <math>\pm</math> 10Hz</li> <li>• Measuring range : 1~100%</li> </ul> <p>(6) DETECTOR</p> 									
ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT				
		UNIT	LOCATION		UNIT	ADJUST			
IF AMPLIFIER	1	• Display channel: 16	• Apply a $-115$ dBm (0.4 $\mu$ V) RF signal to the ANTENNA CONNECTOR. Mod.: 1kHz Dev.: $\pm 3.5$ kHz	• Receive mode	MAIN	Connect a distortion meter as shown in the diagram above with an 8 $\Omega$ load.	Minimum distortion level	MAIN	L118, L107, L108, C148
RF BANDPASS FILTER	1	NOTE: The RF Bandpass Filter circuit has been thoroughly adjusted prior to shipping from the factory. The following should be regarded as reference material.							
		• Receive mode	• Apply an RF sweep signal to the ANTENNA CONNECTOR. Center frequency: 159MHz Sweep bandwidth: $\pm 20$ MHz Signal level: $-20$ dBm	MAIN	Connect a sweep generator to CK101 via a detector.	The signal level for each frequency (155MHz, 163MHz) is equal.	MAIN	L101, L102, L104, L105, L106	
									

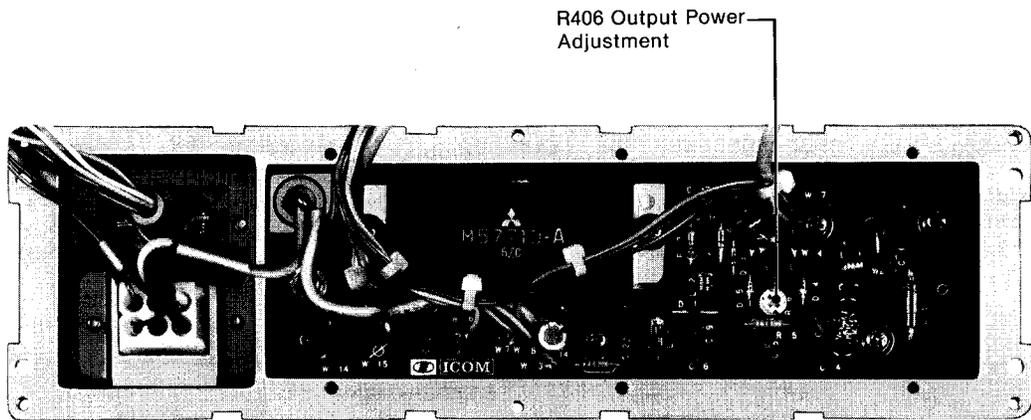
MAIN UNIT



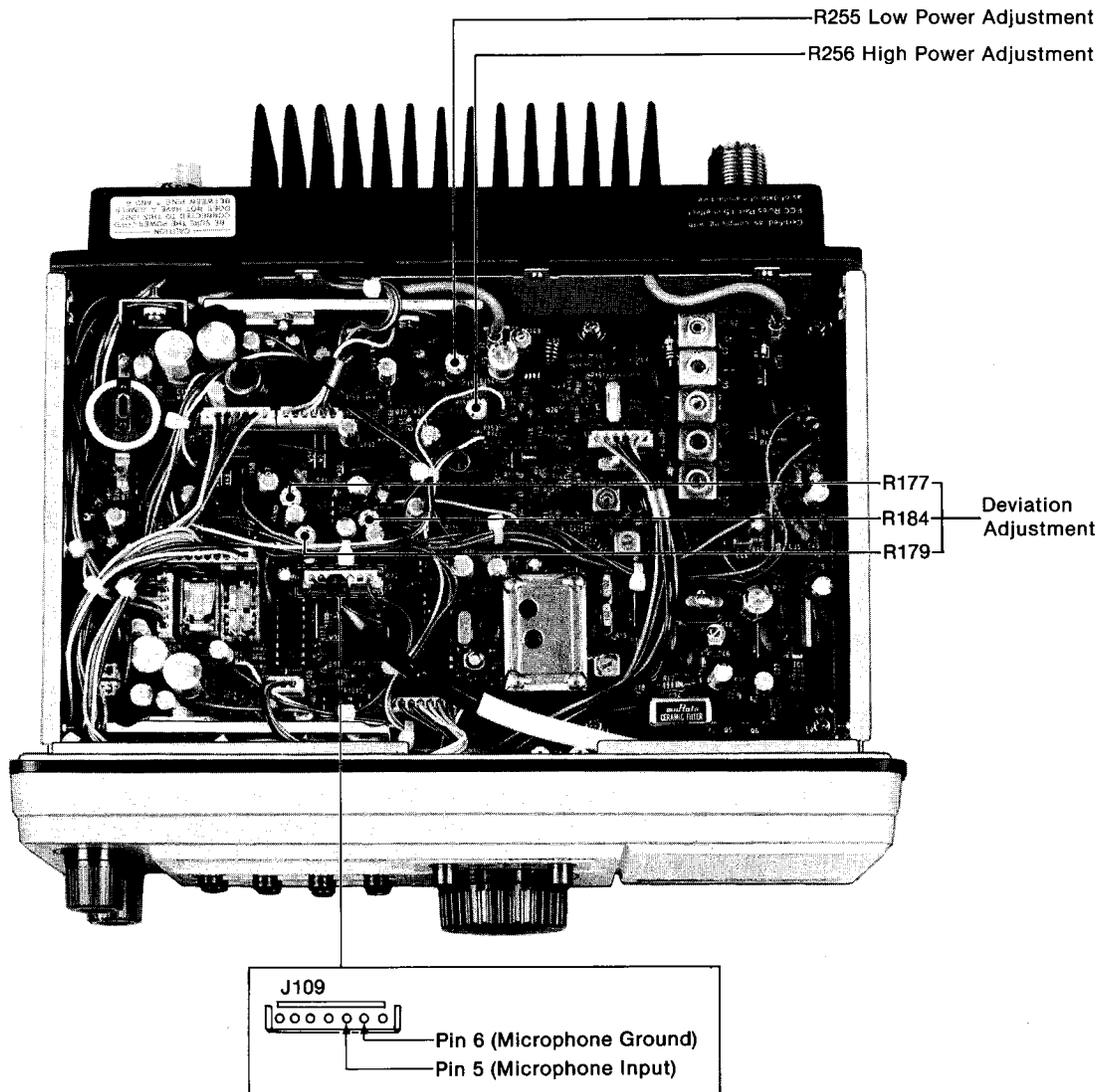
### 6-4 TRANSMITTER ADJUSTMENT

TEST INSTRUMENTS REQUIRED		MEASUREMENT CONNECTION LOCATION				
(1) AC POWER SUPPLY • Output voltage : 13.8V DC • Current capacity : 10A or more (2) FM DEVIATION METER • Frequency range : 140 MHz~180 MHz • Measuring range : 0~10 kHz (3) RF POWER METER (TERMINATED TYPE) • Measuring range : 0.1W~50W • Frequency range : 1 MHz~200 MHz • Impedance : 50Ω • SWR : Less than 1 : 1.2 (4) AC MILLIVOLTMETER • Measuring range : 1μV~10V (5) AF GENERATOR • Frequency range : 200 Hz~5000 Hz • Output level : 0~300 mV						
ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1	REAR PANEL	Connect an RF power meter to the ANTENNA CONNECTOR.	28W or more	MAIN	C249
	2			25W		R256
	3			1W		R255
DEVIATION	1	REAR PANEL	Connect a deviation meter to the ANTENNA CONNECTOR via an attenuator.	±4.2kHz	MAIN	R184
	2			Symmetrical deviation		R179
	3			±3.5kHz		R177
	4			±5kHz or less		Verify
NOTE: Adjust steps 1~3 several times.						

PA UNIT



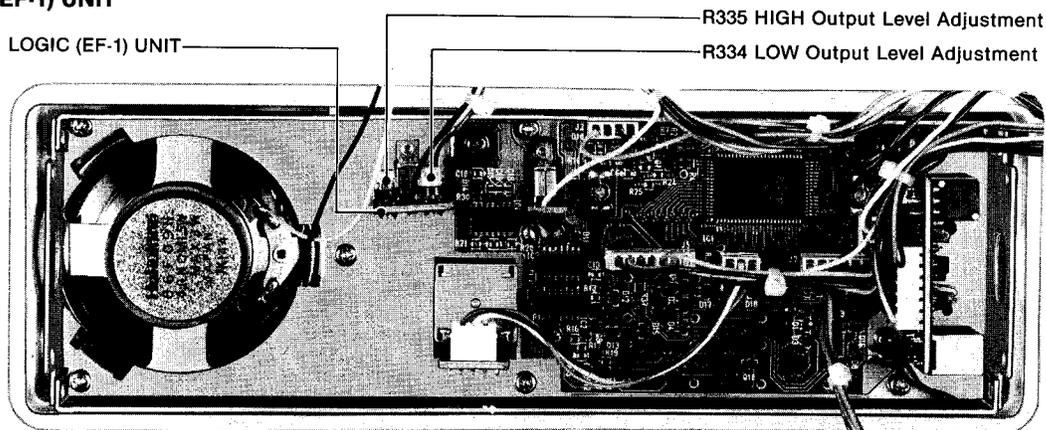
MAIN UNIT



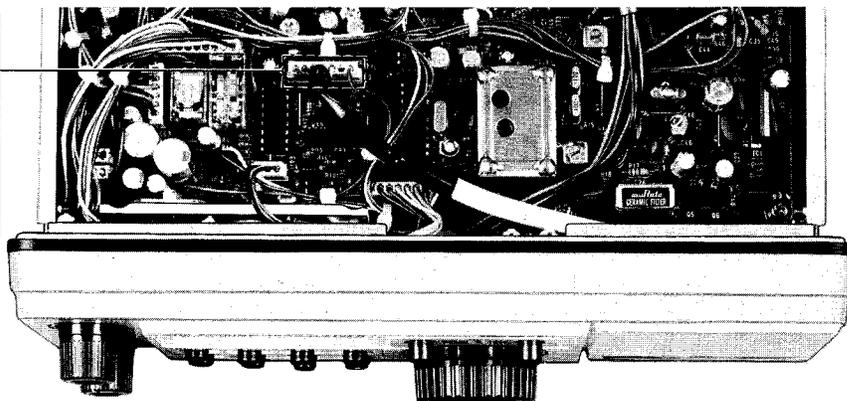
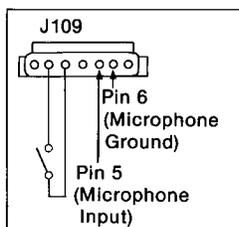
### 6-5 HAILER/INTERCOM OUTPUT ADJUSTMENT

TEST INSTRUMENTS REQUIRED		MEASUREMENT CONNECTION LOCATION				
(1) AC POWER SUPPLY • Output range : 13.8V DC • Current capacity : 10A or more (2) AC MILLIVOLTMETER • Measuring range : 1 $\mu$ V~10V (3) AF GENERATOR • Frequency range : 200Hz~3000Hz • Output level : 0~300mV						
ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
HAILER/INTERCOM OUTPUT LEVEL	1	REAR PANEL	Connect an AC millivoltmeter to HAILER terminal (See above.)	4.5V	LOGIC (EF-1)	R335
	2		Connect an AC millivoltmeter to INTERCOM terminal. (See above.)			1.4V

#### LOGIC (EF-1) UNIT



#### MAIN UNIT

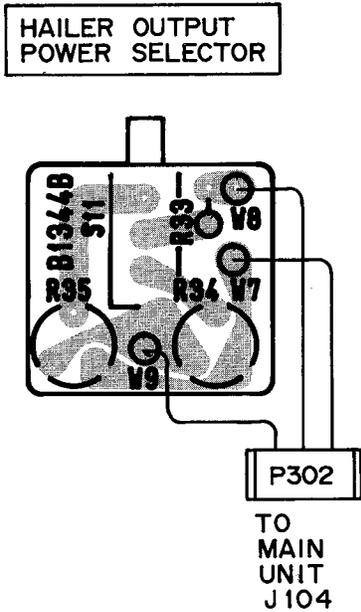


**SECTION 7 BOARD LAYOUTS**

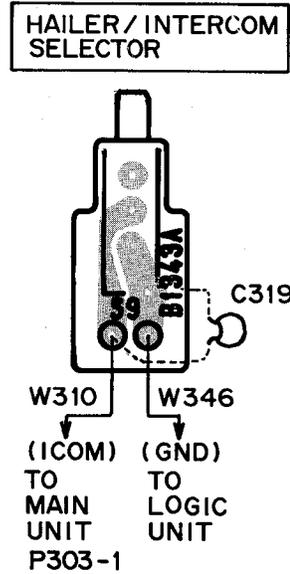
**7-1 LOGIC (1) UNIT**

NOTE: Add "300" to the indicated number on the unit for actual part number.

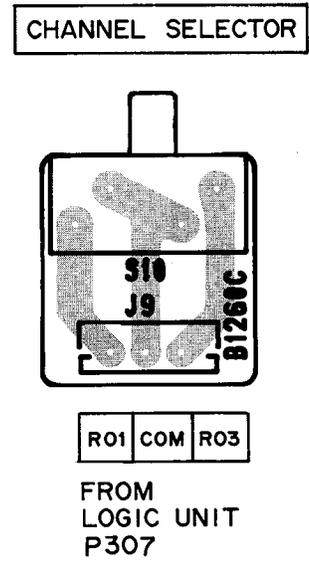
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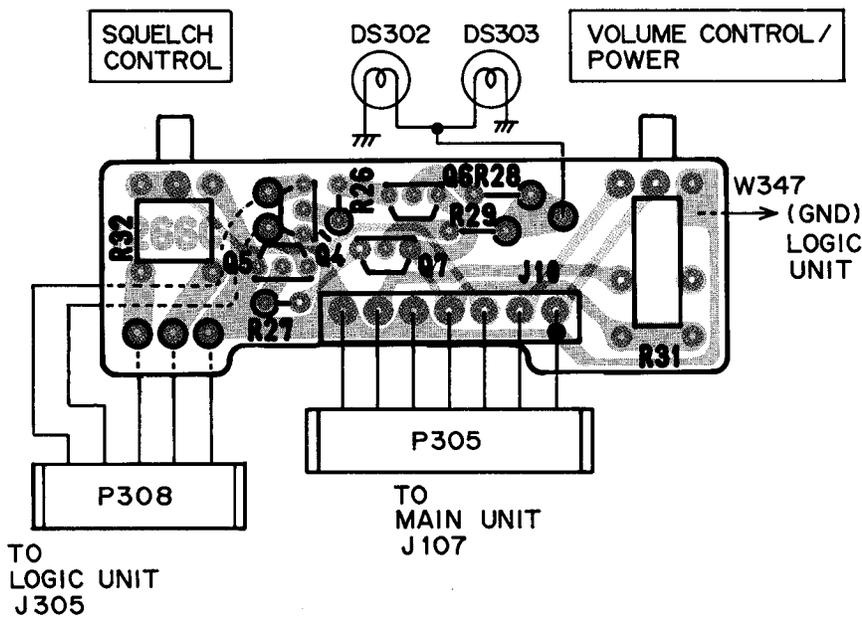
• LOGIC (EF-2) UNIT



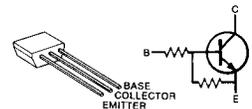
• LOGIC (EF-3) UNIT



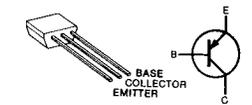
• LOGIC (VR) UNIT



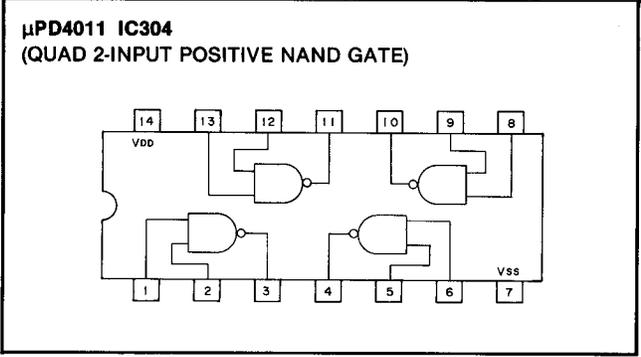
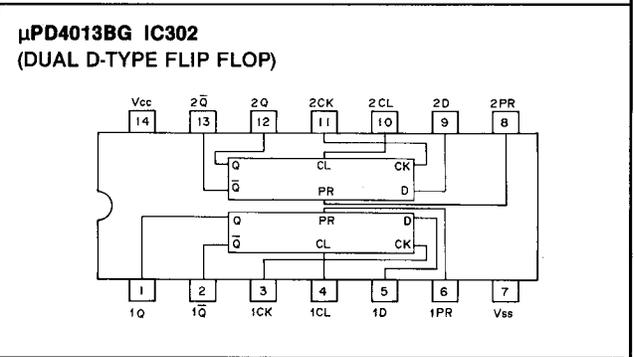
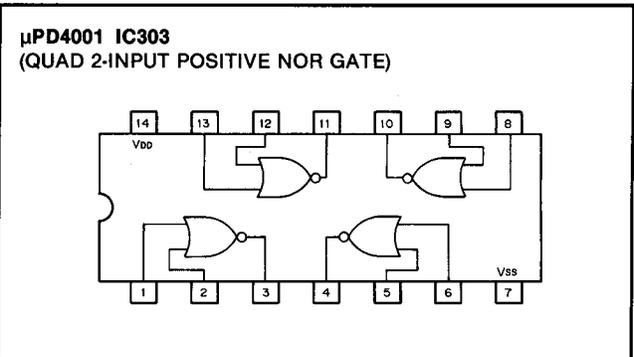
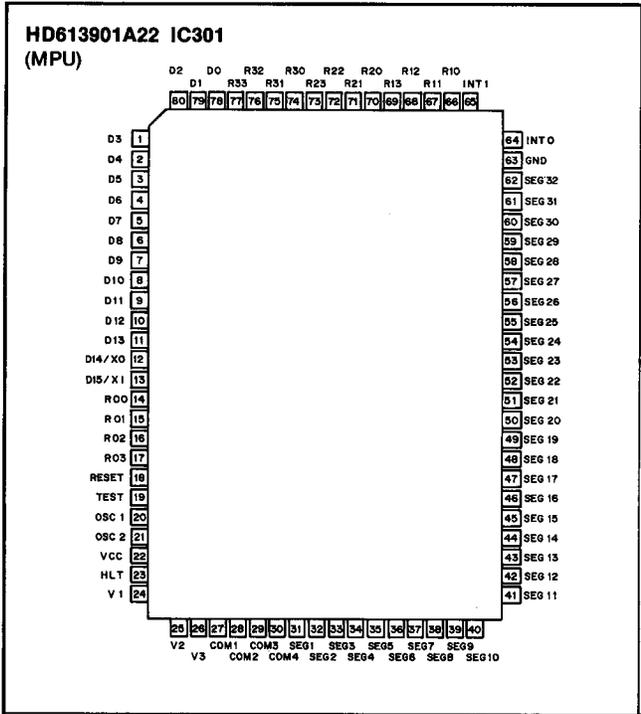
RN1204  
Q304, Q305



2SA1048  
Q306, Q307



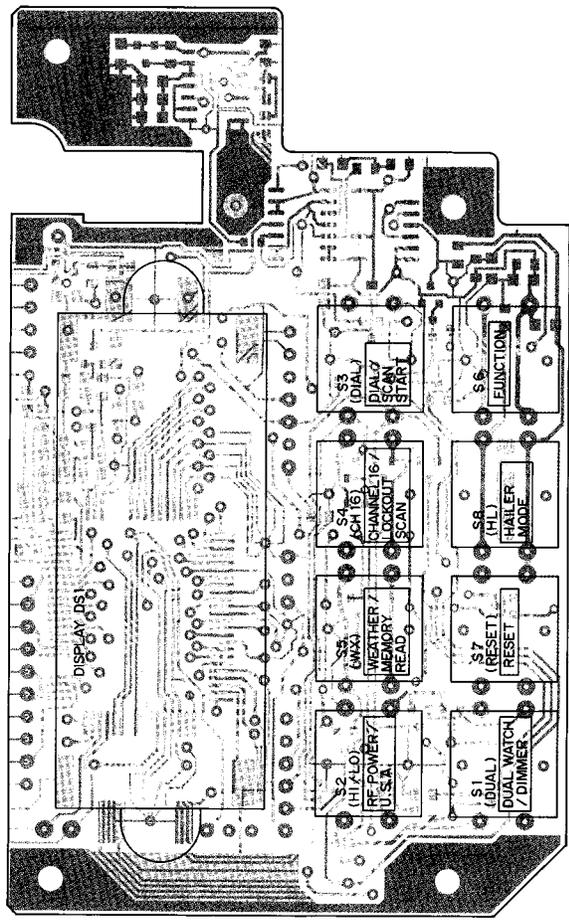
7-2 LOGIC (2) UNIT



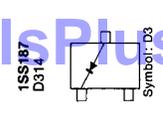
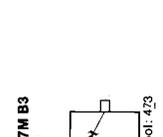
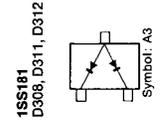
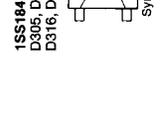
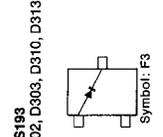
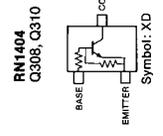
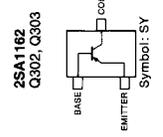
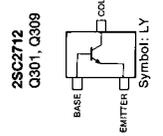
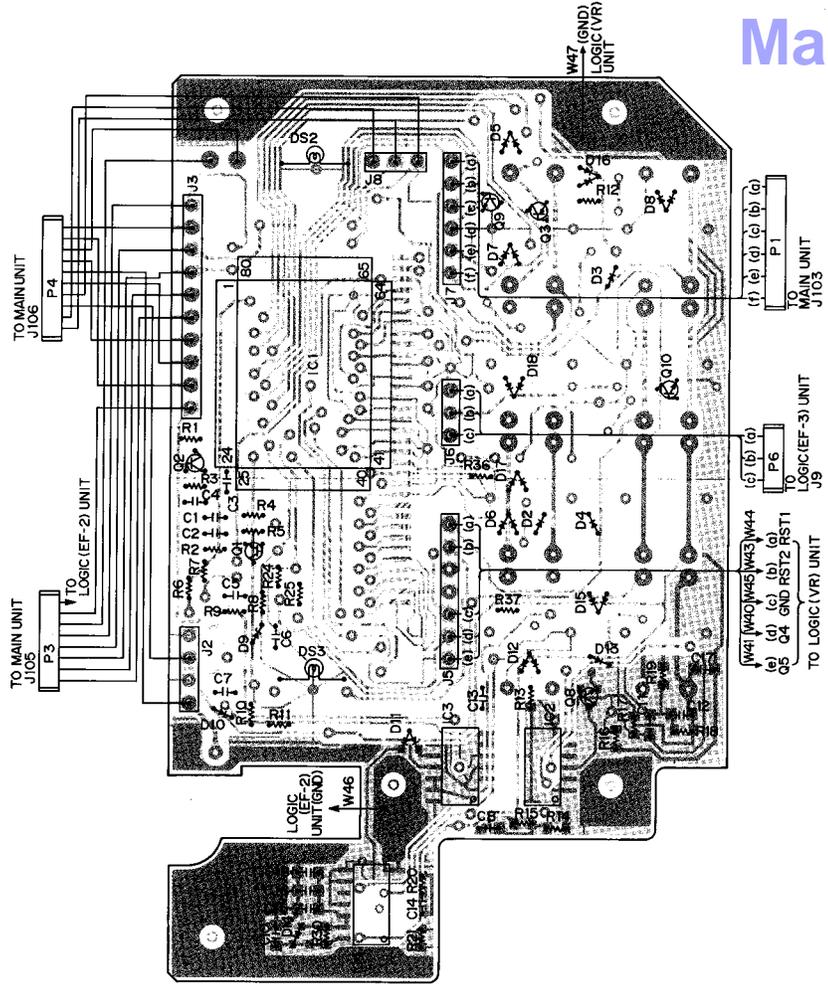
• LOGIC (2) UNIT

NOTE: Add "300" to the indicated number on the unit for actual part number.

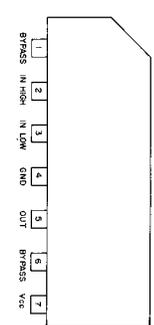
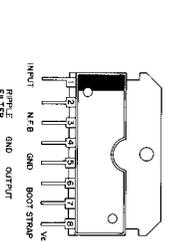
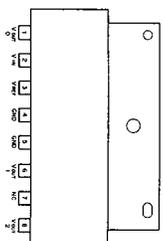
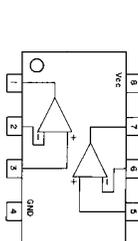
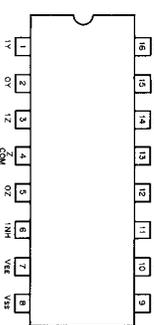
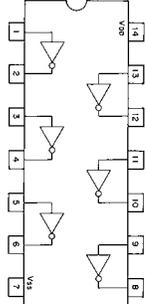
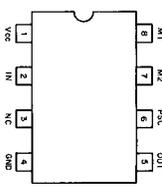
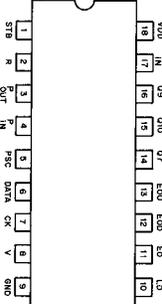
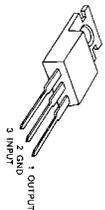
COMPONENT SIDE



FOIL SIDE

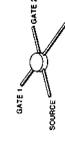
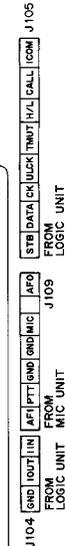
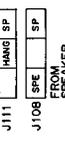
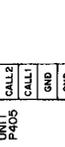
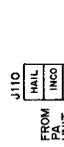
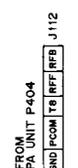
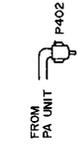
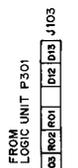
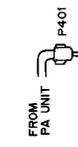
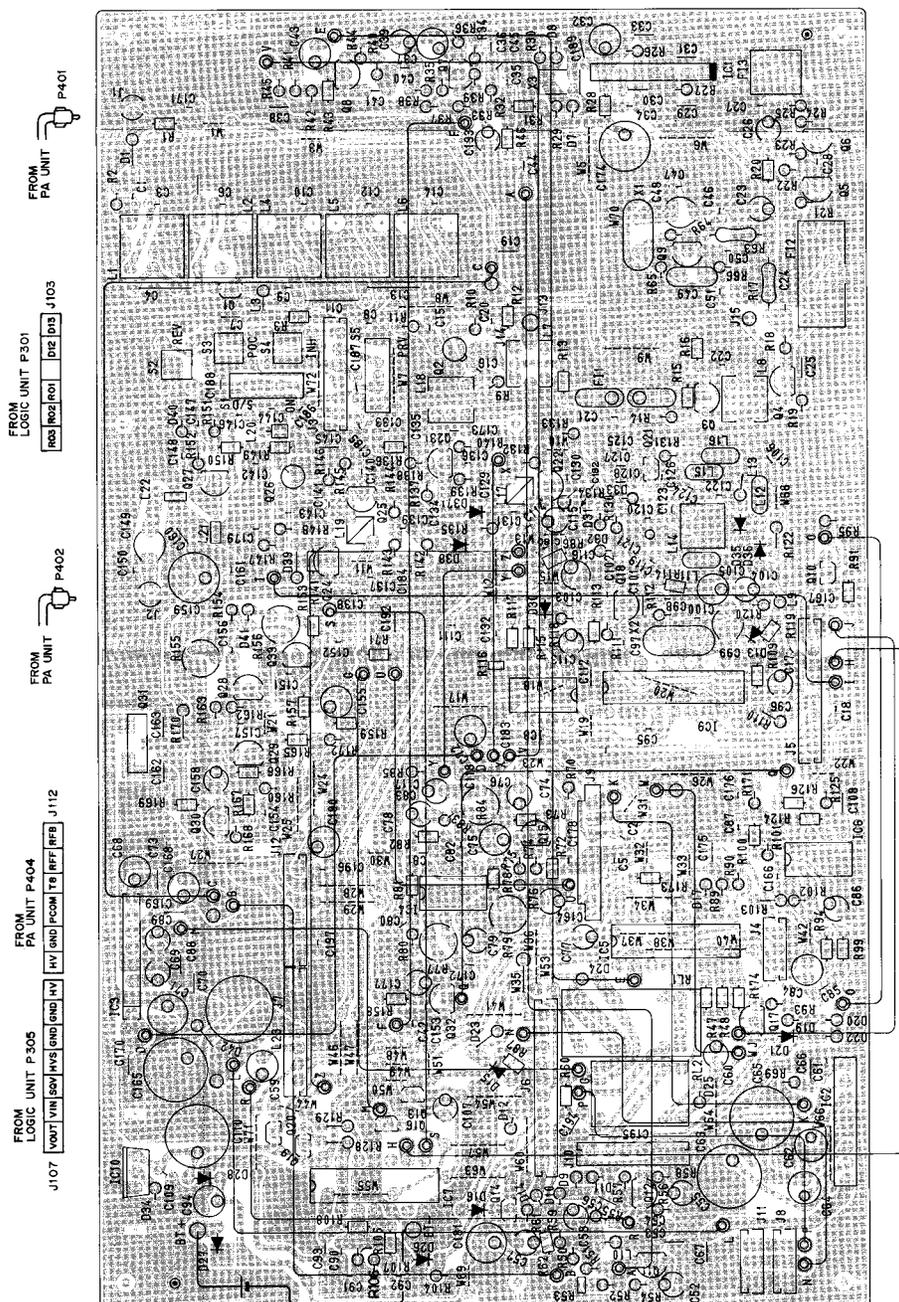
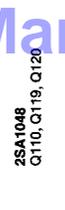
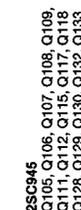


7-3 MAIN UNIT

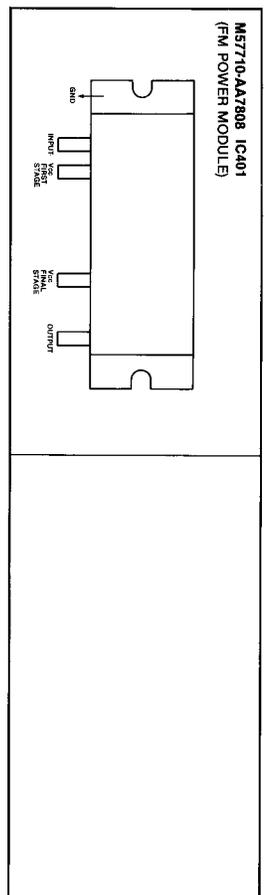
<p><b>µPC577H IC101</b> (FM IF AMPLIFIER)</p> 	<p><b>µPC1241H IC102</b> (AUDIO POWER AMPLIFIER)</p> 
<p><b>MB3756 IC103</b> (VOLTAGE REGULATOR)</p> 	<p><b>µM4558D IC104, IC106</b> (LOW NOISE DUAL OPERATION AMPLIFIER)</p> 
<p><b>TC4053BP IC105</b> (TRIPLE 2-CHANNEL ANALOG MULTIPLEXER)</p> 	<p><b>TC4089UBP IC107</b> (HEX INVERTER)</p> 
<p><b>µPB571C IC108</b> (LOW POWER PRESALER)</p> 	<p><b>µPD2934C IC109</b> (PLL FREQUENCY SYNTHESIZER)</p> 
<p><b>µM7905A IC110</b> (3-TERMINAL 5V REGULATOR)</p> 	

• MAIN UNIT

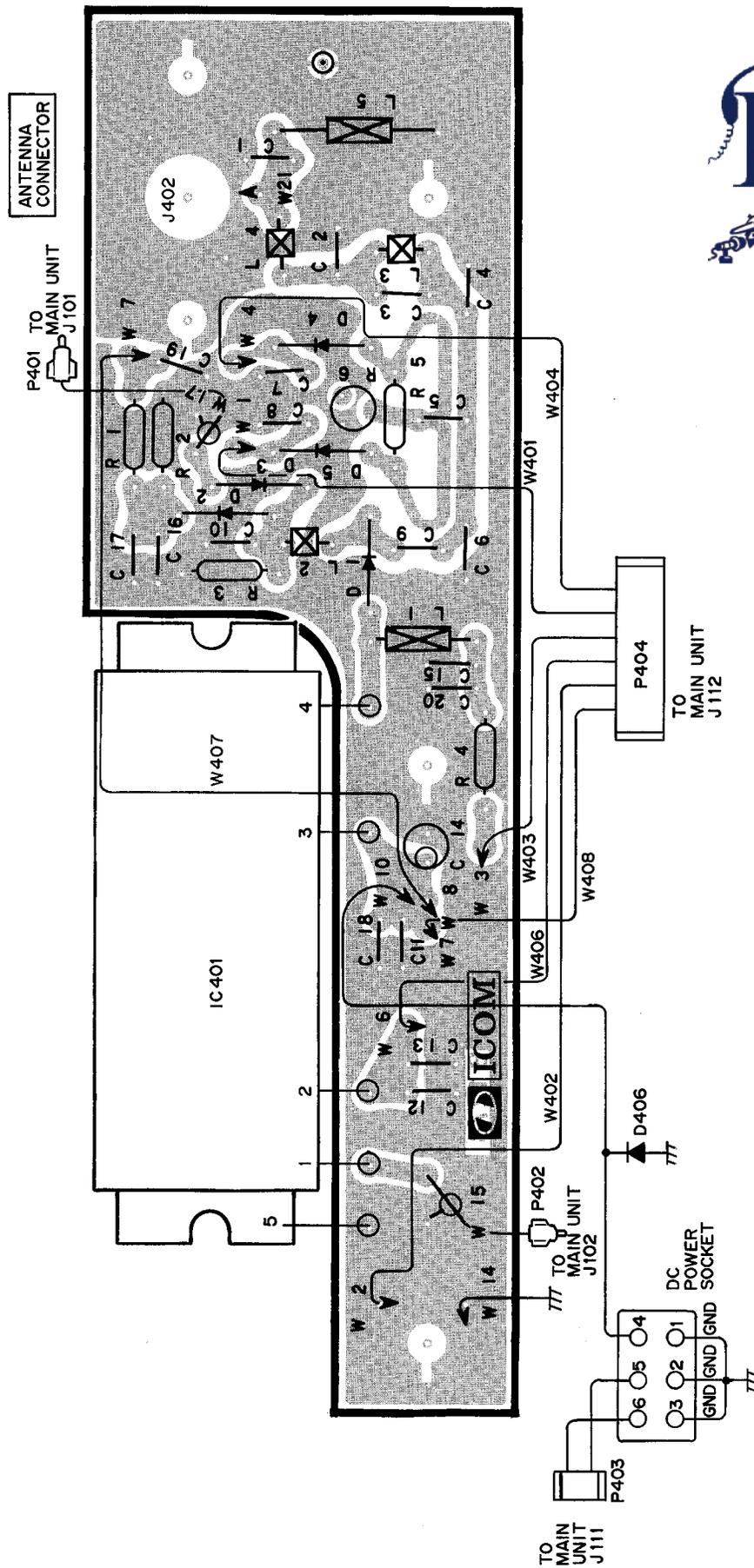
NOTE: Add "100" to the indicated number on the unit for actual part number.



7-4 PA UNIT



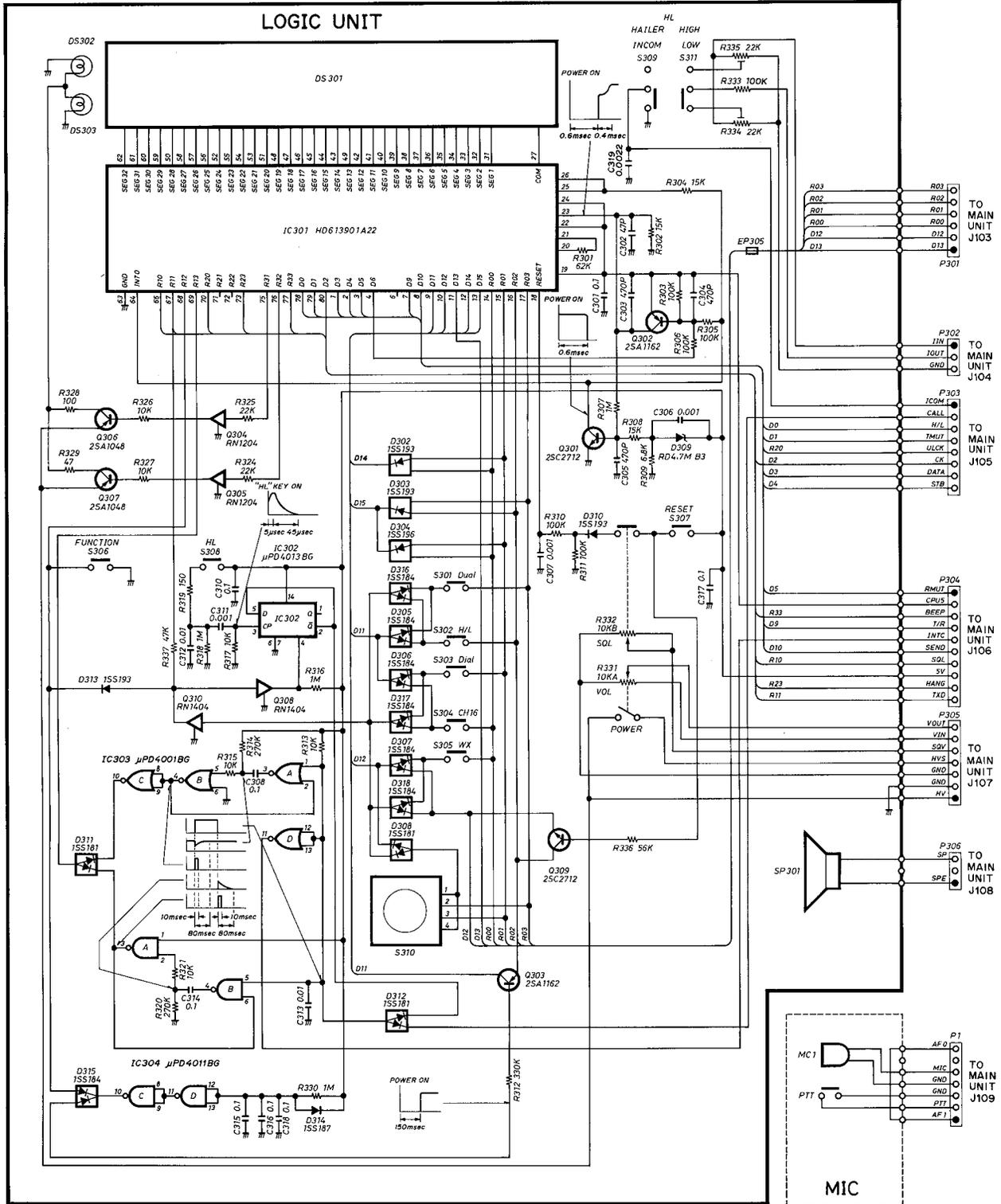
• PA UNIT



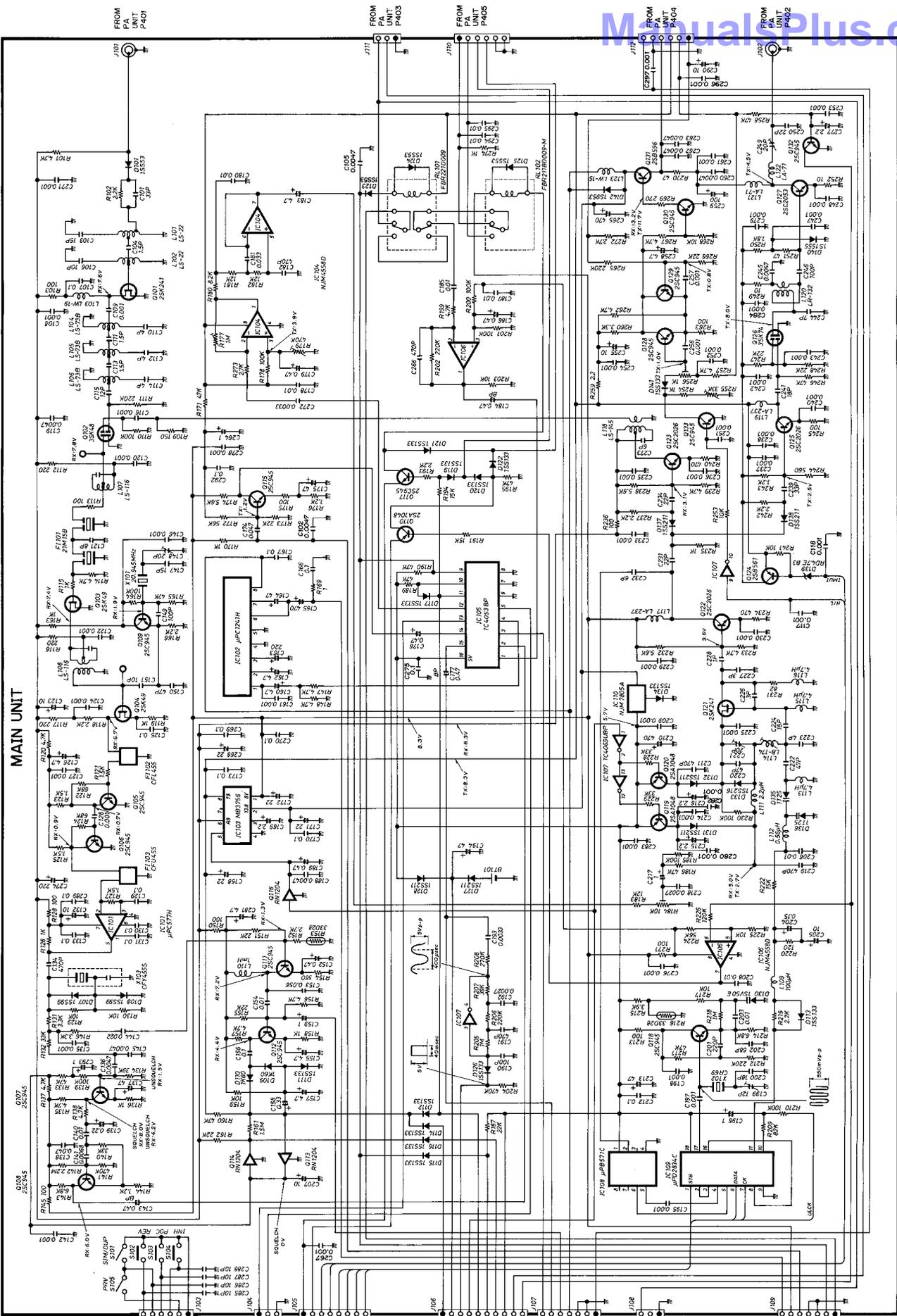
NOTE: Add "400" to the indicated number on the unit for actual part number.

SECTION 8 VOLTAGE DIAGRAM

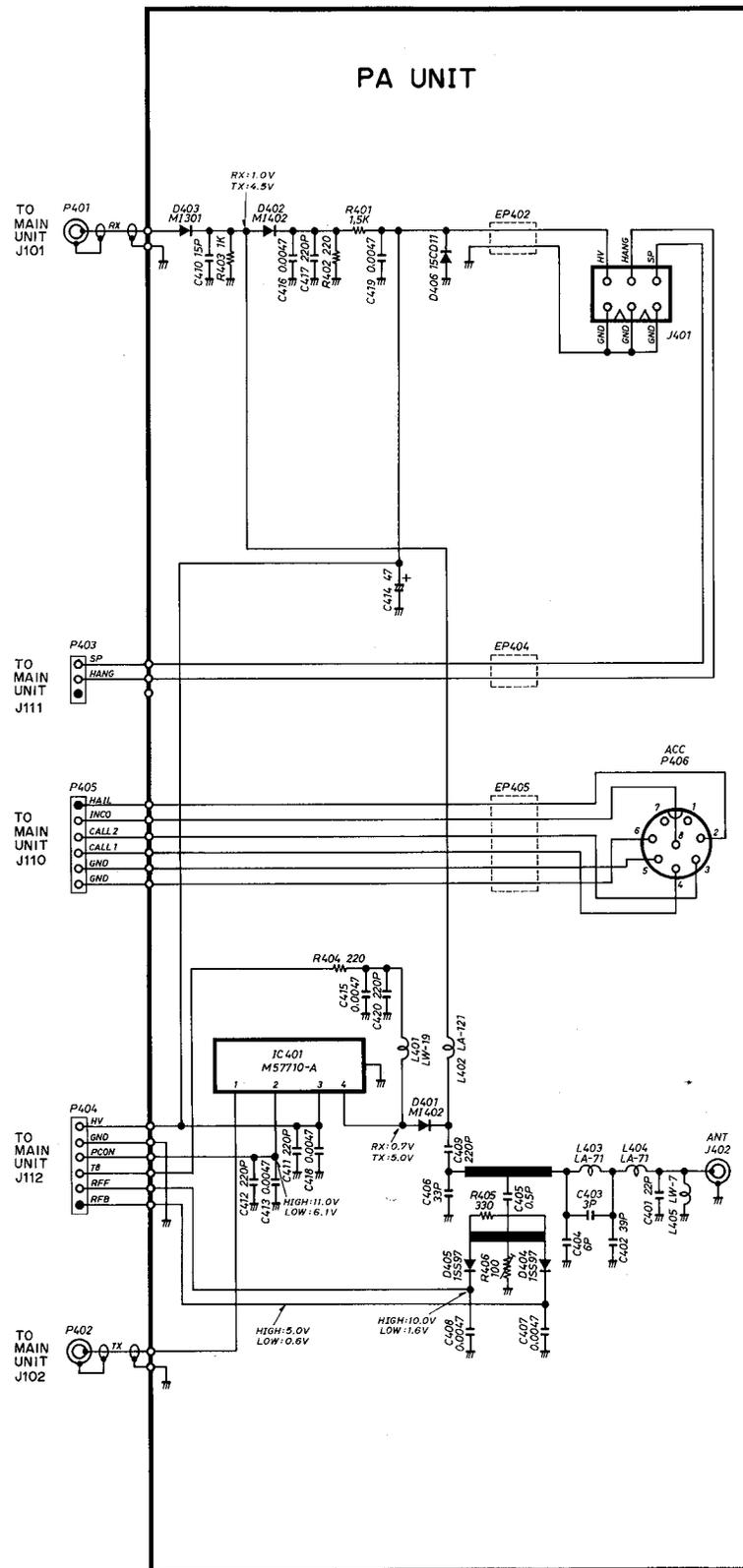
8-1 LOGIC UNIT



8-2 MAIN UNIT



8-3 PA UNIT



## SECTION 9 PARTS LIST

## [LOGIC UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC301	IC	HD613901A22
IC302	IC	$\mu$ PD4013 BG
IC303	IC	$\mu$ PD4001 BG
IC304	IC	$\mu$ PD4011 BG
Q301	Transistor	2SC2712 Y
Q302	Transistor	2SA1162 Y
Q303	Transistor	2SA1162 Y
Q304	Transistor	RN 1204
Q305	Transistor	RN 1204
Q306	Transistor	2SA1048 Y
Q307	Transistor	2SA1048 Y
Q308	Transistor	RN 1404
Q309	Transistor	2SC2712 Y
Q310	Transistor	RN1404
D302	Diode	1SS193
D303	Diode	1SS193
D304	Diode	1SS196
D305	Diode	1SS184
D306	Diode	1SS184
D307	Diode	1SS184
D308	Diode	1SS181
D309	Zener	RD4.7M B3
D310	Diode	1SS193
D311	Diode	1SS181
D312	Diode	1SS181
D313	Diode	1SS193
D314	Diode	1SS187
D315	Diode	1SS184
D316	Diode	1SS184
D317	Diode	1SS184
D318	Diode	1SS184
R301	Chip	62k $\Omega$ MCR10
R302	Chip	15k $\Omega$ MCR10
R303	Chip	100k $\Omega$ MCR10
R304	Chip	15k $\Omega$ MCR10
R305	Chip	100k $\Omega$ MCR10
R306	Chip	100k $\Omega$ MCR10
R307	Chip	1M $\Omega$ MCR10
R308	Chip	15k $\Omega$ MCR10
R309	Chip	6.8k $\Omega$ MCR10
R310	Chip	100k $\Omega$ MCR10
R311	Chip	100k $\Omega$ MCR10
R312	Chip	330k $\Omega$ MCR10
R313	Chip	10k $\Omega$ MCR10
R314	Chip	270k $\Omega$ MCR10
R315	Chip	10k $\Omega$ MCR10
R316	Chip	1M $\Omega$ MCR10
R317	Chip	10k $\Omega$ MCR10
R318	Chip	1M $\Omega$ MCR10
R319	Chip	150 $\Omega$ MCR10
R320	Chip	270k $\Omega$ MCR10
R321	Chip	10k $\Omega$ MCR10
R324	Chip	22k $\Omega$ MCR10
R325	Chip	22k $\Omega$ MCR10
R326	Resistor	10k $\Omega$ ELR20
R327	Resistor	10k $\Omega$ ELR20
R328	Resistor	100 $\Omega$ R50
R329	Resistor	47 $\Omega$ R50
R330	Chip	1M $\Omega$ MCR10
R331	Variable Resistor	10k $\Omega$ RK0971110-5R2121-10KA
R332	Variable Resistor	10k $\Omega$ RK0971110-5R4111-10KB
R333	Resistor	100k $\Omega$ ELR20
R334	Trimmer	22k $\Omega$ RH0651CJ4J01A
R335	Trimmer	22k $\Omega$ RH0651CJ4J01A

## [LOGIC UNIT]

REF. NO.	DESCRIPTION	PART NO.
R336	Chip	56k $\Omega$ MCR10
R337	Chip	47k $\Omega$ MCR10
C301	Monolithic	0.1 $\mu$ F GRM40
C302	Monolithic	47pF GRM40
C303	Monolithic	470pF GRM40
C304	Monolithic	470pF GRM40
C305	Monolithic	470pF GRM40
C306	Monolithic	0.001 $\mu$ F GRM40
C307	Monolithic	0.001 $\mu$ F GRM40
C308	Monolithic	0.1 $\mu$ F GRM40
C310	Monolithic	0.1 $\mu$ F GRM40
C311	Monolithic	0.001 $\mu$ F GRM40
C312	Monolithic	0.01 $\mu$ F GRM40
C313	Monolithic	0.01 $\mu$ F GRM40
C314	Monolithic	0.1 $\mu$ F GRM40
C315	Monolithic	0.1 $\mu$ F GRM40
C316	Monolithic	0.1 $\mu$ F GRM40
C317	Monolithic	0.1 $\mu$ F GRM40
C318	Monolithic	0.1 $\mu$ F GRM40
C319	Ceramic	0.0022 $\mu$ F 50V
J302	Connector	TLB-P04H-B1
J303	Connector	TLB-P10H-B1
J305	Connector	B7B-EH-S
J306	Connector	TLB-P03H-B1
J307	Connector	TLB-P06H-B1
J308	Connector	TLB-P03H-B1
J309	Connector	B3B-EH-S
J310	Connector	TLB-P07H-B1
P301	Connector	EHR-6
P302	Connector	EHR-3
P303	Connector	EHR-8
P304	Connector	EHR-10
P305	Connector	EHR-7
P306	Connector	EHR-3
P307	Connector	EHR-3
P308	Connector	EHR-7
DS301	LCD	HLC9201-01-080
DS302	Lamp	HRS7219A
DS303	Lamp	HRS7219A
S301	Switch	SKHCAA (DUAL)
S302	Switch	SKHCAA (HI/LO)
S303	Switch	SKHCAA (DIAL)
S304	Switch	SKHCAA (CH16)
S305	Switch	SKHCAA (WX)
S306	Switch	SKHCAA (FUNCTION)
S307	Switch	SKHCAA (RESET)
S308	Switch	SKHCAA (HL)
S309	Switch	SPJ312N
S310	Switch	SRB181-0025K2
S311	Switch	SPJ312N
SP301	Speaker	66F09N-7 4 $\Omega$
EP302	P.C. Board	B-1259C
EP303	P.C. Board	B-1260C
EP304	P.C. Board	B-1266C
EP305	Ferrite Bead	FSQH081RL
EP306	P.C. Board	B-1343A
EP307	P.C. Board	B-1344B

## [LOGIC UNIT]

REF. NO.	DESCRIPTION	PART NO.
W301	Wire	31/12/210/B06/C22
W302	Wire	31/11/210/B06/C22
W303	Wire	31/00/210/B06/C22
W304	Wire	31/01/210/B06/C22
W305	Wire	31/02/210/B06/C22
W306	Wire	31/03/210/B06/C22
W307	Wire	31/05/120/B06/W03
W308	Wire	31/04/120/B06/W03
W309	Wire	31/00/120/B06/W03
W310	Wire	31/09/085/B06/W03
W311	Wire	31/12/090/B06/C22
W312	Wire	31/14/105/B06/C21
W313	Wire	31/08/105/B06/C22
W314	Wire	31/10/100/B06/C22
W315	Wire	31/04/100/B06/C22
W316	Wire	31/05/105/B06/C22
W317	Wire	31/06/105/B06/C22
W318	Wire	31/06/160/B06/C22
W319	Wire	31/03/180/B06/C22
W320	Wire	31/07/150/B06/C21
W321	Wire	31/12/180/B06/C22
W322	Wire	31/04/215/B06/C22
W323	Wire	31/08/175/B06/C22
W324	Wire	31/05/155/B06/C22
W325	Wire	31/02/205/B06/C22
W326	Wire	31/09/165/B06/C22
W327	Wire	31/01/155/B06/C22
W328	Wire	31/03/160/B06/C22
W329	Wire	31/00/155/B06/C22
W330	Wire	31/02/155/B06/C22
W331	Wire	31/01/160/B06/C22
W332	Wire	31/05/165/B06/C22
W333	Wire	31/04/165/B06/C22
W334	Wire	31/00/190/B06/W02
W335	Wire	31/04/190/B06/W02
W336	Wire	31/03/090/B06/C22
W337	Wire	31/09/090/B06/C22
W338	Wire	31/01/090/B06/C22
W339	Wire	31/01/100/B06/C21
W340	Wire	31/04/100/B06/C21
W341	Wire	31/05/100/B06/C21
W342	Wire	31/00/155/B06/C22
W343	Wire	31/04/100/B06/C21
W344	Wire	31/09/080/B06/C21
W345	Wire	22/00/055/C21/W02
W346	Wire	31/00/055/W03/W03
W347	Wire	31/00/050/W02/W02

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC101	IC	μPC577H
IC102	IC	μPC1241H
IC103	IC	MB3756
IC104	IC	NJM4558D
IC105	IC	TC4053BP
IC106	IC	NJM4558D
IC107	IC	TC4069UBP
IC108	IC	μPB571C
IC109	IC	μPD2834C
IC110	IC	NJM7805A
Q101	FET	2SK241 GR
Q102	FET	3SK48
Q103	FET	2SK49 H2
Q104	FET	2SK49 H2
Q105	Transistor	2SC945 P
Q106	Transistor	2SC945 P

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
Q107	Transistor	2SC945 P
Q108	Transistor	2SC945 P
Q109	Transistor	2SC945 K
Q110	Transistor	2SA1048 Y
Q111	Transistor	2SC945 P
Q112	Transistor	2SC945 P
Q113	Transistor	RN 1204
Q114	Transistor	RN 1204
Q115	Transistor	2SC945 K
Q116	Transistor	RN 1204
Q117	Transistor	2SC945 P
Q118	Transistor	2SC945 K
Q119	Transistor	2SA1048 Y
Q120	Transistor	2SA1048 Y
Q121	FET	2SK241 GR
Q122	Transistor	2SC2026
Q123	Transistor	2SC2026
Q124	Transistor	2SB561
Q125	Transistor	2SC2026
Q126	FET	3SK74 K
Q127	Transistor	2SC2053
Q128	Transistor	2SC945 P
Q129	Transistor	2SC945 P
Q130	Transistor	2SC945 P
Q131	Transistor	2SB596 Y
Q132	Transistor	2SC945 K
Q133	Transistor	2SC945 K
D101	Diode	1SS53
D107	Diode	1SS99
D108	Diode	1SS99
D109	Diode	1K60
D110	Diode	1K60
D111	Diode	1SS133
D112	Diode	1SS133
D113	Diode	1SS133
D114	Diode	1SS133
D115	Diode	1SS133
D116	Diode	1SS133
D117	Diode	1SS133
D119	Diode	1SS133
D120	Diode	1SS133
D121	Diode	1SS133
D122	Diode	1SS133
D123	Diode	1SS53
D124	Diode	1SS53
D125	Diode	1SS53
D126	Diode	1SS133
D127	Diode	1SS211
D128	Diode	1SS211
D130	Varicap	1SV50 E
D131	Diode	1SS211
D132	Diode	1SS211
D133	Diode	1SS216
D134	Diode	1SS133
D135	Varicap	1T25
D136	Varicap	1T25
D137	Diode	1SS211
D138	Diode	1SS211
D139	Zener	RD4.7E B3
D140	Diode	1S1555
D141	Diode	1SS133
D142	Diode	1S953
FI101	Crystal Filter	21M15B
FI102	Ceramic	CFL455 E
FI103	Ceramic	CFU455 E2
X101	Crystal	20.945MHz HC-18/U
X102	Crystal	CR69
X103	Ceramic	CFY455S

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
L101	Coil	LS-22
L102	Coil	LS-22
L103	Coil	LW-19
L104	Coil	LS-73B
L105	Coil	LS-73B
L106	Coil	LS-73B
L107	Coil	LS-116
L108	Coil	LS-116
L109	Coil	LAL03NA 101
L110	Coil	LAL03NA 102
L111	Coil	LAL03NA 2R2
L112	Coil	LAL03NA R56
L113	Coil	LAL03NA 4R7
L114	Coil	LB-174
L115	Coil	LAL03NA 4R7
L116	Coil	LAL03NA 4R7
L117	Coil	LA-237
L118	Coil	LS-145
L119	Coil	LA-237
L120	Coil	LR-132
L121	Coil	LA-71
L122	Coil	LA-71
L123	Coil	LW-15
R101	Resistor	4.7kΩ R20
R102	Resistor	2.2kΩ ELR20
R103	Resistor	100Ω R20
R109	Resistor	150Ω ELR20
R110	Resistor	100kΩ ELR20
R111	Resistor	220kΩ ELR20
R112	Resistor	220Ω R20
R113	Resistor	100Ω R20
R114	Resistor	4.7kΩ ELR20
R115	Resistor	1kΩ R20
R116	Resistor	220Ω R20
R117	Resistor	220Ω R25
R118	Resistor	2.2kΩ ELR20
R119	Resistor	1kΩ ELR20
R120	Resistor	4.7kΩ R20
R121	Resistor	1.5kΩ ELR20
R122	Resistor	68kΩ ELR20
R123	Resistor	1.5kΩ ELR20
R124	Resistor	68kΩ ELR20
R125	Resistor	1.5kΩ ELR20
R126	Resistor	1kΩ ELR20
R127	Resistor	1.5kΩ ELR20
R128	Resistor	100Ω R20
R129	Resistor	10kΩ ELR20
R130	Resistor	10kΩ ELR20
R131	Resistor	3.3kΩ R20
R132	Resistor	33kΩ ELR20
R133	Resistor	47kΩ ELR20
R134	Resistor	39kΩ ELR20
R135	Resistor	4.7kΩ ELR20
R136	Resistor	1kΩ ELR20
R137	Resistor	4.7kΩ ELR20
R138	Resistor	4.7kΩ ELR20
R139	Resistor	100kΩ ELR20
R140	Resistor	33kΩ ELR20
R141	Resistor	470kΩ ELR20
R142	Resistor	2.2MΩ ELR20
R143	Resistor	6.8kΩ R20
R144	Resistor	1.2kΩ ELR20
R145	Resistor	100Ω ELR20
R146	Resistor	3.3kΩ R20
R147	Resistor	4.7kΩ R20
R148	Resistor	4.7kΩ R20
R150	Resistor	100Ω ELR20
R151	Resistor	22kΩ ELR20
R152	Resistor	2.7kΩ ELR20
R153	Thermistor	33D28
R154	Resistor	560Ω ELR20
R155	Resistor	22kΩ ELR20
R156	Resistor	4.7kΩ ELR20

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
R157	Resistor	4.7kΩ ELR20
R158	Resistor	1kΩ ELR20
R159	Resistor	10kΩ ELR20
R160	Resistor	47kΩ R20
R161	Resistor	1.5MΩ ELR20
R162	Resistor	22kΩ R20
R163	Resistor	1kΩ R25
R164	Resistor	100kΩ ELR20
R165	Resistor	47kΩ ELR20
R166	Resistor	2.2kΩ ELR20
R169	Resistor	1Ω ELR20
R170	Resistor	1kΩ ELR20
R171	Resistor	47kΩ R20
R172	Resistor	56kΩ R20
R173	Resistor	22kΩ R20
R174	Resistor	5.6kΩ ELR20
R175	Resistor	100Ω ELR20
R176	Resistor	1.2kΩ ELR20
R177	Trimmer	1MΩ RH0651C16J0RA
R178	Resistor	100kΩ R20
R179	Trimmer	470kΩ RH0651CS5J10A
R180	Resistor	8.2kΩ ELR20
R181	Resistor	12kΩ R20
R182	Resistor	12kΩ R20
R183	Resistor	12kΩ ELR20
R184	Trimmer	10kΩ RH0651C14J2WA
R185	Resistor	100kΩ ELR20
R186	Resistor	47kΩ R20
R187	Resistor	22kΩ R20
R189	Resistor	47kΩ ELR20
R190	Resistor	47kΩ ELR20
R191	Resistor	15kΩ ELR20
R193	Resistor	2.2kΩ ELR20
R194	Resistor	15kΩ R20
R195	Resistor	47kΩ ELR20
R199	Resistor	4.7kΩ R20
R200	Resistor	100kΩ R20
R201	Resistor	100kΩ ELR20
R202	Resistor	220kΩ ELR20
R203	Resistor	10kΩ ELR20
R204	Resistor	470kΩ ELR20
R205	Resistor	1MΩ ELR20
R206	Resistor	220kΩ ELR20
R207	Resistor	39kΩ R20
R208	Resistor	270kΩ R20
R209	Resistor	82kΩ R20
R210	Resistor	100kΩ ELR20
R211	Resistor	47kΩ ELR20
R212	Resistor	220kΩ ELR20
R213	Resistor	100Ω R20
R214	Resistor	6.8kΩ R20
R215	Resistor	3.9kΩ R20
R216	Thermistor	33D28
R217	Resistor	10kΩ R20
R218	Resistor	1MΩ ELR20
R219	Resistor	2.2kΩ R20
R220	Resistor	120Ω ELR20
R222	Resistor	15kΩ ELR20
R224	Resistor	56kΩ R20
R225	Resistor	10kΩ ELR20
R226	Resistor	120kΩ R20
R228	Resistor	33kΩ ELR20
R229	Resistor	33kΩ ELR20
R230	Resistor	100kΩ ELR20
R231	Resistor	82Ω ELR20
R232	Resistor	5.6kΩ ELR20
R233	Resistor	4.7kΩ ELR20
R234	Resistor	470Ω ELR20
R235	Resistor	1kΩ ELR20
R236	Resistor	100Ω R20
R237	Resistor	2.2kΩ ELR20
R238	Resistor	5.6kΩ ELR20
R239	Resistor	4.7kΩ ELR20
R240	Resistor	470Ω ELR20
R241	Resistor	10kΩ R20

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R242	Resistor	2.2kΩ	ELR20
R243	Resistor	1.2kΩ	ELR20
R244	Resistor	560Ω	ELR20
R245	Resistor	100Ω	ELR20
R246	Resistor	47kΩ	ELR20
R247	Resistor	22kΩ	ELR20
R248	Resistor	22kΩ	ELR20
R249	Resistor	10Ω	R20
R250	Resistor	1.8kΩ	R20
R251	Resistor	47Ω	ELR20
R252	Resistor	10Ω	ELR20
R253	Resistor	10kΩ	R20
R254	Resistor	1kΩ	ELR20
R255	Trimmer	33kΩ	RH0651CN4J0TA
R256	Trimmer	1kΩ	RH0651C13J1YA
R257	Resistor	4.7kΩ	R20
R258	Resistor	47kΩ	R20
R259	Resistor	2.2Ω	R20
R260	Resistor	3.3kΩ	ELR20
R262	Resistor	4.7Ω	ELR20
R263	Resistor	100Ω	ELR20
R265	Resistor	220kΩ	R20
R266	Resistor	22kΩ	R20
R267	Resistor	4.7kΩ	R20
R268	Resistor	10kΩ	ELR20
R269	Resistor	270Ω	R20
R270	Resistor	47Ω	R20
R271	Resistor	100Ω	ELR20
R272	Resistor	2.7kΩ	ELR20
R273	Resistor	2.7kΩ	R20
R274	Resistor	1kΩ	R20
C101	Ceramic	33pF	50V
C102	Ceramic	0.0047μF	50V
C103	Ceramic	15pF	50V
C104	Cylinder	1.5pF	50V
C105	Ceramic	0.0047μF	50V
C106	Ceramic	10pF	50V
C107	Barrier Layer	0.1μF	16V
C108	Ceramic	0.001μF	50V
C109	Ceramic	0.001μF	50V
C110	Ceramic	4pF	50V
C111	Cylinder	1.5pF	50V
C112	Ceramic	4pF	50V
C113	Cylinder	1.5pF	50V
C114	Ceramic	4pF	50V
C115	Ceramic	12pF	50V
C116	Ceramic	0.001μF	50V
C117	Ceramic	0.001μF	50V
C118	Ceramic	0.001μF	50V
C119	Ceramic	0.0047μF	50V
C120	Ceramic	0.001μF	50V
C121	Ceramic	8pF	50V
C122	Ceramic	0.001μF	50V
C123	Electrolytic	10μF	16V
C124	Ceramic	0.001μF	50V
C125	Barrier Layer	0.1μF	16V
C126	Electrolytic	4.7μF	50V
C127	Ceramic	0.001μF	50V
C128	Ceramic	0.001μF	50V
C129	Barrier Layer	0.1μF	16V
C130	Barrier Layer	0.1μF	16V
C131	Barrier Layer	0.1μF	16V
C132	Electrolytic	10μF	16V
C133	Barrier Layer	0.1μF	16V
C134	Ceramic	470pF	50V
C135	Ceramic	0.001μF	50V
C136	Mylar	0.0047μF	
C137	Electrolytic	47μF	10V
C138	Barrier Layer	0.047μF	25V
C139	Electrolytic	0.22μF	50V MS7
C140	Mylar	0.01μF	
C141	Barrier Layer	0.0068μF	25V
C142	Ceramic	0.001μF	50V

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.		
C143	Electrolytic	0.47μF	50V	BP
C144	Mylar	0.022μF		
C145	Mylar	0.0047μF		
C146	Ceramic	0.001μF	50V	
C147	Ceramic	15pF	50V	CH
C148	Trimmer	20pF	CV05D2001	
C149	Dip Mica	100pF	50V	
C150	Dip Mica	47pF	50V	
C151	Ceramic	10pF	50V	
C152	Electrolytic	0.47μF	50V	MS7
C153	Mylar	0.056μF		
C154	Mylar	0.01μF		
C155	Electrolytic	4.7μF	50V	
C156	Barrier Layer	0.1μF	16V	
C157	Electrolytic	4.7μF	25V	MS7
C158	Ceramic	0.33μF	50V	MS7
C159	Electrolytic	1μF	50V	
C160	Electrolytic	4.7μF	50V	
C161	Ceramic	0.001μF	50V	
C162	Electrolytic	4.7μF	50V	
C163	Electrolytic	220μF	16V	
C164	Electrolytic	47μF	16V	
C165	Electrolytic	470μF	16V	
C166	Barrier Layer	0.1μF	16V	
C167	Barrier Layer	0.1μF	16V	
C168	Electrolytic	22μF	16V	MS7
C169	Electrolytic	2.2μF	50V	MS7
C170	Barrier Layer	0.1μF	16V	
C171	Electrolytic	22μF	16V	
C172	Electrolytic	22μF	16V	
C173	Barrier Layer	0.1μF	16V	
C174	Mylar	0.047μF		
C175	Electrolytic	47μF	10V	
C176	Electrolytic	0.47μF	50V	
C177	Electrolytic	0.47μF	50V	B.P
C178	Ceramic	0.01μF	50V	
C179	Electrolytic	0.47μF	50V	
C180	Mylar	0.01μF		
C181	Mylar	0.033μF		
C182	Ceramic	470pF	50V	
C183	Electrolytic	4.7μF	50V	
C184	Electrolytic	0.47μF	50V	BP
C185	Mylar	0.01μF		
C186	Electrolytic	0.47μF	50V	
C187	Barrier Layer	0.01μF	25V	
C188	Ceramic	0.0047μF	50V	
C189	Electrolytic	0.47μF	50V	MS7
C190	Ceramic	100pF	50V	
C191	Ceramic	470pF	50V	
C192	Barrier Layer	0.0027μF	25V	
C193	Mylar	0.0033μF		
C194	Electrolytic	47μF	10V	
C195	Ceramic	0.001μF	50V	
C196	Electrolytic	1μF	50V	
C197	Ceramic	0.001μF	50V	
C198	Ceramic	0.001μF	50V	
C199	Trimmer	12pF	CV05C1201	
C200	Ceramic	18pF	50V	CH
C201	Ceramic	220pF	50V	
C202	Ceramic	68pF	50V	
C203	Barrier Layer	0.01μF	25V	
C204	Tantalum	0.15μF	35V	
C205	Tantalum	10μF	16V	
C206	Mylar	0.01μF		
C207	Electrolytic	10μF	16V	
C208	Ceramic	0.01μF	50V	
C209	Ceramic	0.001μF	50V	
C210	Electrolytic	470μF	10V	
C211	Ceramic	470pF	50V	
C212	Barrier Layer	0.1μF	16V	
C213	Electrolytic	47μF	16V	
C214	Ceramic	0.001μF	50V	
C215	Electrolytic	2.2μF	50V	MS7
C216	Electrolytic	2.2μF	50V	
C217	Electrolytic	1μF	50V	MS7

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C218	Mylar	0.0027 $\mu$ F	
C219	Ceramic	470pF 50V	
C220	Ceramic	47pF 50V	
C221	Trimmer	20pF ECR-GA020E30	
C222	Ceramic	47pF 50V	
C223	Ceramic	4pF 50V	UJ
C224	Ceramic	18pF 50V	
C225	Ceramic	0.001 $\mu$ F 50V	
C226	Ceramic	3pF 50V	UJ
C227	Ceramic	3pF 50V	
C228	Ceramic	1pF 50V	
C229	Ceramic	0.001 $\mu$ F 50V	
C230	Ceramic	0.001 $\mu$ F 50V	
C231	Ceramic	22pF 50V	
C232	Ceramic	6pF 50V	
C233	Ceramic	0.001 $\mu$ F 50V	
C234	Ceramic	22pF 50V	
C235	Ceramic	0.001 $\mu$ F 50V	
C236	Ceramic	0.001 $\mu$ F 50V	
C237	Ceramic	0.001 $\mu$ F 50V	
C238	Ceramic	0.001 $\mu$ F 50V	
C239	Ceramic	33pF 50V	
C240	Ceramic	0.001 $\mu$ F 50V	
C241	Ceramic	18pF 50V	
C242	Ceramic	0.001 $\mu$ F 50V	
C243	Ceramic	0.001 $\mu$ F 50V	
C244	Ceramic	7pF 50V	
C245	Ceramic	0.0047 $\mu$ F 50V	
C246	Ceramic	100pF 50V	
C247	Ceramic	0.001 $\mu$ F 50V	
C248	Ceramic	0.001 $\mu$ F 50V	
C249	Trimmer	20pF CV05D2001	
C250	Ceramic	22pF 50V	
C251	Ceramic	0.001 $\mu$ F 50V	
C252	Ceramic	0.001 $\mu$ F 50V	
C253	Ceramic	0.001 $\mu$ F 50V	
C254	Ceramic	0.001 $\mu$ F 50V	
C255	Electrolytic	10 $\mu$ F 16V	
C256	Ceramic	0.001 $\mu$ F 50V	
C257	Ceramic	0.001 $\mu$ F 50V	
C258	Electrolytic	4.7 $\mu$ F 50V	
C259	Electrolytic	100 $\mu$ F 16V	
C260	Ceramic	0.0047 $\mu$ F 50V	
C261	Ceramic	0.001 $\mu$ F 50V	
C262	Ceramic	0.0047 $\mu$ F 50V	
C263	Ceramic	0.0047 $\mu$ F 50V	
C264	Electrolytic	1 $\mu$ F 50V	MS7
C265	Electrolytic	470 $\mu$ F 16V	
C266	Ceramic	470pF 50V	
C267	Ceramic	0.001 $\mu$ F 50V	
C268	Electrolytic	22 $\mu$ F 16V	MS7
C269	Barrier Layer	0.1 $\mu$ F 16V	
C270	Barrier Layer	0.1 $\mu$ F 16V	
C271	Ceramic	0.001 $\mu$ F 50V	
C272	Mylar	0.0033 $\mu$ F	
C273	Ceramic	6pF 50V	
C274	Electrolytic	220 $\mu$ F 10V	
C275	Barrier Layer	0.1 $\mu$ F 16V	
C276	Ceramic	0.001 $\mu$ F 50V	
C277	Electrolytic	2.2 $\mu$ F 50V	
C278	Ceramic	0.001 $\mu$ F 50V	
C279	Ceramic	0.001 $\mu$ F 50V	
C280	Ceramic	0.001 $\mu$ F 50V	
C281	Electrolytic	4.7 $\mu$ F 50V	
C282	Ceramic	0.001 $\mu$ F 50V	
C283	Ceramic	0.001 $\mu$ F 50V	
C284	Ceramic	0.001 $\mu$ F 50V	
C285	Ceramic	10pF 50V	
C286	Ceramic	10pF 50V	
C287	Ceramic	10pF 50V	
C288	Ceramic	10pF 50V	
C289	Barrier Layer	0.1 $\mu$ F 16V	
C290	Electrolytic	10 $\mu$ F 16V	
C292	Barrier Layer	0.1 $\mu$ F 16V	
C293	Electrolytic	1 $\mu$ F 50V	MS7

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
C294	Ceramic	0.01 $\mu$ F 50V F
C295	Ceramic	0.01 $\mu$ F 50V F
C296	Ceramic	0.001 $\mu$ F 50V
C297	Ceramic	0.001 $\mu$ F 50V
RL101	Relay	FBR221D009
RL102	Relay	FBR211BD009-M
J101	Connector	TMP-J01X-V2
J102	Connector	TMP-J01X-V2
J103	Connector	B6B-EH-S
J104	Connector	B3B-EH-S
J105	Connector	B8B-EH-S
J106	Connector	B10B-EH-S
J107	Connector	B7B-EH-S
J108	Connector	B3B-EH-S
J109	Connector	TL25P-07-V1
J110	Connector	B6B-EH-S
J111	Connector	B3B-EH-S
J112	Connector	B6B-EH-S
J113	Connector	171255-1
J114	Connector	RT-01T-1.0B
J115	Connector	RT-01T-1.0B
S101	Switch	SSS312
S102	Switch	KHH10906
S103	Switch	KHH10906
S104	Switch	KHH10906
S105	Switch	SSS312
BT101	Lithium Battery	BR2032-1T2
EP101	P.C. Board	B-1258D
W101	Jumper	IPS-1041-2
W103	Jumper	IPS-1041-2
W105	Jumper	IPS-1041-4
W106	Jumper	IPS-1041-4
W107	Jumper	IPS-1041-4
W108	Jumper	IPS-1041-4
W109	Jumper	IPS-1041-4
W110	Jumper	IPS-1041-2
W111	Jumper	IPS-1041-2
W112	Jumper	IPS-1041-4
W113	Jumper	IPS-1041-2
W115	Jumper	IPS-1041-2
W117	Jumper	IPS-1041-4
W118	Jumper	IPS-1041-2
W119	Jumper	IPS-1041-2
W120	Jumper	IPS-1041-4
W121	Jumper	IPS-1041-2
W122	Jumper	IPS-1041-2
W123	Jumper	IPS-1041-2
W124	Jumper	IPS-1041-4
W125	Jumper	IPS-1041-4
W126	Jumper	IPS-1041-4
W127	Jumper	IPS-1041-4
W128	Jumper	IPS-1041-4
W129	Jumper	IPS-1041-4
W130	Jumper	IPS-1041-2
W131	Jumper	IPS-1041-2
W132	Jumper	IPS-1041-2
W133	Jumper	IPS-1041-2
W134	Jumper	IPS-1041-4
W135	Jumper	JPW-02H
W136	Jumper	IPS-1041-4
W137	Jumper	IPS-1041-4
W138	Jumper	IPS-1041-4
W140	Jumper	IPS-1041-2

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
W141	Jumper	IPS-1041-4
W142	Jumper	IPS-1041-2
W144	Jumper	IPS-1041-2
W146	Jumper	IPS-1041-4
W147	Jumper	IPS-1041-4
W148	Jumper	IPS-1041-2
W149	Jumper	IPS-1041-2
W150	Jumper	IPS-1041-2
W151	Jumper	IPS-1041-2
W153	Jumper	IPS-1041-4
W154	Jumper	IPS-1041-4
W155	Jumper	IPS-1041-4
W157	Jumper	IPS-1041-4
W160	Jumper	IPS-1041-4
W163	Jumper	IPS-1041-4
W164	Jumper	IPS-1041-4
W166	Jumper	IPS-1041-4
W168	Jumper	IPS-1041-2
W169	Jumper	JPW-02H
W170	Jumper	JPW-02A
W171	Jumper	IPS-1041-4
W172	Jumper	IPS-1041-4
W173	Wire	22/01/230/C21/C21
W174	Wire	22/05/150/C21/C21
W175	Wire	22/05/150/C21/C21
W176	Wire	22/02/100/C21/C21
W177	Wire	22/06/220/C21/C21
W178	Wire	22/07/175/C21/C21
W179	Wire	22/01/170/C21/C21
W180	Wire	22/08/170/C21/C21
W181	Wire	22/04/150/C21/C21
W182	Wire	22/09/090/C21/C21
W183	Wire	22/06/110/C21/C21
W184	Wire	22/03/110/C21/C21
W185	Wire	22/09/070/C21/C21
W186	Wire	22/01/110/C21/C21
W187	Wire	22/05/095/C21/C21
W188	Wire	22/06/080/C21/C21
W189	Wire	22/01/130/C21/C21
W190	Wire	22/07/090/C21/C21
W191	Wire	22/09/130/C21/C21
W193	Wire	22/01/070/C21/C21
W194	Wire	22/02/180/C21/C21
W195	Wire	22/02/100/C21/C21
W196	Wire	22/02/080/C21/C21
W197	Wire	22/04/060/C21/C21
W198	Wire	22/05/120/C21/C21

[PA UNIT]

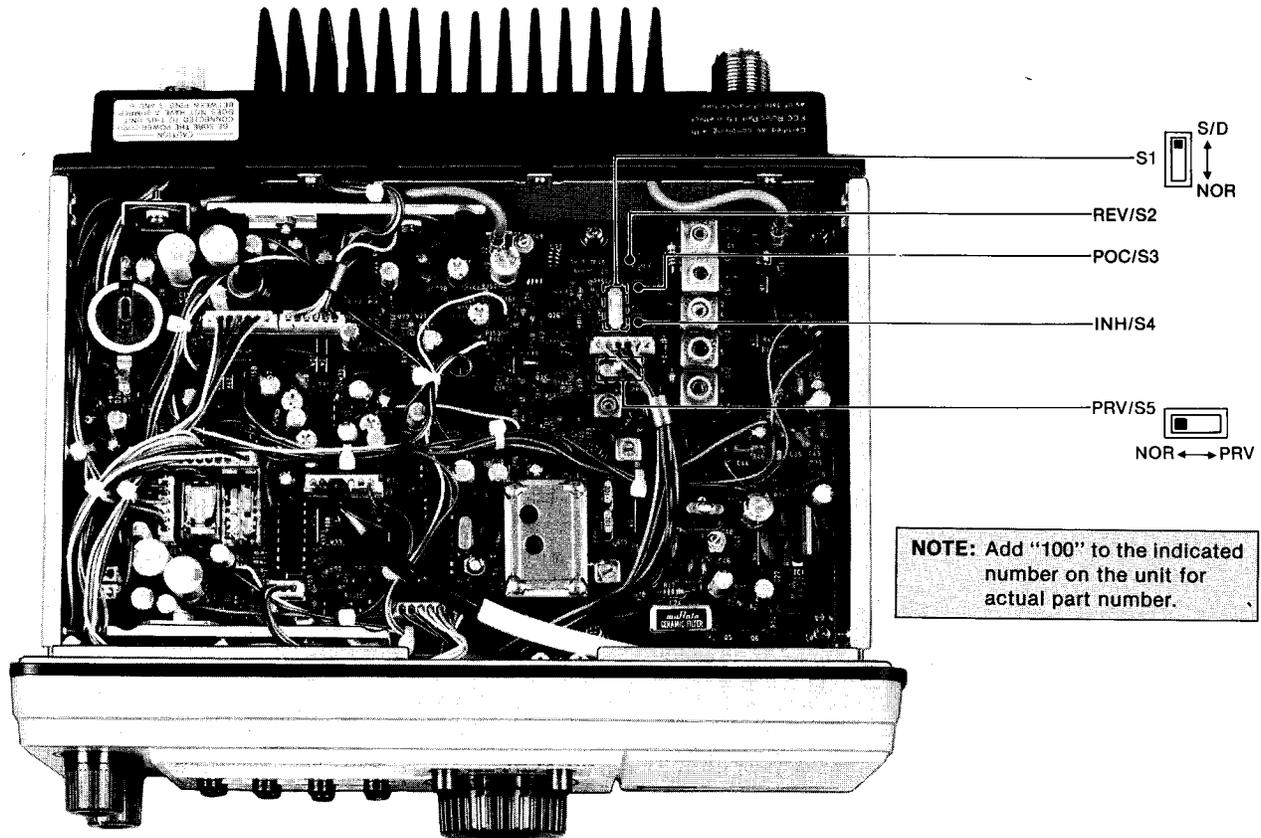
REF. NO.	DESCRIPTION	PART NO.
IC401	IC	M57710-A
D401	Diode	MI402
D402	Diode	MI402
D403	Diode	MI301
D404	Diode	1SS97
D405	Diode	1SS97
D406	Diode	15CD11
L401	Coil	LW-19
L402	Coil	LA-121
L403	Coil	LA-71
L404	Coil	LA-71
L405	Coil	LW-7

[PA UNIT]

REF. NO.	DESCRIPTION	PART NO.
R401	Resistor	1.5kΩ R25
R402	Resistor	220Ω R25
R403	Resistor	1kΩ R25
R404	Resistor	220Ω R25
R405	Resistor	330Ω R25
R406	Trimmer	100Ω RH0651C12J04A
C401	Ceramic	22pF 500V
C402	Ceramic	39pF 500V
C403	Ceramic	3pF 500V
C404	Ceramic	6pF 500V
C405	Ceramic	0.5pF 500V
C406	Ceramic	33pF 500V
C407	Ceramic	0.0047μF 50V
C408	Ceramic	0.0047μF 50V
C409	Ceramic	220pF 50V
C410	Ceramic	15pF 500V
C411	Ceramic	220pF 50V
C412	Ceramic	220pF 50V
C413	Ceramic	0.0047μF 50V
C414	Electrolytic	47μF 16V
C415	Ceramic	0.0047μF 50V
C416	Ceramic	0.0047μF 50V
C417	Ceramic	220pF 50V
C418	Ceramic	0.0047μF 50V
C419	Ceramic	0.0047μF 50V
C420	Ceramic	220pF 50V
J401	Connector	1261P 6P
J402	Connector	FM-MDRmi
P401	Connector	TMP-P01X-A1
P402	Connector	TMP-P01X-A1
P403	Connector	EHR-3
P404	Connector	EHR-6
EP401	P.C. Board	B-1278
EP402	Ferrite Bead	FSQH090RN
EP404	Ferrite Bead	FSQH081RL
EP405	Ferrite Bead	FSQH081RL
W401	Wire	31/05/210/B06/W03
W402	Wire	31/00/130/B06/W03
W403	Wire	31/08/150/B06/W03
W404	Wire	31/01/215/B06/W03
W405	Wire	31/05/190/A05/B06
W406	Wire	31/04/135/B06/W03
W407	Wire	31/03/100/W03/W03
W408	Wire	31/03/145/B06/W03
W409	Wire	31/06/190/A05/B06
W410	Wire	32/03/075/A05/W02
W411	Wire	32/00/060/A05/W02
W412	Wire	31/00/065/A05/W02
W413	Wire	31/00/065/A05/W02
W414	Wire	31/00/050/W03/W03
W415	Coaxial	{ 62/99/125/C31/W13A
W416		{ 08 A
W417	Coaxial	{ 62/99/090/C31/W13A
W418		{ 08 A
W419	Wire	32/03/085/W03/W04
W421	Wire	73/98/015/X98/X98

## **SUPPLEMENTAL FUNCTIONS**

## INTERNAL SWITCHES



The following are instructions for supplemental functions using internal switches.

Turn OFF power to the transceiver and remove the plastic transceiver body from the chassis before programming the following functions.

### 1. HOW TO PROGRAM LOW OUTPUT POWER ON A CHANNEL

- 1) Push the [DIAL] SWITCH on the front panel.
- 2) Select the desired channel for LOW power you wish to program using the CHANNEL SELECTOR.
- 3) Push the POC (Power Output Control) SWITCH (S3) on the MAIN UNIT.
  - "LOW" appears on the FUNCTION DISPLAY.
  - The transceiver is in LOW power mode.
  - The [HI/LO] SWITCH on the front panel does not function in the channel.
- 4) To cancel POC, push the POC SWITCH again.
  - "LOW" disappears from the FUNCTION DISPLAY.
  - Output power can be selected by the [HI/LO] SWITCH.

**NOTE:** Specified channels programmed with low power only cannot output at high power.

### 2. HOW TO INHIBIT OPERATION ON A CHANNEL

#### (1) PROGRAMMING THE INHIBIT CHANNEL

- 1) Place the PRV (Private) SWITCH (S5) in the NOR (normal) position.
- 2) Push the [DIAL] SWITCH on the front panel.
- 3) Select the desired channel you wish to inhibit using the CHANNEL SELECTOR.
- 4) Push the INH (Inhibit) SWITCH (S4) on the MAIN UNIT.
  - "— —" appears on the FUNCTION DISPLAY.
  - The channel is now inhibited.
- 5) Rotate the CHANNEL SELECTOR to confirm that the inhibit channel is not selected.

## (2) CANCELLING THE INHIBIT CHANNEL

- 1) Push the [DIAL] SWITCH on the front panel.
- 2) Place the PRV SWITCH (S5) in the PRV position.
- 3) Select the inhibited channel using the CHANNEL SELECTOR.
- 4) Push the INH SWITCH (S4).
  - “— —” appears and blinks on the FUNCTION DISPLAY.
- 5) Return the PRV SWITCH from the PRV to NOR position.
- 6) Rotate the CHANNEL SELECTOR to confirm that the inhibit channel is cancelled.

## 3. HOW TO PROGRAM PRIVATE CHANNELS INTO A MEMORY CHANNEL

- 1) Place the PRV SWITCH (S5) on the MAIN UNIT in the PRV position.
- 2) Push the [FUNCTION] SWITCH on the front panel, and push and hold the [MR] SWITCH for more than 2 seconds. **NOTE** that the [MR] SWITCH should be pushed just after the [FUNCTION] SWITCH is pushed.
  - “MEMO” and memory channel appear on the FUNCTION DISPLAY, and “MEMO” blinks.
- 3) Select the desired memory channel you wish to program using the CHANNEL SELECTOR.
- 4) Push the [FUNCTION] SWITCH.
  - The channel number blinks.
- 5) Select the desired private channel number using the CHANNEL SELECTOR.
- 6) Push the [FUNCTION] SWITCH.
  - Blinking of the channel number stops.
- 7) Return the PRV SWITCH to the NOR position.
  - The programmed private channel can be used when the MEMORY MODE is selected.

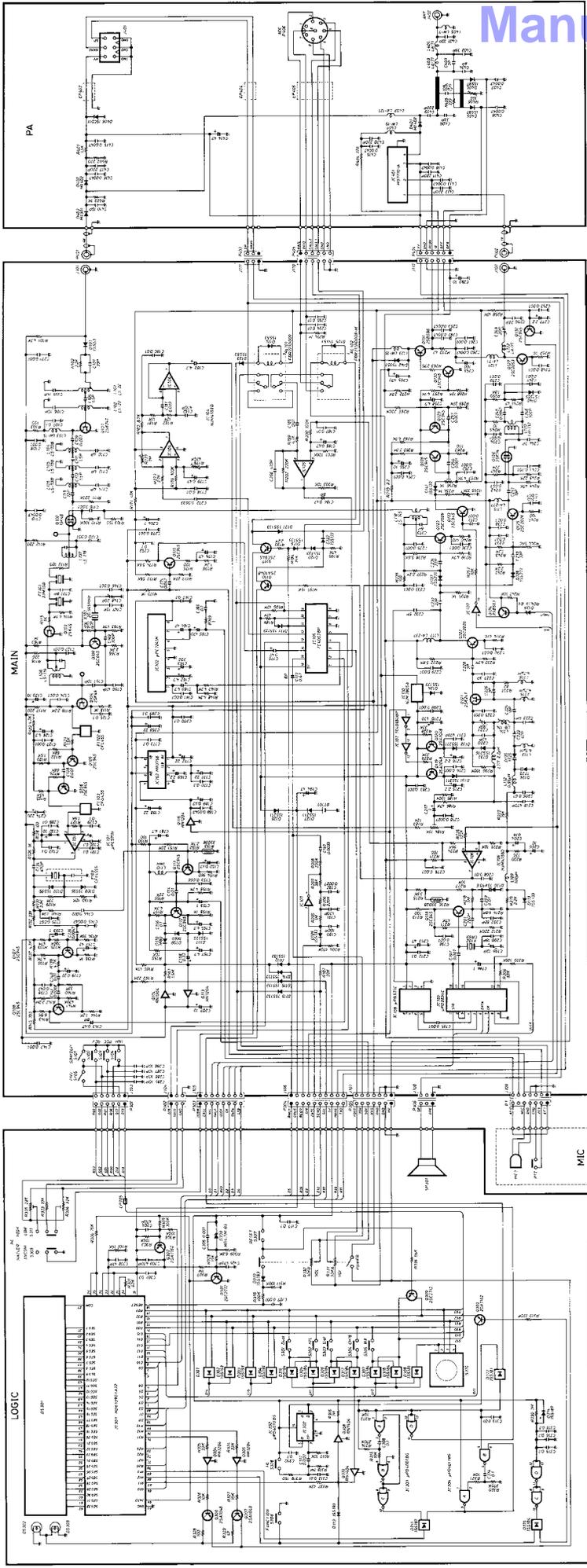
## 4. HOW TO CHANGE THE DUPLEX CHANNEL TO SIMPLEX AND PROGRAM INTO A MEMORY CHANNEL

- 1) Push the [DIAL] SWITCH.
- 2) Push the [FUNCTION] SWITCH on the front panel, and push and hold the [MR] SWITCH for more than 2 seconds. **NOTE** that the [MR] SWITCH should be pushed just after the [FUNCTION] SWITCH is pushed.
  - “MEMO” and memory channel appear on the FUNCTION DISPLAY, and “MEMO” blinks.

- 3) Select the desired memory channel you wish to program using the CHANNEL SELECTOR.
- 4) Push the [FUNCTION] SWITCH.
  - The channel number blinks.
- 5) Select the desired duplex channel you wish to change to simplex mode, using the CHANNEL SELECTOR.
- 6) The S/D SWITCH (S1) should be in the NOR position.
- 7) Push the [FUNCTION] SWITCH.

## 5. HOW TO REVERSE THE FREQUENCIES BETWEEN RECEIVE AND TRANSMIT ON A DUPLEX CHANNEL, AND STORE IN A MEMORY CHANNEL

- 1) Push the [DIAL] SWITCH on the front panel.
- 2) Select the desired duplex channel you wish to reverse.
- 3) Push and hold the REV SWITCH (S2) on the MAIN UNIT until item 9) is completed.
- 4) Push the [FUNCTION] SWITCH on the front panel, and push and hold the [MR] SWITCH for more than 2 seconds. **NOTE** that the [MR] SWITCH should be pushed just after the [FUNCTION] SWITCH is pushed.
  - “MEMO” and memory channel number appear on the FUNCTION DISPLAY, and “MEMO” blinks.
- 5) Select the desired memory channel you wish to program using the CHANNEL SELECTOR.
- 6) Push the [FUNCTION] SWITCH.
  - The channel number blinks.
- 7) Select the desired duplex channel number using the CHANNEL SELECTOR.
- 8) Push the [FUNCTION] SWITCH.
- 9) Release the REV SWITCH.
- 10) To change the REVERSE FUNCTION to the normal condition, simply program the memory channel with the desired duplex channel following the procedure in the OWNER'S MANUAL.



IC-M100 SCHEMATIC DIAGRAM



# Technical

# Bulletin



## MI00

## VHF MARINE TRANSCEIVER

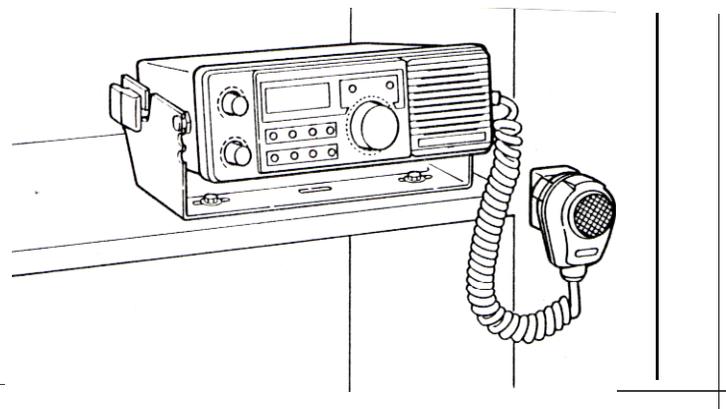
### MIC MOD

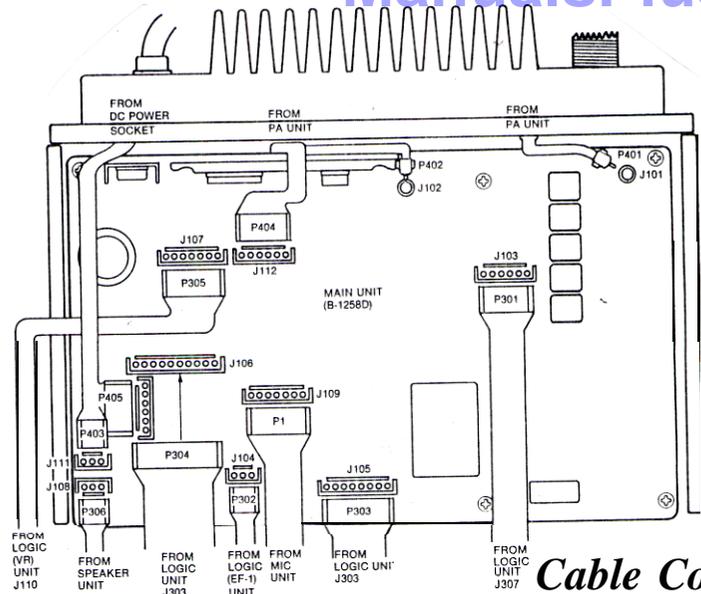
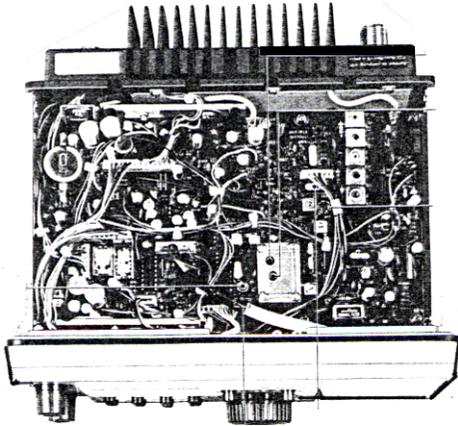
Gjkw2/14/01

The original HM29 and HM30 microphones are no longer available. The MI00 can be modified to accept a replacement HM114 hand microphone.

- 1- Remove 6 screws on back of MI00 holding the case in place and slide off the case.
- 2- Unplug the old mic from the MAIN board and remove
- 3- Unplug coax jacks from P401, P402, P403, P404, P405
- 4- Unplug the other 9 interboard connectors, remove screws holding board down and remove board.
- 5- Turn board over to view circuit side
- 6- Unsolder J9 (use extreme care to avoid board damage)
- 7- Replace J9 with a (#936-05432) connector (make sure pins align 1 for 1 etc)
- 8- On bottom of MAIN board, jumper pin #1 to pin #7 on J9
- 9- Cut circuit trace by J9 as indicated, this removes "GND" from pin 6 (see sketch).
- 10- Sleeve ends of a 4.7K resistor (#915-01171) and install between pin 5 of J9 and the GND side of the above cut trace.
- 11- Reinstall MAIN board and all previously removed connectors and screws
- 12- Thread new mic cord into radio, snug mic cord restraint into notch on side of chassis and plug into J9. The small 2 pin connector on the HM114 is not needed.

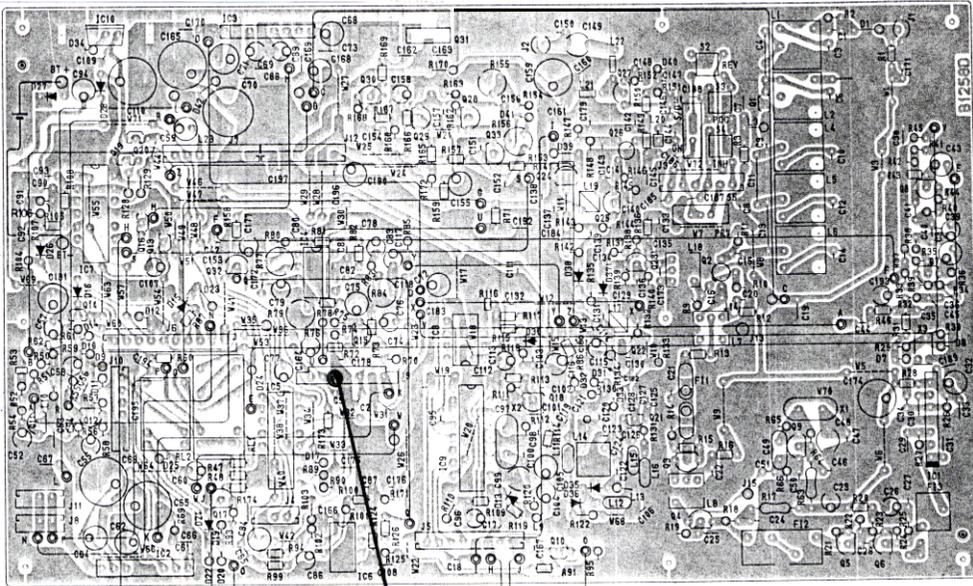
**Note:** Up/Down buttons will not function on the new mic.





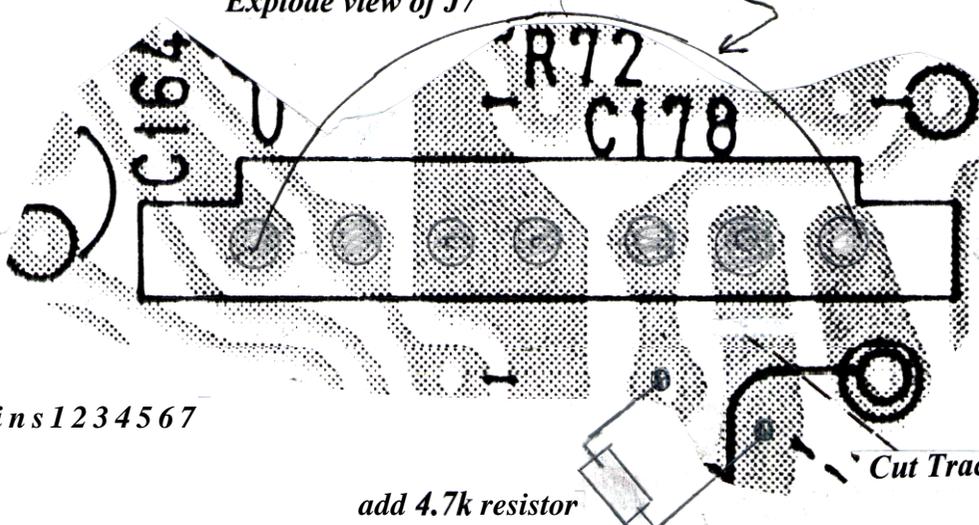
Cable Connections

MAIN BOARD



Explode view of J7

Jumper



J7

Pins 1234567

add 4.7k resistor