



# SERVICE MANUAL

## IC-M700TY

HF TRANSCEIVER

ICOM INCORPORATED



## INTRODUCTION

This service manual contains information relative to the theoretical, physical, mechanical and electrical characteristics of the **IC-M700TY** HF TRANSCEIVER.



## ASSISTANCE

If you require assistance or further information regarding the operation and capabilities of the **IC-M700TY**, 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., IC1012, Q801)
3. Printed circuit board name and number (e.g., FILTER UNIT/B-888C)
4. Part number and name (e.g., 2SC1971 Transistor)
5. Quantity required

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## SECTION 1 SPECIFICATIONS

### 1-1 GENERAL

Frequency coverage	: Receive : 1.6MHz~23.9999MHz Transmit: 2.0MHz~ 2.9999MHz 4.0MHz~ 4.9999MHz 6.0MHz~ 6.9999MHz 8.0MHz~ 8.9999MHz 12.0MHz~13.9999MHz 16.0MHz~17.9999MHz 22.0MHz~22.9999MHz
Frequency control	: CPU based 100Hz step digital PLL synthesizer. Independent transmit/receive frequency programmable on any band.
Frequency readout	: 6 digit 100Hz readout
Frequency stability	: Less than $\pm 10$ Hz in the range $-30^{\circ}\text{C}\sim +60^{\circ}\text{C}$
Memory channel capacity	: 64 simplex or semi-duplex channels (owner programmable)
Power supply requirements	: DC 13.6V $\pm 15\%$ (negative ground) Current drain 30A max. AC power supply available for AC operation.
Current Drain	: Receiving Standby : 1.2A Max. audio output: 1.6A Transmitting Maximum : 30A
Antenna impedance	: 50 ohms unbalanced
Weight	: 7.3kg (16.1 lb)
Dimensions	: 287(297)mm(W) $\times$ 112(124)mm(H) $\times$ 356(376)mm(D) Bracketed values include projections.

### 1-2 TRANSMITTER

Emission modes	: J3E (A3J) USB, LSB H3E (A3H) AM A1A (A1) CW F1A (F1) FSK
RF output power	: 150W
Spurious emissions	: 65dB below peak power output.
Carrier suppression	: 50dB
Unwanted sideband	: $-55$ dB with 1000Hz AF input.
Microphone	: 600 $\Omega$ , noise cancelling microphone with push-to-talk switch.

### 1-3 RECEIVER

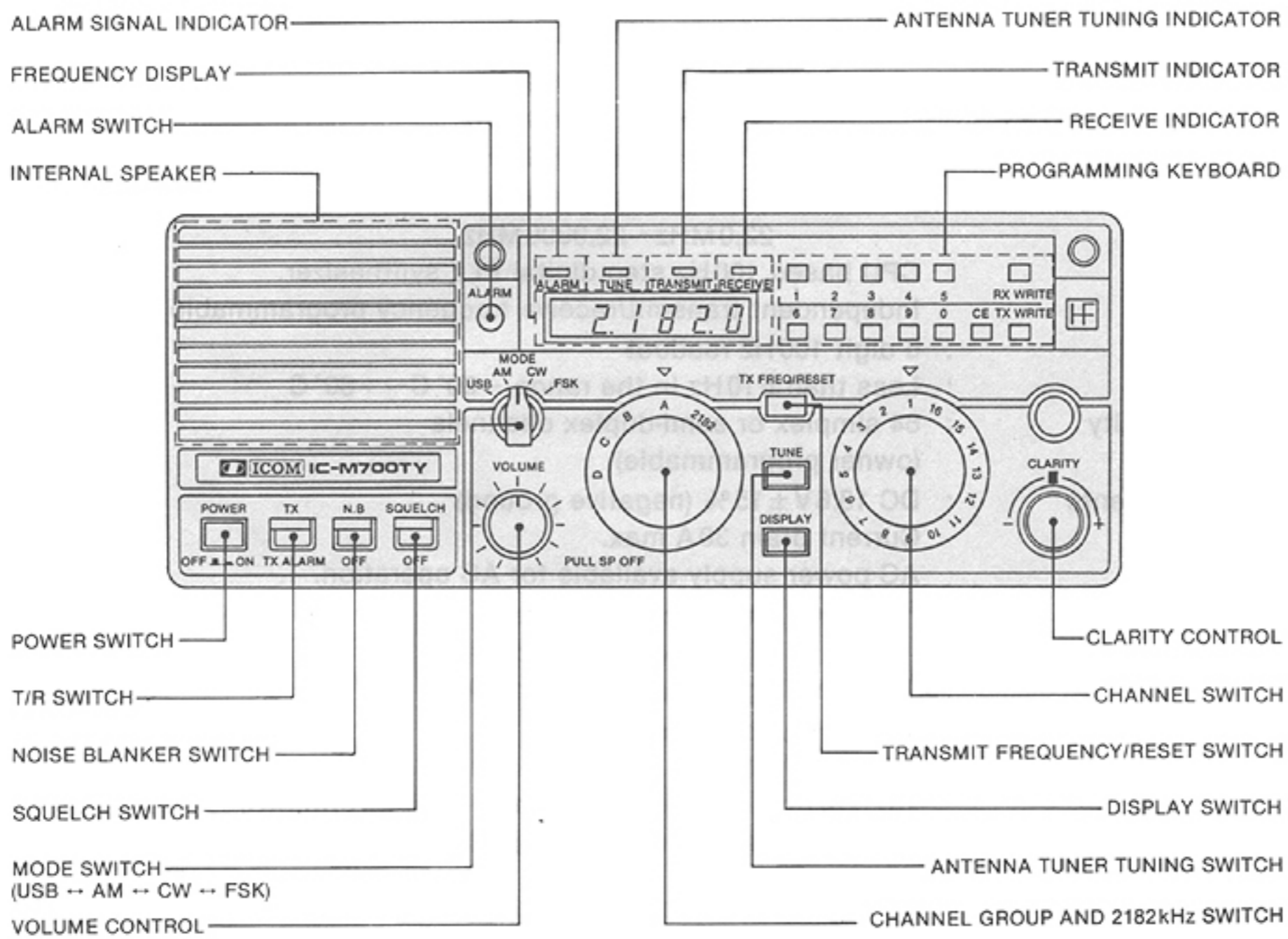
Receive system	: Double conversion superheterodyne
Receive modes	: J3E (A3J) USB, LSB A3E (A3) AM A1A (A1) CW F1A (F1) FSK
Intermediate frequencies	: SSB, CW, FSK 1st 70.4515MHz 2nd 9011.5kHz AM 70.4500MHz 9010.0kHz
Sensitivity	: SSB, CW, FSK 0.5 $\mu\text{V}$ for 12dB SINAD AM 2.0 $\mu\text{V}$ for 12dB SINAD
Selectivity	: SSB 2.3kHz/ $-6$ dB, 4.2kHz/ $-60$ dB AM 6.0kHz/ $-6$ dB, 20.0kHz/ $-60$ dB CW, FSK* 0.5kHz/ $-6$ dB, 1.6kHz/ $-60$ dB
Spurious and image rejection	: 70dB
Clarity control range	: $\pm 150$ Hz
Audio output	: 5W into 4 $\Omega$ with 10% distortion
AF output impedance	: 2~8 $\Omega$

\*Bandwidth for 170Hz shift FSK operation. Internal switches available for 425Hz and 850Hz shift FSK operation.

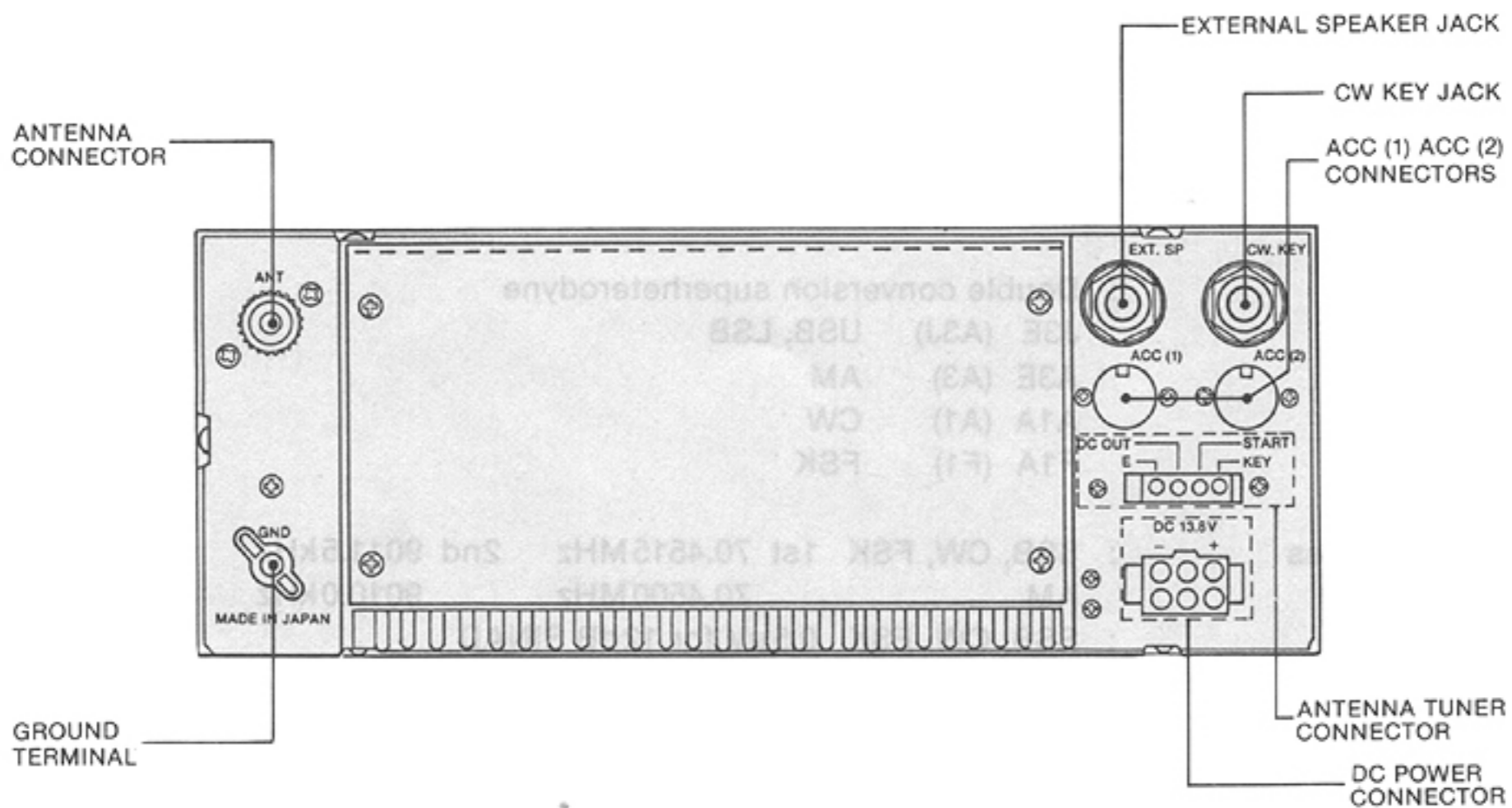


## SECTION 2 OUTSIDE AND INSIDE VIEWS

### 2-1 FRONT PANEL



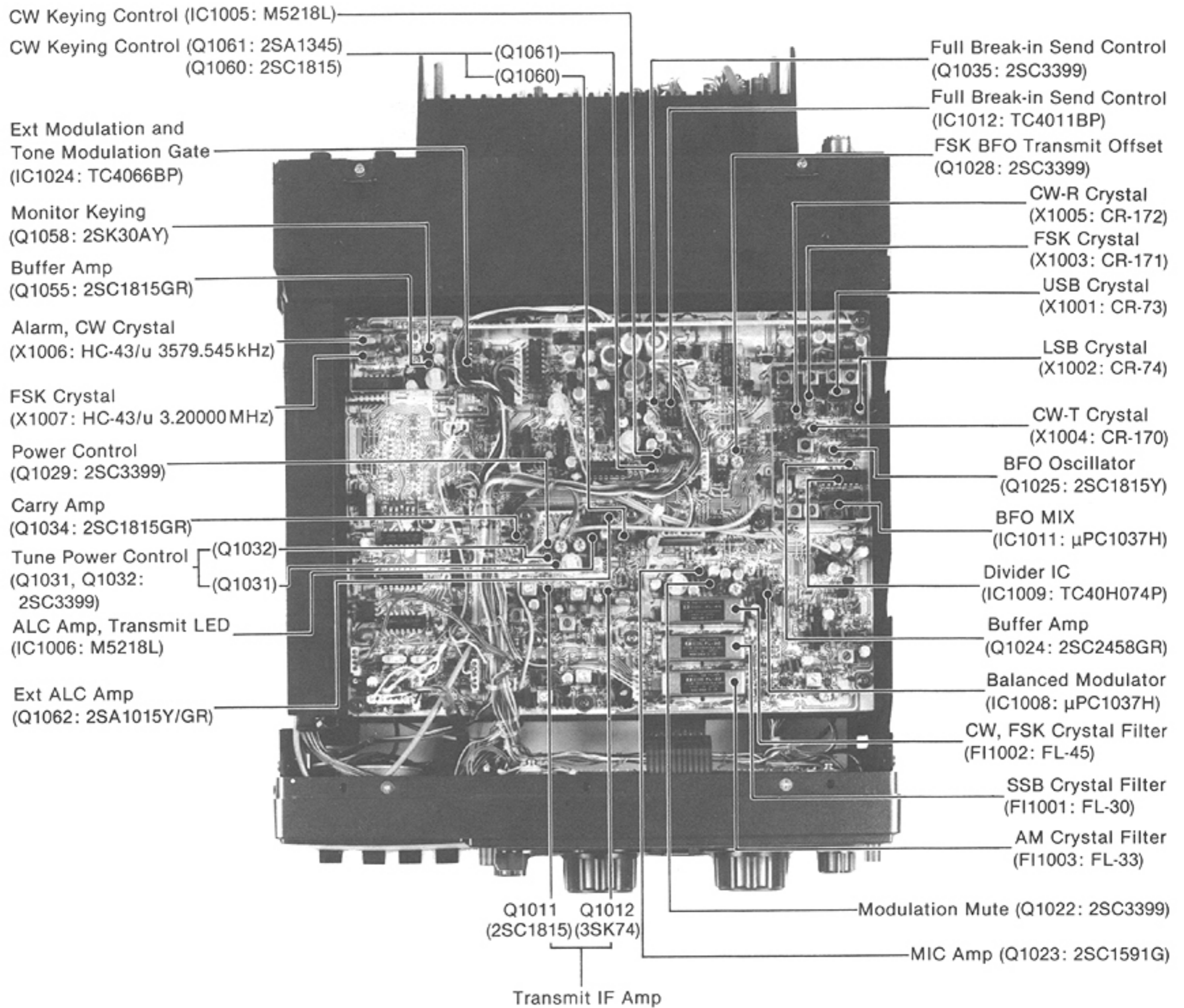
### 2-2 REAR PANEL





## 2-3 INSIDE TOP VIEW (MAIN UNIT)

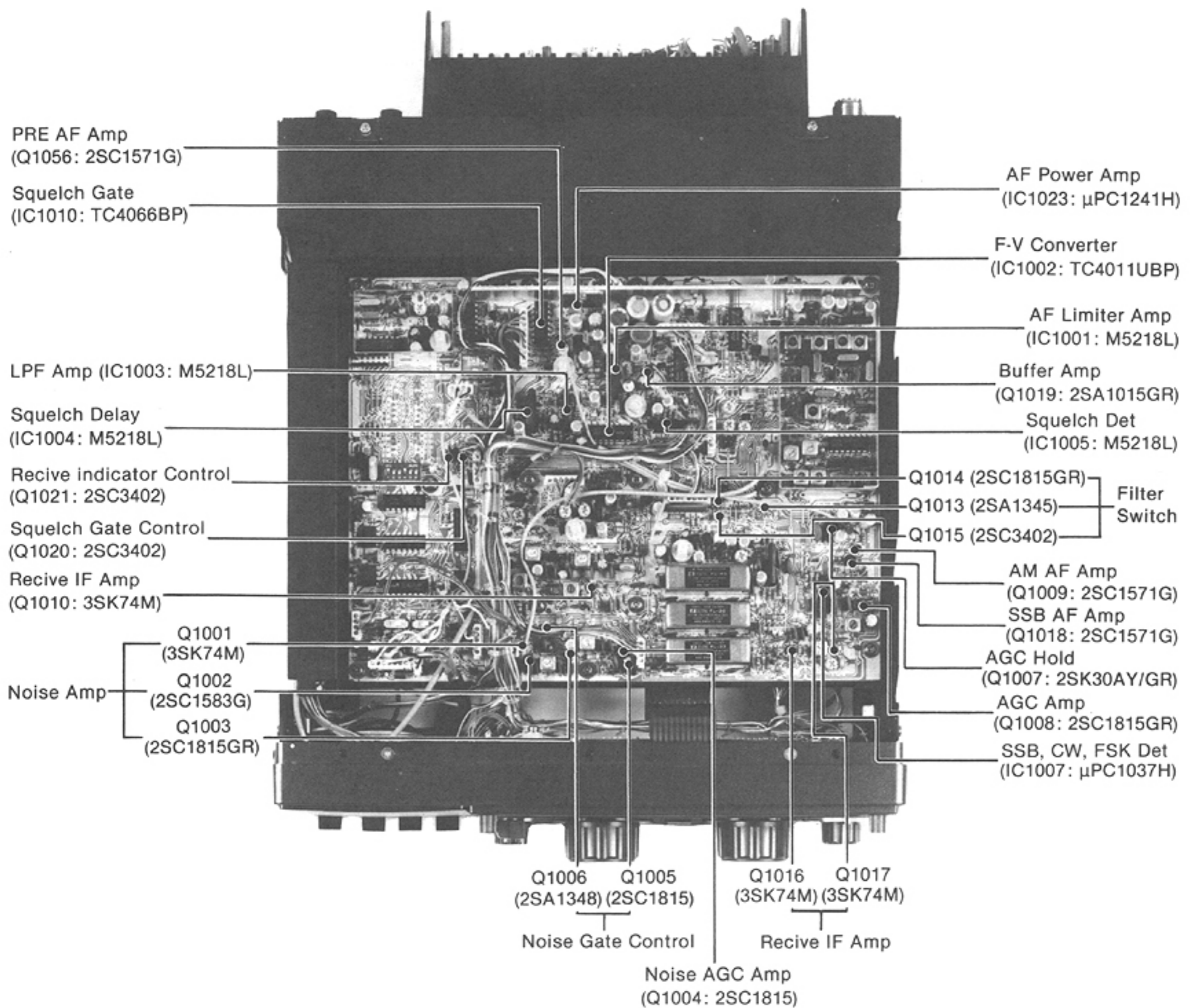
### • TRANSMIT MODE





## 2-4 INSIDE TOP VIEW (MAIN UNIT)

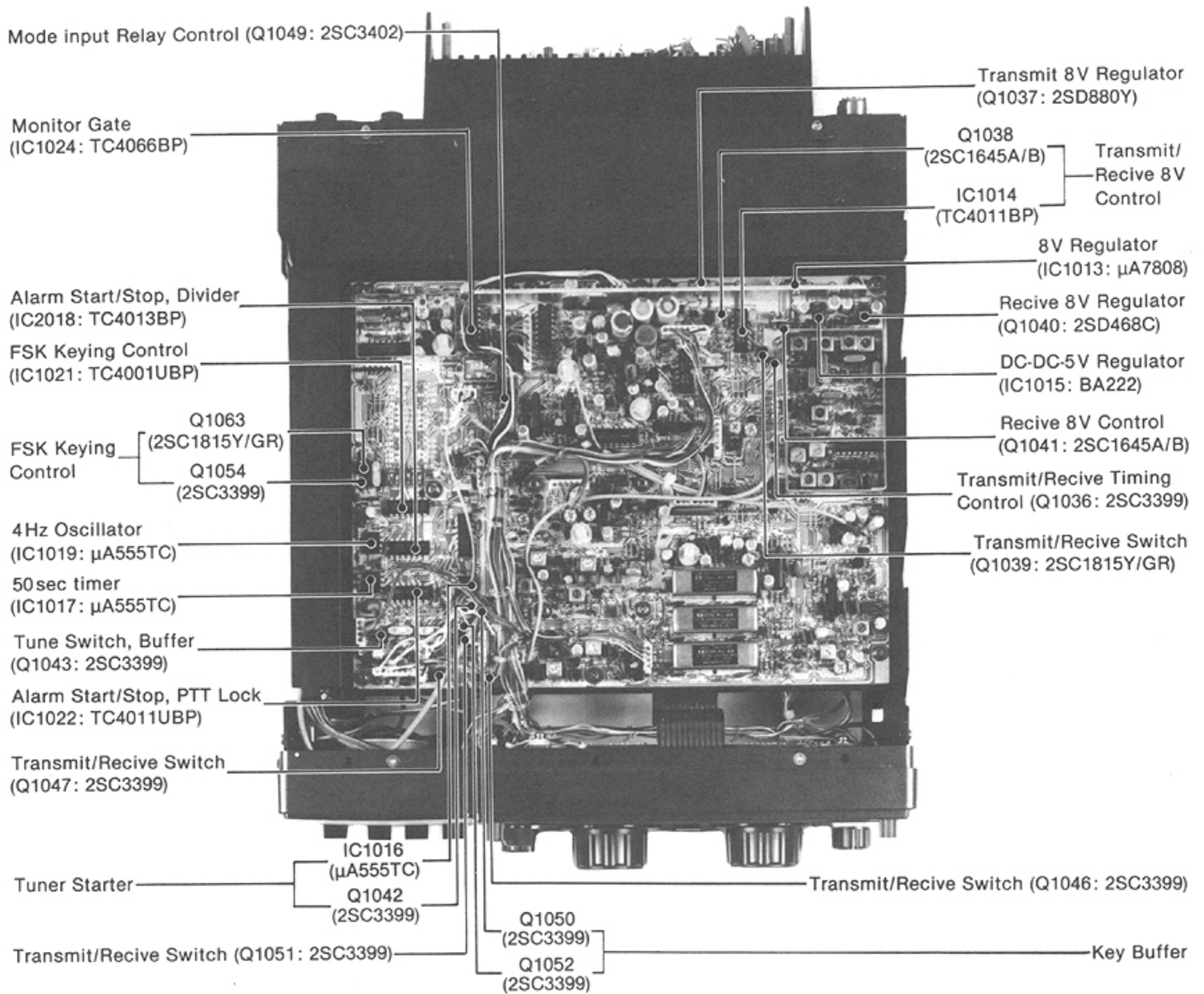
### • RECEIVE MODE





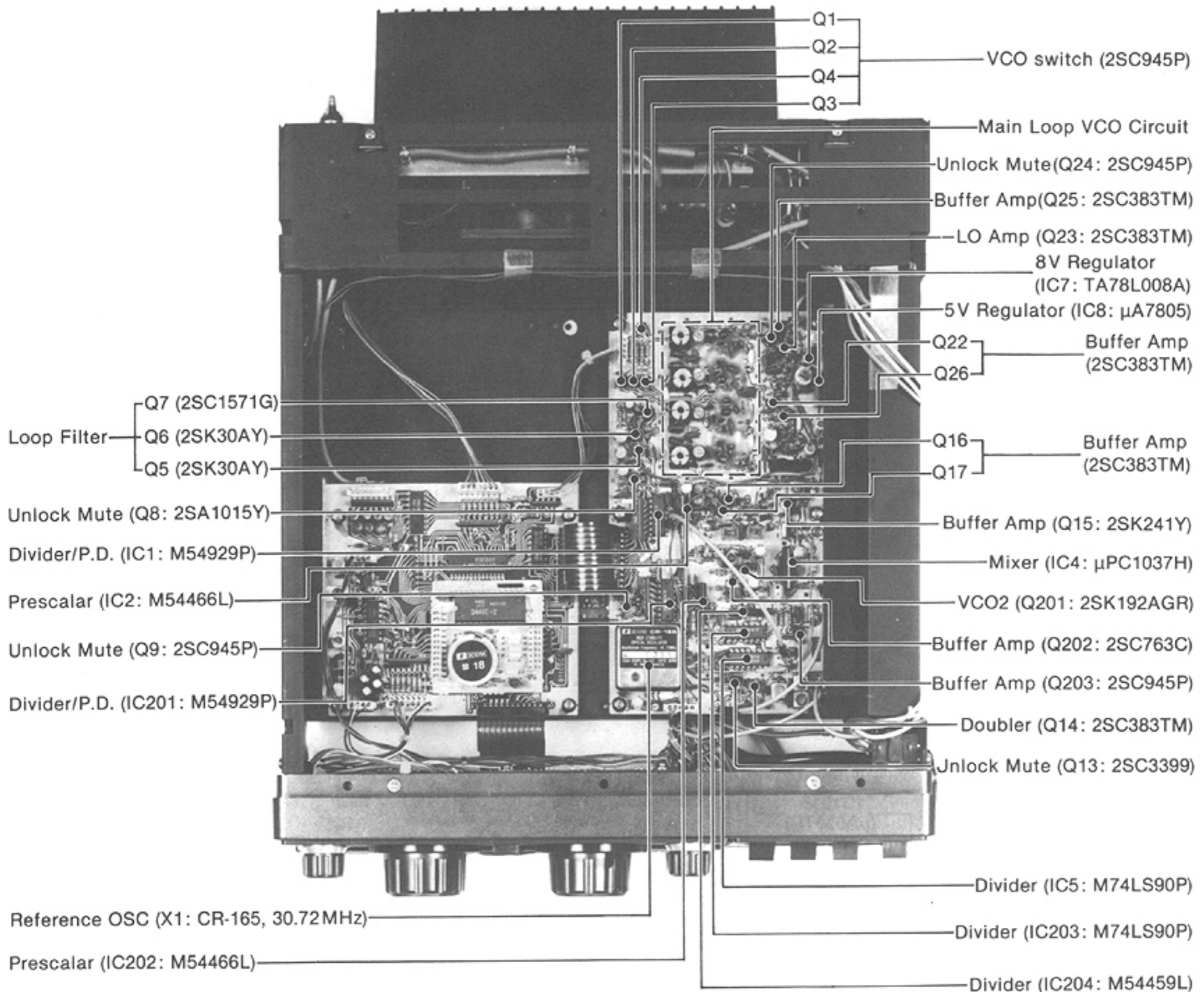
## 2-5 INSIDE TOP VIEW (MAIN UNIT)

### • MISCELLANEOUS



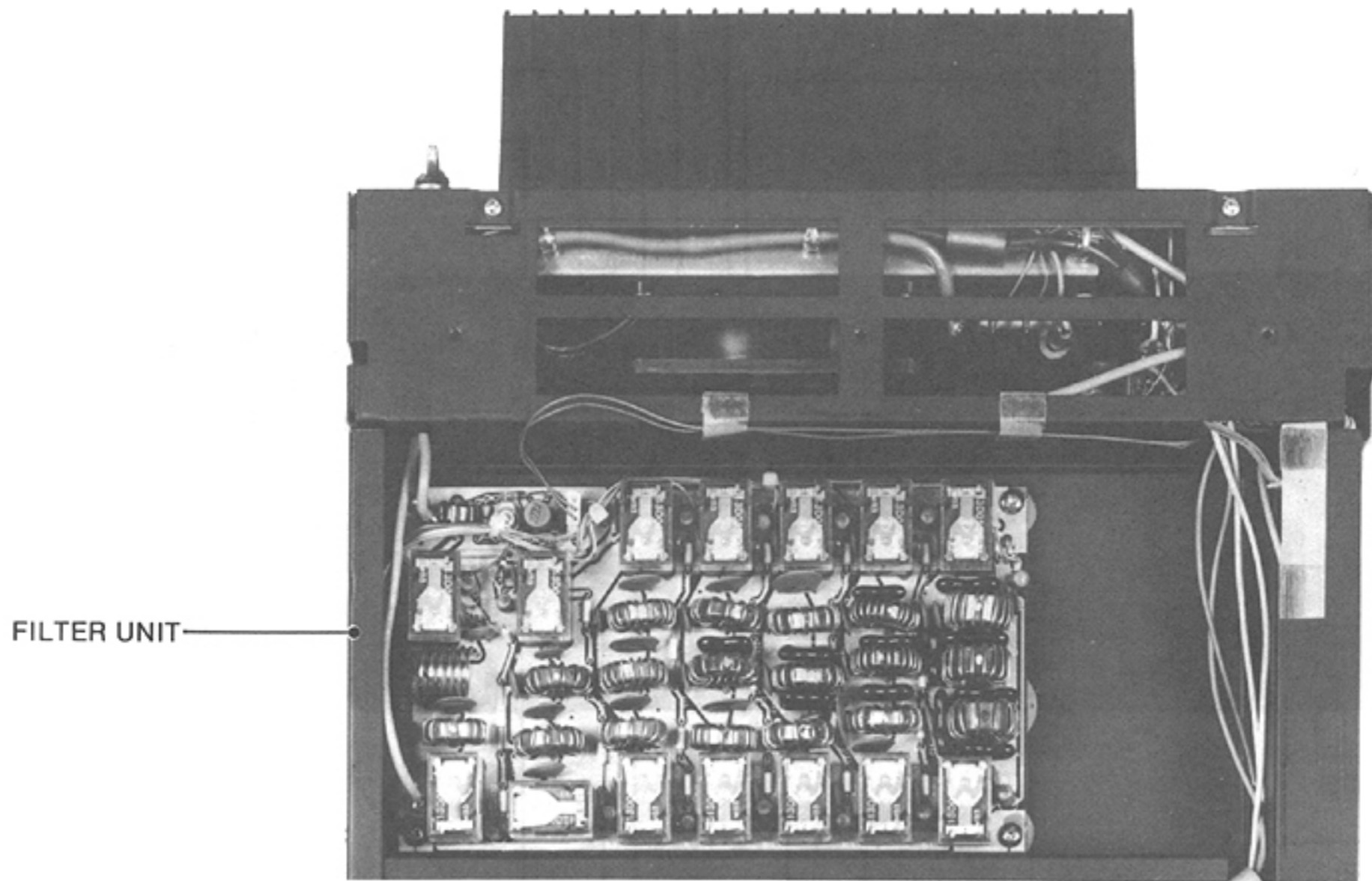


**2-6 INSIDE BOTTOM VIEW  
(PLL UNIT)**





2-7 INSIDE BOTTOM VIEW  
(LOGIC UNIT AND FILTER UNIT)

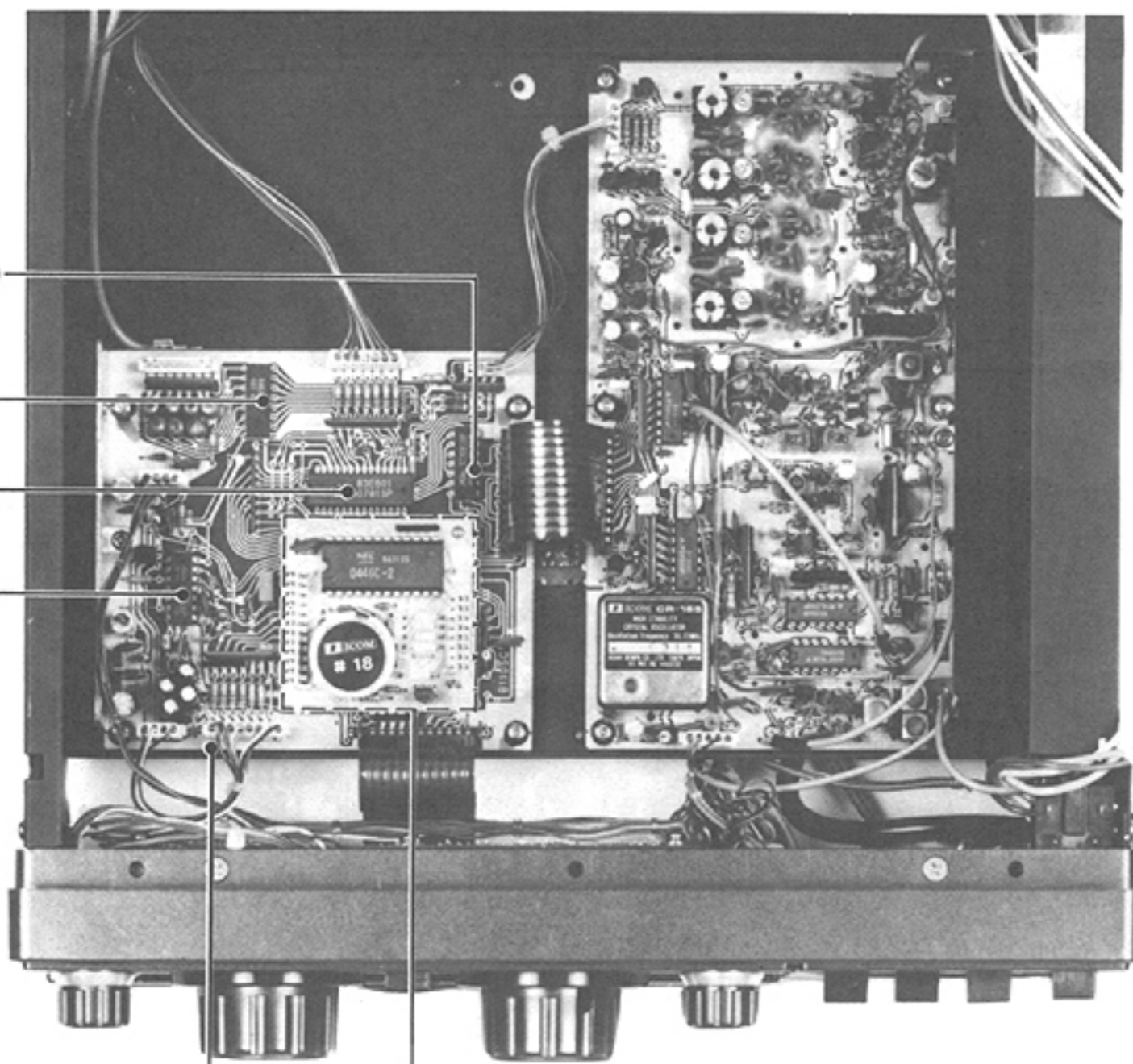


Gate (IC507: TC4081BP)

Filter Decoder  
(IC509: BA618)

I/O Port  
(IC506: M507815P)

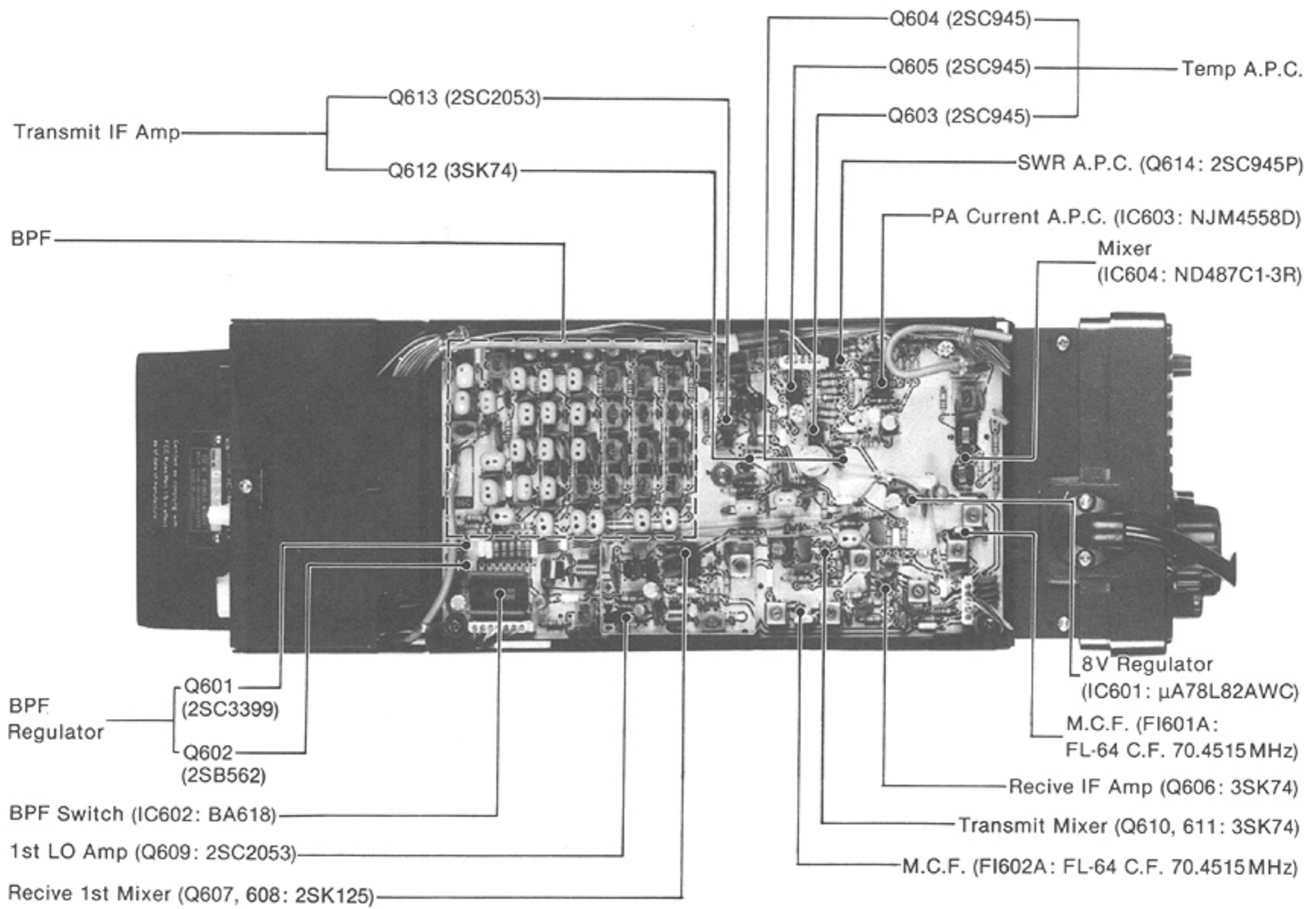
CPU Reset  
(IC508: TC4013BP)



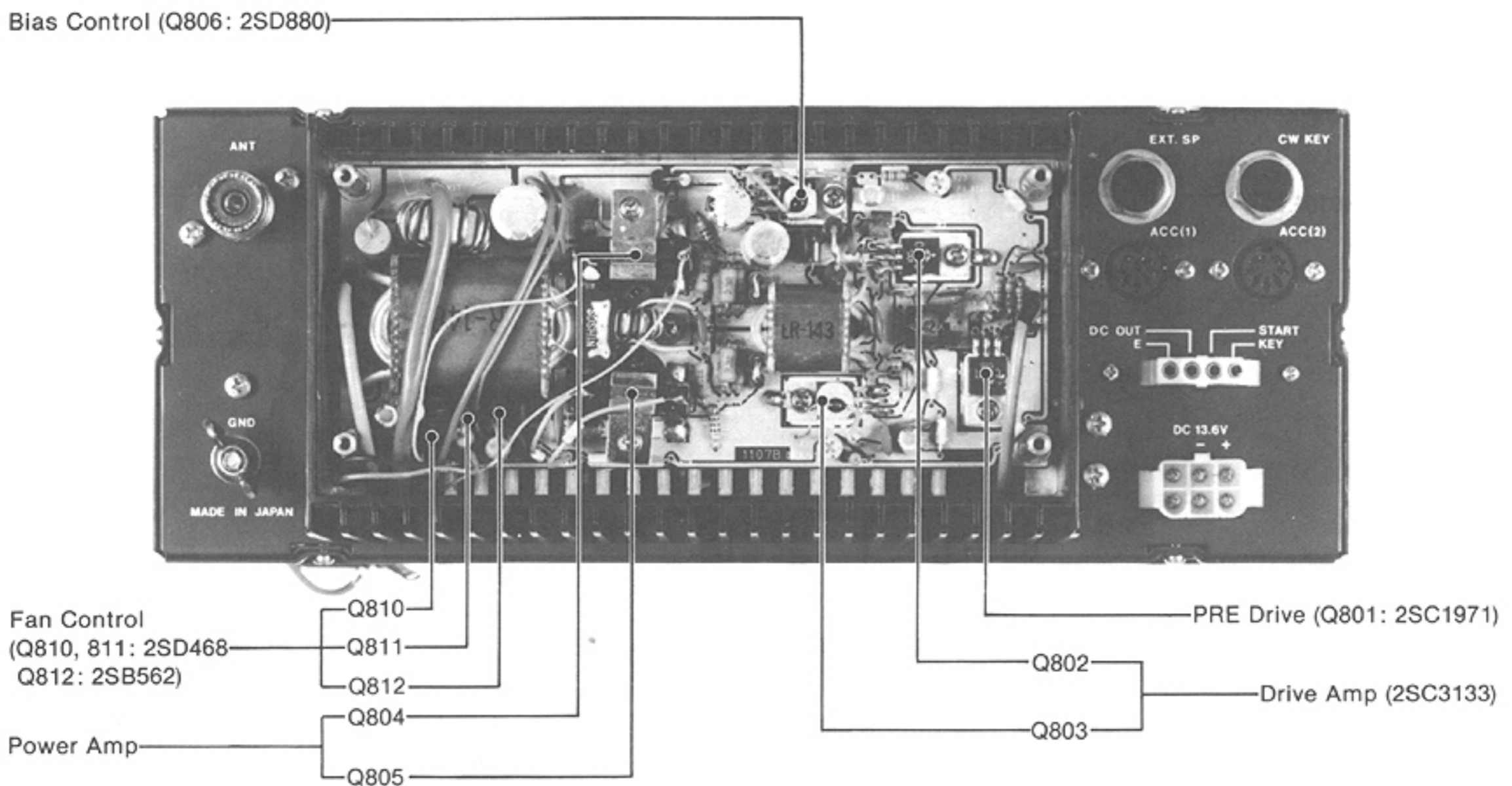
LOGIC UNIT    RAM UNIT



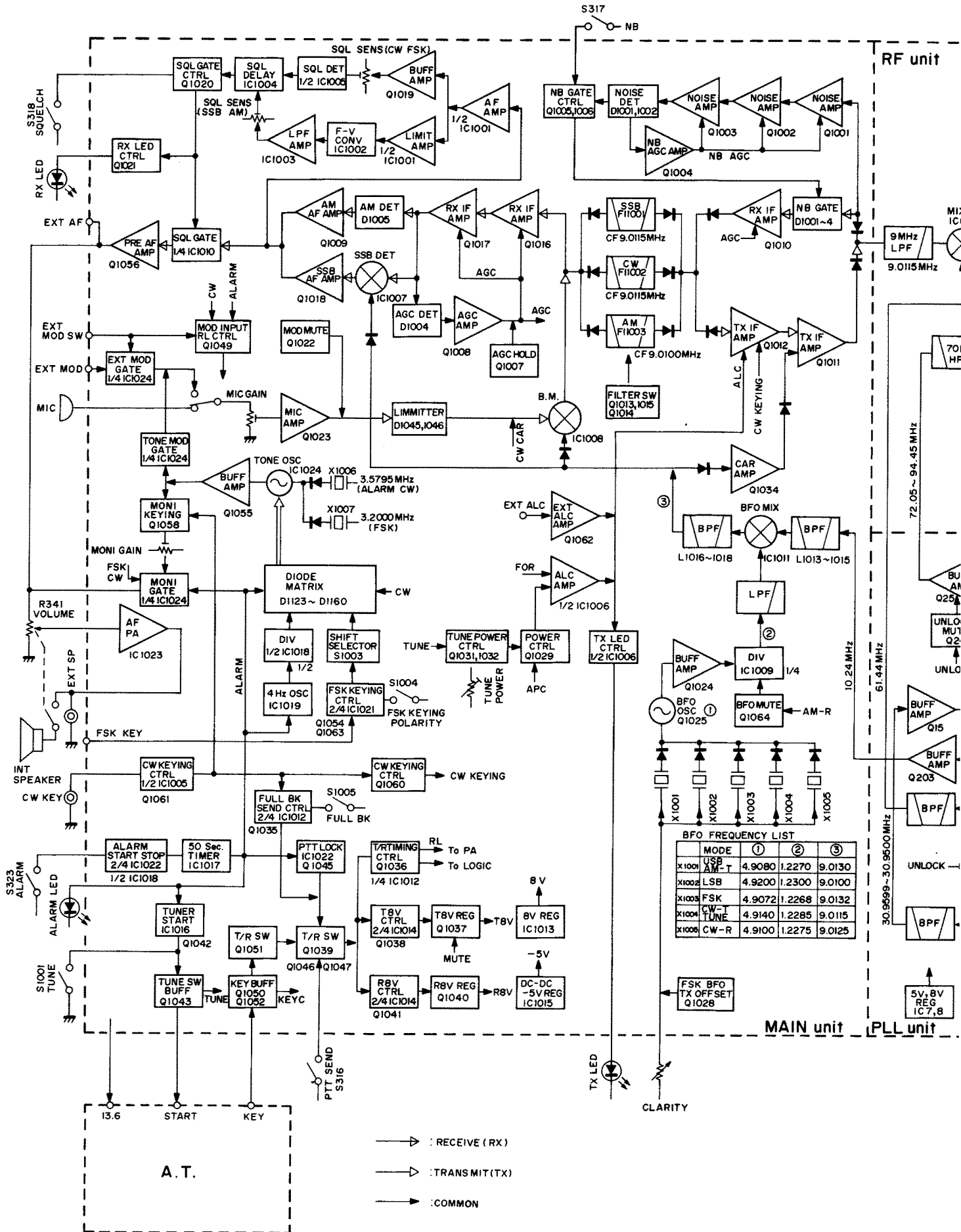
## 2-8 RF UNIT



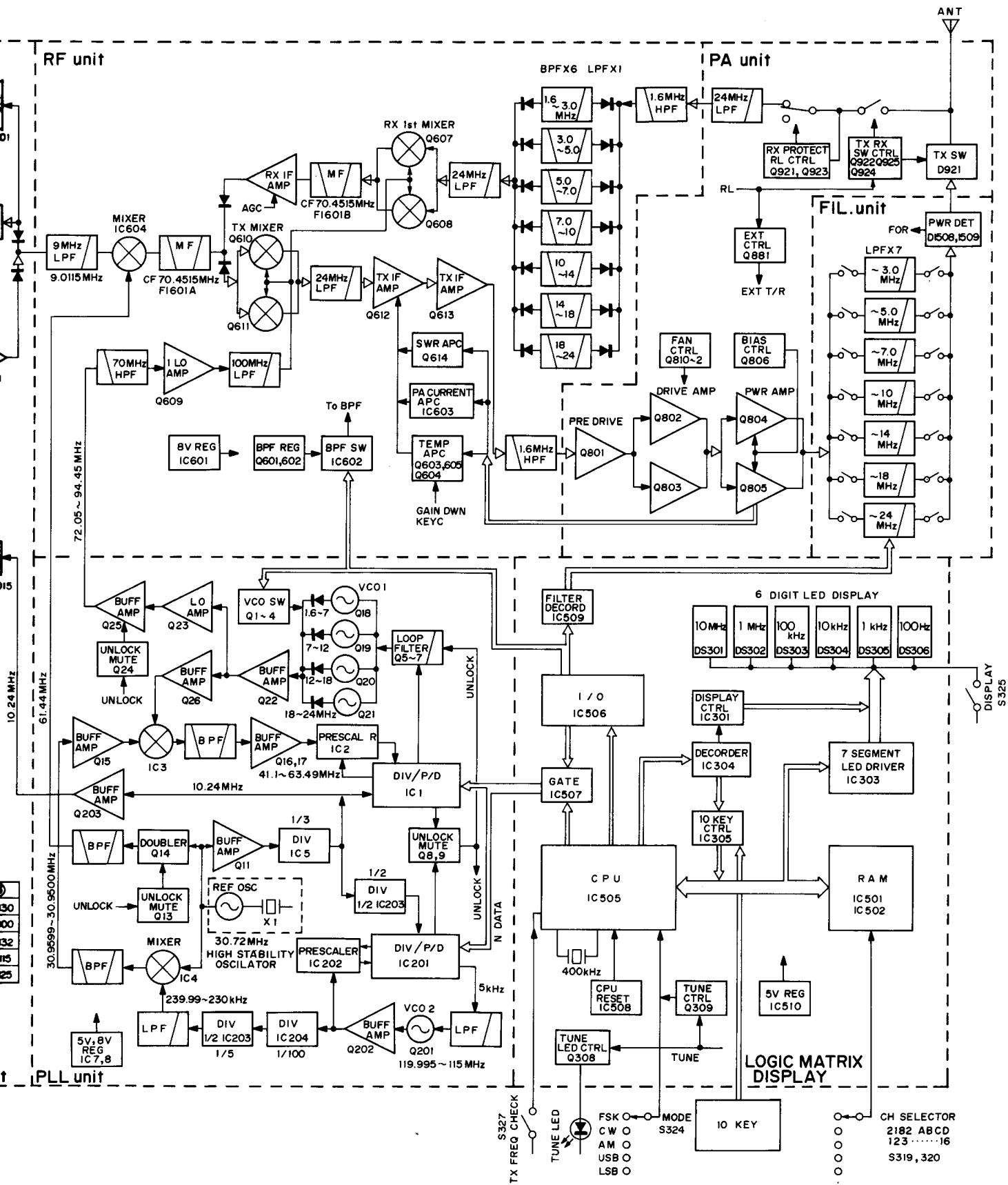
## 2-9 PA UNIT



# SECTION 3 BLOCK DIAGRAM







## SECTION 4 CIRCUIT DESCRIPTION

### 4-1 RECEIVER CIRCUITS

#### 4-1-1 RF CIRCUITS (RF UNIT)

The received signal is passed from J606 through the 1.6MHz high-pass filter consisting of L666~L668 and C736~C741. After the strong broadcast signals are removed, the signal passes the filter which is designed for passing the desired frequency. This filter is switched by D606~D619 from among 6 bandpass filters and 1 low-pass filter.

These 7 filters are designed for the following bands:

BAND	FILTER
1.6MHz~3.0MHz	B1
3MHz~ 5MHz	B2
5MHz~ 7MHz	B3
7MHz~ 10MHz	B4
10MHz~ 14MHz	B5
14MHz~ 18MHz	B6
18MHz~ 24MHz	B7

Then the interference of image frequency is removed and the 1st and 2nd local oscillator frequencies leaking to the ANT terminal are suppressed by the low-pass filter consisting of L620, L621, C638~C641, and C743. The signal is then fed to the 1st mixer.

The 1st mixer, featuring low noise and high dynamic range, consists of JFETs Q607 and Q608, and converts the receiving signal into the 1st IF signal of 70.4515MHz. The 1st local oscillator frequency (70.4515MHz higher than the receiving frequency) from the PLL unit passes the high-pass filter, is amplified by Q609, has its harmonics removed by the low-pass filter, and is applied to the gates of Q607 and Q608.

The signal, converted to 70.4515MHz, passes mechanical crystal filter FI601-B, is amplified by Q606, passes a receive/transmit switching diode D604 and a

mechanical crystal filter FI601-A, and is fed to the 2nd mixer.

The total passband of both FI601-A and FI601-B is  $70.4515\text{MHz} \pm 7.5\text{kHz} / -3\text{dB}$ . The AGC voltage is applied to the 2nd gate of Q606.

The 2nd mixer is a diode DBM (double balanced mixer), IC604 and is injected with the 2nd local oscillator frequency of 61.44MHz from the PLL UNIT. The 70.4515MHz IF signal is converted to the 2nd IF signal (9.0115MHz) and is fed to the MAIN UNIT.

#### 4-1-2 9.0115MHz IF CIRCUIT (MAIN UNIT)

The signal, converted to 9.0115MHz by the 2nd mixer in the RF UNIT, is amplified by Q1010 after the mixer's spurious components are removed by the double tuned circuit of L1005 and L1006.

FI1001 (SSB), FI1002 (CW, FSK), and FI1003 (AM) are crystal filters and their passbands are  $2.3\text{kHz} / -6\text{dB}$ ,  $500\text{Hz} / -6\text{dB}$  and  $6\text{kHz} / -6\text{dB}$ , respectively. Q1013~Q1015 switch among these three filters so that FI1001 (SSB) is selected when the mode switch is set to J3E (A3J), FI1002 (CW, FSK) is selected when the mode is A1A (A1) and FI1003 (AM) is selected when the mode is H3E (A3H).

Switching of filters during mode selection is carried out by Q1013~Q1015. During FSK reception, the filters must be switched according to the shift width of the reception signal.

Switching of the filters is carried out by changing the position of jumper (J1015). FI1002 (CW, FSK) must be selected when the shift width of the FSK reception signal is 170Hz, and FI1001 (SSB) must be selected when the shift width of the FSK reception signal is 425Hz or 850Hz.

The 2nd IF signal, amplified by Q1016 and Q1017, is fed to the detector and the AGC circuits.

#### 9.0115MHz IF CIRCUIT

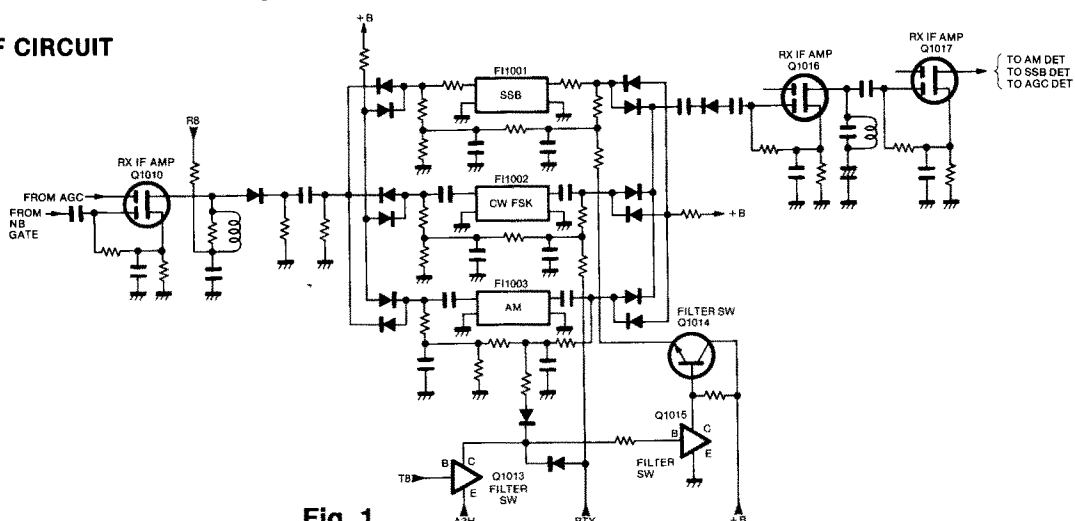


Fig. 1



#### 4-1-3 DETECTOR CIRCUIT AND AF PREAMPLIFIER

The J3E (A3J), A1A (A1) and F1A (F1) signals are converted to AF signals at IC1007 and amplified at the AF amplifier Q1018.

The H3E (A3H) signals are converted to an AF signal at the diode detector D1005 and amplified at the AF amplifier Q1009.

These outputs are fed to the audio controlled squelch circuit. During transmission the local oscillation signal applied to IC1007 from BFO is stopped by turning D1037 OFF. Also, during H3E (A3H) reception output of the signal from IC1007 is stopped by stopping the BFO oscillation.

#### 4-1-4 NOISE BLANKER CIRCUIT (MAIN UNIT)

A portion of the 2nd IF signal (9.0115MHz) from L1005 and L1006 is fed to the noise amplifier, Q1001~Q1003. This signal is amplified by approximately 80dB at Q1001, Q1002 and Q1003 and then rectified by D1001 and D1002. Q1004 is the AGC amplifier for the noise amplifiers and adjusts the gain of the noise amplifiers approximately 50dB.

The gate control circuit consists of Q1005~Q1006. This circuit turns the balanced noise gate consisting of D1011~D1014 ON and OFF by the voltage obtained from D1001 and D1002.

#### 4-1-5 AGC CIRCUIT (MAIN UNIT)

The reception signal amplified at Q1017 is rectified at D1004 and is then amplified at Q1008. When signals are not being received, the output voltage (AGC voltage) of Q1008 is set to approximately 4V by R1021 and R1022. During reception of signals, the output voltage (AGC voltage) of Q1008 drops.

The AGC time constant is set to the fast attack/slow release by R1027, R1026, C1019, and C1018.

When transmission is selected from reception, the AGC voltage output from Q1008 during reception is held by Q1007. This prevents AGC voltage fluctuation each time reception is selected when receive/transmit switching is carried out during a short time (for example, during full break-in operation).

#### 4-1-6 BFO CIRCUIT (MAIN UNIT)

The 9MHz local oscillator signal output from IC1011 (BFO mixer) is generated by mixing the signal obtained by dividing the 30.72MHz output of the PLL UNIT reference oscillator circuit (X1) into 1/3 and the 1.2MHz signal obtained by dividing the 4.9MHz output of the BFO circuit into 1/4.

The BFO circuit consists of X1001~X1005 and Q1025, and uses the necessary crystals in X1001~X1005 to oscillate frequencies in accordance with the various modes, reception and transmission.

The BFO circuit output is divided by 4 at IC1009 and becomes a 1.2MHz signal. This 1.2MHz signal and the 10.24MHz signal from the PLL UNIT are mixed at IC1011 to become the 9MHz local oscillation signal which is fed to IC1007 (SSB detector), IC1008 (balanced modulator) and Q1034 (carrier amplifier).

Varicaps (D1051, D1053, D1055, D1057 and D1060) are connected respectively in series to X1001~X1005. The DC voltage applied across these varicaps can be adjusted by the CLARITY CONTROL (R342) on the FRONT PANEL. This enables clarifier operation during reception.

For H3E (A3H) reception, the dividing operation of IC1009 is stopped to prevent beat reception.

A low-pass filter and double tuned circuit is connected to IC1011 (pin 3) to remove spurious signals from the output signal of IC1011.

#### 4-1-7 SQUELCH AND RECEIVE INDICATOR CIRCUITS (MAIN UNIT)

For A1A (A1) and F1A (F1) reception, the signal that has been detected and amplified is amplified at IC1001<sup>1/2</sup>, is further amplified at buffer amplifier (Q1019) and detected at IC1005<sup>1/2</sup>. A time constant is obtained at C1101 for holding the voltage detected at IC1005<sup>1/2</sup>. This detected voltage is then input to IC1004.

For J3E (A3J) and H3E (A3H) reception, the signal that has been detected and amplified is further amplified, oscillated and limited at IC1001<sup>1/2</sup>, and triggers the one shot multi vibrator comprising IC1002. The mean voltage of the output pulse signal of IC1002 is proportional to the number of pulses per unit time. (In other words, IC1002 operates as an F-V converter.)

The output signal from IC1002 passes through the low-pass filter (IC1003<sup>1/2</sup>) which filters frequencies approximately 3.5Hz and below, is further inverseamplified (gain set at 0dB) at IC1003<sup>1/2</sup>, full-wave rectified at D1006 and D1007, and input to the comparator (IC1004). The output voltage of comparator (IC1004) is charged to C1101 and held.

The output signal of IC1005 is applied to the base of Q1020, and the output from the collector of Q1020 controls the squelch gate (IC1010). At the same time, illumination of the RECEIVE INDICATOR (DS307) is controlled by the output from the collector of Q1020.

#### 4-1-8 AF POWER AMPLIFIER (MAIN UNIT)

After passing through the squelch gate (IC1010), the AF signal is amplified at Q1056, passed through the VOLUME CONTROL (R341) on the FRONT PANEL and applies to the AF power amplifier (IC1023). IC1023 is an audio power amplifier from which an output of 5W or more can be obtained. IC1023 has a low impedance output and has sufficient drive even if a 4Ω speaker is externally connected in parallel with the built-in 4Ω speaker.

### 4-2 TRANSMITTER CIRCUITS

#### 4-2-1 9.0115MHz IF CIRCUIT AND BALANCED MODULATOR (MAIN UNIT)

During H3E (A3H) and J3E (A3J) transmission, the AF signal from the microphone amplifier (Q1023) is modulated at the DBM (IC1008), passed through FI1001 (SSB) filter and becomes the J3E (A3J) signal.

During H3E (A3H) transmission, the output signal from BFO mixer (IC1011) is amplified at carrier amplifier (Q1034), passed through FI1001 (SSB) filter added to the signal amplified at Q1012 as the carrier signal to

become the H3E (A3H) signal.

When the CW mode and the automatic tuning function are in operation, the "High" level signal is applied to the base of Q1022 to turn Q1022 ON. At the same time it mutes the signal from the microphone amplifier (Q1023), DC voltage is applied via D1043 and R1171 to IC1008 (pin 5) to change the DC balance between the input terminals of IC1008. By changing the DC balance between the input terminals of IC1008, the output signal of the BFO mixer (IC1011) is applied to IC1008 (pin 7) via D1047.

During A1A (A1) and F1A (F1) transmission, the signal passes through FI1002 (CW and FSK) filter. (However, this is applicable to F1A (F1) when the frequency shift width is set to 170Hz.)

After passing through filters FI1001~1003, the signal is amplified at Q1012 and Q1011, passed through P1001 and is sent to the RF UNIT. ALC voltage is applied to the 1st gate of Q1012, or the keying signal during the CW mode is applied to the 2nd gate from the keying circuit.

#### 9.0115MHz IF CIRCUIT AND BALANCED MODULATOR

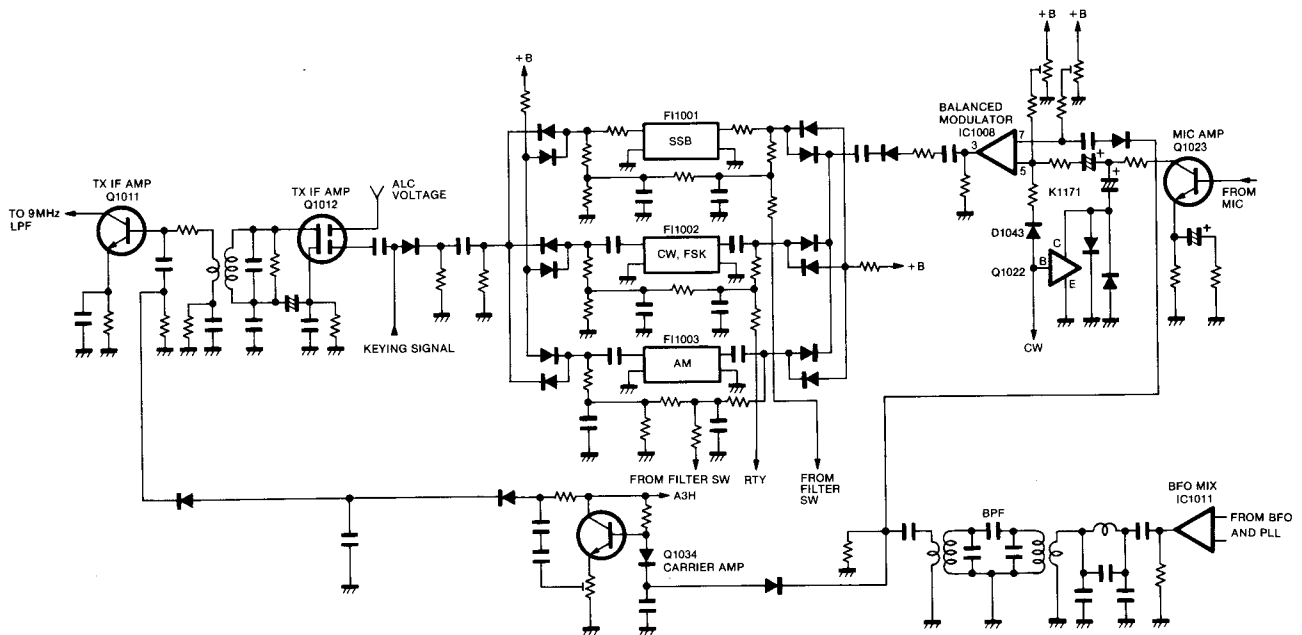


Fig. 2

#### 4-2-2 RF CIRCUITS (RF UNIT)

The 9MHz transmitting output signal from the MAIN UNIT is mixed with the 61.44MHz local oscillator signal at L611~L612 and IC604, and converted to the 70.4515MHz IF signal. The spurious components are removed at the crystal filter FI601-A. The signal passes the transmit/receive switching diode D605 and attenuator R645~R647, then enters the transmitting mixer.

The attenuator acts as a matching network between

FI601-A and the mixer and improves the mixer's frequency characteristics.

The transmitting mixer of Q610 and Q611 is fed the local oscillator signal which goes into the 2nd gate. To improve the frequency characteristics, the output has a resistive load of approximately 500Ω so that the frequency characteristics are not affected at the output, and the signal is sent through the 25MHz low-pass filter of L629, L630 and C664~C668, then fed to Q612.



The FET amplifier Q612 has an input impedance of  $470\Omega$  to match the low-pass filter. The drain also has a resistive load. The 2nd gate of Q612 is applied with a control voltage for protection against overcurrents and high SWR, and to control output power.

The output of Q612 is amplified by Q613. To improve the frequency characteristics at Q613, the impedance between Q612 and Q613 is low so input capacitance can be ignored. Further, to compensate the frequency characteristics at the output, C673 is added to the emitter.

The output of Q613, after passing the 1.6MHz high-pass filter, passes through the attenuator of R670~R672 and is output to the PA UNIT. The attenuator acts as a buffer to the PA UNIT. This output is approximately +6dBm when the output is 150W.

To get stable operation, the transmitting circuits are supplied with T8V regulated power supply from the MAIN UNIT. The local oscillator frequency amplifier circuit also is supplied with an 8V regulated power supply from IC601.

#### 4-2-3 PA PROTECTION CIRCUIT (RF UNIT)

The voltage of the 2nd gate of Q612 is lowered and the gain is reduced for lower power to protect the final transistors from a temperature rise caused by increased collector loss of the final transistors and overcurrent due to high SWR. This is accomplished by the circuit of IC603, Q605, and Q614.

IC603B is a differential amplifier and amplifies the potential difference generated at R871 (located in the PA UNIT) due to the current flowing through the PA UNIT. Q614 buffers the reflected wave voltage from the SWR detector circuit in the FILTER UNIT. If either or both voltages exceed the voltage determined by R614 and R681, the inverted amplifier IC603A begins amplification. Normally, the output voltage of IC603B is determined by R614 and R681~R684. The voltage is lowered due to overcurrent or high SWR and the transmitting power is also lowered.

When the temperature rises, the voltage from J602 pin 4 (POL) turns Q605 ON. The output voltage from IC603B is divided by R620 and R621 to lower the voltage and the power is lowered.

Further, when the antenna tuner is connected, the key signal turns Q603 OFF and Q604 ON. The tuning power is set by the voltage divided by R620 and R619.

#### 4-2-4 PA UNIT

This unit consists of 4 boards (PA, ANT SW, DIN and JACK) and the rear panel chassis to which they are attached.

The PA board is a linear amplifier with an output of 150W and amplifies the transmitting signal from the RF UNIT. The ANT SW board performs antenna switching for transmit/receive and has a protection circuit to prevent damage to the receiving unit caused by a strong input during receive when the output of an adjacent transmitter is induced by the antenna. The connector board and rear panel chassis holds the various boards and the wiring for the connectors mounted on the rear panel chassis.

#### 4-2-5 PA CIRCUIT (RF UNIT) (See fig. 3)

The power amplifier is a 3-stage wide band linear amplifier and consists of a class A single amplifier for the input stage and class AB push-pull amplifiers for the driver and final stages. This unit produces an output of 150W PEP with an input of approximately +6dBm PEP. Further, each stage uses negative feedback and RC frequency compensation for a total gain variation of  $\pm 1.5$ dB or less (at an output of 55W).

#### 4-2-6 BIAS CIRCUIT (PA UNIT) (See fig. 3)

Although the input stage has a fixed bias due to the class A operation, the driver and final stages have adjustable biases due to their class AB operation.

The bias of the driver stage is adjusted by varying the current flowing through D801 with R827. Further, D801 and Q803 are thermally coupled to minimize the variations of the idling current due to temperature changes.

The final stage is provided with emitter follower Q806 since the current flow is greater than in the driver stage. The bias of the final stage is adjusted by varying with R823 the current flowing through D802 and D804. D804 compensates for the voltage drop between the base and emitter of Q806. D802 and Q804 are thermally coupled with Q806 for stability.

#### 4-2-7 THERMAL PROTECTION CIRCUIT (PA UNIT)

To prevent the final transistors (Q804, Q805) from excessive temperature rises and damage due to continuous transmitting, thermal switches S801 and S802 are thermally coupled to Q804 and Q805, respectively. When the temperature rises, the fan motor provided for the heat sink is turned on for forced air cooling. The fan motor rotates at intermediate speed during transmission.

S801 is a 80°C thermal switch and turns on the fan for high speed when Q804 reaches approximately 80°C. S802 is a 110°C thermal switch and turns on when Q804 reaches approximately 110°C. Then the HTP voltage is supplied to the RF UNIT to lower the transmitting output to approximately 60W.

Even when reception is selected from transmission, the fan motor continues rotating at low speed if the temperature of Q804 is at 80°C or more, namely when S801 is ON.

**4-2-8 ANTENNA SWITCHING CIRCUIT (ANTENNA SWITCH UNIT)**

D921 and RL922 carry out antenna switching for transmission and receive.

During transmission, the transmission signal supplied from the FILTER UNIT is input from P922 by turning ON of D921, passed through D921 and input to the antenna connector (J922).

During reception, the reception signal input from the antenna connector (J922) is passed through RL922, C924, RL921 and low-pass filter by turning ON of RL922, and input to the J606 of the RF UNIT from P921.

A low-pass filter with a cut-off frequency of approximately 30Hz consisting of L921, L922, C921 and C922 operates to prevent incidental radiation from the antenna during reception.

The antenna connector (J922) is provided with a surge absorber to prevent damage to the transmitting and receiving circuits caused by high voltages such as from lightning induction.

If a reception signal of 1W or more is input to the antenna connector (J922) during reception, the

resultant voltage generated at D923 is applied to Q921 to control Q923 and Q924. This controls RL921, the connection between the antenna and the RF UNIT is not maintained, and the receiving circuits are protected.

**4-2-9 FILTER CIRCUIT (FILTER UNIT)**

This unit is located between the PA UNIT and the antenna connector and suppresses the harmonics found in the transmitting output from the PA UNIT to -65dB or below.

Chebyshev low-pass filters are used and 7 filters having different cutoff frequencies are switched depending on the transmitting frequency.

Filter switching is performed by driving the relay with the signal from the LOGIC UNIT.

At the output is an SWR detection circuit which uses a toroidal core. The detected traveling wave voltage is sent to the MAIN UNIT to control the ALC and the reflected wave voltage is sent to the RF unit as a control voltage for the protection circuit used to prevent an overload on the PA stage caused by a mismatched antenna.

FILTER	FREQUENCY
L1	2~ 3MHz
L2	3~ 5MHz
L3	5~ 7MHz
L4	7~10MHz
L5	10~14MHz
L6	14~18MHz
L7	18~24MHz

**PA CIRCUIT AND BIAS CIRCUIT**

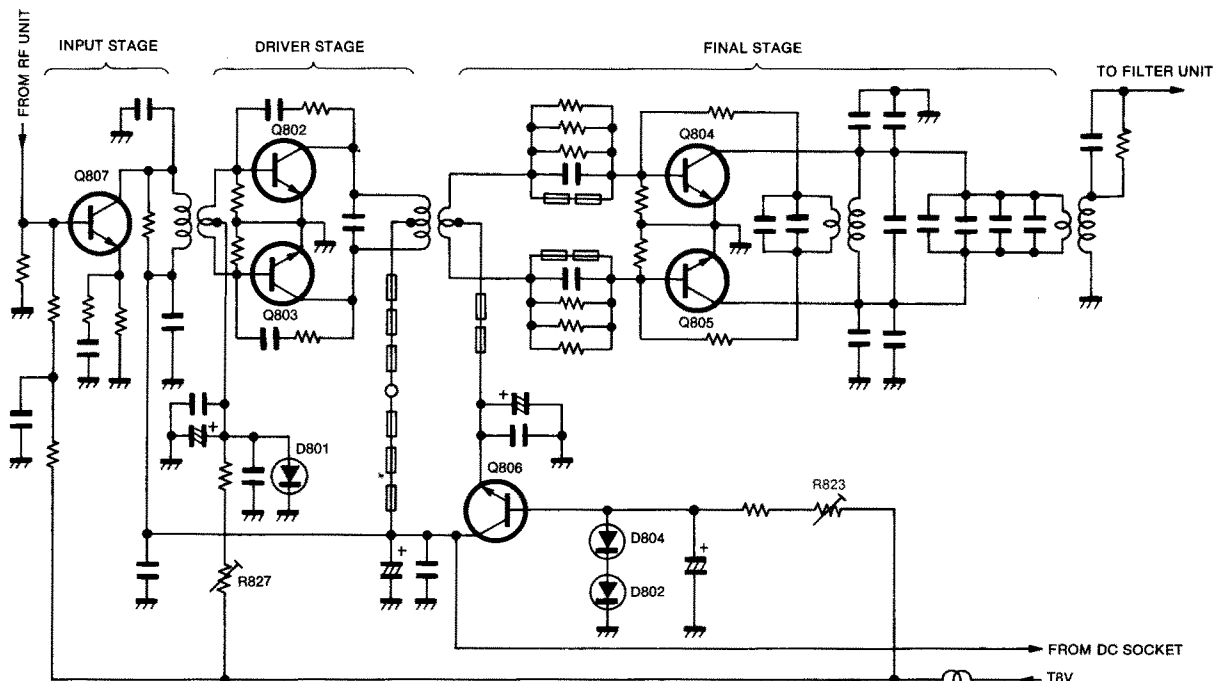


Fig. 3



#### 4-2-10 ALC CIRCUIT (MAIN UNIT)

A peak ALC circuit is provided so that the transmit peak level does not exceed the rated output. The traveling-wave voltage detected from the FILTER UNIT is amplified at operational amplifier IC1006 and compared with the reference voltage set by R1244 to

generate the ALC voltage. This ALC voltage is applied to the 1st gate of Q1012 to control the output level of the transmit signal. The ALC voltage is also inverted and amplified by the same IC1006 to light up the TRANSMIT INDICATOR.

#### ALC CIRCUIT

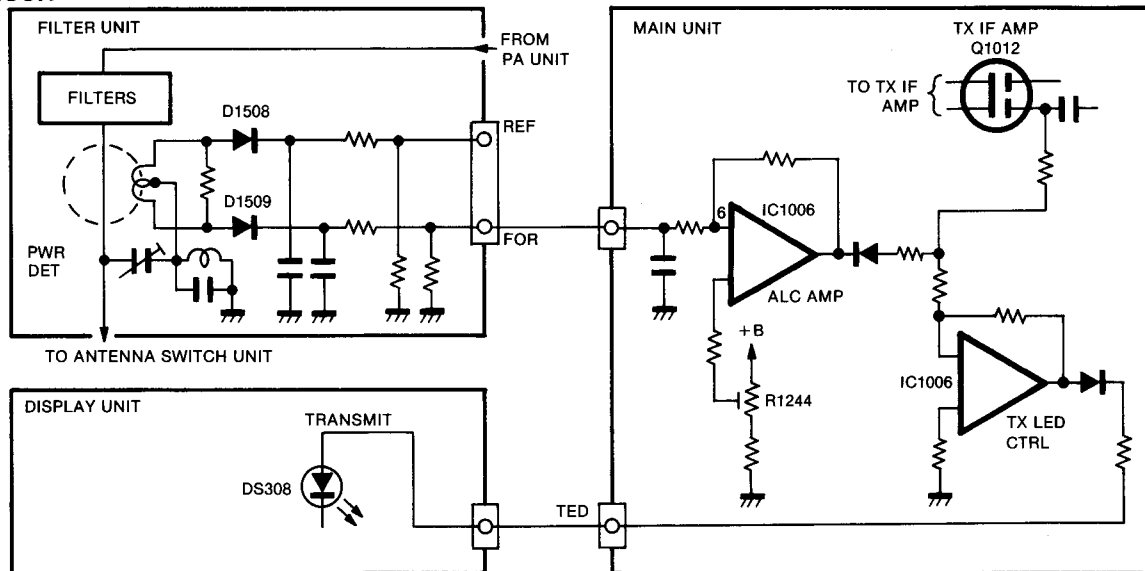


Fig. 4

#### 4-2-11 KEYING CIRCUIT (MAIN UNIT)

Keying control in the CW mode is carried out by IC1005. In other modes and when the CW KEY is turned down, an "High" level signal is output from IC1005 (pin 7), and this causes the voltage of the 2nd gate of Q1012 to become approximately 4V.

When the CW KEY has been turned up, the output voltage from IC1005 (pin 7) becomes a minus voltage, and Q1012 is turned OFF. Also, bias voltage of D1018 is controlled as the CW KEY is turned up or down which improves isolation. The leading edge of the bias voltage applied to D1018 is the first attack and its trailing edge is the slow delay so as not to effect the transmission signal waveform during CW KEY operation.

#### 4-2-12 POWER DOWN CIRCUIT (MAIN UNIT)

A power down circuit is provided to protect the circuits from overheating of the PA UNIT and to set the output signal power during tuning.

When the PA UNIT has overheated, the output signal power is lowered to 60W by lowering of the comparison voltage for setting the output signal power by R1245 and Q1029.

During tuning, the output signal power is lowered to 10W by lowering of the comparison voltage for setting the output signal power by R1247 and Q1031.

At the same time as the above operations are being executed, the RF UNIT gain is also controlled so that the ideal overall gain can be obtained.

#### 4-3 OTHER CIRCUITS

##### 4-3-1 ALARM CIRCUIT (MAIN UNIT)

When the ALARM SWITCH (S323) on the FRONT PANEL is pushed ON, IC1022 removes chattering generated at the ALARM SWITCH and triggers IC1017.

IC1017 is a monostable multivibrator whose one shot time is set at approximately 50 seconds. This determines the alarm time (30~60 seconds). During alarm transmission (full alarm), a signal of 4Hz frequency is generated from IC1019. This signal is further divided at IC1018<sup>1/2</sup> to become a signal of 2Hz frequency which is used for determining the cycle of the alarm tone.

1300 Hz and 2200 Hz AF signals are switched over every 250 milliseconds and generated as the alarm signal.

##### 4-3-2 POWER SUPPLY CIRCUIT (+8V) (MAIN UNIT)

A constant voltage of approximately 8V is produced by IC1013.

During transmission, this voltage is supplied by Q1037 to the circuits for transmission that require 8V.

During reception, this voltage is supplied by Q1040 to the circuits for reception that require 8V.

A circuit comprising CMOS gates that switch with high reliability and in a short time are employed for selecting between the above reception and transmission states.

Also, the timing indication is output from all MAIN UNIT circuits (Q1036, IC1012) during switching over to circuits that require reception/transmission selection in each of the units.

#### 4-3-3 POWER SUPPLY CIRCUIT (-5V) (MAIN UNIT)

Minus DC voltage of approximately -5V is obtained by double voltage rectifying at D1090 and D1091 the oscillation signal output from IC1015 (pin 6) and applying this to constant-voltage diode (D1089).

This minus DC voltage (-5V) is used at ALC, AGC and keying circuit.

#### 4-3-4 TONE GENERATOR CIRCUIT (MAIN UNIT)

A 1kHz side tone for the CW mode, 1300Hz and 2200Hz emergency signal alarm tones and the TONE frequency

during the FSK mode are generated at IC1025.

IC1025 is an IC for TONE generation. By selecting any one of IC1025 pins 1~5, the dividing ratio of the oscillation frequencies of X1006 and X1007 can be varied, and transmission output of stable frequency can be obtained.

To obtain the transmission output of the required frequency from IC1025, the input program to IC1025 pins 1~5 is changed by the matrix circuit consisting of D1123~D1160.

Keying of the monitor tone in the CW mode and ON/OFF switching of the monitor tone in the FSK mode are carried out by Q1058.

### TONE GENERATOR CIRCUIT

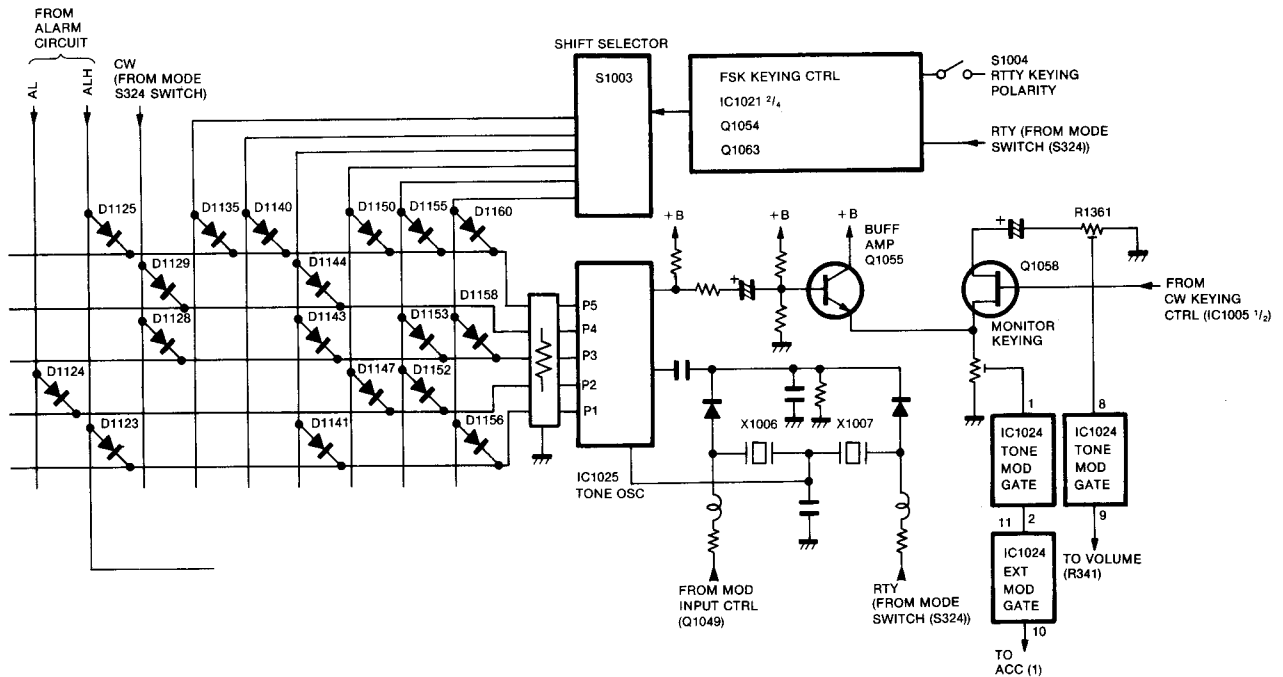


Fig. 5

#### 4-3-5 MIC CIRCUITS (MAIN UNIT)

MAIN UNIT receives the signal from the MIC connector. MIC circuit is selectable according to the type of microphone and antenna tuner.

J1009 is a connector for the microphone. The use of each pin is as follows.

1. AF1 Connected to the built-in speaker. When the SPEAKER SWITCH is turned ON while shorting pins 1 and 7, the built-in speaker is used.
2. PTT PTT pin. Transmits when shorted with pin 3 and ground.
3. PTTE Ground pin for the PTT.
4. MIC MIC ground pin.
5. MICE MIC pin. When shipped from the factory, a DC voltage is applied but becomes input through a capacitor when W63 is cut.
6. NC No connection.
7. AF2 AF output from the MAIN UNIT.

#### 4-4 PLL CIRCUITS

PLL UNIT generates 2 oscillating outputs (1st LO and 2nd LO signals) required by the RF UNIT and another oscillating output (3rd LO signal) used to produce the BFO frequency within the MAIN UNIT. Among these, the 1st LO is a frequency variable output in the 72~95MHz band and is generated by the PLL circuit having 2 locked loops. The 2nd and 3rd LO outputs are fixed and produced by multiplying or dividing the reference frequency signals.

The oscillating outputs produced within PLL UNIT are all determined by a single reference frequency. Adjusting this frequency corrects all the oscillating outputs.



#### 4-4-1 REFERENCE OSCILLATOR CIRCUIT (PLL UNIT)

X1 is a reference oscillator circuit for oscillation of 30.72MHz frequency.

In X1, consisting of a temperature-compensating oven heater and crystal unit, an oscillation circuit and a power stabilizing circuit for protecting the oscillation circuit are contained in a single case which is of two-layer construction for thermal stability.

The output signal frequency of X1 used as the reference frequency is highly stable with a maximum error of  $\pm 0.1$ ppm in an ambient temperature of  $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$ .

#### 4-4-2 2nd LO CIRCUIT (PLL UNIT)

The output of the reference oscillator circuit is doubled at Q14, has its spurious components removed by the band pass filter of L3~L5, and fed to the RF UNIT. The output is +3dBm with a 50Ω load at 61.44MHz.

#### 4-4-3 3rd LO CIRCUIT (PLL UNIT)

The output of the reference oscillator circuit is divided by 3 at IC5 to obtain 10.24MHz. It is fed to the MAIN UNIT through emitter follower of Q203.

#### 4-4-4 1st LO CIRCUIT (PLL UNIT)

The PLL circuit composed of 2 locked loops, a main loop and sub-loop are used. The sub-loop is used for the heterodyne signal within the main loop and the VCO output from the main loop is used for the 1st LO output.

The sub-loop causes VCO Q201 to oscillate at approximately 115~120MHz. This signal passes buffer amplifier Q202 and is locked by PLL ICs IC201 and IC202. The phase comparator frequency of this loop is 5kHz and varies the dividing ratio of the programmable divider within IC201. A frequency variation of 5MHz in 50kHz steps is obtained. The locked VCO

output passes through IC204 and IC203, is divided into 1/500 to a frequency of 230~240kHz. This is mixed by IC4 with the frequency of the reference oscillator circuit and is applied to IC3 within the main loop as a signal having a 10kHz variation in 100Hz steps within 30.95~30.96MHz.

The main loop switches 4 VCOs to oscillate at a frequency within 72.053MHz~94.4529MHz, required by the 1st LO. The lock is accomplished by the loop consisting of IC1, IC2, IC3, etc. The phase comparator frequency is 10kHz and varies the dividing ratio of the programmable divider within IC1 to vary the frequency in 10kHz steps. Further, mixer IC3 is provided within the loop. The signal obtained from the sub-loop having a frequency variable in 100Hz steps is used as a heterodyne signal. This covers the frequency variation in 100Hz steps required by the 1st LO.

The comparator frequency for both the main and sub loops is produced by dividing the frequency of the reference oscillator circuit.

#### 4-4-5 MUTE CIRCUIT (PLL CIRCUIT)

When the lock of the main or sub loop becomes "unlocked" or when the frequency is varied, the outputs of the 1st and 2nd LO are blocked to prevent transmitting or receiving on a frequency other than the desired one. The unlock signal output from IC1 and IC201 is given a suitable time constant by Q8 and Q9 and applied to Q24 and Q13 to stop the operation of the amplifiers in the 1st and 2nd LO, respectively, so that there are no outputs.

### 4-5 LOGIC CIRCUIT

All control of the receive and transmit frequencies of this equipment is performed by IC505.

#### CPU PORT ALLOCATIONS

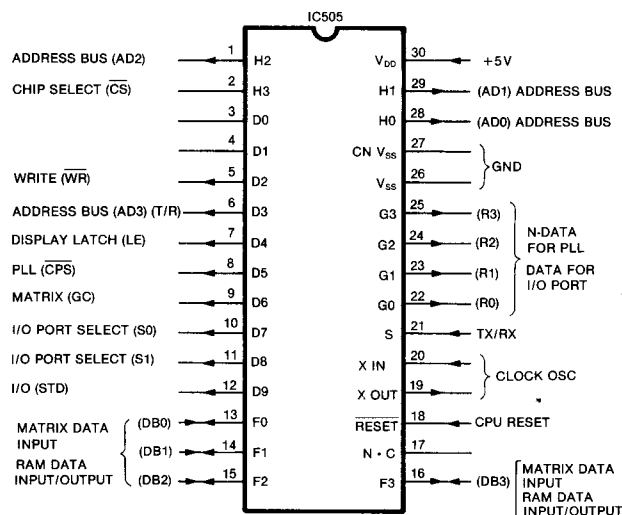


Fig. 6

#### INPUT/OUTPUT CONTROL IC PORT ALLOCATIONS

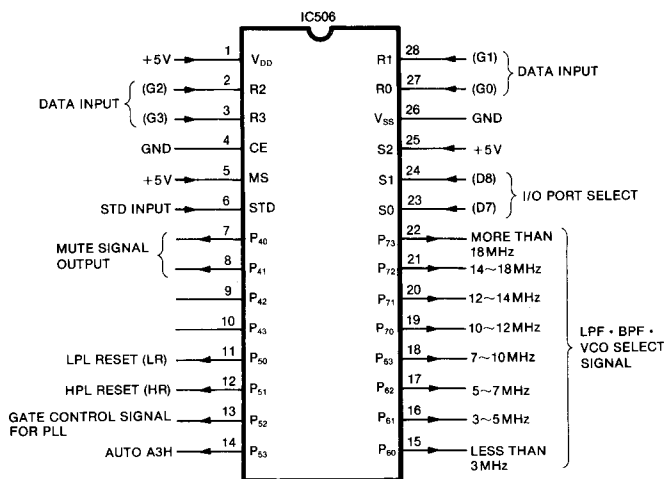


Fig. 7

When the power is turned on, the signal from IC508 (pin 12) resets IC505. The receiving and transmitting signal is fetched from the S input terminal and the frequency data stored in IC501 from the port F. (port H is for the control signal for IC501) Next, IC505 outputs, from port G, frequency data, PLL's N-data (PLL control data), and switching data for the band pass filter and low-pass filter.

As a result of the data from port G and control signals

D7~D9, IC506 outputs band switching data to P60~P73 (Table 1), PLL control signals to P50~P52, and mute signals for outside the marine bands to P40 and P41.

IC507 buffers the outputs for the data from port G of IC505 and the control signal from P52 of IC506. IC509 is the buffer for the low-pass filter switching relay. IC510 is the power supply (5V) for LOGIC and MATRIX UNITS.

Port P	Band	BPF	LPF	VCO	Transmit Enable Band
P60	1.6000~ 2.9999 MHz	B1	L1	V1	2.0000~ 2.9999 MHz
P61	3.0000~ 4.9999 MHz	B2	L2	V1	4.0000~ 4.9999 MHz
P62	5.0000~ 6.9999 MHz	B3	L3	V1	6.0000~ 6.9999 MHz
P63	7.0000~ 9.9999 MHz	B4	L4	V2	8.0000~ 8.9999 MHz
P70	10.0000~11.9999 MHz	B5	L5	V2	—————
P71	12.0000~13.9999 MHz	B5	L5	V3	12.0000~13.9999 MHz
P72	14.0000~17.9999 MHz	B6	L6	V3	16.0000~17.9999 MHz
P73	18.0000~23.9999 MHz	B7	L7	V4	22.0000~22.9999 MHz

Notes: The voltage supplied by the lithium backup battery installed in the RAM UNIT drops as the battery approaches its service life. This may cause the frequency data stored to the RAM (IC501) to be lost.

If the frequency data stored to the RAM (IC501) is lost, the transceiver can be used by inputting the desired frequency by the PROGRAMMING KEYBOARD on the FRONT PANEL. Further, the frequency data of 2182kHz will not be lost as it is written into the CPU memory.

Table 1

#### 4-6 CIRCUITS ON THE FRONT PANEL (DISPLAY AND MATRIX UNITS)

LEDs (DS301~DS306) for frequency indication are lit by the 7-segment LED drive signal supplied from IC303. The 7-segment LED drive signal is obtained by conversion of the data supplied from the LOGIC UNIT at IC303 (BCD to 7-segment latch/decoder/driver). R301~R308 are resistors for limiting the capacity of the current flowing to the LEDs when the LEDs (DS301~DS306) for frequency indication are lit.

IC302a and Q302 are provided for lighting the segments for decimal point display on DS302 and DS305. (Each of the decimal points are for indicating 1MHz and 100kHz bands.)

IC302b and Q301 are provided for lighting the LEDs for indicating the 10MHz decimal point when 2182kHz is selected using the CHANNEL GROUP and 2182kHz SWITCH. (This 10MHz decimal point display is for indicating that the transceiver has automatically switched over to the H3E mode when 2182kHz has been selected using the CHANNEL GROUP and 2182kHz SWITCHES.)

IC304 (BCD to decimal decoder) converts the BCD signal supplied from the LOGIC UNIT to a decimal signal and sends this to the matrix circuit in the DISPLAY UNIT and IC301 (LED driver). IC301 buffer amplifies the signal supplied from IC304 and outputs this to LEDs (DS301~DS306) for frequency indication as the signal for lighting each of the digits.

IC305 (tri-state buffer) is used as a gate for sending data supplied from the matrix circuit in the DISPLAY UNIT to the LOGIC UNIT. IC305 (tri-state buffer) closes the gate except when data from the matrix circuit is being sent to the CPU (IC505) in the LOGIC UNIT. This prevents collision of output data sent from the RAM UNIT and output data from the matrix circuit.

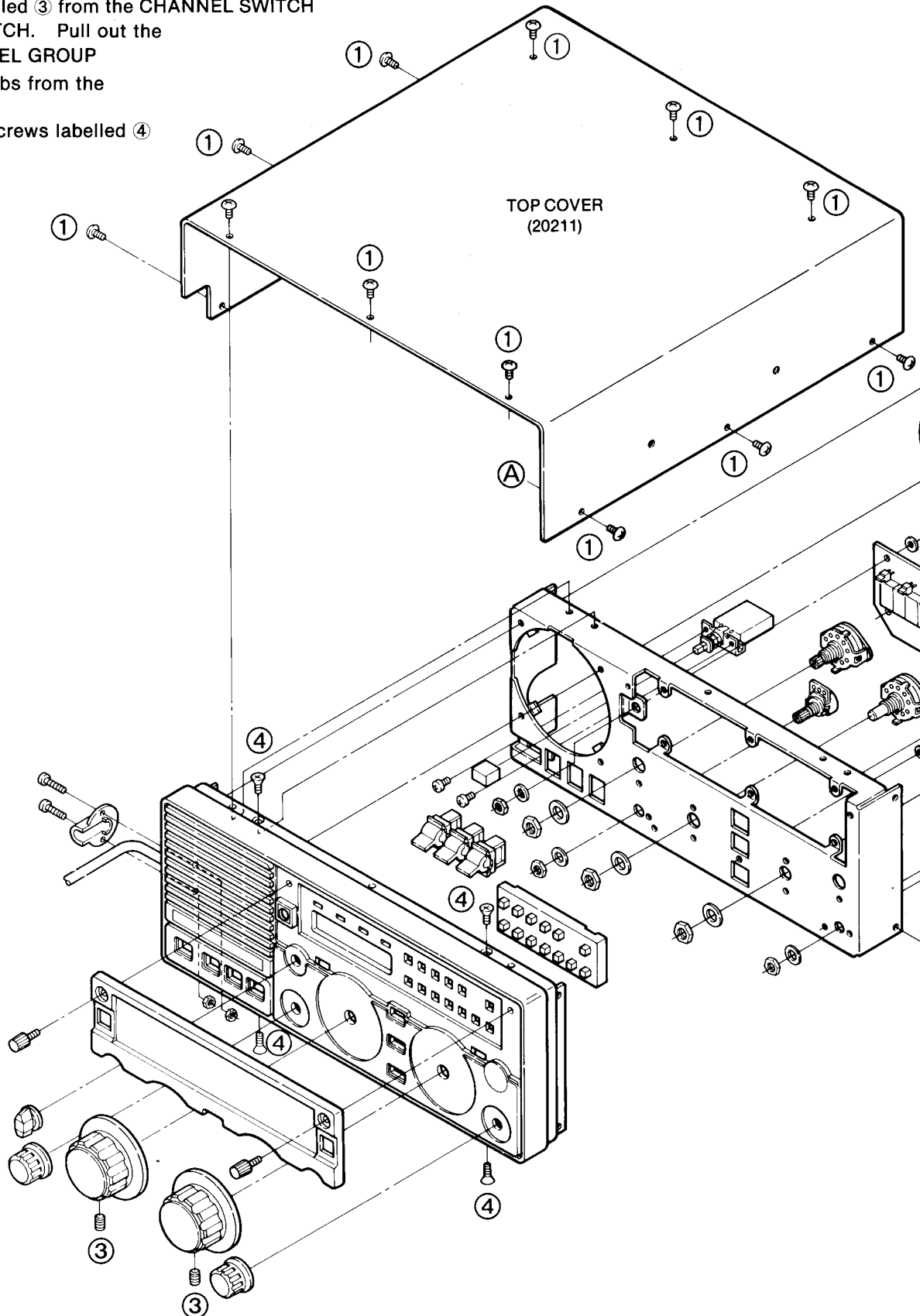
IC307 controls generation of the control signal for automatically setting the frequency to 2182kHz and the mode to the H3E mode when the transceiver has switched over to alarm operation. It is also controls generation of the control signal for cancelling these.

Q307~Q312 and Q304 buffer the signal for MODE SWITCH (S324) and outputs to MAIN UNIT. S328 is used to disable the key input and a key cannot be input in open state.

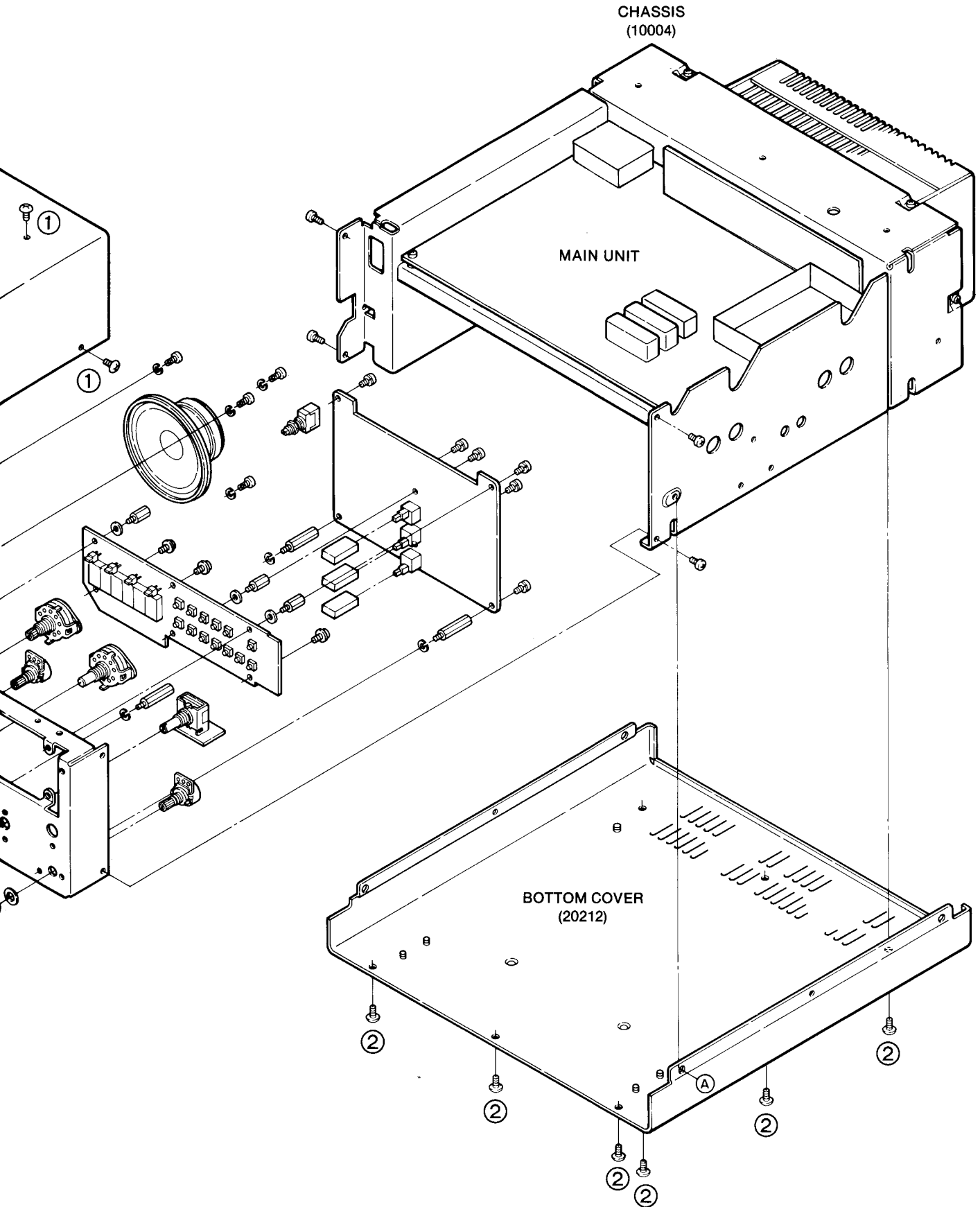
## SECTION 5 MECHANICAL PARTS AND DISASSEMBLY

### 5-1 FRAME DISASSEMBLY

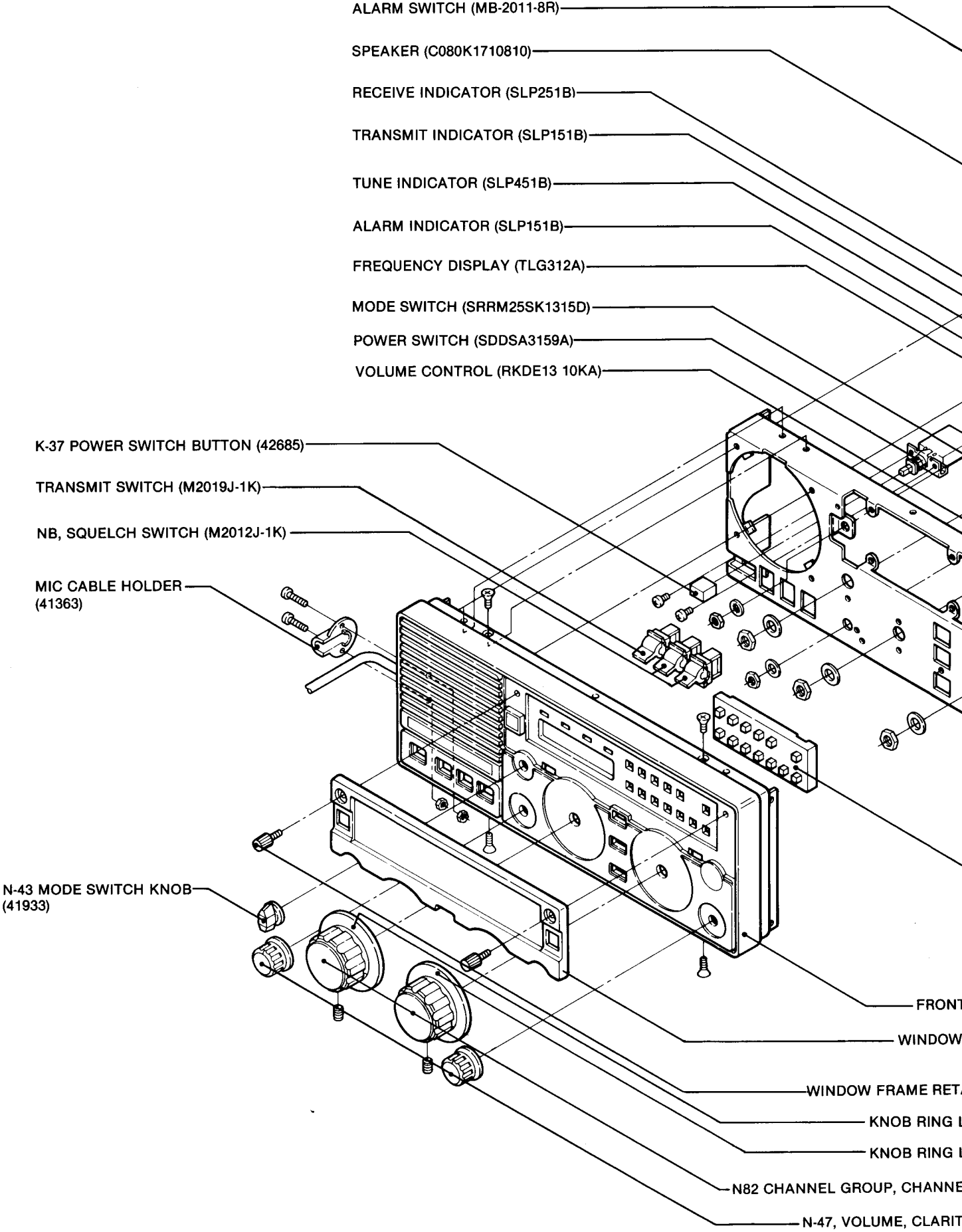
1. Unscrew and remove the 12 screws labelled ① from the top cover. Remove the top cover.
2. Unscrew and remove the 6 screws labelled ② from the bottom cover. Remove the bottom cover.
3. Remove the hex screws labelled ③ from the CHANNEL SWITCH and CHANNEL GROUP SWITCH. Pull out the CHANNEL SWITCH, CHANNEL GROUP SWITCH and the other 3 knobs from the front panel.
4. Unscrew and remove the 4 screws labelled ④ from the front panel. Remove the front panel.

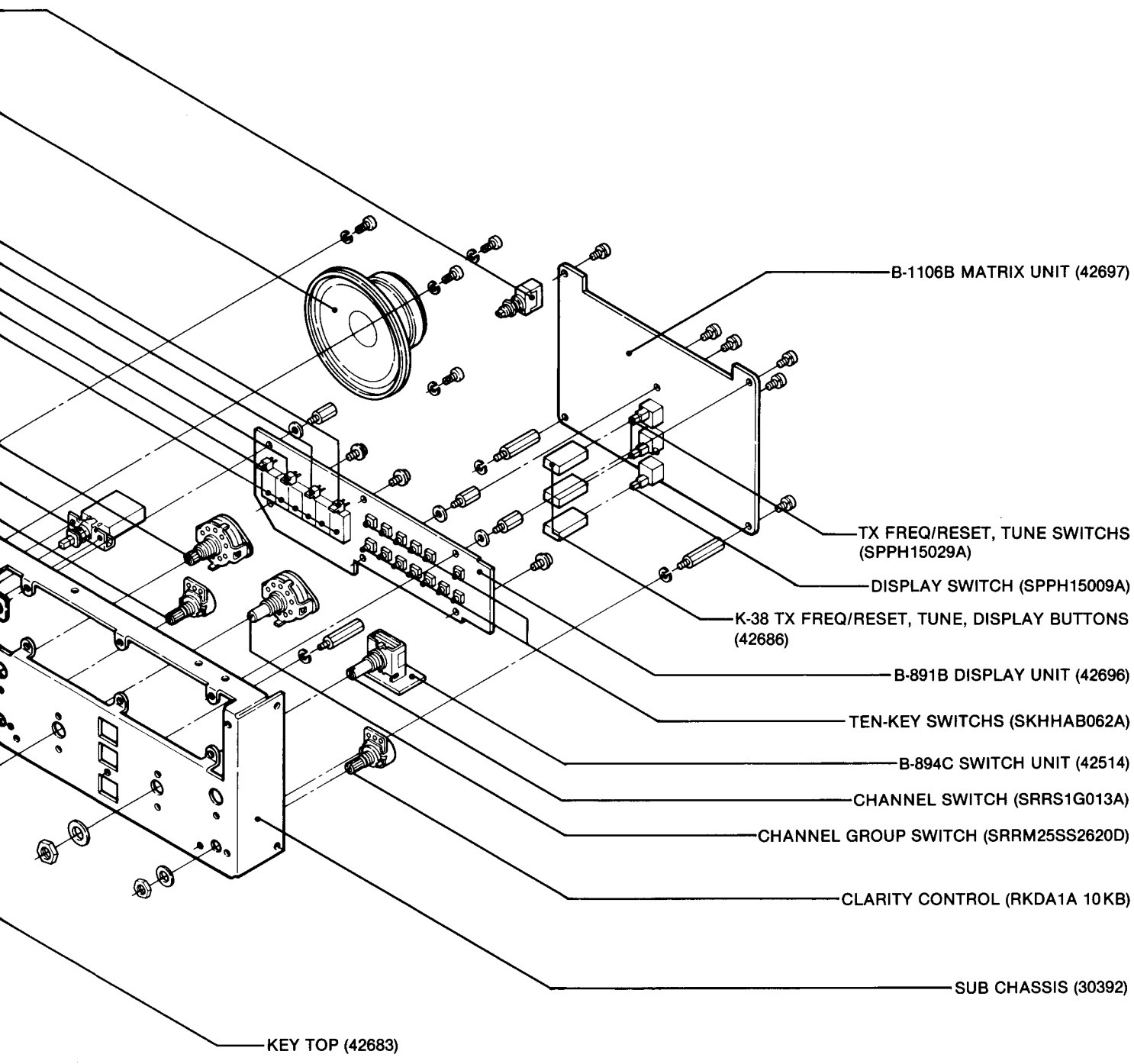






# 5-2 FRONT PANEL DISASSEMBLY

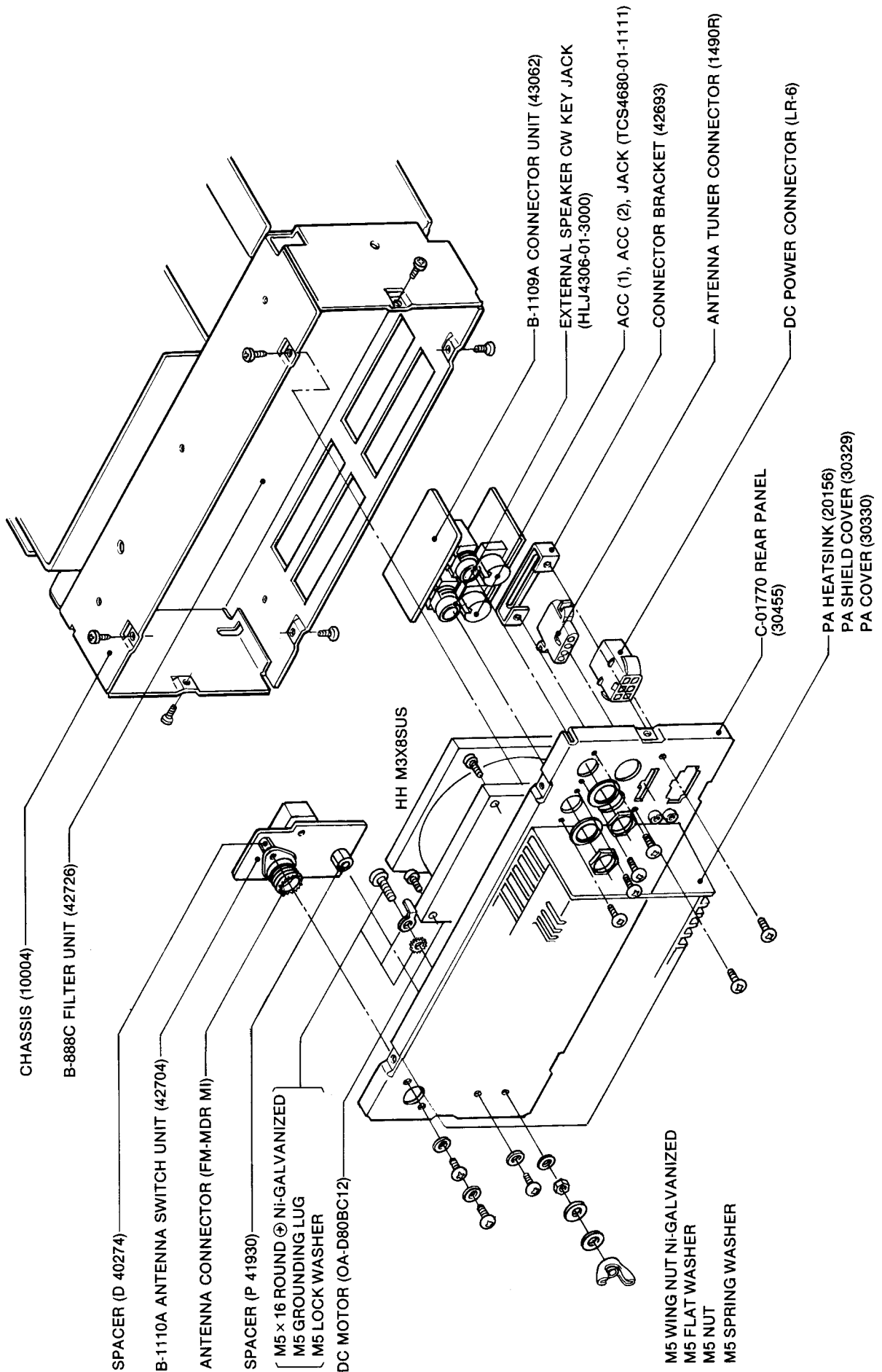




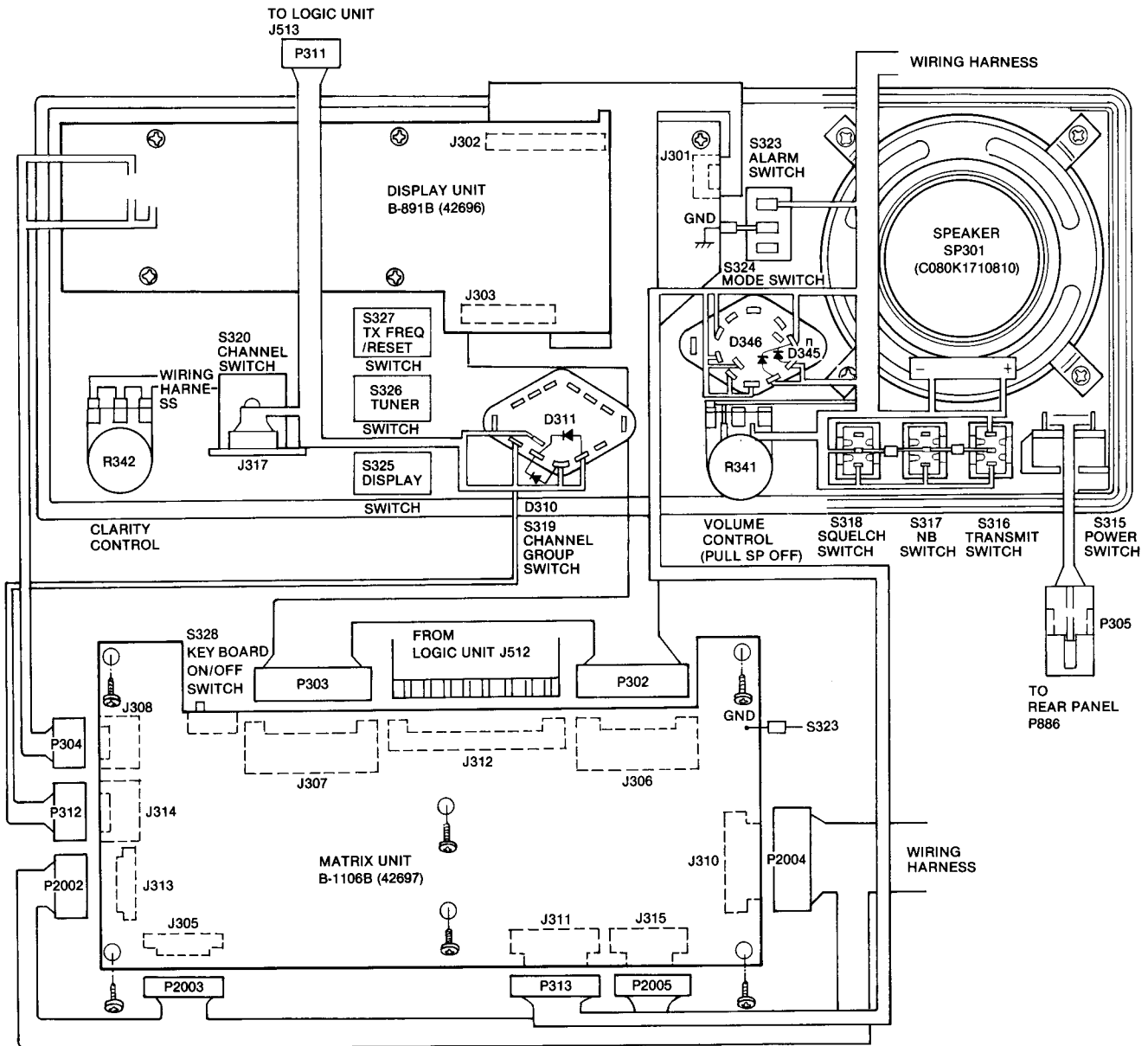
- FRONT PANEL (20210)
- WINDOW FRAME (30391)
- WINDOW FRAME RETAINING SCREW
- KNOB RING LABEL B (42684)
- KNOB RING LABEL A (42684)
- CHANNEL GROUP, CHANNEL KNOB (42676)
- VOLUME, CLARITY KNOB (41938)



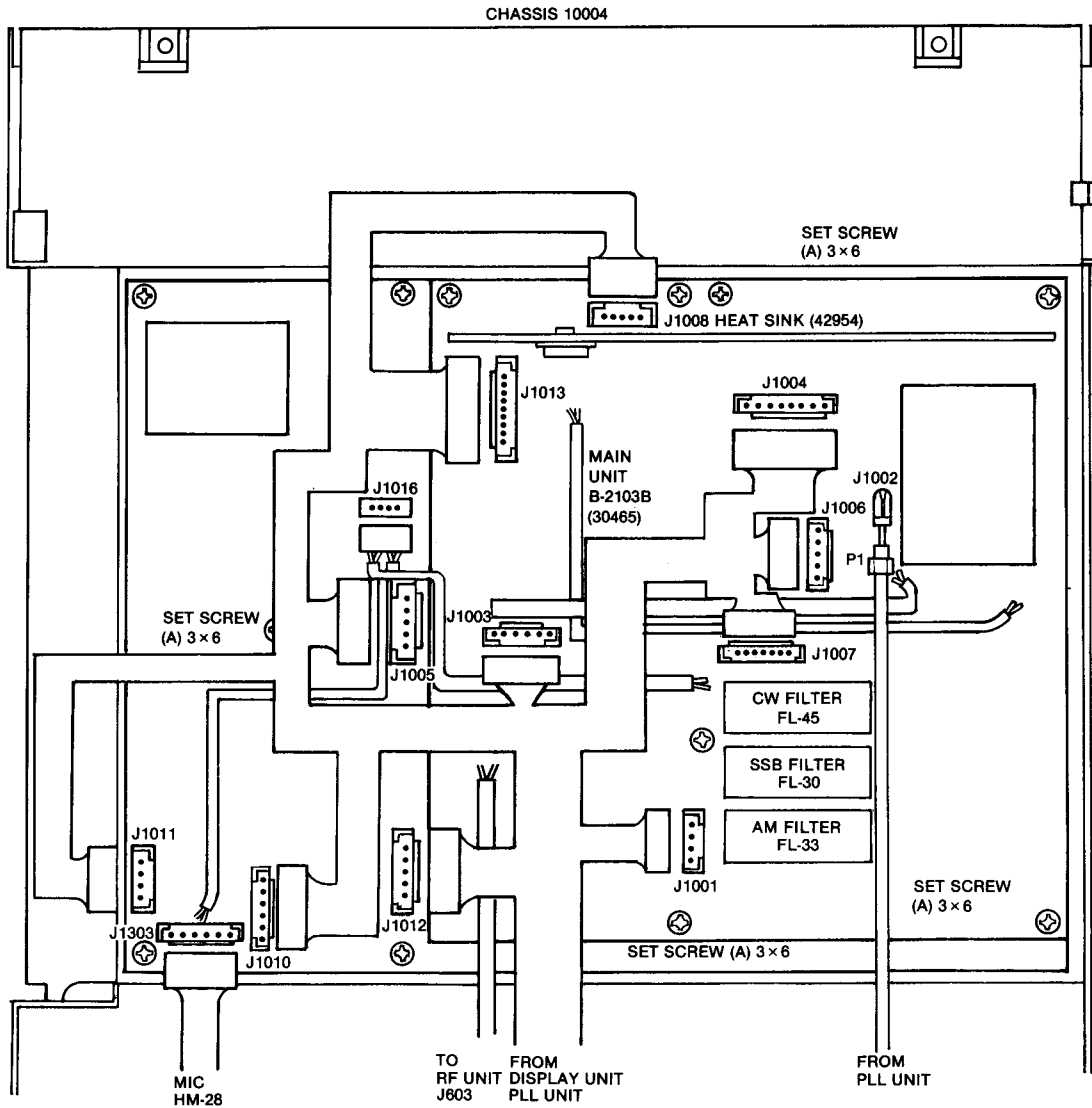
### 5-3 REAR PANEL DISASSEMBLY



## 5-4 FRONT PANEL CONNECTOR CONNECTIONS (DISPLAY UNIT AND MATRIX UNIT)

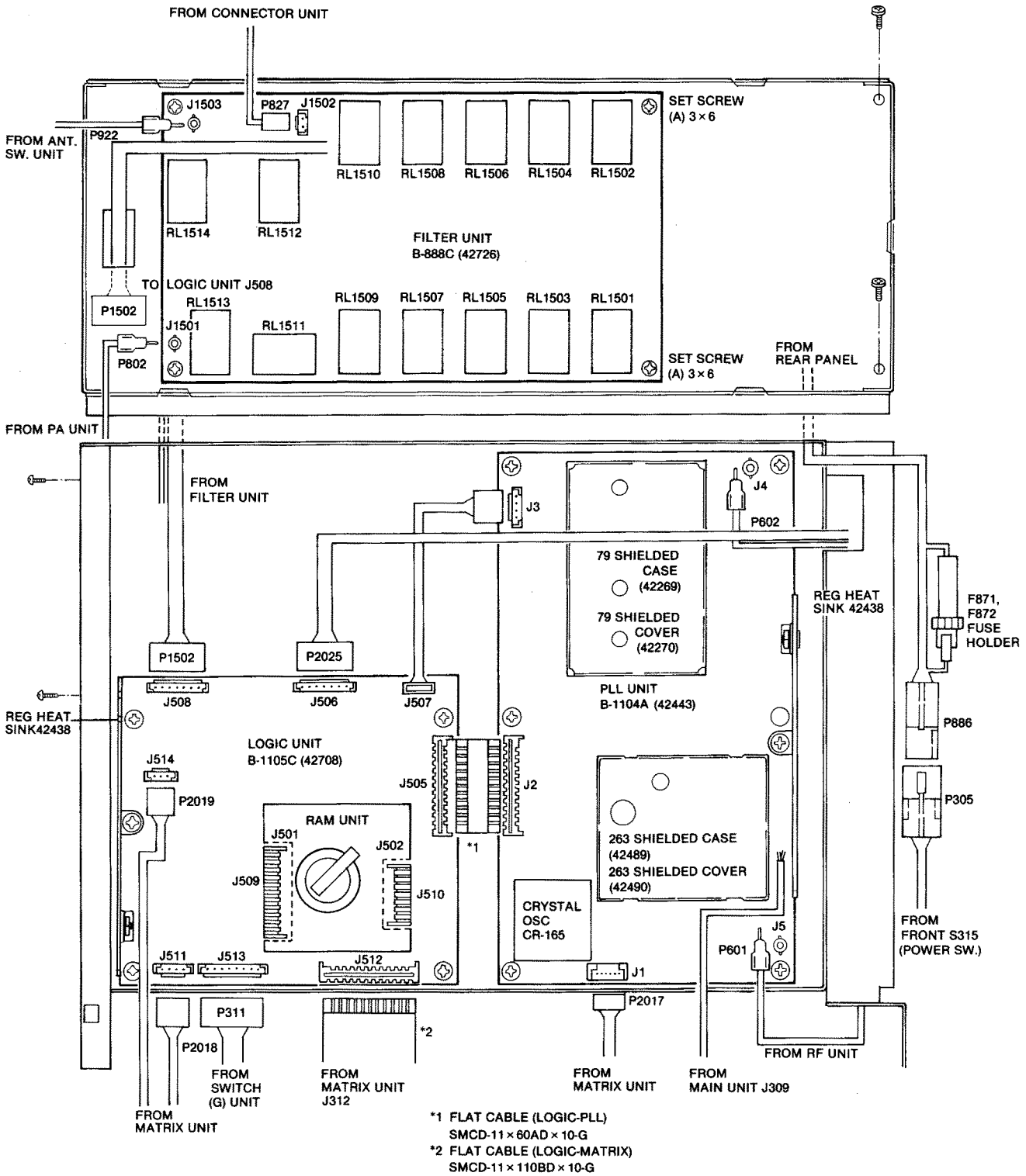


# 5-5 MAIN UNIT CONNECTOR CONNECTIONS

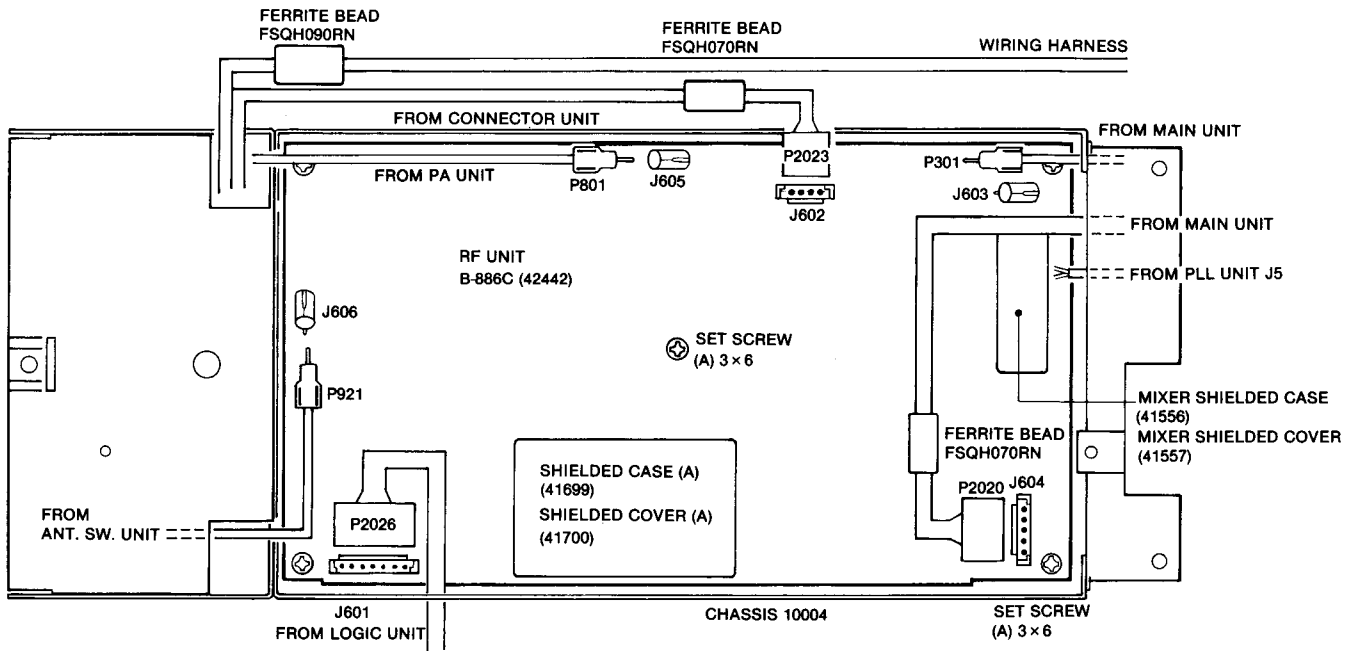




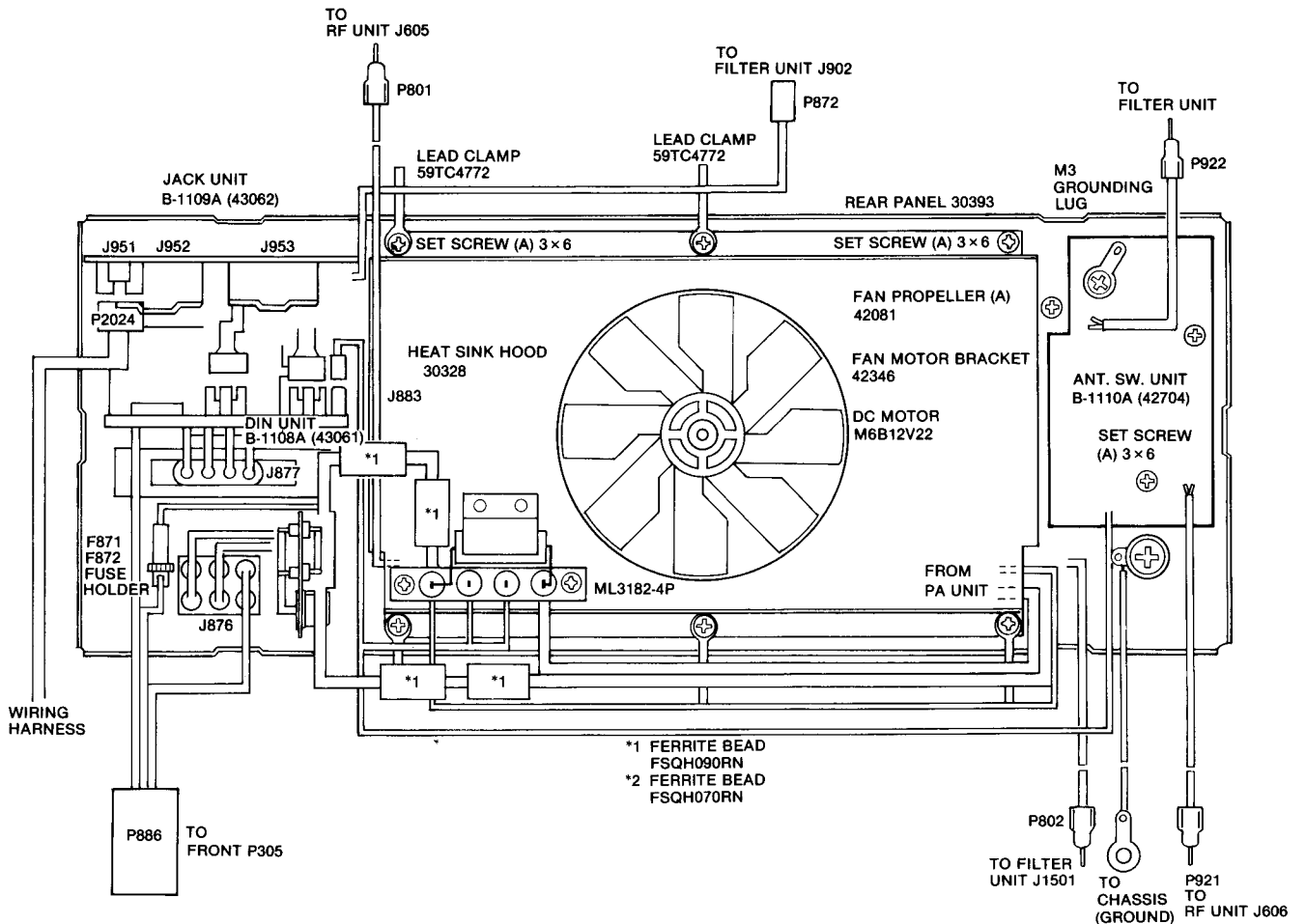
## 5-6 LOGIC-PLL UNIT AND FILTER UNIT CONNECTOR CONNECTIONS



## 5-7 RF UNIT CONNECTOR CONNECTIONS



## 5-8 REAR PANEL CONNECTOR CONNECTIONS



## **SECTION 6      MAINTENANCE AND ADJUSTMENT**

### **6-1 PREPARATION BEFORE SERVICING**

1. Detach the power cord 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. Verify that external sources do not cause the problem.
8. Use the correct tools and test equipment.
9. Remove the transceiver case as shown in SECTION 5-1.
10. Attach a 13.6V DC external power source to the power supply connector. Be sure to check the polarity.
11. For transmission problems, attach a dummy load to the ANTENNA CONNECTOR. For reception problems, attach an antenna or signal generator to the ANTENNA CONNECTOR. Do not transmit into the signal generator.
12. Recheck 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.

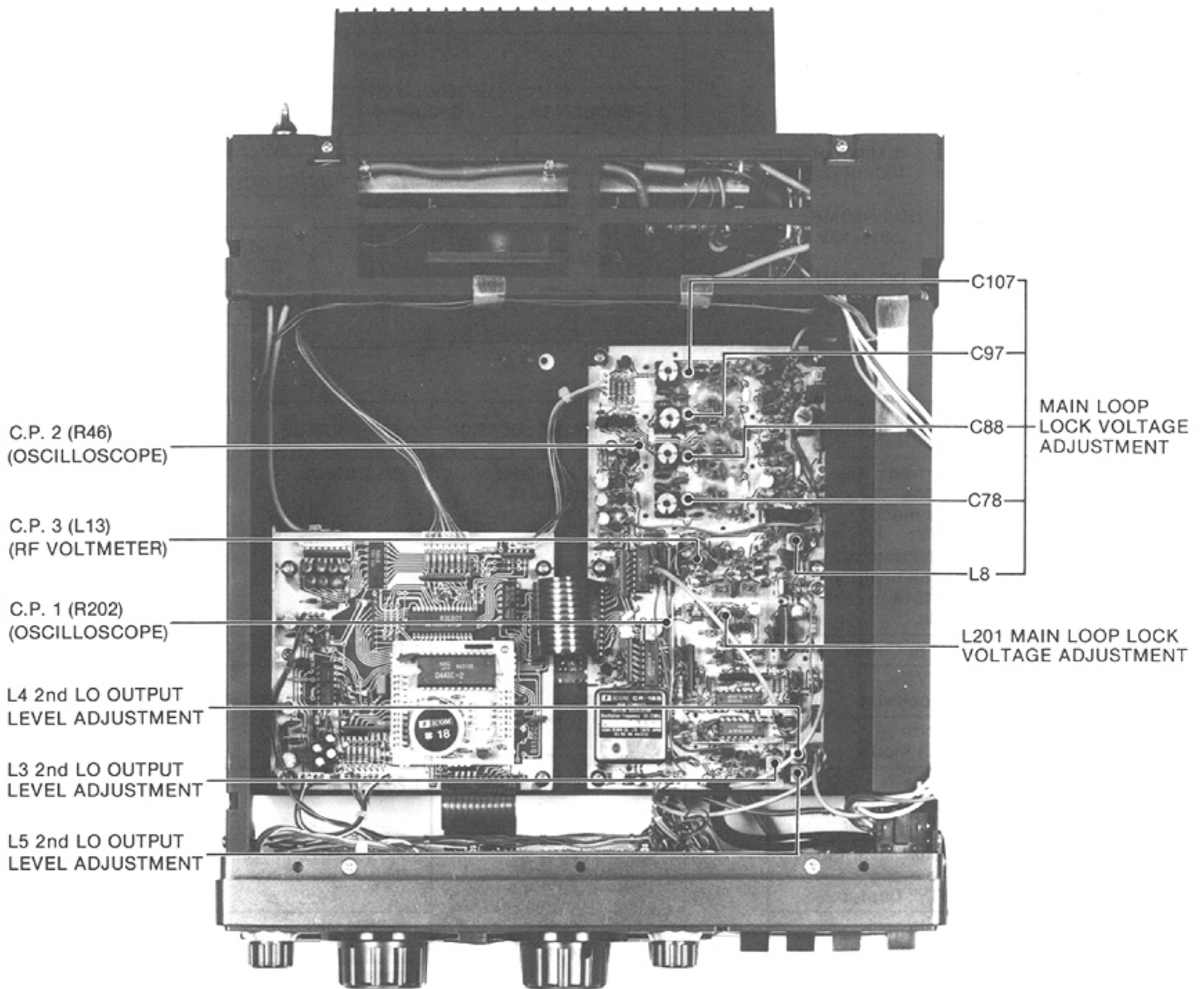


## 6-2 PLL ADJUSTMENT

INSTRUMENTS REQUIRED	CONNECTIONS
(1) VOLTAGE REGULATED POWER SUPPLY • OUTPUT VOLTAGE : DC 13.6V ± 15% • CURRENT CAPACITY : 30A or more (2) FREQUENCY COUNTER • FREQUENCY RANGE : 0.1~90MHz • ACCURACY : ± 1ppm or better • SENSITIVITY : 100mV or better (3) RF VOLT METER • FREQUENCY RANGE : 0.1~80MHz • MEASURING RANGE : 0.01~10V (4) OSCILLOSCOPE • FREQUENCY RANGE : DC~20MHz • MEASURING RANGE : 0.01~10V	

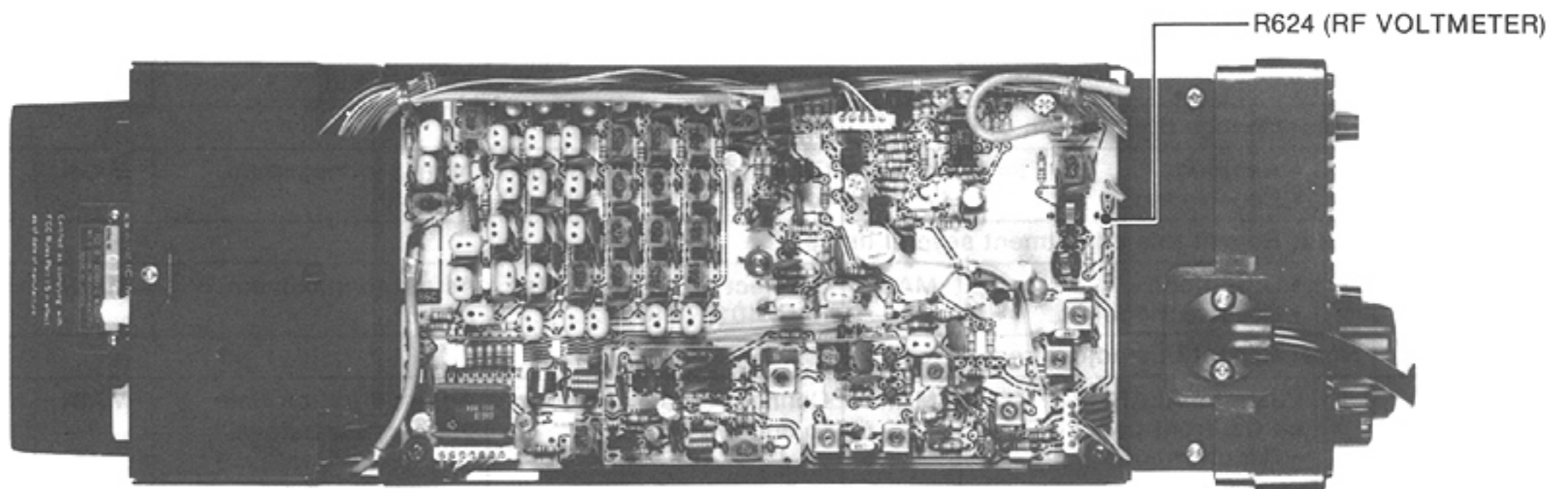
ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST
SUB LOOP LOCK VOLTAGE	1 • Display freq.: 6.9999MHz • MODE: Any	PLL	Connect an oscilloscope to CP1 (R202).	3V	PLL	L201
	2 • Display freq.: 6.9999MHz			Approx. 1.5V		
MAIN LOOP LOCK VOLTAGE	1 • Display freq.: 6.9999MHz • MODE: Any	PLL	Connect an RF voltmeter to CP3 (L13).  Connect an oscilloscope to CP2 (R46).	Adjust to maximum output: 200~400mVrms	PLL	L8
	2 • Display freq.: 6.9999MHz			6.5V		C78
	3 • Display freq.: 11.9999MHz					C88
	4 • Display freq.: 17.9999MHz					C97
	5 • Display freq.: 23.9999MHz					C107
2nd LO OUTPUT LEVEL	1 • Display freq.: Any • MODE: Any	RF	Connect an RF voltmeter to R624 (coaxial cable side)	Adjust to maximum output: +1~+5dBm/50Ω	PLL	L3~L5
REFERENCE FREQUENCY	1 • Display freq.: Any • MODE: Any	PLL	Connect a frequency counter to J5.	61.440000MHz	PLL	Confirming

**PLL UNIT**



\* C.P.: Check Point

**RF UNIT**



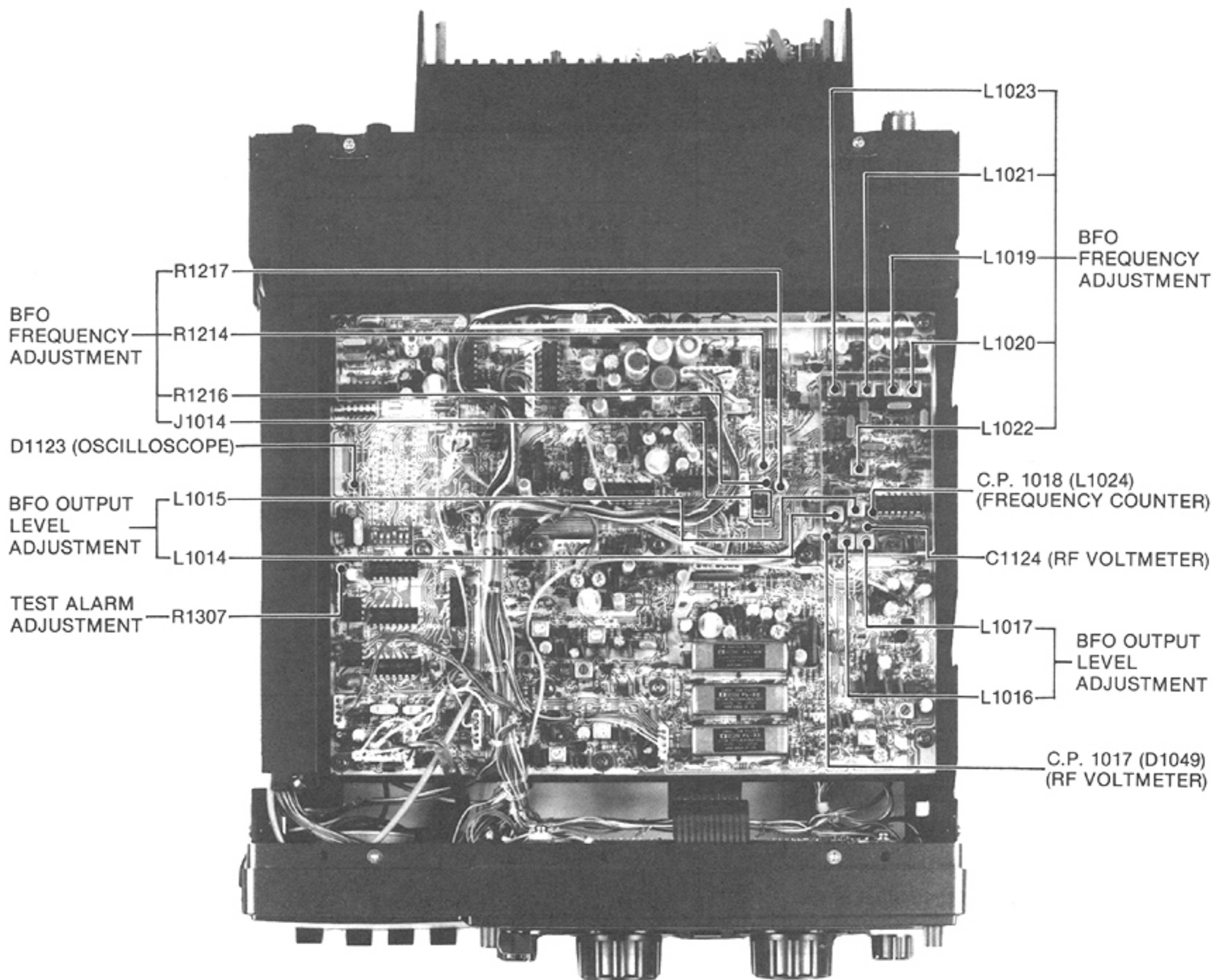
**NOTE:** For complete parts number, "600" must be added to the binary numeral on RF UNIT.

### 6-3 MAIN UNIT ADJUSTMENT

INSTRUMENTS REQUIRED	CONNECTIONS
(1) VOLTAGE REGULATED POWER SUPPLY • OUTPUT VOLTAGE : DC 13.6V ± 15% • CURRENT CAPACITY : 30A or more (2) FREQUENCY COUNTER • FREQUENCY RANGE : 0.1~90MHz • ACCURACY : ± 1ppm or better • SENSITIVITY : 100mV or better (3) RF VOLT METER • FREQUENCY RANGE : 0.1~80MHz • MEASURING RANGE : 0.01~10V (4) OSCILLOSCOPE • FREQUENCY RANGE : DC~10MHz • MEASURING RANGE : 0.01~10V	

ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST			
(a) USB receive	1	<ul style="list-style-type: none"> <li>Display freq.: Any</li> <li>USB mode</li> <li>Receive mode</li> <li>CLARITY: Fully counterclockwise</li> </ul> Change the position of jumper J1014 to rear panel side.	MAIN	Connect a frequency counter to CP1018 (L1024).	1.226830 MHz	MAIN	L1019		
	2	<ul style="list-style-type: none"> <li>CLARITY: Center</li> </ul>			1.227004 MHz			R1214	
	3	<ul style="list-style-type: none"> <li>CLARITY: Fully clockwise</li> </ul>			1.227150 MHz~ 1.227200 MHz			Confirming	
	(b) USB transmit	4			<ul style="list-style-type: none"> <li>USB mode</li> <li>Transmit mode</li> </ul>			1.227004 MHz	R1216
	(c) LSB receive	5			<ul style="list-style-type: none"> <li>LSB mode</li> <li>Receive mode</li> <li>CLARITY: Center</li> </ul>			1.230004 MHz	L1020
	(d) CW receive	6			<ul style="list-style-type: none"> <li>CW mode</li> <li>Receive mode</li> <li>CLARITY: Center</li> </ul>			1.227504 MHz	L1023
	(e) CW transmit	7			<ul style="list-style-type: none"> <li>CW mode</li> <li>Transmit mode</li> </ul>			1.228504 MHz	L1022
	(f) FSK receive	8			<ul style="list-style-type: none"> <li>FSK mode</li> <li>Receive mode</li> <li>CLARITY: Center</li> </ul>			1.226804 MHz	L1021
	(g) FSK transmit (Shift freq.: 425Hz)	9			Change the position of jumper J1014 to front panel side. <ul style="list-style-type: none"> <li>FSK mode</li> <li>Transmit mode</li> </ul>			1.226678 MHz	R1217
	(h) FSK transmit (Shift freq.: 850Hz)	10			Same as above.			1.226653 MHz	R1217
Note: Change the position of jumper J1014 to rear panel side.									
3rd LO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>AM mode</li> <li>Receive mode</li> </ul>	MAIN	Connect an RF voltmeter to C1124.	Adjust to maximum output.	MAIN	L1014 L1015		
	Note: Repeat this adjustment several times.								
BFO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>USB mode</li> <li>Receive mode</li> </ul>	MAIN	Connect an RF voltmeter to CP1017 (D1049).	Adjust to maximum output.	MAIN	L1016 L1017		
	Note: Repeat this adjustment several times.								
TEST ALARM	1	Push the ALARM SWITCH on the front panel. <ul style="list-style-type: none"> <li>Receive mode</li> </ul>	MAIN	Connect an oscilloscope to anode of D1123.	Adjust duration time 250 ms (See below).	MAIN	R1307		
				T: 250ms					

**MAIN UNIT**



\* C.P.: Check Point

**NOTE:** For complete parts number, "1000" must be added to the binary numeral on MAIN UNIT.

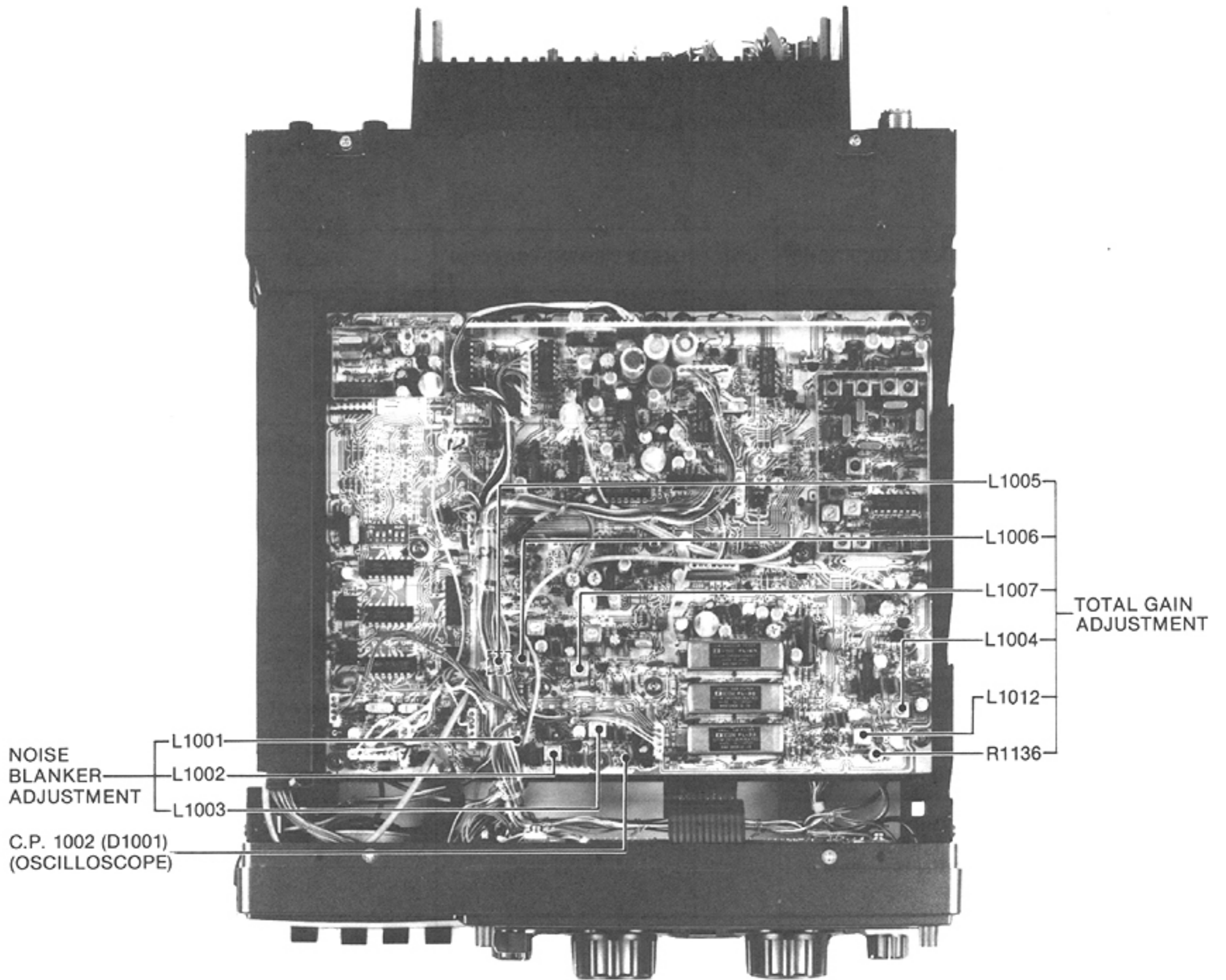


## 6-4 RECEIVER ADJUSTMENT

INSTRUMENTS REQUIRED	CONNECTIONS
<p>(1) VOLTAGE REGULATED POWER SUPPLY</p> <ul style="list-style-type: none"> <li>• OUTPUT VOLTAGE : DC 13.6V ± 15%</li> <li>• CURRENT CAPACITY : 30A or more</li> </ul> <p>(2) STANDARD SIGNAL GENERATOR (SSG)</p> <ul style="list-style-type: none"> <li>• FREQUENCY RANGE : 0.1~40MHz</li> <li>• OUTPUT LEVEL : 0.1μV~32mV (-127~-17dBm)</li> </ul> <p>(3) AC MILLIVOLTMETER</p> <ul style="list-style-type: none"> <li>• MEASURING RANGE : 10mV~3V</li> </ul> <p>(4) EXTERNAL SPEAKER</p> <ul style="list-style-type: none"> <li>• IMPEDANCE : 8Ω</li> </ul> <p>(5) OSCILLOSCOPE</p> <ul style="list-style-type: none"> <li>• FREQUENCY RANGE : DC~20MHz</li> <li>• MEASURING RANGE : 0.01~10V</li> </ul>	

ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST
TOTAL GAIN	<p>1</p> <ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> <li>• SPEAKER: OFF</li> <li>• NB: ON</li> </ul> <p>Connect CP1003 to CP1004 with a jumper wire to turn AGC OFF. Set the output level of a SSG to 1μV (-107dBm)</p>	REAR PANEL	Connect an AC MILLIVOLTMETER to EXT. SPEAKER JACK.	Adjust to maximum output.	MAIN	L1004~L1007, L1012
	<p>2</p> <p>Disconnect a jumper wire between CP1003 and CP1004. Set the output level of a SSG to approximate 0.32mV (-57dBm).</p>			3V	FRONT PANEL	VOLUME CONTROL
	<p>3</p> <p>Turn off the output of the SSG.</p>			100mV	MAIN	R1136
NOISE BLANKER	<p>1</p> <ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> <li>• USB mode</li> <li>• NB: ON</li> </ul> <p>Apply pulse noise (S1 or more on S meter) to the ANT. connector.</p>	MAIN	Connect an oscilloscope to CP1002.	Adjust to maximum noise waveform on the scope.	MAIN	L1001~L1003

MAIN UNIT



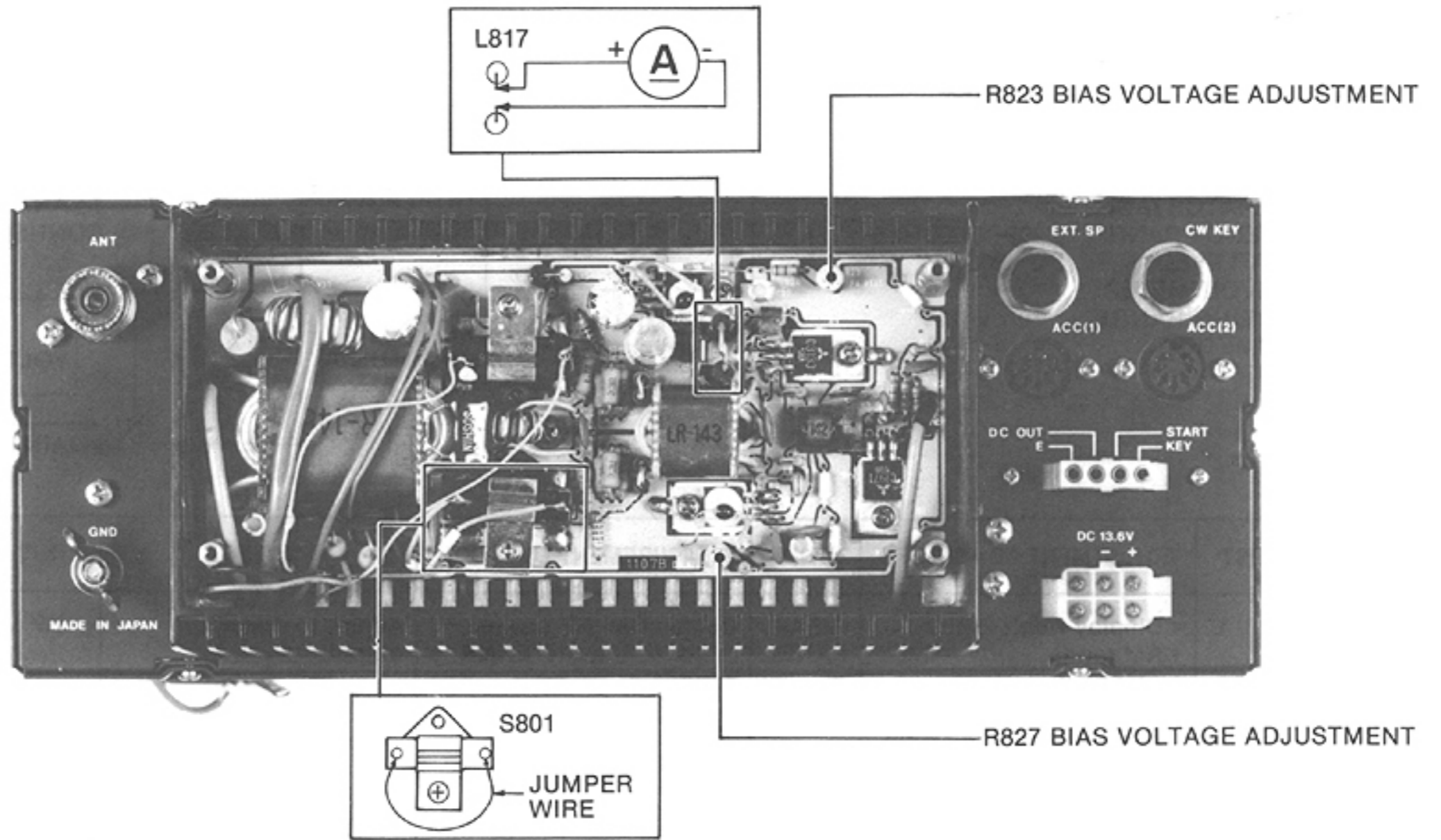
\* C.P.: Check Point

NOTE: For complete parts number, "1000" must be added to the binary numeral on MAIN UNIT.

## 6-5 PA UNIT ADJUSTMENT

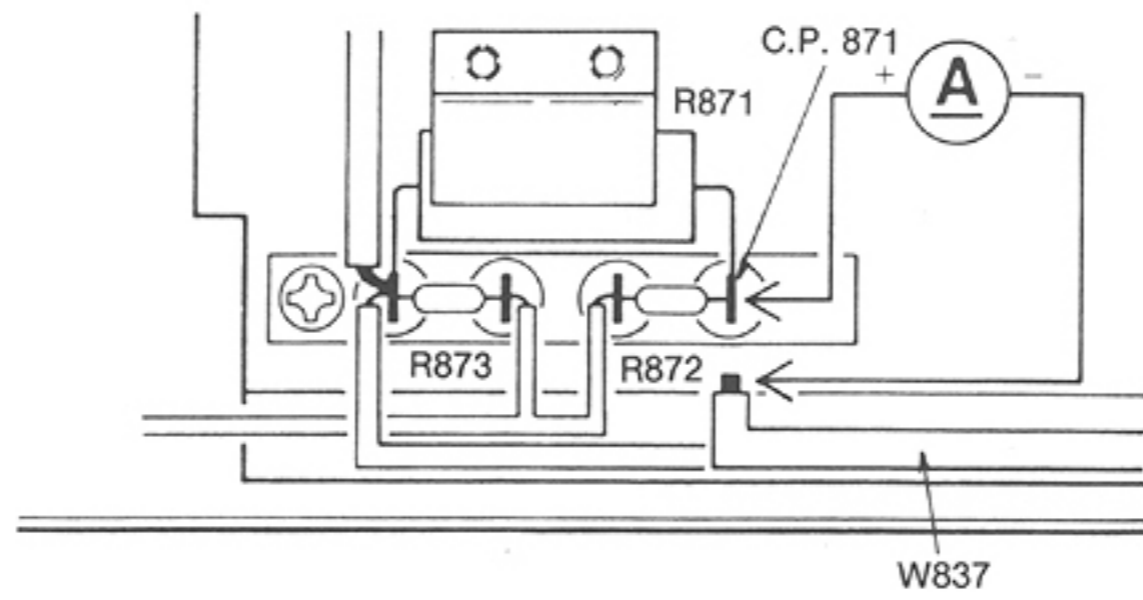
INSTRUMENTS REQUIRED			CONNECTIONS				
(1) VOLTAGE REGULATED POWER SUPPLY • OUTPUT VOLTAGE : DC 13.6V + 15% • CURRENT CAPACITY : 30A (2) DC AMMETER • MEASURING RANGE : 0~3A							
ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST	
BIAS VOLTAGE (a) For driver transistors	1	<ul style="list-style-type: none"> <li>Display freq.: 22MHz</li> <li>LSB mode</li> <li>R1181 (MAIN UNIT): Fully counterclockwise</li> <li>Transmit mode</li> </ul>	PA	Desolder at the center at L817 (CP801) with 6 bead cores, and connect a DC ammeter there in series.	100mA	PA	R827
	Note: After adjustment, solder the center at L817 with 6 bead core to restore the original condition of the unit.						
(b) For final transistors	2	Same as above.	REAR CHASSIS	Desolder at CP871 (an intersection of R871 and R872) at W837, and connect a DC ammeter there in series.	600mA	PA	R823
	Notes: After adjustment, solder CP871 to restore the original condition of the unit. After adjustments of 1 and 2, set R1181 of MAIN UNIT and to original condition.						
FAN CONTROL	1	• Receive mode	REAR CHASSIS		The fan does not rotate.	REAR CHASSIS	Confirming
	2	• Transmit mode			The fan rotates.		
	3	• Transmit mode Connect a jumper wire between the terminals of S801.			Rotation speed of the fan is shifted to high.		
	4	• Receive mode			Rotation speed of the fan is shifted to low.		
Note: After confirmings, remove a jumper wire from both terminals of S801.							

PA UNIT



NOTE: For complete parts number, "800" must be added to the binary numeral on PA UNIT.

REAR CHASSIS



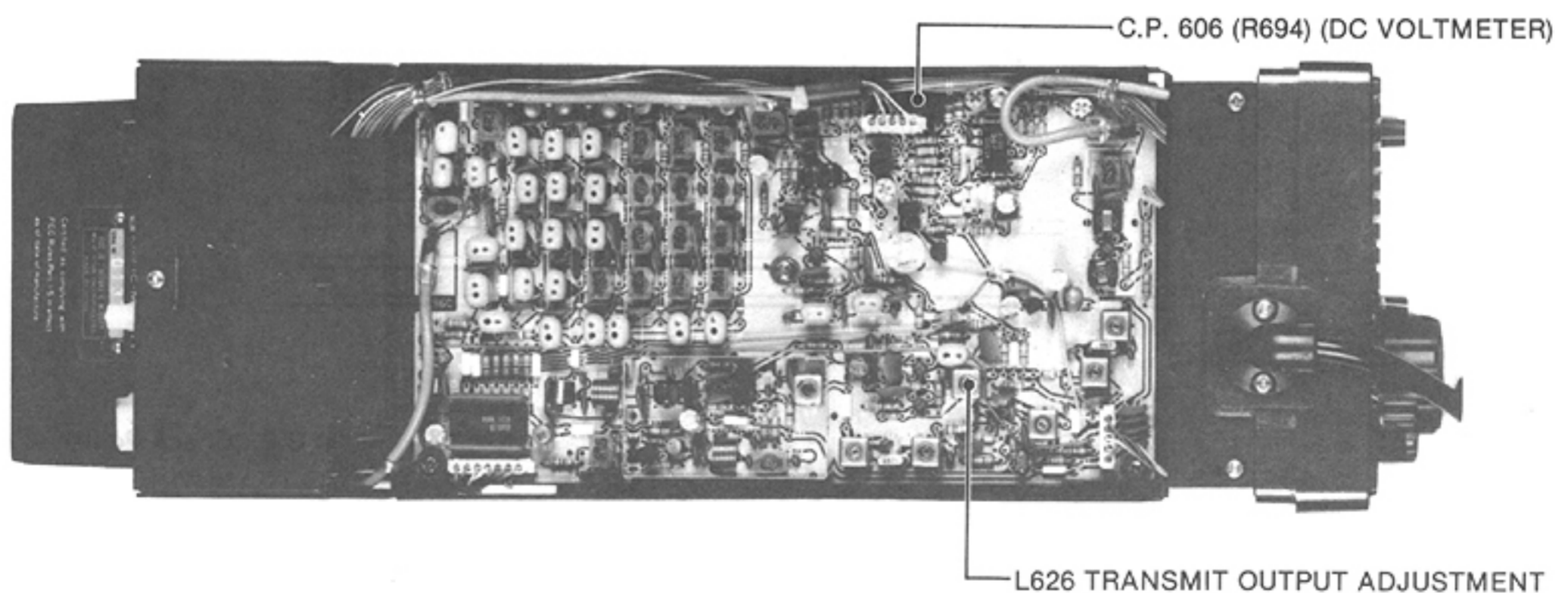
\* C.P.: Check Point



## 6-6 TRANSMITTER ADJUSTMENT

INSTRUMENTS REQUIRED			CONNECTIONS				
(1) VOLTAGE REGULATED POWER SUPPLY • OUTPUT VOLTAGE : DC 13.6V ± 15% • CURRENT CAPACITY : 30A (2) RF POWER METER (TERMINATED TYPE) • MEASURING RANGE : 5~200W • FREQUENCY RANGE : 1.6~25MHz • IMPEDANCE : 50Ω • SWR : 1: 1.1 or better (3) AF GENERATOR (AG) • FREQUENCY RANGE : 200~3000Hz • OUTPUT LEVEL : 0~300mV (4) AC MILLIVOLTMETER • MEASURING RANGE : 10mV~3V (5) DC VOLTMETER							
ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST	
TRANSMIT OUTPUT (a) COIL	1	<ul style="list-style-type: none"> <li>• Display freq.: 2MHz</li> <li>• AM mode</li> <li>• Transmit mode</li> <li>• R684 (RF UNIT): Fully counterclockwise</li> <li>• R612 (RF UNIT): Fully clockwise</li> <li>• Mic input: none</li> </ul>	REAR PANEL	Connect an RF power meter to the ANTENNA connector.	Adjust to maximum output.	RF	L626
	2	<ul style="list-style-type: none"> <li>• Display freq.: 2MHz</li> <li>• SSB (LSB or USB) mode</li> <li>• Transmit mode</li> </ul> Set the frequency of an AG to 1.5kHz and the output level to get the transmit output of 40~50W.	MAIN			Adjust to maximum output.	MAIN
(b) SWR	3	<ul style="list-style-type: none"> <li>• Display freq.: 2MHz</li> <li>• Transmit mode</li> </ul>	RF	Connect a DC voltmeter to CP606.	Adjust to minimum output.	FILTER	C1536

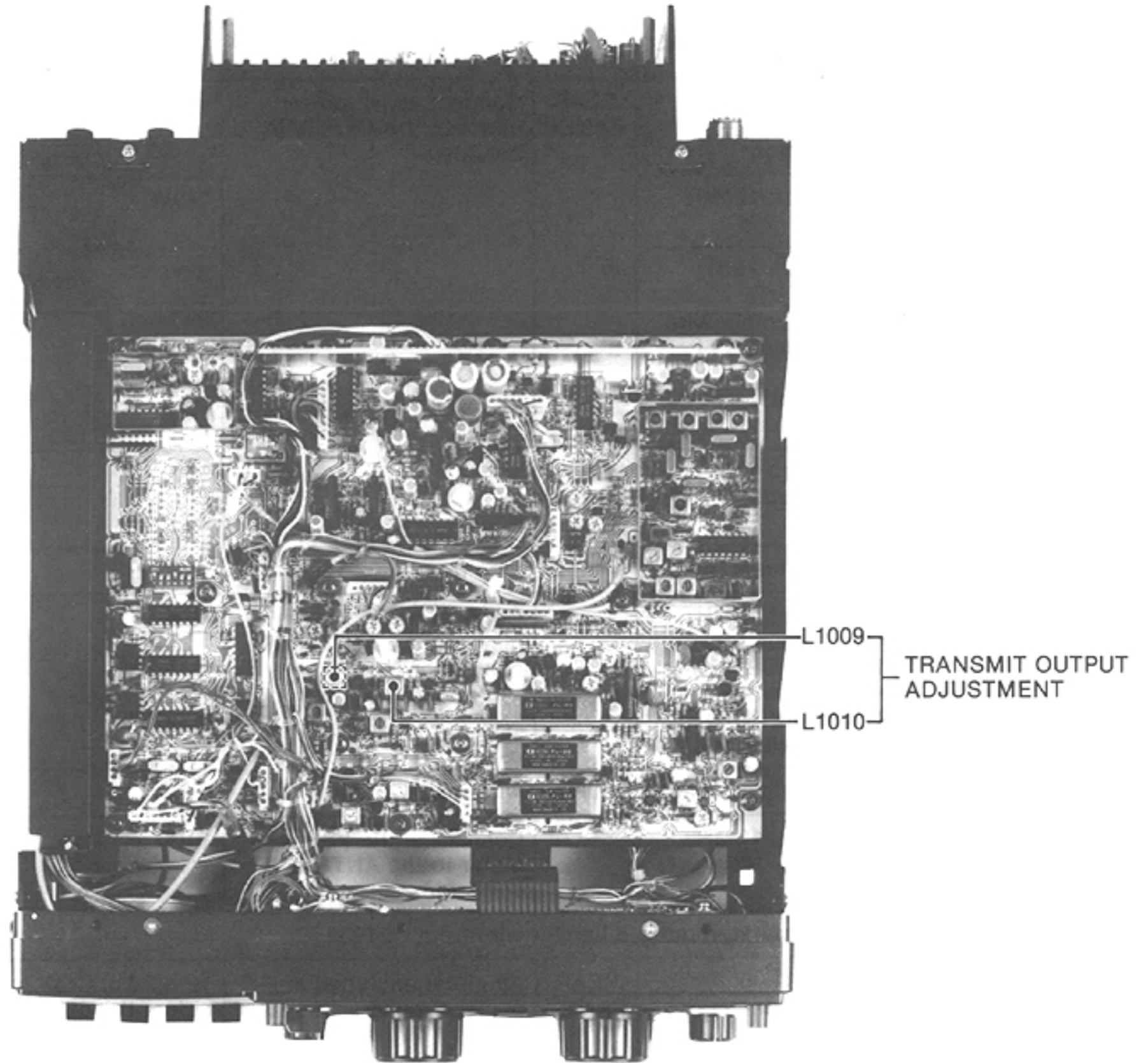
### RF UNIT



\* C.P.: Check Point

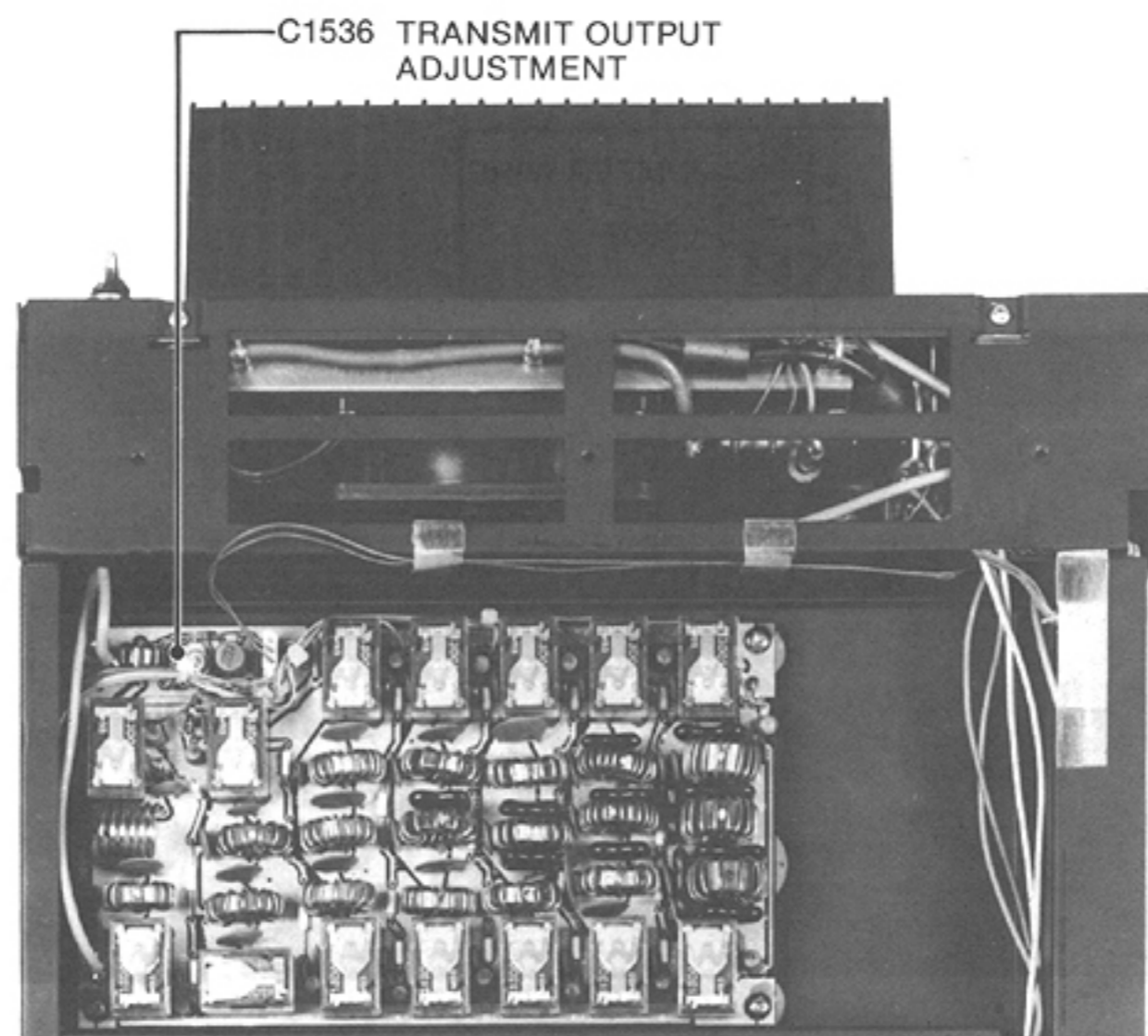
NOTE: For complete parts number, "600" must be added to the binary numeral on RF UNIT.

**MAIN UNIT**



**NOTE:** For complete number, "1000" must be added to the binary numeral on MAIN UNIT.

**FILTER UNIT**

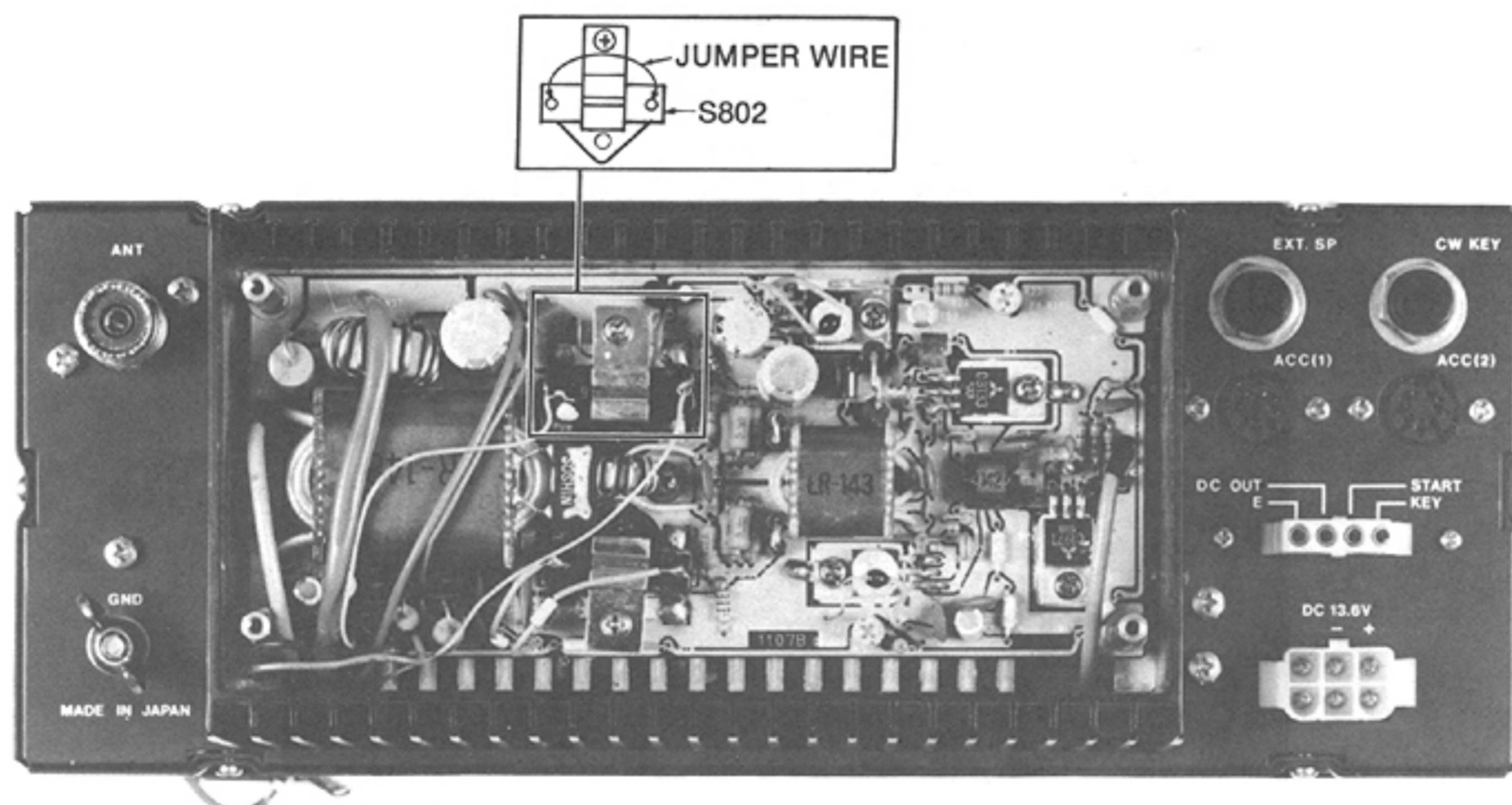


**NOTE:** For complete parts number, "1000" must be added to the binary numeral on FILTER UNIT.

## TRANSMITTER ADJUSTMENT (Continued)

ADJUSTMENT	ADJUSTMENT CONDITIONS	UNIT	MEASUREMENT LOCATION	VALUE	UNIT	ADJUST	
TRANSMIT OUTPUT (c) OUTPUT POWER	4	<ul style="list-style-type: none"> <li>• Display freq.: 2MHz</li> <li>• AM mode</li> <li>• No modulation</li> </ul>	REAR PANEL	Connect an RF power meter to the ANTENNA connector.	50W	MAIN	R1256
	5	<ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> <li>• FSK mode</li> </ul>					140W
	6	<ul style="list-style-type: none"> <li>• Display freq.: 2MHz</li> <li>• S802 (PA UNIT): Connect a jumper wire to both terminals of S802.</li> <li>• Transmit mode</li> <li>• No modulation</li> </ul>			20W	RF	R621
	7	<ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> <li>• Transmit mode</li> <li>• FSK mode</li> </ul>			60W	MAIN	R1245
Note: After adjustment, remove a jumper wire from S802.							
	8	<ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> <li>Connect ground to CP1015 and CP1030 with jumper wires.</li> <li>• R1247 (MAIN UNIT): Fully clockwise</li> </ul>		Connect an RF power meter to the ANTENNA connector.	40W	RF	R619
Note: After adjustment, remove a jumper wire from CP1015.							
	9	<ul style="list-style-type: none"> <li>• Display freq.: 12MHz</li> </ul>		Connect an RF power meter to the ANTENNA connector.	10W	MAIN	R1247
Note: After adjustment, remove a jumper wire from CP1030.							
IC APC	1	<ul style="list-style-type: none"> <li>• FSK mode</li> <li>• Transmit mode</li> <li>• Display freq.: Choose a frequency (at 12MHz or 22MHz band) which makes maximum current.</li> </ul>	REAR PANEL	Ammeter (included in a power supply)	Turn R612 CCW just before the output power drops.	RF	R612

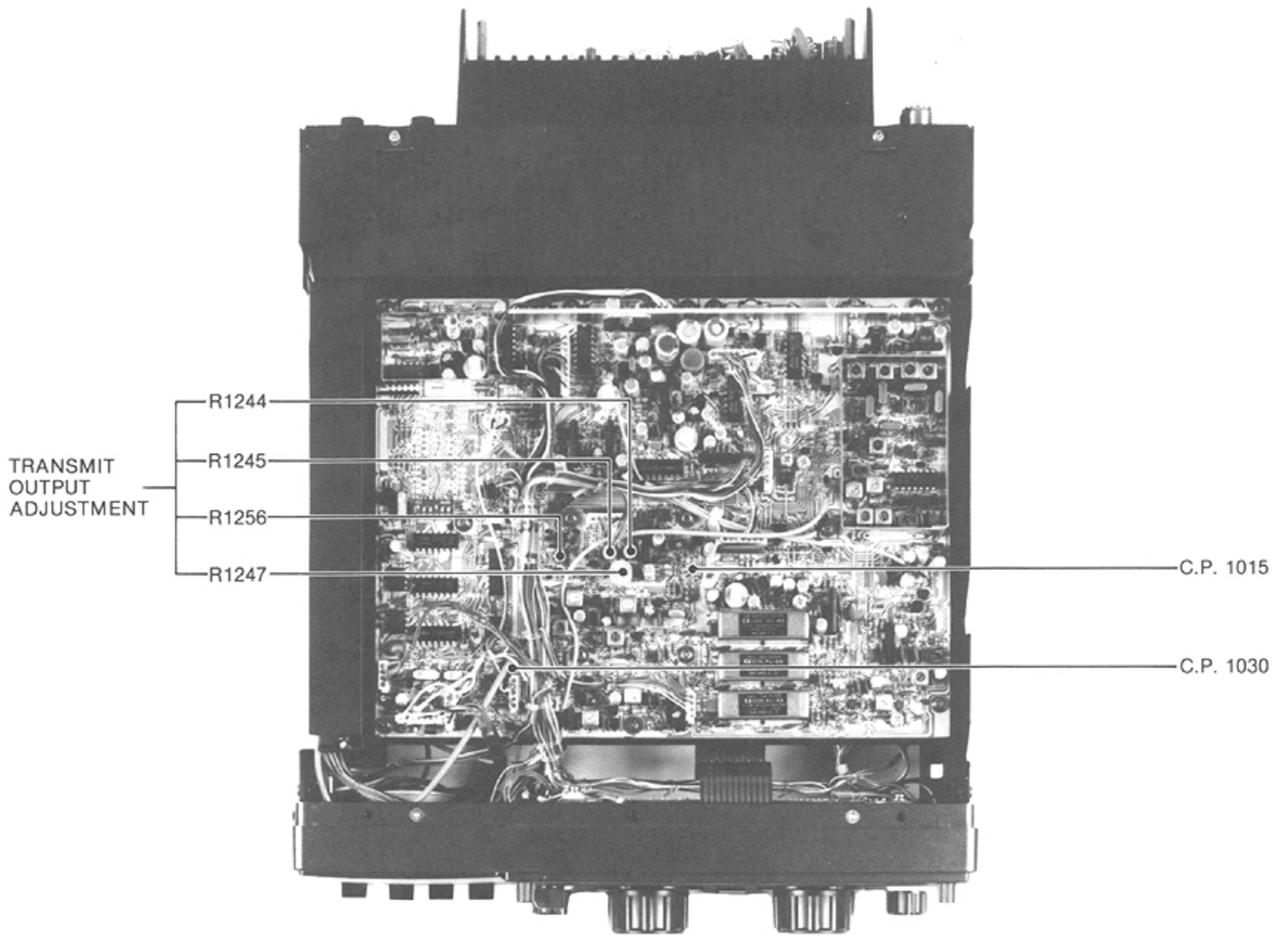
## PA UNIT



**NOTE:** For complete parts number, "800" must be added to the binary numeral on PA UNIT.



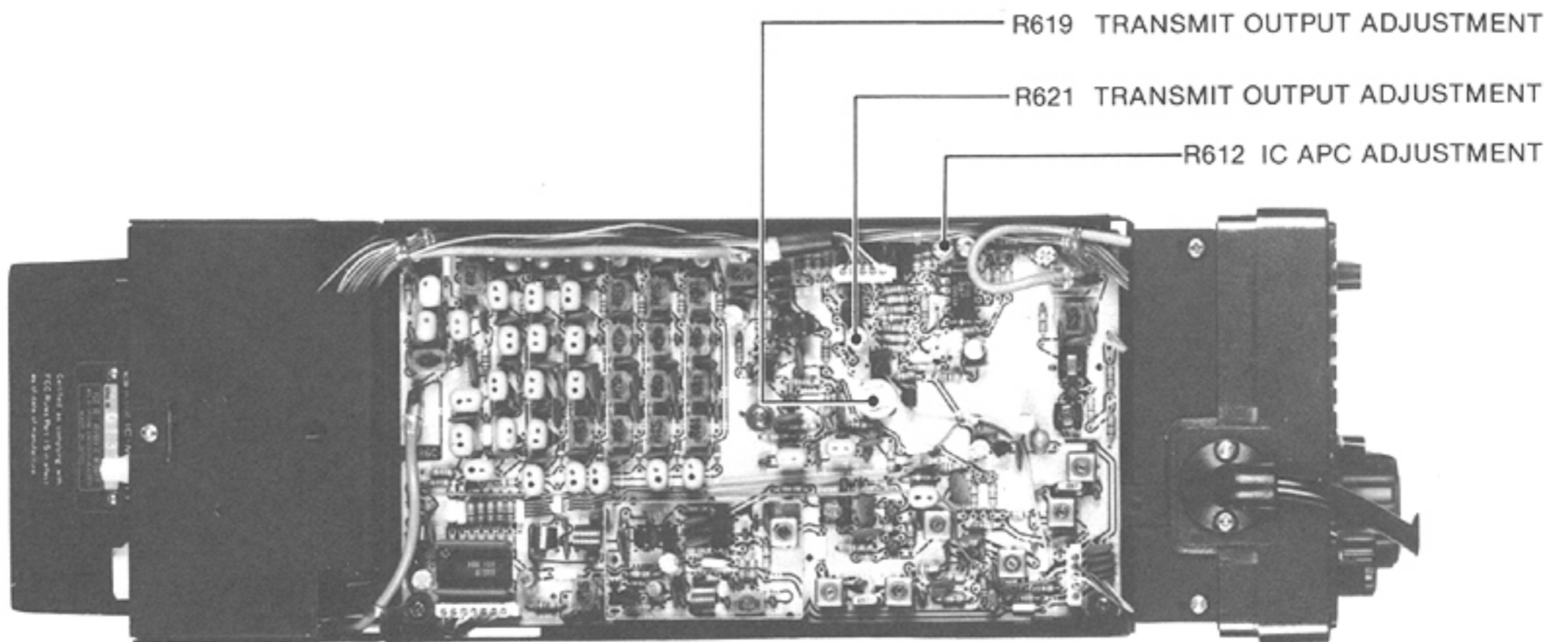
**MAIN UNIT**



\* C.P.: Check Point

**NOTE:** For complete parts number, "1000" must be added to the binary numeral on MAIN UNIT.

**RF UNIT**

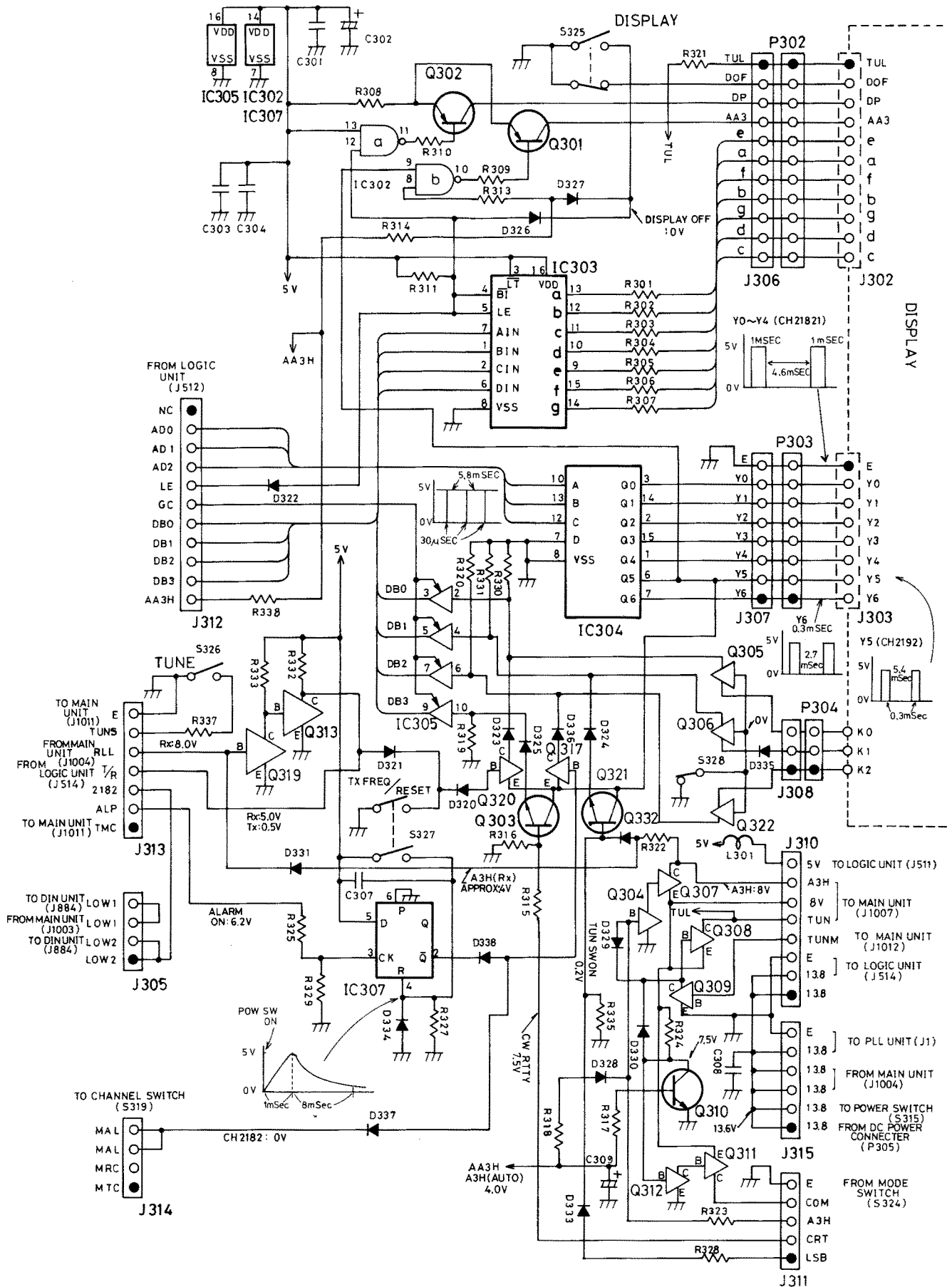


**NOTE:** For complete parts number, "600" must be added to the binary numeral on MAIN UNIT.

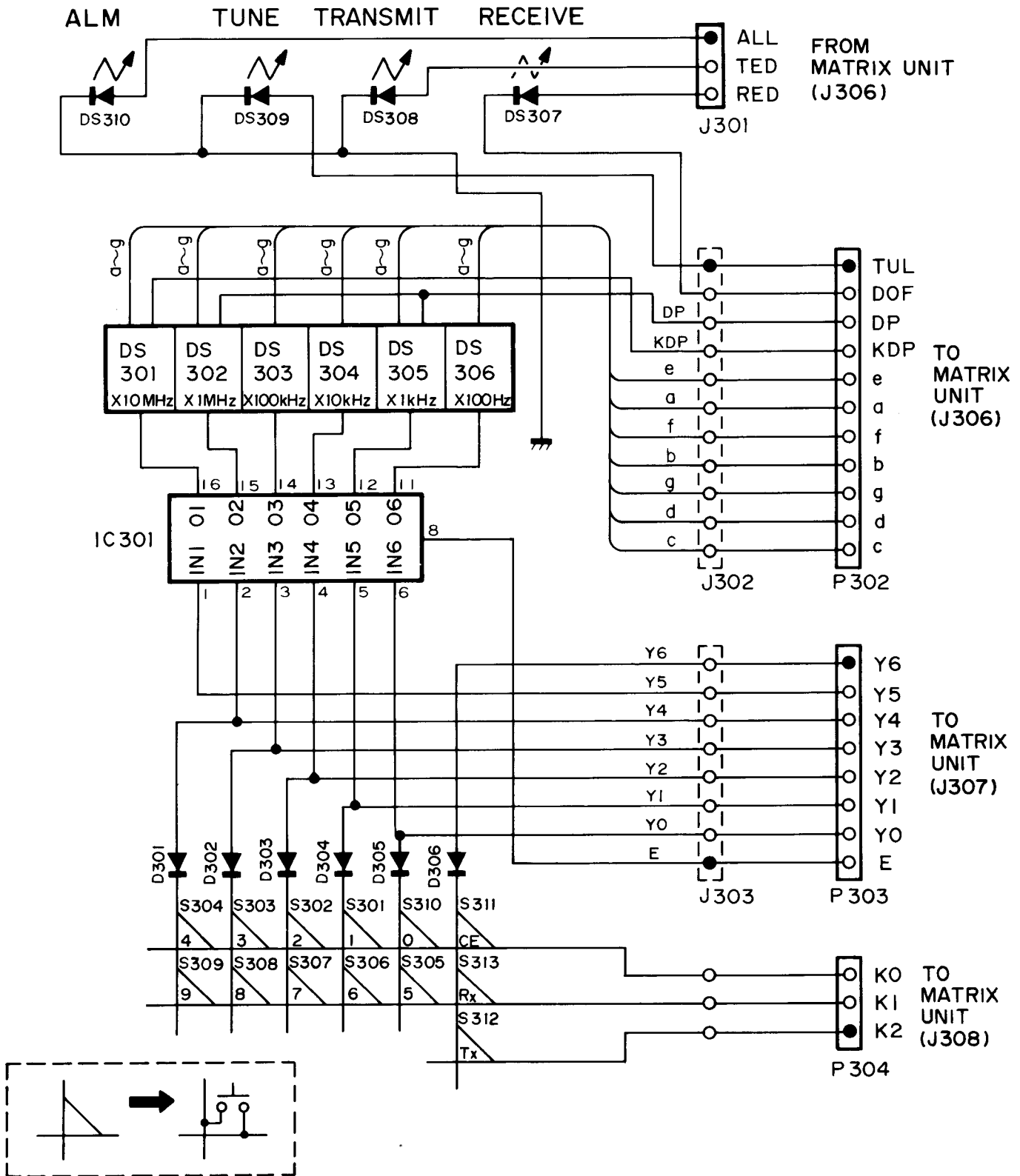


# SECTION 7 VOLTAGE/CIRCUIT DIAGRAMS

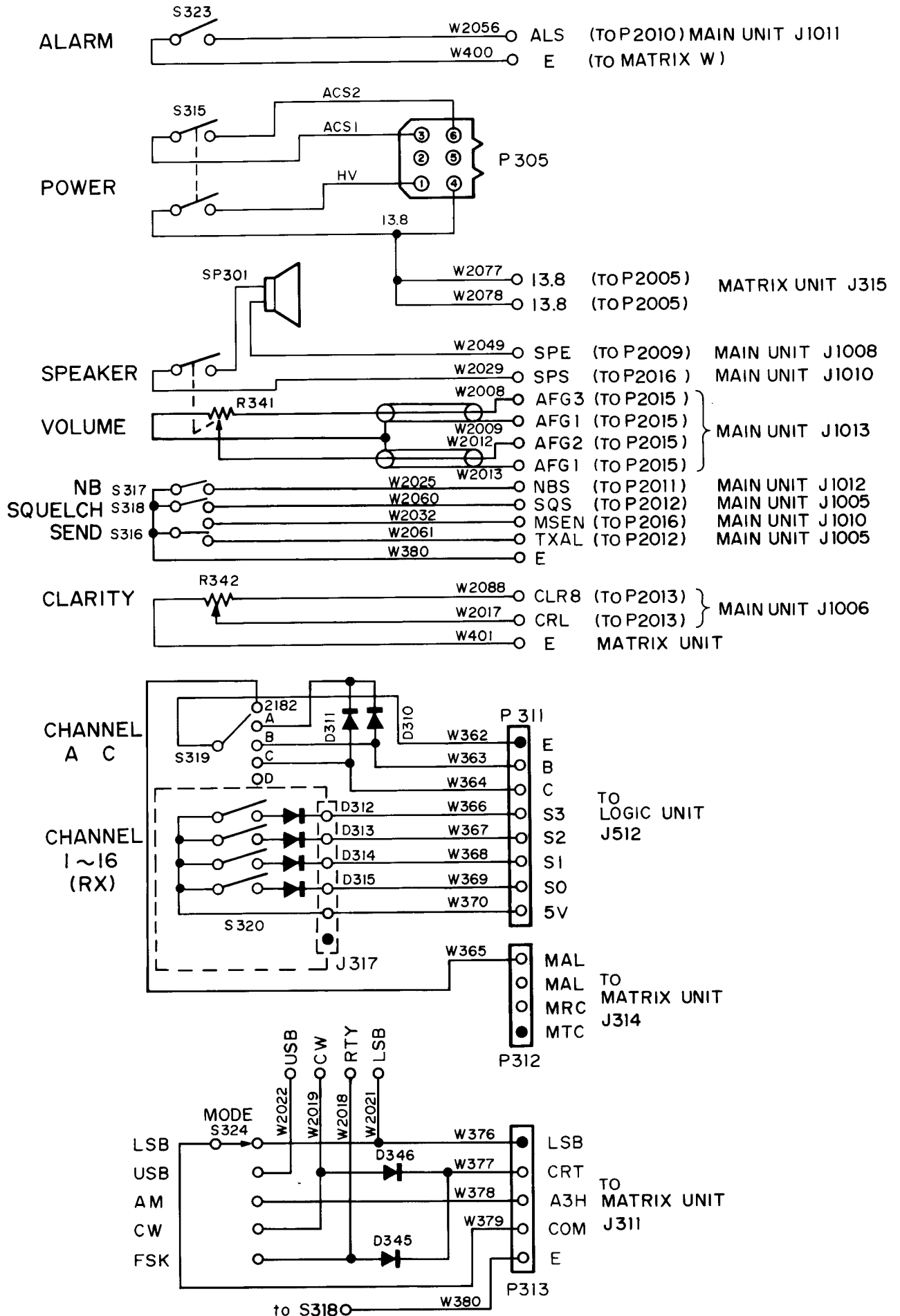
## 7-1 FRONT UNIT (MATRIX)



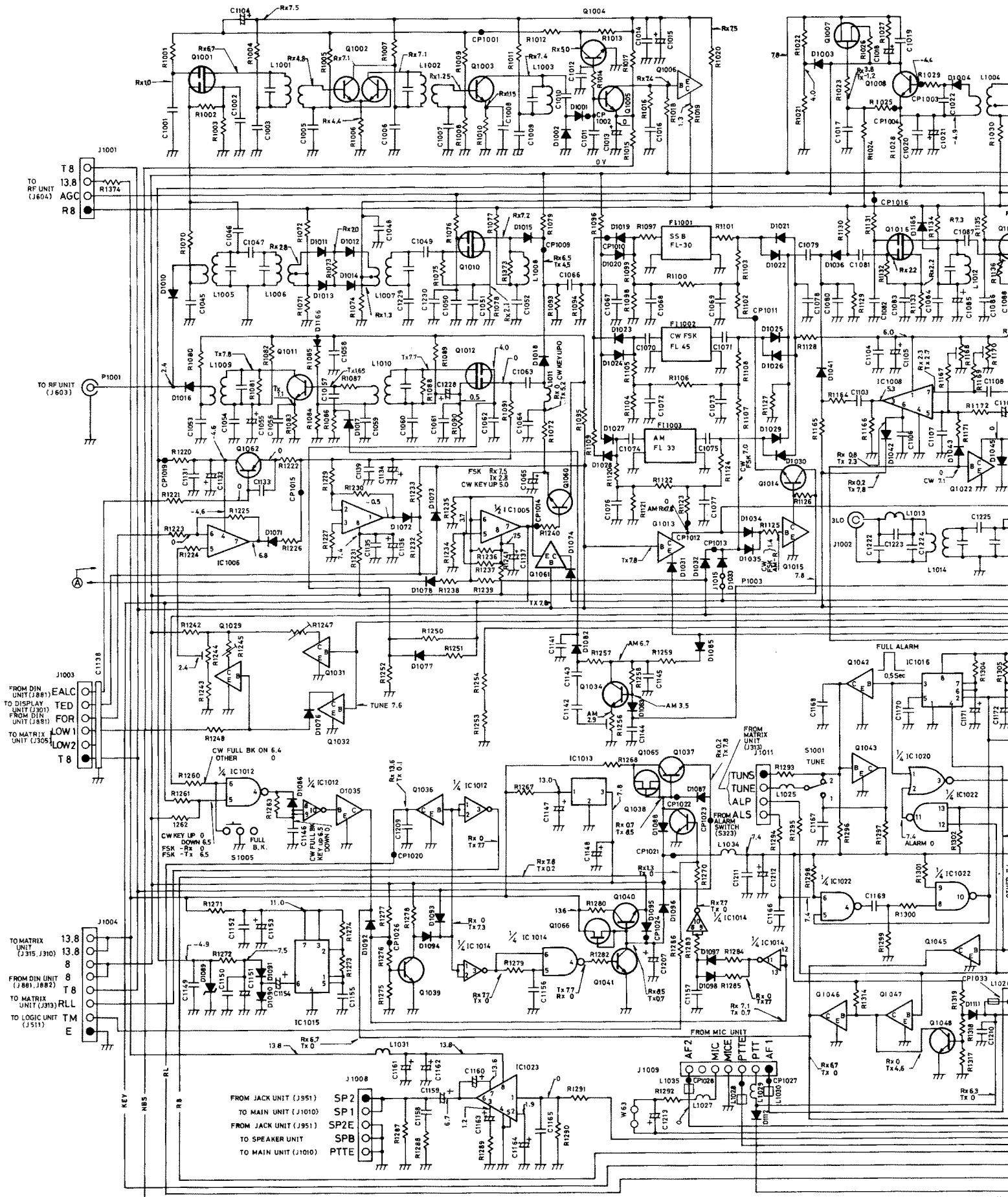
## 7-2 FRONT UNIT (DISPLAY)



### 7-3 FRONT UNIT (SWITCH)



# 7-4 MAIN UNIT



FROM JACK UNIT (J351) SP2  
 TO MAIN UNIT (J1010) SP1  
 FROM JACK UNIT (J351) SP2E  
 TO SPEAKER UNIT SPB  
 PTT

FROM MIC UNIT (J1009)  
 AF2  
 MIC  
 PTT  
 AF1

T8  
 13.8  
 AGC  
 R8

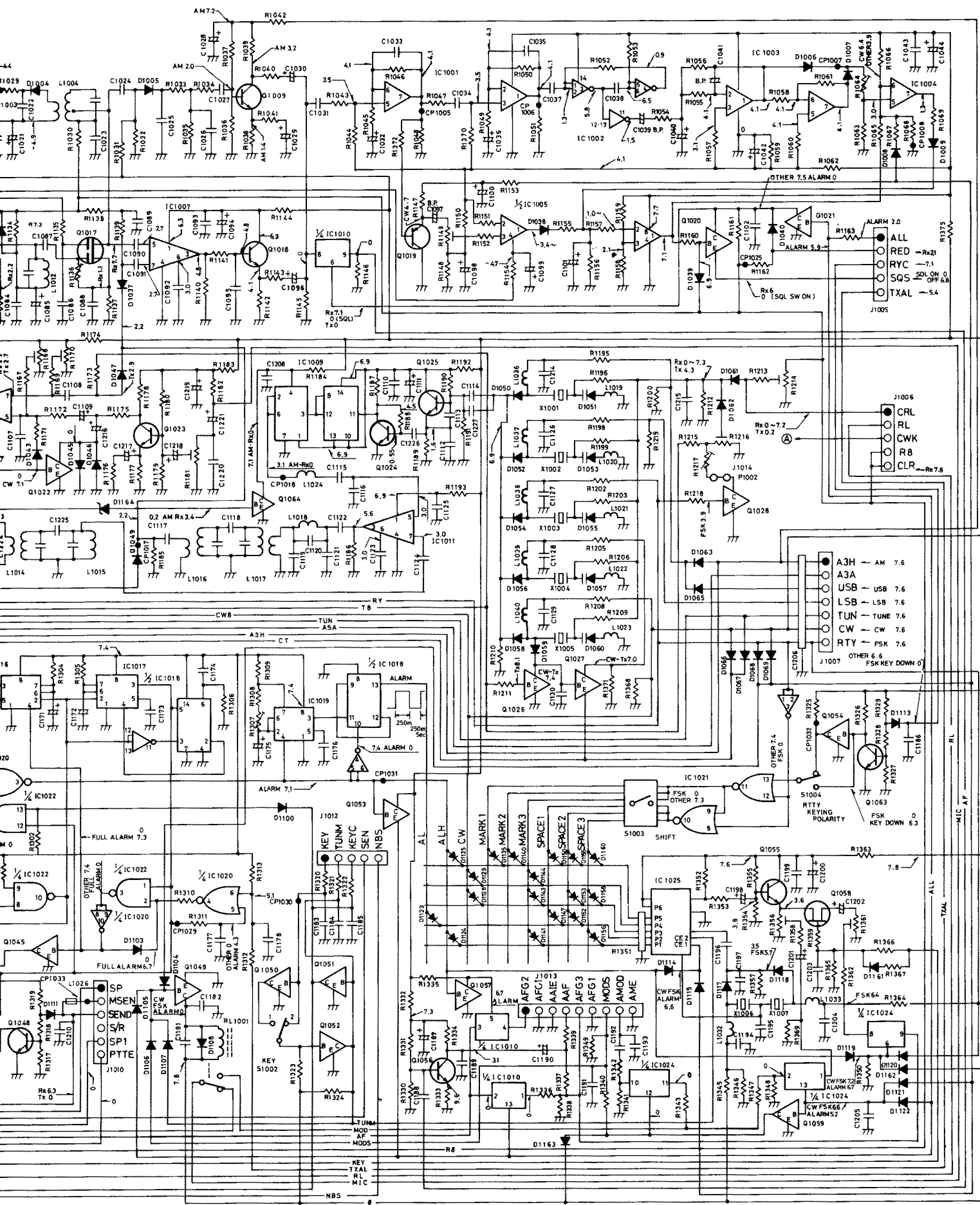
TO RF UNIT (J603)

FROM DIN UNIT (J881) EALC  
 TO DISPLAY UNIT (J301) TED  
 FROM DIN UNIT (J882) FOR  
 TO MATRIX UNIT (J303) LOW1  
 T8 LOW2

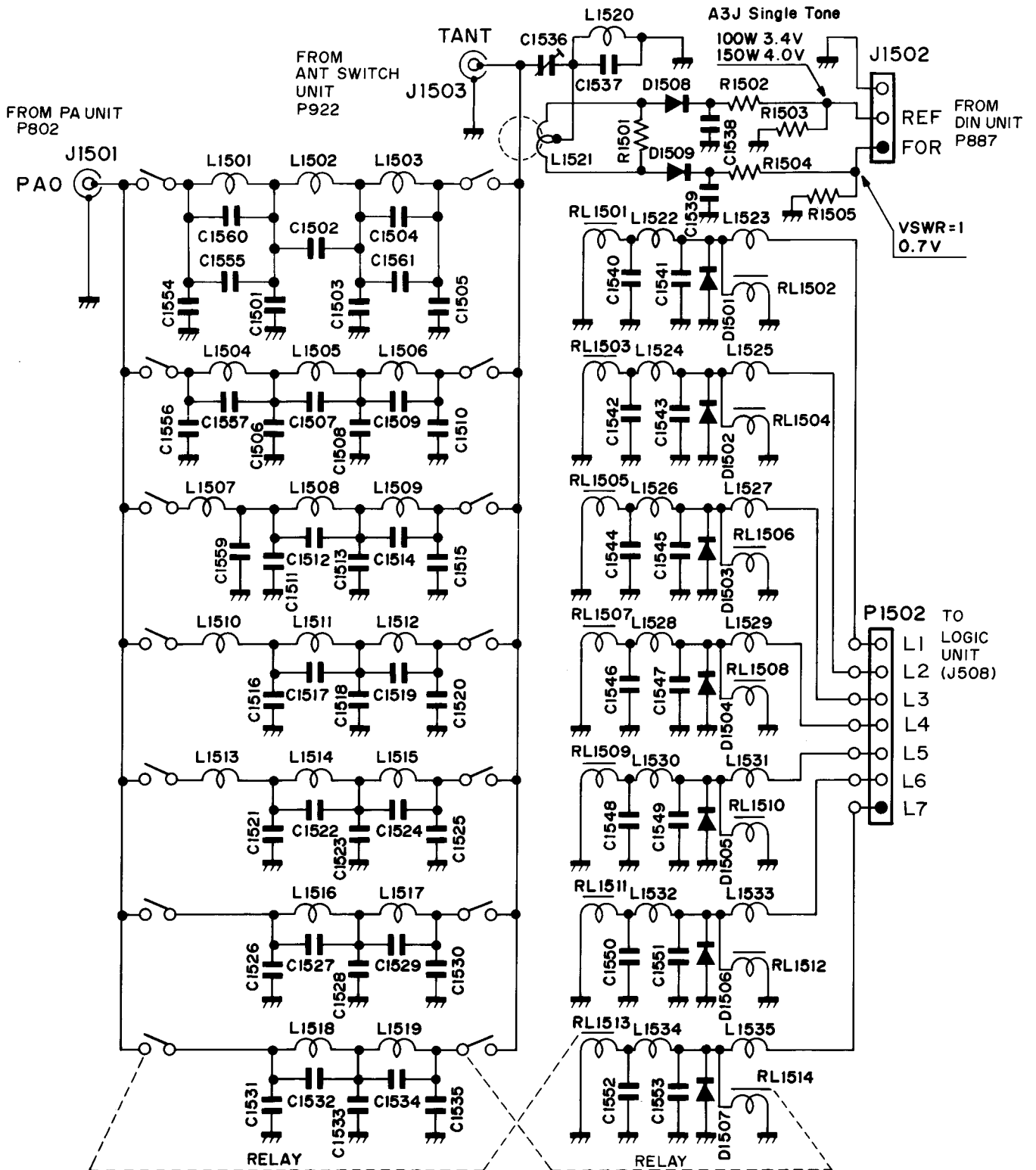
TO MATRIX UNIT (J315, J310) 13.8  
 13.8  
 8  
 FROM DIN UNIT (J881, J882) 8  
 T8  
 TO MATRIX UNIT (J313) RLL  
 TO LOGIC UNIT (J311) TM  
 E

KEY  
 NBS  
 RB





# 7-5 FILTER UNIT

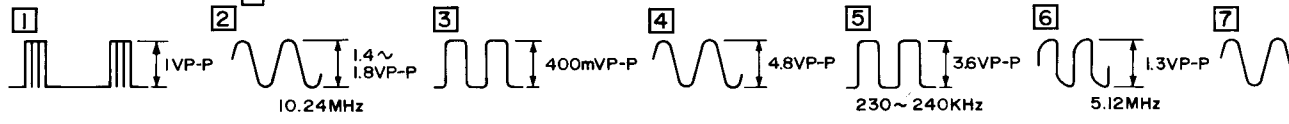
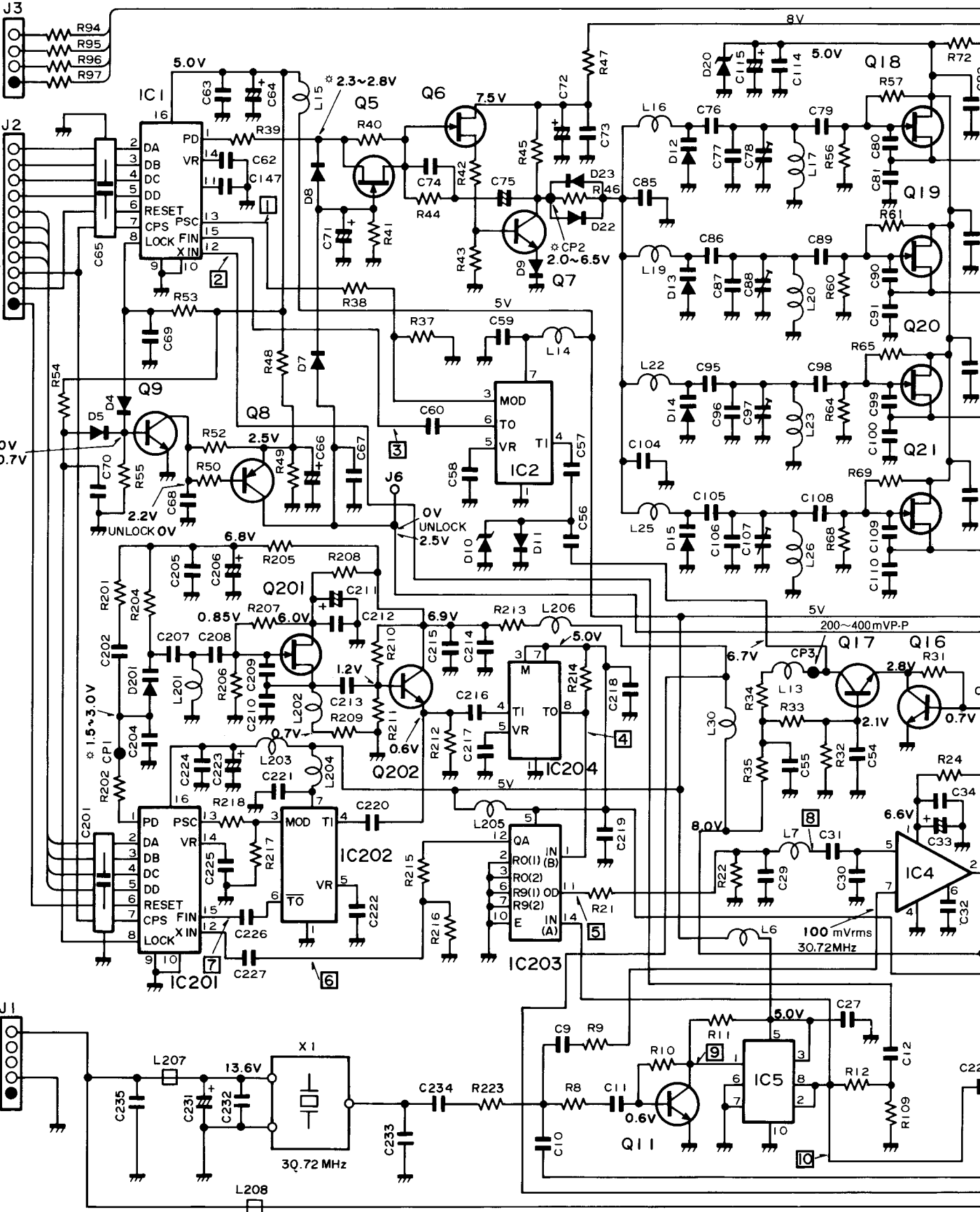


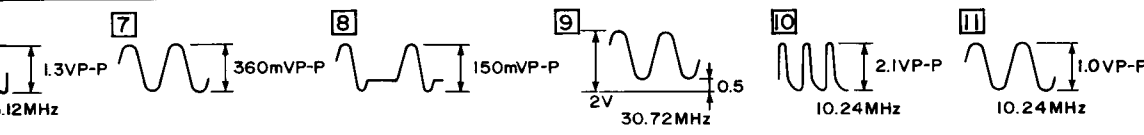
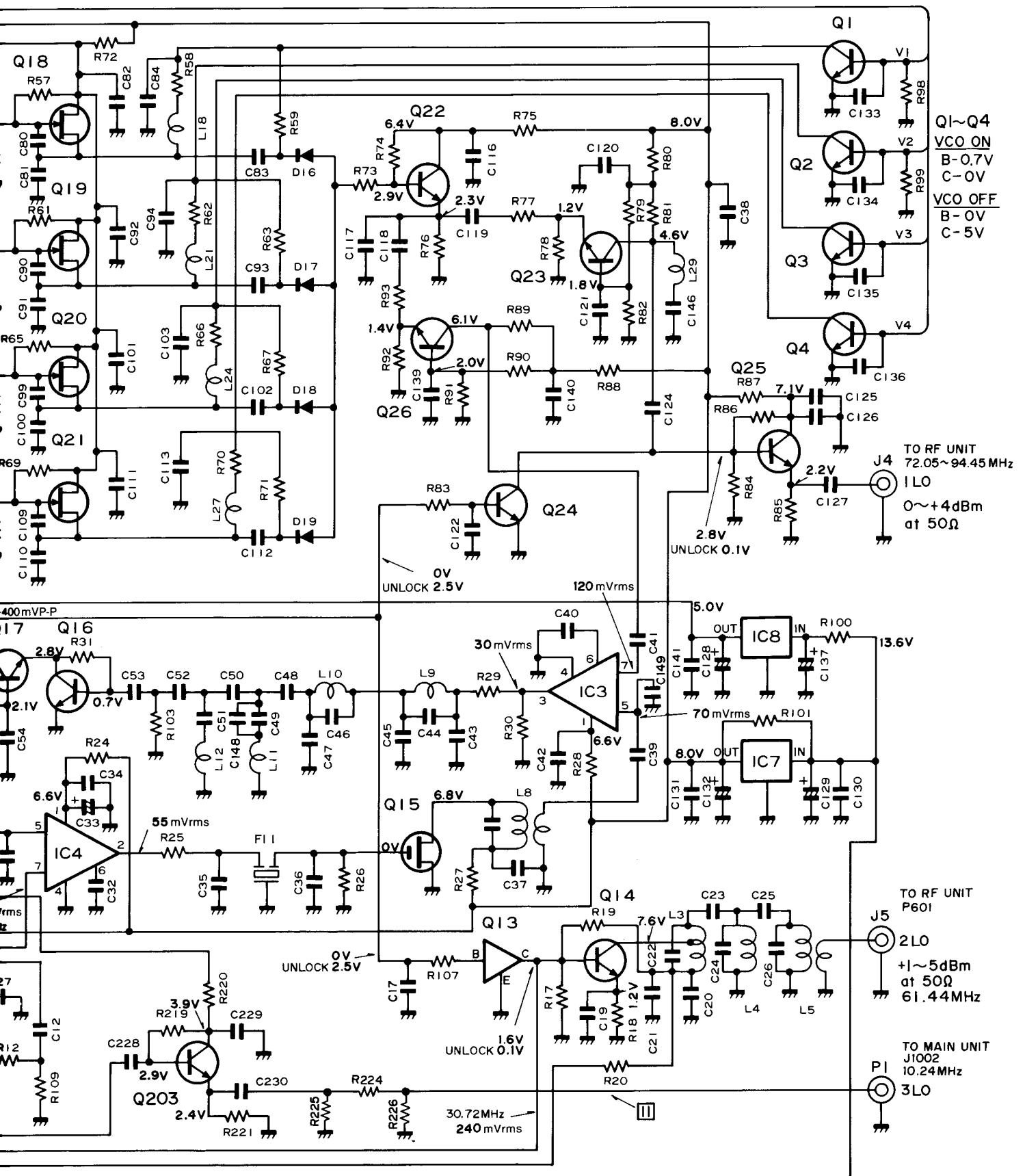
# 7-6 PLL UNIT

FROM LOGIC UNIT (J507)

FROM LOGIC UNIT (J505)

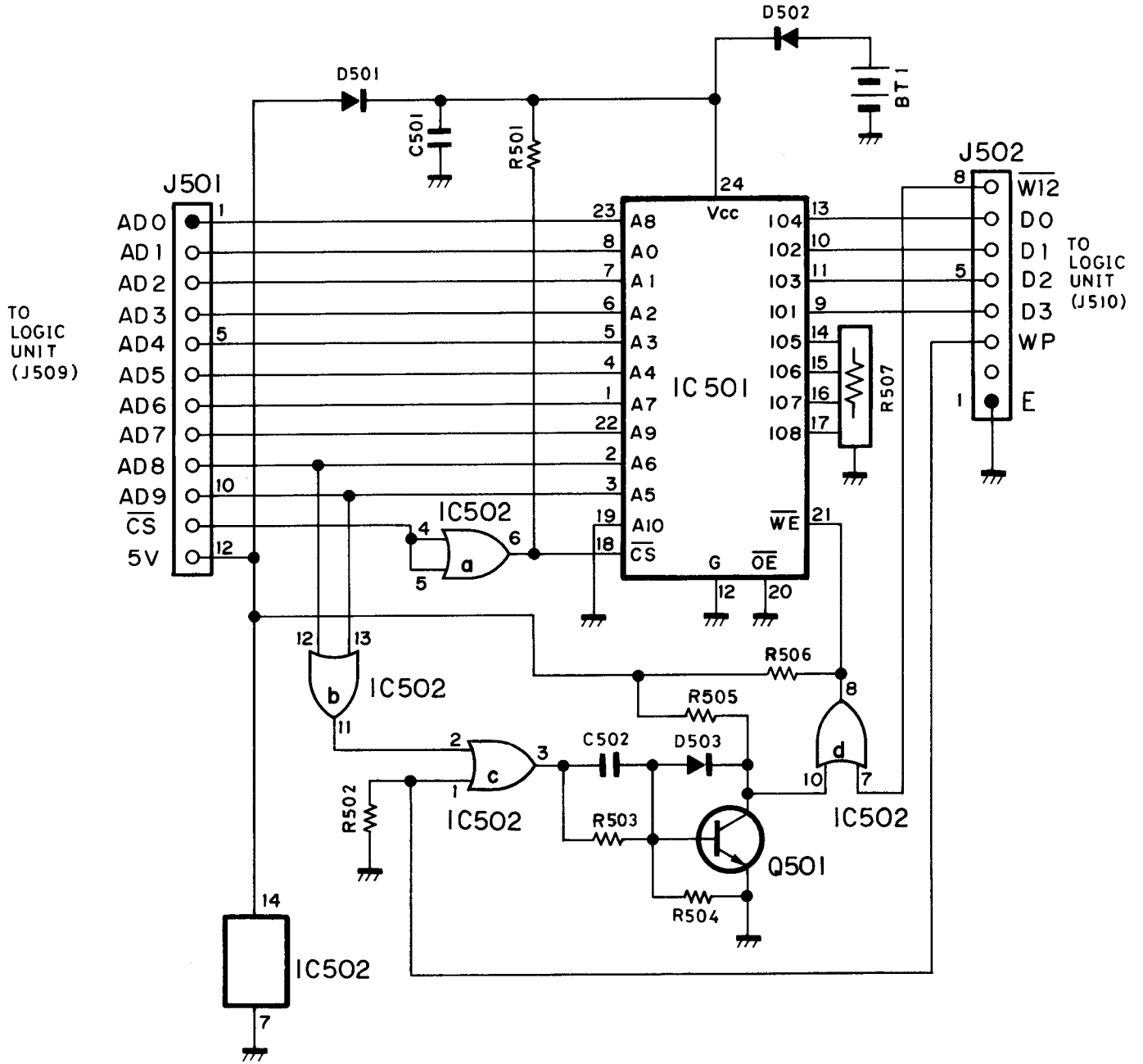
FROM MATRIX UNIT (J315)





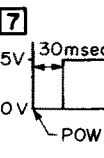
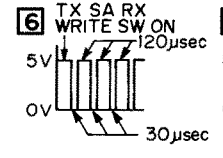
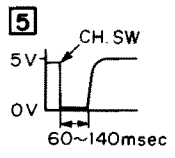
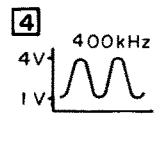
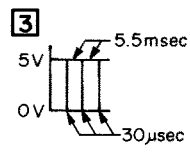
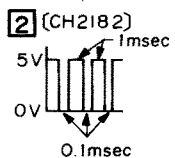
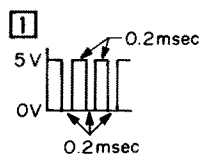
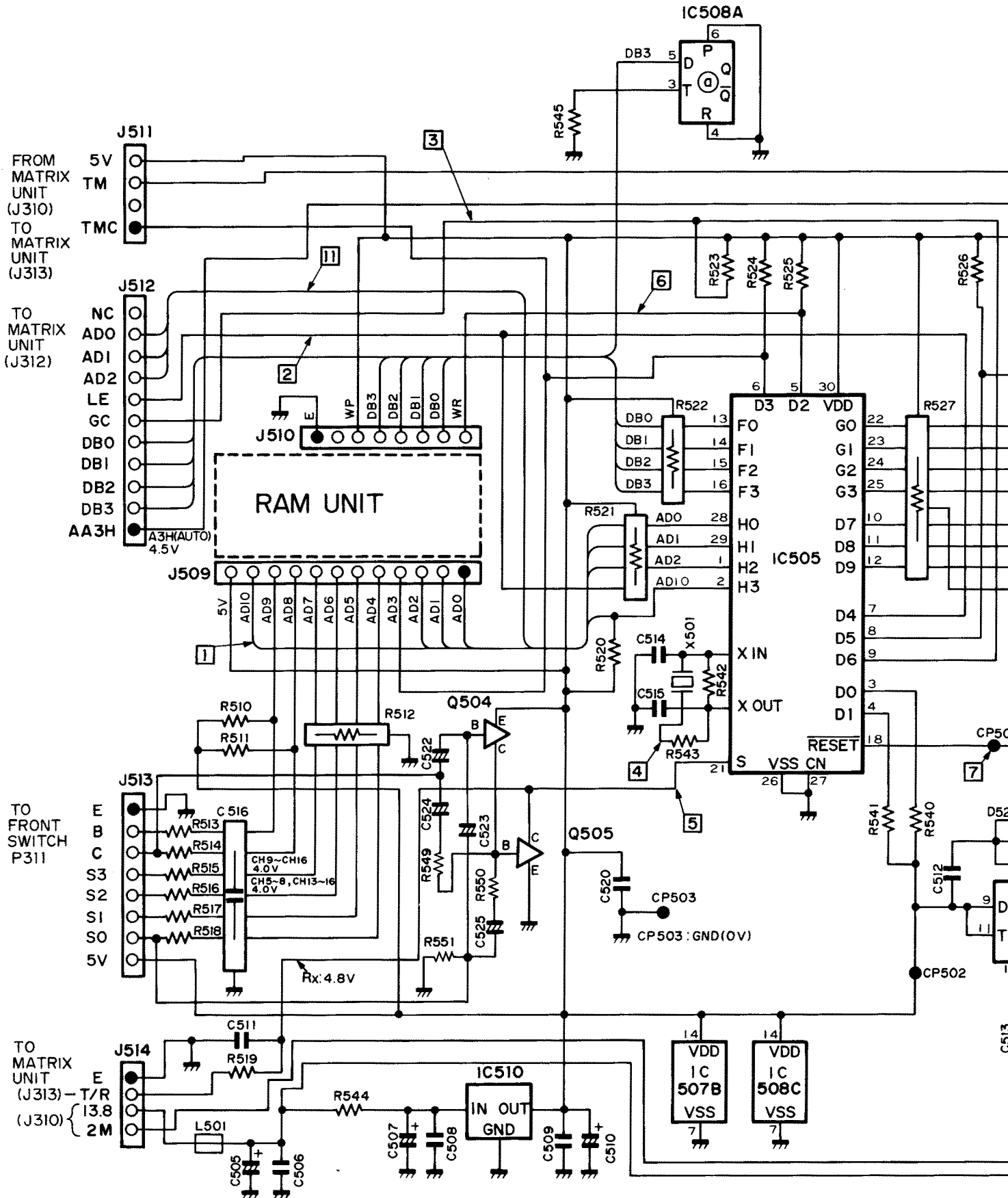
8.4V DC Voltage by 50kΩ-V multimeter  
 \* 3.6V DC Voltage by high impedance meter  
 7.8mV RF Voltage by RF millivolt meter

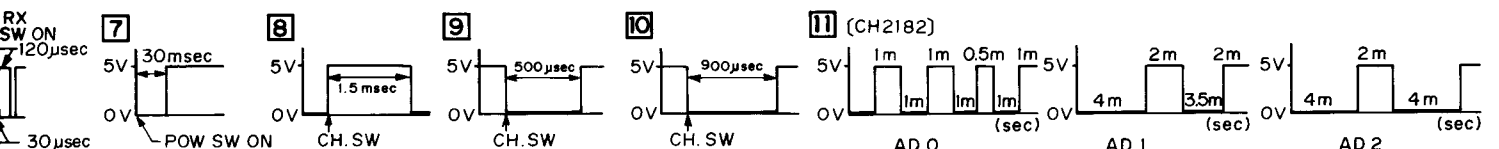
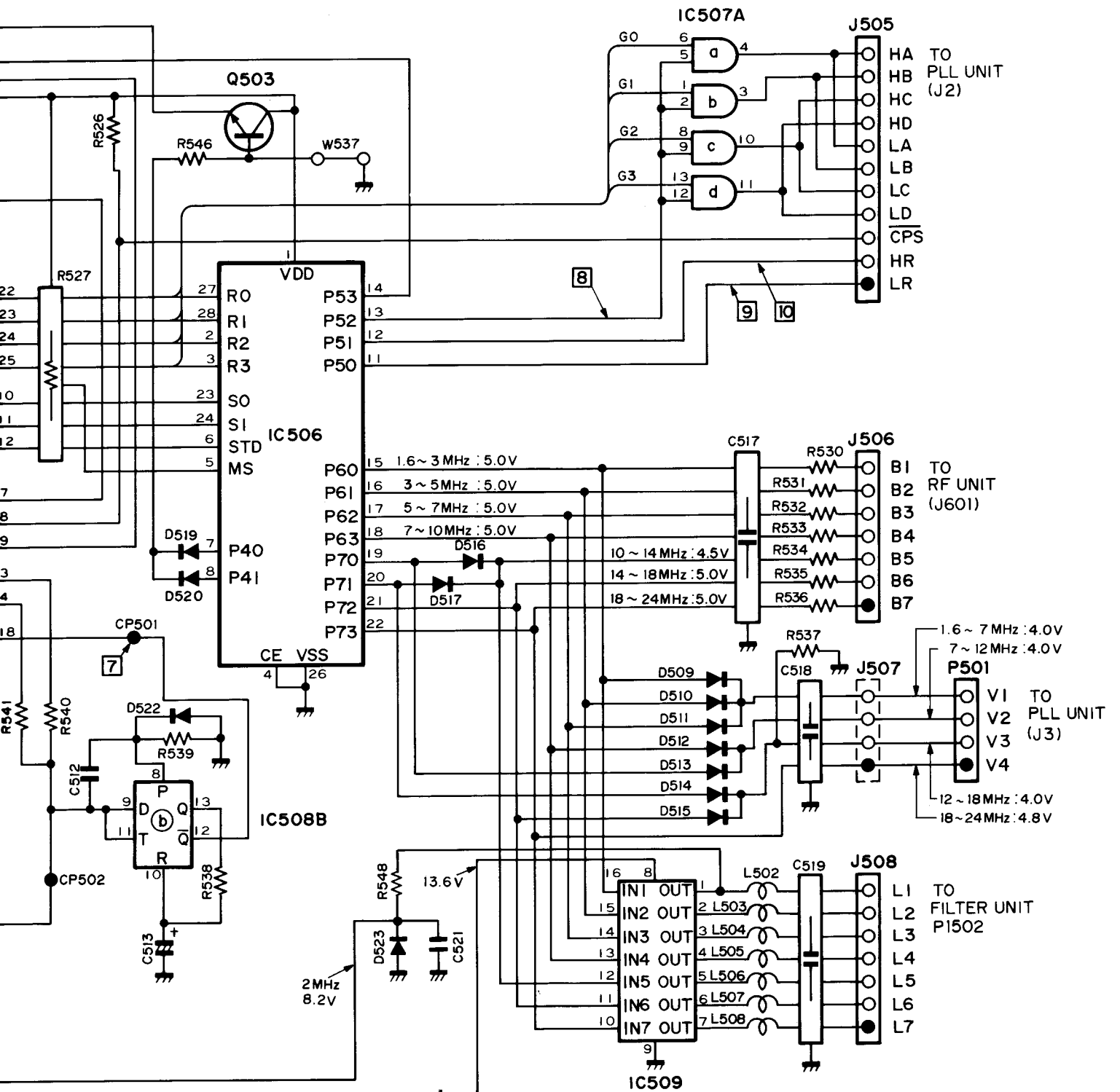
# 7-7 RAM UNIT



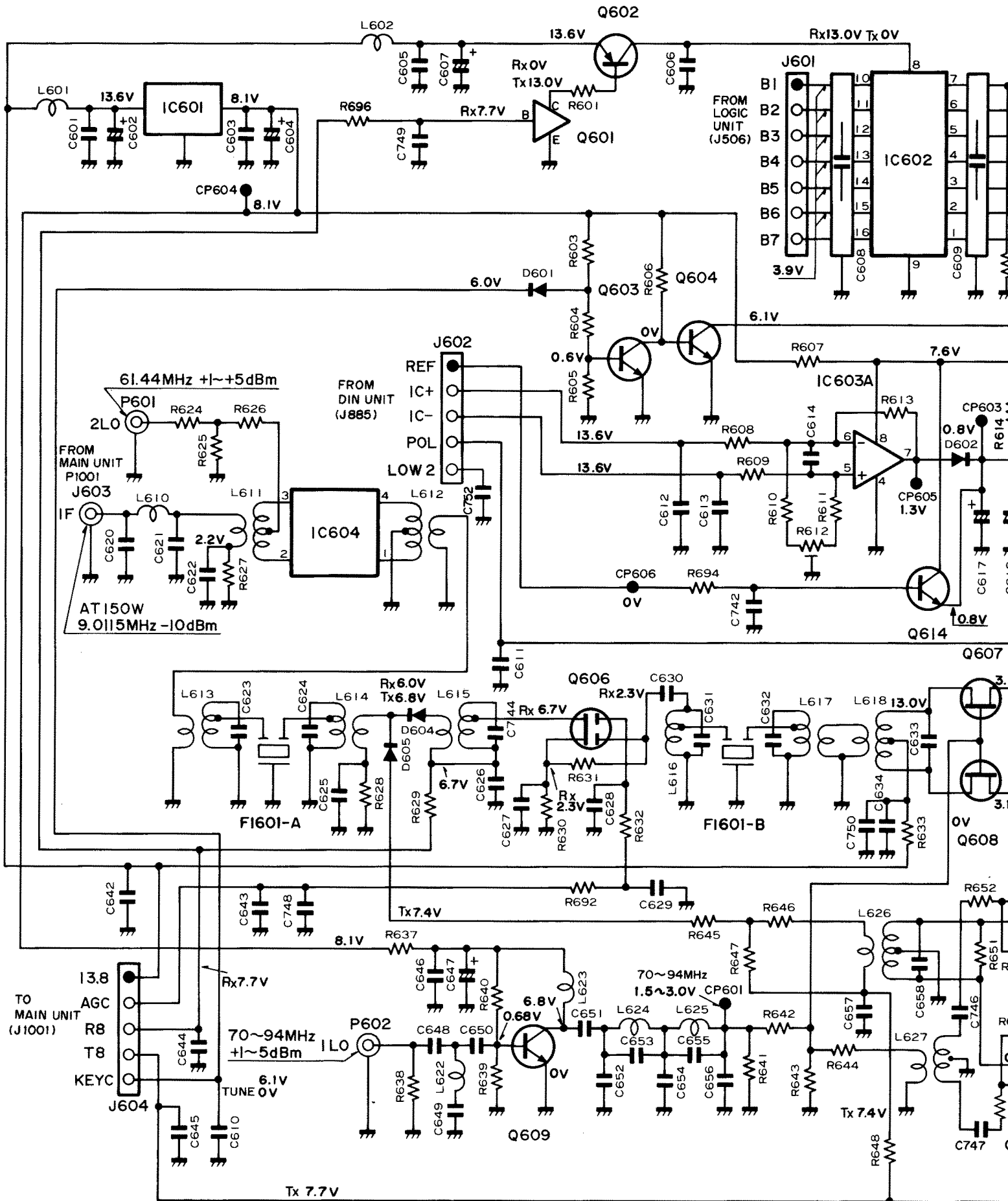


# 7-8 LOGIC UNIT

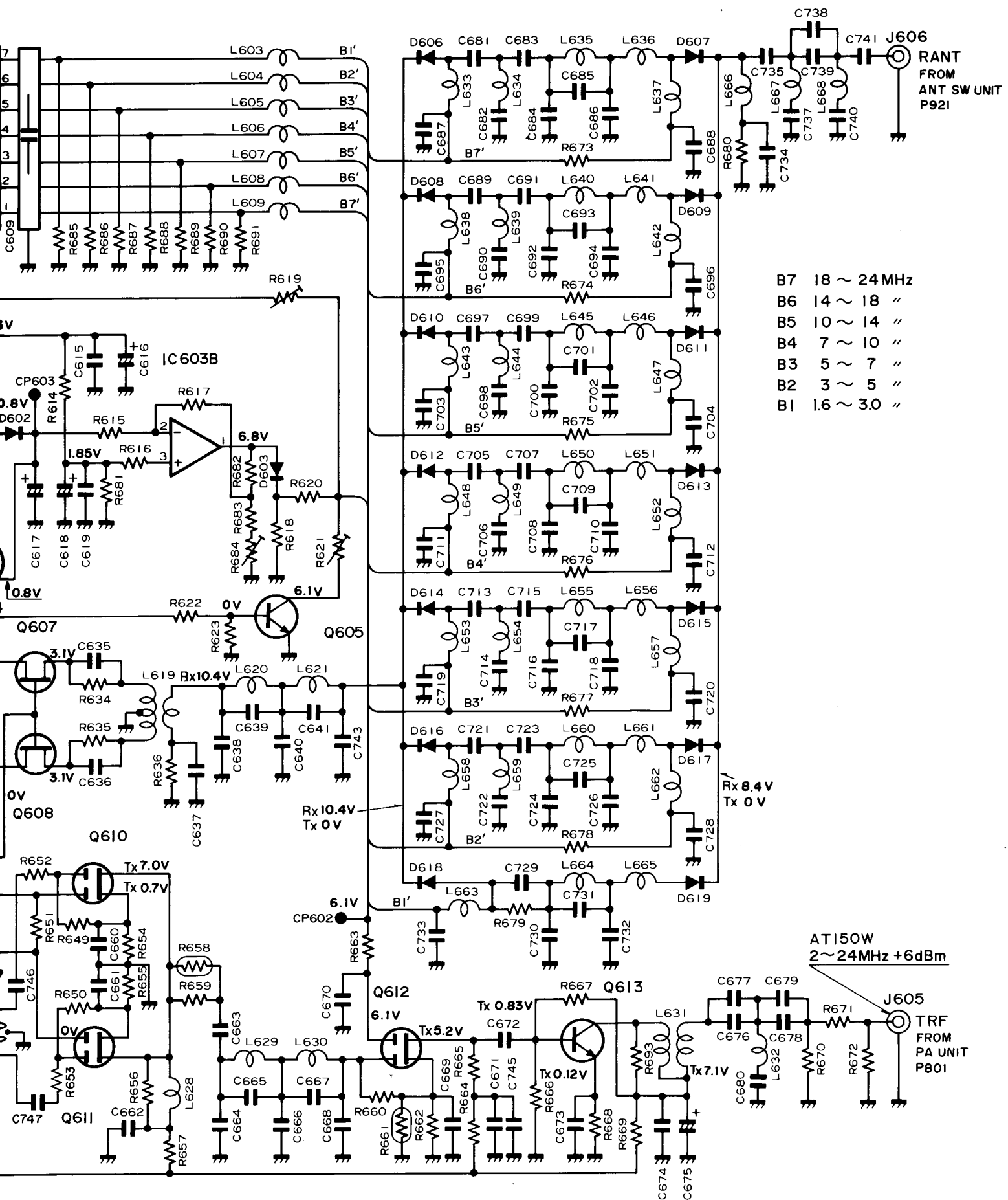




# 7-9 RF UNIT



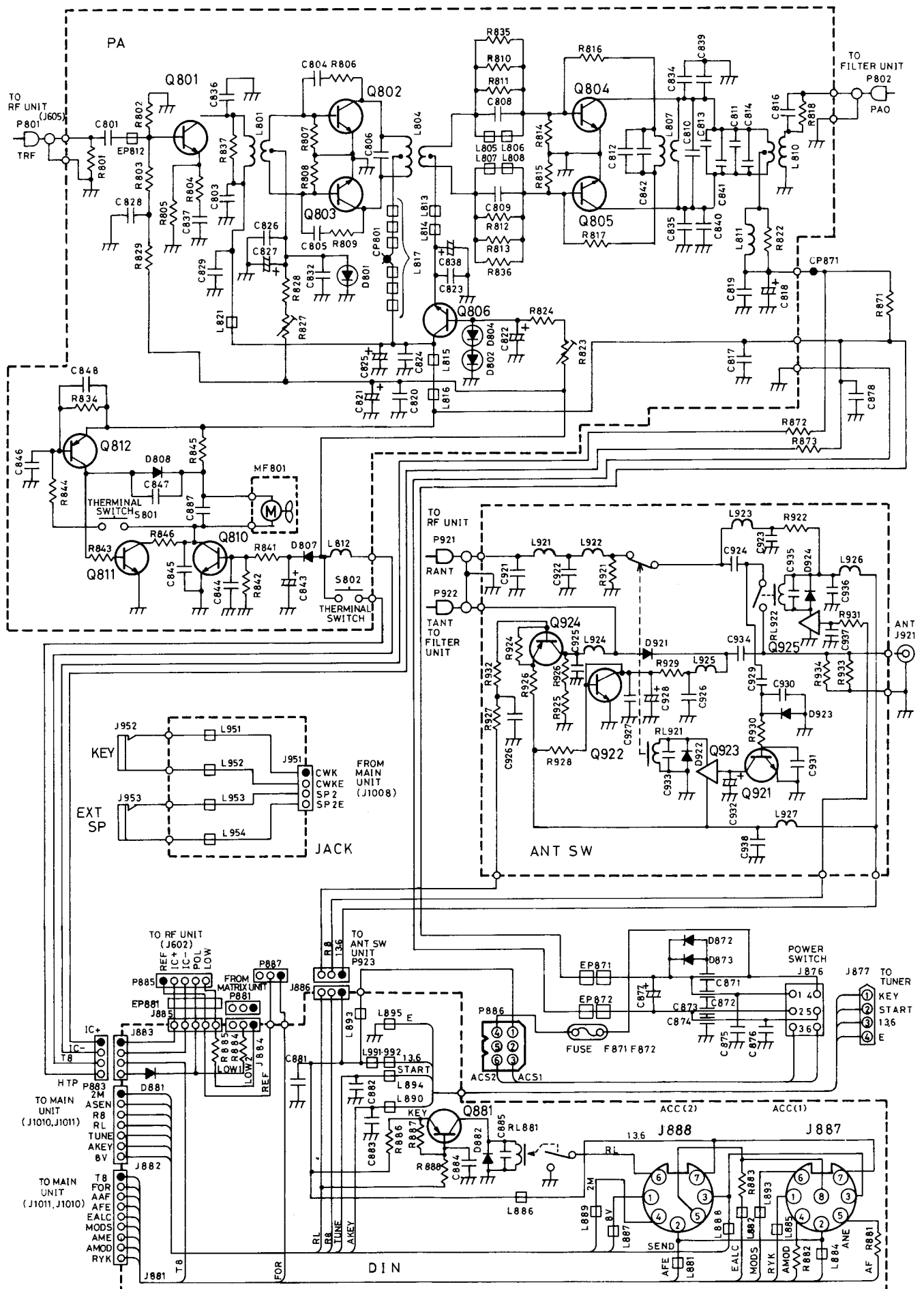
7.8V DC Voltage by 50KΩ-V multimeter



B7	18 ~ 24 MHz
B6	14 ~ 18 "
B5	10 ~ 14 "
B4	7 ~ 10 "
B3	5 ~ 7 "
B2	3 ~ 5 "
B1	1.6 ~ 3.0 "

AT150W  
2~24MHz +6dBm

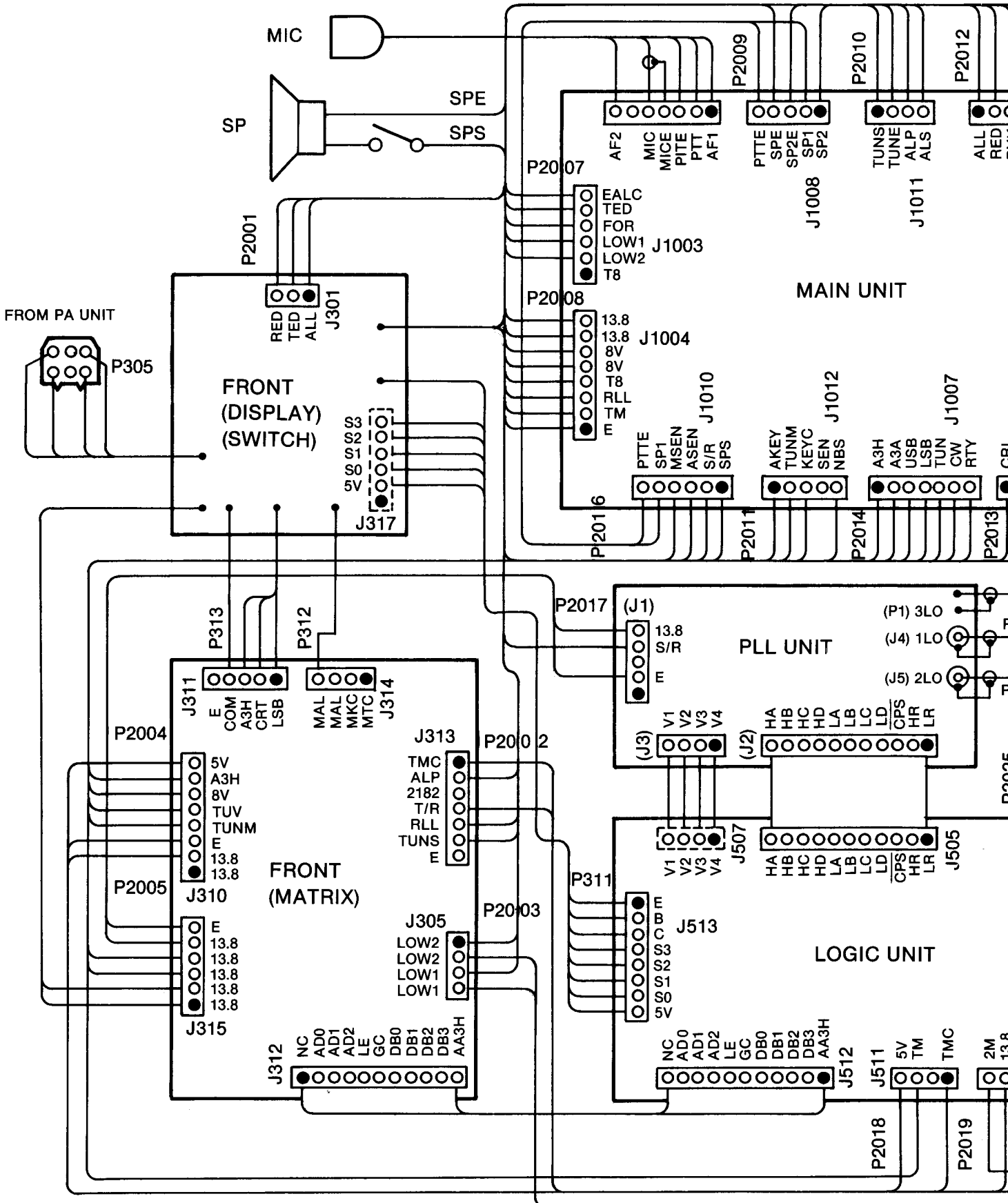
# 7-10 PA UNIT AND OTHER UNIT

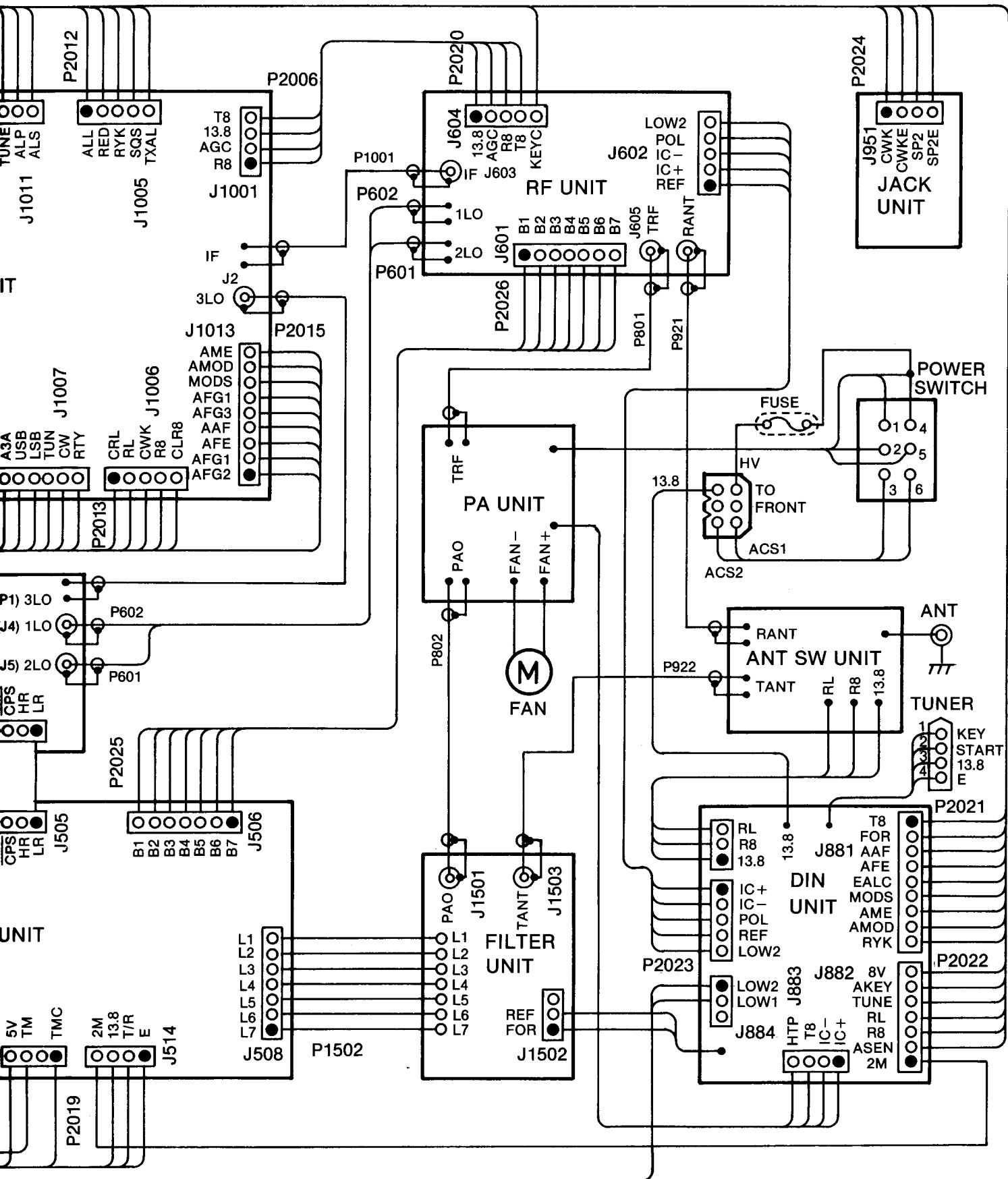




**SECTION 8 BOARD LAYOUT**

**8-1 INTER CONNECTION**

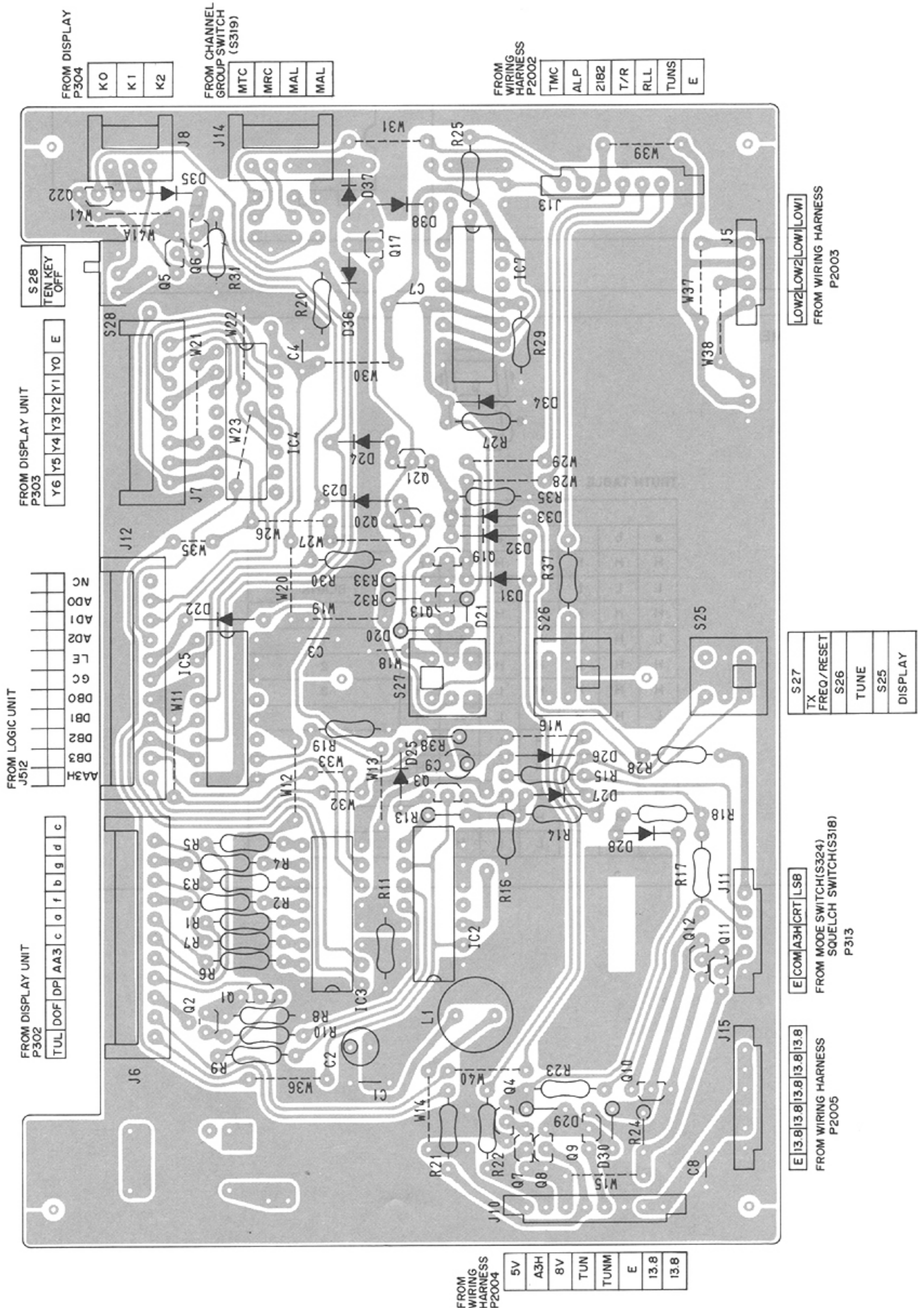




## 8-2 FRONT UNIT (MATRIX)

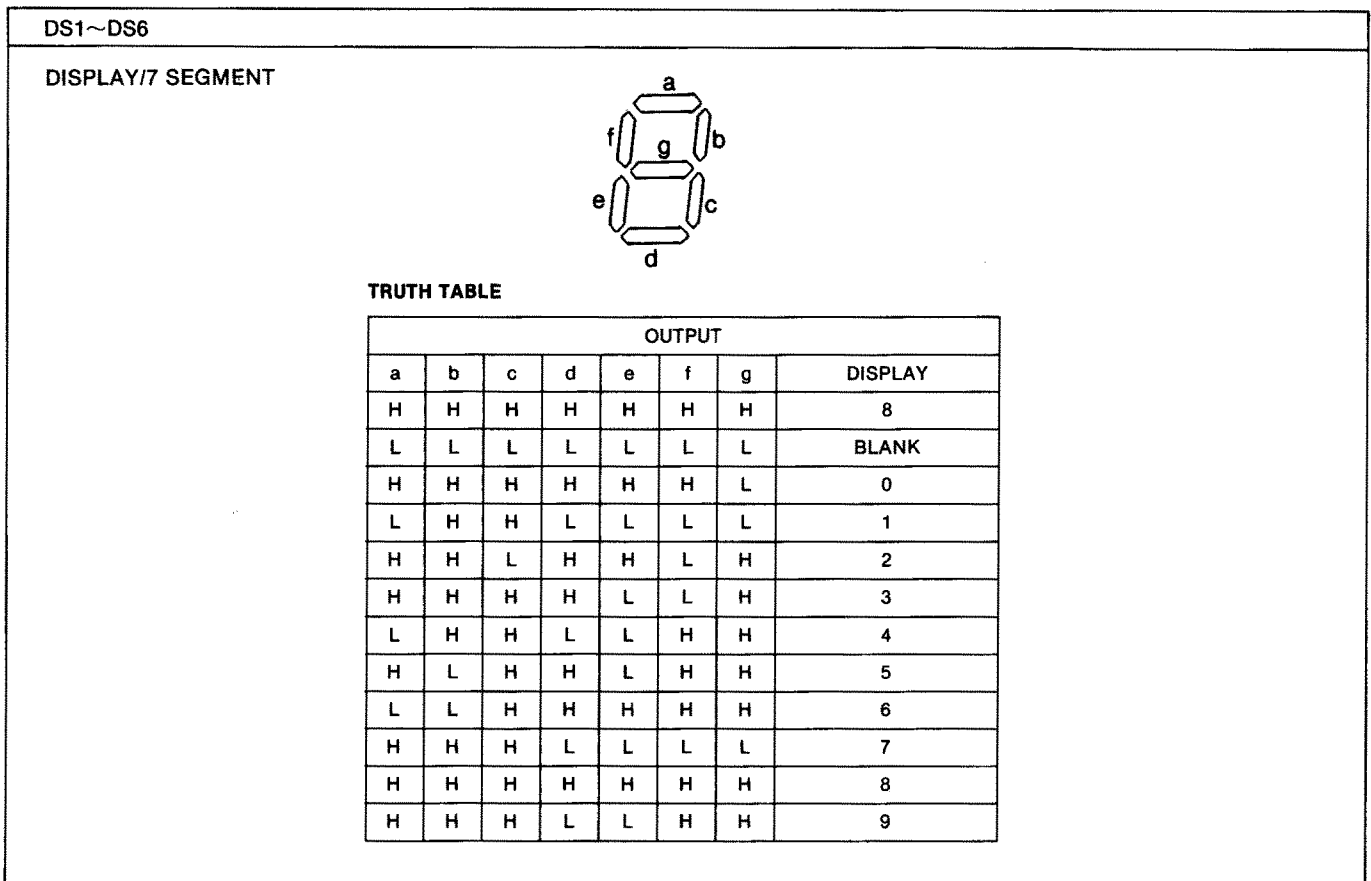
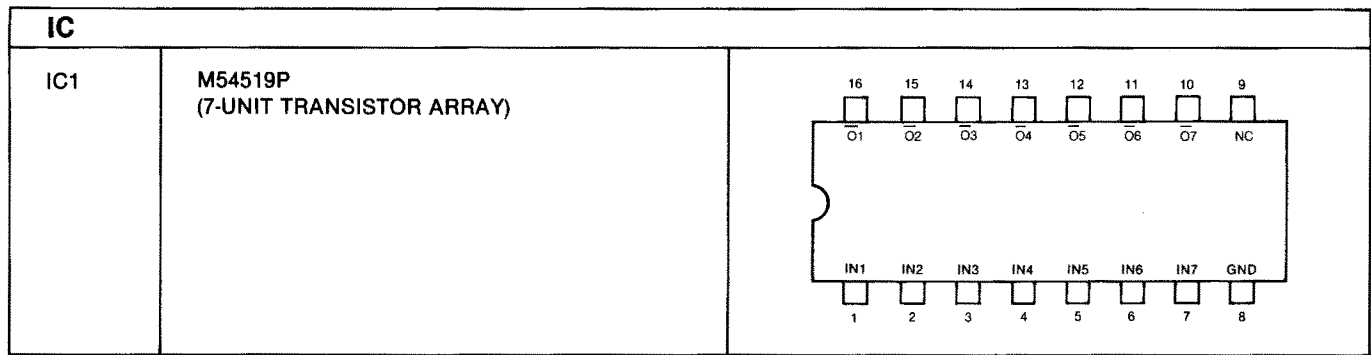
IC		
IC2	TC4011BP (QUAD 2-INPUT POSITIVE NAND GATE)	
IC3	TC4511BP (BCD TO 7-SEGMENT LATCH/DECODER/DRIVER)	
IC4	TC4028BP (BCD TO DECIMAL DECODER)	
IC5	$\mu$ PD4503BC (HEX NON-INVERTING 3-STATE BUFFER)	
IC7	TC4013BP (DUAL "D" FLIP-FLOP WITH SET/RESET CAPABILITY)	
TRANSISTOR		
<p>Q1, Q2 2SA1048</p>	<p>Q3, Q10, Q21 2SC2458</p>	<p>Q4, Q9, Q12, Q13, Q19 2SC3399</p>
<p>Q5, Q6, Q17, Q20, Q22 2SA1345</p>	<p>Q7, Q8, Q11 2SA1348</p>	

• MATRIX UNIT



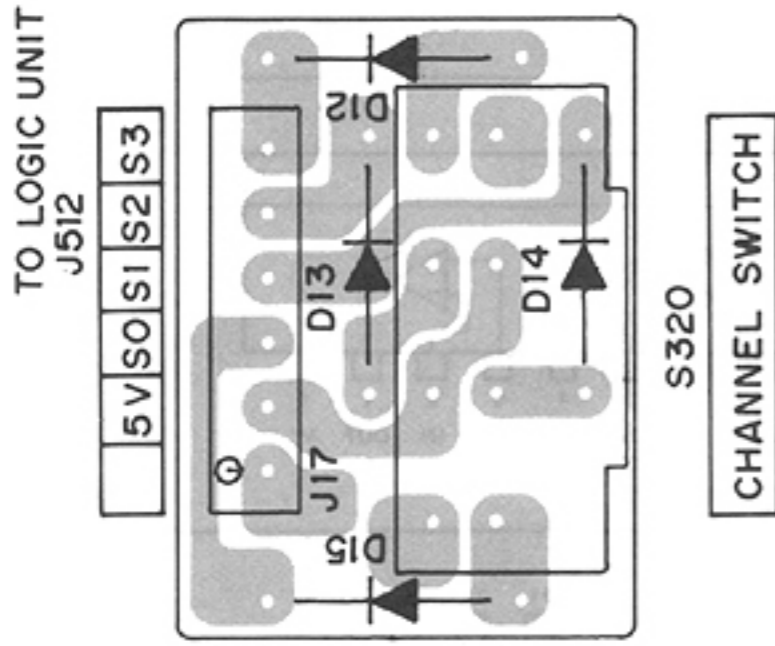
NOTE: Add "300" to the indicated number on the unit for actual part number respectively.

### 8-3 FRONT UNIT (DISPLAY AND CHANNEL SWITCH)

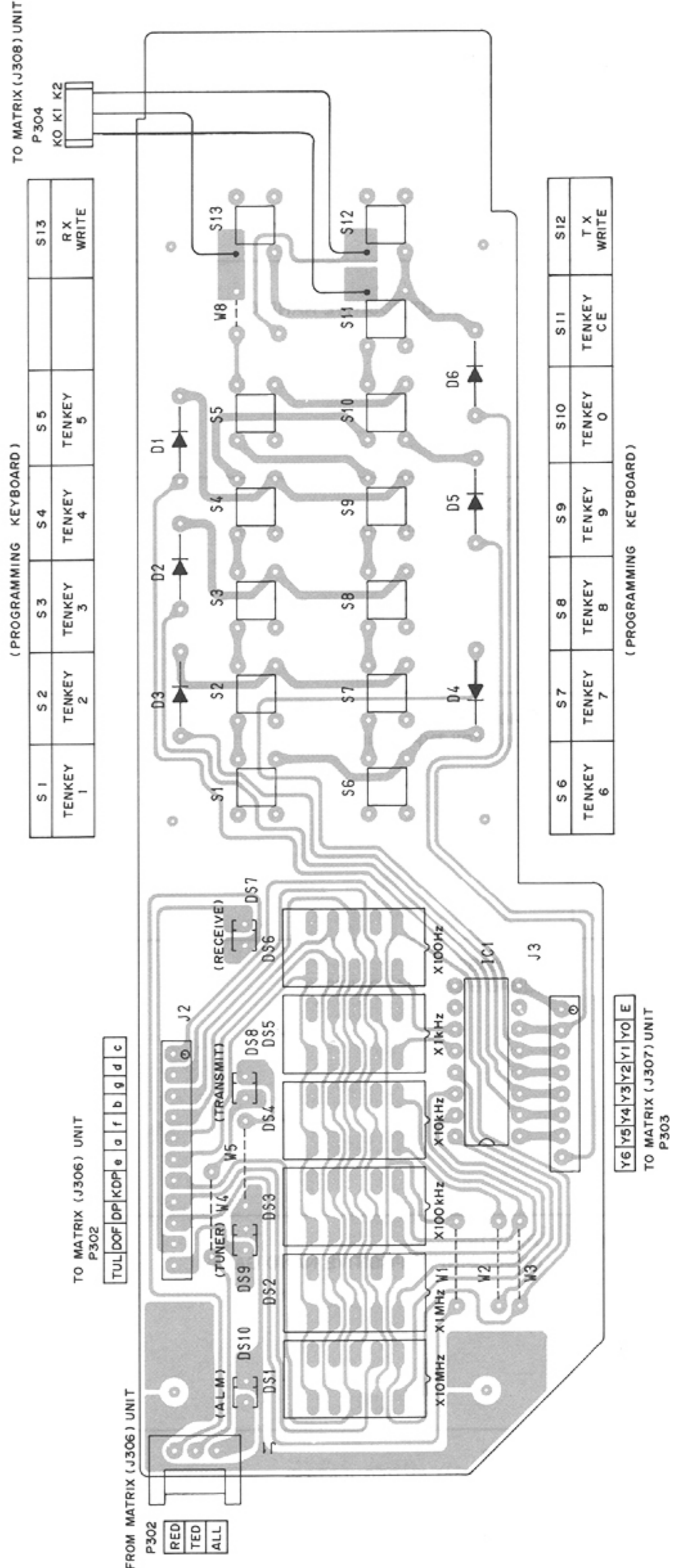




• CHANNEL SWITCH UNIT

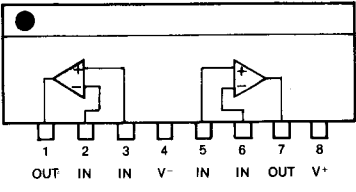
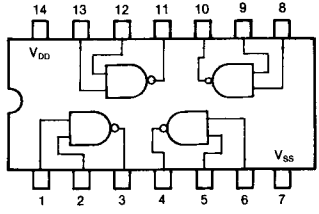
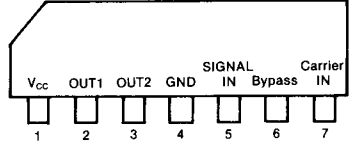
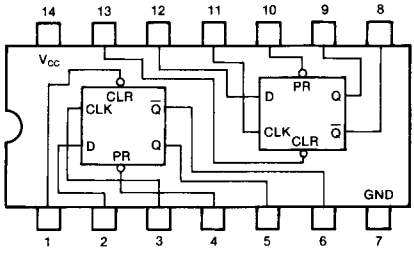
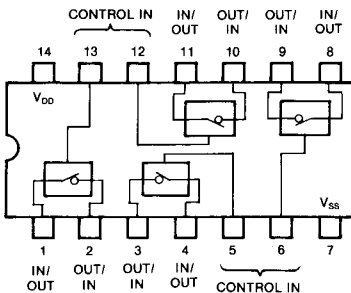
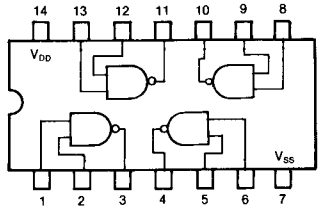
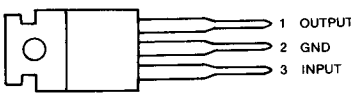


• DISPLAY UNIT



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

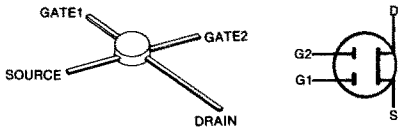
### 8-4 MAIN UNIT

IC		
IC1, 3, 4, 5, 6	M5218L (LOW NOISE DUAL OPERATIONAL AMPLIFIER)	
IC2, 22	TC4011UBP (QUAD 2-INPUT POSITIVE NAND GATE)	
IC7, 8, 11	μPC1037H (DOUBLE BALANCED MODULATOR)	
IC9	TC40H074P (DUAL "D" TYPE FLIP FLOP)	
IC10, 24	TC4066BP (QUAD BILATERAL SWITCH)	
IC12, 14	TC4011BP (QUAD 2-INPUT POSITIVE NAND GATE)	
IC13	μA7808 (3-TERMINAL 8V REGULATOR)	

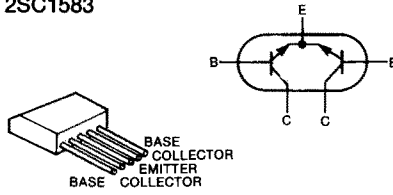
IC		
IC15	BA222 (MONOLITHIC TIMER)	
IC16, 17, 19	$\mu$ A555TC (TIMER)	
IC18	TC4013BP (DUAL "D" FLIP-FLOP WITH SET/RESET CAPABILITY)	
IC20, 21	TC4001UBP (QUAD 2-INPUT POSITIVE NOR GATE)	
IC23	$\mu$ PC1241H (5.8W AUDIO POWER AMPLIFIER)	
IC25	S-7116A (PROGRAMMABLE TONE GENERATOR)	

# TRANSISTOR

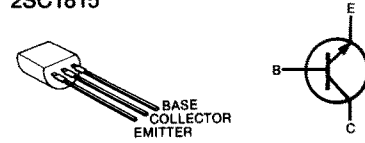
Q1, Q10, Q12, Q16, Q17  
3SK74



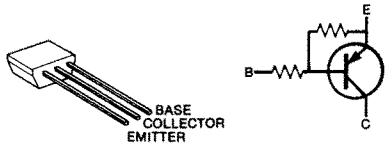
Q2  
2SC1583



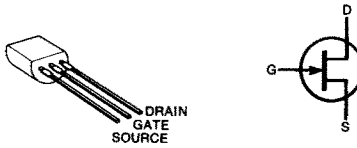
Q3, Q4, Q5, Q8, Q11, Q14, Q25, Q34,  
Q39, Q48, Q55, Q60, Q63  
2SC1815



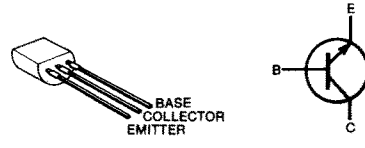
Q6  
2SA1348



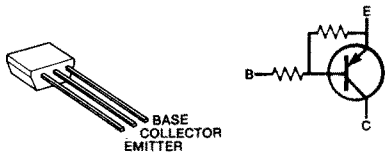
Q7, Q58  
2SK30A



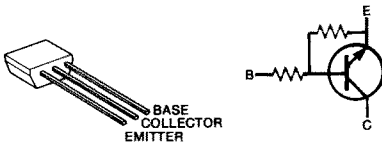
Q9, Q18, Q23, Q56  
2SC1571



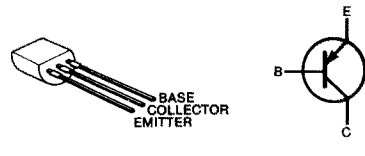
Q13, Q27, Q61  
2SA1345



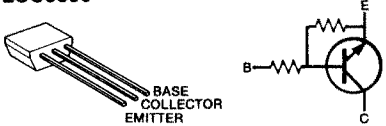
Q15, Q20, Q21, Q49, Q53  
2SC3402



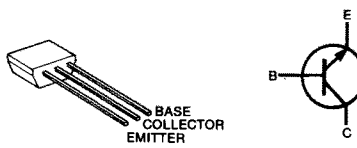
Q19, Q62  
2SA1015



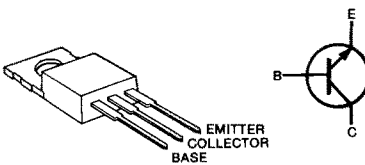
Q22, Q26, Q28, Q29, Q31,  
Q32, Q35, Q36, Q42, Q43,  
Q45, Q46, Q47, Q50, Q51,  
Q52, Q54, Q57, Q59, Q64  
2SC3399



Q24  
2SC2458



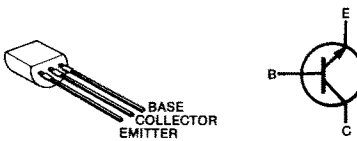
Q37  
2SD880



Q38, Q41  
2SC1645



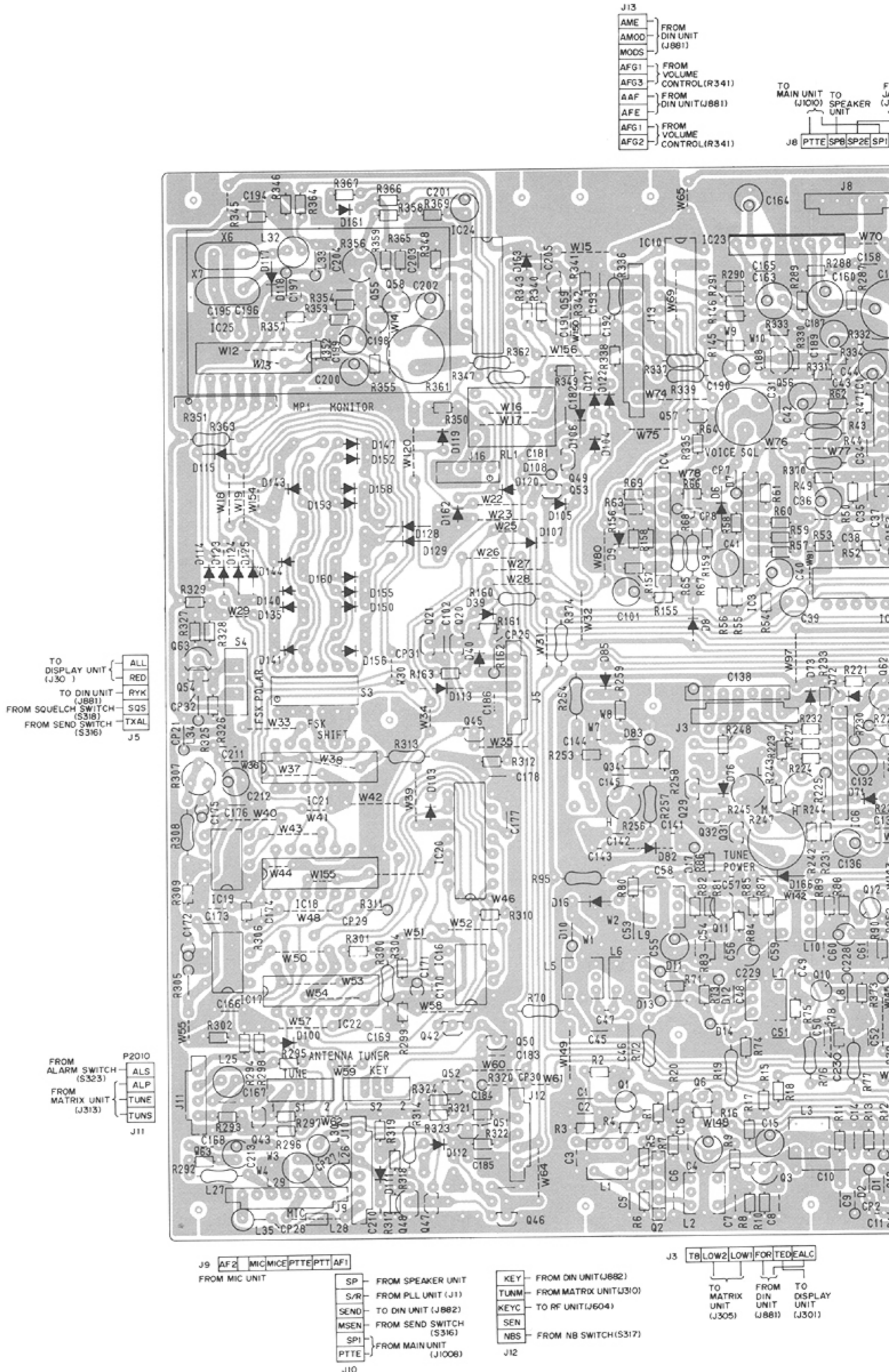
Q40  
2SD468



Q65, Q66  
2SK192A

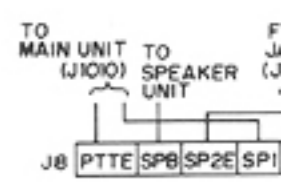


• MAIN UNIT



J13

AME	FROM DIN UNIT (J881)
AMOD	FROM DIN UNIT (J881)
MODS	FROM DIN UNIT (J881)
AFG1	FROM VOLUME CONTROL (R341)
AFG3	FROM VOLUME CONTROL (R341)
AAF	FROM DIN UNIT (J881)
AFE	FROM DIN UNIT (J881)
AFG1	FROM VOLUME CONTROL (R341)
AFG2	FROM VOLUME CONTROL (R341)



TO DISPLAY UNIT (J30)

ALL
RED

TO DIN UNIT (J881)

RYK
-----

FROM SQUELCH SWITCH (S318)

SQS
-----

FROM SEND SWITCH (S316)

TXAL
------

J5

FROM ALARM SWITCH (S323)

P2010
ALS
ALP

FROM MATRIX UNIT (J313)

TUNE
TUNS

J11

J9

AF2	MIC	MICE	PTTE	PTT	AF1
-----	-----	------	------	-----	-----

FROM MIC UNIT

SP	FROM SPEAKER UNIT
S/R	FROM PLL UNIT (J1)
SEND	TO DIN UNIT (J882)
MSEN	FROM SEND SWITCH (S316)
SPI	FROM MAIN UNIT (J1006)
PTTE	FROM MAIN UNIT (J1006)

J10

KEY	FROM DIN UNIT (J882)
TUNM	FROM MATRIX UNIT (J310)
KEYC	TO RF UNIT (J604)
SEN	FROM NB SWITCH (S317)
NBS	FROM NB SWITCH (S317)

J12

J3

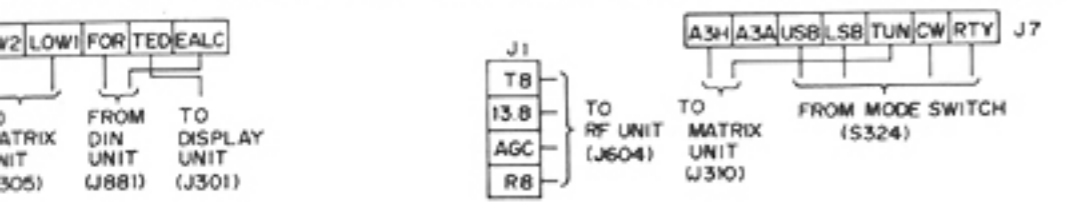
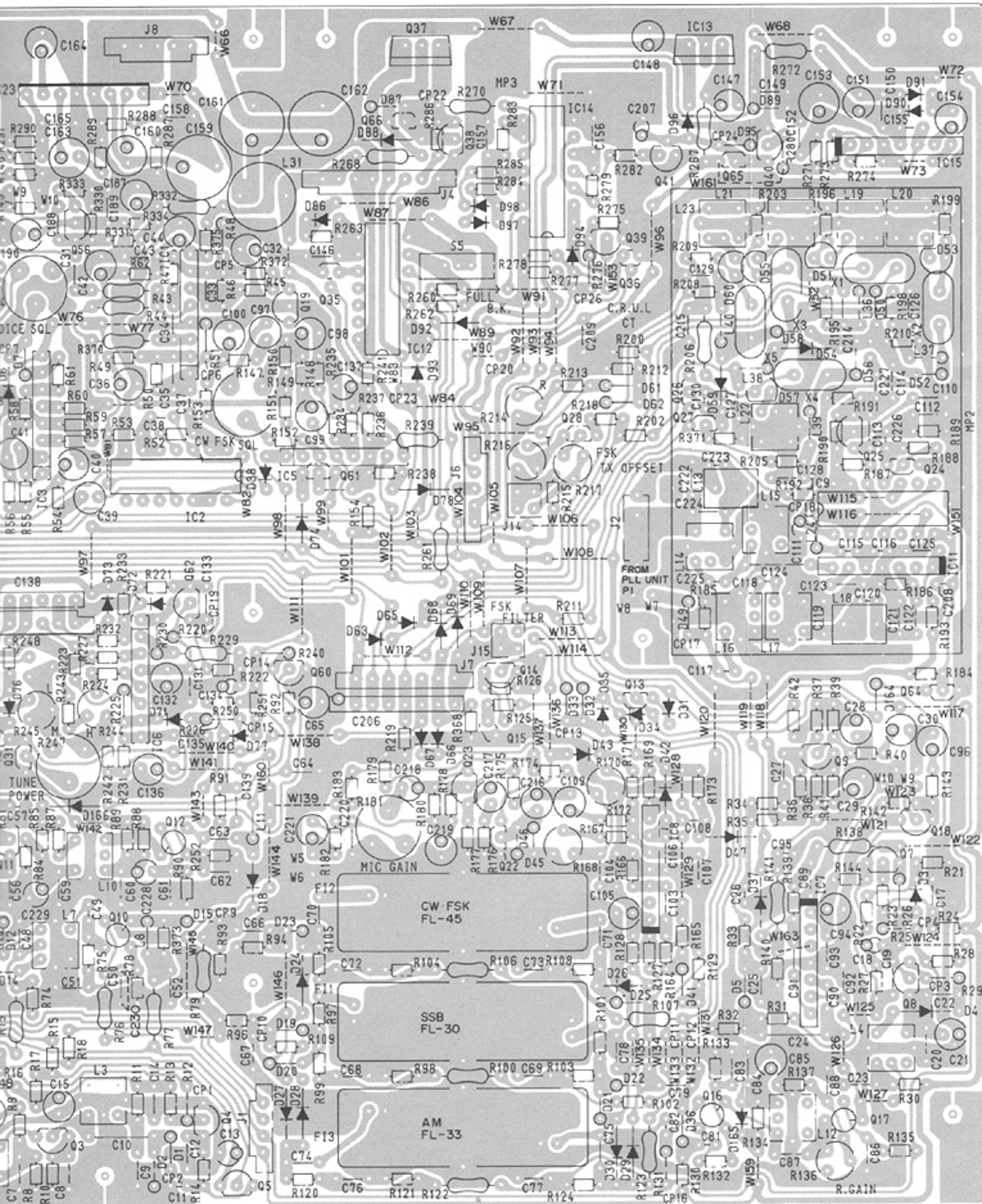
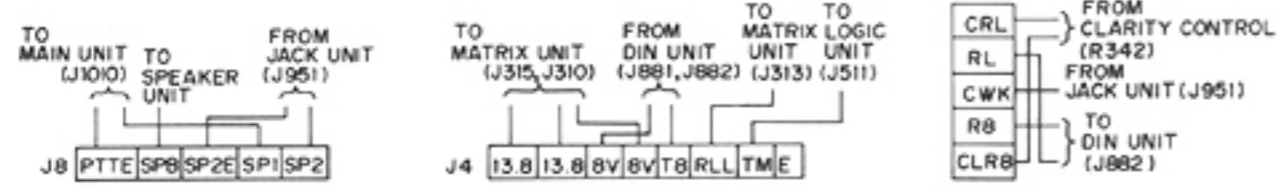
T8	LOW2	LOW1	FOR	TE	DE	ALC
----	------	------	-----	----	----	-----

TO MATRIX UNIT (J305) FROM DIN UNIT (J881) TO DISPLAY UNIT (J301)

NOTE: Add "1000" to the indicated number on the unit for actual part number respectively.

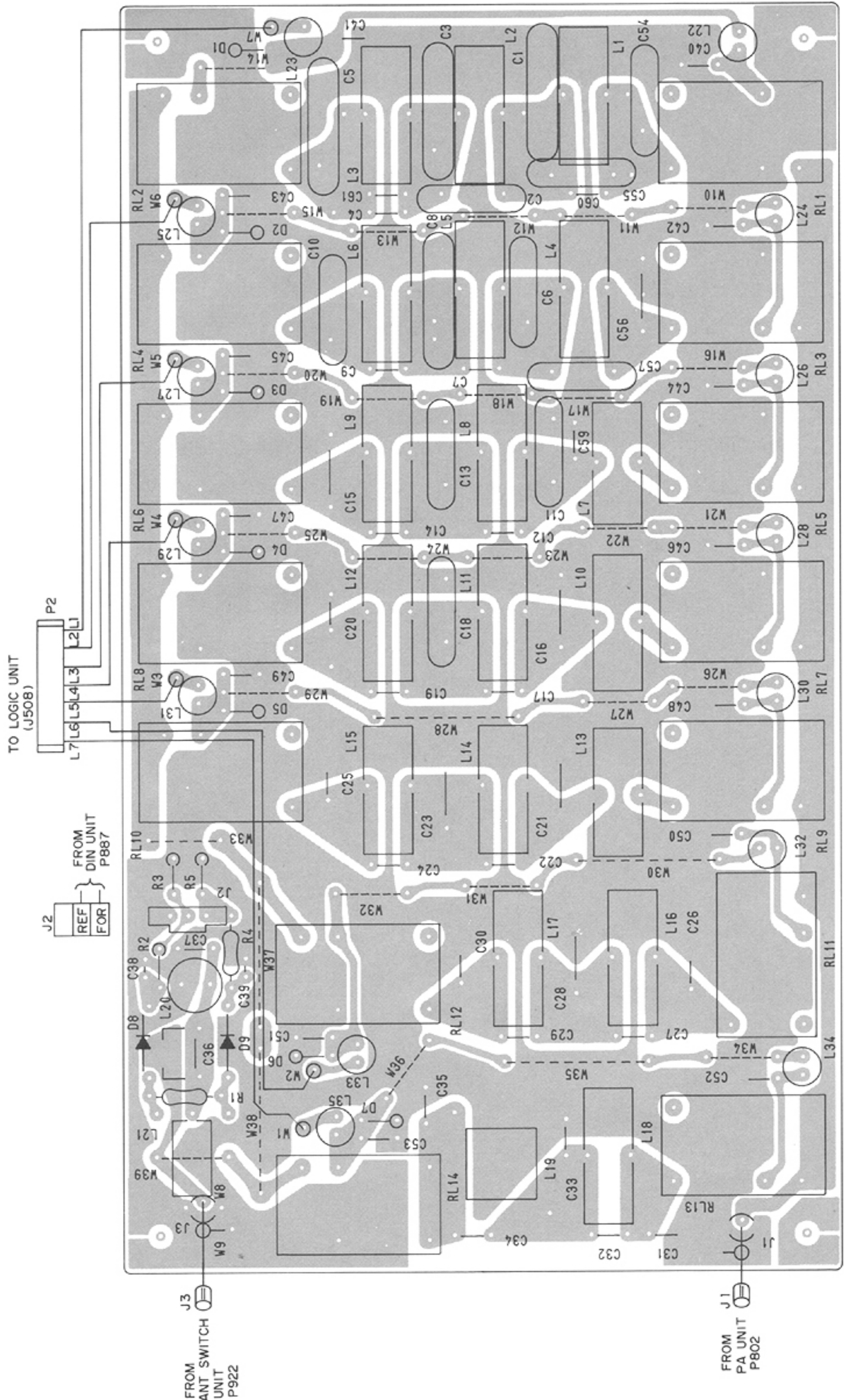


341)  
81)  
341)





# 8-5 FILTER UNIT

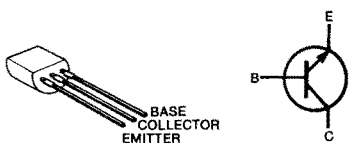
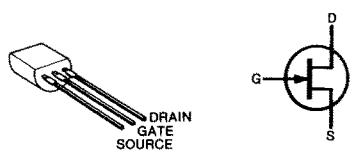
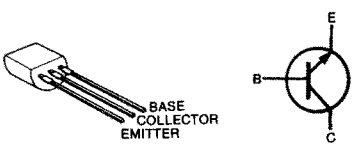
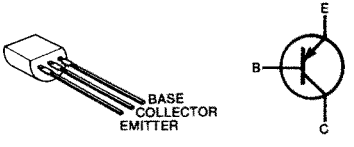
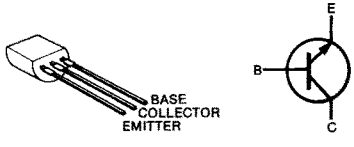
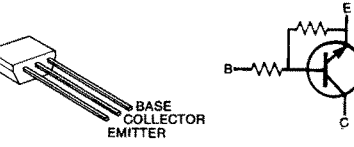
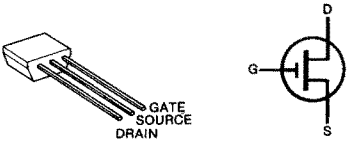
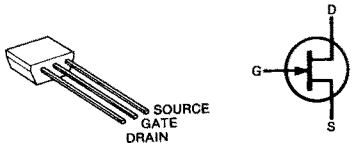
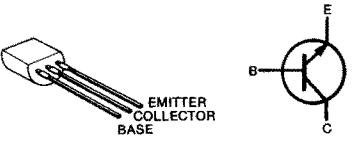


**NOTE:** Add "1500" to the indicated number on the unit for actual part number respectively.

## 8-6 PLL UNIT

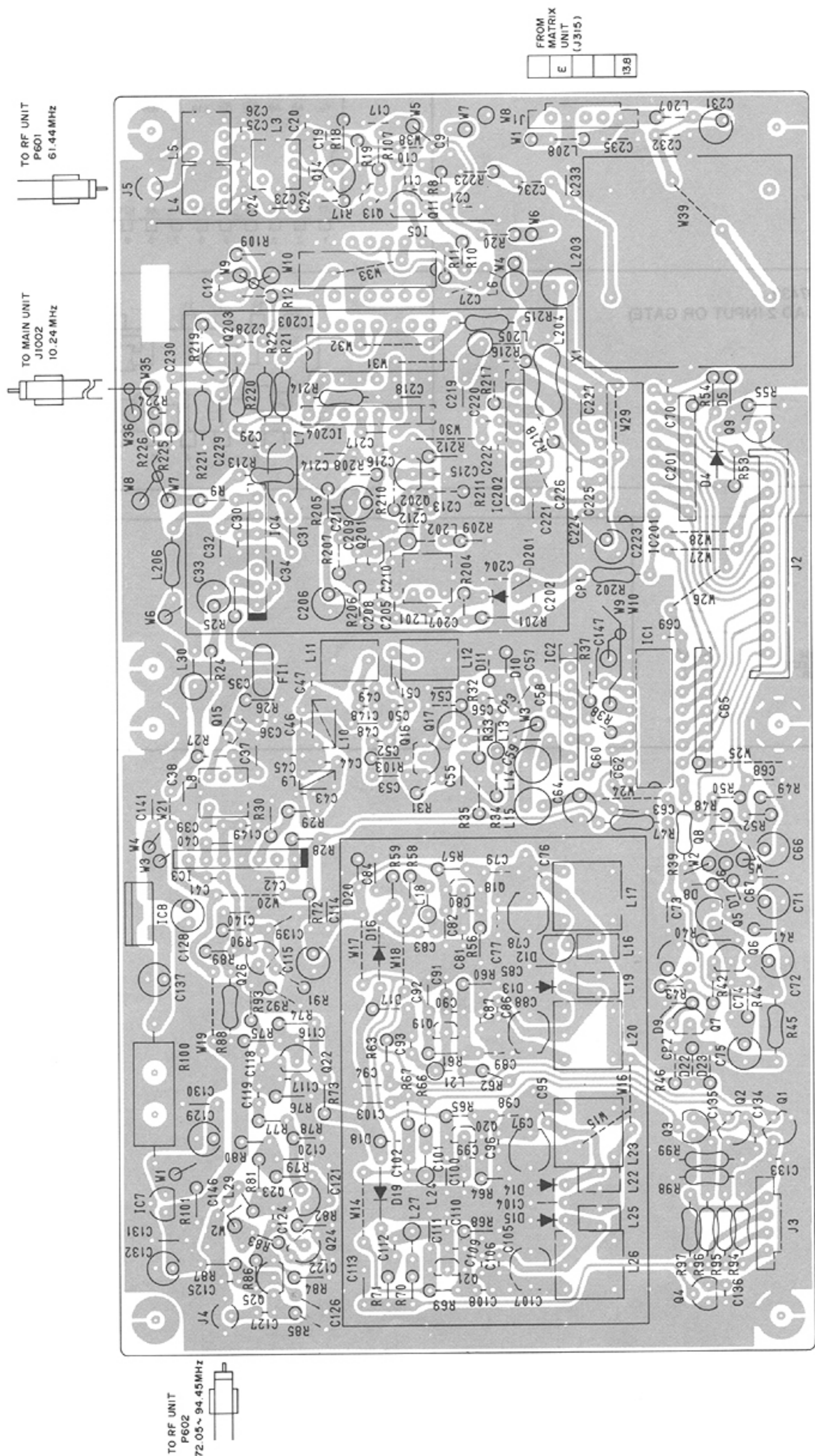
IC		
IC1, 201	M54929P (DUAL MODULUS PLL IC)	
IC2, 202	M54466L (1/10, 1/11 DIVIDER)	
IC3, 4	$\mu$ PC1037H (DOUBLE-BALANCED MODULATOR)	
IC5, 203	M74LS90P (DECODE COUNTER)	
IC7	TA78L008AP (3-TERMINAL 8V REGULATOR)	<p>(BOTTOM VIEW)</p>
IC8	$\mu$ A7805 (3-TERMINAL 5V REGULATOR)	
IC204	M54459L (1/20, 1/100 HIGH SPEED DIVIDER)	

**TRANSISTOR**

<p>Q1, Q2, Q3, Q4, Q9, Q24, Q203 2SC945</p> 	<p>Q5, Q6 2SK30A</p> 	<p>Q7 2SC1571</p> 
<p>Q8 2SA1015</p> 	<p>Q11, Q24, Q16, Q17, Q22, Q23, Q25, Q26 2SC383TM</p> 	<p>Q13 2SC3399</p> 
<p>Q15 2SK241</p> 	<p>Q18, Q19, Q20, Q21, Q201 2SK192A</p> 	<p>Q202 2SC763</p> 



• PLL UNIT



HA	HB	HC	HD	LA	LB	LC	LD	CP	FS	HR	LR
----	----	----	----	----	----	----	----	----	----	----	----

FROM LOGIC UNIT (J505)

V1	V2	V3	V4
----	----	----	----

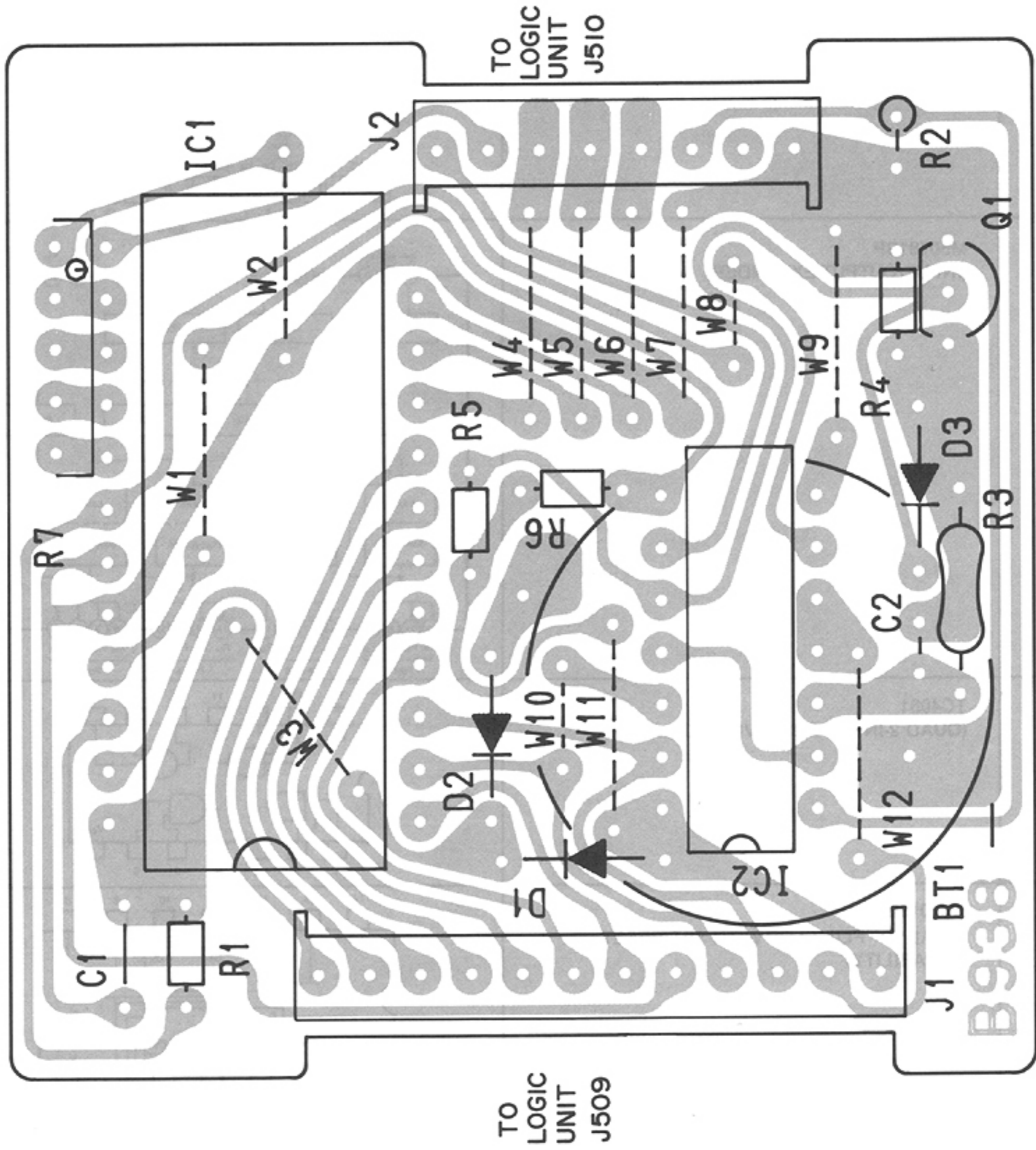
FROM LOGIC UNIT (J507)



## 8-7 RAM UNIT

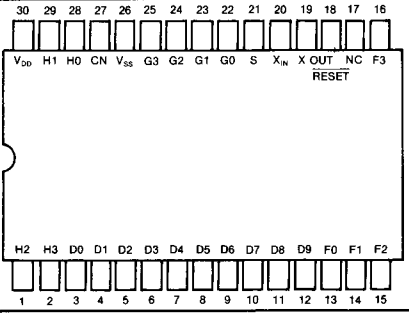
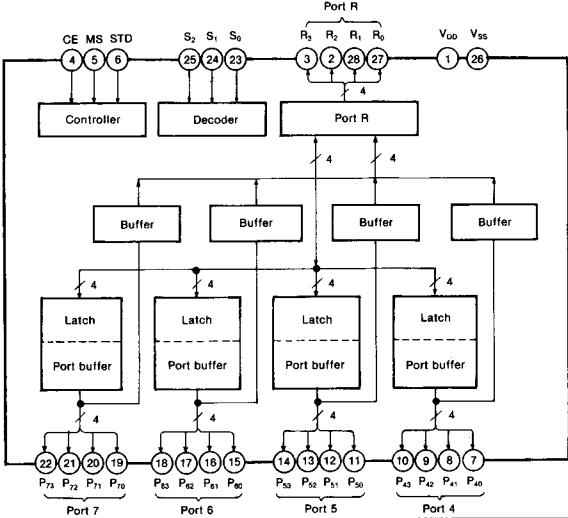
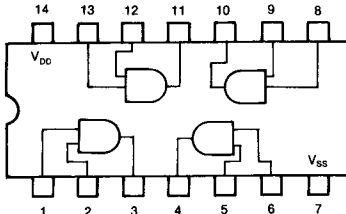
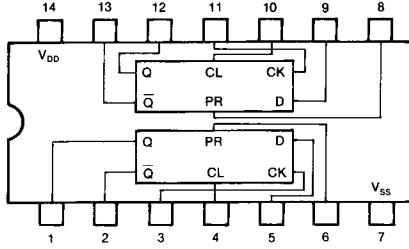
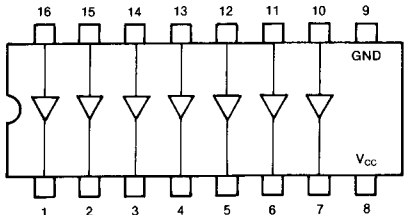
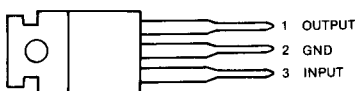
IC		
IC1	<p><math>\mu</math>PD446C-1 (RANDOM ACCESS MEMORY)</p>	
IC2	<p>HD7432 (QUAD 2-INPUT OR GATE)</p>	
TRANSISTOR		
<p>Q1 2SC945P</p>		

• RAM UNIT



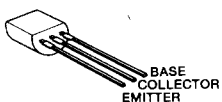
NOTE: Add "500" to the indicated number on the unit for actual part number respectively.

## 8-8 LOGIC UNIT

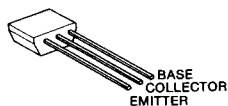
IC		
IC5	M50763-537SP (CPU)	
IC6	M50781SP (INPUT/OUTPUT EXPANDER)	
IC7	TC4081 (QUAD 2-INPUT POSITIVE AND GATE)	
IC8	TC4013BP (DUAL 'D' FLIP-FLOP WITH SET/RESET CAPABILITY)	
IC9	BA618 (LED DRIVER)	
IC10	F7805 (3-TERMINAL 5V REGULATOR)	

## TRANSISTOR

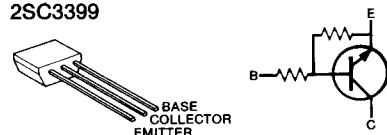
Q3  
2SC945P



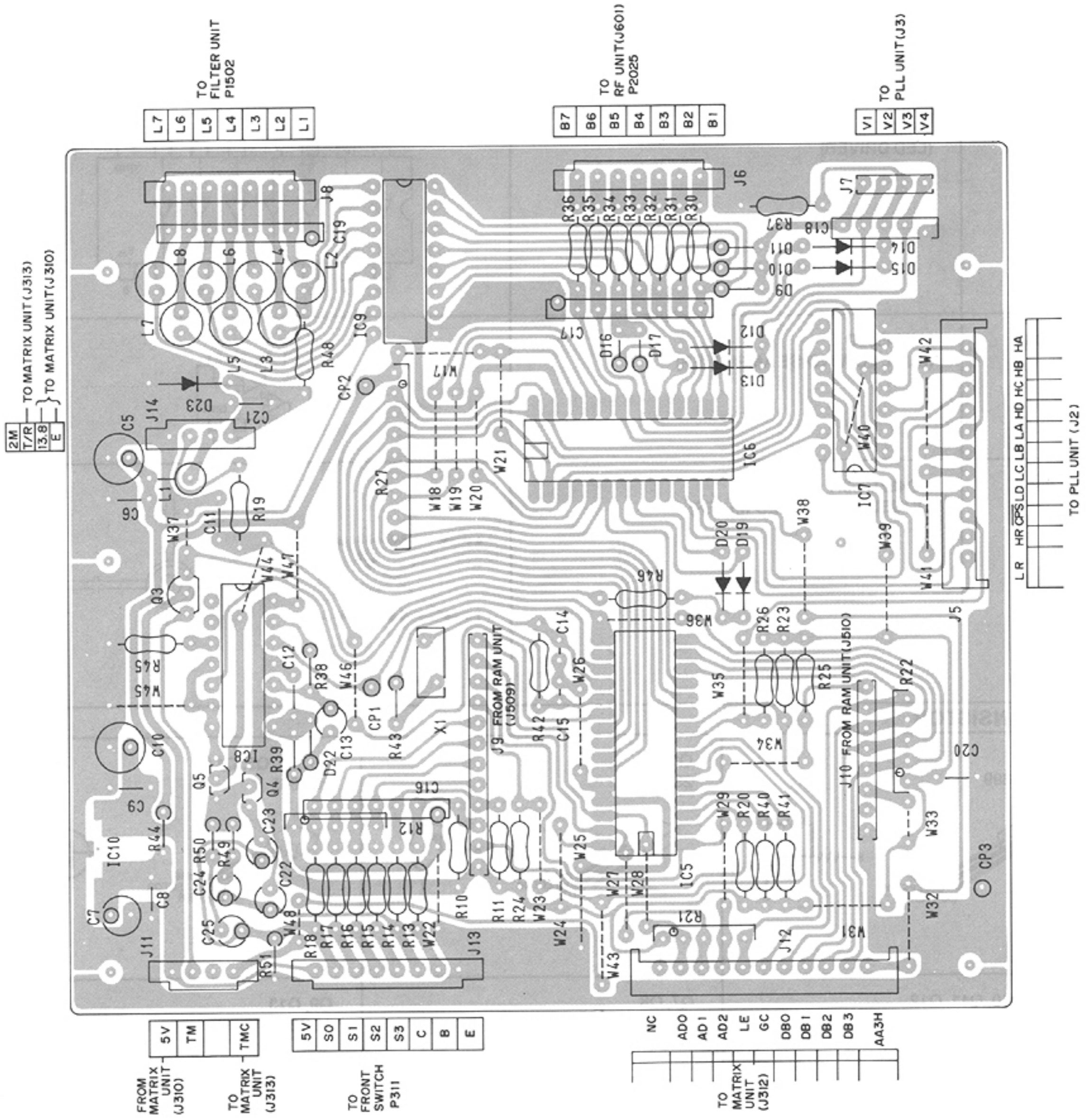
Q4  
2SA1345



Q5  
2SC3399

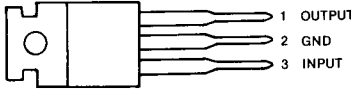
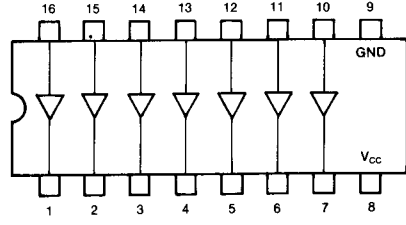
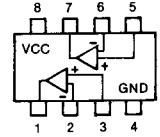
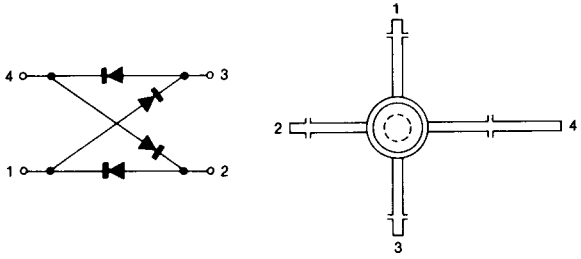
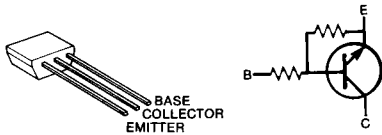

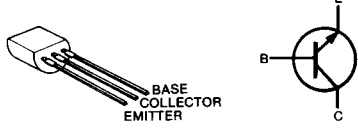
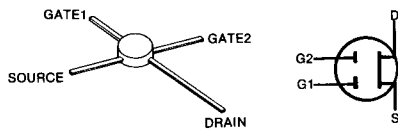
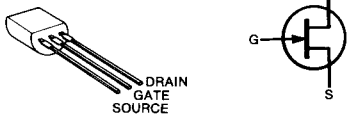



• LOGIC UNIT



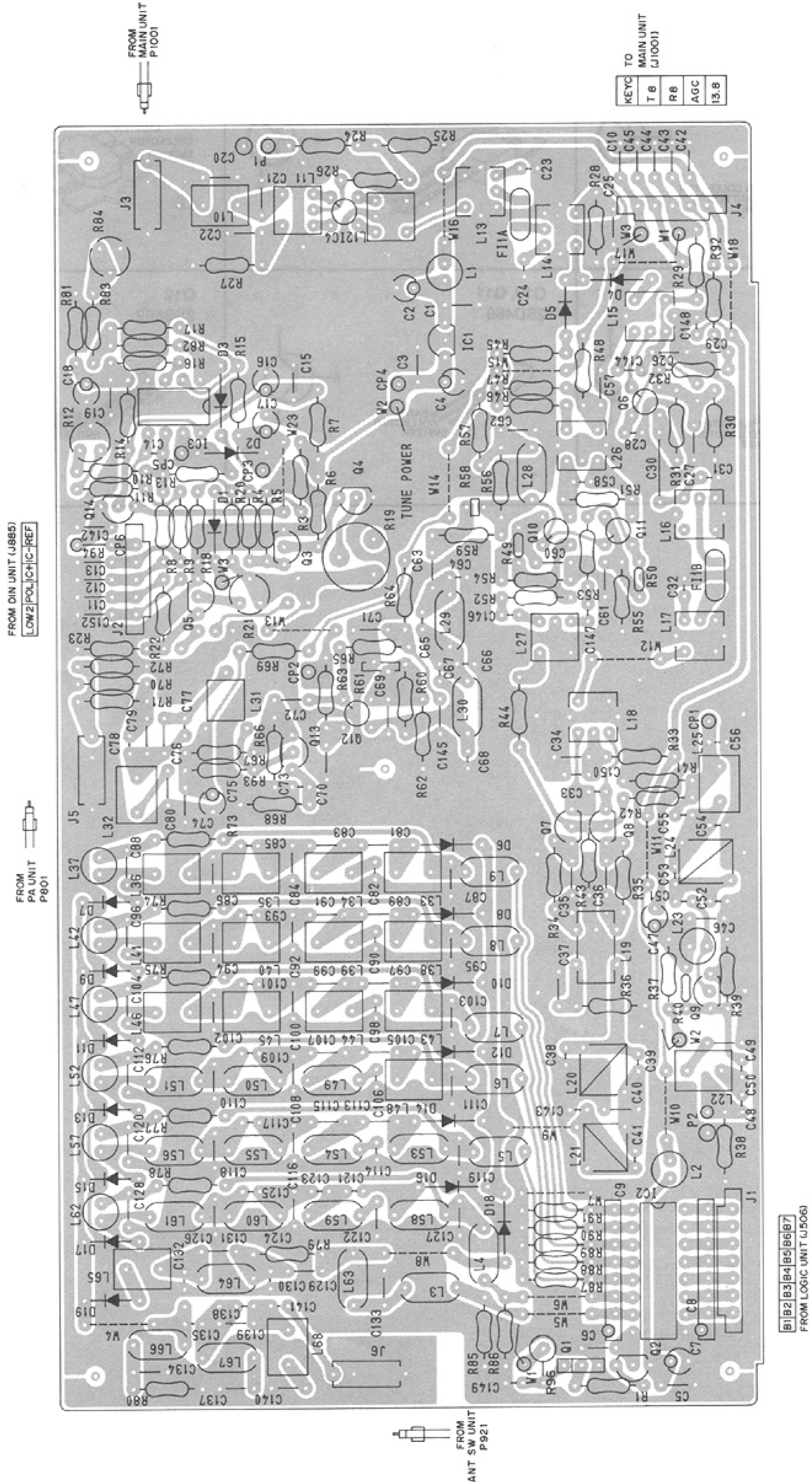
NOTE: Add "500" to the indicated on the unit for actual part number respectively.

## 8-9 RF UNIT

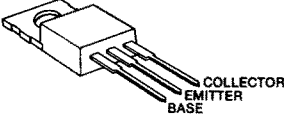
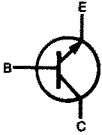
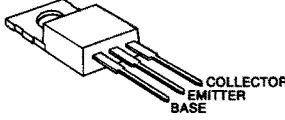
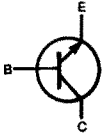
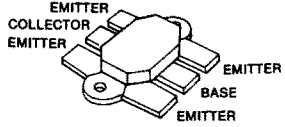
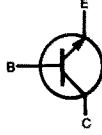
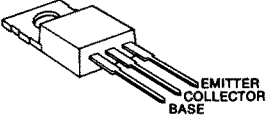
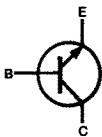

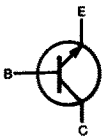

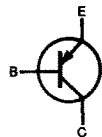
IC		
IC1	$\mu$ A78L82AWC (3-TERMINAL 8V REGULATOR)	
IC2	BA618 (LED DRIVER)	
IC3	NJM4558D (DUAL LOW NOISE AMPLIFIER)	
IC4	ND487C1-3R (DOUBLE-BALANCED MIXER)	
TRANSISTOR		
<p>Q1 2SC3399</p> 	<p>Q2 2SB562</p> 	<p>Q3, Q4, Q5, Q14 2SC945</p> 
<p>Q6, Q10, Q11, Q12 3SK74</p> 	<p>Q7, Q8 2SK125</p> 	<p>Q9, Q13 2SC2053</p> 



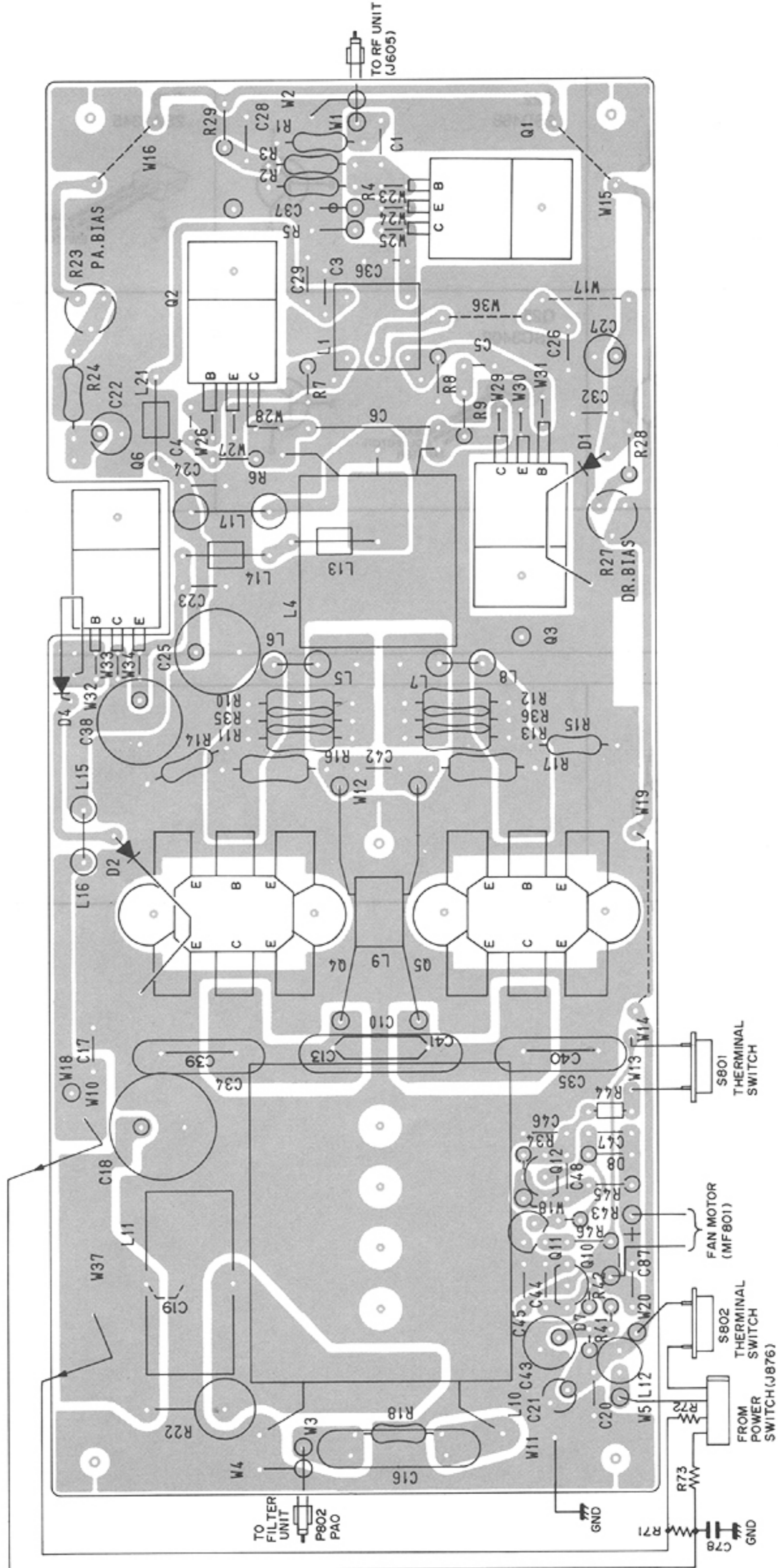
• RF UNIT



**8-10 PA UNIT**

<b>TRANSISTOR</b>		
<p><b>Q1</b> 2SC1971</p>  	<p><b>Q2, Q3</b> 2SC3133</p>  	<p><b>Q4, Q5</b> 2SC3908</p>  
<p><b>Q6</b> 2SD880</p>  	<p><b>Q10, Q11</b> 2SD468</p>  	<p><b>Q12</b> 2SB562</p>  

• PA UNIT



NOTE: Add "800" to the indicated on the unit for actual part number respectively.

## 8-11 OTHER UNITS

### • ANT SW UNIT

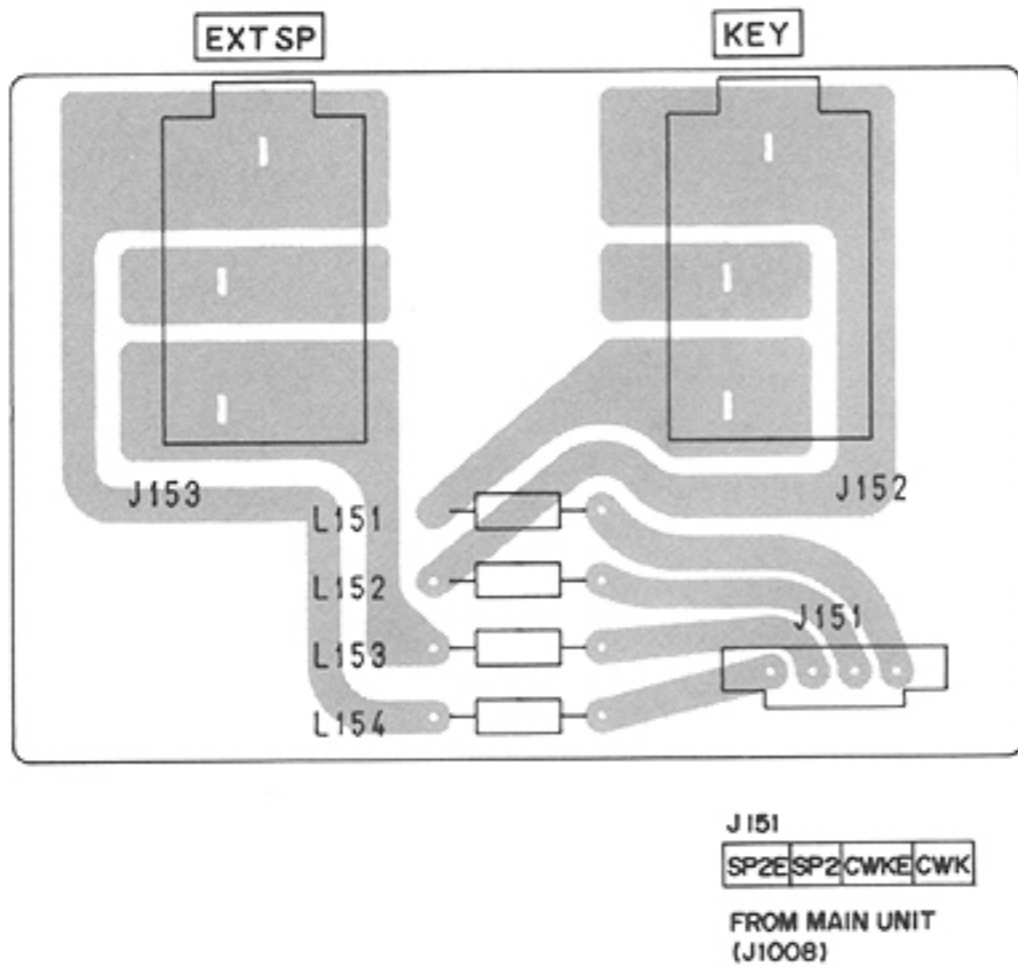
TRANSISTOR		
<p>Q21 2SC945</p>	<p>Q22 2SD468</p>	<p>Q23 2SA1345</p>
<p>Q24 2SB562</p>	<p>Q25 2SC3402</p>	

### • DIN UNIT

TRANSISTOR	
<p>Q81 2SA1015</p>	

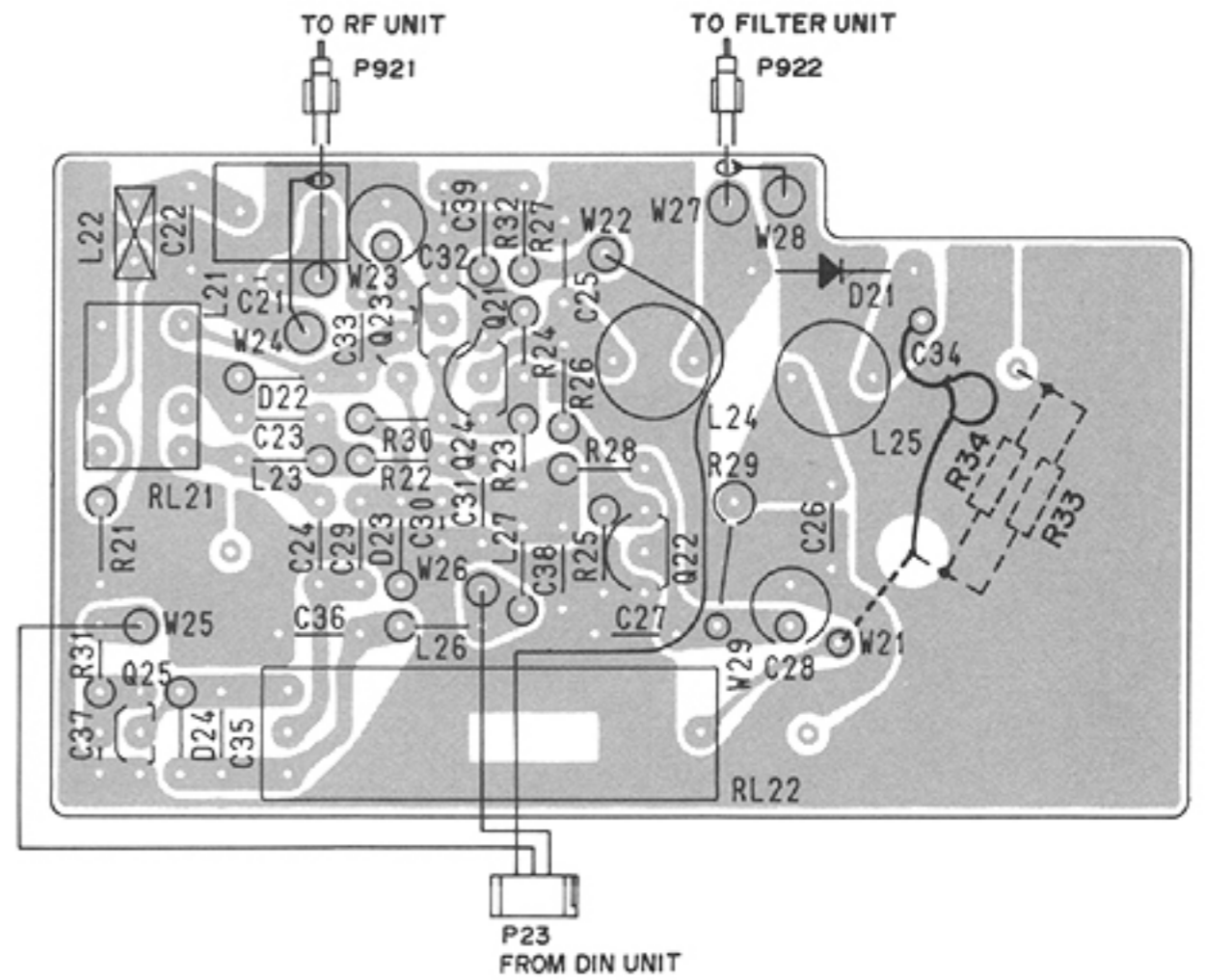


• JACK UNIT



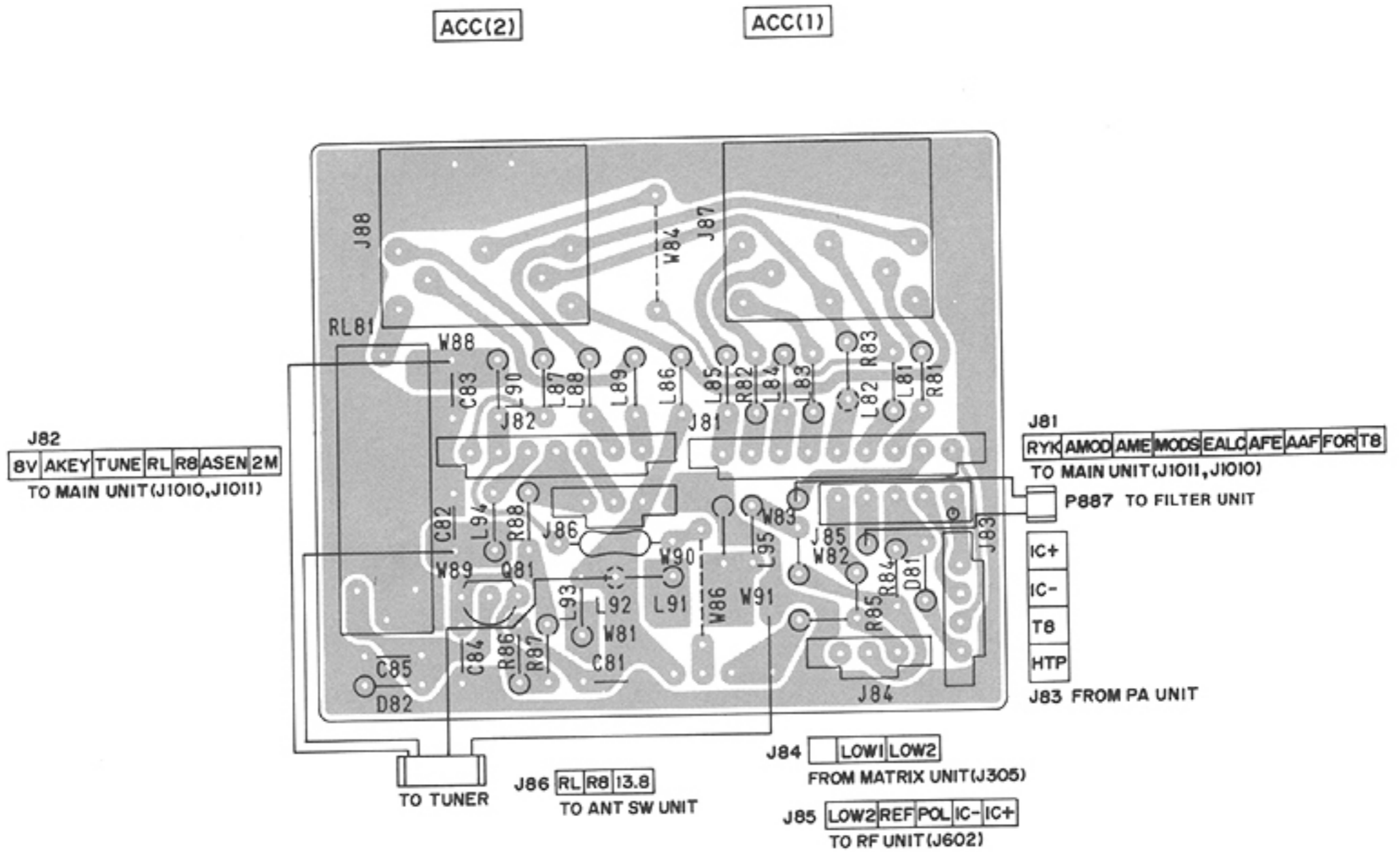
NOTE: Add "800" to the indicated on the unit for actual part number respectively.

• ANT SW UNIT



NOTE: Add "900" to the indicated on the unit for actual part number respectively.

• DIN UNIT



NOTE: Add "800" to the indicated on the unit for actual part number respectively.



## SECTION 9 PARTS LIST

### [FRONT UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC301	IC	M54519P
IC302	IC	TC4011BP
IC303	IC	TC4511BP
IC304	IC	TC4028BP
IC305	IC	μPD4503BC
IC307	IC	TC4013BP
Q301	Transistor	2SA1048 Y
Q302	Transistor	2SA1048 Y
Q303	Transistor	2SC2458 GR
Q304	Transistor	2SC3399
Q305	Transistor	2SA1345
Q306	Transistor	2SA1345
Q307	Transistor	2SA1348
Q308	Transistor	2SA1348
Q309	Transistor	2SC3399
Q310	Transistor	2SC2458 GR
Q311	Transistor	2SA1348
Q312	Transistor	2SC3399
Q313	Transistor	2SC3399
Q317	Transistor	2SA1345
Q319	Transistor	2SC3399
Q320	Transistor	2SA1345
Q321	Transistor	2SC2458 GR
Q322	Transistor	2SA1345
D301	Diode	1S953
D302	Diode	1S953
D303	Diode	1S953
D304	Diode	1S953
D305	Diode	1S953
D306	Diode	1S953
D310	Diode	1S953
D311	Diode	1S953
D312	Diode	1SS53
D313	Diode	1SS53
D314	Diode	1SS53
D315	Diode	1SS53
D320	Diode	1SS53
D321	Diode	1S953
D322	Diode	1S953
D323	Diode	1SS53
D324	Diode	1SS53
D325	Diode	1SS53
D326	Diode	1S953
D327	Diode	1S953
D328	Diode	1SS53
D329	Diode	1S953
D330	Diode	1S953
D331	Diode	1SS53
D332	Diode	1SS53
D333	Diode	1SS53
D334	Diode	1S953
D335	Diode	1S953
D336	Diode	1SS53
D337	Diode	1SS53
D338	Diode	1S953
D345	Diode	1SS53

### [FRONT UNIT]

REF. NO.	DESCRIPTION	PART NO.
D346	Diode	1SS53
L301	Coil	FL9H 471K
R301	Resistor	27 R25
R302	Resistor	27 R25
R303	Resistor	27 R25
R304	Resistor	27 R25
R305	Resistor	27 R25
R306	Resistor	27 R25
R307	Resistor	27 R25
R308	Resistor	27 R25
R309	Resistor	8.2k R25
R310	Resistor	33k R25
R311	Resistor	47k R25
R313	Resistor	1k ELR25
R314	Resistor	47k R25
R315	Resistor	27k R25
R316	Resistor	47k R25
R317	Resistor	10k R25
R318	Resistor	2.2k R25
R319	Resistor	220k R25
R320	Resistor	470k R25
R321	Resistor	1.2k R25
R322	Resistor	27k R25
R323	Resistor	4.7k R25
R324	Resistor	4.7k ELR25
R325	Resistor	27k R25
R327	Resistor	470k R25
R328	Resistor	22k R25
R329	Resistor	47k R25
R330	Resistor	470k R25
R331	Resistor	470k R25
R332	Resistor	4.7k ELR25
R333	Resistor	10k ELR25
R335	Resistor	47k R25
R337	Resistor	10 R25
R338	Resistor	1.5k ELR25
R341	Variable Resistor	RKDE13 10kA
R342	Variable Resistor	RKDA1A 10kB
C301	Ceramic	0.0047 50V
C302	Electrolytic	100 10V MS7
C303	Barrier Lay	0.1 16V
C304	Barrier Lay	0.047 25V
C307	Mylar	0.022 50V
C308	Ceramic	0.0047 50V
C309	Electrolytic	4.7 25V MS7
J301	Connector	TL-25P-03-L1
J302	Connector	TLB-P11H-B1
J303	Connector	TLB-P08H-B1
J305	Connector	TL-25P-04-V1
J306	Connector	TL-25P-11-L1
J307	Connector	TL-25P-08-L1
J308	Connector	TL-25P-03-L1

[FRONT UNIT]

REF. NO.	DESCRIPTION	PART NO.
J310	Connector	TL-25P-08-V1
J311	Connector	TL-25P-05-V1
J312	Connector	5138-11APB
J313	Connector	TL-25P-07-V1
J314	Connector	TL-25P-04-L1
J315	Connector	TL-25P-06-V1
J317	Connector	TLB-P06H-B1
P302	Connector	TL-25H-11-B1
P303	Connector	TL-25H-08-B1
P304	Connector	TL-25H-03-B1
P305	Connector	1261P1
P311	Connector	TL-25H-08-B1
P312	Connector	TL-25H-04-B1
P313	Connector	TL-25H-05-B1
DS301	LED	TLG312A (10M)
DS302	LED	TLG312A (1M)
DS303	LED	TLG312A (100K)
DS304	LED	TLG312A (10K)
DS305	LED	TLG312A (1K)
DS306	LED	TLG312A (100Hz)
DS307	LED	SLP251B (Receive)
DS308	LED	SLP151B (Transmit)
DS309	LED	SLP451B (Tuner)
DS310	LED	SLP151B (Alarm)
S301	Switch	SKHHAB062A (TENKEY 1)
S302	Switch	SKHHAB062A (TENKEY 2)
S303	Switch	SKHHAB062A (TENKEY 3)
S304	Switch	SKHHAB062A (TENKEY 4)
S305	Switch	SKHHAB062A (TENKEY 5)
S306	Switch	SKHHAB062A (TENKEY 6)
S307	Switch	SKHHAB062A (TENKEY 7)
S308	Switch	SKHHAB062A (TENKEY 8)
S309	Switch	SKHHAB062A (TENKEY 9)
S310	Switch	SKHHAB062A (TENKEY 0)
S311	Switch	SKHHAB062A (TENKEY CE)
S312	Switch	SKHHAB062A (TENKEY TX)
S313	Switch	SKHHAB062A (TENKEY RX)
S315	Switch	SDDSA3159A (POWER)
S316	Switch	M2019J-1K (SEND)
S317	Switch	M2012J-1K (NB)
S318	Switch	M2012J-1K (SQUELCH)
S319	Switch	SRRM25SS2620D (L=20mm) (CH (A, B, C))
S320	Switch	SRRS1G013A (CH SW)
S323	Switch	MB-2011-8R (ALARM)

[FRONT UNIT]

REF. NO.	DESCRIPTION	PART NO.
S324	Switch	SRRM25SK1315D (L=15mm) (MODE)
S325	Switch	SPPH15009A (DISPLAY)
S326	Switch	SPPH15029A (TUNER)
S327	Switch	SPPH15029A (TX FREQ)
S328	Switch	SSSS21148A TYPE (B)
SP301	Speaker	C080K1710810
EP301	P.C.B	B-1106C (42697)
EP302	P.C.B	B-891C (42696)
EP303	P.C.B	B-894C (42514)
W301	Jumper	IPS-1041-4
W302	Jumper	IPS-1041-4
W303	Jumper	IPS-1041-4
W304	Jumper	IPS-1041-4
W305	Jumper	IPS-1041-4
W308	Jumper	IPS-1041-2
W311	Jumper	IPS-1041-4
W312	Jumper	IPS-1041-4
W313	Jumper	IPS-1041-4
W314	Jumper	IPS-1041-4
W315	Jumper	IPS-1041-4
W316	Jumper	IPS-1041-4
W318	Jumper	IPS-1041-2
W319	Jumper	IPS-1041-4
W320	Jumper	IPS-1041-4
W321	Jumper	IPS-1041-4
W322	Jumper	IPS-1041-4
W323	Jumper	IPS-1041-4
W326	Jumper	IPS-1041-4
W327	Jumper	IPS-1041-4
W328	Jumper	IPS-1041-4
W329	Jumper	IPS-1041-4
W330	Jumper	IPS-1041-4
W332	Jumper	IPS-1041-2
W333	Jumper	IPS-1041-2
W335	Jumper	IPS-1041-2
W336	Jumper	IPS-1041-4
W337	Jumper	JPW-02A
W338	Jumper	JPW-02A
W339	Jumper	IPS-1041-4
W340	Jumper	IPS-1041-4
W341	Jumper	JPW-02A
W345	Flat Cable	SMCD-11X100-BDX10G
W348	Jumper	23/00/125/C22/C01
W349	Jumper	23/01/125/C22/C01
W350	Jumper	23/02/125/C22/C01
W351	Jumper	23/03/125/C22/C01
W352	Jumper	23/04/125/C22/C01
W353	Jumper	23/05/125/C22/C01
W354	Jumper	23/06/125/C22/C01
W355	Jumper	23/07/125/C22/C01
W358	Jumper	23/01/060/W02/C01
W359	Jumper	23/02/070/W02/C01
W360	Jumper	23/03/070/W02/C01
W362	Jumper	23/00/230/W02/C01
W363	Jumper	23/09/230/W02/C01
W364	Jumper	23/06/230/W02/C01
W365	Jumper	23/07/180/W02/C01

## [FRONT UNIT]

REF. NO.	DESCRIPTION	PART NO.
W366	Jumper	23/08/180/C22/C01
W367	Jumper	23/04/180/C22/C01
W368	Jumper	23/02/180/C22/C01
W369	Jumper	23/01/180/C22/C01
W370	Jumper	23/05/180/C22/C01
W376	Jumper	23/01/100/W02/C01
W377	Jumper	23/02/100/W02/C01
W378	Jumper	23/03/100/W02/C01
W379	Jumper	23/04/100/W02/C01
W380	Jumper	23/00/100/W02/C01
W381	Jumper	23/09/110/W02/W02
W382	Jumper	JPW-02A
W383	Jumper	JPW-02A
W384	Jumper	13/03/100/W02/A05
W385	Jumper	13/02/100/W02/A05
W386	Jumper	13/09/100/W02/A05
W387	Jumper	13/09/100/W02/A05
W389	Jumper	23/04/110/C22/C01
W390	Jumper	23/06/115/C22/C01
W391	Jumper	23/01/120/C22/C01
W392	Jumper	23/02/125/C22/C01
W393	Jumper	23/03/130/C22/C01
W394	Jumper	23/04/135/C22/C01
W395	Jumper	23/05/140/C22/C01
W396	Jumper	23/06/145/C22/C01
W397	Jumper	23/07/150/C22/C01
W398	Jumper	23/08/155/C22/C01
W399	Jumper	23/09/160/C22/C01
W400	Jumper	JPW-02A
W401	Jumper	JPW-02A

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC1001	IC	M5218L
IC1002	IC	TC4011UBP
IC1003	IC	M5218L
IC1004	IC	M5218L
IC1005	IC	M5218L
IC1006	IC	M5218L
IC1007	IC	μPC1037H
IC1008	IC	μPC1037H
IC1009	IC	TC40H074P
IC1010	IC	TC4066BP
IC1011	IC	μPC1037H
IC1012	IC	TC4011BP
IC1013	IC	μA7808
IC1014	IC	TC4011BP
IC1015	IC	BA222
IC1016	IC	μA555TC
IC1017	IC	μA555TC
IC1018	IC	TC4013BP
IC1019	IC	μA555TC
IC1020	IC	TC4001UBP
IC1021	IC	TC4001UBP
IC1022	IC	TC4011UBP
IC1023	IC	μPC1241H
IC1024	IC	TC4066BP
IC1025	IC	S-7116A
Q1001	FET	3SK74 M
Q1002	Transistor	2SC1583 G
Q1003	Transistor	2SC1815 GR
Q1004	Transistor	2SC1815 GR
Q1005	Transistor	2SC1815 GR
Q1006	Transistor	2SA1348
Q1007	FET	2SK30A Y/GR
Q1008	Transistor	2SC1815 GR
Q1009	Transistor	2SC1571 G
Q1010	FET	3SK74 M
Q1011	Transistor	2SC1815 GR
Q1012	FET	3SK74 M
Q1013	Transistor	2SA1345
Q1014	Transistor	2SC1815 GR
Q1015	Transistor	2SC3402
Q1016	FET	3SK74 M
Q1017	FET	3SK74 M
Q1018	Transistor	2SC1571 G
Q1019	Transistor	2SA1015 GR
Q1020	Transistor	2SC3402
Q1021	Transistor	2SC3402
Q1022	Transistor	2SC3399
Q1023	Transistor	2SC1571 G
Q1024	Transistor	2SC2458 GR
Q1025	Transistor	2SC1815 Y
Q1026	Transistor	2SC3399
Q1027	Transistor	2SA1345
Q1028	Transistor	2SC3399
Q1029	Transistor	2SC3399
Q1031	Transistor	2SC3399
Q1032	Transistor	2SC3399
Q1034	Transistor	2SC1815 GR
Q1035	Transistor	2SC3399
Q1036	Transistor	2SC3399
Q1037	Transistor	2SD880 Y
Q1038	Transistor	2SC1645 A/B
Q1039	Transistor	2SC1815 Y/GR

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
Q1040	Transistor	2SD468 C
Q1041	Transistor	2SC1645 A/B
Q1042	Transistor	2SC3399
Q1043	Transistor	2SC3399
Q1045	Transistor	2SC3399
Q1046	Transistor	2SC3399
Q1047	Transistor	2SC3399
Q1048	Transistor	2SC1815 Y/GR
Q1049	Transistor	2SC3402
Q1050	Transistor	2SC3399
Q1051	Transistor	2SC3399
Q1052	Transistor	2SC3399
Q1053	Transistor	2SC3402
Q1054	Transistor	2SC3399
Q1055	Transistor	2SC1815 GR
Q1056	Transistor	2SC1571 G
Q1057	Transistor	2SC3399
Q1058	FET	2SK30A Y
Q1059	Transistor	2SC3399
Q1060	Transistor	2SC1815 Y/GR
Q1061	Transistor	2SA1345
Q1062	Transistor	2SA1015 Y/GR
Q1063	Transistor	2SC1815 Y/GR
Q1064	Transistor	2SC3399
Q1065	FET	2SK192A GR
Q1066	FET	2SK192A GR
D1001	Diode	1K60
D1002	Diode	1K60
D1003	Diode	1SS133
D1004	Diode	1K60
D1005	Diode	1K60
D1006	Diode	1SS133
D1007	Diode	1SS53
D1008	Diode	1SS133
D1009	Diode	1SS133
D1010	Diode	1SS53
D1011	Diode	1SS53
D1012	Diode	1SS53
D1013	Diode	1SS53
D1014	Diode	1SS53
D1015	Diode	1SS53
D1016	Diode	1SS53
D1017	Diode	1SS53
D1018	Diode	MI204
D1019	Diode	1SS53
D1020	Diode	1SS53
D1021	Diode	1SS53
D1022	Diode	1SS53
D1023	Diode	1SS53
D1024	Diode	1SS53
D1025	Diode	1SS53
D1026	Diode	1SS53
D1027	Diode	1SS53
D1028	Diode	1SS53
D1029	Diode	1SS53
D1030	Diode	1SS53
D1031	Diode	1SS133
D1032	Diode	1SS133
D1033	Diode	1SS53
D1034	Diode	1SS133
D1035	Diode	1SS133
D1036	Diode	1SS53

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
D1037	Diode	1SS53
D1038	Diode	1SS133
D1039	Diode	1SS133
D1040	Diode	1SS133
D1041	Diode	1SS53
D1042	Diode	1SS133
D1043	Diode	1SS133
D1045	Diode	1SS99
D1046	Diode	1SS99
D1047	Diode	1SS53
D1049	Diode	1SS53
D1050	Diode	1SS53
D1051	Varicap	FC51M
D1052	Diode	1SS53
D1053	Varicap	FC51M
D1054	Diode	1SS53
D1055	Varicap	FC51M
D1056	Diode	1SS53
D1057	Varicap	FC51M
D1058	Diode	1SS53
D1059	Diode	1SS53
D1060	Varicap	FC51M
D1061	Diode	1S953
D1062	Diode	1S953
D1063	Diode	1SS133
D1065	Diode	1SS133
D1066	Diode	1SS133
D1067	Diode	1SS133
D1068	Diode	1SS133
D1069	Diode	1SS133
D1071	Diode	1SS133
D1072	Diode	1SS133
D1073	Diode	1SS133
D1074	Diode	1SS133
D1076	Diode	1SS133
D1077	Diode	1SS133
D1078	Diode	1SS133
D1082	Diode	1SS53
D1083	Diode	1SS53
D1085	Diode	1SS133
D1086	Diode	1SS133
D1087	Diode	1N4002
D1088	Diode	1SS133
D1089	Zener	RD5.1E B2
D1090	Diode	1SS133
D1091	Diode	1SS133
D1092	Diode	1SS133
D1093	Diode	1SS133
D1094	Diode	1SS133
D1095	Diode	1N4002
D1096	Diode	1SS133
D1097	Diode	1SS133
D1098	Diode	1SS133
D1100	Diode	1SS133
D1103	Diode	1SS133
D1104	Diode	1SS133
D1105	Diode	1SS133
D1106	Diode	1SS133
D1107	Diode	1SS133
D1108	Diode	1SS53
D1111	Diode	1SS133
D1112	Diode	1SS133
D1113	Diode	1SS133
D1114	Diode	1SS133

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
D1115	Diode	1SS133
D1117	Diode	1SS133
D1118	Diode	1SS133
D1119	Diode	1SS133
D1120	Diode	1SS133
D1121	Diode	1SS133
D1122	Diode	1SS133
D1123	Diode	1SS133
D1124	Diode	1SS133
D1125	Diode	1SS133
D1128	Diode	1SS133
D1129	Diode	1SS133
D1135	Diode	1SS133
D1140	Diode	1SS133
D1141	Diode	1SS133
D1143	Diode	1SS133
D1144	Diode	1SS133
D1147	Diode	1SS133
D1150	Diode	1SS133
D1152	Diode	1SS133
D1153	Diode	1SS133
D1155	Diode	1SS133
D1156	Diode	1SS133
D1158	Diode	1SS133
D1160	Diode	1SS133
D1161	Diode	1SS133
D1162	Diode	1SS133
D1163	Diode	1SS133
D1164	Zener	RD5.1E B2
D1165	Diode	1SS133
D1166	Diode	1SS133
FI1001	Crystal Filter	FL-30 (SSB)
FI1002	Crystal Filter	FL-45 (CW. FSK)
FI1003	Crystal Filter	FL-33 (AM)
X1001	Crystal	CR-73 (USB)
X1002	Crystal	CR-74 (LSB)
X1003	Crystal	CR-171 (FSK)
X1004	Crystal	CR-170 (CW-T)
X1005	Crystal	CR-172 (CW-R)
X1006	Crystal	3579.545kHz HC-43/u
X1007	Crystal	3.20000MHz HC-43/u
L1001	Coil	LS-175
L1002	Coil	LS-175
L1003	Coil	LS-175
L1004	Coil	LS-137
L1005	Coil	LS-163
L1006	Coil	LS-90A
L1007	Coil	LS-90A
L1008	Coil	LAL03NA 101K (100μ)
L1009	Coil	LS-175
L1010	Coil	LS-175
L1011	Coil	LAL03NA 101K (100μ)
L1012	Coil	LS-175
L1013	Coil	LB4 R50K (0.5μ)
L1014	Coil	LS-66A
L1015	Coil	LS-66A
L1016	Coil	LS-163
L1017	Coil	LS-163

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
L1018	Coil	LB4 R50K (0.5μ)
L1019	Coil	LS-267
L1020	Coil	LS-267
L1021	Coil	LS-267
L1022	Coil	LS-267
L1023	Coil	LS-267
L1024	Coil	LAL03NA 101K
L1025	Coil	FL5H 101K (100μ)
L1026	Coil	BT01RN1-A61
L1027	Coil	LAL03NA 101K (100μ)
L1028	Coil	BT01RN1-A61
L1029	Coil	FL5H 101K (100μ)
L1030	Coil	BT01RN1-A61
L1031	Coil	LW-15
L1032	Coil	FL5H 102K
L1033	Coil	LAL04NA 102K
L1034	Coil	LAL04NA 102K
L1035	Coil	BT01RN1-A61
L1036	Coil	LAL03NA 681K (680μ)
L1037	Coil	LAL03NA 681K (680μ)
L1038	Coil	LAL03NA 681K (680μ)
L1039	Coil	LAL03NA 681K (680μ)
L1040	Coil	LAL03NA 681K (680μ)
R1001	Resistor	1M R20
R1002	Resistor	100k R20
R1003	Resistor	330 R20
R1004	Resistor	100 R20
R1005	Resistor	22k R20
R1006	Resistor	1k R20
R1007	Resistor	100 R20
R1008	Resistor	100k R20
R1009	Resistor	150k R20
R1010	Resistor	1k R20
R1011	Resistor	100 R20
R1012	Resistor	6.8k R25
R1013	Resistor	68k R20
R1014	Resistor	47k R20
R1015	Resistor	330 R20
R1016	Resistor	22k R20
R1017	Resistor	10k R20
R1018	Resistor	100k R20
R1019	Resistor	100 R25
R1020	Resistor	47 R20
R1021	Resistor	10k R20
R1022	Resistor	10k R20
R1023	Resistor	100k R20
R1024	Resistor	47k R20
R1025	Resistor	100k R25
R1026	Resistor	3.3M ELR25
R1027	Resistor	22k R20
R1028	Resistor	220 R20
R1029	Resistor	10k R25
R1030	Resistor	47 R20
R1031	Resistor	100k R20
R1032	Resistor	4.7k R20
R1033	Resistor	4.7k R20
R1034	Resistor	47k R20
R1035	Resistor	47k R20
R1036	Resistor	47k R20
R1037	Resistor	100k R20
R1038	Resistor	330 R20
R1039	Resistor	1k R20



[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R1040	Resistor	2.2k	R20
R1041	Resistor	22	R20
R1042	Resistor	220	R20
R1043	Resistor	4.7k	R25
R1044	Resistor	100k	R25
R1045	Resistor	470	R20
R1046	Resistor	100k	R20
R1047	Resistor	22k	R20
R1048	Resistor	10k	R25
R1049	Resistor	470	R20
R1050	Resistor	220k	R20
R1051	Resistor	10k	R25
R1052	Resistor	15k	R20
R1053	Resistor	15k	R20
R1054	Resistor	8.2k	R20
R1055	Resistor	8.2k	R20
R1056	Resistor	180k	R20
R1057	Resistor	180k	R20
R1058	Resistor	10k	R20
R1059	Resistor	4.7k	R20
R1060	Resistor	4.7k	R20
R1061	Resistor	10k	R20
R1062	Resistor	2.2k	R20
R1063	Resistor	33k	R20
R1064	Trimmer	RHA3A140SA	10k
R1065	Resistor	47k	R25
R1066	Resistor	6.8k	R20
R1067	Resistor	1k	R25
R1068	Resistor	12k	R25
R1069	Resistor	1k	R20
R1070	Resistor	4.7k	R25
R1071	Resistor	2.2k	R20
R1072	Resistor	2.2k	R25
R1073	Resistor	220	R20
R1074	Resistor	1k	R20
R1075	Resistor	47k	R20
R1076	Resistor	2.2k	R25
R1077	Resistor	100	R25
R1078	Resistor	220	R20
R1079	Resistor	33k	R25
R1080	Resistor	4.7k	R20
R1081	Resistor	47k	R20
R1082	Resistor	100	R20
R1083	Resistor	1k	R20
R1084	Resistor	10k	R20
R1085	Resistor	33k	R20
R1086	Resistor	2.2k	R20
R1087	Resistor	100	R20
R1088	Resistor	10k	R20
R1089	Resistor	100	R20
R1090	Resistor	330	R20
R1091	Resistor	1.5k	R20
R1092	Resistor	2.2k	R20
R1093	Resistor	10k	R20
R1094	Resistor	10k	R20
R1095	Resistor	22	R25
R1096	Resistor	10k	R20
R1097	Resistor	100	R20
R1098	Resistor	2.2k	R20
R1099	Resistor	2.2k	R20
R1100	Resistor	100	R25
R1101	Resistor	100	R20
R1102	Resistor	100	R20
R1103	Resistor	2.2k	R20

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R1104	Resistor	2.2k	R20
R1105	Resistor	2.2k	R20
R1106	Resistor	100	R25
R1107	Resistor	100	R25
R1108	Resistor	2.2k	R20
R1109	Resistor	680	R20
R1120	Resistor	1.5k	R20
R1121	Resistor	2.2k	R20
R1122	Resistor	100	R25
R1123	Resistor	100	R25
R1124	Resistor	2.2k	R20
R1125	Resistor	47k	R20
R1126	Resistor	4.7k	R20
R1127	Resistor	10k	R20
R1128	Resistor	47	R20
R1129	Resistor	4.7k	R20
R1130	Resistor	10k	R20
R1131	Resistor	22k	R25
R1132	Resistor	2.2k	R20
R1133	Resistor	220	R20
R1134	Resistor	100	R20
R1135	Resistor	22k	R20
R1136	Trimmer	RHB0CJ401A	22k
R1137	Resistor	100	R20
R1138	Resistor	220	R25
R1139	Resistor	4.7k	R20
R1140	Resistor	3.3k	R20
R1141	Resistor	4.7k	R25
R1142	Resistor	1k	R20
R1143	Resistor	1.5k	R20
R1144	Resistor	100	R20
R1145	Resistor	1k	R20
R1146	Resistor	100k	R20
R1147	Resistor	4.7k	R20
R1148	Resistor	4.7k	R20
R1149	Trimmer	RHA3A140SA	10k
R1150	Resistor	470	R20
R1151	Resistor	47k	R20
R1152	Resistor	47k	R20
R1153	Resistor	220	R20
R1154	Resistor	220	R20
R1155	Resistor	1k	R20
R1156	Resistor	1M	R20
R1157	Resistor	100k	R20
R1158	Resistor	150k	R20
R1159	Resistor	330k	R20
R1160	Resistor	10k	R25
R1161	Resistor	47k	R20
R1162	Resistor	470	R25
R1163	Resistor	470	R20
R1164	Resistor	1k	R20
R1165	Resistor	10k	R20
R1166	Resistor	2.2k	R20
R1167	Resistor	100k	R20
R1168	Trimmer	RHB0C1431A	10k
R1169	Resistor	47k	R20
R1170	Trimmer	RHB0C1431A	10k
R1171	Resistor	33k	R20
R1172	Resistor	470	R20
R1173	Resistor	4.7k	R20
R1174	Resistor	100	R20
R1175	Resistor	470	R20
R1176	Resistor	22	R20
R1177	Resistor	1.5k	R20

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R1178	Resistor	3.3k	R20
R1179	Resistor	47k	R20
R1180	Resistor	100k	R20
R1181	Trimmer	RHA3A140SA	10k
R1182	Resistor	3.3k	R20
R1183	Resistor	100	R20
R1184	Resistor	47k	R20
R1185	Resistor	2.2k	R20
R1186	Resistor	1.5k	R20
R1187	Resistor	1k	R20
R1188	Resistor	470k	R20
R1189	Resistor	1k	R20
R1190	Resistor	47k	R20
R1191	Resistor	22k	R20
R1192	Resistor	100	R20
R1193	Resistor	47	R20
R1195	Resistor	220	R20
R1196	Resistor	100k	R20
R1198	Resistor	220	R20
R1199	Resistor	100k	R20
R1200	Resistor	100k	R20
R1202	Resistor	220	R20
R1203	Resistor	100k	R20
R1205	Resistor	220	R20
R1206	Resistor	100k	R25
R1208	Resistor	220	R20
R1209	Resistor	100k	R20
R1210	Resistor	10k	R20
R1211	Resistor	68k	R20
R1212	Resistor	1M	R20
R1213	Resistor	4.7k	R20
R1214	Trimmer	RHLOC141BA	10k
R1215	Resistor	4.7k	R20
R1216	Trimmer	RHLOC141BA	10k
R1217	Trimmer	RHLOC141BA	10k
R1218	Resistor	47k	R20
R1219	Resistor	100k	R20
R1220	Resistor	220	R25
R1221	Resistor	2.2k	R20
R1222	Resistor	220	R20
R1223	Resistor	2.2M	R20
R1224	Resistor	1.8M	R20
R1225	Resistor	3.3M	ELR25
R1226	Resistor	220	R25
R1227	Resistor	470k	R20
R1229	Resistor	470k	R25
R1230	Resistor	3.3M	ELR25
R1231	Resistor	220	R20
R1232	Resistor	470	R20
R1233	Resistor	10k	R20
R1234	Resistor	10k	R20
R1235	Resistor	10k	R20
R1236	Resistor	10k	R20
R1237	Resistor	10k	R20
R1238	Resistor	2.2k	R20
R1239	Resistor	10k	R25
R1240	Resistor	18k	R25
R1241	Resistor	220	R20
R1242	Resistor	33k	R20
R1243	Resistor	33k	R20
R1244	Trimmer	RHBOC151 × A	100k
R1245	Trimmer	RHBOC151 × A	100k
R1247	Trimmer	RHA3A140SA	10k
R1248	Resistor	47k	R20

## [MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R1250	Resistor	100k	R20
R1251	Resistor	10k	R20
R1252	Resistor	220k	R20
R1253	Resistor	10k	R20
R1254	Resistor	10k	R25
R1256	Trimmer	RHLOCJ31HA	2.2k
R1257	Resistor	10k	R25
R1258	Resistor	47k	R20
R1259	Resistor	220	R20
R1260	Resistor	100k	R20
R1261	Resistor	33k	R25
R1262	Resistor	82k	R20
R1263	Resistor	220k	R20
R1267	Resistor	2.2	R25
R1268	Resistor	4.7	R25
R1270	Resistor	22k	R25
R1271	Resistor	100	R20
R1272	Resistor	150	R25
R1273	Resistor	47k	R20
R1274	Resistor	10k	R20
R1275	Resistor	15k	R20
R1276	Resistor	47k	R25
R1277	Resistor	4.7k	R20
R1278	Resistor	4.7k	R20
R1279	Resistor	220k	R20
R1280	Resistor	4.7	ELR25
R1282	Resistor	22k	R20
R1283	Resistor	10k	R20
R1284	Resistor	82k	R20
R1285	Resistor	10k	R20
R1286	Resistor	22k	R20
R1287	Resistor	10k	R20
R1288	Resistor	1	R20
R1289	Resistor	47	R20
R1290	Resistor	10k	R20
R1291	Resistor	22	R20
R1292	Resistor	220	R20
R1293	Resistor	220	R20
R1294	Resistor	22	R20
R1295	Resistor	1k	R20
R1296	Resistor	4.7k	R20
R1297	Resistor	1k	R20
R1298	Resistor	220k	R20
R1299	Resistor	100k	R20
R1300	Resistor	10k	R25
R1301	Resistor	47k	R20
R1302	Resistor	47k	R20
R1304	Resistor	470k	R20
R1305	Resistor	4.7M	ERC-14GJ
R1306	Resistor	470k	R20
R1307	Trimmer	RHM0A1505A	100k
R1308	Resistor	150k	CRB25FX
R1309	Resistor	1k	R20
R1310	Resistor	47k	R20
R1311	Resistor	220k	R25
R1312	Resistor	22	R20
R1313	Resistor	220k	R25
R1314	Resistor	22k	R25
R1317	Resistor	15k	R20
R1318	Resistor	47k	R20
R1319	Resistor	4.7k	R20
R1320	Resistor	220	R25
R1321	Resistor	2.2k	R20
R1322	Resistor	220	R20

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R1323	Resistor	4.7k	R20
R1324	Resistor	3.3k	R20
R1325	Resistor	22k	R25
R1326	Resistor	4.7k	R20
R1327	Resistor	15k	R20
R1328	Resistor	47k	R20
R1329	Resistor	4.7k	R20
R1330	Resistor	22k	R20
R1331	Resistor	100k	R20
R1332	Resistor	220	R25
R1333	Resistor	330	R20
R1334	Resistor	2.2k	R20
R1335	Resistor	47k	R20
R1336	Resistor	12k	R25
R1337	Resistor	22k	R25
R1338	Resistor	10k	R20
R1339	Resistor	4.7k	R25
R1340	Resistor	2.2k	R20
R1341	Resistor	100k	R20
R1342	Resistor	2.2k	R20
R1343	Resistor	1k	R20
R1345	Resistor	4.7k	R20
R1346	Resistor	10k	R20
R1347	Resistor	4.7k	R25
R1348	Resistor	100k	R20
R1349	Resistor	100k	R20
R1350	Resistor	100k	R20
R1351	Array	RMX-6	47k
R1352	Resistor	47k	R20
R1353	Resistor	47k	R20
R1354	Resistor	180k	R20
R1355	Resistor	100k	R20
R1356	Trimmer	RHB0C1324A	1k
R1357	Resistor	10k	R20
R1358	Resistor	2.2k	R20
R1359	Resistor	100k	R20
R1361	Trimmer	RHA3A140SA	10k
R1362	Resistor	2.2k	R25
R1363	Resistor	47	R25
R1364	Resistor	2.2k	R20
R1365	Resistor	470k	R20
R1366	Resistor	470k	R20
R1367	Resistor	180k	R20
R1368	Resistor	2.2k	R20
R1369	Resistor	100k	R20
R1370	Resistor	100k	R25
R1371	Resistor	100k	R20
R1372	Resistor	2.2k	R20
R1373	Resistor	1.5k	R20
R1374	Resistor	2.2	R25
R1375	Resistor	47	R20
C1001	Barrier Lay	0.1	16V
C1002	Ceramic	0.0047	50V
C1003	Ceramic	0.0047	50V
C1004	Tantalum	3.3	16V
C1005	Ceramic	0.0047	50V
C1006	Ceramic	0.0047	50V
C1007	Ceramic	0.0047	50V
C1008	Ceramic	0.0047	50V
C1009	Ceramic	0.0047	50V
C1010	Cylindrical	UP125X	472M
C1011	Ceramic	47P	50V

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C1012	Barrier Lay	0.047	25V
C1013	Electrolytic	10	16V MS7
C1014	Ceramic	0.0047	50V
C1015	Electrolytic	47	10V
C1016	Barrier Lay	0.1	16V
C1017	Ceramic	0.0047	50V
C1018	Tantalum	2.2	16V
C1019	Barrier Lay	0.1	16V
C1020	Ceramic	0.0047	50V
C1021	Electrolytic	47	10V
C1022	Ceramic	330P	50V
C1023	Ceramic	0.0047	50V
C1024	Cylindrical	UP125X	472M 0.0047
C1025	Ceramic	330P	50V
C1026	Ceramic	0.001	50V
C1027	Barrier Lay	0.1	16V
C1028	Electrolytic	47	10V
C1029	Electrolytic	22	10V
C1030	Electrolytic	4.7	25V
C1031	Mylar	0.0047	50V
C1032	Electrolytic	2.2	50V
C1033	Ceramic	DD109SL471J50V02	470P
C1034	Barrier Lay	0.047	25V
C1035	Ceramic	DD109SL471J50V02	470P
C1036	Electrolytic	2.2	50V
C1037	Mylar	0.01	50V
C1038	Mylar	0.01	50V
C1039	Electrolytic	10	16V BP
C1040	Electrolytic	4.7	25V
C1041	Electrolytic	0.47	50V BP
C1042	Electrolytic	100	10V
C1043	Ceramic	0.0047	50V
C1044	Electrolytic	47	10V
C1045	Ceramic	0.0047	50V
C1046	Cylindrical	UP125SL	010M 1P
C1047	Ceramic	2P	50V
C1048	Ceramic	0.0047	50V
C1049	Ceramic	0.001	50V
C1050	Mylar	0.033	50V
C1051	Ceramic	0.0047	50V
C1052	Ceramic	0.0047	50V
C1053	Ceramic	0.0047	50V
C1054	Ceramic	0.0047	50V
C1055	Electrolytic	22	10V
C1056	Ceramic	0.0047	50V
C1057	Ceramic	100P	50V
C1058	Ceramic	0.0047	50V
C1059	Ceramic	0.0047	50V
C1060	Ceramic	0.0047	50V
C1061	Ceramic	0.0047	50V
C1062	Mylar	0.047	50V
C1063	Ceramic	0.0047	50V
C1064	Ceramic	0.0047	50V
C1065	Electrolytic	1	50V
C1066	Ceramic	0.0047	50V
C1067	Ceramic	0.0047	50V
C1068	Ceramic	0.0047	50V
C1069	Ceramic	0.0047	50V
C1070	Ceramic	0.0047	50V
C1071	Ceramic	0.0047	50V
C1072	Ceramic	0.0047	50V
C1073	Ceramic	0.0047	50V

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C1074	Ceramic	0.0047	50V
C1075	Ceramic	0.0047	50V
C1076	Ceramic	0.0047	50V
C1077	Ceramic	0.0047	50V
C1078	Ceramic	0.0047	50V
C1079	Ceramic	0.0047	50V
C1081	Ceramic	0.001	50V
C1082	Barrier Lay	0.01	25V
C1083	Ceramic	0.0047	50V
C1084	Ceramic	0.0047	50V
C1085	Electrolytic	47	10V
C1086	Mylar	0.01	50V
C1087	Ceramic	0.0047	50V
C1088	Ceramic	0.0047	50V
C1089	Ceramic	0.0047	50V
C1090	Ceramic	22P	50V
C1091	Ceramic	0.0047	50V
C1092	Ceramic	0.0047	50V
C1093	Ceramic	0.0047	50V
C1094	Electrolytic	47	10V
C1095	Ceramic	0.001	50V
C1096	Electrolytic	2.2	50V
C1097	Electrolytic	0.47	50V BP
C1098	Electrolytic	47	10V
C1099	Electrolytic	10	25V
C1100	Electrolytic	22	10V
C1101	Electrolytic	2.2	25V
C1102	Barrier Lay	0.1	16V
C1103	Ceramic	0.0047	50V
C1104	Ceramic	0.0047	50V
C1105	Electrolytic	47	10V
C1106	Barrier Lay	0.1	16V
C1107	Barrier Lay	0.047	25V
C1108	Ceramic	47P	50V
C1109	Electrolytic	2.2	50V BP
C1110	Ceramic	0.0047	50V
C1111	Tantalum	10	10V
C1112	Ceramic	200P	50V XL
C1113	Ceramic	200P	50V XL
C1114	Ceramic	100P	50V CH
C1115	Ceramic	470P	50V
C1116	Ceramic	0.001	50V
C1117	Ceramic	0.001	50V
C1118	Ceramic	2P	50V
C1119	Ceramic	DD109SL471J50V02	470P
C1120	Ceramic	51P	50V
C1121	Ceramic	DD109SL471J50V02	470P
C1122	Ceramic	0.0047	50V
C1123	Ceramic	0.0047	50V
C1124	Cylindrical	UP125X	472M 0.0047
C1125	Barrier Lay	0.047	25V
C1126	Ceramic	0.0047	50V
C1127	Ceramic	0.0047	50V
C1128	Ceramic	0.0047	50V
C1129	Ceramic	0.0047	50V
C1130	Ceramic	0.001	50V
C1131	Ceramic	0.0047	50V
C1132	Electrolytic	10	25V
C1133	Ceramic	0.0047	50V
C1134	Tantalum	3.3	16V
C1135	Ceramic	0.0047	50V
C1136	Electrolytic	47	10V

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C1137	Electrolytic	22	10V
C1138	Array	B7ZC0711-32N	0.01 × 6
C1139	Ceramic	0.0047	50V
C1141	Ceramic	100P	50V
C1142	Ceramic	150P	50V
C1143	Ceramic	0.001	50V
C1144	Ceramic	47P	50V
C1145	Ceramic	0.0047	50V
C1146	Ceramic	0.022	50V
C1147	Electrolytic	22	10V
C1148	Electrolytic	47	10V
C1149	Barrier Lay	0.047	25V
C1150	Ceramic	0.0047	50V
C1151	Electrolytic	47	10V
C1152	Ceramic	0.0047	50V
C1153	Electrolytic	47	16V
C1154	Electrolytic	10	25V
C1155	Mylar	0.001	50V
C1156	Mylar	0.047	50V
C1157	Mylar	0.047	50V
C1158	Mylar	0.1	50V
C1159	Electrolytic	470	16V
C1160	Electrolytic	47	16V
C1161	Electrolytic	470	16V
C1162	Electrolytic	470	16V
C1163	Electrolytic	100	10V
C1164	Electrolytic	47	16V
C1165	Mylar	0.033	50V
C1166	Mylar	0.047	50V
C1167	Ceramic	0.0047	50V
C1168	Ceramic	0.0047	50V
C1169	Mylar	0.0022	50V
C1170	Mylar	0.01	50V
C1171	Tantalum	1	35V
C1172	Tantalum	10	10V
C1173	Mylar	0.01	50V
C1174	Mylar	0.033	50V
C1175	Tantalum	1	35V
C1176	Mylar	0.01	50V
C1177	Mylar	0.022	50V
C1178	Mylar	0.022	50V
C1181	Ceramic	0.0047	50V
C1182	Ceramic	0.0047	50V
C1183	Ceramic	0.0047	50V
C1184	Ceramic	0.0047	50V
C1185	Ceramic	0.0047	50V
C1186	Ceramic	0.0047	50V
C1187	Electrolytic	47	10V
C1188	Mylar	0.022	50V
C1189	Mylar	0.033	50V
C1190	Electrolytic	2.2	50V
C1191	Ceramic	0.0047	50V
C1192	Barrier Lay	0.1	16V
C1193	Ceramic	0.0047	50V
C1194	Ceramic	0.0047	50V
C1195	Ceramic	10P	50V
C1196	Barrier Lay	0.047	25V
C1197	Ceramic	10P	50V
C1198	Electrolytic	0.47	50V BP
C1199	Ceramic	0.0047	50V
C1200	Electrolytic	10	25V
C1201	Electrolytic	1	50V
C1202	Electrolytic	0.47	50V
C1203	Mylar	0.047	50V

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
C1204	Ceramic	0.0047 50V
C1205	Ceramic	0.0047 50V
C1206	Array	B8ZC0111-32N 0.0082 × 7
C1207	Tantalum	3.3 16V
C1208	Ceramic	0.001 50V
C1209	Ceramic	0.0047 50V
C1210	Ceramic	0.001 50V
C1211	Ceramic	0.0047 50V
C1212	Electrolytic	10 25V
C1213	Electrolytic	4.7 25V
C1214	Ceramic	0.0047 50V
C1215	Ceramic	0.0047 50V
C1216	Electrolytic	10 25V
C1217	Electrolytic	33 16V
C1218	Electrolytic	1 16V MS7
C1219	Electrolytic	47 10V
C1220	Ceramic	0.0047 50V
C1221	Electrolytic	2.2 50V
C1222	Ceramic	DD108SL391J50V02 390P
C1223	Ceramic	22P 50V
C1224	Ceramic	DD108SL391J50V02 390P
C1225	Ceramic	33P 50V
C1226	Ceramic	47P 50V
C1227	Ceramic	22P 50V CH
C1228	Electrolytic	0.47 50V RC2
C1229	Electrolytic	0.33 50V RC2
C1230	Ceramic	0.0047 50V
RL1001	Relay	FBR211BD-009M
J1001	Connector	TL-25P-04-V1
J1002	Connector	TMP-J01X-A2
J1003	Connector	TL-25P-06-V1
J1004	Connector	TL-25P-08-V1
J1005	Connector	TL-25P-05-V1
J1006	Connector	TL-25P-05-V1
J1007	Connector	TL-25P-07-V1
J1008	Connector	TL-25P-05-V1
J1009	Connector	TL-25P-07-V1
J1010	Connector	TL-25P-06-V1
J1011	Connector	TL-25P-04-V1
J1012	Connector	TL-25P-05-V1
J1013	Connector	TL-25P-09-V1
J1014	Connector	IMSA-9201B-2-04-T
J1015	Connector	IMSA-9201B-2-04-T
J1016	Connector	TLB-P04H-B1
P1001	Connector	TMP-P01X-A1
P1002	Connector	IMSA-9201-HT
P1003	Connector	IMSA-9201-HT
S1001	Switch	SSSS31124A
S1002	Switch	SSSS31124A
S1003	Switch	SSGK16012A
S1004	Switch	SSSS31124A
S1005	Switch	SSSS31124A

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
EP1001	P.C.B	B-1103B (30465)
W1001	Wire	[ 62/99/270/W13A/C31
W1002		[ 08 A
W1003		[ 51/09/175/W13A/C22
W1004		[ 08 A
W1005	Wire	[ 51/04/175/W13A/C22
W1006		[ 08 A
W1007	Wire	[ 61/99/160/W13A/W13A
W1008		[ 00 A
W1009	Wire	[ 51/05/220/W13A/W13A
W1010		[ 08 A A
W1011	Jumper	IPS-1041-2
W1012	Jumper	IPS-1041-4
W1013	Jumper	IPS-1041-2
W1014	Jumper	IPS-1041-4
W1015	Jumper	IPS-1041-4
W1016	Jumper	IPS-1041-4
W1017	Jumper	IPS-1041-4
W1018	Jumper	IPS-1041-4
W1019	Jumper	IPS-1041-4
W1020	Jumper	IPS-1041-4
W1022	Jumper	IPS-1041-4
W1023	Jumper	IPS-1041-4
W1025	Jumper	IPS-1041-2
W1026	Jumper	IPS-1041-4
W1027	Jumper	IPS-1041-4
W1028	Jumper	IPS-1041-4
W1029	Jumper	IPS-1041-2
W1030	Jumper	JPW-02H
W1031	Jumper	IPS-1041-4
W1032	Jumper	IPS-1041-4
W1033	Jumper	IPS-1041-4
W1034	Jumper	IPS-1041-2
W1035	Jumper	IPS-1041-4
W1036	Jumper	IPS-1041-4
W1037	Jumper	IPS-1041-4
W1038	Jumper	IPS-1041-4
W1039	Jumper	IPS-1041-4
W1040	Jumper	IPS-1041-4
W1041	Jumper	IPS-1041-2
W1042	Jumper	IPS-1041-4
W1043	Jumper	IPS-1041-4
W1044	Jumper	IPS-1041-2
W1045	Jumper	IPS-1041-4
W1046	Jumper	IPS-1041-2
W1047	Jumper	IPS-1041-2
W1048	Jumper	IPS-1041-4
W1050	Jumper	IPS-1041-4
W1051	Jumper	IPS-1041-2
W1052	Jumper	IPS-1041-4
W1053	Jumper	IPS-1041-4
W1054	Jumper	IPS-1041-4
W1055	Jumper	IPS-1041-2
W1057	Jumper	IPS-1041-4
W1058	Jumper	IPS-1041-4
W1059	Jumper	IPS-1041-2
W1060	Jumper	IPS-1041-4
W1061	Jumper	IPS-1041-2
W1062	Jumper	IPS-1041-2
W1063	Jumper	JPW-02H
W1064	Jumper	IPS-1041-4
W1065	Jumper	IPS-1041-2



[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
W1066	Jumper	IPS-1041-2
W1067	Jumper	IPS-1041-4
W1068	Jumper	IPS-1041-4
W1069	Jumper	IPS-1041-4
W1070	Jumper	IPS-1041-2
W1071	Jumper	IPS-1041-4
W1072	Jumper	IPS-1041-2
W1073	Jumper	IPS-1041-2
W1074	Jumper	IPS-1041-4
W1075	Jumper	IPS-1041-4
W1076	Jumper	IPS-1041-2
W1077	Jumper	IPS-1041-2
W1078	Jumper	IPS-1041-2
W1079	Jumper	IPS-1041-2
W1080	Jumper	IPS-1041-4
W1081	Jumper	IPS-1041-2
W1082	Jumper	IPS-1041-2
W1083	Jumper	JPW-02H
W1084	Jumper	IPS-1041-4
W1086	Jumper	IPS-1041-4
W1087	Jumper	IPS-1041-4
W1088	Jumper	IPS-1041-2
W1089	Jumper	IPS-1041-4
W1090	Jumper	JPW-02H
W1091	Jumper	IPS-1041-4
W1092	Jumper	IPS-1041-4
W1093	Jumper	IPS-1041-4
W1094	Jumper	IPS-1041-4
W1095	Jumper	IPS-1041-4
W1096	Jumper	IPS-1041-4
W1097	Jumper	IPS-1041-4
W1098	Jumper	IPS-1041-4
W1099	Jumper	IPS-1041-2
W1100	Jumper	IPS-1041-2
W1101	Jumper	IPS-1041-4
W1102	Jumper	IPS-1041-4
W1103	Jumper	IPS-1041-2
W1104	Jumper	IPS-1041-2
W1105	Jumper	IPS-1041-2
W1106	Jumper	IPS-1041-4
W1107	Jumper	IPS-1041-4
W1108	Jumper	IPS-1041-4
W1109	Jumper	IPS-1041-4
W1110	Jumper	IPS-1041-4
W1111	Jumper	IPS-1041-4
W1112	Jumper	IPS-1041-4
W1113	Jumper	IPS-1041-4
W1114	Jumper	IPS-1041-4
W1115	Jumper	IPS-1041-2
W1116	Jumper	IPS-1041-4
W1117	Jumper	IPS-1041-4
W1118	Jumper	IPS-1041-4
W1119	Jumper	IPS-1041-4
W1120	Jumper	IPS-1041-4
W1121	Jumper	IPS-1041-4
W1122	Jumper	IPS-1041-4
W1123	Jumper	IPS-1041-2
W1124	Jumper	IPS-1041-4
W1125	Jumper	IPS-1041-2
W1126	Jumper	IPS-1041-2
W1127	Jumper	IPS-1041-2
W1128	Jumper	IPS-1041-2
W1129	Jumper	IPS-1041-4
W1130	Jumper	IPS-1041-2

[MAIN UNIT]

REF. NO.	DESCRIPTION	PART NO.
W1131	Jumper	IPS-1041-4
W1132	Jumper	JPW-02H
W1133	Jumper	JPW-02H
W1134	Jumper	IPS-1041-2
W1135	Jumper	IPS-1041-2
W1136	Jumper	IPS-1041-4
W1137	Jumper	IPS-1041-4
W1138	Jumper	IPS-1041-4
W1139	Jumper	IPS-1041-4
W1140	Jumper	IPS-1041-4
W1141	Jumper	IPS-1041-4
W1142	Jumper	IPS-1041-2
W1143	Jumper	IPS-1041-2
W1144	Jumper	IPS-1041-4
W1145	Jumper	IPS-1041-4
W1146	Jumper	IPS-1041-4
W1147	Jumper	IPS-1041-2
W1148	Jumper	IPS-1041-2
W1149	Jumper	IPS-1041-4
W1150	Jumper	IPS-1041-4
W1151	Jumper	IPS-1041-2
W1152	Jumper	IPS-1041-2
W1153	Jumper	IPS-1041-2
W1154	Jumper	IPS-1041-2
W1155	Jumper	IPS-1041-2
W1156	Jumper	IPS-1041-4
W1157	Jumper	IPS-1041-2
W1158	Jumper	JPW-02A
W1159	Jumper	IPS-1041-2
W1160	Jumper	IPS-1041-2
W1161	Jumper	JPW-02A
W1162	Jumper	JPW-02A
W1163	Jumper	JPW-02A

[FILTER UNIT]

[FILTER UNIT]

REF. NO.	DESCRIPTION	PART NO.	
D1501	Diode	1N4002	
D1502	Diode	1N4002	
D1503	Diode	1N4002	
D1504	Diode	1N4002	
D1505	Diode	1N4002	
D1506	Diode	1N4002	
D1507	Diode	1N4002	
D1508	Diode	1K60	
D1509	Diode	1K60	
L1501	Coil	LR-51	
L1502	Coil	LR-50	
L1503	Coil	LR-49	
L1504	Coil	LR-141	
L1505	Coil	LR-138	
L1506	Coil	LR-138	
L1507	Coil	LR-140	
L1508	Coil	LR-149	
L1509	Coil	LR-149	
L1510	Coil	LR-53	
L1511	Coil	LR-140	
L1512	Coil	LR-140	
L1513	Coil	LR-54	
L1514	Coil	LR-91	
L1515	Coil	LR-91	
L1516	Coil	LR-55	
L1517	Coil	LR-56	
L1518	Coil	LR-56	
L1519	Coil	LA-168	
L1520	Coil	L6 222 (2.2m)	
L1521	Coil	LR-22A	
L1522	Coil	FL5H 101K (100μ)	
L1523	Coil	FL5H 101K (100μ)	
L1524	Coil	FL5H 101K (100μ)	
L1525	Coil	FL5H 101K (100μ)	
L1526	Coil	FL5H 101K (100μ)	
L1527	Coil	FL5H 101K (100μ)	
L1528	Coil	FL5H 101K (100μ)	
L1529	Coil	FL5H 101K (100μ)	
L1530	Coil	FL4H 100K (10μ)	
L1531	Coil	FL4H 100K (10μ)	
L1532	Coil	FL4H 100K (10μ)	
L1533	Coil	FL4H 100K (10μ)	
L1534	Coil	FL4H 100K (10μ)	
L1535	Coil	FL4H 100K (10μ)	
R1501	Resistor	68	R50X
R1502	Resistor	22k	ELR25
R1503	Resistor	100k	ELR25
R1504	Resistor	22k	R25
R1505	Resistor	47k	ELR25
C1501	Dip Mica	DM20C122J51CR 1200P 500V	
C1502	Dip Mica	DM19C561J51CR 560P 500V	
C1503	Dip Mica	DM20C152J51CR 1500P 500V	
C1504	Ceramic	150P 500V	
C1505	Dip Mica	DM20C122J51CR 1200P 500V	

REF. NO.	DESCRIPTION	PART NO.	
C1506	Dip Mica	DM19C681J51CR 680P 500V	
C1507	Ceramic	150P 500V	
C1508	Dip Mica	DM19C821J51CR 820P 500V	
C1509	Ceramic	120P 500V	
C1510	Dip Mica	DM19C471J51CR 470P 500V	
C1511	Dip Mica	DM19C471J51CR 470P 500V	
C1512	Ceramic	120P 500V	
C1513	Dip Mica	DM19C561J51CR 560P 500V	
C1514	Ceramic	68P 500V	
C1515	Ceramic	300P 500V	
C1516	Ceramic	330P 500V	
C1517	Ceramic	100P 500V	
C1518	Dip Mica	DM19C391J51CR 390P 500V	
C1519	Ceramic	56P 500V	
C1520	Ceramic	220P 500V	
C1521	Ceramic	270P 500V	
C1522	Ceramic	39P 500V	
C1523	Ceramic	330P 500V	
C1524	Ceramic	33P 500V	
C1525	Ceramic	180P 500V	
C1526	Ceramic	180P 500V	
C1527	Ceramic	22P 500V	
C1528	Ceramic	270P 500V	
C1529	Ceramic	56P 500V	
C1530	Ceramic	100P 500V	
C1531	Ceramic	100P 500V	
C1532	Ceramic	10P 500V	
C1533	Ceramic	200P 500V	
C1534	Ceramic	47P 500V	
C1535	Ceramic	100P 500V	
C1536	Trimmer	ECV-1ZW20 × 32E 20P	
C1537	Ceramic	220P 50V	
C1538	Ceramic	100P 50V	
C1539	Ceramic	100P 50V	
C1540	Barrier Lay	0.047 25V	
C1541	Barrier Lay	0.047 25V	
C1542	Barrier Lay	0.047 25V	
C1543	Barrier Lay	0.047 25V	
C1544	Barrier Lay	0.047 25V	
C1545	Barrier Lay	0.047 25V	
C1546	Barrier Lay	0.047 25V	
C1547	Barrier Lay	0.047 25V	
C1548	Ceramic	0.0047 50V	
C1549	Ceramic	0.0047 50V	
C1550	Ceramic	0.0047 50V	
C1551	Ceramic	0.0047 50V	
C1552	Ceramic	0.0047 50V	
C1553	Ceramic	0.0047 50V	
C1554	Dip Mica	DM19C561J51CR 560P 500V	
C1555	Dip Mica	DM20C102J51CR 1000P 500V	
C1556	Ceramic	270P 500V	
C1557	Ceramic	330P 500V	
C1559	Ceramic	56P 500V	
C1560	Ceramic	120P 500V	
C1561	Ceramic	100P 500V	

[FILTER UNIT]

REF. NO.	DESCRIPTION	PART NO.
RL1501	Relay	FBR313D012-22
RL1502	Relay	FBR313D012-22
RL1503	Relay	FBR313D012-22
RL1504	Relay	FBR313D012-22
RL1505	Relay	FBR313D012-22
RL1506	Relay	FBR313D012-22
RL1507	Relay	FBR313D012-22
RL1508	Relay	FBR313D012-22
RL1509	Relay	FBR313D012-22
RL1510	Relay	FBR313D012-22
RL1511	Relay	FBR313D012-22
RL1512	Relay	FBR313D012-22
RL1513	Relay	FBR313D012-22
RL1514	Relay	FBR313D012-22
J1501	Connector	TMP-J01X-V2
J1502	Connector	TL-25P-03-V1
J1503	Connector	TMP-J01X-V2
P1502	Connector	TL-25H-07-B1
EP1501	P.C.B	B-888C (42726)
W1501	Wire	23/01/195/C01/C21
W1502	Wire	23/02/195/C01/C21
W1503	Wire	23/03/245/C01/C21
W1504	Wire	23/04/270/C01/C21
W1505	Wire	23/05/290/C01/C21
W1506	Wire	23/06/310/C01/C21
W1507	Wire	23/07/330/C01/C21
W1510	Jumper	JPW-02A
W1511	Jumper	JPW-02A
W1512	Jumper	JPW-02A
W1513	Jumper	JPW-02A
W1514	Jumper	JPW-02A
W1515	Jumper	JPW-02A
W1516	Jumper	JPW-02A
W1517	Jumper	JPW-02A
W1518	Jumper	JPW-02A
W1519	Jumper	JPW-02A
W1520	Jumper	JPW-02A
W1521	Jumper	JPW-02A
W1522	Jumper	JPW-02A
W1523	Jumper	JPW-02A
W1524	Jumper	JPW-02A
W1525	Jumper	JPW-02A
W1526	Jumper	JPW-02A
W1527	Jumper	JPW-02A
W1528	Jumper	JPW-02A
W1529	Jumper	JPW-02A
W1530	Jumper	JPW-02A
W1531	Jumper	JPW-02A
W1532	Jumper	JPW-02A
W1533	Jumper	74/98/040/X98/X98
W1534	Jumper	JPW-02A
W1535	Jumper	JPW-02A
W1536	Jumper	JPW-02H
W1537	Jumper	74/98/050/X98/X98
W1538	Jumper	74/98/050/X98/X98
W1539	Jumper	JPW-02A

[PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC1	IC	M54929P
IC2	IC	M54466L
IC3	IC	μPC1037H
IC4	IC	μPC1037H
IC5	IC	M74LS90P
IC7	IC	TA78L008AP
IC8	IC	μA7805
IC201	IC	M54929P
IC202	IC	M54466L
IC203	IC	M74LS90P
IC204	IC	M54459L
Q1	Transistor	2SC945 P
Q2	Transistor	2SC945 P
Q3	Transistor	2SC945 P
Q4	Transistor	2SC945 P
Q5	FET	2SK30A Y
Q6	FET	2SK30A Y
Q7	Transistor	2SC1571 G
Q8	Transistor	2SA1015 Y
Q9	Transistor	2SC945 P
Q11	Transistor	2SC383TM
Q13	Transistor	2SC3399
Q14	Transistor	2SC383TM
Q15	FET	2SK241 Y
Q16	Transistor	2SC383TM
Q17	Transistor	2SC383TM
Q18	FET	2SK192A GR
Q19	FET	2SK192A GR
Q20	FET	2SK192A GR
Q21	FET	2SK192A GR
Q22	Transistor	2SC383TM
Q23	Transistor	2SC383TM
Q24	Transistor	2SC945 P
Q25	Transistor	2SC383TM
Q26	Transistor	2SC383TM
Q201	FET	2SK192A GR
Q202	Transistor	2SC763 C
Q203	Transistor	2SC945 P
D4	Diode	1SS53
D5	Diode	1SS53
D7	Diode	1SS53
D8	Diode	1SS53
D9	Diode	1SS53
D10	Diode	1SS53
D11	Diode	1SS53
D12	Varicap	FC52M
D13	Varicap	1SV50E
D14	Varicap	1SV50E
D15	Varicap	1SV50E
D16	Diode	1SS53
D17	Diode	1SS53
D18	Diode	1SS53
D19	Diode	1SS53
D20	Zener	RD5.1E B2
D22	Diode	1SS53
D23	Diode	1SS53
D201	Varicap	1SV50E
F11	Crystal Filter	FL-69 (30M15A)

[PLL UNIT]

[PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.	
X1	Crystal	CR-165 (30.72MHz)	
L3	Coil	LS-114	
L4	Coil	LS-114	
L5	Coil	LS-114	
L6	Coil	LAL04NA 102K	
L7	Coil	EL0810SKI-101K (100μ)	
L8	Coil	LS-162	
L9	Coil	LA-224	
L10	Coil	LA-254	
L11	Coil	LB4 R36 (0.36μ)	
L12	Coil	LB4 R23 (0.23μ)	
L13	Coil	LW-20	
L14	Coil	FL5H 101K (100μ)	
L15	Coil	FL5H 101K (100μ)	
L16	Coil	LR-79	
L17	Coil	LB-135	
L18	Coil	LW-25	
L19	Coil	LR-79	
L20	Coil	LB-135	
L21	Coil	LW-25	
L22	Coil	LR-79	
L23	Coil	LB-135	
L24	Coil	LW-25	
L25	Coil	LR-79	
L26	Coil	LB-135	
L27	Coil	LW-25	
L29	Coil	LAL03NA R56M (0.56μ)	
L30	Coil	LAL04NA 101K (100μ)	
L201	Coil	LB-113	
L202	Coil	LW-25	
L203	Coil	FL5H 101K (100μ)	
L204	Coil	LAL04NA 101K (100μ)	
L205	Coil	LAL04NA 101K (100μ)	
L206	Coil	LAL04NA 101K (100μ)	
L207	Coil	BT01RN1-A61	
L208	Coil	BT01RN1-A61	
R8	Resistor	47	ELR20
R9	Resistor	100	ELR25
R10	Resistor	15k	ELR25
R11	Resistor	1k	R25
R12	Resistor	470	ELR25
R17	Resistor	10k	ELR25
R18	Resistor	220	ELR25
R19	Resistor	22k	ELR25
R20	Resistor	100	ELR25
R21	Resistor	8.2k	R25
R22	Resistor	1k	R25
R24	Resistor	100	ELR25
R25	Resistor	100	ELR25
R26	Resistor	470	ELR25
R27	Resistor	220	ELR25
R28	Resistor	100	ELR25
R29	Resistor	3.3	ELR25
R30	Resistor	1.5k	ELR25
R31	Resistor	22k	ELR25
R32	Resistor	10k	ELR25
R33	Resistor	10k	ELR25
R34	Resistor	220	ELR25
R35	Resistor	220	ELR25
R37	Resistor	2.7k	ELR25

REF. NO.	DESCRIPTION	PART NO.	
R38	Resistor	390	ELR25
R39	Resistor	1k	R25
R40	Resistor	4.7k	ELR25
R41	Resistor	1.8M	ELR25
R42	Resistor	1k	ELR25
R43	Resistor	1k	ELR25
R44	Resistor	4.7k	ELR25
R45	Resistor	1k	R25
R46	Resistor	4.7k	R25
R47	Resistor	100	R25
R48	Resistor	2.2k	ELR25
R49	Resistor	2.2k	ELR25
R50	Resistor	10k	ELR25
R52	Resistor	27k	ELR25
R53	Resistor	22k	ELR25
R54	Resistor	22k	ELR25
R55	Resistor	47k	ELR25
R56	Resistor	100k	ELR25
R57	Resistor	100k	ELR25
R58	Resistor	150	ELR25
R59	Resistor	3.3k	ELR25
R60	Resistor	100k	ELR25
R61	Resistor	100k	ELR25
R62	Resistor	150	ELR25
R63	Resistor	3.3k	ELR25
R64	Resistor	100k	ELR25
R65	Resistor	100k	ELR25
R66	Resistor	150	ELR25
R67	Resistor	3.3k	ELR25
R68	Resistor	100k	ELR25
R69	Resistor	100k	ELR25
R70	Resistor	150	ELR25
R71	Resistor	3.3k	ELR25
R72	Resistor	180	ELR25
R73	Resistor	33	ELR25
R74	Resistor	4.7k	ELR25
R75	Resistor	220	ELR25
R76	Resistor	330	ELR25
R77	Resistor	22	ELR25
R78	Resistor	220	ELR25
R79	Resistor	22k	ELR25
R80	Resistor	100	ELR25
R81	Resistor	560	ELR25
R82	Resistor	10k	ELR25
R83	Resistor	47k	ELR25
R84	Resistor	10k	ELR25
R85	Resistor	220	ELR25
R86	Resistor	10k	ELR25
R87	Resistor	100	ELR25
R88	Resistor	100	R25
R89	Resistor	220	ELR25
R90	Resistor	22k	ELR25
R91	Resistor	10k	ELR25
R92	Resistor	470	ELR25
R93	Resistor	47	ELR25
R94	Resistor	10k	R25
R95	Resistor	10k	R25
R96	Resistor	10k	R25
R97	Resistor	10k	R25
R98	Resistor	47k	R25
R99	Resistor	47k	R25
R100	Resistor	SRW1P10-J	101W
R101	Resistor	120	R50X
R103	Resistor	47	ELR25

## [PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R107	Resistor	100	ELR25
R109	Resistor	3.3k	ELR25
R201	Resistor	33k	ELR25
R202	Resistor	1k	R25
R204	Resistor	33k	ELR25
R205	Resistor	10k	ELR25
R206	Resistor	470k	ELR25
R207	Resistor	470k	ELR25
R208	Resistor	180	ELR25
R209	Resistor	150	ELR25
R210	Resistor	1.2k	ELR25
R211	Resistor	1.2k	ELR25
R212	Resistor	330	ELR25
R213	Resistor	150	R25
R214	Resistor	4.7k	R25
R215	Resistor	2.2k	R25
R216	Resistor	2.7k	ELR25
R217	Resistor	2.7k	ELR25
R218	Resistor	390	ELR25
R219	Resistor	22k	ELR25
R220	Resistor	220	R25
R221	Resistor	470	R25
R223	Resistor	150	R20
R224	Resistor	18	ELR20
R225	Resistor	270	ELR20
R226	Resistor	270	ELR20
C9	Ceramic	10P	50V
C10	Ceramic	68P	50V
C11	Ceramic	47P	50V
C12	Ceramic	100P	50V
C17	Ceramic	0.0047	50V
C19	Ceramic	0.001	50V
C20	Ceramic	0.001	50V
C21	Ceramic	0.0047	50V
C22	Ceramic	8P	50V
C23	Ceramic	1P	50V
C24	Ceramic	8P	50V
C25	Ceramic	1P	50V
C26	Ceramic	8P	50V
C27	Barrier Lay	0.047	25V
C29	Ceramic	470P	50V
C30	Ceramic	470P	50V
C31	Ceramic	0.1	16V
C32	Ceramic	0.0047	50V
C33	Electrolytic	47	10V
C34	Ceramic	0.0047	50V
C35	Ceramic	6P	50V
C36	Ceramic	6P	50V
C37	Ceramic	0.0047	50V
C38	Ceramic	0.0047	50V
C39	Ceramic	33P	50V
C40	Ceramic	0.0047	50V
C41	Ceramic	0.001	50V
C42	Ceramic	0.0047	50V
C43	Ceramic	43P	50V
C44	Ceramic	51P	50V
C45	Ceramic	120P	50V
C46	Ceramic	22P	50V
C47	Ceramic	100P	50V
C48	Ceramic	150P	50V
C49	Ceramic	82P	50V
C50	Ceramic	56P	50V

## [PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C51	Ceramic	330P	50V
C52	Ceramic	68P	50V
C53	Ceramic	150P	50V
C54	Ceramic	0.0047	50V
C55	Ceramic	0.0047	50V
C56	Ceramic	0.001	50V
C57	Ceramic	0.0047	50V
C58	Ceramic	0.0022	50V
C59	Ceramic	0.0047	50V
C60	Ceramic	0.0047	50V
C62	Ceramic	0.0047	50V
C63	Ceramic	0.0047	50V
C64	Electrolytic	47	10V
C65	Array	B7ZC0717-32N	470P × 6
C66	Electrolytic	47	10V
C67	Barrier Lay	0.047	25V
C68	Barrier Lay	0.1	16V
C69	Ceramic	0.001	50V
C70	Ceramic	0.001	50V
C71	Electrolytic	1	50V
C72	Electrolytic	100	10V
C73	Ceramic	0.0047	50V
C74	Barrier Lay	0.047	25V
C75	Electrolytic	0.47	50V BP
C76	Ceramic	30P	50V CH
C77	Ceramic	30P	50V CH
C78	Trimmer	VCT51C143A	10P
C79	Ceramic	47P	50V CH
C80	Ceramic	12P	50V CH
C81	Ceramic	12P	50V CH
C82	Ceramic	0.0047	50V
C83	Ceramic	1P	50V
C84	Ceramic	0.0047	50V
C85	Barrier Lay	0.047	25V
C86	Ceramic	51P	50V CH
C87	Ceramic	18P	50V CH
C88	Trimmer	VCT51C143A	10P
C89	Ceramic	51P	50V CH
C90	Ceramic	12P	50V CH
C91	Ceramic	12P	50V CH
C92	Ceramic	0.0047	50V
C93	Ceramic	1P	50V
C94	Ceramic	0.0047	50V
C95	Ceramic	47P	50V CH
C96	Ceramic	15P	50V CH
C97	Trimmer	VCT51A123A	6P
C98	Ceramic	47P	50V CH
C99	Ceramic	12P	50V CH
C100	Ceramic	8P	50V CH
C101	Ceramic	0.0047	50V
C102	Ceramic	1P	50V
C103	Ceramic	0.0047	50V
C104	Barrier Lay	0.047	25V
C105	Ceramic	39P	50V CH
C106	Ceramic	10P	50V CH
C107	Trimmer	VCT51A123A	6P
C108	Ceramic	47P	50V CH
C109	Ceramic	12P	50V CH
C110	Ceramic	6P	50V CH
C111	Ceramic	0.0047	50V
C112	Ceramic	1P	50V
C113	Ceramic	0.0047	50V
C114	Barrier Lay	0.047	25V
C115	Electrolytic	100	10V



[PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C116	Ceramic	0.0047	50V
C117	Ceramic	22P	50V
C118	Ceramic	47P	50V
C119	Ceramic	47P	50V
C120	Ceramic	0.0047	50V
C121	Ceramic	0.0047	50V
C122	Ceramic	0.001	50V
C124	Ceramic	47P	50V
C125	Ceramic	0.001	50V
C126	Ceramic	0.0047	50V
C127	Ceramic	47P	50V
C128	Electrolytic	47	10V
C129	Electrolytic	100	16V
C130	Ceramic	0.0047	50V
C131	Ceramic	0.0047	50V
C132	Electrolytic	47	10V
C133	Ceramic	0.001	50V
C134	Ceramic	0.001	50V
C135	Ceramic	0.001	50V
C136	Ceramic	0.001	50V
C137	Electrolytic	10	16V
C139	Ceramic	0.0047	50V
C140	Ceramic	0.0047	50V
C141	Ceramic	0.0047	50V
C146	Ceramic	100P	50V
C147	Ceramic	5P	50V
C148	Ceramic	10P	50V
C149	Ceramic	120P	50V
C201	Array	B7ZC0717-32N	470P × 6
C202	Mylar	0.01	50V
C204	Ceramic	0.0022	50V
C205	Ceramic	0.001	50V
C206	Electrolytic	47	10V
C207	Ceramic	39P	50V UJ
C208	Ceramic	22P	50V
C209	Ceramic	4P	50V
C210	Ceramic	4P	50V
C211	Electrolytic	47	10V
C212	Ceramic	0.0022	50V
C213	Ceramic	1P	50V
C214	Ceramic	0.0047	50V
C215	Ceramic	0.001	50V
C216	Ceramic	47P	50V
C217	Ceramic	0.0022	50V
C218	Ceramic	0.0047	50V
C219	Barrier Lay	0.047	25V
C220	Ceramic	470P	50V
C221	Ceramic	0.0047	50V
C222	Ceramic	0.001	50V
C223	Electrolytic	47	10V
C224	Ceramic	0.0047	50V
C225	Ceramic	0.0047	50V
C226	Ceramic	0.0047	50V
C227	Ceramic	0.0047	50V
C228	Ceramic	330P	50V
C229	Barrier Lay	0.047	25V
C230	Ceramic	470P	50V
C231	Electrolytic	10	25V
C232	Ceramic	0.0047	50V
C233	Ceramic	82P	50V CH
C234	Ceramic	0.0047	50V
C235	Ceramic	0.0047	50V

[PLL UNIT]

REF. NO.	DESCRIPTION	PART NO.
J1	Connector	TL-25P-05-V1
J2	Connector	5138-11CPB
J3	Connector	TL-25P-04-V1
J4	Connector	TMP-J01X-V2
J5	Connector	TMP-J01X-V2
J6	Connector	IPS-1136
P1	Connector	(TMP-P01X-A1) W35
EP1	P.C.B	B-1104B (42443)
W1	Wire	23/01/250/C21/C21
W2	Wire	23/02/165/C21/C21
W3	Wire	23/03/105/C21/C21
W4	Wire	23/04/165/C21/C21
W5	Wire	23/05/170/C21/C21
W6	Wire	23/06/135/C21/C21
W7	Wire	[ 61/99/125/W13A/W13A
W8	Wire	[ 08 A A
W9	Wire	[ 61/99/140/W13A/W13A
W10	Wire	[ 08 A A
W14	Jumper	JPW-02A
W15	Jumper	IPS-1041-4
W16	Jumper	JPW-02A
W17	Jumper	JPW-02A
W18	Jumper	JPW-02A
W19	Jumper	JPW-02A
W20	Jumper	JPW-02A
W21	Jumper	JPW-02H
W24	Jumper	JPW-02A
W25	Jumper	JPW-02A
W26	Jumper	JPW-02A
W27	Jumper	JPW-02A
W28	Jumper	JPW-02A
W29	Jumper	IPS-1041-4
W30	Jumper	JPW-02A
W31	Jumper	IPS-1041-4
W32	Jumper	IPS-1041-4
W33	Jumper	IPS-1041-4
W35	Wire	[ 61/99/350/W13A/C31
W36	Wire	[ 08 A
W38	Jumper	IPS-1041-2
W39	Jumper	IPS-1041-4
W40	Jumper	73/98/020/X98/X98

[EF UNIT]

REF. NO.	DESCRIPTION	PART NO.
P2001	Connector	TL-25H-03-B1
P2002	Connector	TL-25H-07-B1
P2003	Connector	TL-25H-04-B1
P2004	Connector	TL-25H-08-B1
P2005	Connector	TL-25H-06-B1
P2006	Connector	TL-25H-04-B1
P2007	Connector	TL-25H-06-B1
P2008	Connector	TL-25H-08-B1
P2009	Connector	TL-25H-05-B1
P2010	Connector	TL-25H-04-B1
P2011	Connector	TL-25H-05-B1
P2012	Connector	TL-25H-05-B1
P2013	Connector	TL-25H-05-B1
P2014	Connector	TL-25H-07-B1
P2015	Connector	TL-25H-09-B1
P2016	Connector	TL-25H-06-B1
P2017	Connector	TL-25H-05-B1
P2018	Connector	TL-25H-04-B1
P2019	Connector	TL-25H-04-B1
P2020	Connector	TL-25H-05-B1
P2021	Connector	TL-25H-09-B1
P2022	Connector	TL-25H-07-B1
P2023	Connector	TL-25H-03-B1
P2024	Connector	TL-25H-04-B1
P2025	Connector	TL-25H-07-B1
P2026	Connector	TL-25H-07-B1
MC2001	Microphone	HM-28

[RAM UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC501	IC	μPD446C-1
IC502	IC	HD7432
Q501	Transistor	2SC945P
D501	Diode	1S953
D502	Diode	1S953
D503	Diode	1S953
R501	Resistor	47k R20
R502	Resistor	390 ELR20
R503	Resistor	10k R25
R504	Resistor	4.7k R20
R505	Resistor	1k R20
R506	Resistor	47k R20
R507	Array	RM4-473
C501	Barrier Lay	0.1 16V
C502	Ceramic	47P 50V
J501	Connector	5124-12BH
J502	Connector	5124-08BH
BT1	Lithium Battery	BR2325-1HM
EP1	P.C.B	B-938
W1	Jumper	IPS-1041-4
W2	Jumper	IPS-1041-4
W3	Jumper	IPS-1041-4
W4	Jumper	JPW-02A
W5	Jumper	JPW-02A
W6	Jumper	JPW-02A
W7	Jumper	JPW-02A
W8	Jumper	IPS-1041-2
W9	Jumper	JPW-02A
W10	Jumper	IPS-1041-2
W11	Jumper	JPW-02A
W12	Jumper	JPW-02A

[LOGIC UNIT]

[LOGIC UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC505	IC	M50763-537SP (SC-1042)
IC506	IC	M50781SP
IC507	IC	TC4081BP
IC508	IC	TC4013BP
IC509	IC	BA618
IC510	IC	F7805
Q503	Transistor	2SC945 P
Q504	Transistor	2SA1345
Q505	Transistor	2SC3399
D509	Diode	1SS53
D510	Diode	1SS53
D511	Diode	1SS53
D512	Diode	1SS53
D513	Diode	1SS53
D514	Diode	1SS53
D515	Diode	1SS53
D516	Diode	1SS53
D517	Diode	1SS53
D519	Diode	1SS53
D520	Diode	1SS53
D522	Diode	1S953
D523	Diode	RD8.2E B3
X501	Ceralock	CSB400A
L501	Coil	BT01RN1-A61
L502	Coil	FL5H 101K (100μ)
L503	Coil	FL5H 101K (100μ)
L504	Coil	FL5H 101K (100μ)
L505	Coil	FL5H 101K (100μ)
L506	Coil	FL5H 101K (100μ)
L507	Coil	FL5H 101K (100μ)
L508	Coil	FL5H 101K (100μ)
R510	Resistor	10k R25
R511	Resistor	5.6k R25
R512	Array	RMX-4 47k
R513	Resistor	1.5 R25
R514	Resistor	1.5 R25
R515	Resistor	1k R25
R516	Resistor	1k R25
R517	Resistor	1k R25
R518	Resistor	1k R25
R519	Resistor	1k R25
R520	Resistor	10k R25
R521	Array	RMX-4 10k
R522	Array	RMX-4 10k
R523	Resistor	10k R25
R524	Resistor	10k R25
R525	Resistor	10k R25
R526	Resistor	10k R25
R527	Array	RMX-8 47k
R530	Resistor	1k R25
R531	Resistor	1k R25
R532	Resistor	1k R25
R533	Resistor	1k R25
R534	Resistor	1k R25

REF. NO.	DESCRIPTION	PART NO.
R535	Resistor	1k R25
R536	Resistor	1k R25
R537	Resistor	47k R25
R538	Resistor	100k ELR25
R539	Resistor	680k ELR25
R540	Resistor	1k R25
R541	Resistor	1k R25
R542	Resistor	1M R25
R543	Resistor	2.7k R25
R544	Resistor	10 R50X
R545	Resistor	560k R25
R546	Resistor	47k R25
R548	Resistor	1k R25
R549	Resistor	47k ELR25
R550	Resistor	47k ELR25
R551	Resistor	4.7k ELR25
C505	Electrolytic	47 16V
C506	Ceramic	0.0047 50V
C507	Electrolytic	47 16V
C508	Ceramic	0.0047 50V
C509	Barrier Lay	0.1 16V
C510	Electrolytic	100 10V
C511	Ceramic	0.0047 50V
C512	Barrier Lay	0.047 25V
C513	Tantalum	1 35V
C514	Ceramic	120P 50V
C515	Ceramic	120P 50V
C516	Array	B7ZC0717-32N 470P × 6
C517	Array	B8ZC0111-32N 0.0082 × 7
C518	Array	B5RC0124-32N 0.001 × 4
C519	Array	B8ZC0111-32N 0.0082 × 7
C520	Barrier Lay	0.1 16V
C521	Barrier Lay	0.047 25V
C522	Electrolytic	0.47 50V BP
C523	Electrolytic	0.47 50V BP
C524	Electrolytic	1 50V BP
C525	Electrolytic	1 50V BP
J505	Connector	5138-11CPB
J506	Connector	TL-25P-07-V1
J507	Connector	TLB-P04H-B1
J508	Connector	TL-25P-07-V1
J509	Connector	3022-12B
J510	Connector	3022-08B
J511	Connector	TL-25P-04-V1
J512	Connector	5138-11CPB
J513	Connector	TL-25P-08-V1
J514	Connector	TL-25P-04-V1
P501	Connector	TL-25H-04-B1
EP501	P.C.B.	B-1105C (42708)
W517	Jumper	IPS-1041-4
W518	Jumper	IPS-1041-4
W519	Jumper	IPS-1041-4

[LOGIC UNIT]

REF. NO.	DESCRIPTION	PART NO.
W520	Jumper	IPS-1041-4
W521	Jumper	IPS-1041-4
W522	Jumper	IPS-1041-4
W523	Jumper	IPS-1041-4
W524	Jumper	IPS-1041-4
W525	Jumper	IPS-1041-4
W526	Jumper	IPS-1041-4
W527	Jumper	IPS-1041-4
W528	Jumper	IPS-1041-4
W529	Jumper	IPS-1041-4
W531	Jumper	IPS-1041-4
W532	Jumper	IPS-1041-4
W533	Jumper	JPW-02H
W534	Jumper	IPS-1041-4
W535	Jumper	IPS-1041-4
W536	Jumper	IPS-1041-4
W537	Jumper	JPW-02H
W538	Jumper	IPS-1041-4
W539	Jumper	IPS-1041-4
W540	Jumper	IPS-1041-4
W541	Jumper	IPS-1041-4
W542	Jumper	IPS-1041-4
W543	Jumper	IPS-1041-4
W544	Jumper	IPS-1041-4
W545	Jumper	IPS-1041-4
W546	Jumper	IPS-1041-4
W547	Jumper	IPS-1041-4
W548	Jumper	IPS-1041-2
W551	Wire	23/01/100/C22/C01
W552	Wire	23/02/100/C22/C01
W553	Wire	23/03/105/C22/C01
W554	Wire	23/04/110/C22/C01
W555	Wire	SMCD-11X60ADX10-G

[RF UNIT]

REF. NO.	DESCRIPTION	PART NO.
IC601	IC	μA78L82AWC
IC602	IC	BA618
IC603	IC	NJM4558D
IC604	IC	ND487C1-3R
Q601	Transistor	2SC3399
Q602	Transistor	2SB562
Q603	Transistor	2SC945 Q
Q604	Transistor	2SC945 Q
Q605	Transistor	2SC945 Q
Q606	FET	3SK74 M
Q607	FET	2SK125
Q608	FET	2SK125
Q609	Transistor	2SC2053
Q610	FET	3SK74 K
Q611	FET	3SK74 K
Q612	FET	3SK74 M
Q613	Transistor	2SC2053
Q614	Transistor	2SC945 P
D601	Diode	1SS53
D602	Diode	1SS53
D603	Diode	1SS53
D604	Diode	1SS53
D605	Diode	1SS53
D606	Diode	1SS53
D607	Diode	1SS53
D608	Diode	1SS53
D609	Diode	1SS53
D610	Diode	1SS53
D611	Diode	1SS53
D612	Diode	1SS53
D613	Diode	1SS53
D614	Diode	1SS53
D615	Diode	1SS53
D616	Diode	1SS53
D617	Diode	1SS53
D618	Diode	1SS53
D619	Diode	1SS53
FI601	Crystal Filter	FL-64 (70M15B)
L601	Coil	FL5H 102K (1m)
L602	Coil	FL5H 102K (1m)
L603	Coil	EL0810SKI-102K (1m)
L604	Coil	EL0810SKI-101K (100μ)
L605	Coil	EL0810SKI-101K (100μ)
L606	Coil	EL0810SKI-101K (100μ)
L607	Coil	EL0810SKI-101K (100μ)
L608	Coil	EL0810SKI-101K (100μ)
L609	Coil	EL0810SKI-101K (100μ)
L610	Coil	LB4 R83K (0.83μ)
L611	Coil	LR-116
L612	Coil	LR-116
L613	Coil	LS-254
L614	Coil	LS-254
L615	Coil	LS-114
L616	Coil	LS-254
L617	Coil	LS-254
L618	Coil	LS-198

## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.
L619	Coil	LR-18
L620	Coil	LA-258
L621	Coil	LA-257
L622	Coil	LB4 R15K (0.15 $\mu$ )
L623	Coil	FL4H 100K (10 $\mu$ )
L624	Coil	LA-267
L625	Coil	LB4 R30K (0.30 $\mu$ )
L626	Coil	LS-198
L627	Coil	LR-145
L628	Coil	EL0810SKI-101K (100 $\mu$ )
L629	Coil	EL0810SKI-3R3K (3.3 $\mu$ )
L630	Coil	EL0810SKI-2R7K (2.7 $\mu$ )
L631	Coil	LR-20
L632	Coil	LB4 6R2J (6.2 $\mu$ )
L633	Coil	LB4 R41K (0.41 $\mu$ )
L634	Coil	LB4 R41K (0.41 $\mu$ )
L635	Coil	LB4 R45K (0.45 $\mu$ )
L636	Coil	LB4 R50K (0.50 $\mu$ )
L637	Coil	EL5H 101K (100 $\mu$ )
L638	Coil	LB4 R45K (0.45 $\mu$ )
L639	Coil	LB4 R50K (0.50 $\mu$ )
L640	Coil	LB4 R54K (0.54 $\mu$ )
L641	Coil	LB4 R65K (0.65 $\mu$ )
L642	Coil	FL5H 101K (100 $\mu$ )
L643	Coil	LB4 R65K (0.65 $\mu$ )
L644	Coil	LB4 R70K (0.70 $\mu$ )
L645	Coil	LB4 R70K (0.70 $\mu$ )
L646	Coil	LB4 R83K (0.83 $\mu$ )
L647	Coil	FL5H 101K (100 $\mu$ )
L648	Coil	LB4 R83K (0.83 $\mu$ )
L649	Coil	EL0810SKI-1R0K (1.0 $\mu$ )
L650	Coil	EL0810SKI-1R0K (1.0 $\mu$ )
L651	Coil	EL0810SKI-1R0K (1.0 $\mu$ )
L652	Coil	FL5H 101K (100 $\mu$ )
L653	Coil	EL0810SKI-1R2K (1.2 $\mu$ )
L654	Coil	EL0810SKI-1R5K (1.5 $\mu$ )
L655	Coil	EL0810SKI-1R5K (1.5 $\mu$ )
L656	Coil	EL0810SKI-1R5K (1.5 $\mu$ )
L657	Coil	FL5H 101K (100 $\mu$ )
L658	Coil	EL0810SKI-1R8K (1.8 $\mu$ )
L659	Coil	EL0810SKI-2R2K (2.2 $\mu$ )
L660	Coil	EL0810SKI-2R2K (2.2 $\mu$ )
L661	Coil	EL0810SKI-2R2K (2.2 $\mu$ )
L662	Coil	FL5H 101K (100 $\mu$ )
L663	Coil	EL0810SKI-102K (1m)
L664	Coil	EL0810SKI-3R3K (3.3 $\mu$ )
L665	Coil	LB4 4R3J (4.3 $\mu$ )
L666	Coil	EL0810SKI-3R9K (3.9 $\mu$ )
L667	Coil	EL0810SKI-3R9K (3.9 $\mu$ )
L668	Coil	LB4 4R3J (4.3 $\mu$ )
R601	Resistor	1k R25
R603	Resistor	15k R25
R604	Resistor	47k R25
R605	Resistor	15k R25
R606	Resistor	22k R25
R607	Resistor	100 R25
R608	Resistor	68k CRB25FX
R609	Resistor	68k CRB25FX
R610	Resistor	39k CRB25FX
R611	Resistor	39k CRB25FX
R612	Trimmer	RHL0CS3
R613	Resistor	1M R25

## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.
R614	Resistor	6.8k R25
R615	Resistor	220k R25
R616	Resistor	220k R25
R617	Resistor	330k R25
R618	Resistor	10k R25
R619	Trimmer	RHA3A140SA 10k
R620	Resistor	10k R25
R621	Trimmer	RHB0CN40YA 33k
R622	Resistor	47k R25
R623	Resistor	15k R25
R624	Resistor	8.2 R25
R625	Resistor	150 R25
R626	Resistor	8.2 R25
R627	Resistor	2.2k R25
R628	Resistor	4.7k R25
R629	Resistor	100 R25
R630	Resistor	270 R25
R631	Resistor	3.9k R25
R632	Resistor	10k R25
R633	Resistor	47 R25
R634	Resistor	470 R25
R635	Resistor	470 R25
R636	Resistor	560 R25
R637	Resistor	47 R25
R638	Resistor	100 R25
R639	Resistor	680 R25
R640	Resistor	4.7k R10
R641	Resistor	680 R25
R642	Resistor	33 R25
R643	Resistor	220 R25
R644	Resistor	33 R25
R645	Resistor	8.2 R25
R646	Resistor	8.2 R25
R647	Resistor	150 R25
R648	Resistor	100 R25
R649	Resistor	100k R10
R650	Resistor	100k R10
R651	Resistor	10k R25
R652	Resistor	68 R25
R653	Resistor	68 R25
R654	Resistor	220 R25
R655	Resistor	220 R25
R656	Resistor	390 R25
R657	Resistor	100 R25
R658	Thermistor	23D29
R659	Resistor	390 R25
R660	Resistor	470 R25
R661	Thermistor	33D28
R662	Resistor	560 R25
R663	Resistor	1k R25
R664	Resistor	100 R25
R665	Resistor	39 R25
R666	Resistor	820 R25
R667	Resistor	4.7k R25
R668	Resistor	4.7k R25
R669	Resistor	22 R25
R670	Resistor	470 R25
R671	Resistor	12 R25
R672	Resistor	470 R25
R673	Resistor	100 R25
R674	Resistor	100 R25
R675	Resistor	100 R25
R676	Resistor	100 R25
R677	Resistor	100 R25



## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R678	Resistor	100	R25
R679	Resistor	100	R25
R680	Resistor	470	R25
R681	Resistor	2.2k	R25
R682	Resistor	33k	R25
R683	Resistor	12k	R25
R684	Trimmer	RHB0C1431A	10k
R685	Resistor	10k	R25
R686	Resistor	10k	R25
R687	Resistor	10k	R25
R688	Resistor	10k	R25
R689	Resistor	10k	R25
R690	Resistor	10k	R25
R691	Resistor	10k	R25
R692	Resistor	1M	R25
R693	Resistor	220	R25
R694	Resistor	100k	R25
R696	Resistor	33k	ELR25
C601	Ceramic	0.0047	50V
C602	Electrolytic	4.7	50V
C603	Ceramic	0.0047	50V
C604	Electrolytic	10	16V
C605	Ceramic	0.0047	50V
C606	Barrier Lay	0.047	25V
C607	Electrolytic	4.7	50V
C608	Array	B8ZC0111N-32N	0.0082 × 7
C609	Array	B8ZC0111N-32N	0.0082 × 7
C610	Barrier Lay	0.047	25V
C611	Barrier Lay	0.047	25V
C612	Ceramic	0.0047	50V
C613	Ceramic	0.0047	50V
C614	Ceramic	100P	50V
C615	Ceramic	0.0047	50V
C616	Electrolytic	10	16V
C617	Electrolytic	4.7	50V
C618	Electrolytic	10	16V
C619	Ceramic	0.0047	50V
C620	Barrier Lay	RAU06SA 681K	50V 680P
C621	Barrier Lay	RAU06SA 681K	50V 680P
C622	Ceramic	0.0047	50V
C623	Ceramic	8P	50V
C624	Ceramic	8P	50V
C625	Ceramic	0.0047	50V
C626	Ceramic	0.0047	50V
C627	Ceramic	0.0047	50V
C628	Ceramic	0.001	50V
C629	Mylar	0.01	50V
C630	Cylindrical	UP125B	102K 0.001
C631	Ceramic	3P	50V
C632	Ceramic	8P	50V
C633	Ceramic	8P	50V
C634	Barrier Lay	0.1	16V
C635	Barrier Lay	0.1	16V
C636	Barrier Lay	0.1	16V
C637	Barrier Lay	0.1	16V
C638	Ceramic	100P	50V
C639	Ceramic	10P	50V
C640	Ceramic	150P	50V

## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C641	Ceramic	30P	50V
C642	Barrier Lay	0.047	25V
C643	Ceramic	0.0047	50V
C644	Barrier Lay	0.047	25V
C645	Barrier Lay	0.047	25V
C646	Ceramic	0.0047	50V
C647	Electrolytic	2.2	50V
C648	Ceramic	39P	50V
C649	Ceramic	220P	50V
C650	Ceramic	39P	50V
C651	Ceramic	0.001	50V
C652	Ceramic	3P	50V
C653	Ceramic	5P	50V
C654	Ceramic	15P	50V
C655	Ceramic	1.5P	50V
C656	Ceramic	3P	50V
C657	Ceramic	0.0047	50V
C658	Ceramic	3P	50V
C660	Barrier Lay	0.1	16V
C661	Barrier Lay	0.1	16V
C662	Barrier Lay	0.1	16V
C663	Barrier Lay	0.047	25V
C664	Ceramic	5P	50V
C665	Ceramic	1.5P	50V
C666	Ceramic	22P	50V
C667	Ceramic	4P	50V
C668	Ceramic	5P	50V
C669	Barrier Lay	0.1	16V
C670	Ceramic	0.0047	50V
C671	Barrier Lay	0.1	16V
C672	Barrier Lay	0.1	16V
C673	Barrier Lay	UAT04V	152K 50V 0.0015
C674	Ceramic	0.0047	50V
C675	Electrolytic	2.2	50V
C676	Ceramic	330P	50V
C677	Barrier Lay	UAT04V	222K 50V 0.0022
C678	Barrier Lay	UAT04V	222K 50V 0.0022
C679	Ceramic	330P	50V
C680	Barrier Lay	UAT06V	822K 50V 0.0082
C681	Ceramic	150P	50V
C682	Barrier Lay	UAT04V	122K 50V 0.0012
C683	Ceramic	200P	50V
C684	Ceramic	180P	50V
C685	Ceramic	24P	50V
C686	Ceramic	200P	50V
C687	Barrier Lay	0.047	25V
C688	Barrier Lay	0.047	25V
C689	Ceramic	180P	50V
C690	Barrier Lay	UAT04V	152K 50V 0.0015
C691	Ceramic	270P	50V
C692	Ceramic	220P	50V
C693	Ceramic	39P	50V
C694	Ceramic	300P	50V
C695	Barrier Lay	0.047	25V
C696	Barrier Lay	0.047	25V
C697	Ceramic	270P	50V
C698	Barrier Lay	UAT04V	222K 50V 0.0022

## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.
C699	Ceramic	330P 50V
C700	Ceramic	300P 50V
C701	Ceramic	47P 50V
C702	Ceramic	390P 50V
C703	Barrier Lay	0.047 25V
C704	Barrier Lay	0.047 25V
C705	Ceramic	330P 50V
C706	Barrier Lay	UAT05V 272K 50V 0.0027
C707	Ceramic	DD109SL471J50V02 470P
C708	Ceramic	330P 50V
C709	Ceramic	56P 50V
C710	Ceramic	DD109SL471J50V02 470P
C711	Barrier Lay	0.047 25V
C712	Barrier Lay	0.047 25V
C713	Ceramic	DD109SL471J50V02 470P
C714	Barrier Lay	UAT05V 392K 50V 0.0039
C715	Barrier Lay	RAU06SA 681K 50V 680P
C716	Ceramic	DD109SL471J50V02 470P
C717	Ceramic	100P 50V
C718	Barrier Lay	RAU06SA 561K 50V 560P
C719	Barrier Lay	0.047 25V
C720	Barrier Lay	0.047 25V
C721	Barrier Lay	UAT04V 102K 50V 0.001
C722	Barrier Lay	UAT06V 682K 50V 0.0068
C723	Barrier Lay	UAT04V 152K 50V 0.0015
C724	Barrier Lay	RAU06SA 561K 50V 560P
C725	Ceramic	120P 50V
C726	Barrier Lay	RAU08SA 821K 50V 820P
C727	Barrier Lay	0.047 25V
C728	Barrier Lay	0.047 25V
C729	Barrier Lay	0.1 16V
C730	Barrier Lay	UAT04V 102K 50V 0.001
C731	Ceramic	200P 50V
C732	Barrier Lay	UAT04V 152K 50V 0.0015
C733	Barrier	0.1 16V
C734	Barrier	0.1 16V
C735	Barrier Lay	UAT04V 152K 50V 0.0015
C737	Barrier Lay	UAT05V 472K 50V 0.0047
C738	Barrier Lay	UAT04V 122K 50V 0.0012
C739	Ceramic	220P 50V
C740	Barrier Lay	UAT06V 103K 50V 0.01
C741	Barrier Lay	UAT04V 182K 50V 0.0018
C742	Ceramic	220P 50V
C743	Ceramic	120P 50V

## [RF UNIT]

REF. NO.	DESCRIPTION	PART NO.
C744	Ceramic	6P 50V
C745	Ceramic	0.0022 50V
C746	Ceramic	0.001 50V
C747	Ceramic	0.001 50V
C748	Ceramic	0.001 50V
C749	Ceramic	0.001 50V
C750	Ceramic	0.001 50V
C752	Barrier Lay	0.047 25V
J601	Connector	TL-25P-07-V1
J602	Connector	TL-25P-05-V1
J603	Connector	TMP-J01X-A2
J604	Connector	TL-25P-05-V1
J605	Connector	TMP-J01X-A2
J606	Connector	TMP-J01X-A2
P601	Connector	(TMP-P01X-A1) W619
P602	Connector	(TMP-P01X-A1) W621
EP601	P.C.B	B-886C (42442)
W601	Wire	23/01/195/C21/C21
W602	Wire	23/02/140/C21/C21
W603	Wire	23/03/105/C21/C21
W604	Jumper	JPW-02A
W605	Jumper	JPW-02A
W606	Jumper	JPW-02A
W607	Jumper	JPW-02A
W608	Jumper	JPW-02A
W609	Jumper	JPW-02A
W610	Jumper	JPW-02A
W611	Jumper	JPW-02A
W612	Jumper	JPW-02A
W613	Jumper	JPW-02A
W614	Jumper	JPW-02A
W615	Jumper	JPW-02A
W616	Jumper	JPW-02A
W617	Jumper	JPW-02A
W618	Jumper	JPW-02A
W619	Wire	[ 61/99/150/C31/W15A
W620	Wire	[ 08 A
W621	Wire	[ 61/99/150/C31/W18X
W622	Wire	[ 08 X
W623	Jumper	JPW-02A
W625	Jumper	73/98/010/X98/X98

## [PA UNIT]

REF. NO.	DESCRIPTION	PART NO.
Q801	Transistor	2SC1971
Q802	Transistor	2SC3133
Q803	Transistor	2SC3133
Q804	Transistor	2SC3908
Q805	Transistor	2SC3908
Q806	Transistor	2SD880 Y
Q810	Transistor	2SD468 C
Q811	Transistor	2SD468 C
Q812	Transistor	2SB562 C
Q881	Transistor	2SA1015 Y
Q921	Transistor	2SC945 P
Q922	Transistor	2SD468 C
Q923	Transistor	2SA1345
Q924	Transistor	2SB562 C
Q925	Transistor	2SC3402
D801	Diode	MV5
D802	Diode	MV5
D804	Diode	MV5
D807	Diode	1SS53
D808	Diode	1N4002
D872	Diode	15CD11
D873	Diode	15CD11
D881	Diode	1SS53
D882	Diode	1N4002
D921	Diode	U05G
D922	Diode	1N4002
D923	Diode	1K60
D924	Diode	1N4002
L801	Coil	LR-142
L804	Coil	LR-143
L805	Coil	BT01RN1-A61
L806	Coil	BT01RN1-A61
L807	Coil	BT01RN1-A61
L808	Coil	BT01RN1-A61
L809	Coil	LR-83
L810	Coil	LR-148
L811	Coil	LR-146
L812	Coil	FL4H 100K (10μ)
L813	Coil	BT01RN1-A61
L814	Coil	BT01RN1-A61
L815	Coil	BT01RN1-A61
L816	Coil	FSQH050RN
L817	Coil	FSQH050RN
L821	Coil	BT01RN1-A61
L881	Coil	BT01RN1-A61
L882	Coil	FSQH050RN
L883	Coil	BT01RN1-A61
L884	Coil	BT01RN1-A61
L885	Coil	BT01RN1-A61
L886	Coil	BT01RN1-A61
L887	Coil	BT01RN1-A61
L888	Coil	BT01RN1-A61
L889	Coil	BT01RN1-A61
L890	Coil	BT01RN1-A61
L891	Coil	BT01RN1-A61
L892	Coil	FSQH050RN
L893	Coil	BT01RN1-A61
L894	Coil	BT01RN1-A61
L895	Coil	BT01RN1-A61
L921	Coil	LB4 R36K (0.36μ)

## [PA UNIT]

REF. NO.	DESCRIPTION	PART NO.
L922	Coil	LR-151
L923	Coil	LAL03NA 101K (100μ)
L924	Coil	FL9H 102K (1m)
L925	Coil	FL9H 102K (1m)
L926	Coil	LAL03NA 101K (100μ)
L927	Coil	LAL04NA 101K (100μ)
L951	Coil	BT01RN1-A61
L952	Coil	BT01RN1-A61
L953	Coil	BT01RN1-A61
L954	Coil	BT01RN1-A61
R801	Resistor	82 R25
R802	Resistor	180 R25
R803	Resistor	470 R25
R804	Resistor	3.3 R25
R805	Resistor	5.6 ELR25
R806	Resistor	100 R50X
R807	Resistor	47 ELR25
R808	Resistor	47 ELR25
R809	Resistor	100 R50X
R810	Resistor	RSS1B3.3-J 3.3
R811	Resistor	RSS1B3.3-J 3.3
R812	Resistor	RSS1B3.3-J 3.3
R813	Resistor	RSS1B3.3-J 3.3
R814	Resistor	10 R50X
R815	Resistor	10 R50X
R816	Resistor	RSS1B2.2-J 2.2
R817	Resistor	RSS1B2.2-J 2.2
R818	Resistor	33k R25
R822	Resistor	CRH200R-02J 4R7 4.7
R823	Trimmer	RHB0CS21LA 470
R824	Resistor	150 R25
R827	Trimmer	RHB0C1204A 100
R828	Resistor	68 R50X
R829	Resistor	150 ELR25
R834	Resistor	1k ELR20
R835	Resistor	RSS1B3.3-J 3.3
R836	Resistor	RSS1B3.3-J 3.3
R837	Resistor	180 R25
R841	Resistor	1k ELR20
R842	Resistor	1k ELR20
R843	Resistor	1k ELR20
R844	Resistor	1k R20
R845	Resistor	SRW2P10-J 10 2W
R846	Resistor	SRW2P12-J 12 2W
R871	Resistor	SQ5L 0.012-J 0.012
R872	Resistor	1k R25
R873	Resistor	1k R25
R881	Resistor	1k ELR25
R882	Resistor	1k ELR25
R883	Resistor	1k ELR25
R884	Resistor	220 ELR25
R885	Resistor	220 ELR25
R886	Resistor	220 ELR25
R887	Resistor	4.7k ELR25
R888	Resistor	4.7k ELR25
R921	Resistor	10k ELR25
R922	Resistor	10k ELR25
R923	Resistor	4.7 ELR25
R924	Resistor	1k ELR25
R925	Resistor	2.2k ELR25
R926	Resistor	2.2k ELR25
R927	Resistor	100 ELR25

## [PA UNIT]

REF. NO.	DESCRIPTION	PART NO.	
R928	Resistor	47k	ELR25
R929	Resistor	SRW5P56-P 56 5W	
R930	Resistor	22k	ELR25
R931	Resistor	22k	ELR25
R932	Resistor	1k	ELR25
R933	Surge Absorber	DSA301	
R934	Resistor	47k	R25
C801	Ceramic	0.0047	50V
C803	Barrier Lay	0.1	16V
C804	Mylar	0.01	50V
C805	Mylar	0.01	50V
C806	Ceramic	DD109SL511J50V02	
C808	Monolithic	GR44CH682K	50V
C809	Monolithic	GR44CH682K	50V
C810	Dip Mica	DM20C102J51CR 0.001	
C811	Monolithic	GR43CH471K 50V 470P	
C812	Monolithic	GR43CH471K 50V 470P	
C813	Monolithic	GR44CH102K 50V 0.001	
C814	Dip Mica	DM20C122J51CR 0.0012	
C816	Dip Mica	DM20C472J51CR 0.0047	
C817	Barrier Lay	0.047	25V
C818	Electrolytic	1000	16V MS16
C819	Monolithic	GR44Y5V684Z 25V 0.68	
C820	Barrier Lay	0.047	25V
C821	Electrolytic	47	10V
C822	Electrolytic	10	16V
C823	Barrier Lay	0.047	25V
C824	Barrier Lay	0.047	25V
C825	Electrolytic	470	16V
C826	Barrier Lay	0.047	25V
C827	Electrolytic	10	16V
C828	Barrier Lay	0.047	25V
C829	Ceramic	0.0047	50V
C832	Barrier Lay	0.047	25V
C834	Ceramic	330P	500V
C835	Ceramic	330P	500V
C836	Ceramic	33P	50V CH
C837	Barrier Lay	UAT04V 122K	
C838	Electrolytic	1000	6.3V TWSS
C839	Monolithic	GR43CH471K 50V 470P	
C840	Monolithic	GR43CH471K 50V 470P	
C841	Monolithic	GR44CH102K 50V 0.001	
C842	Ceramic	DD109SL471J50V02	
C843	Electrolytic	100	10V
C844	Barrier Lay	0.047	25V
C845	Barrier Lay	0.047	25V
C846	Barrier Lay	0.047	25V
C847	Barrier Lay	0.047	25V
C848	Ceramic	0.0047	50V
C871	Feed Through	TF318-452E102GMV	
C872	Feed Through	TF318-452E102GMV	
C873	Feed Through	TF318-452E102GMV	
C874	Feed Through	TF318-452E102GMV	

## [PA UNIT]

REF. NO.	DESCRIPTION	PART NO.	
C875	Barrier Lay	0.047	25V
C876	Barrier Lay	0.047	25V
C877	Electrolytic	2200	16V
C878	Barrier Lay	0.047	25V
C881	Ceramic	0.0047	50V
C882	Ceramic	0.0047	50V
C883	Ceramic	0.0047	50V
C884	Ceramic	0.0047	50V
C885	Ceramic	0.0047	50V
C887	Ceramic	0.0047	50V
C921	Ceramic	100P	50V
C922	Ceramic	150P	50V
C923	Barrier Lay	0.047	25V
C924	Ceramic	0.0047	50V
C925	Barrier Lay	0.047	25V
C926	Barrier Lay	0.047	25V
C927	Barrier Lay	0.047	25V
C928	Electrolytic	10	16V
C929	Ceramic	10P	500V
C930	Ceramic	33P	50V
C931	Barrier Lay	0.047	25V
C932	Electrolytic	2.2	16V
C933	Ceramic	0.0047	50V
C934	Ceramic	DD112F473Z50V 0.047	
C935	Ceramic	0.0047	50V
C936	Barrier Lay	0.047	25V
C937	Ceramic	0.001	50V
C938	Barrier Lay	0.047	25V
C939	Ceramic	0.001	50V
RL881	Relay	OMR-109F	
RL921	Relay	FBR22D12-P	
RL922	Relay	UPM12912-Y	
J876	Connector	LR-6	
J877	Connector	1490R	
J881	Connector	TL-25P-09-V1	
J882	Connector	TL-25P-07-V1	
J883	Connector	TL-25P-04-V1	
J884	Connector	TL-25P-03-V1	
J885	Connector	TLB-P05H-B1	
J886	Connector	TL-25P-03-V1	
J887	Connector	TCS4680-01-1111	
J888	Connector	TCS4670-01-1111	
J921	Connector	FM-MDR MI	
J951	Connector	TL-25P-04-V1	
J952	Connector	HLJ4306-01-3000	
J953	Connector	HLJ4306-01-3000	
P801	Connector	(TMP-P01X-A1) W801	
P802	Connector	(TMP-P01X-A1) W803	
P883	Connector	TL-25H-04-B1	
P884	Connector	TL-25H-03-B1	
P885	Connector	TL-25H-05-B1	
P886	Connector	1261R3	
P887	Connector	TL-25H-03-B1	
P921	Connector	(TMP-P01X-A1) W923	
P922	Connector	(TMP-P01X-A1) W927	
P923	Connector	TL-25H-03-B1	

[PA UNIT]

REF. NO.	DESCRIPTION	PART NO.
F871	Fuse Holder	TFH-S30
F872	Fuse	5A
S801	Thermal switch	OHD-80M
S802	Thermal switch	OHD-110M
MF801	DC Motor	OA-D80BC12
EP801	P.C.B	B-1107B (42447)
EP802	P.C.B	B-1108B (43061)
EP803	P.C.B	B-1109A (43062)
EP804	P.C.B	B-1110A (42704)
W801	Wire	[ 62/99/350/C31/W13D
W802	Wire	[ 08 D
W803	Wire	[ 62/99/300/C31/W13D
W804	Wire	[ 08 D
W805	Wire	23/03/400/C21/C01
W806	Wire	23/04/450/W04/C01
W808	Wire	23/02/165/W02/C01
W809	Wire	23/01/165/W02/C01
W810	Wire	13/02/360/W06/W03
W811	Wire	36/00/310/W04/W06
W812	Wire	31/04/070/W07/W07
W813	Jumper	JPW-02A
W814	Jumper	JPW-02A
W815	Jumper	JPW-02A
W816	Jumper	JPW-02A
W817	Jumper	JPW-02A
W818	Wire	31/02/100/W04/W04
W819	Jumper	JPW-02A
W820	Wire	23/03/100/C21/W04
W823	Wire	72/98/010/X98/X98
W824	Wire	72/98/010/X98/X98
W825	Wire	72/98/010/X98/X98
W826	Wire	72/98/010/X98/X98
W827	Wire	72/98/010/X98/X98
W828	Wire	72/98/010/X98/X98
W829	Wire	72/98/010/X98/X98
W830	Wire	72/98/010/X98/X98
W831	Wire	72/98/010/X98/X98
W832	Wire	72/98/010/X98/X98
W833	Wire	72/98/010/X98/X98
W834	Wire	72/98/010/X98/X98
W835	Wire	73/98/070/X89/X98
W836	Jumper	JPW-02A
W837	Wire	36/02/310/W03/W06
W838	Jumper	JPW-02A
W871	Wire	23/01/230/C22/C01
W872	Wire	23/02/230/C22/C01
W873	Wire	23/03/230/C22/C01
W874	Wire	23/04/230/C22/C01
W875	Wire	23/05/230/C22/C01
W881	Wire	13/02/250/W02/A06
W882	Wire	23/02/300/C21/C01
W883	Wire	23/01/300/C21/C01
W884	Wire	IPS-1041-4
W885	Wire	13/00/050/W03/W03
W887	Wire	36/02/085/W03/W04
W888	Wire	13/01/060/W04/A08

[PA UNIT]

REF. NO.	DESCRIPTION	PART NO.
W889	Wire	13/02/060/W04/A08
W890	Wire	13/03/060/W04/A08
W891	Wire	13/04/060/W04/A08
W892	Wire	13/09/250/B03/A06
W893	Wire	13/09/250/B03/A06
W894	Wire	13/03/180/W03/W03
W895	Wire	13/03/070/W02/A06
W896	Wire	35/02/060/B03/W03
W897	Wire	35/02/060/B03/W03
W898	Wire	35/00/050/B03/W03
W899	Wire	35/00/050/B03/W03
W900	Wire	13/00/150/W03/W03
W921	Jumper	JPW-02H
W922	Wire	23/03/350/C21/C01
W923	Wire	[ 62/99/400/C31/W13D
W924	Wire	[ 08 D
W925	Wire	23/02/350/C21/C01
W926	Wire	23/01/350/C21/C01
W927	Wire	[ 62/99/150/C31/W13D
W928	Wire	[ 08 D
W929	Jumper	JPW-02H



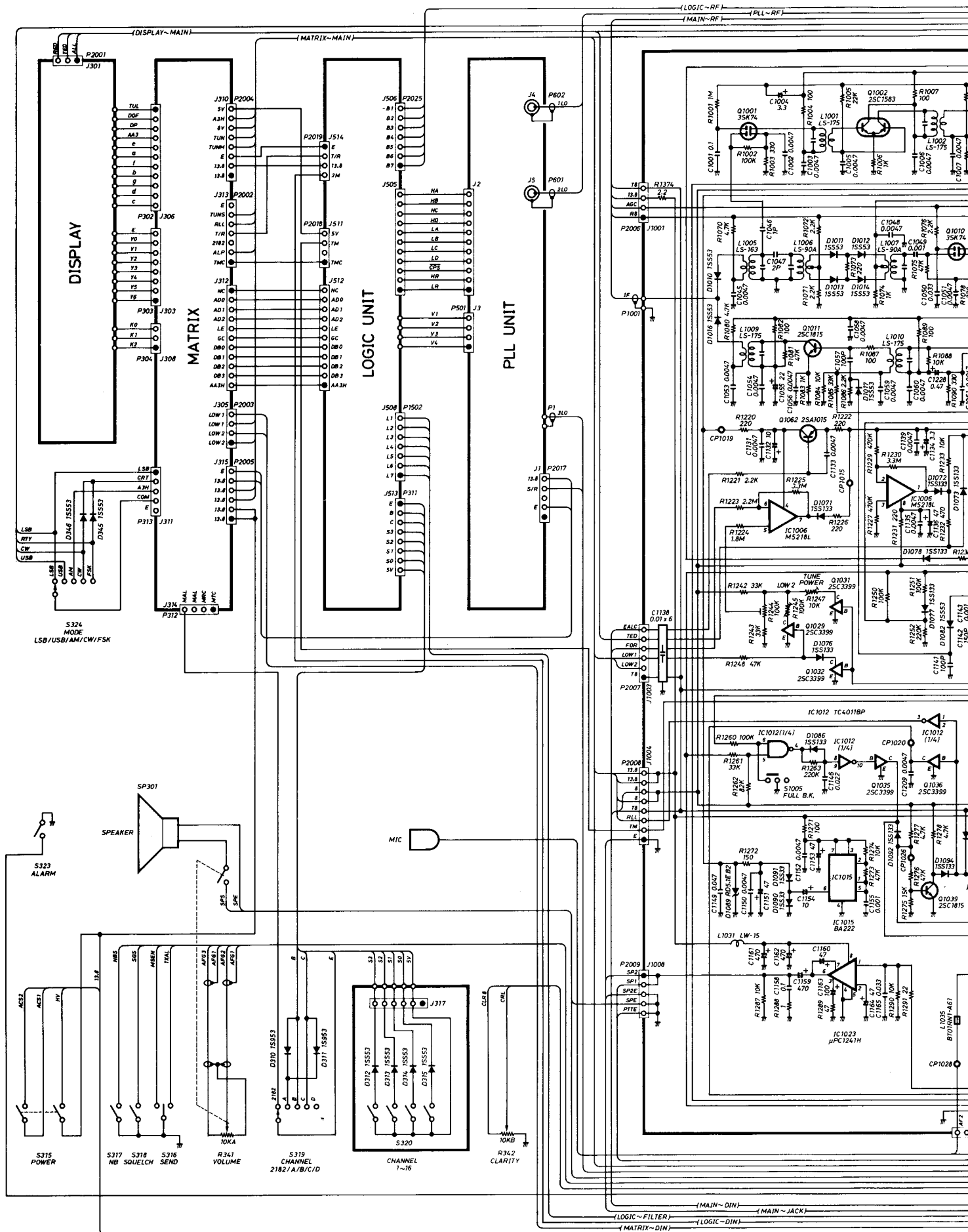
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[G UNIT]

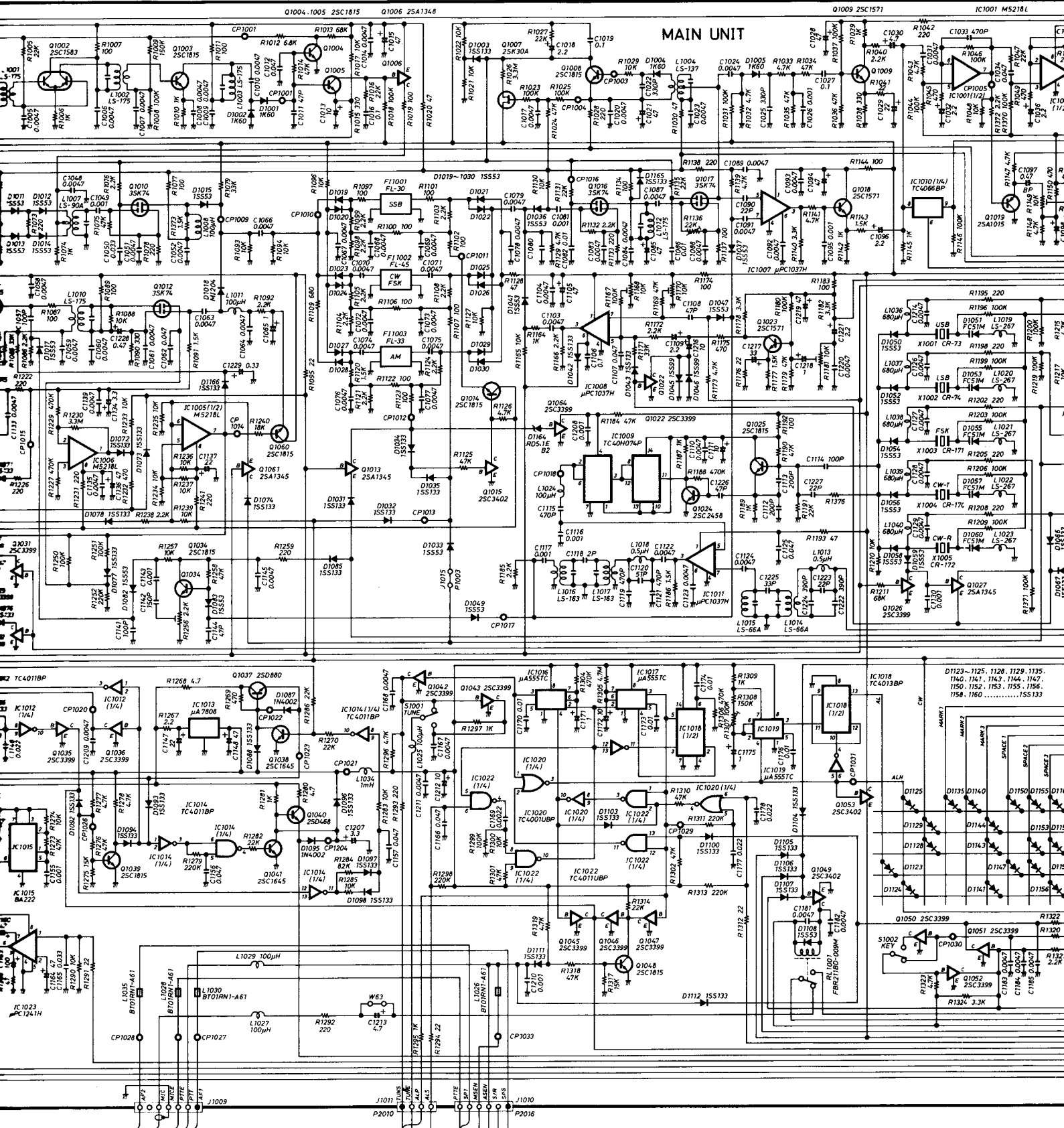
REF. NO.	DESCRIPTION	PART NO.
W2001	Wire	23/05/290/C01/C01
W2002	Wire	23/02/290/C01/C01
W2003	Wire	23/03/290/C01/C01
W2004	Wire	23/04/290/C01/C01
W2005	Wire	23/07/630/C01/C01
W2006	Wire	23/06/630/C01/C01
W2007	Wire	23/08/630/C01/C01
W2008	Wire	51/00/310/C01/W12A
W2009	Wire	08 A
W2010	Wire	23/02/630/C01/C01
W2011	Wire	23/01/630/C01/C01
W2012	Wire	51/02/310/C01/W12A
W2013	Wire	08 A
W2014	Wire	23/04/680/C01/C01
W2015	Wire	23/03/680/C01/C01
W2016	Wire	23/02/680/C01/C01
W2017	Wire	23/01/475/C01/W02
W2018	Wire	23/02/335/C01/W02
W2019	Wire	23/01/335/C01/W02
W2020	Wire	23/08/370/C01/C01
W2021	Wire	23/00/335/C01/W02
W2022	Wire	23/09/335/C01/W02
W2023	Wire	23/07/335/C01/W02
W2024	Wire	23/06/370/C01/C01
W2025	Wire	23/02/235/C01/W02
W2026	Wire	23/06/240/C01/C01
W2027	Wire	23/09/220/C01/C01
W2028	Wire	23/07/530/C01/C01
W2029	Wire	22/09/190/C01/W02
W2030	Wire	23/01/215/C01/C01
W2031	Wire	23/05/520/C01/C01
W2032	Wire	23/08/245/C01/W02
W2033	Wire	22/09/310/C01/C01
W2034	Wire	23/00/310/C01/C01
W2035	Wire	23/09/470/C01/C01
W2036	Wire	23/04/500/C01/C01
W2037	Wire	23/05/710/C01/C01
W2038	Wire	23/07/395/C01/C01
W2039	Wire	23/08/715/C01/C01
W2040	Wire	23/02/400/C01/C01
W2041	Wire	23/02/400/C01/C01
W2043	Wire	23/06/480/C01/C01
W2044	Wire	23/08/480/C01/C01
W2045	Wire	23/03/635/C01/C01
W2046	Wire	23/02/305/C01/C01
W2047	Wire	23/00/635/C01/C01
W2049	Wire	22/00/450/C01/W02
W2050	Wire	22/00/730/C01/C01
W2052	Wire	22/09/730/C01/C01
W2053	Wire	23/05/370/C01/C01
W2054	Wire	23/06/575/C01/C01
W2055	Wire	23/02/370/C01/C01
W2056	Wire	23/03/635/C01/W02
W2057	Wire	23/01/240/C01/C01
W2058	Wire	23/03/240/C01/C01
W2059	Wire	23/04/585/C01/C01
W2060	Wire	23/05/280/C01/W02
W2061	Wire	23/06/330/C01/W02
W2062	Wire	23/07/395/C01/C01
W2063	Wire	23/06/395/C01/C01
W2064	Wire	23/05/395/C01/C01
W2065	Wire	23/04/395/C01/C01
W2066	Wire	23/03/395/C01/C01
W2067	Wire	23/02/395/C01/C01

REF. NO.	DESCRIPTION	PART NO.
W2068	Wire	23/01/395/C01/C01
W2069	Wire	23/00/365/C01/C01
W2070	Wire	23/03/225/C01/C01
W2071	Wire	23/02/365/C01/C01
W2072	Wire	23/01/710/C01/C01
W2073	Wire	23/01/160/C01/C01
W2074	Wire	23/05/300/C01/C01
W2075	Wire	23/02/220/C01/C01
W2076	Wire	23/00/220/C01/C01
W2077	Wire	22/02/165/C01/W02
W2078	Wire	22/02/165/C01/W02
W2079	Wire	23/09/725/C01/C01
W2080	Wire	23/07/725/C01/C01
W2083	Wire	23/00/720/C01/C01
W2088	Wire	23/05/475/C01/W02

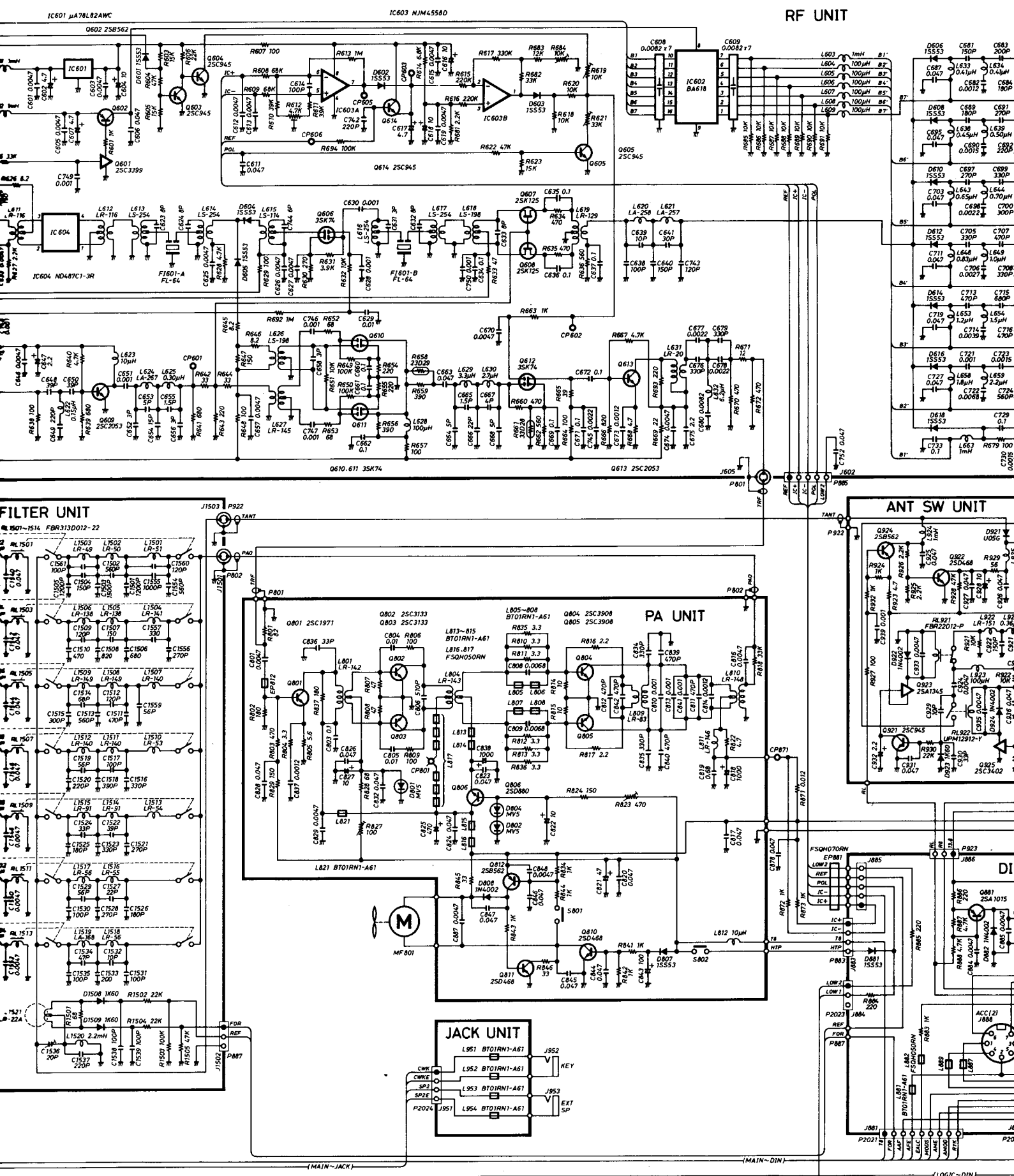
# IC-M700TY SCHEMATIC D



# TIC DIAGRAM







IC601  $\mu$ A78L82AWC

IC603 NJM4558D

RF UNIT

FILTER UNIT

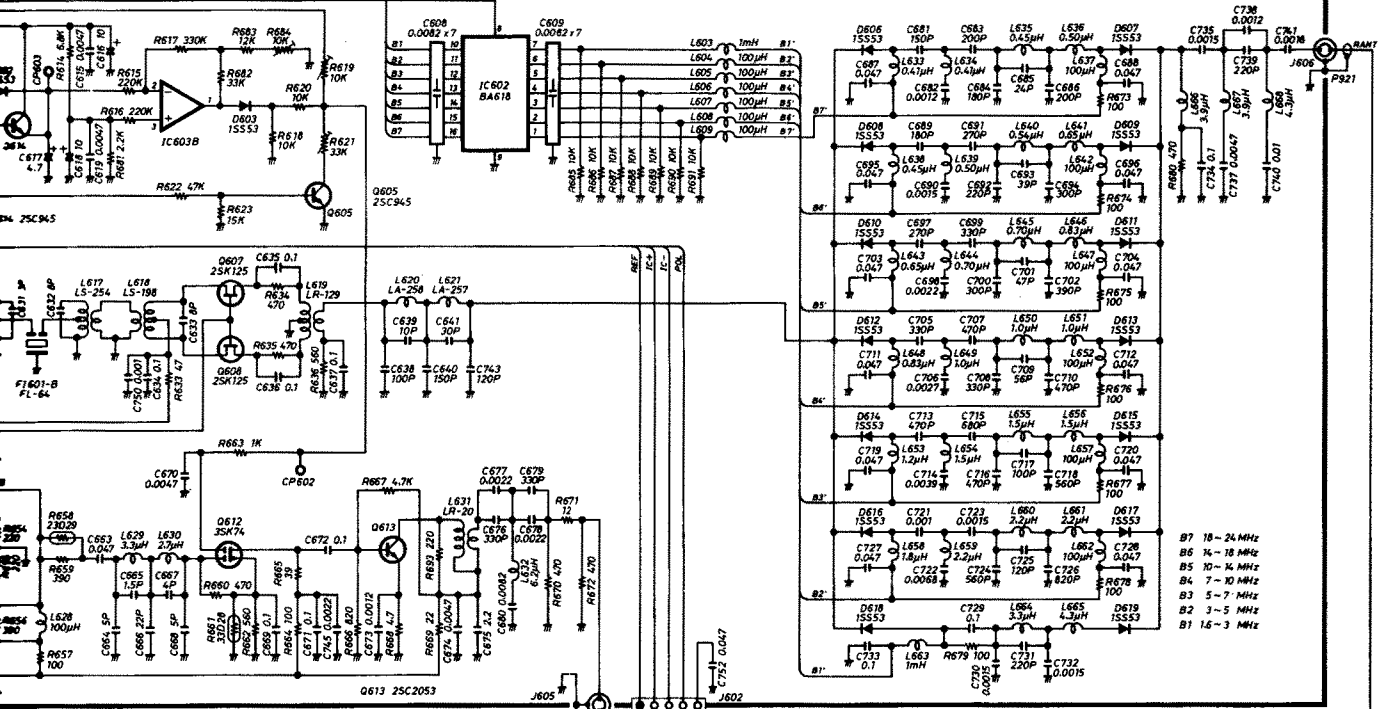
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JACK UNIT

ANT SW UNIT

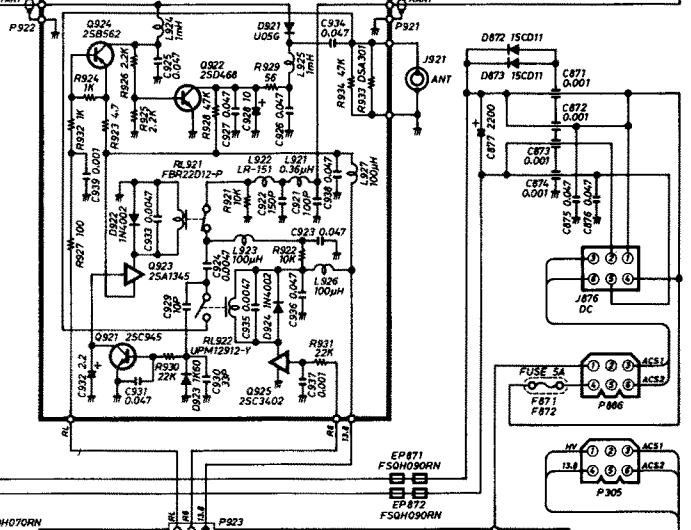


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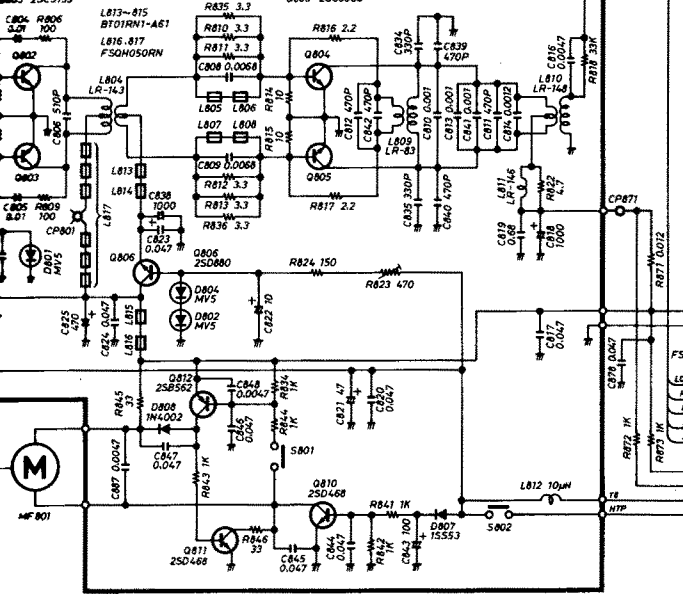


- B7 18 - 24 MHz
- B6 14 - 18 MHz
- B5 10 - 14 MHz
- B4 7 - 10 MHz
- B3 5 - 7 MHz
- B2 3 - 5 MHz
- B1 1.6 - 3 MHz

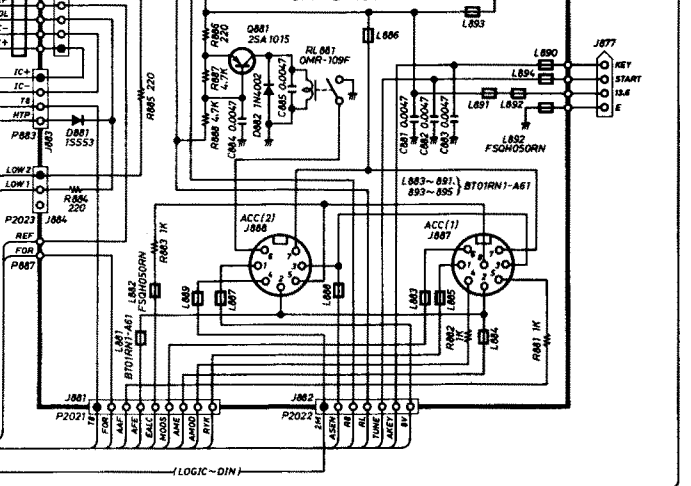
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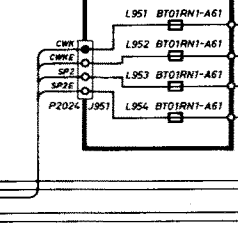
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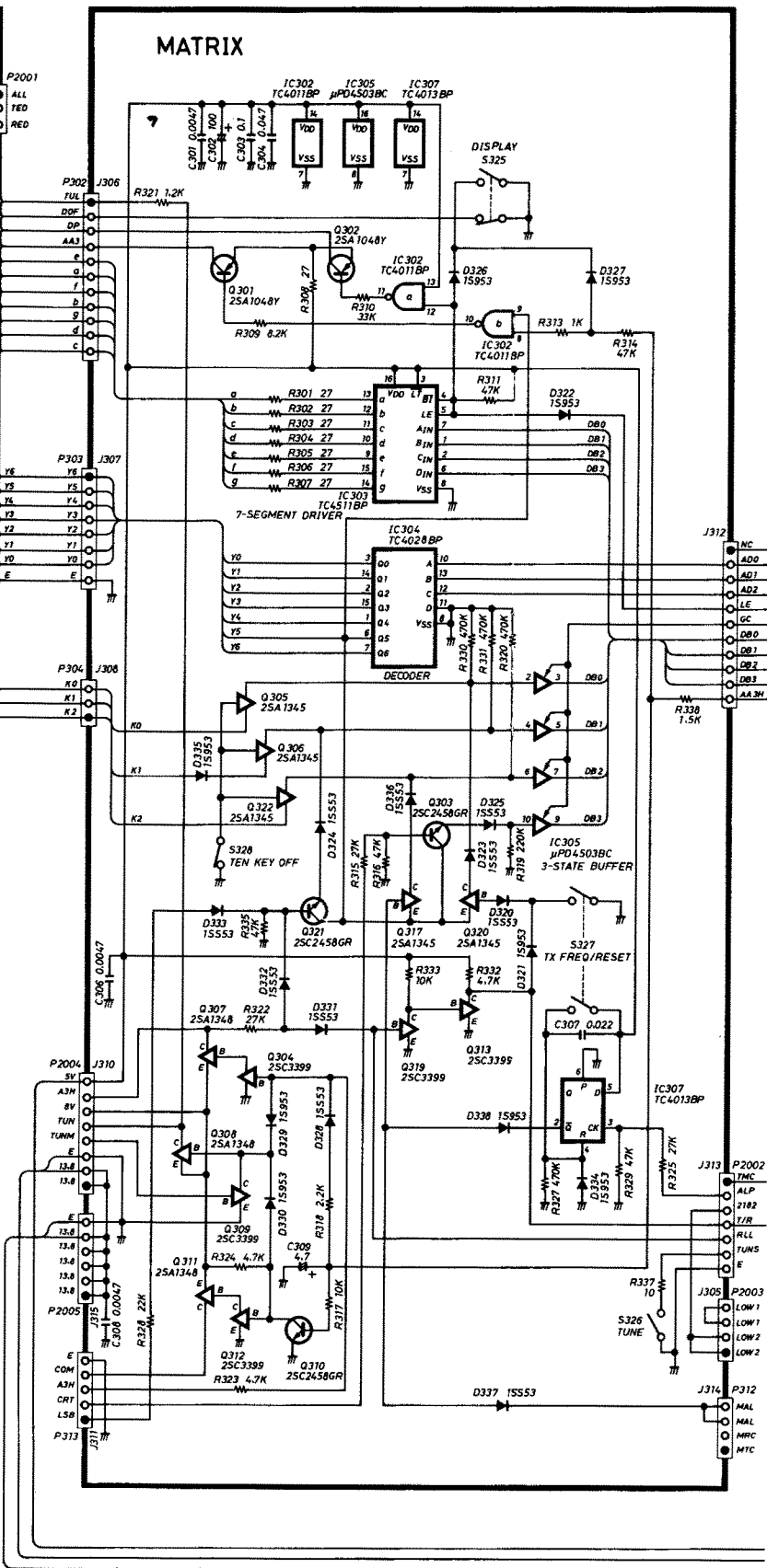
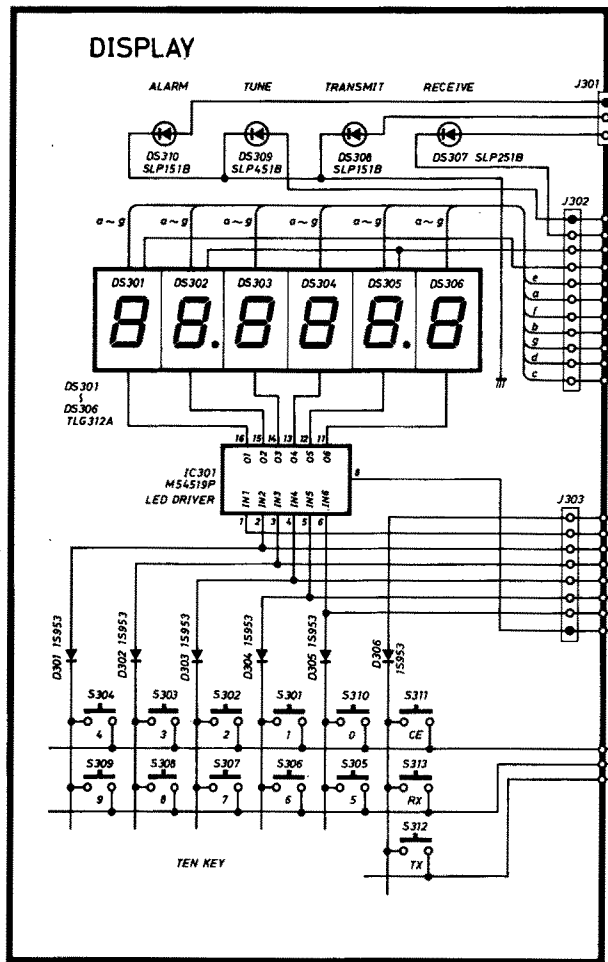


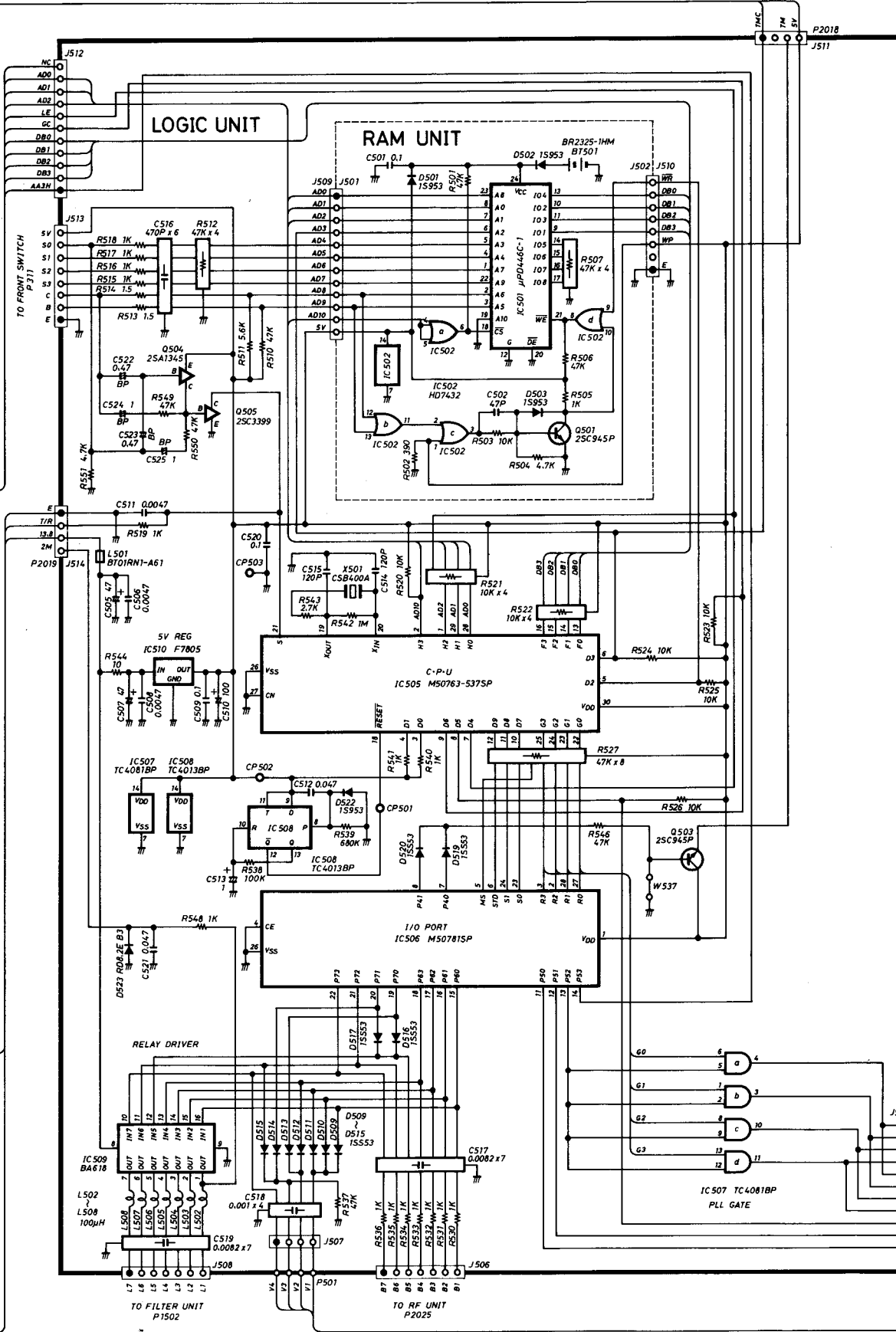
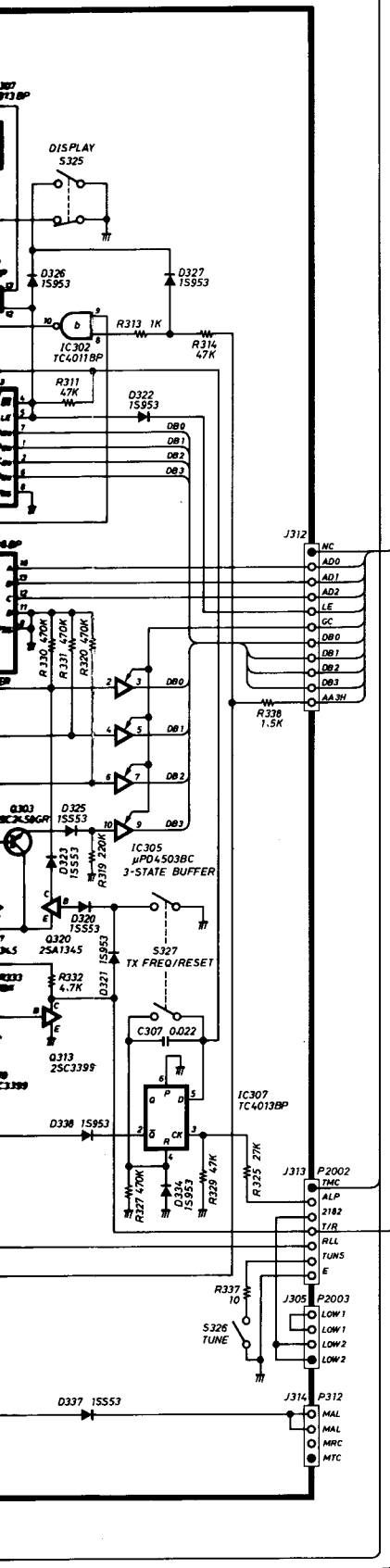
### DIN UNIT



### JACK UNIT

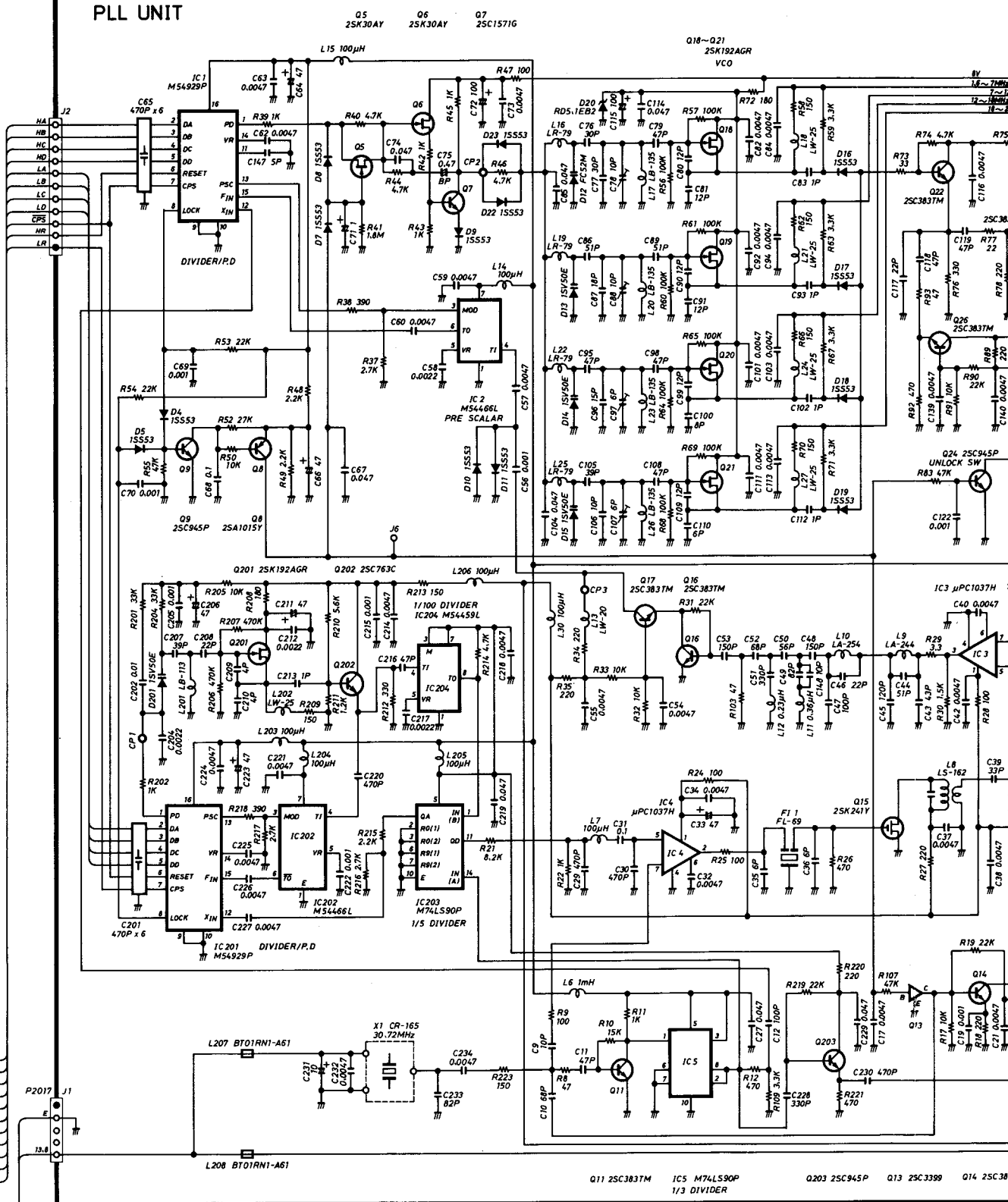






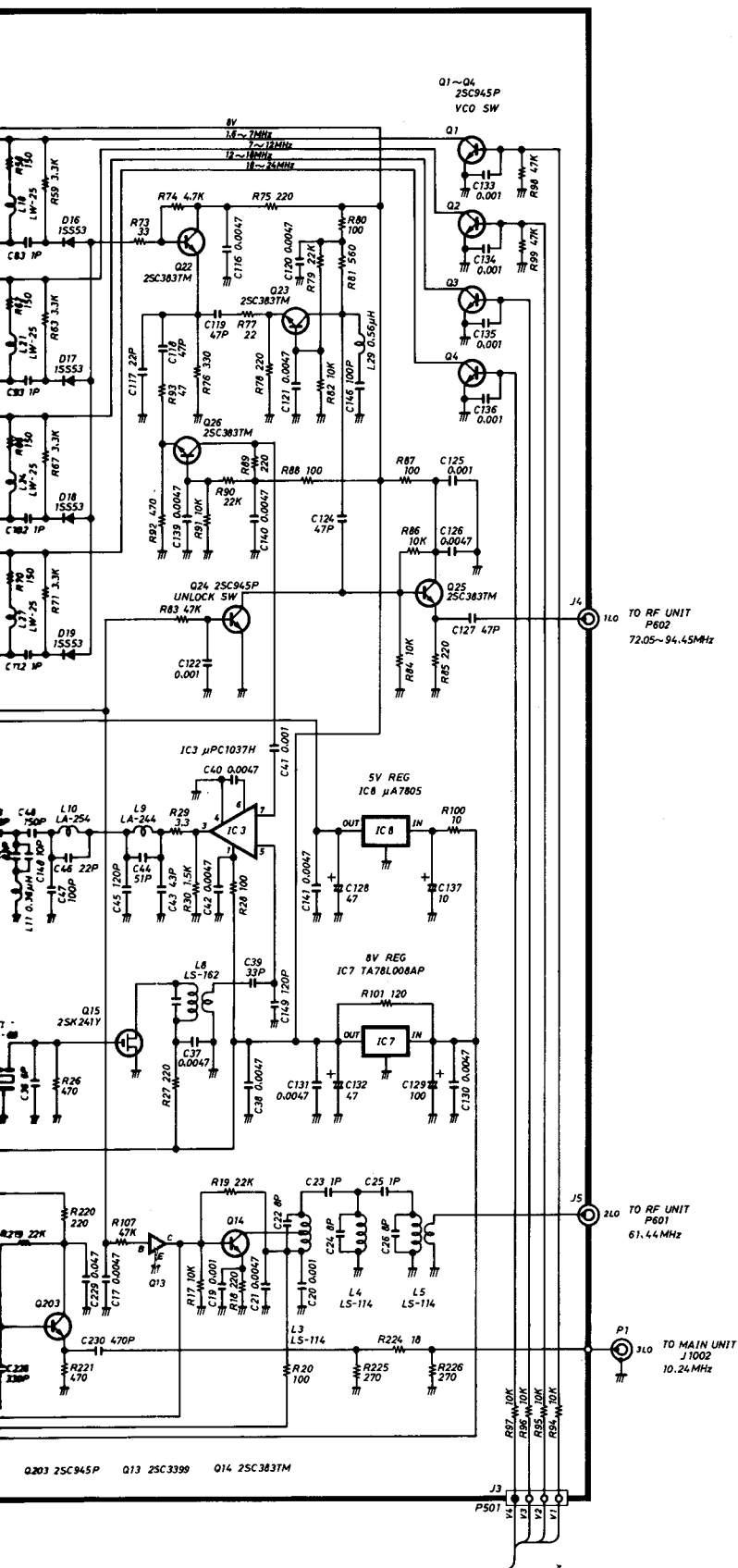
P2018  
J511

# PLL UNIT



J505  
P2017  
J1

Q11 25C383TM IC5 M74LS90P 1/3 DIVIDER Q203 25C945P Q13 25C3399 Q14 25C383







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