



SERVICE MANUAL

220MHz FM TRANSCEIVER

IC-3SAT

INTRODUCTION

This service manual describes the latest service information for the **IC-3SAT** 220 MHz FM TRANSCEIVER at the time of publication.

To upgrade quality, any electric or mechanical part and internal circuits are subject to change without notice or obligation.

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. This will ruin the transceiver.

DO NOT expose the transceiver to rain, snow or any liquids.

DO NOT reverse the polarities of the power supply when connecting the transceiver.

DO NOT apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front end.

ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

<SAMPLE ORDER>

| | | | | |
|------------|-------|------------------|--------------------|-----------|
| 1150000800 | IC | SC1107 | IC-3SAT MAIN UNIT | 5 pieces |
| 8810005720 | Screw | PH B0 M2 × 20 ZK | IC-3SAT Rear panel | 10 pieces |

Addresses are provided on the inside back cover for your convenience.

REPAIR NOTE

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from a power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 30 dB ~ 40 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.



TABLE OF CONTENTS

| | | |
|-------------------|---|-------------------|
| SECTION 1 | SPECIFICATIONS | 1 — 1 |
| SECTION 2 | INSIDE VIEWS | 2 — 1 |
| SECTION 3 | BLOCK DIAGRAM | 3 — 1 |
| SECTION 4 | CIRCUIT DESCRIPTION | 4 — 1 ~ 6 |
| 4 - 1 | RECEIVER CIRCUITS | 4 — 1 |
| 4 - 2 | TRANSMITTER CIRCUITS | 4 — 2 |
| 4 - 3 | PLL CIRCUITS | 4 — 3 |
| 4 - 4 | POWER SUPPLY CIRCUITS | 4 — 4 |
| 4 - 5 | OTHER CIRCUITS | 4 — 4 |
| 4 - 6 | CPU PORT ALLOCATIONS (LOGIC UNIT) | 4 — 5 |
| SECTION 5 | MECHANICAL PARTS AND DISASSEMBLY | 5 — 1 ~ 2 |
| 5 - 1 | FRONT PARTS | 5 — 1 |
| 5 - 2 | CHASSIS PARTS | 5 — 2 |
| SECTION 6 | ADJUSTMENT PROCEDURES | 6 — 1 ~ 5 |
| 6 - 1 | PREPARATION BEFORE SERVICING | 6 — 1 |
| 6 - 2 | PLL ADJUSTMENT | 6 — 2 |
| 6 - 3 | RECEIVER ADJUSTMENT | 6 — 3 |
| 6 - 4 | TRANSMITTER ADJUSTMENT | 6 — 4 |
| SECTION 7 | BOARD LAYOUTS | 7 — 1 ~ 10 |
| 7 - 1 | LOGIC DAUGHTER UNITS | 7 — 1 |
| 7 - 2 | LOGIC (LGC) UNIT | 7 — 2 |
| 7 - 3 | MAIN UNIT | 7 — 4 |
| 7 - 4 | MAIN DAUGHTER UNITS | 7 — 6 |
| SECTION 8 | PARTS LIST | 8 — 1 ~ 7 |
| SECTION 9 | OPTIONAL UNITS | 9 — 1 ~ 3 |
| 9 - 1 | UT-50 TONE SQUELCH UNIT | 9 — 1 |
| 9 - 2 | UT-51 TONE ENCODER UNIT | 9 — 2 |
| 9 - 3 | UT-49 DTMF DECODER UNIT | 9 — 3 |
| SECTION 10 | VOLTAGE DIAGRAM | 10 — 1 |

SECTION 1 SPECIFICATIONS

■ GENERAL

- Frequency coverage : 220.000~225.000 MHz
- Mode : F3 (FM)
- Selectable tuning step : 5, 10, 12.5, 15, 20, 25, 50, 100 kHz or 1 MHz
- Memory channels : 48 plus a call channel
- Antenna impedance : 50 Ω
- Power supply requirement : 6~16 V DC negative ground or battery packs BP-81~BP-85 or battery case BP-90
- Current drain (at 13.8 V DC) : Receive 16 mA (power saved)
250 mA (max. audio output)
Transmit 550 mA (LOW 1)
1400 mA (HIGH)
- Usable temperature range : -10 °C~+60 °C (+14 °F~+140 °F)
- Frequency stability : ± 15 ppm (-10 °C~+60 °C) (+14 °F~+140 °F)
- Dimensions : 49 (W) \times 102.5 (H) \times 35 (D) mm
1.9 (W) \times 4.0 (H) \times 1.4 (D) in
(Projections not included)
- Weight : 280 g (9.9 oz)

■ TRANSMITTER

- Output power (at 13.8 V DC) : High More than 5.0 W
Low 3.5/1.5/0.5 W (selectable)
- Modulation system : Variable reactance frequency modulation
- Max. frequency deviation : ± 5 kHz
- Spurious emissions : Less than -60 dB
- Microphone impedance : 2 k Ω

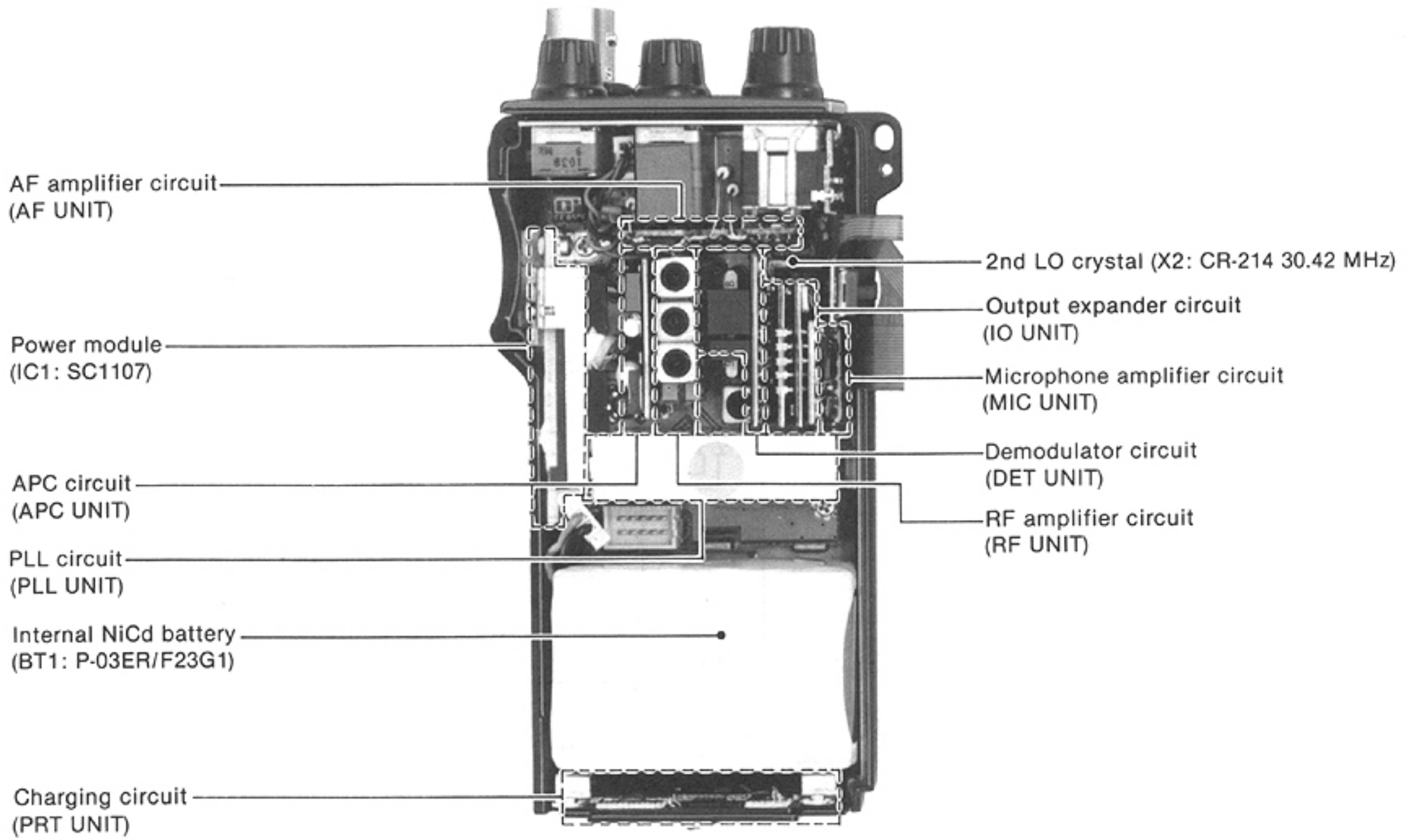
■ RECEIVER

- Receive system : Double-conversion superheterodyne
- Intermediate frequencies : 1st 30.875 MHz
2nd 455 kHz
- Sensitivity : 0.22 μ V for 12 dB SINAD
- Selectivity : More than 15 kHz/-6 dB
Less than 30 kHz/-60 dB
- Spurious rejection ratio : More than 60 dB
- Audio output power : More than 200 mW at 10 % distortion with an 8 Ω load
- Audio output impedance : 8 Ω

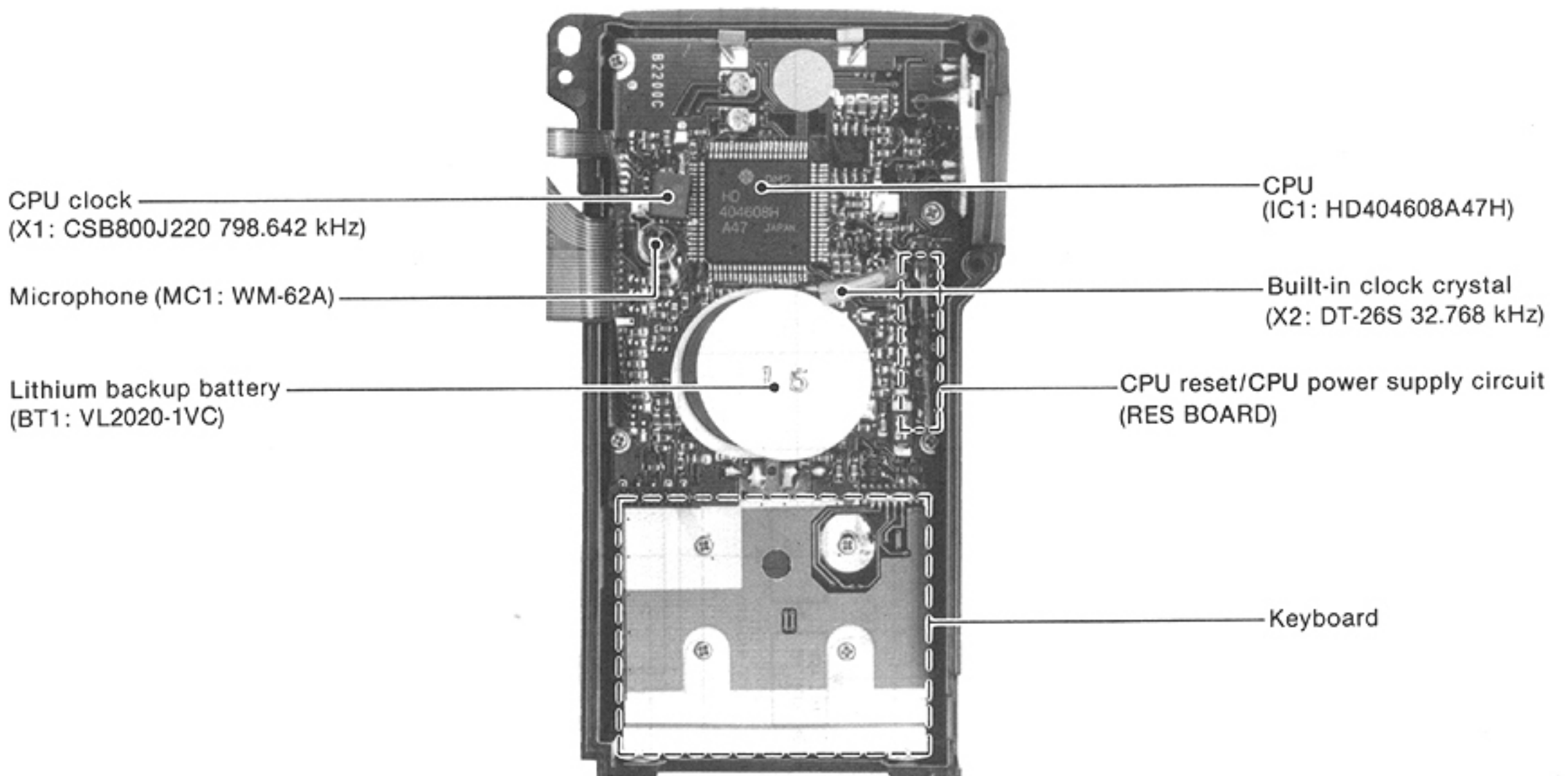
All stated specifications are subject to change without notice or obligation.

SECTION 2 INSIDE VIEWS

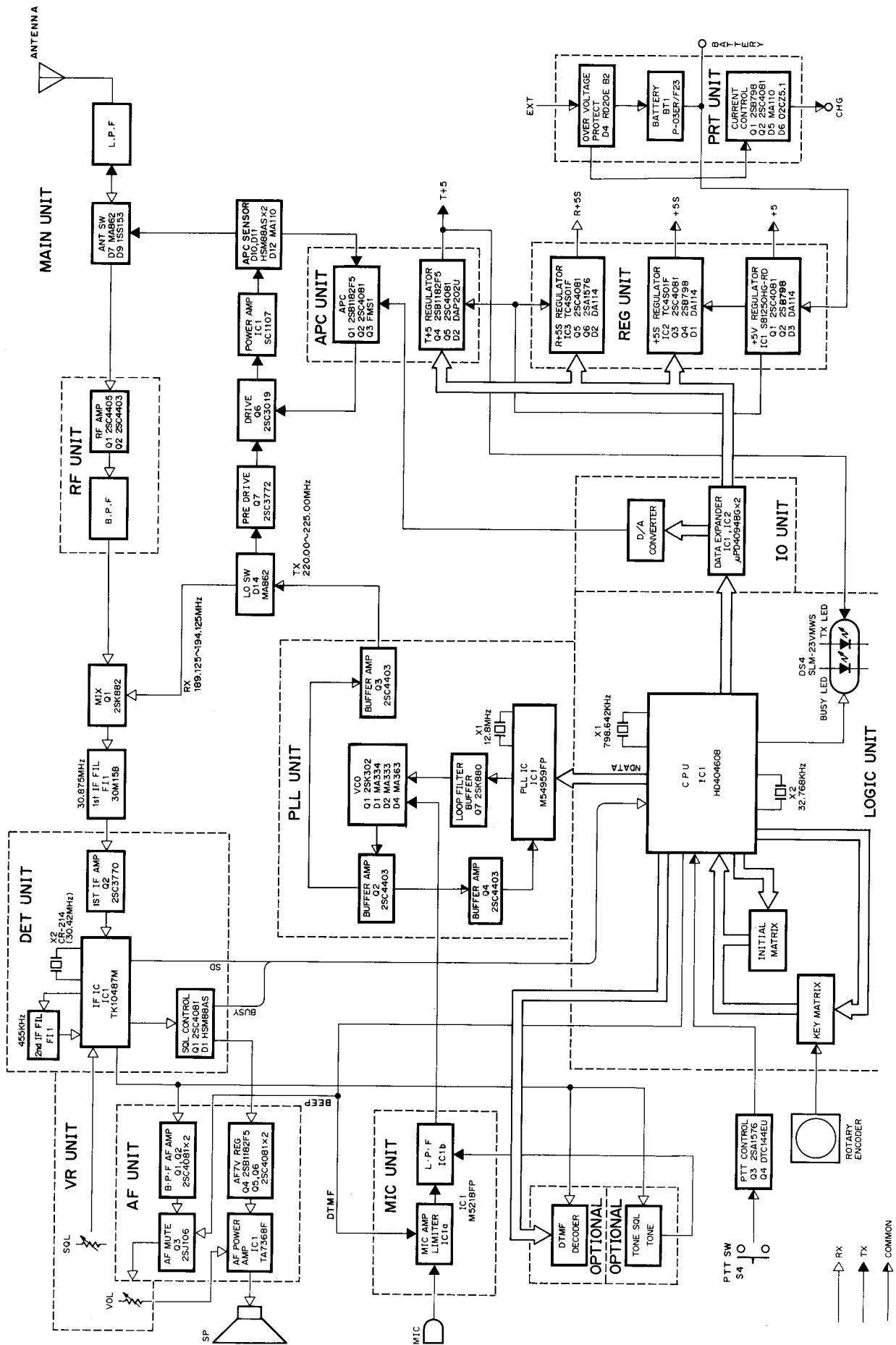
• MAIN UNIT



• LOGIC UNIT



SECTION 3 BLOCK DIAGRAM



SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

Received signals enter the antenna connector and pass through a bandpass filter (L3, L4, C21~C25). The signals are applied to the antenna switching circuit (D7, D9, L5, L6, C26~C28) and then to the RF UNIT via the RFIN signal line. The antenna switching circuit employs a two-stage $\lambda/4$ -type diode switching system.

The antenna switching circuit switches the transmit/receive circuit and functions as a low-pass filter while in receiving and becomes very high impedance while in transmitting.

4-1-2 RF CIRCUIT (RF UNIT)

The signals from the antenna switching circuit are applied to the bandpass filter (L1) and are then applied to the RF amplifier circuit (Q1, Q2).

The amplified signals are reapplied to the other bandpass filter (L2, L3). The bandpass filters suppress out-of-band signals. The signals are applied to the 1st mixer circuit (MAIN UNIT Q1).

4-1-3 1ST MIXER CIRCUIT (MAIN UNIT)

The signals from the RF circuit are mixed with the 1st LO signal from the PLL UNIT to produce a 30.875 MHz 1st IF signal.

4-1-4 1ST IF CIRCUIT (MAIN AND DET UNITS)

After passing through the matching circuit (L1), the 1st IF signal is applied to a pair of crystal filters (F1) to suppress out-of-band signals. The 1st IF signal enters the DET UNIT and is amplified at the IF amplifier (Q2) and then applied to the 2nd mixer circuit.

4-1-5 2ND IF AND DEMODULATOR CIRCUITS (DET UNIT)

The 1st IF signal from Q2 is applied to the 2nd mixer section of IC1, and is mixed with the 2nd LO signal to be converted to a 455 kHz 2nd IF signal.

IC1 contains the 2nd mixer, local oscillator, limiter amplifier and quadrature detector circuits. The local oscillator section and X2 generate 30.42 MHz for the 2nd LO signal.

The 2nd IF signal from the 2nd mixer (IC1, pin 4) passes through the ceramic filter, F11, where unwanted signals are suppressed. It is then amplified at the limiter amplifier section (IC1, pin 6) and applied to the quadrature detector section (IC1, pin 10) and ceramic discriminator X1) to demodulate the 2nd IF signal into an AF signal.

AF signal output from IC1 pin 11 is applied to the squelch circuit and de-emphasis circuit (R7, C24, C25). This de-emphasis circuit is an integrated circuit with frequency characteristics of -6 dB/octave. The resulting signal is applied to the AF amp, optional tone squelch and optional DTMF decoder circuits.

RECEIVER CIRCUIT BLOCK DIAGRAM

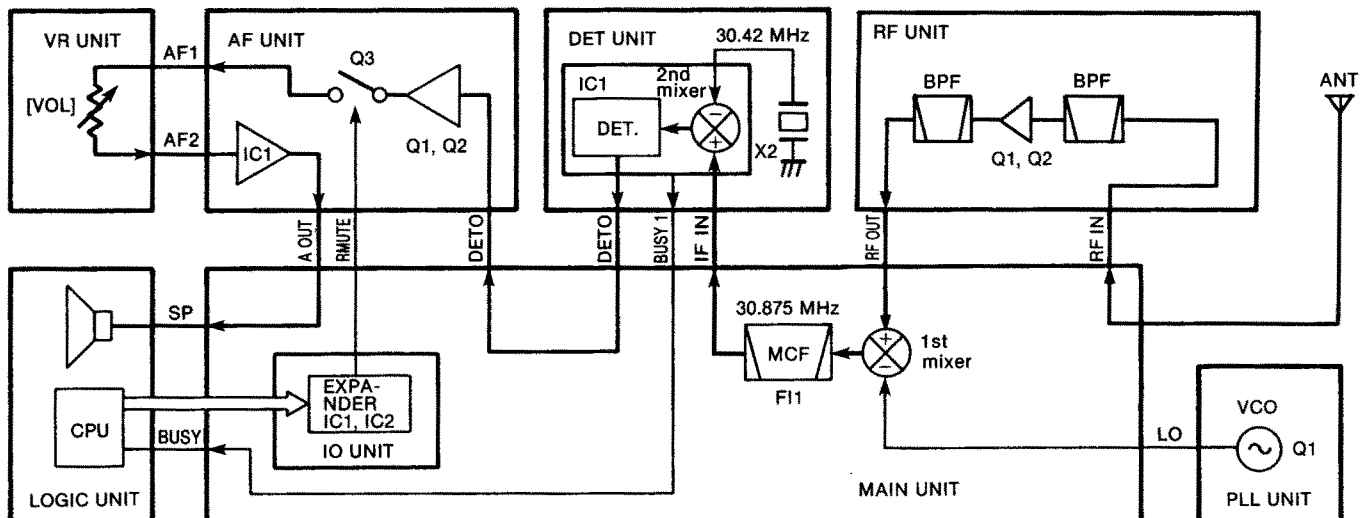


Fig. 1

4-1-6 AF AMP CIRCUIT (AF AND VR UNITS)

The AF signal is applied to Q1 and Q2 on the AF UNIT. Q1 is an active filter that functions as a high-pass filter to suppress tone signals for the tone squelch operation. Q2 is also an active filter that functions as a low-pass filter to suppress higher noise signals.

The filtered signal is applied to the [VOL] control (R1) on the VR UNIT via the AF mute circuit (Q3). When the squelch is closed, Q3 cuts the AF signal as the AF mute switch. The AF signal is power-amplified at the AF power amplifier (IC1) to drive the speaker.

The AF voltage regulator (Q4~Q6) supplies power to the AF power amplifier. The AFS signal from the MAIN UNIT controls Q6 and mutes AF output while receiving no signal or no specified tone/DTMF signal.

4-1-7 SQUELCH CIRCUIT (DET UNIT)

Some of the noise components in the AF signal from IC1 pin 11 are applied to IC1 pin 13 via C11, R8, C13 and C14. The [SQL] control (R2) on the VR UNIT adjusts the pin 13 input level.

The active filter section in IC1 amplifies noise components of frequencies of 20 kHz and above, and outputs the resulting signals from pin 14. Output signals are rectified by D1 and are converted to DC voltage.

The rectified voltage triggers the squelch switch (Q1). The collector of Q1 outputs the squelch signal. The signal is applied to the CPU (IC1, pin 27) on the LOGIC UNIT through the BUSY signal line. The CPU outputs the RMUTE and BUSY LED signals.

The RMUTE signal, decoded at the output expander (IC1) on the IO UNIT, activates the AF mute circuit (Q3) on the AF UNIT to cut the AF signal. The BUSY LED signal is applied to Q1 on the LOGIC UNIT, turning OFF the receive indicator.

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER (MIC UNIT)

AF signals from the built-in condenser microphone or from the [MIC] jack are applied to IC1 pin 3, and are pre-emphasized to +6 dB/octave through C6 and R4 connected to pin 2. IC1 functions as the microphone amplifier and the limiter.

The output signals from IC1 pin 1 pass through the splatter filter circuit (IC1 pins 5 and 6) where signals of 3 kHz and above are attenuated. IC1 pin 7 then outputs the signals. The signals are applied to the modulation circuit (PLL UNIT, D4) to produce an FM signal.

The VCO circuit (Q1, D1, D2) oscillates the transmit frequency with AF signal modulation as a PLL output.

4-2-2 DRIVE AMPLIFIER (MAIN UNIT)

The PLL output (LO signal line), buffer-amplified at Q3 on the PLL UNIT, is applied to the transmit/receive switching circuit (D14). The PLL output is then amplified at the predrive amplifier (Q7) and the drive amplifier (Q6).

The voltage controlled by the APC circuit is applied to the collector of Q6 and Q7 to protect the RF power module from damage by an antenna mismatch.

4-2-3 RF POWER AMPLIFIER (MAIN UNIT)

IC1 is a power module which provides stable 5 W output power.

An RF signal from the drive amplifier (Q6) is applied to IC1 pin 1. The amplified signal is output from pin 4, and applied to the antenna connector through the diode switching and bandpass filter circuits.

TRANSMITTER CIRCUIT BLOCK DIAGRAM

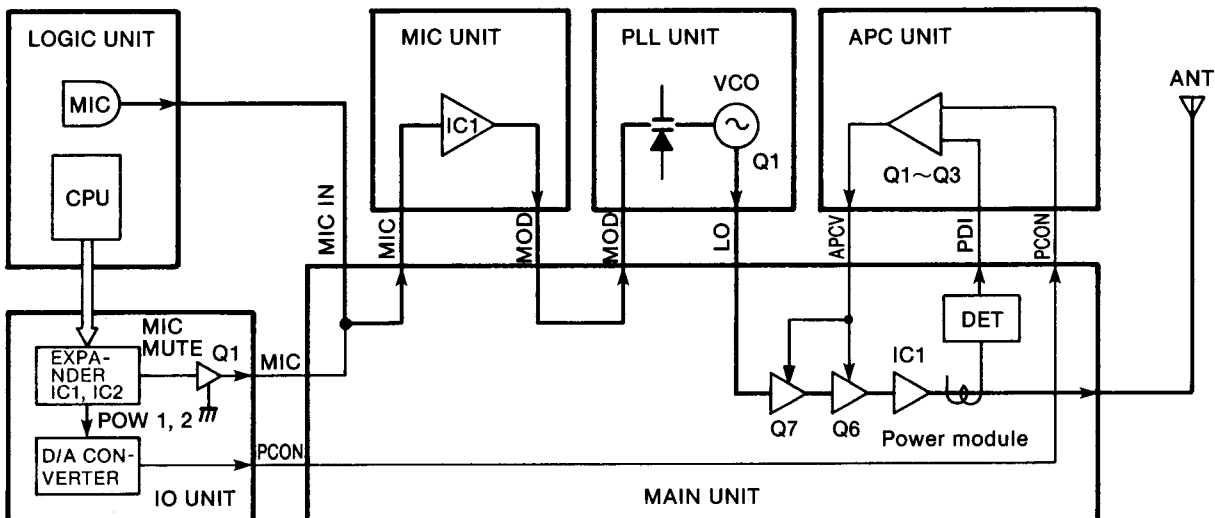


Fig. 2

4-2-4 APC CIRCUIT (MAIN AND APC UNITS)

The APC circuit protects the power module (IC1) from a mismatched output load and selects HIGH and LOW output power.

The output power level from the power module (IC1) is detected at the APC detector (D10~D12). When antenna impedance is matched at 50 Ω, the detected level is at a minimum. However, when antenna impedance is mismatched, the detected voltage is higher than when it is matched.

When the antenna impedance is mismatched, the base voltage of Q3b (APC UNIT) is higher than the other base voltage of Q3a (reference voltage). Q3b decreases the collector current of Q1 using Q2. Collector current of Q1 is used at the drive amplifiers (Q6, Q7) on the MAIN UNIT. Hence, when the antenna impedance is mismatched, the output power is decreased.

The circuit which selects output power uses the APC circuit. The PCON voltage from the IO UNIT shifts the reference voltage, changing the output power to HIGH or LOW 1~3.

4-2-5 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

When transmitting, D7 and D9 are turned ON. The RF output signal is not applied to the receiver circuit, passing through D9 and C60, the bandpass filter (L3, L4, C21~C25) and then to the antenna. The bandpass filter suppresses high harmonic components.

4-3 PLL CIRCUITS

4-3-1 GENERAL (PLL UNIT)

The PLL circuit, using a one chip modulus prescaler (IC1), directly generates the transmit and 1st LO frequencies with the VCO (Q1). The modulus prescaler (IC1) sets the dividing ratio based on serial data from the CPU, and compares the phases of a VCO signal and the reference oscillator frequency. It detects the out-of-step phase and outputs it. The reference frequency is oscillated at X1.

4-3-2 REFERENCE OSCILLATOR CIRCUIT (PLL UNIT)

A reference frequency is produced by the local oscillator section of IC1 and X1. C21 provides frequency control.

PLL CIRCUIT

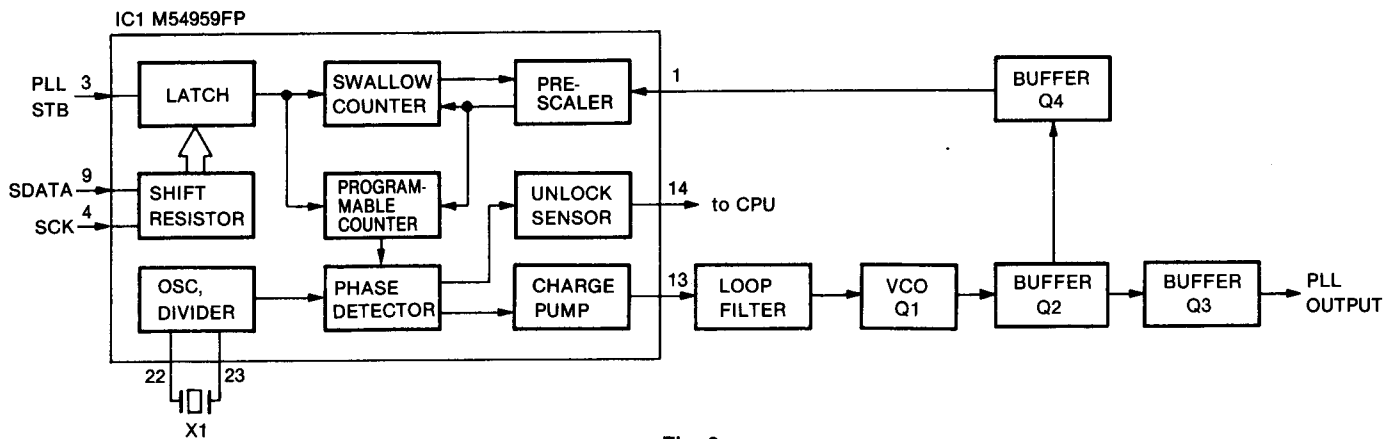


Fig. 3

4-3-3 LOOP FILTER CIRCUIT (PLL UNIT)

Phase-detected signals from IC1 pin 13 are converted to DC voltage by a lag-lead loop filter (R10, R20, C12, C13).

The frequency at which the VCO oscillates is controlled by varactor diodes (D1, D2). DC voltage (PLL lock voltage) is provided through the buffer amplifier (Q7).

4-3-4 VCO CIRCUIT (PLL UNIT)

The VCO circuit (Q1) generates the receive and transmit frequencies and makes an FM modulation.

D3 changes the inductive reactance of the VCO, shifting the receive and transmit frequencies using a control signal from IC1 pins 10 and 11. Varactor diodes (D1, D2) provide frequency control. The buffer amplifiers (Q2, Q3, Q4) do not affect the PLL output signal from VCO oscillation.

4-3-5 UNLOCK SENSOR CIRCUIT (PLL UNIT)

When the PLL circuit is unlocked, IC1 pin 14 is "HIGH" and the "HIGH" signal is applied to the CPU pin 7 as an unlock signal.

4-4 POWER SUPPLY CIRCUITS

4-4-1 VOLTAGE LINES

| LINE | DESCRIPTION |
|--------|--|
| Vcc | The internal or attached battery pack voltage or external DC power passed through the power switch. |
| +5 | Common 5 V converted from the Vcc line at Q1 and Q2 on the REG UNIT using IC1 output as the reference voltage. |
| +5S | 5 V controlled by the power saver function. This voltage is converted from Vcc line at Q3 and Q4 on the REG UNIT using IC2 output as the reference voltage. |
| R+5S | Receive 5 V controlled by the power saver function and SEND signal line. This voltage is converted from Vcc line at Q5 and Q6 on the REG UNIT using IC3 output as the reference voltage. |
| T+5 | Transmit 5 V controlled by the TMUTE signal line. This voltage is converted from Vcc line at Q4 and Q5 on the APC UNIT. |
| AF 7 V | AF amp power source controlled by the AFS signal line. R14/R15 provides reference voltage. |

4-4-2 CPU POWER SUPPLY CIRCUIT (LOGIC UNIT)

When the internal or attached battery pack is discharged, voltage is applied to the CPU (IC1) pin 73 via R29 from the lithium backup battery (BT1) installed in the transceiver to provide backup for the memory contents.

When the internal or attached battery pack voltage or external DC power is applied to the transceiver, BT1 is charged using the current regulator (Q3).

4-4-3 +5S AND R+5S SWITCHING CIRCUITS (REG UNIT)

The IC-3SAT has a power saver to reduce current consumption to approx. 1/4.

The PSC (Power Saver Control) signal is applied to IC2. IC2 controls +5S regulator (Q3, Q4, D1) to turn ON and OFF +5S voltage.

PSC and SEND signals are applied to IC3. IC3 controls R+5S regulator (Q5, Q6, D2). R+5S turns OFF during power saved period or transmitting.

4-4-4 CHARGING CIRCUIT (PRT UNIT)

Voltage from the [DC 13.8V] jack is applied to current control circuit (Q1, Q2, D5, D6) to charge an internal or attached battery pack (except the BP-85).

When the external battery pack is attached, the current from D2 charges the attached battery pack. When the external battery pack is removed, the current from D2 charges the internal battery pack.

The IC-3SAT has an external battery switch. When a battery pack is attached, this switch connects the external battery to the charging circuit.

Over voltage protector (D4) decreases the transceiver circuit damage from over voltage and reverse polarity connections of the power supply.

4-5 OTHER CIRCUITS

4-5-1 S/RF INDICATOR CIRCUIT (DET, MAIN AND LOGIC UNITS)

A portion of the 2nd IF signal is output from IC1 pin 12 on the DET UNIT via the SD signal line. The signal is rectified at D1 on the MAIN UNIT to obtain an S-indicator signal. The S-indicator signal is applied to IC2b pin 5 on the LOGIC UNIT.

IC2b pin 6 receives an S-indicator reference signal from the CPU KEYS0~3 terminals via the D/A converter (R11, R37~R40). The CPU terminals increase the reference signal level.

When the D/A converted level becomes greater than the S-indicator level, IC2b pin 7 becomes "LOW." The CPU detects the signal strength level using the KEYS0~3 terminal outputs and indicates the signal strength level on the function display when receiving the "LOW" signal.

While transmitting, the S/RF indicator indicates the selected output power.

S INDICATOR CIRCUIT

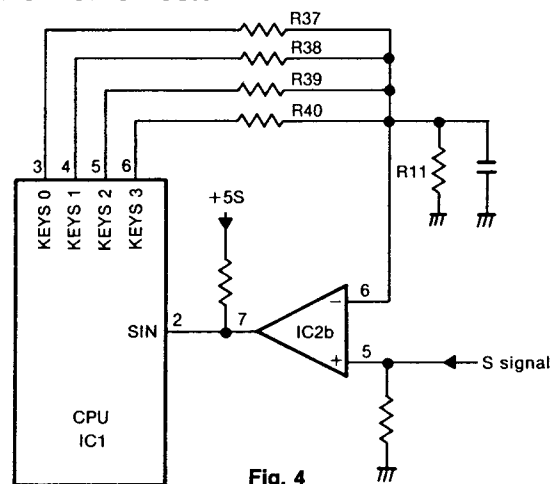


Fig. 4

4-5-2 DISPLAY BACKLIGHT CIRCUIT (LOGIC UNIT)

When the [LIGHT] switch is pushed, pin 77 of the CPU outputs "HIGH." The signal is applied to Q1 to light up the backlight LEDs (DS2, DS3).

4-5-3 SUBAUDIBLE TONE ENCODER CIRCUIT

This function can be activated only when an optional UT-50 TONE SQUELCH UNIT or UT-51 PROGRAMMABLE TONE ENCODER UNIT is installed.

A tone signal is applied to the splatter filter circuit on the MIC UNIT via the TONE signal line. R10 on the UT-50 and R5 on the UT-51 adjust the subaudible tone deviation.

4-5-4 DTMF ENCODER CIRCUIT (LOGIC UNIT)

This function can be activated only when the matrix KEYS1→KEY11 is OPEN. (an optional UT-49 DTMF DECODER UNIT is installed.)

Pins 70 and 71 of the CPU (TONEC/TONER) output a DTMF code signal. R16 adjusts the DTMF code signal deviation. The signal is also output to the AF UNIT via R17.

4-5-5 CPU RESET CIRCUIT (LOGIC UNIT)

IC3 detects +5 voltage. When the +5 voltage line becomes 5 V, IC3 turns INTO "HIGH" and the CPU (IC1) restarts operation.

The CPU is reset when IC1 pin 76 becomes "HIGH." The AND gate IC (IC4) outputs a reset signal when both input terminals are "HIGH." One terminal is "HIGH" when the [MONI] switch is pushed and the other (INT0 line) is "HIGH" when the power is turned ON.

RESET CIRCUIT

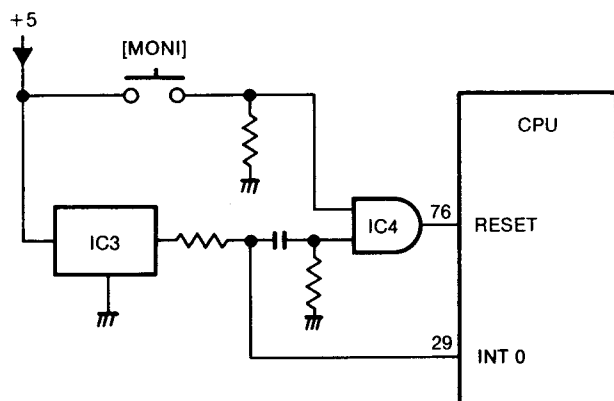


Fig. 5

4-5-6 TRANSMIT/RECEIVE INDICATOR CIRCUIT (LOGIC UNIT)

The transmit/receive indicator (DS4) uses a 2-input LED and lights up in red or green.

The indicator lights up in red as the transmit indicator while transmitting using the T+5 voltage.

The indicator lights up in green as the busy indicator while the squelch opens using CPU pin 78 output via the inverter (Q2).

4-5-7 CLOCK OSCILLATOR CIRCUIT (LOGIC UNIT)

IC1 oscillates the 798.642 kHz CPU system clock signal using X1. IC1 oscillates the 32.768 kHz clock signal for the built-in clock using X2.

4-6 CPU PORT ALLOCATIONS (LOGIC UNIT)

• INPUT PORT

| PORT NUMBER | PIN NUMBER | DESCRIPTION |
|-----------------------|------------|---|
| D4 [PTT] | 1 | Inputs a signal on the PTT line. This port becomes "LOW" when the PTT switch is pushed. |
| D5 [SIN] | 2 | Inputs S-meter-compared signal from IC2b to indicate the CPU counting level to the S-indicator in the function display. |
| D10 [UL] | 7 | Detects a PLL unlock signal. When the signal is "HIGH," the PLL is unlocked. |
| D12, D13 [DIAL UP/DN] | 9, 10 | Input port for the up/down signal of the tuning control. |
| R10~R13 [KEY10~KEY13] | 19~22 | These are input ports for the initial and key matrices. |
| R20~R23 [KEYR0~KEYR3] | 23~26 | These are input ports for the keyboard and DTMF code from the UT-49. |
| R30 [BUSY] | 27 | Detects a squelch signal. The signal is "HIGH" when the squelch opens. |
| R31 [OPT] | 28 | Input port for an optional unit. This port becomes "HIGH" when the tone squelch opens. (UT-50) This port becomes "LOW" when the UT-51 is installed. |
| R32 [INT0] | 29 | Detects a signal for the standby mode of the CPU. The CPU enters the standby mode when the port becomes "LOW." |
| R33 [INT1] | 30 | The CPU decodes received DTMF code when this port becomes "LOW." |

• OUTPUT PORT

| PORT NUMBER | PIN NUMBER | DESCRIPTION |
|------------------------|------------|--|
| D0 [LAMP0] | 77 | Becomes "HIGH" when the backlight LEDs light up. |
| D1 [BUSY LED] | 78 | Outputs a signal for lighting up in green the transmit/receive indicator. This port becomes "LOW" while receiving. (squench opens) |
| D3 [TOE] | 80 | Outputs an enable signal for the UT-49. |
| D6~D9 [KEYS0~KEYS3] | 3~6 | Outputs a strobe signal for the keyboard, initial and key matrices and D/A converter counting signal alternately in an interval. |
| R00 [SCK] | 15 | Outputs clock signals for serial data. |
| R01 [IO STB] | 16 | Outputs a strobe signal for serial data to the expander ICs. |
| R02 [SDATA] | 17 | Outputs serial data synchronized with the SCK signal. |
| R03 [PLL STB] | 18 | Outputs a strobe signal for serial data to the PLL IC. |

• OUTPUT EXPANDER (IO UNIT, IC2)

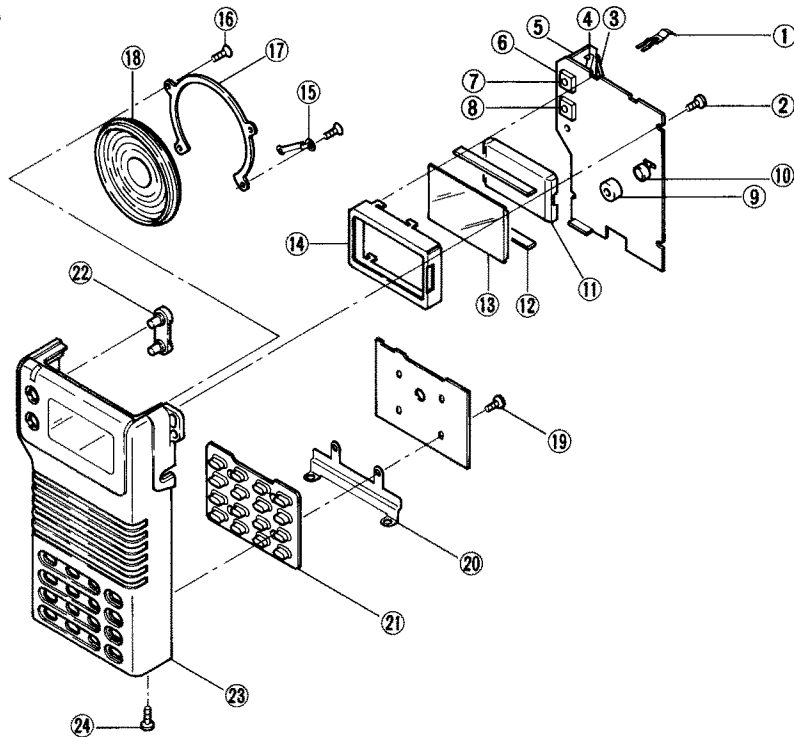
| PORT NUMBER | PIN NUMBER | DESCRIPTION |
|--------------------------|------------|--|
| Q5, Q6 [POW 1, POW 2] | 13, 14 | Outputs a control signal for the output power selecting circuit. This signal is converted into PCON voltage (APC reference voltage) using the D/A converter (R2~R6). |

• OUTPUT EXPANDER (IO UNIT, IC1)

| PORT NUMBER | PIN NUMBER | DESCRIPTION |
|------------------|------------|--|
| Q1 [AF ON] | 4 | Outputs an AF mute signal for AF power amplifier. |
| Q2 [MIC MUTE] | 5 | Outputs a microphone mute signal. When transmitting a tone signal, the MIC signal line goes to ground. |
| Q3 [RMUTE] | 6 | Outputs a receive mute signal for the AF mute circuit. When emitting a beep tone, this port outputs the mute signal and the AF ON port does not output it. |
| Q4 [TMUTE] | 7 | Outputs a control signal for T+5 V regulator. |
| Q5 [SEND] | 14 | Outputs transmit/receive switching signals. This port becomes "HIGH" while transmitting. |
| Q6 [PSC] | 13 | This port becomes "HIGH" while the power saver function is activated. |
| Q7 [CPC] | 12 | Outputs a control signal to cut off the loop filter while the power saver function is activated. |

SECTION 5 MECHANICAL PARTS AND DISASSEMBLY

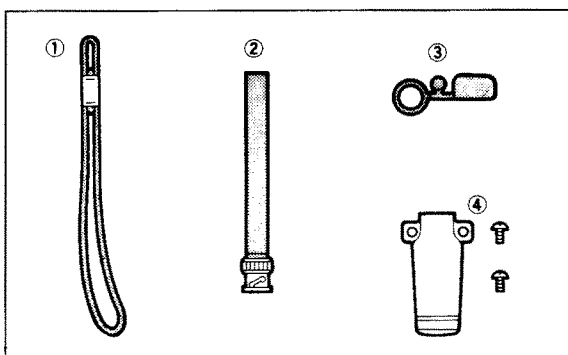
5-1 FRONT PARTS



| LABEL NUMBER | ORDER NO. | DESCRIPTION | QTY. | LABEL NUMBER | ORDER NO. | DESCRIPTION | QTY. |
|--------------|------------|---------------------------------------|------|--------------|------------|---|------|
| ① | 8930016400 | 756 LOGIC Ground spring plate | 2 | ⑭ | 8930015960 | 756 LCD holder | 1 |
| ② | 8810001700 | Screw PH B0 No. 0-3 M1.4 × 3 | 4 | ⑮ | 8930016410 | 756 Speaker ground lag | 1 |
| ③ | 8930015790 | PTT Ground spring plate | 1 | ⑯ | 8810005740 | Screw FH B0 No. 0 M2 × 3 | 4 |
| ④ | 8930014880 | 752 P.C. Board holder | 1 | ⑰ | 8930014810 | 752 Speaker plate | 1 |
| ⑤ | 2230000770 | Switch [F] SW-104 (SKHUPE004B) | 1 | ⑱ | 8810001700 | Screw PH B0 No. 0-3 M1.4 × 3 | 4 |
| ⑥ | 2230000770 | Switch [PTT] SW-104 (SKHUPE004B) | 1 | ⑳ | 8510006050 | Key shield | 1 |
| ⑦ | 2260001150 | Switch [H/L/DTMF] SW-103 (SKHUPC007B) | 1 | ㉑ | 8010009080 | 756 Keyboard | 1 |
| ⑧ | 2260001150 | Switch [MONI] SW-103 (SKHUPC007B) | 1 | ㉒ | 8610005970 | Knob K138 [H/L/DTMF], [MONI] | 2 |
| ⑨ | 8930014940 | 752 MIC holder | 1 | ㉓ | 8210005171 | 756 Front panel (F)-1 (incl. Front plate and 756 lens) | 1 |
| ⑩ | 7700000860 | Microphone WM-62A | 1 | ㉔ | 8810005890 | Screw FH M2 × 4 ZK | 2 |
| ⑪ | 8010009070 | 756 Reflector plate | 1 | | | | |
| ⑫ | 8930015920 | LCD contact strip SRCN-756 | 2 | | | | |
| ⑬ | 6910003910 | LCD LCD2439 (incl. shield) | 1 | | | | |

Screw abbreviations PH: Pan head B0: Self-tapping screw ZK: Black

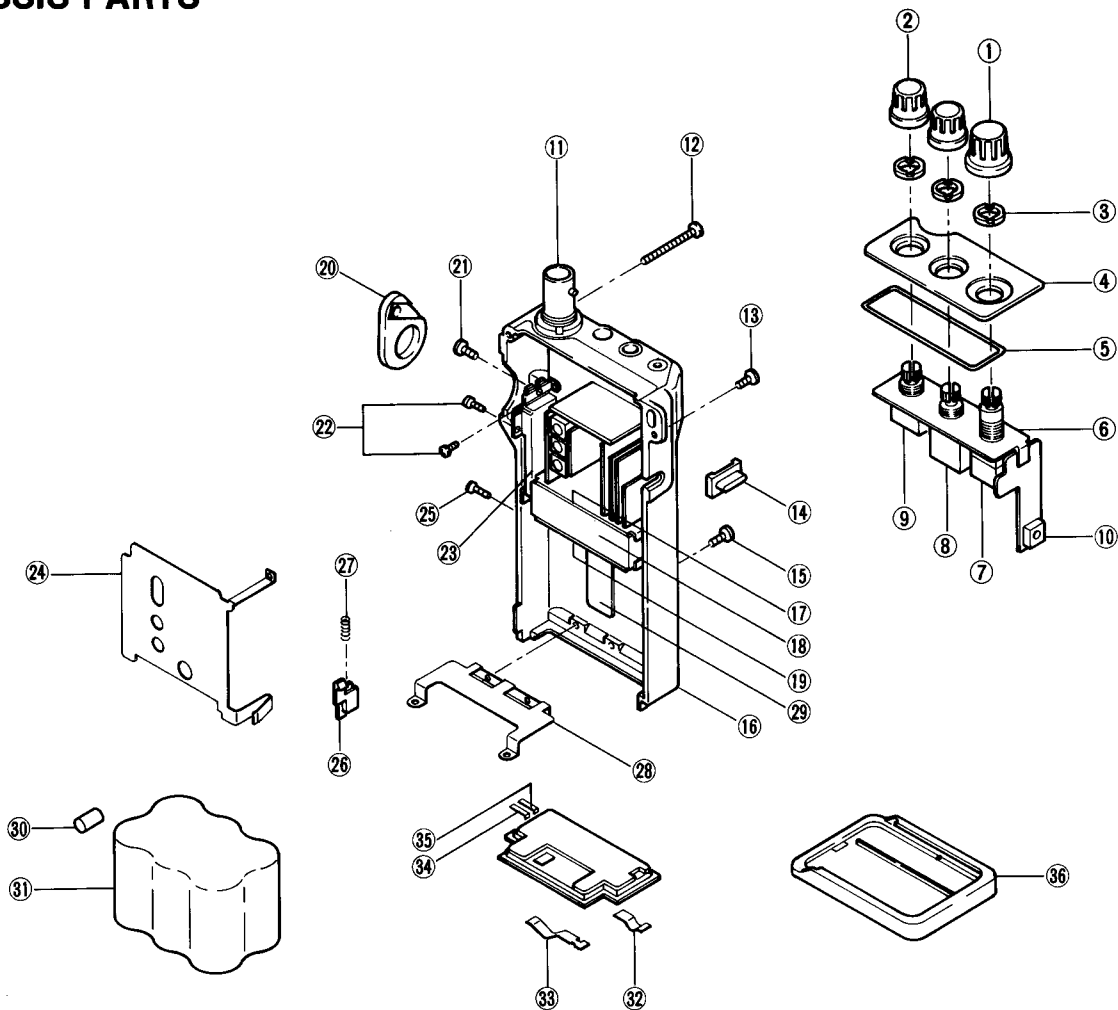
• ACCESSORIES



| LABEL NUMBER | ORDER NO. | DESCRIPTION | QTY. |
|--------------|------------------|---------------------------|------|
| ① | 8010008970 | Handstrap HK-002 | 1 |
| ② | Optional product | FA-215BA FLEXIBLE ANTENNA | 1 |
| ③ | 8930014961 | 752 Rainproof cap-1 | 1 |
| ④ | 8010008620 | 752 Belt clip | 1 |
| ⑤ | 8810005730 | Screw BuH M3 × 3 ZK BS | 2 |

Screw abbreviations BuH: Button head BS: Brass ZK: Black

5-2 CHASSIS PARTS



| LABEL NUMBER | ORDER NO. | DESCRIPTION | QTY. | LABEL NUMBER | ORDER NO. | DESCRIPTION | QTY. |
|--------------|------------|---|------|--------------|------------------|---------------------------|------|
| ① | 8610005790 | Knob N147 [TUNING] | 1 | ⑱ | 8510005850 | 752 PLL case | 1 |
| ② | 8610005780 | Knob N146 [SQUELCH], [PWR/VOL] | 2 | ⑲ | 8510006170 | 755 PLL 'cover | 1 |
| ③ | 8830000550 | VR nut (E) | 3 | ⑳ | 8930015940 | 756 PTT switch rubber | 1 |
| ④ | 8210005071 | 756 TOP panel-1 | 1 | ㉑ | 8810000120 | Screw PH M2.6 × 3 | 1 |
| ⑤ | 8930014950 | 752 TOP seal | 1 | ㉒ | 8810005860 | Screw PH No. 0 M2 × 3 Ni | 5 |
| ⑥ | 8930014801 | 752 VR plate-1 | 1 | ㉓ | 8930014840 | 752 Module shield plate | 1 |
| ⑦ | 2260000890 | Rotary switch [TUNING] SRBM1L040A | 1 | ㉔ | 8510006180 | 755 MAIN shield plate | 1 |
| ⑧ | 7210001440 | Variable resistor [PWR/VOL] RK097111101NA (10KA) | 1 | ㉕ | 8810005700 | Screw PH No. 0 M2 × 4 ZK | 1 |
| ⑨ | 7210001450 | Variable resistor [SQUELCH] RK0971110051A (10KB) | 1 | ㉖ | 8930014922 | 752 Release button-2 | 1 |
| ⑩ | 2260001150 | Switch [LIGHT] SW-103 (SKHUPC007B) | 1 | ㉗ | 8930014820 | Release spring (M) | 1 |
| ⑪ | 6510008620 | Antenna connector BNC-RM-F | 1 | ㉘ | 8930015980 | Joint plate | 1 |
| ⑫ | 8810005720 | Screw PH B0 M2 × 20 ZK | 2 | ㉙ | 8930016570 | 756 BP holder plate | 1 |
| ⑬ | 8810000100 | Screw PH M2 × 4 ZK | 1 | ⑳ | 8930016590 | BP rubber | 1 |
| ⑭ | 8930014911 | Light switch-1 rubber | 1 | ㉑ | 3030000270 | NiCd battery P-03ER/F23G1 | 1 |
| ⑮ | 8810005890 | Screw FH M2 × 4 ZK | 2 | ㉒ | 8930014852 | 752 Battery terminal-2 | 3 |
| ⑯ | 8010009064 | 756 Rear panel-4 | 1 | ㉓ | 8930016583 | 756C terminal-3 | 1 |
| ⑰ | 8510005830 | CO-PLL cover | 1 | ㉔ | 8930016970 | 756A Contact | 1 |
| | | | | ㉕ | 8930016980 | 756B Contact | 1 |
| | | | | ㉖ | Optional product | BOTTOM CAP-2 | 1 |

Screw abbreviations PH: Pan head FH: Flat head B0: Self-tapping screw ZK: Black Ni: Nickel

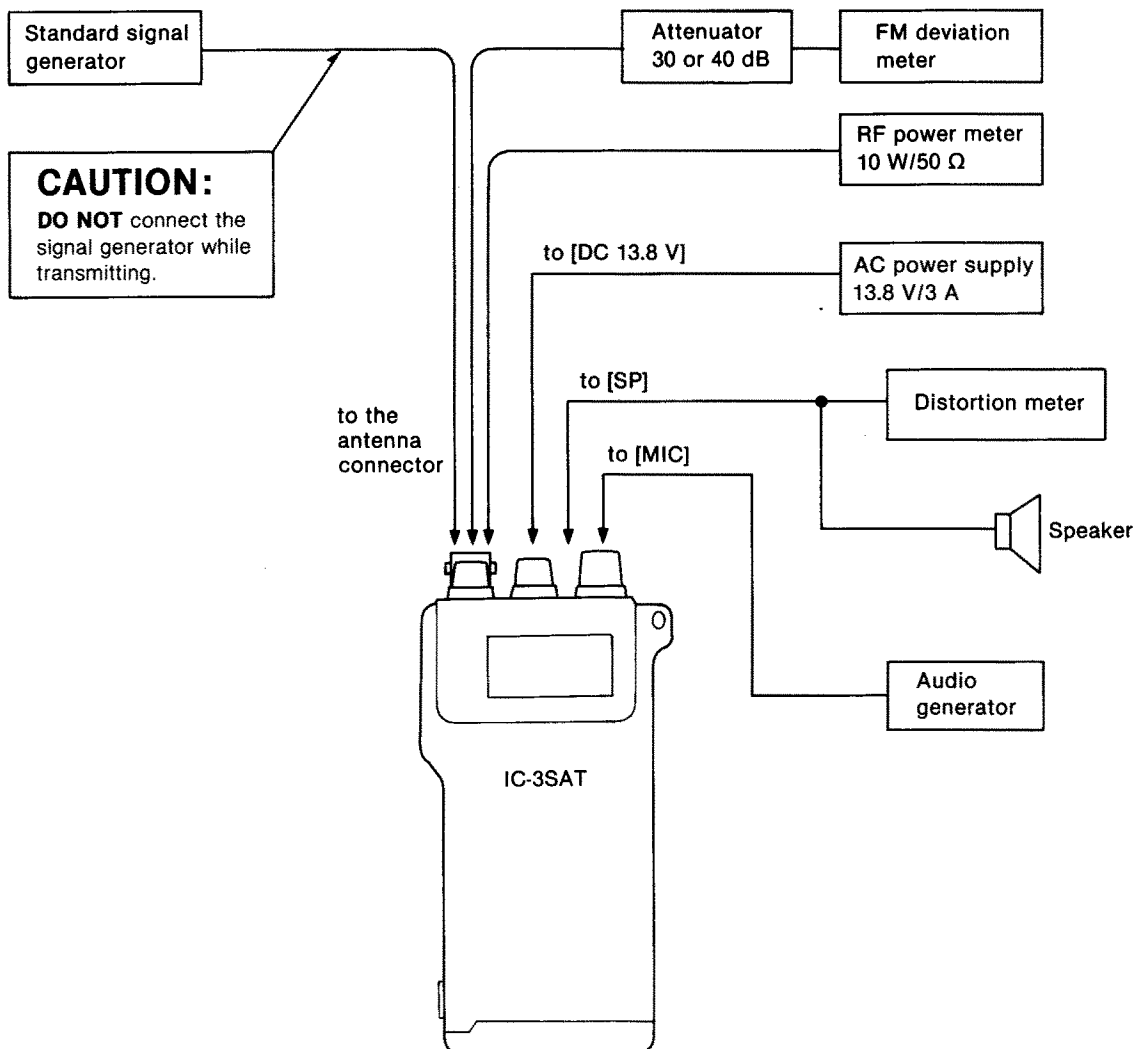
SECTION 6 ADJUSTMENT PROCEDURES

6-1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

| EQUIPMENT | GRADE AND RANGE | EQUIPMENT | GRADE AND RANGE |
|-------------------------------------|--|----------------------------|---|
| AC power supply | Output voltage : 13.8 V DC | DC voltmeter | Input impedance : 50 k Ω /DC or better |
| | Current capacity : 3 A or more | AC milli-voltmeter | Measuring range : 10 mV~10 V |
| RF power meter (terminated type) | Measuring range : 1~10 W | External speaker | Impedance : 8 Ω |
| | Frequency range : 220~250 MHz | Audio generator | Frequency range : 300~3000 Hz |
| | Impedance : 50 Ω | | Output level : 1~500 mV |
| | SWR : Less than 1.2 : 1 | Attenuator | Power attenuation : 30 or 40 dB |
| Frequency counter | Frequency range : 0.1~250 MHz | Capacity : 10 W or more | Distortion meter |
| | Frequency accuracy : ± 1 ppm or better | Measuring range : 0.1~20 % | |
| Oscilloscope | Frequency range : DC~20 MHz | FM deviation meter | Frequency minimum : 250 MHz |
| | Measuring range : 0.01~10 V | | Measuring range : 0~ ± 10 kHz |
| Standard signal generator (SSG) | Frequency range : 0.1~250 MHz | | |
| | Output level : -127~-17 dBm (0.1 μ V~32 mV) | | |

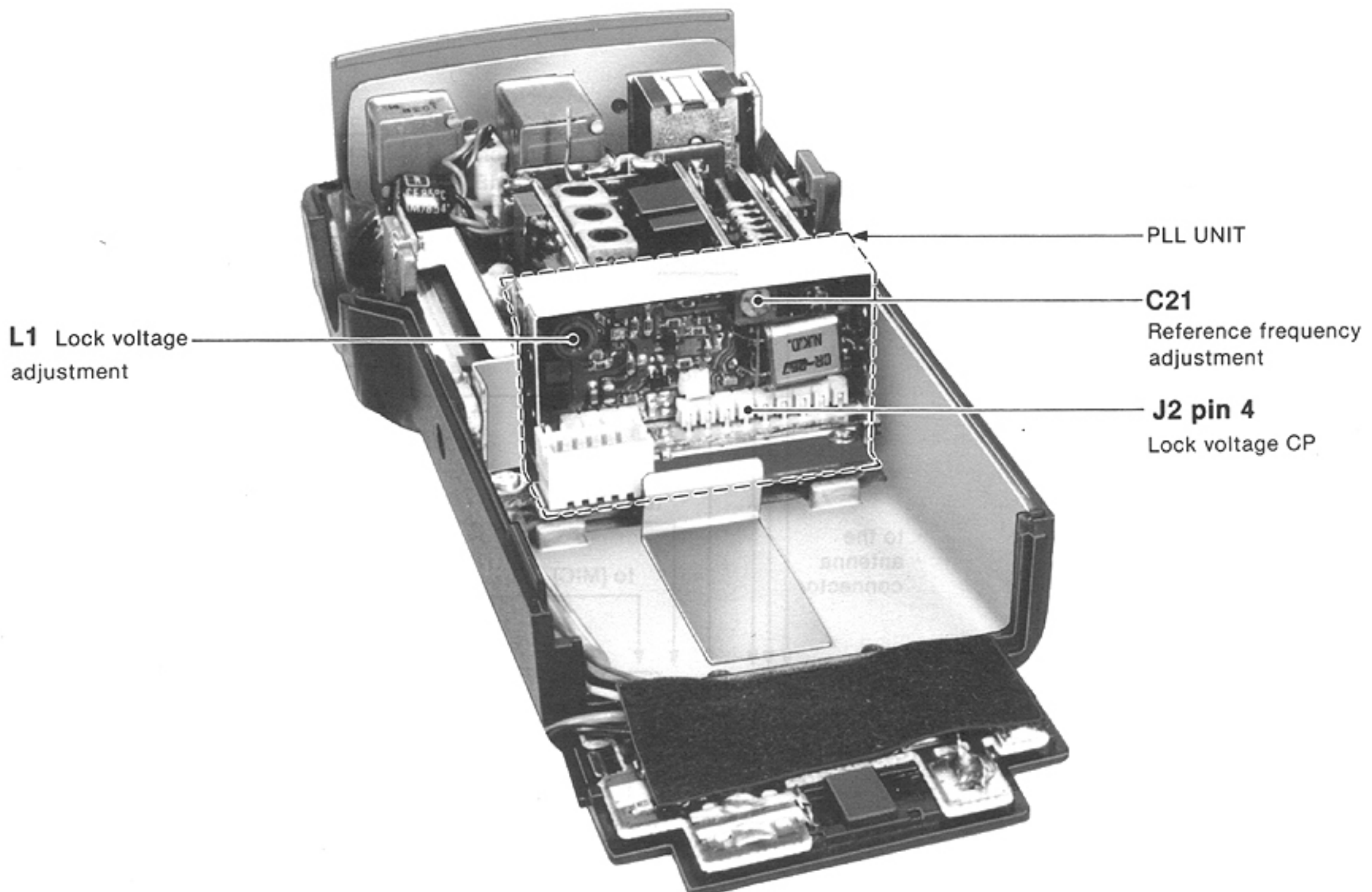
■ CONNECTION



6-2 PLL ADJUSTMENT

| ADJUSTMENT | ADJUSTMENT CONDITIONS | MEASUREMENT | | VALUE | ADJUSTMENT POINT | |
|---------------------|---|-------------|--|--------------|------------------|------------------|
| | | UNIT | LOCATION | | UNIT | ADJUST |
| LOCK VOLTAGE | 1 <ul style="list-style-type: none"> • Displayed frequency: 220.00 MHz • Simplex • Receiving | PLL | Connect the oscilloscope to J2 pin 4. | 1.6 V DC | PLL | L2 |
| | 2 <ul style="list-style-type: none"> • Transmitting | | | | | 1.6 V ± 0.5 V DC |
| REFERENCE FREQUENCY | 1 <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • Connect the RF power meter or a 50 Ω dummy load. • Transmitting | Top panel | Loosely couple the frequency counter to the antenna connector. | 222.5000 MHz | PLL | C21 |

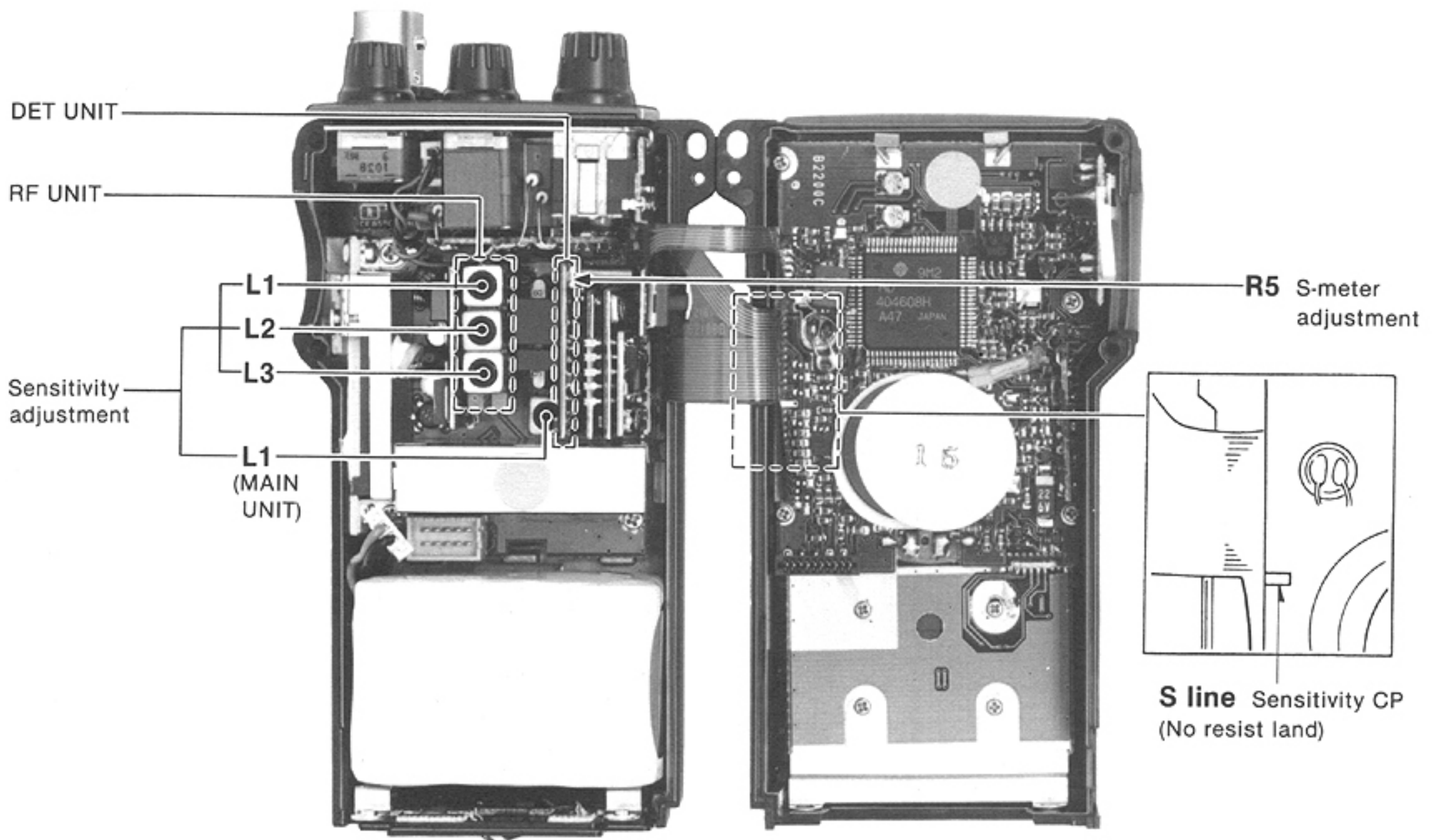
PLL UNIT



6-3 RECEIVER ADJUSTMENT

| ADJUSTMENT | ADJUSTMENT CONDITIONS | MEASUREMENT | | VALUE | ADJUSTMENT POINT | |
|-------------|--|------------------|---|-------------|------------------|------------|
| | | UNIT | LOCATION | | UNIT | ADJUST |
| SENSITIVITY | 1 <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • [SQL] control : Max. CCW • Set the signal generator; <ul style="list-style-type: none"> Level : 0.32 μV (-117 dBm) Modulation: 1 kHz Deviation : \pm3.5 kHz • Receiving | LOGIC | Connect the DC voltmeter to the land of the S line. | Maximum | RF | L1, L2, L3 |
| | | | | | MAIN | L1 |
| S-METER | 1 <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • Set the signal generator; <ul style="list-style-type: none"> Level : 0.32 μV (-117 dBm) Modulation: 1 kHz Deviation : \pm3.5 kHz • Receiving | Function display | S/RF indicator | 2 bars (S2) | DET | R5 |

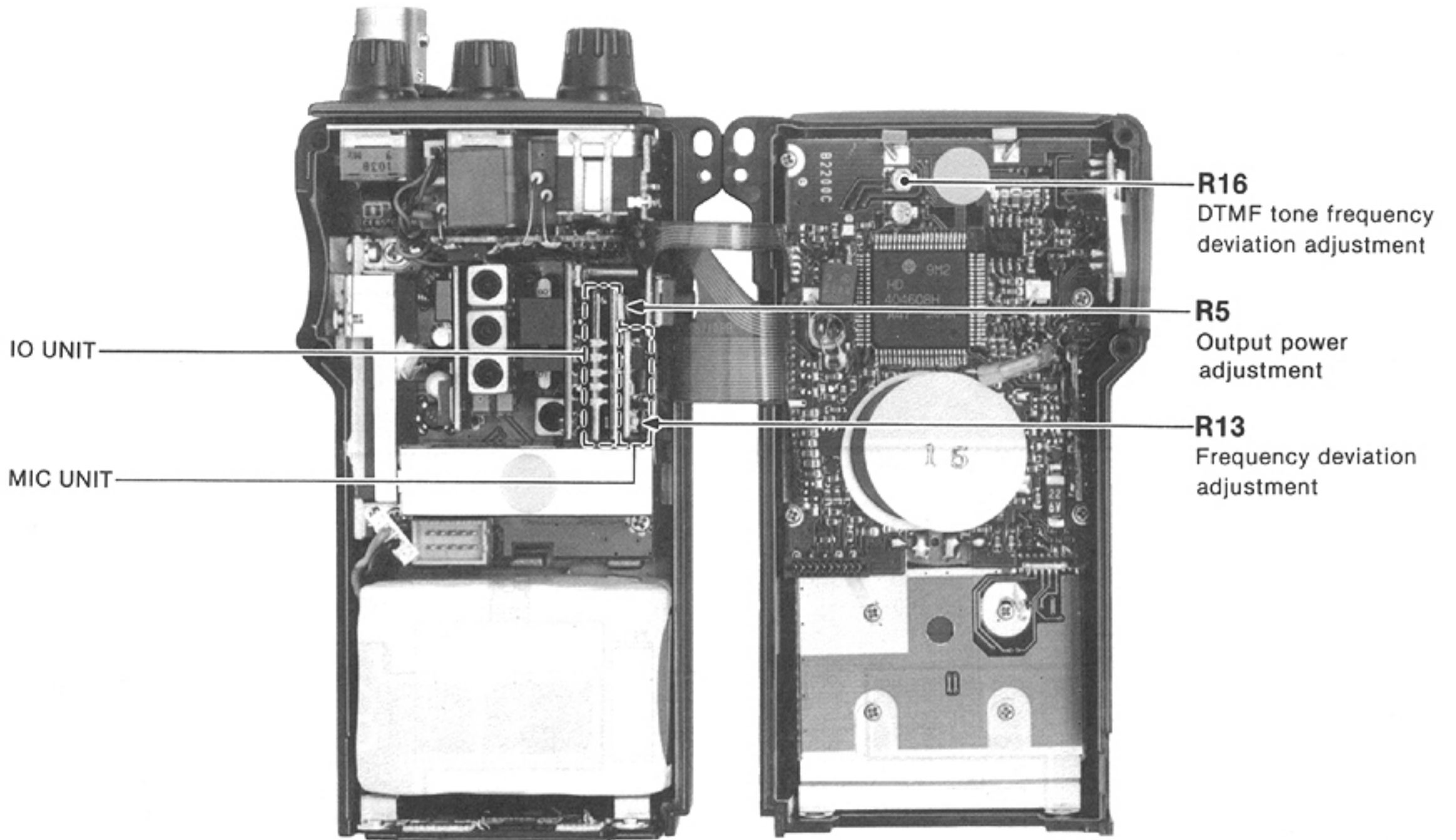
LOGIC, RF, MAIN AND DET UNITS



6-4 TRANSMITTER ADJUSTMENT

| ADJUSTMENT | | ADJUSTMENT CONDITIONS | MEASUREMENT | | VALUE | ADJUSTMENT POINT | | |
|-------------------------------|---|--|-------------|---|----------|------------------|---------------|--------|
| | | | UNIT | LOCATION | | UNIT | ADJUST | |
| OUTPUT POWER | 1 | <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • Output power : HIGH • Simplex • Transmitting | Top panel | Connect the RF power meter to the antenna connector. | 5.0 W | IO | R5 | |
| | 2 | <ul style="list-style-type: none"> • Output power : LOW 1 | | | | | 0.25~1.0 W | Verify |
| | 3 | <ul style="list-style-type: none"> • Output power : LOW 2 | | | | | Approx. 1.5 W | Verify |
| | 4 | <ul style="list-style-type: none"> • Output power : LOW 3 | | | | | Approx. 3.5 W | Verify |
| FREQUENCY DEVIATION | 1 | <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • Output power : HIGH • Apply an AF signal to the [MIC] jack. 170 mV/1 kHz • Set the FM deviation meter. HPF : 50 Hz LPF : 20 kHz De-emphasis: OFF Detector : (P-P)/2 • Transmitting | Top panel | Connect the FM deviation meter to the antenna connector via the attenuator. | ±4.8 kHz | MIC | R13 | |
| DTMF TONE FREQUENCY DEVIATION | 1 | <ul style="list-style-type: none"> • Displayed frequency: 222.50 MHz • Push and hold the [PTT] switch and then push the [D] key. | Top panel | Connect the deviation meter to the antenna connector via the attenuator. | ±3.5 kHz | LOGIC | R16 | |

IO, MIC AND LOGIC UNITS

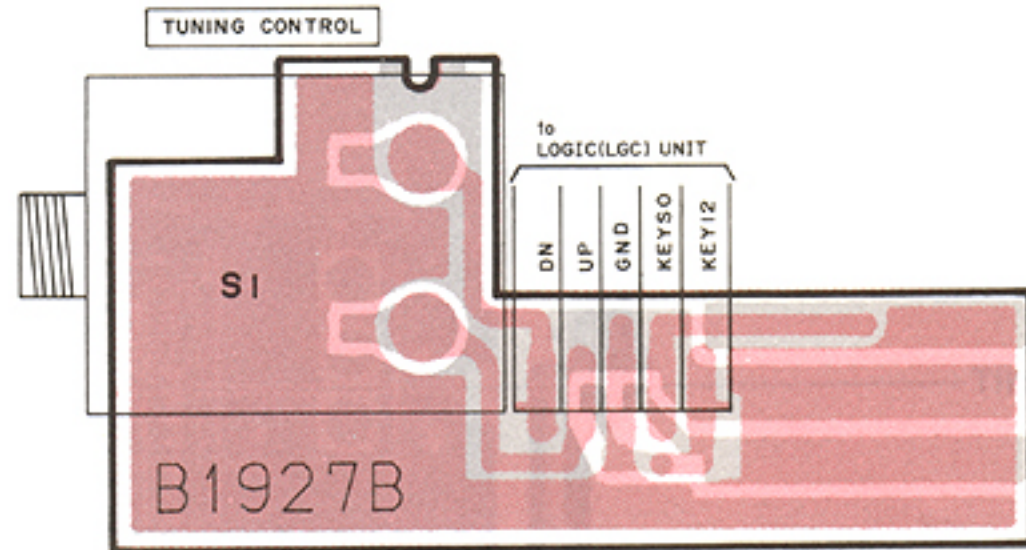
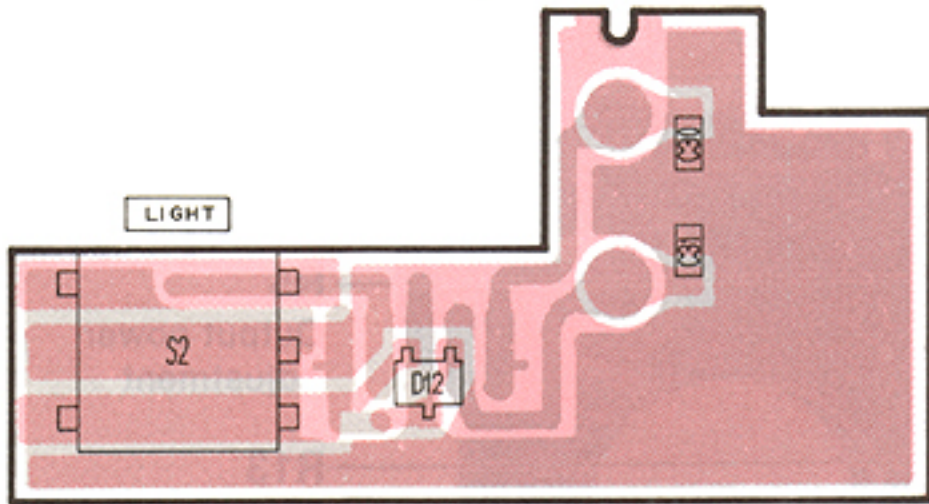


SECTION 7 BOARD LAYOUTS

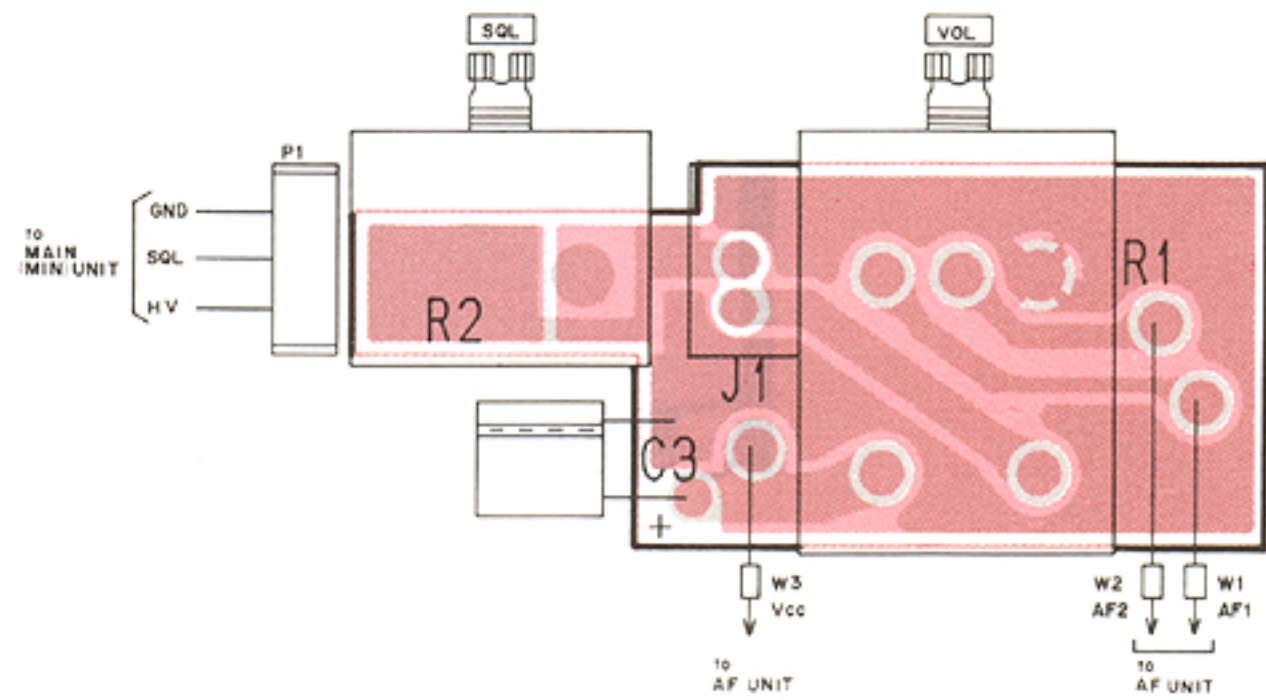
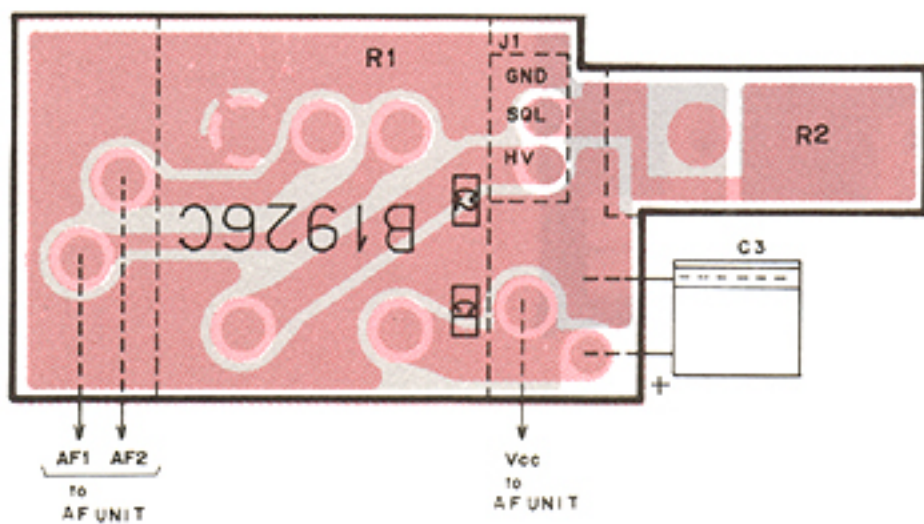
7-1 LOGIC DAUGHTER UNITS

• TUNING BOARD

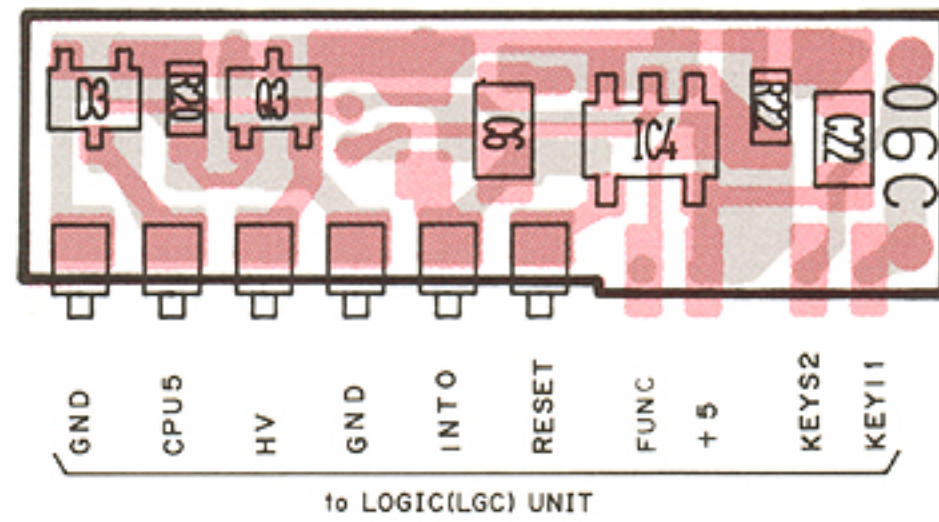
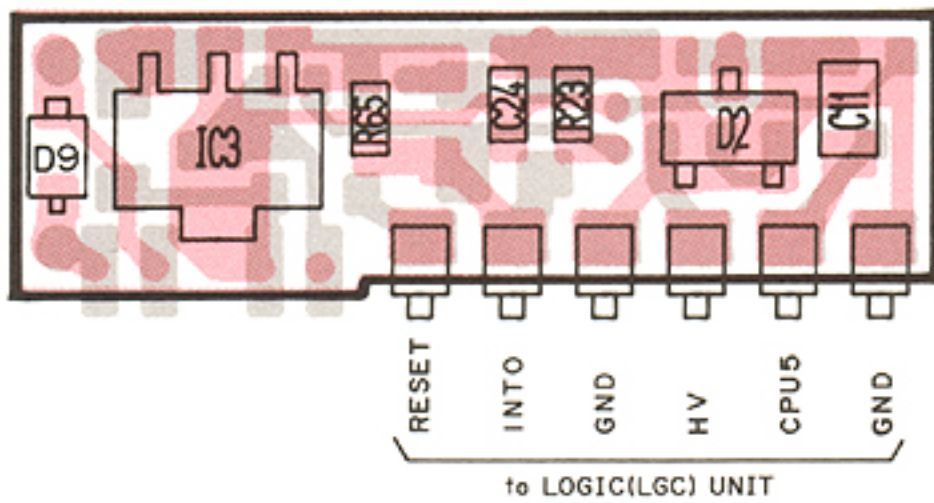
The used parts in the logic daughter units are included in the logic unit parts list.



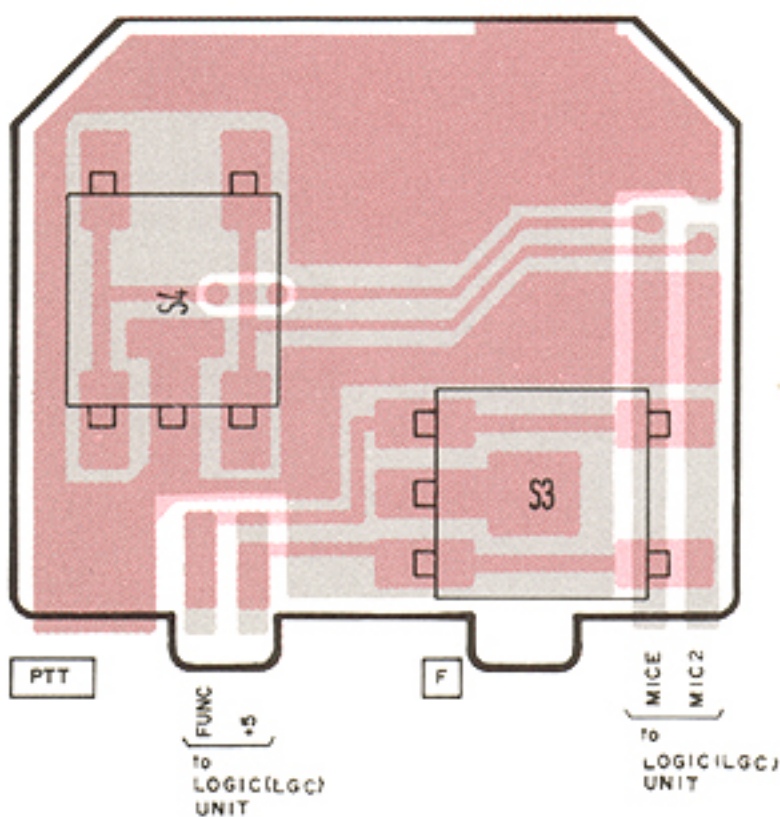
• VR UNIT



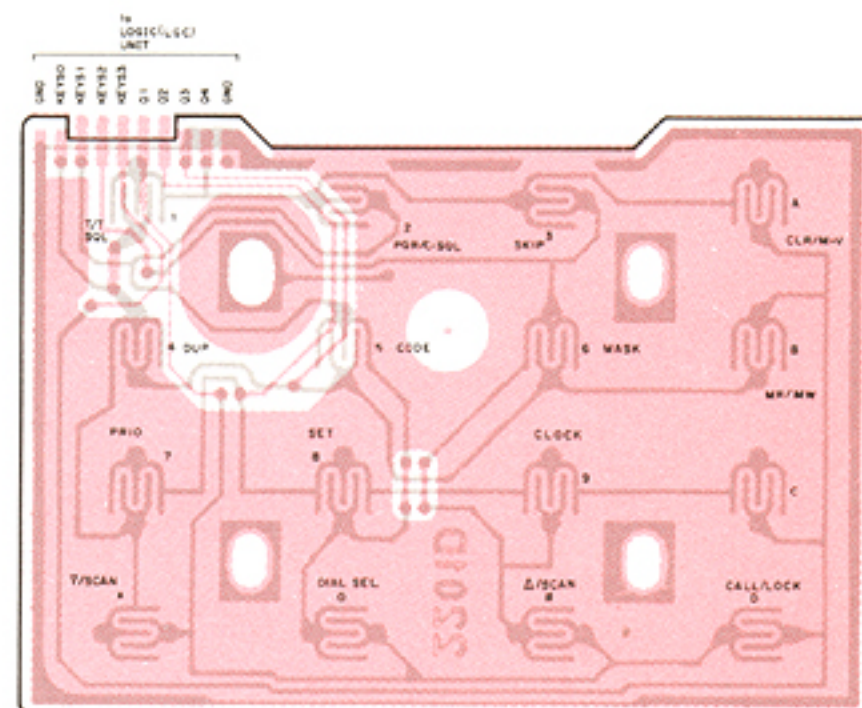
• RES BOARD



• PTT BOARD



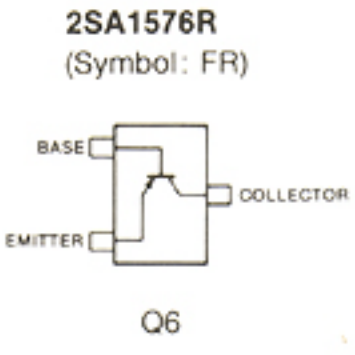
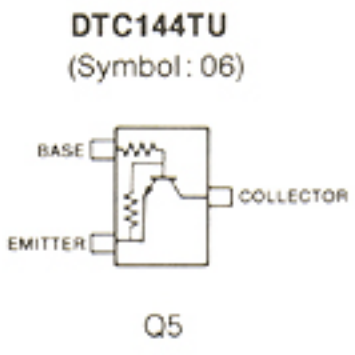
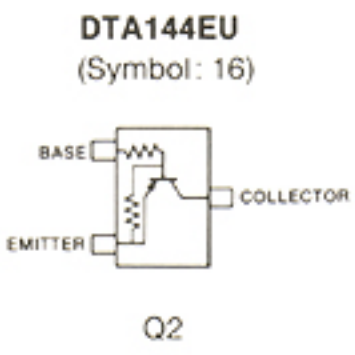
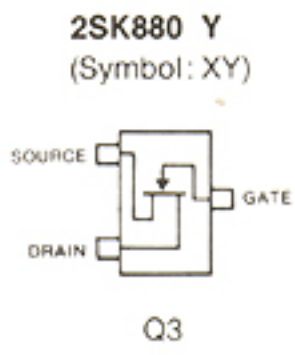
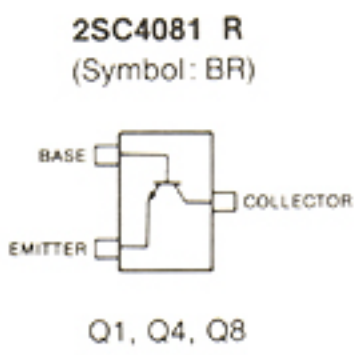
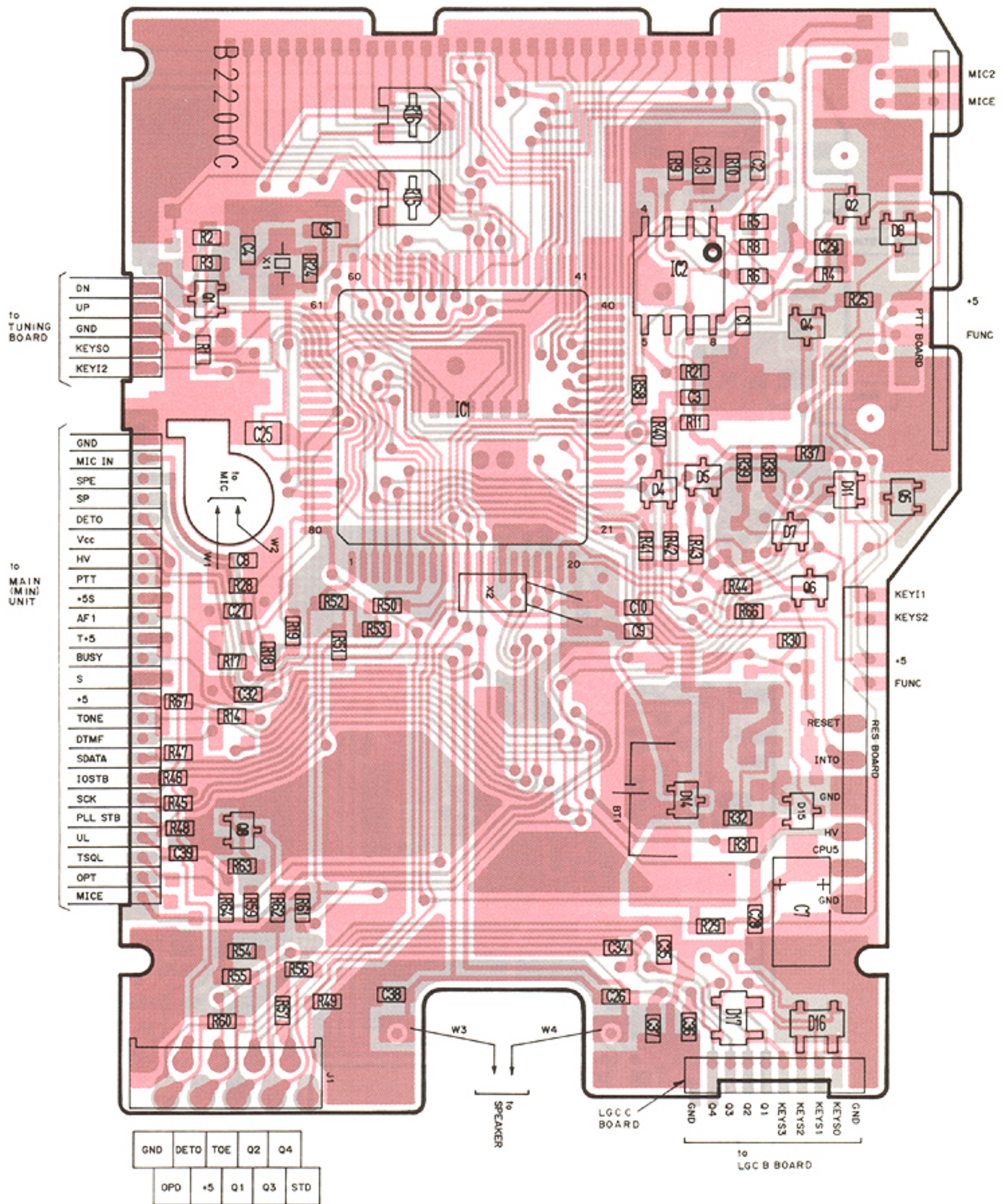
• LGC B BOARD



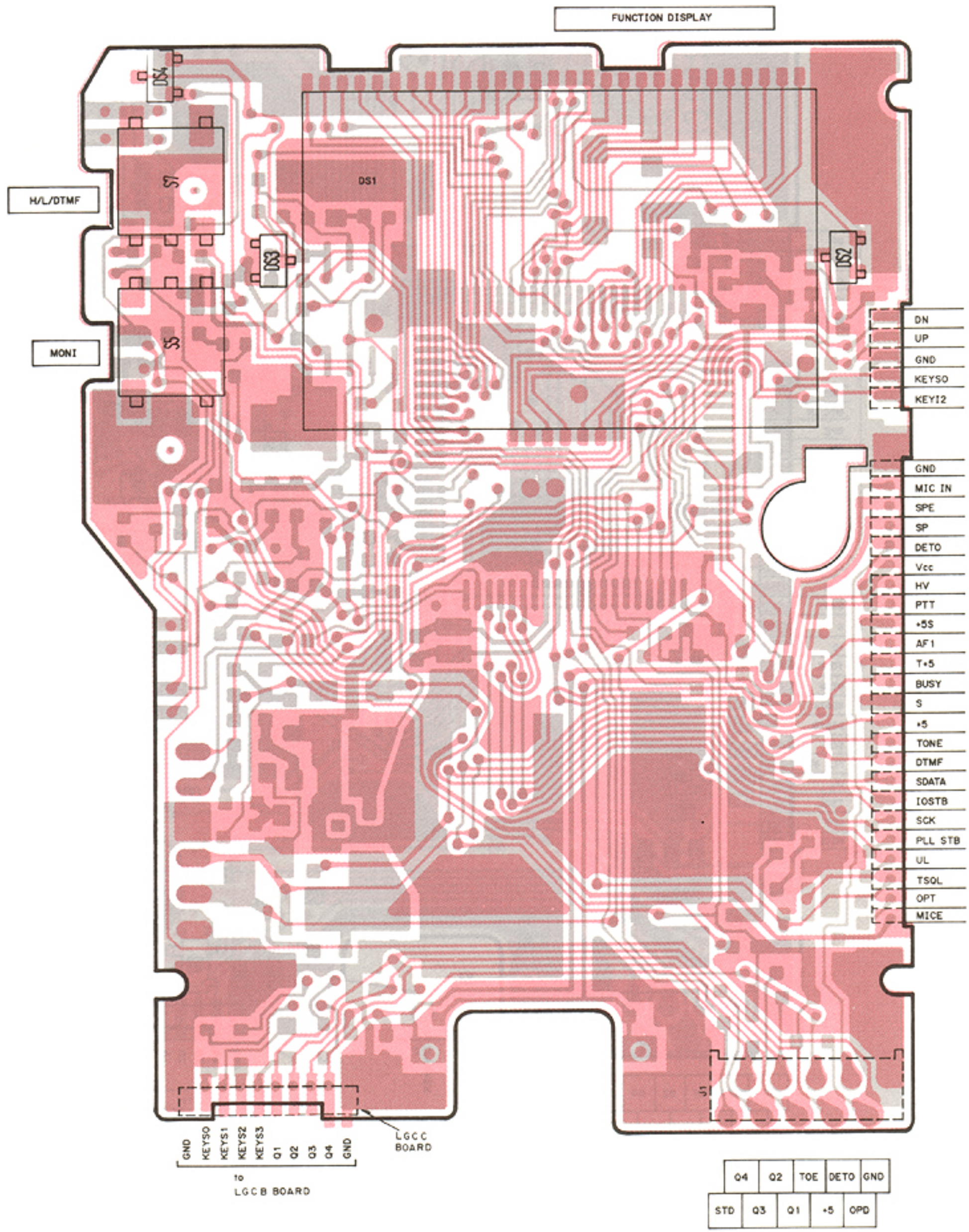
7-2 LOGIC (LGC) UNIT

• LOGIC UNIT (TOP VIEW)

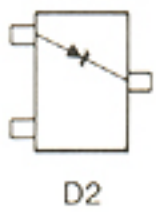
The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



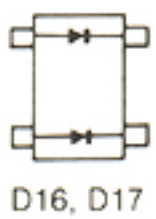
• LOGIC UNIT (BOTTOM VIEW)



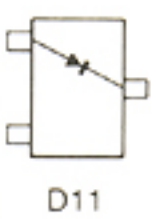
02CZ5.1-Z
(Symbol: 5.1Z)



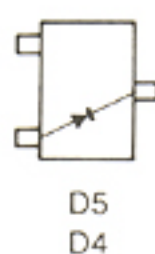
DWA010
(Symbol: 8M)



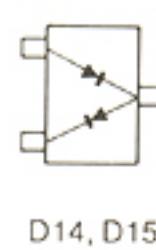
DA114
(Symbol: AV)



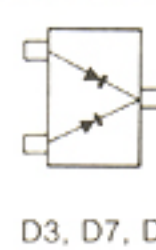
DA115
(Symbol: AU)



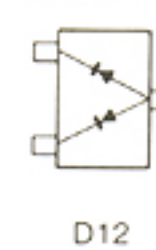
DA204U
(Symbol: K)



DAN202U
(Symbol: N)



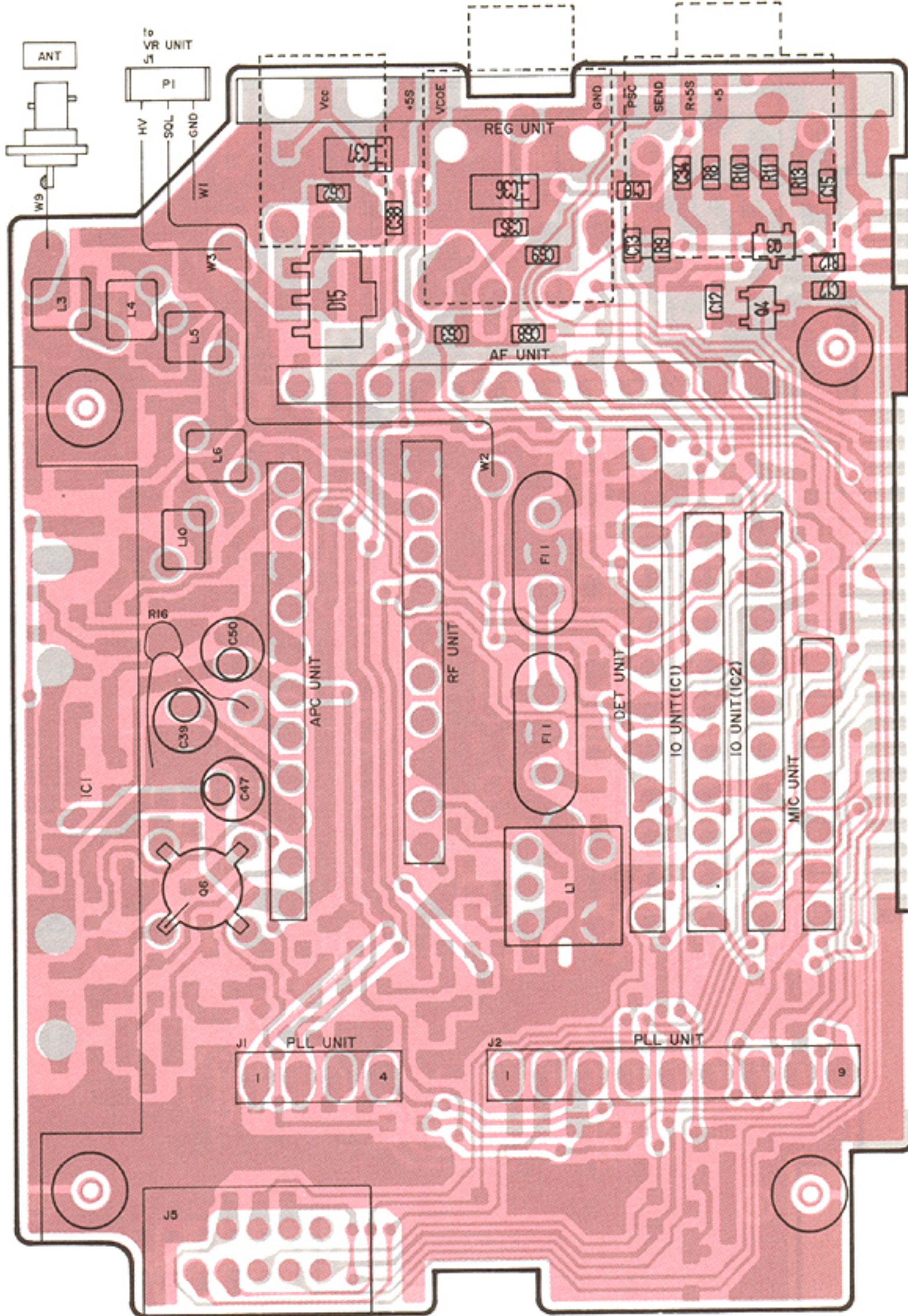
DAP202U
(Symbol: P)



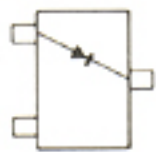
7-3 MAIN UNIT

• MAIN UNIT (TOP VIEW)

The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.

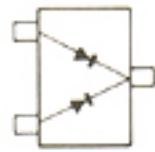


1SS153
(Symbol: A9)



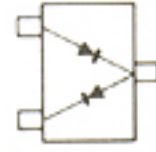
D9

DAN202U
(Symbol: N)



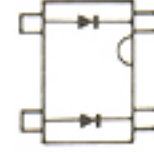
D8

HSM88AS
(Symbol: C1)
DA204U
(Symbol: K)



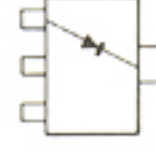
HSM88AS: D10, D11
DA204U: D13, D2

MA862
(Symbol: M11)



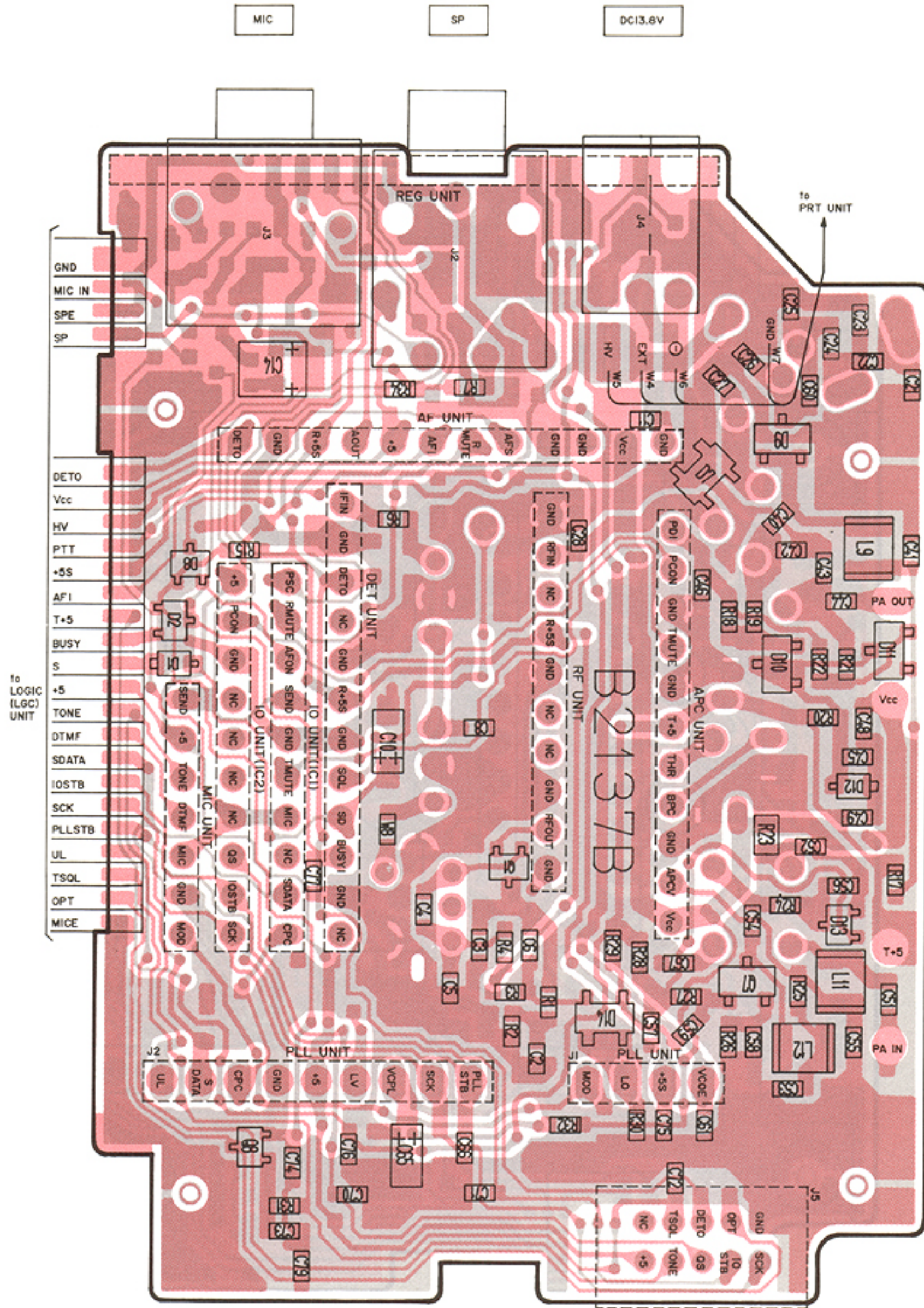
D14, D7

SB20-03P-TD
(Symbol: SC)

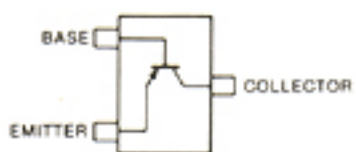


D15

• MAIN UNIT (BOTTOM VIEW)



2SA1576 R
(Symbol: FR)



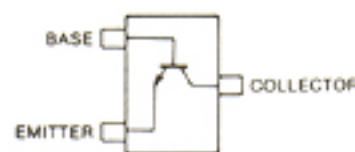
Q3, Q8

2SC3019



Q6

2SC3772 3
(Symbol: LY3)



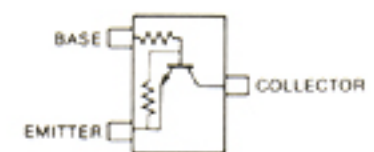
Q7

2SK882 Y
(Symbol: TY)



Q1

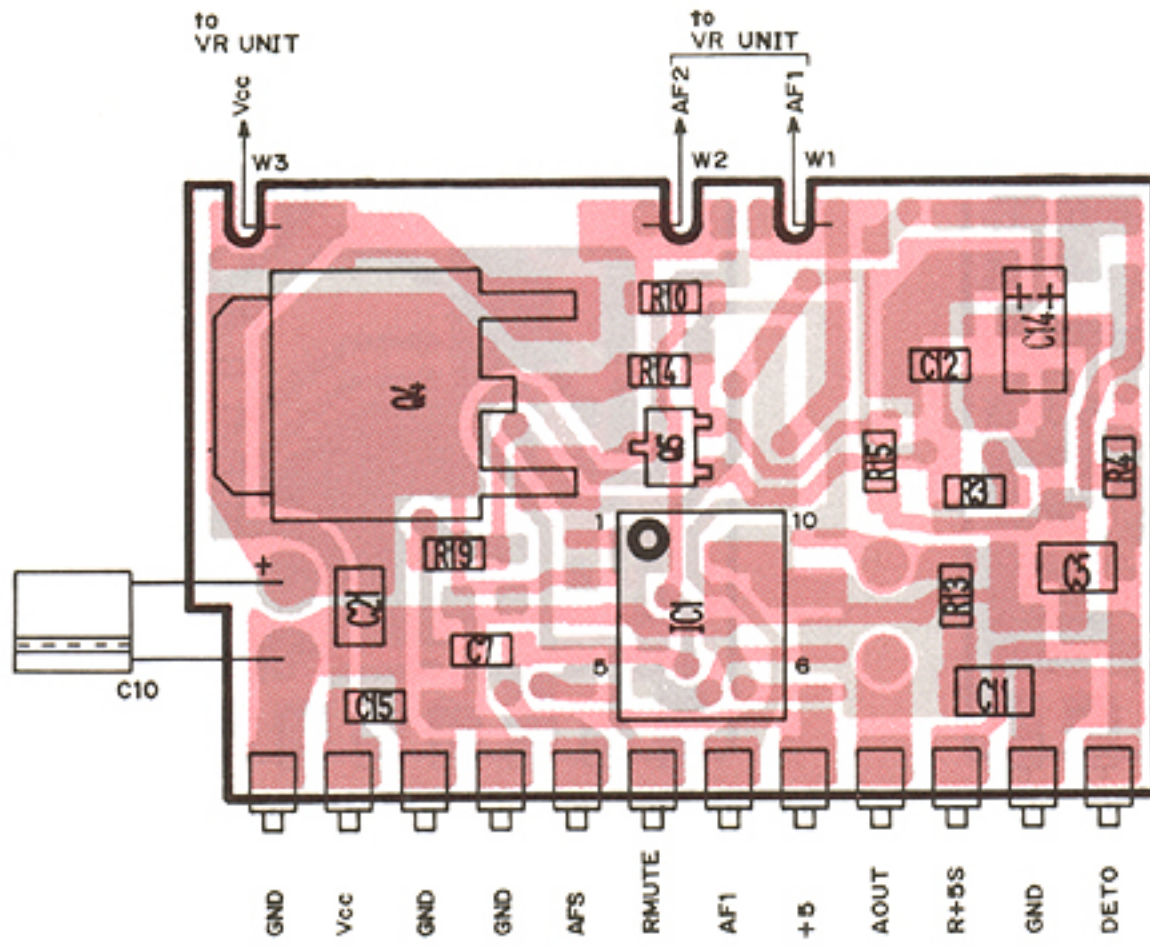
DTC144EU
(Symbol: 26)



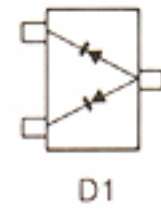
Q4

7-4 MAIN DAUGHTER UNITS

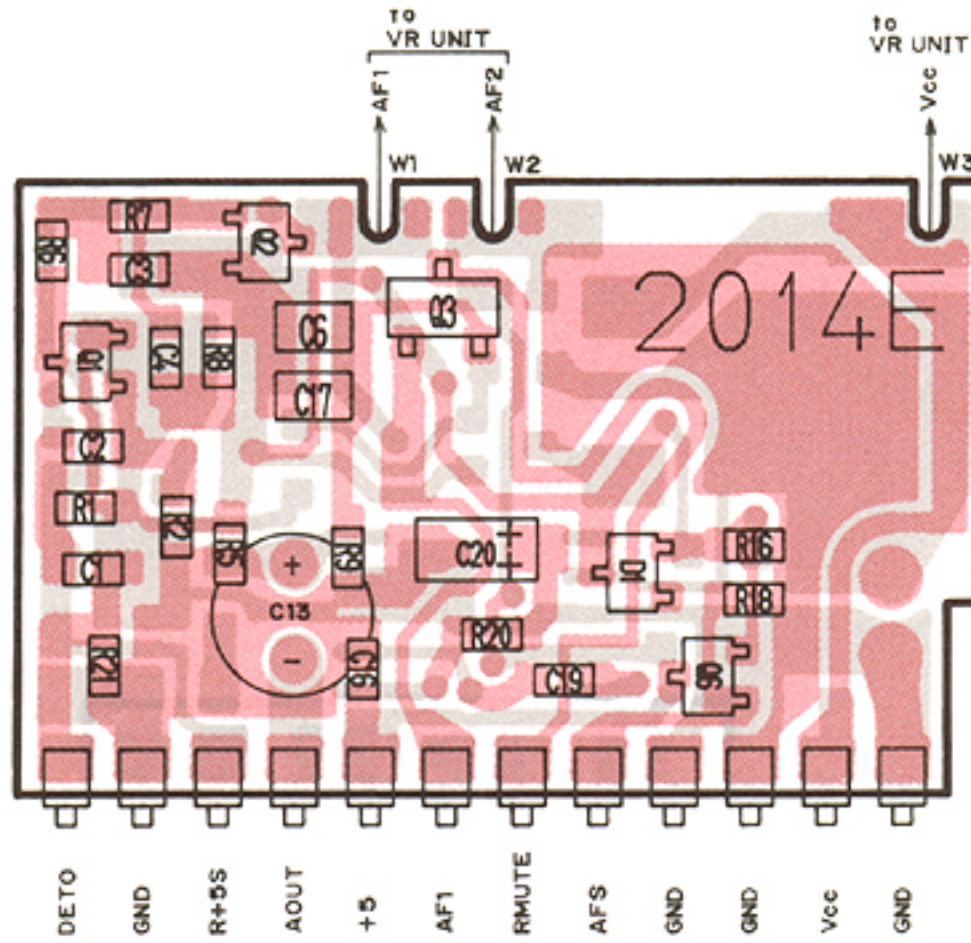
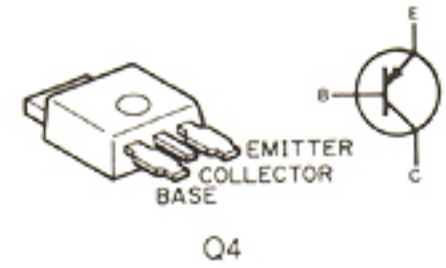
• AF UNIT



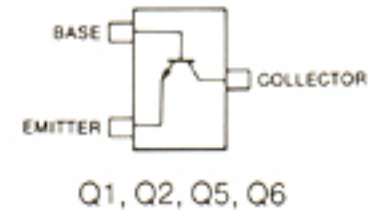
DAP202U
(Symbol: P)



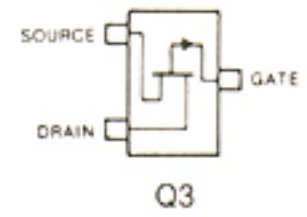
2SB1182 Q



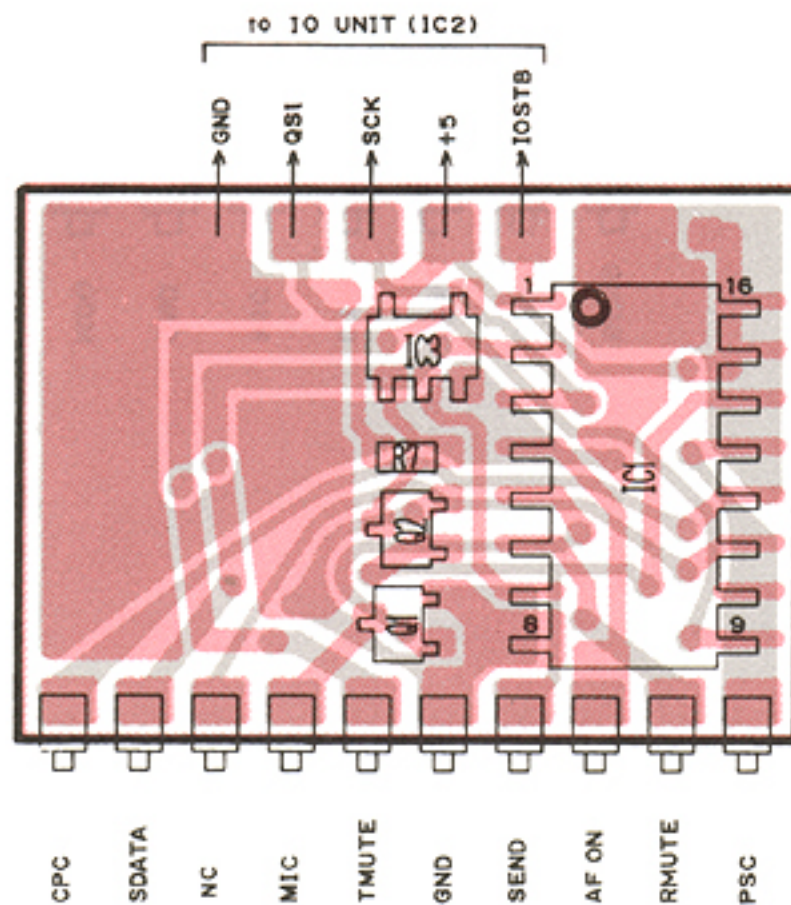
2SC4081 R
(Symbol: BR)



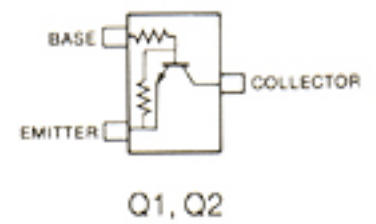
2SJ106-GR
(Symbol: VG)



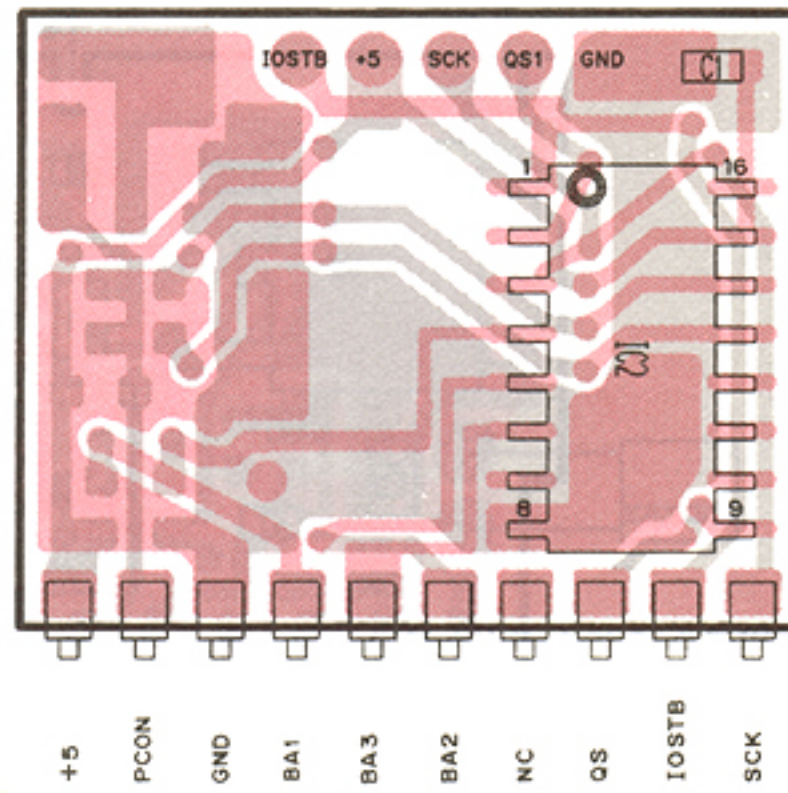
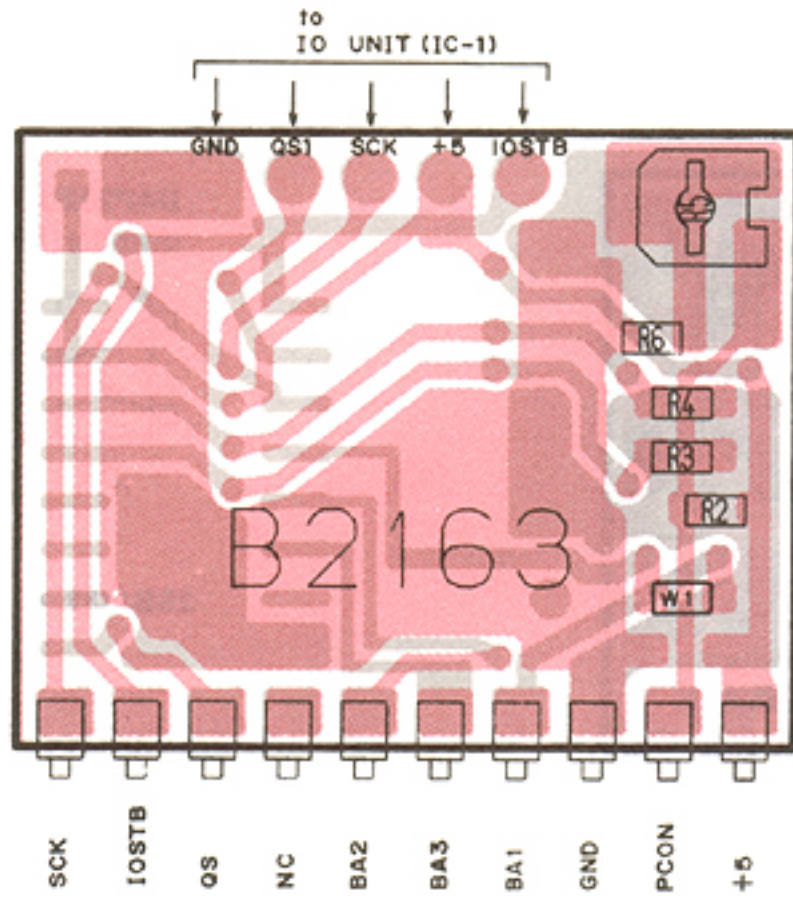
• IO UNIT (IC1)



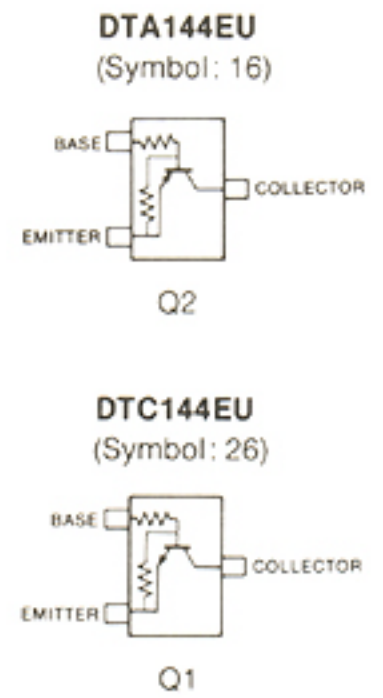
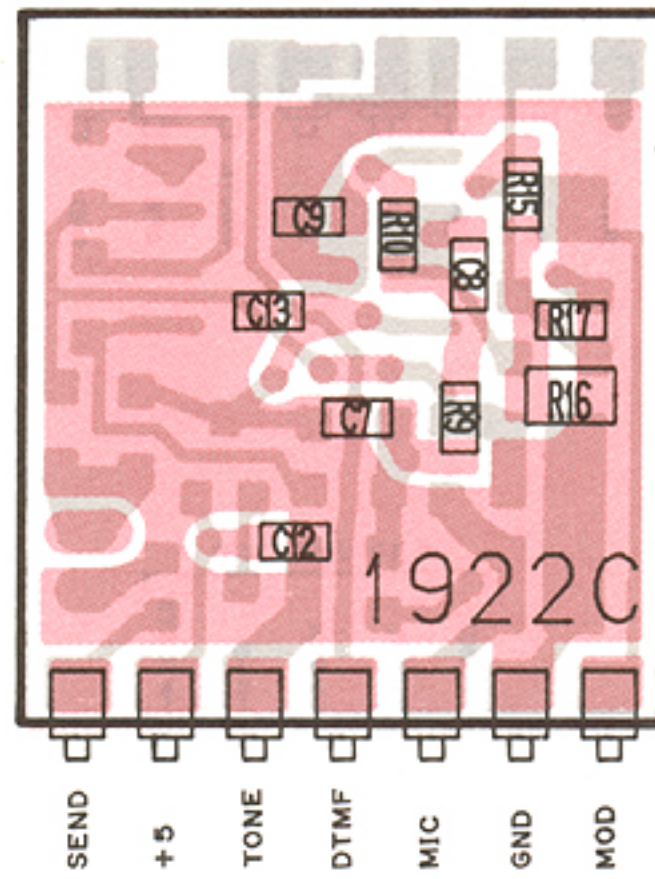
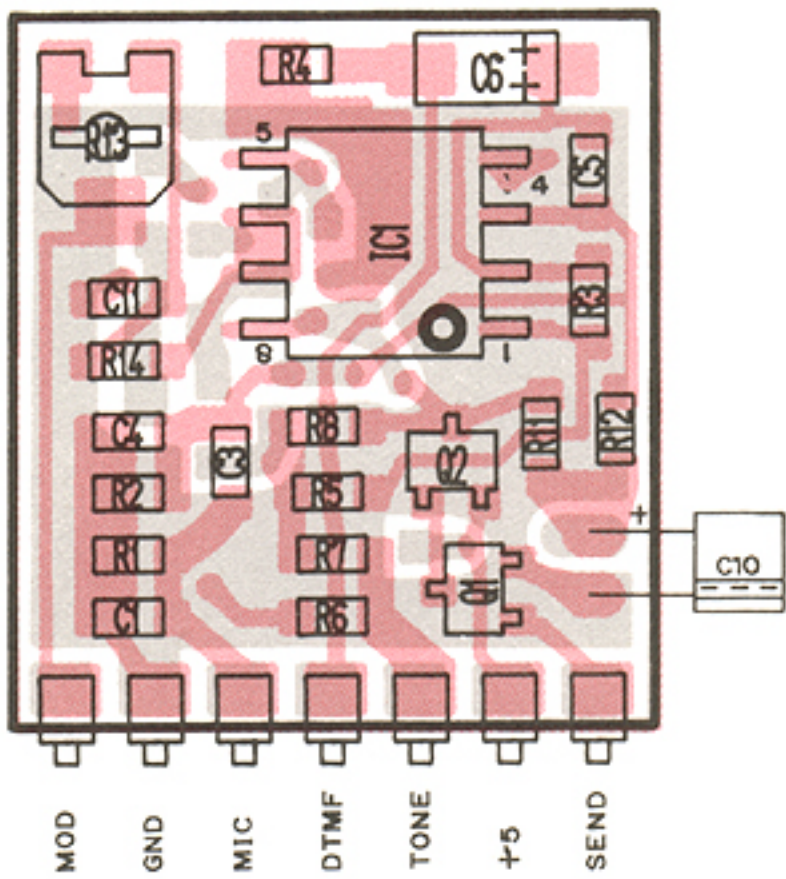
DTC144EU
(Symbol: 26)



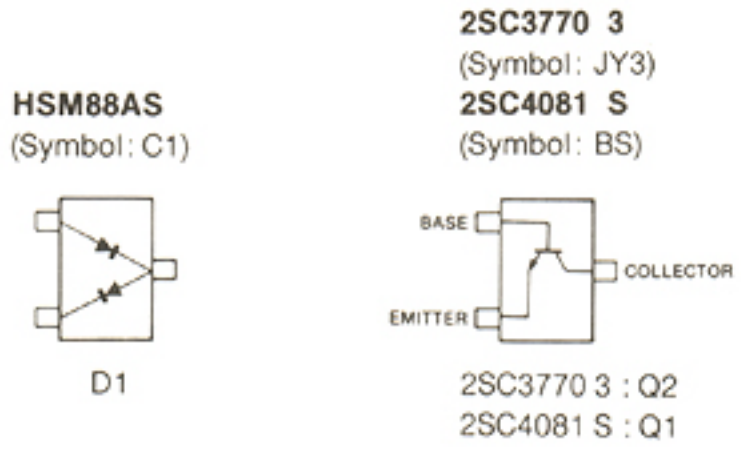
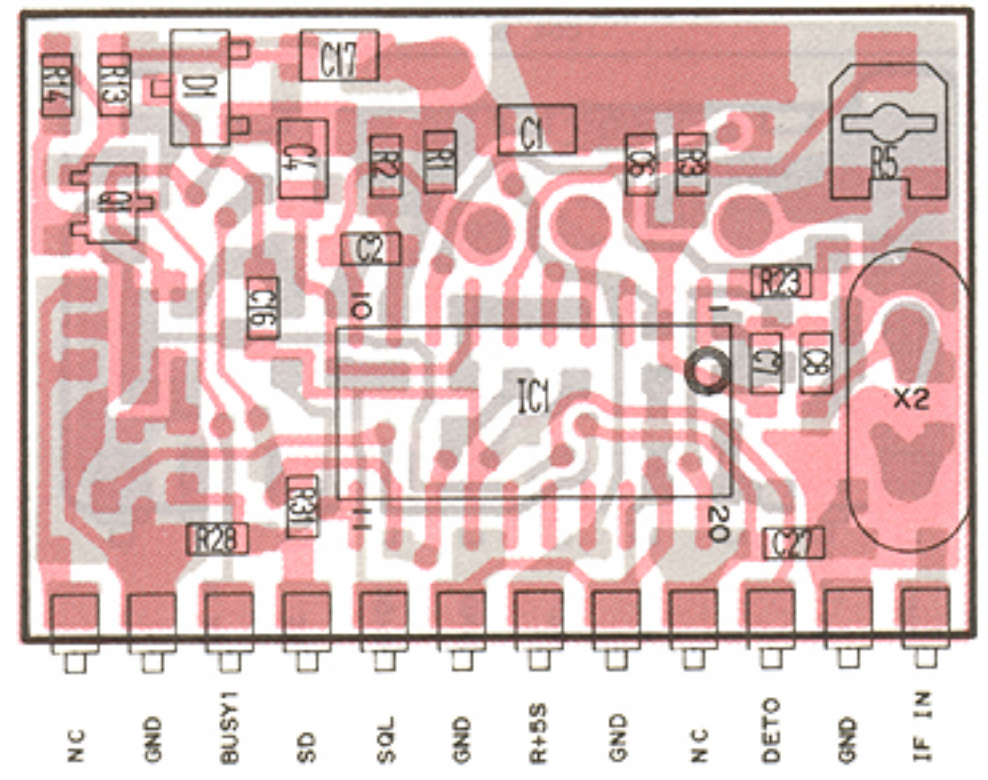
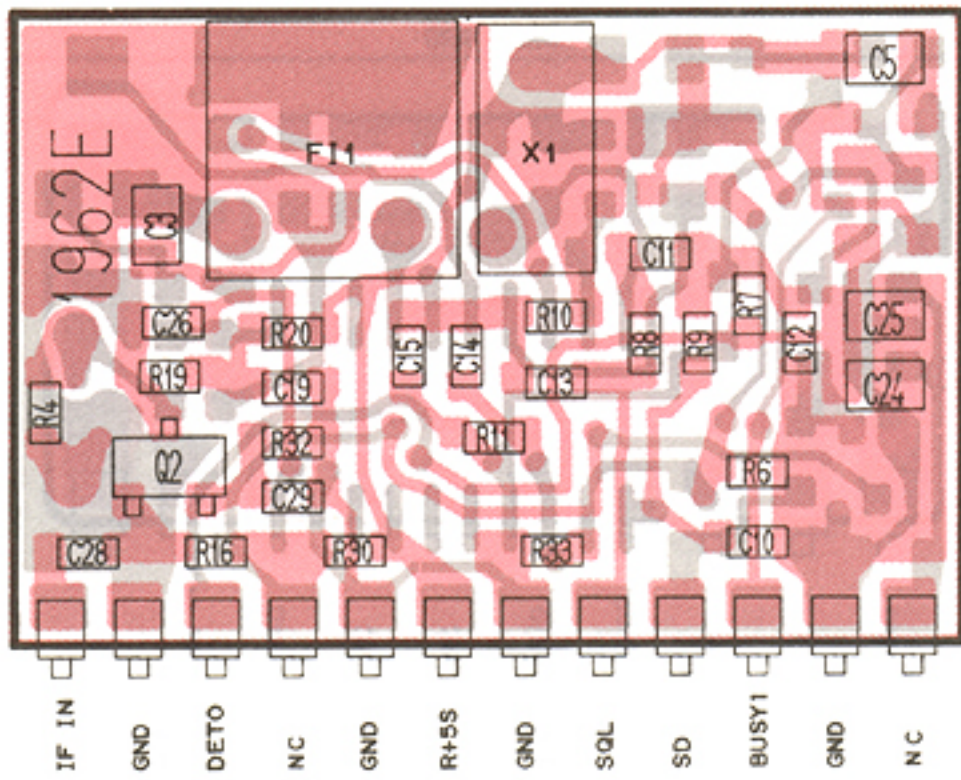
• IO UNIT (IC2)



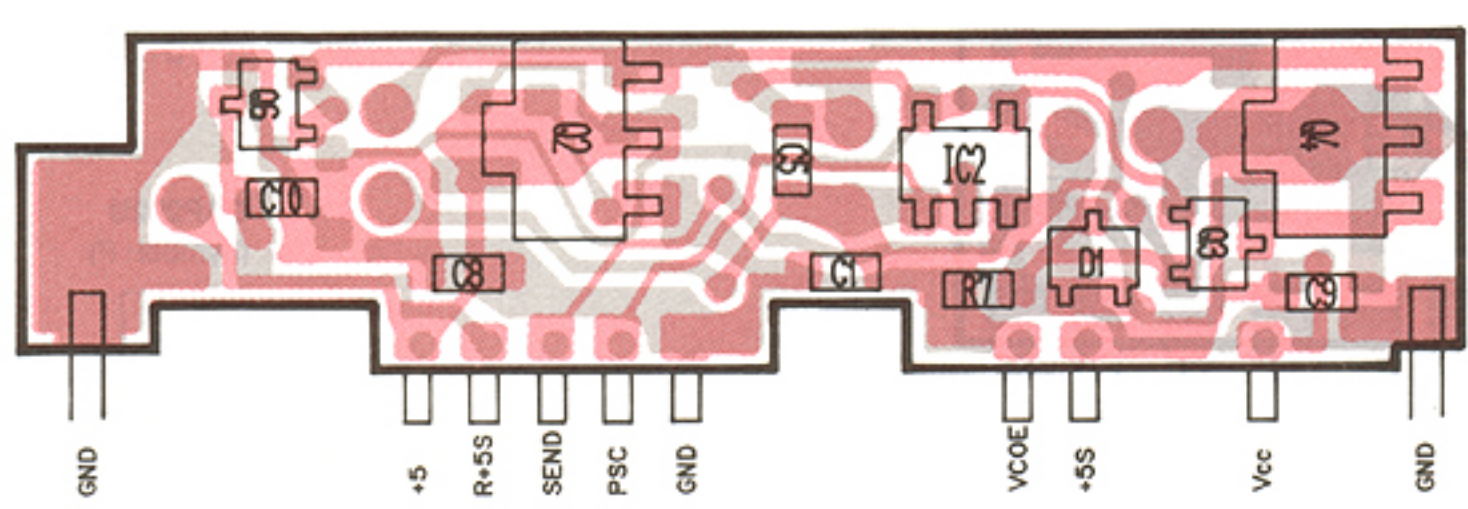
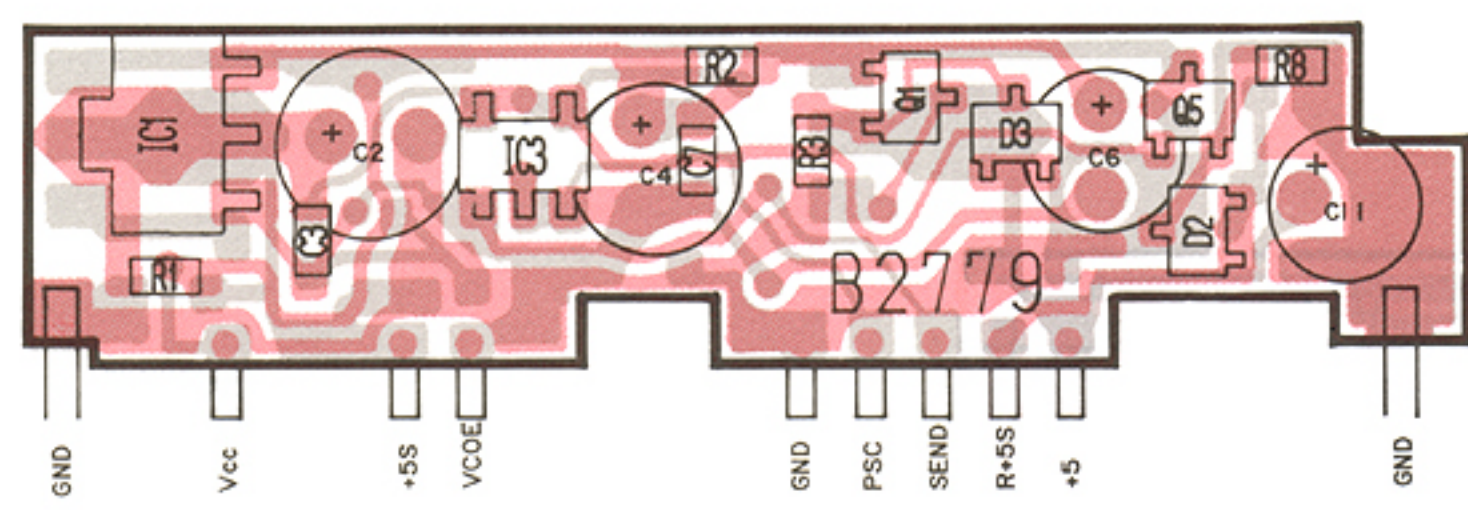
• MIC UNIT



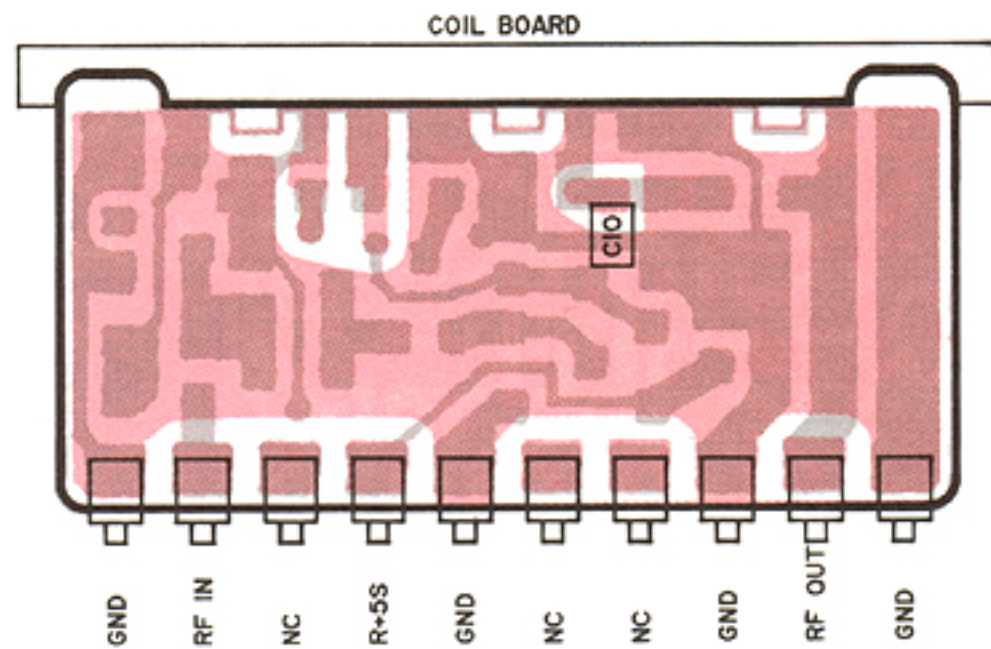
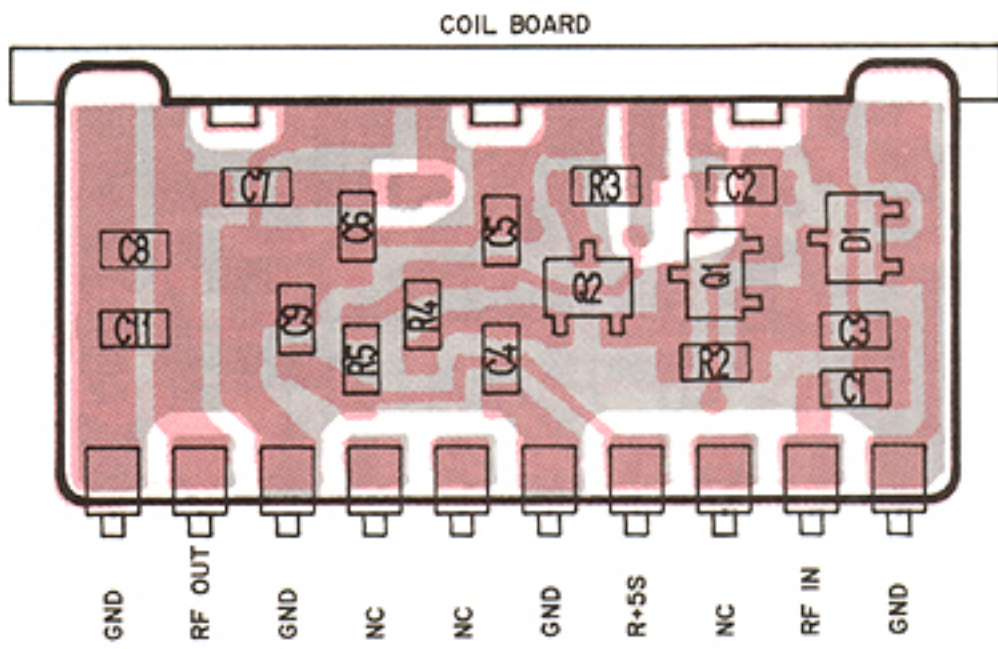
• DET UNIT



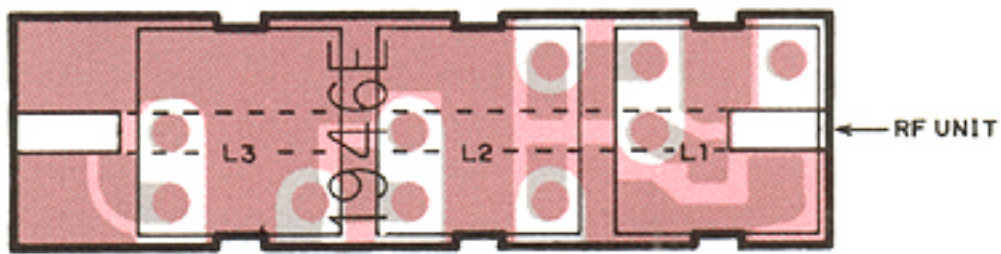
• REG UNIT



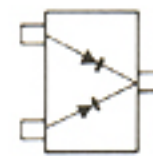
• RF UNIT



COIL BOARD

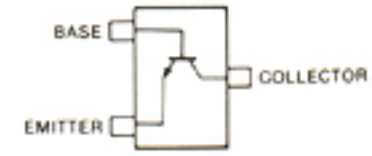


DAN202U
(Symbol: N)



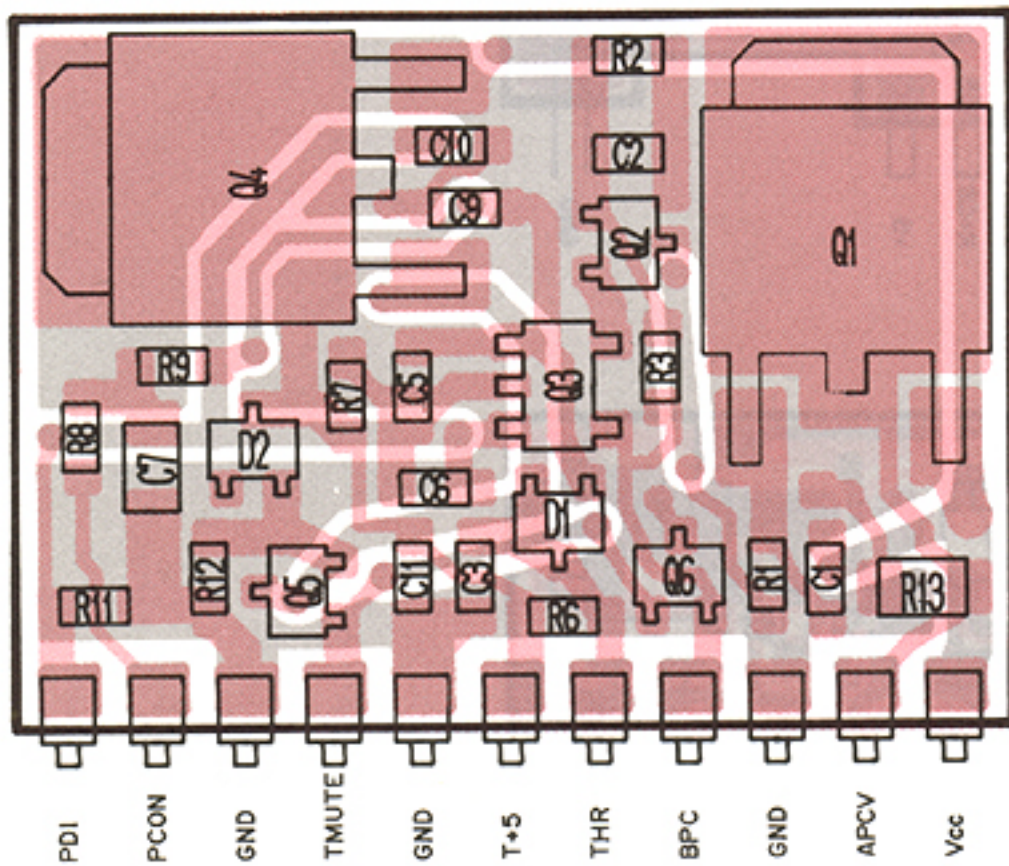
D1

2SC4403 3
(Symbol: LY3)
2SC4405 3
(Symbol: OY3)

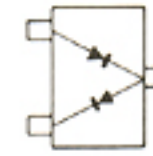


2SC4403 3 : Q2
2SC4405 3 : Q1

• APC UNIT

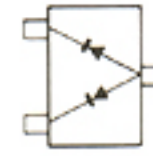


DA204U
(Symbol: K)



D1

DAP202U
(Symbol: P)



D2

2SA1576 R
(Symbol: RF)



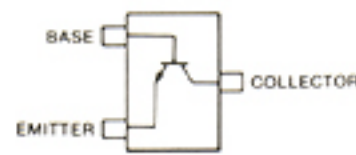
Q6

2SB1182 Q



Q1, Q4

2SC4081 S
(Symbol: BS)



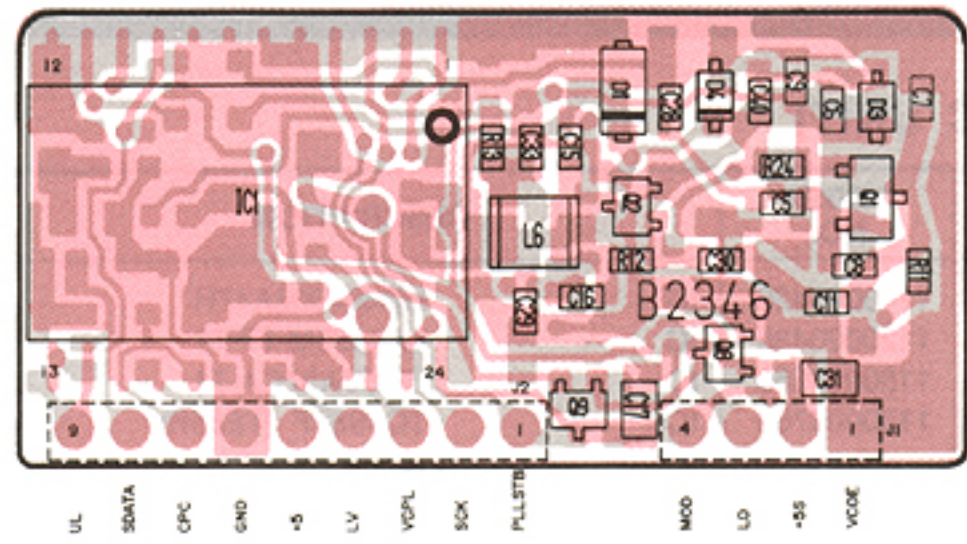
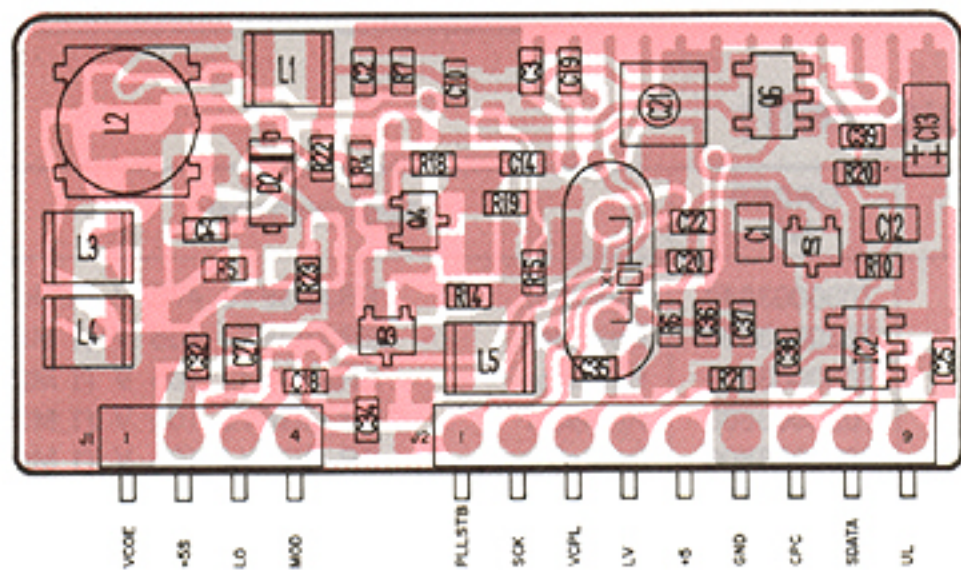
Q2, Q5

FMS1
(Symbol: SI)

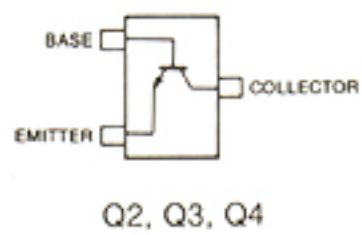


Q3

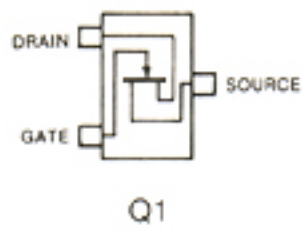
• PLL UNIT



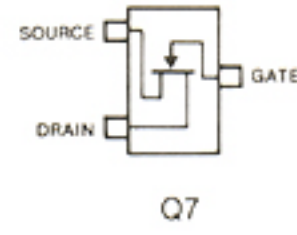
2SC4403 3
(Symbol: LY3)



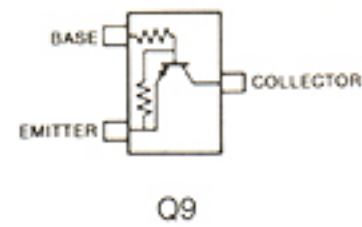
2SK302 Y
(Symbol: TY)



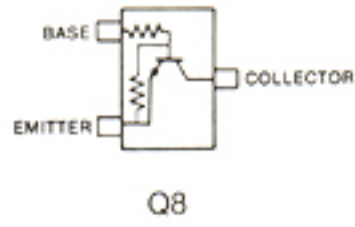
2SK880 Y
(Symbol: XY)



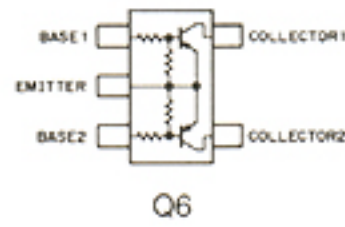
DTA143ZU
(Symbol: 113)



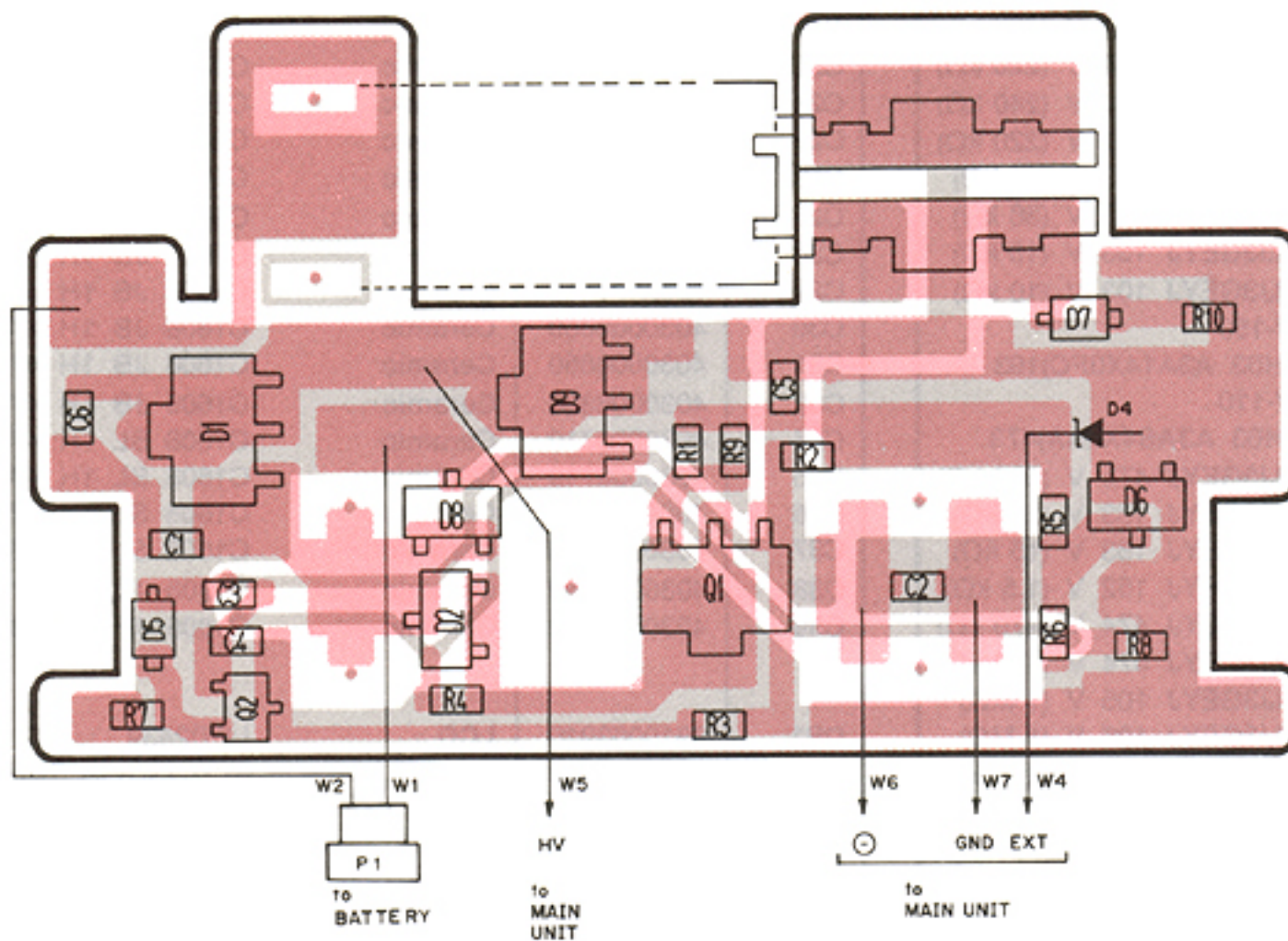
DTC144EU
(Symbol: 26)



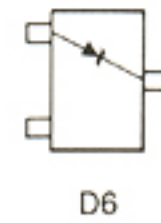
FMA2
(Symbol: A2)



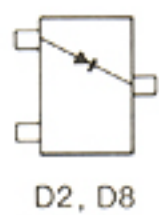
• PRT UNIT



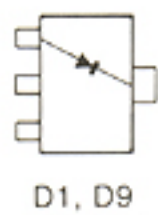
02CZ5.1-Z
(Symbol: 5.1Z)



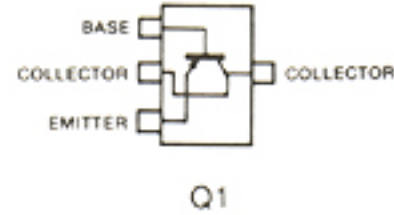
SB07-03C-TA
(Symbol: J)



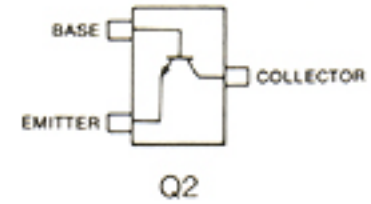
SB20-03P-TD
(Symbol: SC)



2SB798
(Symbol: DK)



2SC4081 S
(Symbol: BS)



SECTION 8 PARTS LIST

[LOGIC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-------------------------------|
| IC1 | 1140001420 | IC | HD404608A47H |
| IC2 | 1120000430 | IC | LA6393M-TP-T1 |
| IC3 | 1180000550 | IC | RH5VA37CA-T1 |
| IC4 | 1130003760 | IC | TC4S81F (TE85R) |
| Q1 | 1530002060 | Transistor | 2SC4081 T107 R |
| Q2 | 1590000720 | Transistor | DTA144EU T107 |
| Q3 | 1560000540 | FET | 2SK880-Y (TE85R) |
| Q4 | 1530002060 | Transistor | 2SC4081 T107 R |
| Q5 | 1590000660 | Transistor | DTC144TU T107 |
| Q6 | 1510000510 | Transistor | 2SA1576 T107 R |
| Q8 | 1530002060 | Transistor | 2SC4081 T107 R |
| D2 | 1730002160 | Zener | 02CZ5.1-Z (TE85R) |
| D3 | 1160000060 | Diode | DAN202U T107 |
| D4 | 1750000170 | Diode | DA115 T107 |
| D5 | 1750000170 | Diode | DA115 T107 |
| D7 | 1160000060 | Diode | DAN202U T107 |
| D8 | 1160000060 | Diode | DAN202U T107 |
| D9 | 1710000600 | Diode | 1SS254 |
| D11 | 1750000160 | Diode | DA114 T107 |
| D12 | 1160000050 | Diode | DAP202U T107 |
| D14 | 1750000130 | Diode | DA204U T107 |
| D15 | 1750000130 | Diode | DA204U T107 |
| D16 | 1750000120 | Diode | DWA010-TE |
| D17 | 1750000120 | Diode | DWA010-TE |
| X1 | 6060000260 | Ceralock | CSB800J220 |
| X2 | 6050005800 | Crystal | DT-26S 32.768KHZ |
| R1 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 kΩ) |
| R2 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 kΩ) |
| R3 | 7030003280 | Resistor | ERJ3GEYJ 470 V (47 Ω) |
| R4 | 7030003360 | Resistor | ERJ3GEYJ 221 V (220 Ω) |
| R5 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R6 | 7030003880 | Resistor | ERJ3GEYJ 244 V (240 kΩ) |
| R8 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R9 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R10 | 7030003650 | Resistor | ERJ3GEYJ 563 V (56 kΩ) |
| R11 | 7030003580 | Resistor | ERJ3GEYJ 153 V (15 kΩ) |
| R14 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R15 | 7310002740 | Trimmer | RV-150 (RH03 A3A14X0FC)103 |
| R16 | 7310002600 | Trimmer | RV-110 (RH03 A3AS4X0AA)473 |
| R17 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 kΩ) |
| R18 | 7030003580 | Resistor | ERJ3GEYJ 153 V (15 kΩ) |
| R19 | 7030003580 | Resistor | ERJ3GEYJ 153 V (15 kΩ) |
| R20 | 7030003460 | Resistor | ERJ3GEYJ 152 V (1.5 kΩ) |
| R21 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 kΩ) |
| R22 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 kΩ) |
| R23 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R24 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R25 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 kΩ) |
| R28 | 7030003620 | Resistor | ERJ3GEYJ 333 V (33 kΩ) |
| R29 | 7030003380 | Resistor | ERJ3GEYJ 331 V (330 Ω) |
| R30 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 kΩ) |
| R31 | 7030003580 | Resistor | ERJ3GEYJ 153 V (15 kΩ) |
| R32 | 7030003610 | Resistor | ERJ3GEYJ 273 V (27 kΩ) |
| R37 | 7030003790 | Resistor | ERJ3GEYJ 824 V (820 kΩ) |
| R38 | 7030003750 | Resistor | ERJ3GEYJ 394 V (390 kΩ) |
| R39 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R40 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R41 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R42 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R43 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |

[LOGIC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-----------------|-------------------------|
| R44 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R45 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R46 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R47 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R48 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R49 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R50 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R51 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R52 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R53 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R54 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R55 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R56 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R57 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R58 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R59 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R60 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R61 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R62 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R63 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R64 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R65 | 7030003200 | Resistor | ERJ3GEYJ 100 V (10 Ω) |
| R66 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R67 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| C1 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C2 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C3 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C4 | 4030006800 | Ceramic | C1608 SL 1H 221J- T-A |
| C5 | 4030006800 | Ceramic | C1608 SL 1H 221J- T-A |
| C6 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C7 | 4550000770 | Tantalum | TESVC 0J 226M-12L |
| C8 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C9 | 4030007030 | Ceramic | C1608 CH 1H 150J- T-A |
| C10 | 4030007030 | Ceramic | C1608 CH 1H 150J- T-A |
| C11 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C13 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C22 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C24 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C25 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C26 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C27 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C28 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C29 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C30 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C31 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C32 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C34 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C35 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C36 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C37 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C38 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C39 | 4030008430 | Ceramic | C1608 JF 1H 223Z- T-A |
| DS1 | 6910003910 | LCD | LCD2439 |
| DS2 | 5040000950 | LED | SLM-13DWS T97B |
| DS3 | 5040000950 | LED | SLM-13DWS T97B |
| DS4 | 5040001110 | LED | SLM-23VMWS T97B |
| MC1 | 7700000860 | Microphone | WM-62A |
| BT1 | 3020000160 | Lithium Battery | VL2020-1VC |
| S1 | 2260000890 | Encoder | SRBM1L040A [TUNING] |

[LOGIC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------------|--------------------------------|
| S2 | 2260001150 | Switch | SW-103 (SKHUPC007B) [LIGHT] |
| S3 | 2230000770 | Switch | SW-104 (SKHUPE004B) [F] |
| S4 | 2230000770 | Switch | SW-104 (SKHUPE004B) [PTT] |
| S5 | 2260001150 | Switch | SW-103 (SKHUPC007B) [MONI] |
| S7 | 2260001150 | Switch | SW-103 (SKHUPC007B) [H/L/DTMF] |
| SP1 | 2510000450 | Speaker | EAS-3P123D |
| EP1 | 0910022773 | P.C. Board | B 2200C (LOGIC) |
| EP2 | 0910024633 | P.C. Board | B 1927C (ENC) |
| EP3 | 0910024674 | P.C. Board | B 2106D (RES) |
| EP4 | 0910023222 | P.C. Board | B 2276B (PTT) |
| EP5 | 0910021322 | P.C. Board | B 2108B |
| EP6 | 0910021912 | P.C. Board | B 2111B |
| EP7 | 0910022754 | P.C. Board | B 2201D (LGCB) |
| EP8 | 0910023513 | P.C. Board | B 2291C |
| EP9 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |
| EP10 | 8930019700 | LCD Contact Strip | SRCN754 |

[VR UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------------|----------------------------|
| R1 | 7210001440 | Variable Resistor | RK097111101NA (10KA) [VOL] |
| R2 | 7210001450 | Variable Resistor | RK0971110051A (10KB) [SQL] |
| C1 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C2 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C3 | 4510002650 | Electrolytic | 16 MS7 100 μ F |
| EP1 | 0910024624 | P.C. Board | B 1926D |

[MAIN UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|----------------------------------|
| IC1 | 1150000800 | IC | SC1107 |
| Q1 | 1560000550 | FET | 2SK882-Y (TE85R) |
| Q3 | 1510000510 | Transistor | 2SA1576 T107 R |
| Q4 | 1590000430 | Transistor | DTC144EU T107 |
| Q6 | 1530000900 | Transistor | 2SC3019 |
| Q7 | 1530002030 | Transistor | 2SC3772-3-TA |
| Q8 | 1510000510 | Transistor | 2SA1576 T107 R |
| D1 | 1790000590 | Diode | MA110(TW) |
| D2 | 1750000130 | Diode | DA204U T107 |
| D7 | 1790000450 | Diode | MA862(TX) |
| D8 | 1160000060 | Diode | DAN202U T107 |
| D9 | 1750000080 | Diode | 1SS153-T2 |
| D10 | 1790000490 | Diode | HSM88AS-TR |
| D11 | 1790000490 | Diode | HSM88AS-TR |
| D12 | 1790000590 | Diode | MA110(TW) |
| D13 | 1750000130 | Diode | DA204U T107 |
| D14 | 1790000450 | Diode | MA862(TX) |
| D15 | 1790000680 | Diode | SB20-03P-TD |
| FI1 | 2010000230 | Filter | 30M15B (FL-76) |
| L1 | 6150003210 | Coil | LS-319 |
| L3 | 6110002000 | Coil | LA-226 |
| L4 | 6110002000 | Coil | LA-226 |
| L5 | 6110002000 | Coil | LA-226 |
| L6 | 6110002000 | Coil | LA-226 |
| L9 | 6200000260 | Coil | LQN 2A R10K |
| L10 | 6110002040 | Coil | LA-225 |
| L11 | 6200000110 | Coil | LQN 2A 33NM |
| L12 | 6200000760 | Coil | LQN 2A 56NM |
| R1 | 7030003290 | Resistor | ERJ3GEYJ 560 V (56 Ω) |
| R2 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 k Ω) |
| R3 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 k Ω) |
| R4 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R6 | 7030003410 | Resistor | ERJ3GEYJ 561 V (560 Ω) |
| R7 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 k Ω) |
| R8 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R9 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R10 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 k Ω) |
| R11 | 7030003450 | Resistor | ERJ3GEYJ 122 V (1.2 k Ω) |
| R12 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 k Ω) |
| R13 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 k Ω) |
| R15 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 k Ω) |
| R16 | 7510000070 | Thermistor | ERT-D2FHL503S |
| R17 | 7030003340 | Resistor | ERJ3GEYJ 151 V (150 Ω) |
| R18 | 7030003380 | Resistor | ERJ3GEYJ 331 V (330 Ω) |
| R19 | 7030003470 | Resistor | ERJ3GEYJ 182 V (1.8 k Ω) |
| R20 | 7030003550 | Resistor | ERJ3GEYJ 822 V (8.2 k Ω) |
| R21 | 7030003490 | Resistor | ERJ3GEYJ 272 V (2.7 k Ω) |
| R22 | 7030003390 | Resistor | ERJ3GEYJ 391 V (390 Ω) |
| R23 | 7030000100 | Resistor | MCR10EZHJ 4.7 Ω (4R7) |
| R24 | 7030003320 | Resistor | ERJ3GEYJ 101 V (100 Ω) |
| R25 | 7030003200 | Resistor | ERJ3GEYJ 100 V (10 Ω) |
| R26 | 7030003260 | Resistor | ERJ3GEYJ 330 V (33 Ω) |
| R27 | 7030003410 | Resistor | ERJ3GEYJ 561 V (560 Ω) |
| R28 | 7030003410 | Resistor | ERJ3GEYJ 561 V (560 Ω) |
| R29 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 k Ω) |
| R30 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 k Ω) |
| R31 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 M Ω) |
| R32 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 k Ω) |
| R34 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 k Ω) |
| C2 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C3 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C4 | 4030006670 | Ceramic | C1608 SL 1H 270J- T-A |
| C5 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |

[MAIN UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|--------------|----------------------------|
| C6 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C8 | 4030006620 | Ceramic | C1608 SL 1H 120J- T-A |
| C10 | 4550000460 | Tantalum | TESVA 1C 105M1-8L |
| C11 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C12 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C13 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C14 | 4550003040 | Tantalum | TEMSVB2 0J 106M-8 L |
| C15 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C16 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C17 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |
| C21 | 4030006620 | Ceramic | C1608 SL 1H 120J- T-A |
| C22 | 4030006520 | Ceramic | C1608 SL 1H 010C- T-A |
| C23 | 4030006660 | Ceramic | C1608 SL 1H 220J- T-A |
| C24 | 4030008440 | Ceramic | C1608 SL 1H 1R5C- T-A |
| C25 | 4030006620 | Ceramic | C1608 SL 1H 120J- T-A |
| C26 | 4030006630 | Ceramic | C1608 SL 1H 150J- T-A |
| C27 | 4030006660 | Ceramic | C1608 SL 1H 220J- T-A |
| C28 | 4030006610 | Ceramic | C1608 SL 1H 100D- T-A |
| C34 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C35 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C36 | 4550002890 | Tantalum | TESVA 1A 225M1-8L |
| C37 | 4550002890 | Tantalum | TESVA 1A 225M1-8L |
| C38 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C39 | 4510001380 | Electrolytic | 25 MS5 4R7 μ F |
| C40 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C41 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C42 | 4030006630 | Ceramic | C1608 SL 1H 150J- T-A |
| C43 | 4030006630 | Ceramic | C1608 SL 1H 150J- T-A |
| C44 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C45 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C46 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C47 | 4510003160 | Electrolytic | 16 RC2 22 μ F (D =4.0) |
| C48 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C49 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C50 | 4510001350 | Electrolytic | 16 MS5 10 μ F |
| C51 | 4030006590 | Ceramic | C1608 SL 1H 080D- T-A |
| C52 | 4030006890 | Ceramic | C1608 JF 1H 103Z- T-A |
| C53 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C54 | 4030006610 | Ceramic | C1608 SL 1H 100D- T-A |
| C55 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C56 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C57 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C58 | 4030006890 | Ceramic | C1608 JF 1H 103Z- T-A |
| C59 | 4030006670 | Ceramic | C1608 SL 1H 270J- T-A |
| C60 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C61 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C62 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C63 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C65 | 4550000460 | Tantalum | TESVA 1C 105M1-8L |
| C66 | 4030006760 | Ceramic | C1608 SL 1H 121J- T-A |
| C67 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C68 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C69 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C70 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C71 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C72 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C73 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C74 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C75 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C76 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C77 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C79 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| EP1 | 0910022142 | P.C. Board | B 2137B (MAIN) |

[AF UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|--------------|----------------------------------|
| IC1 | 1110001810 | IC | TA7388F(TP1) |
| Q1 | 1530002060 | Transistor | 2SC4081 T107 R |
| Q2 | 1530002060 | Transistor | 2SC4081 T107 R |
| Q3 | 1590000520 | FET | 2SJ106-GR (TE85R) |
| Q4 | 1520000270 | Transistor | 2SB1182 T201 Q |
| Q5 | 1530002060 | Transistor | 2SC4081 T107 R |
| Q6 | 1530002060 | Transistor | 2SC4081 T107 R |
| D1 | 1160000050 | Diode | DAP202U T107 |
| R1 | 7030003580 | Resistor | ERJ3GEYJ 153 V (15 k Ω) |
| R2 | 7030003700 | Resistor | ERJ3GEYJ 154 V (150 k Ω) |
| R3 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 k Ω) |
| R4 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 k Ω) |
| R5 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 k Ω) |
| R6 | 7030003630 | Resistor | ERJ3GEYJ 393 V (39 k Ω) |
| R7 | 7030003630 | Resistor | ERJ3GEYJ 393 V (39 k Ω) |
| R8 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 k Ω) |
| R9 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 M Ω) |
| R10 | 7030003320 | Resistor | ERJ3GEYJ 101 V (100 Ω) |
| R13 | 7030003200 | Resistor | ERJ3GEYJ 100 V (10 Ω) |
| R14 | 7030003420 | Resistor | ERJ3GEYJ 681 V (680 Ω) |
| R15 | 7030003420 | Resistor | ERJ3GEYJ 681 V (680 Ω) |
| R16 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 k Ω) |
| R18 | 7030003760 | Resistor | ERJ3GEYJ 474 V (470 k Ω) |
| R19 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 k Ω) |
| R20 | 7030003340 | Resistor | ERJ3GEYJ 151 V (150 Ω) |
| R21 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 k Ω) |
| C1 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |
| C2 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |
| C3 | 4030006870 | Ceramic | C1608 JB 1H 222K- T-A |
| C4 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C5 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C6 | 4030005110 | Ceramic | C2012 JB 1E 473K- T-A |
| C7 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C10 | 4510001340 | Electrolytic | 10 MS5 33 μ F |
| C11 | 4030005110 | Ceramic | C2012 JB 1E 473K- T-A |
| C12 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C13 | 4510003180 | Electrolytic | 6.3 RC2 100 μ F (D =5.0) |
| C14 | 4550003290 | Tantalum | TESVA 0G 475M1-8L |
| C15 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C16 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C17 | 4030005110 | Ceramic | C2012 JB 1E 473K- T-A |
| C19 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C20 | 4550002950 | Tantalum | TESVA 0J 335M1-8L |
| C21 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| EP1 | 0910024656 | P.C. Board | B 2014F (AF) |
| EP2 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[IO UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-------------------------------|
| IC1 | 1130000830 | IC | μPD4094BG-T1 |
| IC2 | 1130000830 | IC | μPD4094BG-T1 |
| IC3 | 1130004170 | IC | TC4S01F (TE85R) |
| Q1 | 1590000430 | Transistor | DTC144EU T107 |
| Q2 | 1590000430 | Transistor | DTC144EU T107 |
| R2 | 7030003700 | Resistor | ERJ3GEYJ 154 V (150 kΩ) |
| R3 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R4 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R5 | 7310002580 | Trimmer | RV-108 (RH03 A3A15X05A)104 |
| R6 | 7030003620 | Resistor | ERJ3GEYJ 333 V (33 kΩ) |
| R7 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| C1 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| EP1 | 0910024663 | P.C. Board | B 2070D (IC1) |
| EP2 | 0910024680 | P.C. Board | B 2163A (IC2) |

[MIC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|--------------|-----------------------|
| C9 | 4030006760 | Ceramic | C1608 SL 1H 121J- T-A |
| C10 | 4510001850 | Electrolytic | 16 MS5 4R7 μF |
| C11 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |
| C12 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C13 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| EP1 | 0910024614 | P.C. Board | B 1922D (MIC) |
| EP2 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[DET UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|-------------|----------------|-------------------------------|
| IC1 | 1120001650 | IC | TK10487MT1 |
| Q1 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q2 | 1530002020 | Transistor | 2SC3770-3-TA |
| D1 | 1790000490 | Diode | HSM88AS-TR |
| FI1 | 2020000550 | Ceramic Filter | CFUM455E |
| X1 | 6070000060 | Discriminator | CDBM455C7 |
| X2 | 60500005010 | Crystal | CR-214 |
| R1 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 kΩ) |
| R2 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 kΩ) |
| R3 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 kΩ) |
| R4 | 7030003460 | Resistor | ERJ3GEYJ 152 V (1.5 kΩ) |
| R5 | 7310002590 | Trimmer | RV-109 (RH03 A3AJ3X0BA)222 |
| R6 | 7030003550 | Resistor | ERJ3GEYJ 822 V (8.2 kΩ) |
| R7 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R8 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 kΩ) |
| R9 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R10 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 kΩ) |
| R11 | 7030003730 | Resistor | ERJ3GEYJ 274 V (270 kΩ) |
| R13 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R14 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R16 | 7030003630 | Resistor | ERJ3GEYJ 393 V (39 kΩ) |
| R19 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R20 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R23 | 7030003320 | Resistor | ERJ3GEYJ 101 V (100 Ω) |
| R28 | 7030003710 | Resistor | ERJ3GEYJ 184 V (180 kΩ) |
| R30 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R31 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R32 | 7030003460 | Resistor | ERJ3GEYJ 152 V (1.5 kΩ) |
| R33 | 7030003730 | Resistor | ERJ3GEYJ 274 V (270 kΩ) |
| C1 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C2 | 4030006740 | Ceramic | C1608 SL 1H 820J- T-A |
| C3 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C4 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C5 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C6 | 4030006640 | Ceramic | C1608 SL 1H 180J- T-A |
| C7 | 4030006720 | Ceramic | C1608 SL 1H 560J- T-A |

[MIC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-------------------------------|
| IC1 | 1110001540 | IC | M5218FP-71A |
| Q1 | 1590000430 | Transistor | DTC144EU T107 |
| Q2 | 1590000720 | Transistor | DTA144EU T107 |
| R1 | 7030003640 | Resistor | ERJ3GEYJ 473 V (47 kΩ) |
| R2 | 7030003880 | Resistor | ERJ3GEYJ 244 V (240 kΩ) |
| R3 | 7030003710 | Resistor | ERJ3GEYJ 184 V (180 kΩ) |
| R4 | 7030003370 | Resistor | ERJ3GEYJ 271 V (270 Ω) |
| R5 | 7030003670 | Resistor | ERJ3GEYJ 823 V (82 kΩ) |
| R6 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R7 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R8 | 7030003740 | Resistor | ERJ3GEYJ 334 V (330 kΩ) |
| R9 | 7030003630 | Resistor | ERJ3GEYJ 393 V (39 kΩ) |
| R10 | 7030003630 | Resistor | ERJ3GEYJ 393 V (39 kΩ) |
| R11 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 kΩ) |
| R12 | 7030003710 | Resistor | ERJ3GEYJ 184 V (180 kΩ) |
| R13 | 7310002600 | Trimmer | RV-110 (RH03 A3AS4X0AA)473 |
| R14 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R15 | 7030003540 | Resistor | ERJ3GEYJ 682 V (6.8 kΩ) |
| R16 | 7510000180 | Thermistor | DTN-T203S223LS(T) |
| R17 | 7030003570 | Resistor | ERJ3GEYJ 123 V (12 kΩ) |
| C1 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C3 | 4030006880 | Ceramic | C1608 JB 1H 472K- T-A |
| C4 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C5 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C6 | 4550000530 | Tantalum | TESVA 1V 104M1-8L |
| C7 | 4030008470 | Ceramic | C1608 JB 1H 272K- T-A |
| C8 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |

[DET UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-----------------------|
| C8 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C10 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C11 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C12 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C13 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C14 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C15 | 4030006690 | Ceramic | C1608 SL 1H 330J- T-A |
| C16 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C17 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C19 | 4030006890 | Ceramic | C1608 JF 1H 103Z- T-A |
| C24 | 4030005110 | Ceramic | C2012 JB 1E 473K- T-A |
| C25 | 4030005110 | Ceramic | C2012 JB 1E 473K- T-A |
| C26 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C27 | 4030006890 | Ceramic | C1608 JF 1H 103Z- T-A |
| C28 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C29 | 4030006890 | Ceramic | C1608 JF 1H 103Z- T-A |
| EP1 | 0910024646 | P.C. Board | B 1962F (DET) |
| EP2 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[REG UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|--------------|-------------------------|
| IC1 | 1180000530 | IC | S-81250HG-RD-T1 |
| IC2 | 1130004170 | IC | TC4S01F (TE85R) |
| IC3 | 1130004170 | IC | TC4S01F (TE85R) |
| Q1 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q2 | 1520000200 | Transistor | 2SB798-T2 DK |
| Q3 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q4 | 1520000200 | Transistor | 2SB798-T2 DK |
| Q5 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q6 | 1510000510 | Transistor | 2SA1576 T107 R |
| D1 | 1750000160 | Diode | DA114 T107 |
| D2 | 1750000160 | Diode | DA114 T107 |
| D3 | 1750000160 | Diode | DA114 T107 |
| R1 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R2 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 kΩ) |
| R3 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R7 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R8 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| C1 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C2 | 4510003160 | Electrolytic | 16 RC2 22 μF (D =4.0) |
| C3 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C4 | 4510001320 | Electrolytic | 6R3 MS5 47 μF |
| C5 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C6 | 4510003190 | Electrolytic | 6.3 RC2 47 μF (D =4.0) |
| C7 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C8 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C9 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C10 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C11 | 4510003190 | Electrolytic | 6.3 RC2 47 μF (D =4.0) |

[REG UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|------------------|
| EP1 | 0910024705 | P.C. Board | B 2779 (REG) |
| EP2 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[RF UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|------------------------|
| Q1 | 1530002570 | Transistor | 2SC4405-3-TR |
| Q2 | 1530002560 | Transistor | 2SC4403-3-TR |
| D1 | 1160000060 | Diode | DAN202U T107 |
| L1 | 6150002970 | Coil | LS-308 |
| L2 | 6150002970 | Coil | LS-308 |
| L3 | 6150002970 | Coil | LS-308 |
| R2 | 7030003570 | Resistor | ERJ3GEYJ 123 V (12 kΩ) |
| R3 | 7030003240 | Resistor | ERJ3GEYJ 220 V (22 Ω) |
| R4 | 7030003570 | Resistor | ERJ3GEYJ 123 V (12 kΩ) |
| R5 | 7030003370 | Resistor | ERJ3GEYJ 271 V (270 Ω) |
| C1 | 4030006590 | Ceramic | C1608 SL 1H 080D- T-A |
| C2 | 4030006590 | Ceramic | C1608 SL 1H 080D- T-A |
| C3 | 4030006640 | Ceramic | C1608 SL 1H 180J- T-A |
| C4 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C5 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C6 | 4030006610 | Ceramic | C1608 SL 1H 100D- T-A |
| C7 | 4030006510 | Ceramic | C1608 SL 1H 0R5C- T-A |
| C8 | 4030006610 | Ceramic | C1608 SL 1H 100D- T-A |
| C9 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C10 | 4030006520 | Ceramic | C1608 SL 1H 010C- T-A |
| C11 | 4030006520 | Ceramic | C1608 SL 1H 010C- T-A |
| EP1 | 0910022162 | P.C. Board | B 2174B (RF) |
| EP2 | 0910020185 | P.C. Board | B 1946E (COIL) |
| EP3 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[APC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|----------------|
| Q1 | 1520000270 | Transistor | 2SB1182 T201 Q |
| Q2 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q3 | 1590000620 | Transistor | FMS1 T148 |
| Q4 | 1520000270 | Transistor | 2SB1182 T201 Q |

[APC UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-------------------------|
| Q5 | 1530002280 | Transistor | 2SC4081 T107 S |
| Q6 | 1510000510 | Transistor | 2SA1576 T107 R |
| D1 | 1750000130 | Diode | DA204U T107 |
| D2 | 1160000050 | Diode | DAP202U T107 |
| R1 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 kΩ) |
| R2 | 7030003770 | Resistor | ERJ3GEYJ 564 V (560 kΩ) |
| R3 | 7030003720 | Resistor | ERJ3GEYJ 224 V (220 kΩ) |
| R6 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 kΩ) |
| R7 | 7030003670 | Resistor | ERJ3GEYJ 823 V (82 kΩ) |
| R8 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 kΩ) |
| R9 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 kΩ) |
| R11 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 kΩ) |
| R12 | 7030003480 | Resistor | ERJ3GEYJ 222 V (2.2 kΩ) |
| R13 | 7030000440 | Resistor | MCR10EZHJ 3.3 kΩ (332) |
| C1 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C2 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C3 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C5 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C6 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C7 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C9 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C10 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C11 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| EP1 | 0910024691 | P.C. Board | B 2361A (APC) |
| EP2 | 6910003110 | Lead Frame | HFB2.0-0.7-8 (N) |

[PLL UNIT]

| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|------------------|
| IC1 | 1120001550 | IC | M54959FP |
| IC2 | 1130004200 | IC | TC4S66F (TE85R) |
| Q1 | 1560000270 | FET | 2SK302-Y (TE85R) |
| Q2 | 1530002560 | Transistor | 2SC4403-3-TR |
| Q3 | 1530002560 | Transistor | 2SC4403-3-TR |
| Q4 | 1530002560 | Transistor | 2SC4403-3-TR |
| Q6 | 1590000970 | Transistor | FMA2 T148 |
| Q7 | 1560000540 | FET | 2SK880-Y (TE85R) |
| Q8 | 1590000430 | Transistor | DTC144EU T107 |
| Q9 | 1590000440 | Transistor | DTA143ZU T107 |
| D1 | 1790000460 | Varicap | MA334B(TX) |
| D2 | 1790000530 | Varicap | MA333(TW) |
| D3 | 1790000620 | Diode | MA77(TW) |
| D4 | 1790000640 | Varicap | MA363B(TX) |
| X1 | 6050005790 | Crystal | CR-257 |
| L1 | 6200000240 | Coil | LQH 3N R68M |
| L2 | 6130002000 | Coil | LB-204 |
| L3 | 6200000750 | Coil | LQH 3N 4R7M |
| L4 | 6200000750 | Coil | LQH 3N 4R7M |

[PLL UNIT]

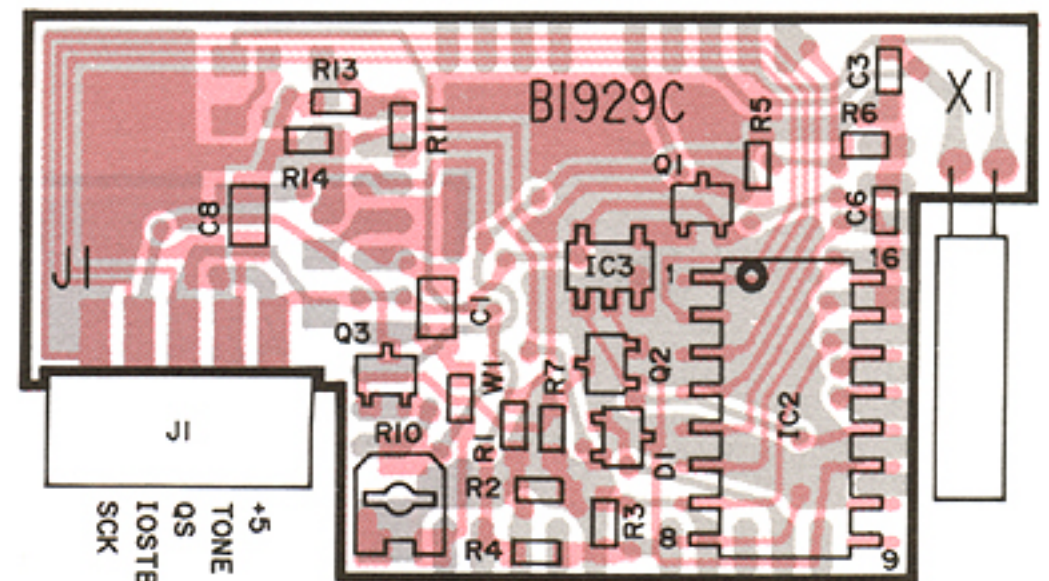
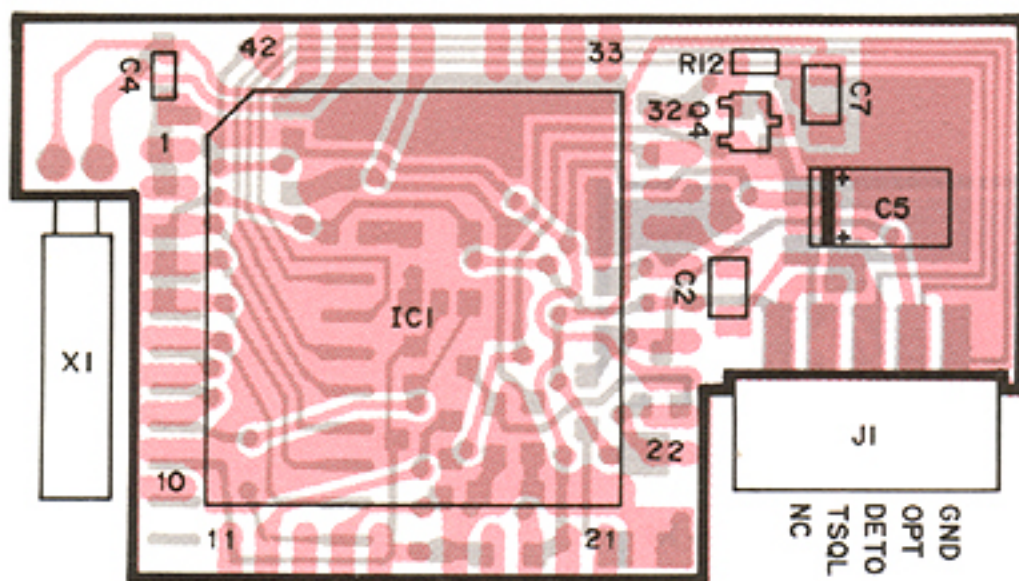
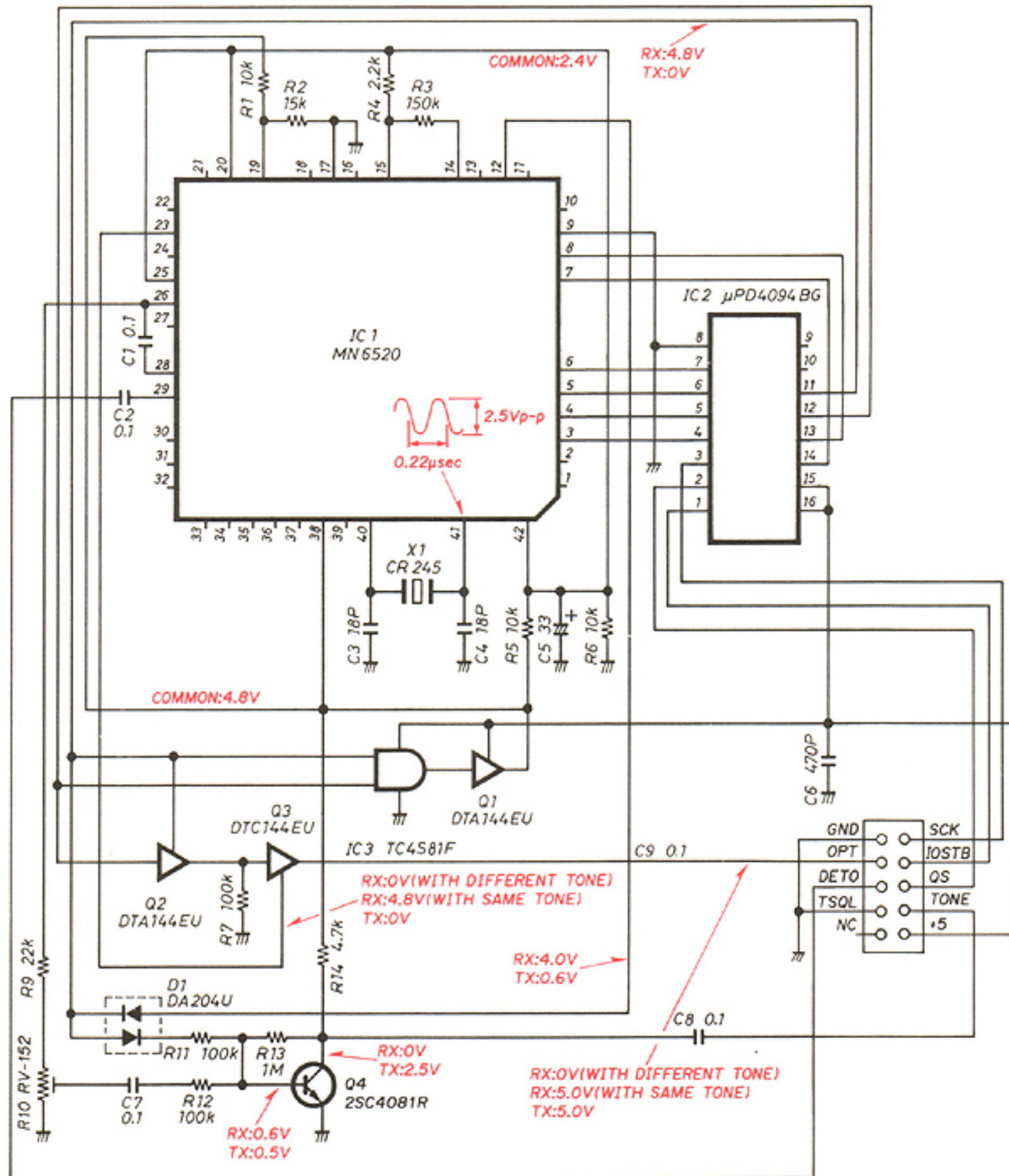
| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|-------------------------|
| L5 | 6200000910 | Coil | LQN 2A 82NM |
| L6 | 6200000910 | Coil | LQN 2A 82NM |
| R4 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 kΩ) |
| R5 | 7030003550 | Resistor | ERJ3GEYJ 822 V (8.2 kΩ) |
| R6 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R7 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R10 | 7030003550 | Resistor | ERJ3GEYJ 822 V (8.2 kΩ) |
| R11 | 7030003240 | Resistor | ERJ3GEYJ 220 V (22 Ω) |
| R12 | 7030003660 | Resistor | ERJ3GEYJ 683 V (68 kΩ) |
| R13 | 7030003420 | Resistor | ERJ3GEYJ 681 V (680 Ω) |
| R14 | 7030003650 | Resistor | ERJ3GEYJ 563 V (56 kΩ) |
| R15 | 7030003390 | Resistor | ERJ3GEYJ 391 V (390 Ω) |
| R18 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R19 | 7030003400 | Resistor | ERJ3GEYJ 471 V (470 Ω) |
| R20 | 7030003500 | Resistor | ERJ3GEYJ 332 V (3.3 kΩ) |
| R21 | 7030003800 | Resistor | ERJ3GEYJ 105 V (1 MΩ) |
| R22 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| R23 | 7030003560 | Resistor | ERJ3GEYJ 103 V (10 kΩ) |
| R24 | 7030003680 | Resistor | ERJ3GEYJ 104 V (100 kΩ) |
| C1 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C2 | 4030006900 | Ceramic | C1608 JB 1E 103K- T-A |
| C3 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C4 | 4030006670 | Ceramic | C1608 SL 1H 270J- T-A |
| C5 | 4030006690 | Ceramic | C1608 SL 1H 330J- T-A |
| C6 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C7 | 4030006540 | Ceramic | C1608 SL 1H 030C- T-A |
| C8 | 4030006560 | Ceramic | C1608 SL 1H 050C- T-A |
| C9 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C10 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C11 | 4030008440 | Ceramic | C1608 SL 1H 1R5C- T-A |
| C12 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C13 | 4550000460 | Tantalum | TESVA 1C 105M1-8L |
| C14 | 4030006620 | Ceramic | C1608 SL 1H 120J- T-A |
| C15 | 4030006560 | Ceramic | C1608 SL 1H 050C- T-A |
| C16 | 4030006560 | Ceramic | C1608 SL 1H 050C- T-A |
| C17 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C18 | 4030006610 | Ceramic | C1608 SL 1H 100D- T-A |
| C19 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C20 | 4030007080 | Ceramic | C1608 CH 1H 390J- T-A |
| C21 | 4610001260 | Trimmer | ECRJA020E12W |
| C22 | 4030007030 | Ceramic | C1608 CH 1H 150J- T-A |
| C25 | 4030006850 | Ceramic | C1608 JB 1H 471K- T-A |
| C27 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C28 | 4030006530 | Ceramic | C1608 SL 1H 020C- T-A |
| C29 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C30 | 4030006560 | Ceramic | C1608 SL 1H 050C- T-A |
| C31 | 4030004760 | Ceramic | C2012 JF 1E 104Z- T-A |
| C32 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C33 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C34 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C35 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C36 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C37 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C38 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C39 | 4030006750 | Ceramic | C1608 SL 1H 101J- T-A |
| C40 | 4030006580 | Ceramic | C1608 SL 1H 070D- T-A |
| EP1 | 0910024411 | P.C. Board | B 2346A (PLL) |

[PRT UNIT]

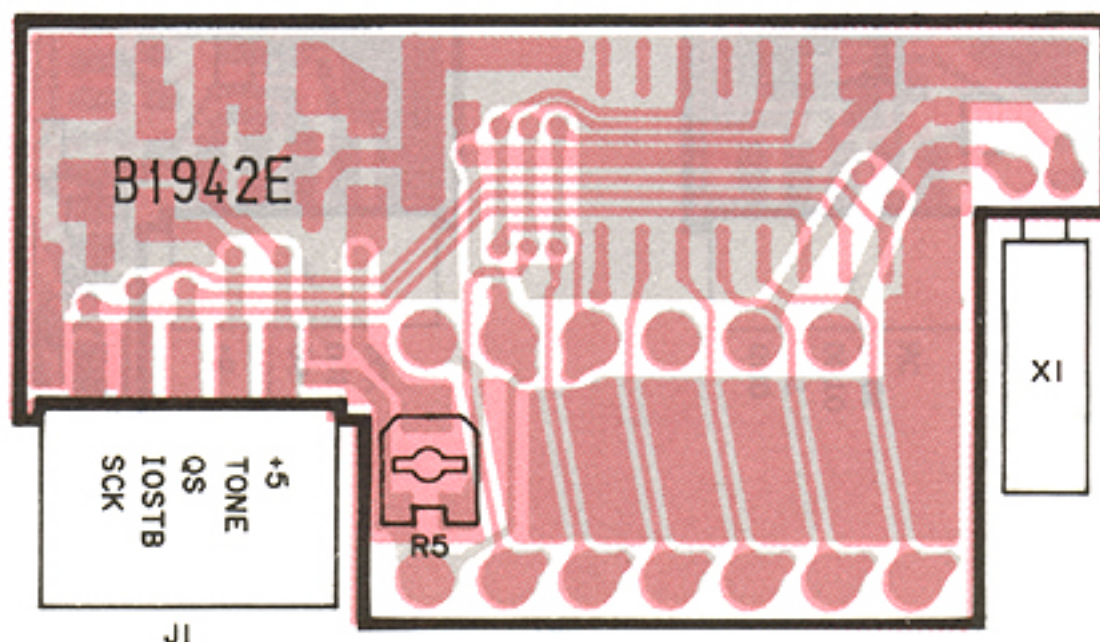
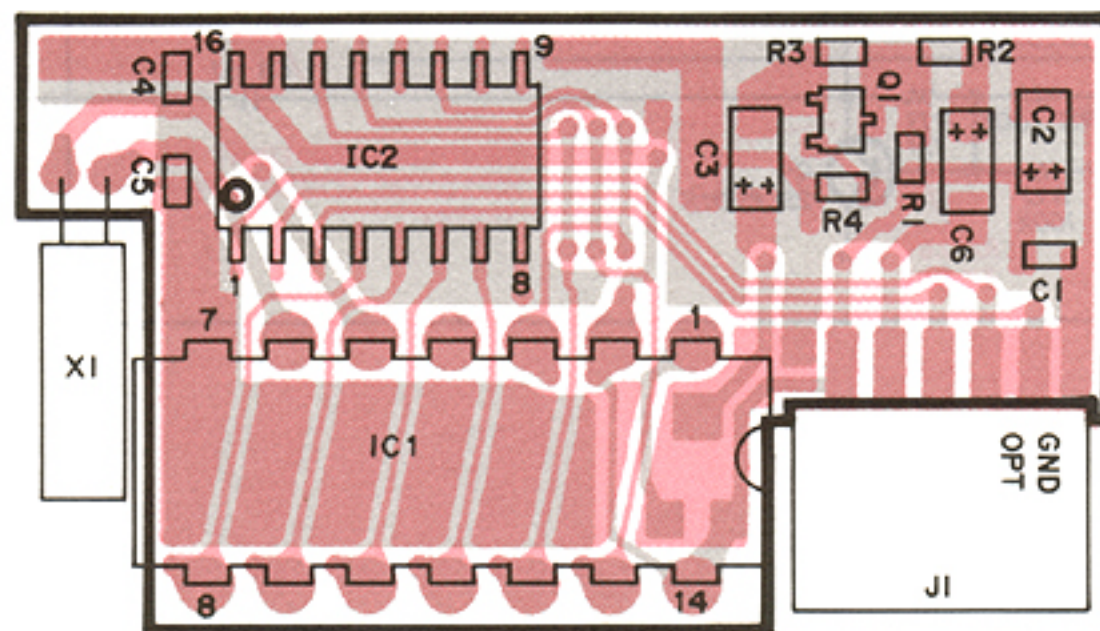
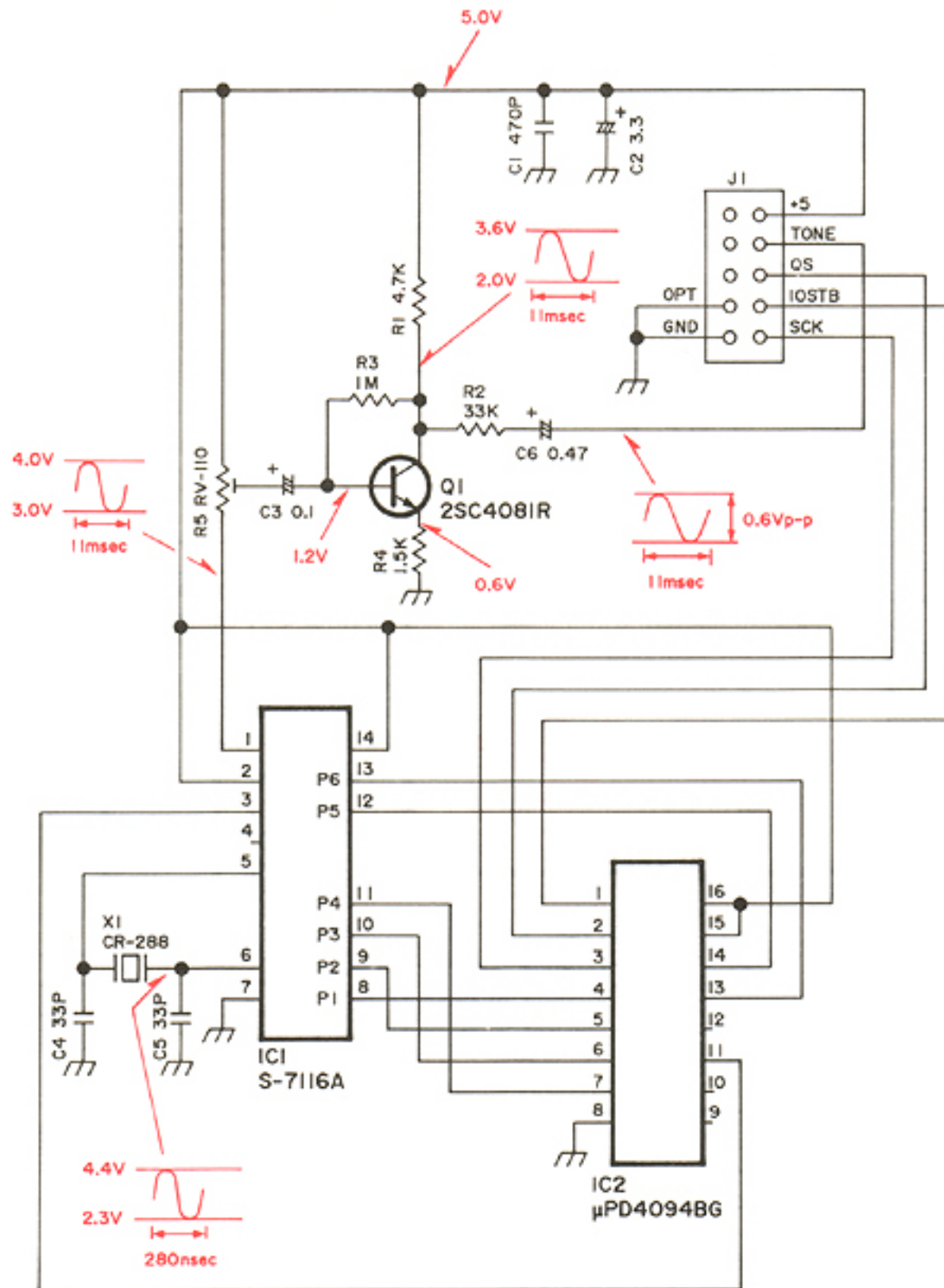
| REF. NO. | ORDER NO. | DESCRIPTION | |
|----------|------------|-------------|----------------------------------|
| Q1 | 1520000200 | Transistor | 2SB798-T2 DK |
| Q2 | 1530002280 | Transistor | 2SC4081 T107 S |
| D1 | 1790000680 | Diode | SB20-03P-TD |
| D2 | 1790000670 | Diode | SB07-03C-TA |
| D5 | 1790000590 | Diode | MA110(TW) |
| D6 | 1730002160 | Zener | 02CZ5.1-Z (TE85R) |
| D7 | 1790000590 | Diode | MA110(TW) |
| D8 | 1790000670 | Diode | SB07-03C-TA |
| D9 | 1790000680 | Diode | SB20-03P-TD |
| R1 | 7030003250 | Resistor | ERJ3GEYJ 270 V (27 Ω) |
| R2 | 7030003380 | Resistor | ERJ3GEYJ 331 V (330 Ω) |
| R3 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 k Ω) |
| R4 | 7030003600 | Resistor | ERJ3GEYJ 223 V (22 k Ω) |
| R5 | 7030003470 | Resistor | ERJ3GEYJ 182 V (1.8 k Ω) |
| R6 | 7030003520 | Resistor | ERJ3GEYJ 472 V (4.7 k Ω) |
| R7 | 7030003320 | Resistor | ERJ3GEYJ 101 V (100 Ω) |
| R8 | 7030003440 | Resistor | ERJ3GEYJ 102 V (1 k Ω) |
| R9 | 7030003250 | Resistor | ERJ3GEYJ 270 V (27 Ω) |
| R10 | 7030003230 | Resistor | ERJ3GEYJ 180 V (18 Ω) |
| C1 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C2 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C3 | 4030006710 | Ceramic | C1608 SL 1H 470J- T-A |
| C4 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C5 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| C6 | 4030006860 | Ceramic | C1608 JB 1H 102K- T-A |
| EP1 | 0910023862 | P.C. Board | B 2278B (PRT) |

SECTION 9 OPTIONAL UNITS

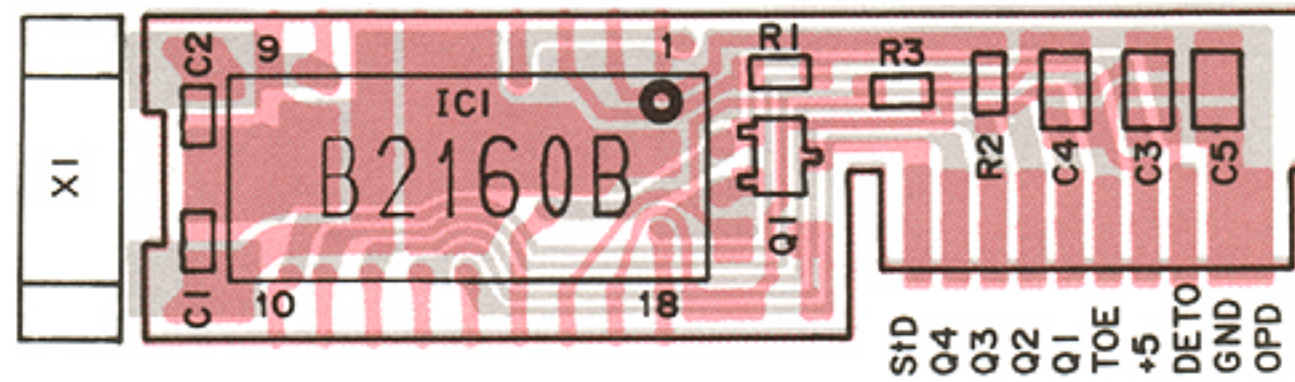
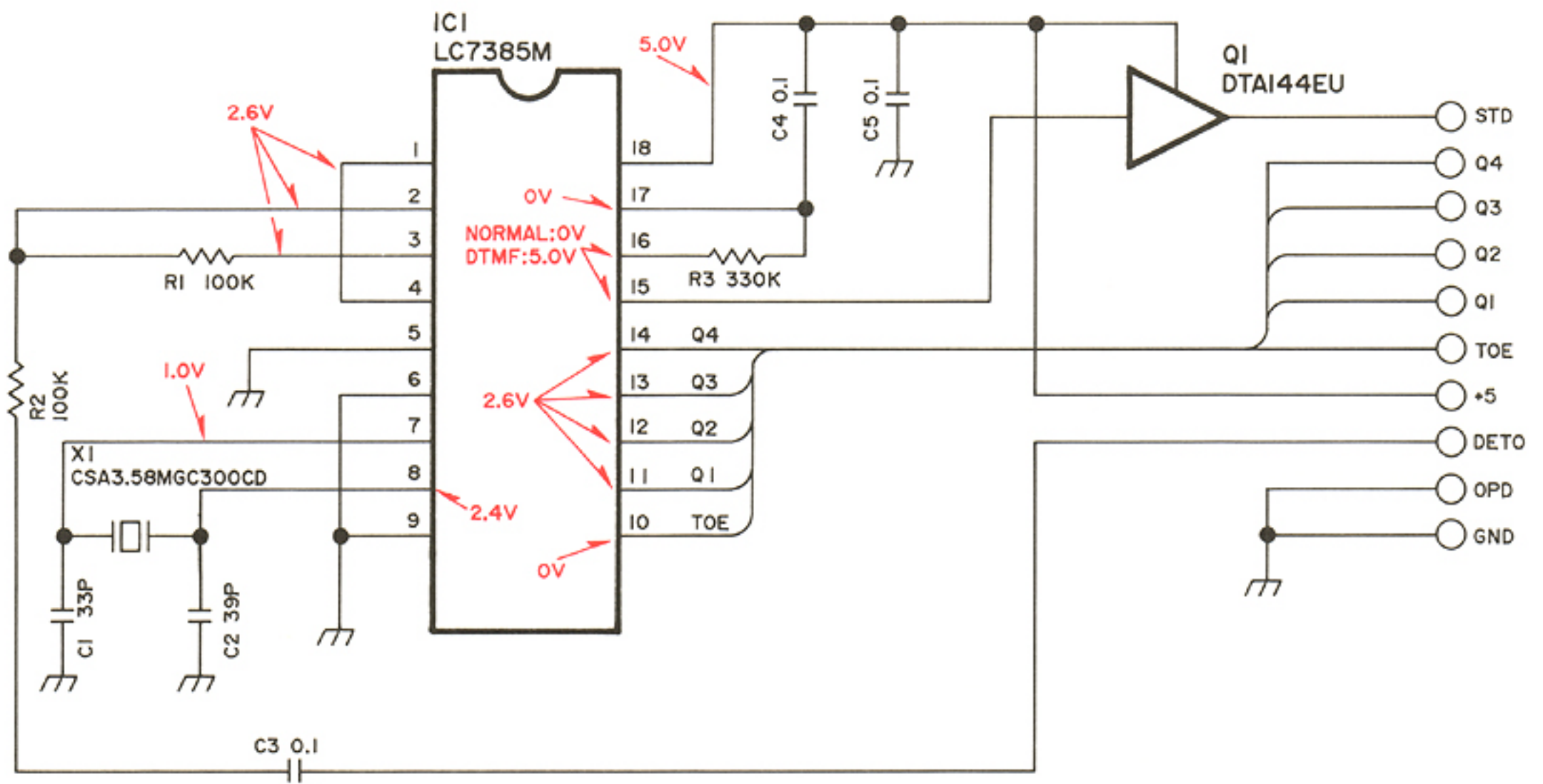
9-1 UT-50 TONE SQUELCH UNIT



9-2 UT-51 TONE ENCODER UNIT

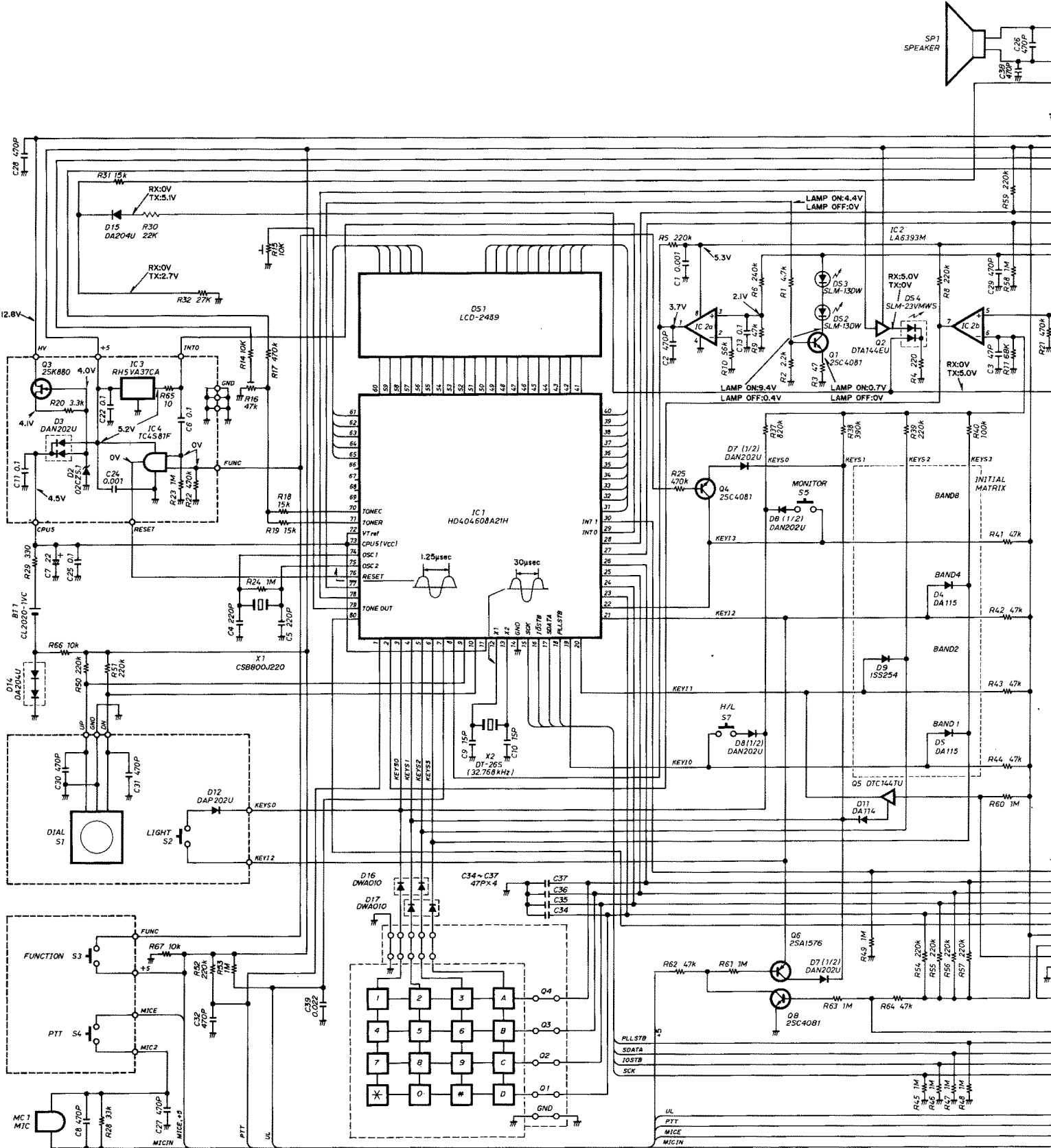


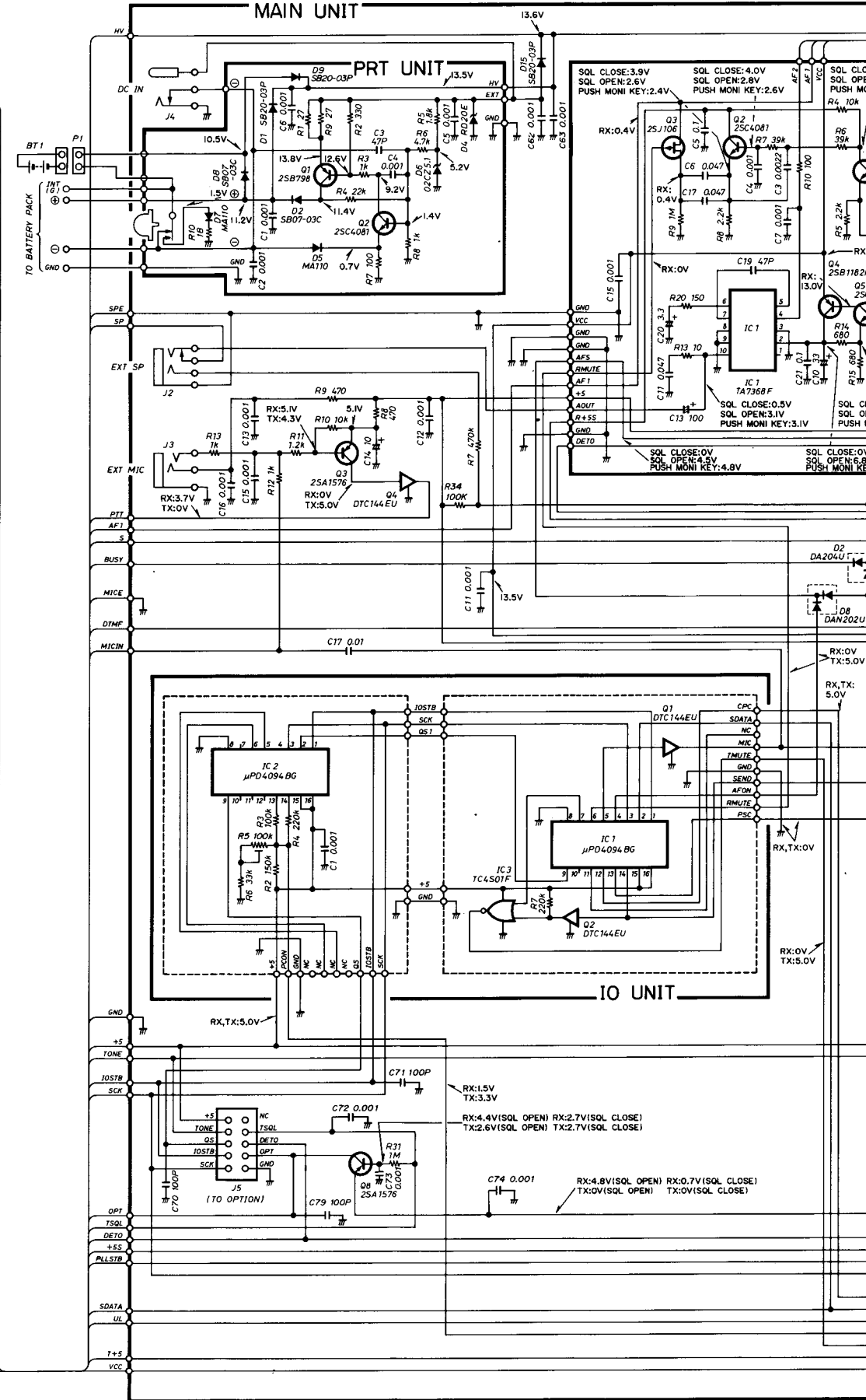
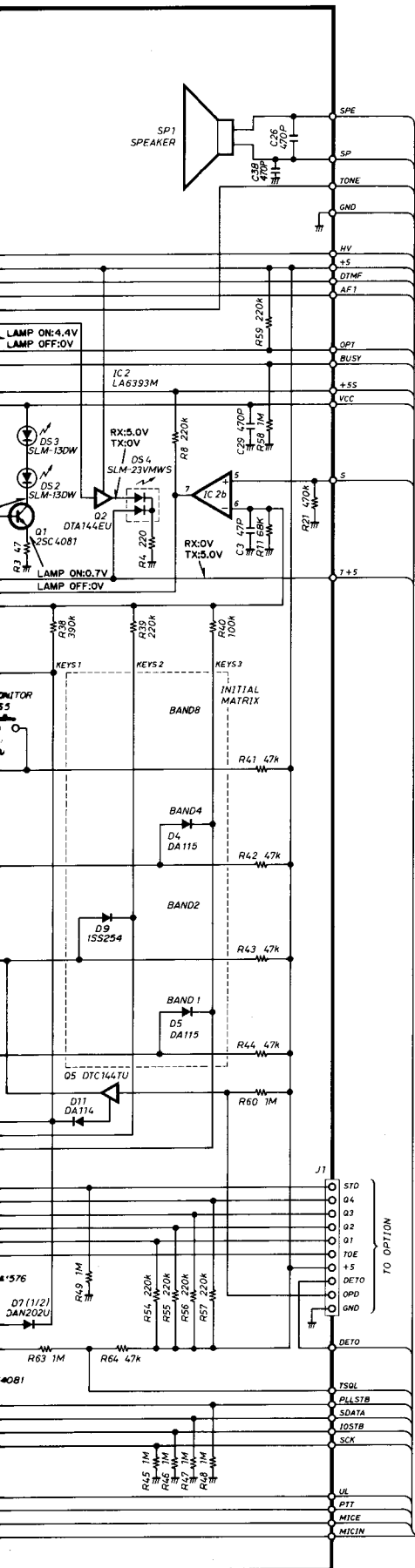
9-3 UT-49 DTMF DECODER UNIT

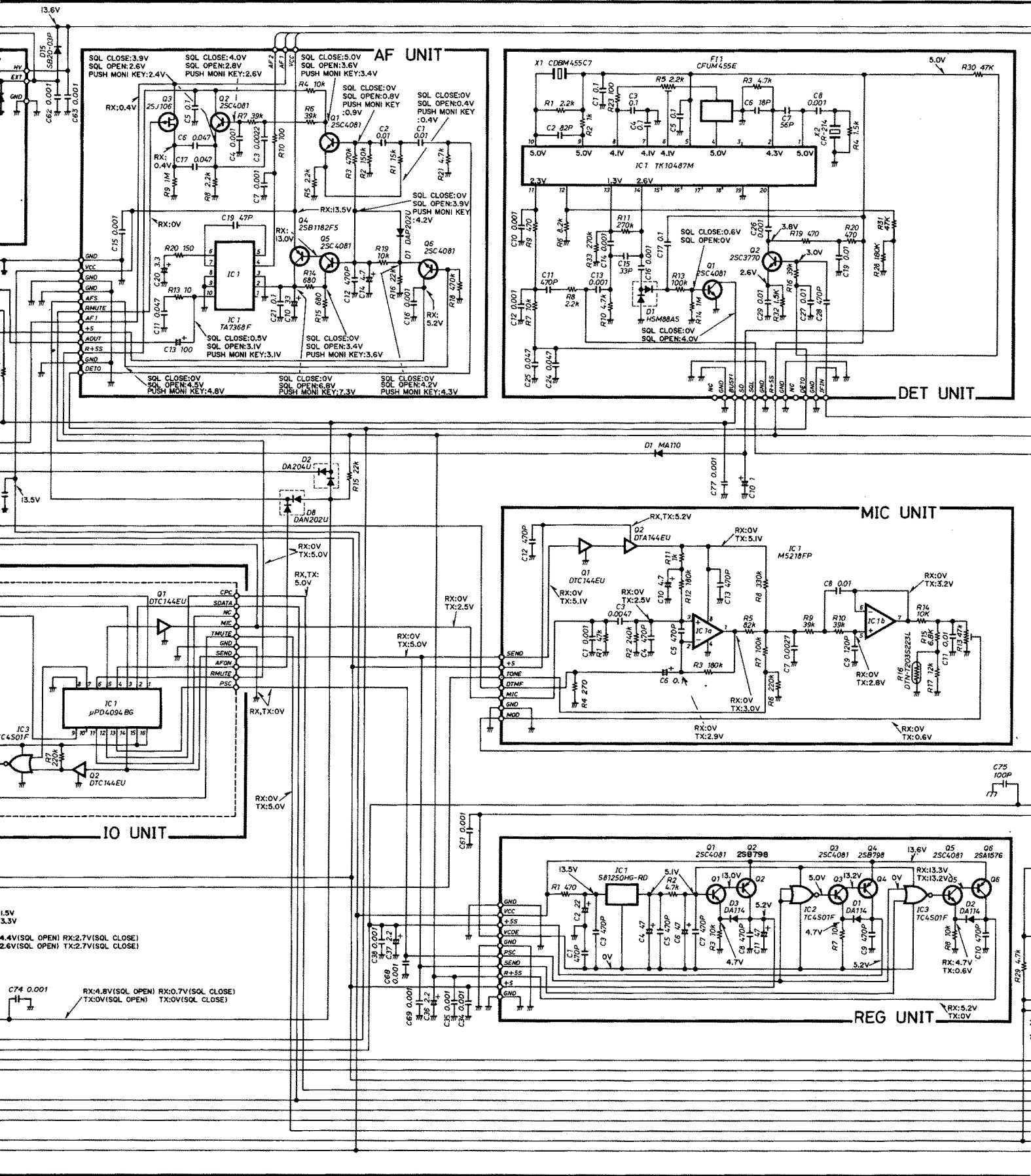


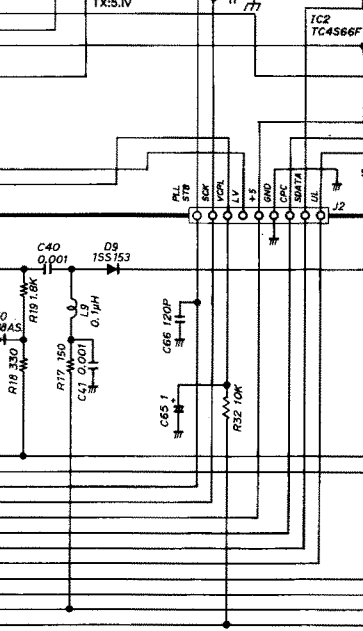
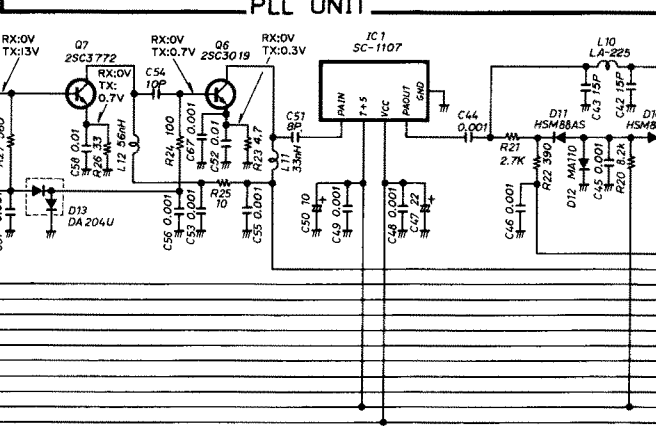
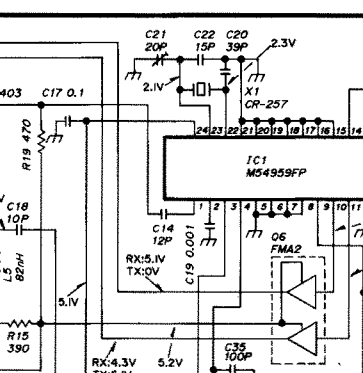
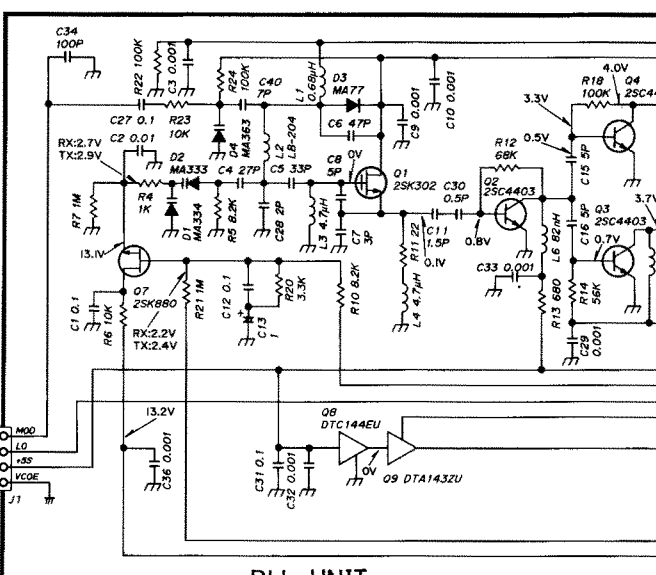
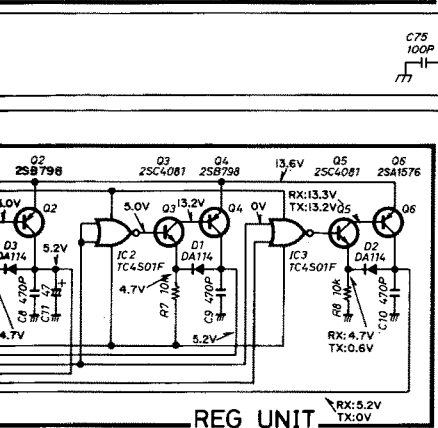
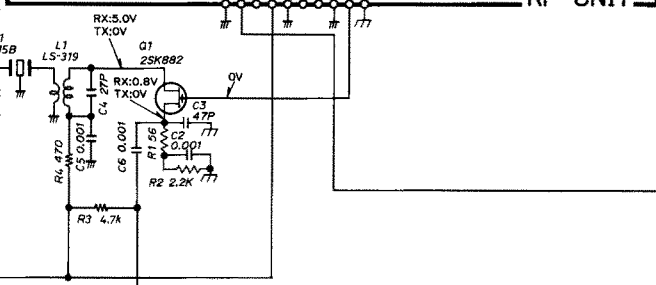
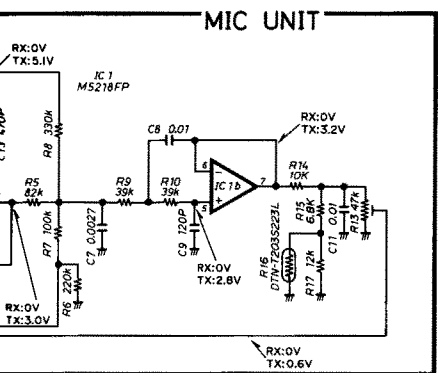
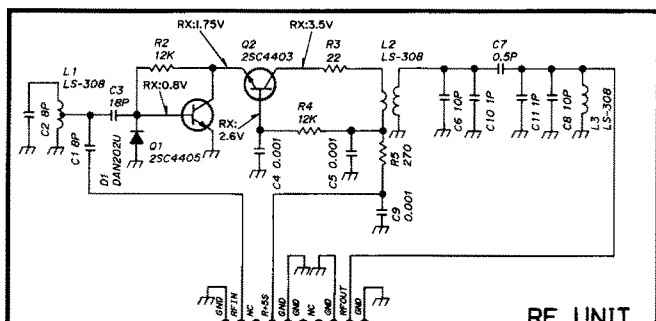
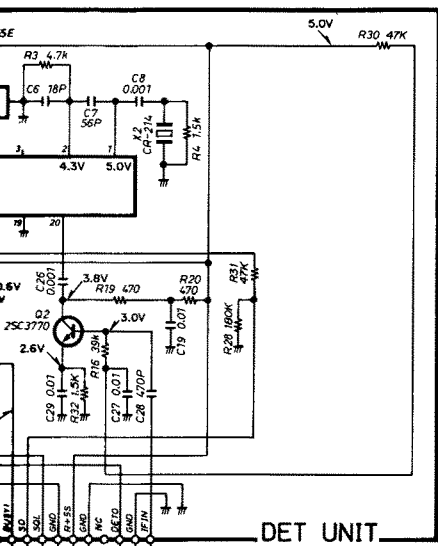
SECTION 10 VOLTAGE DIAGRAM

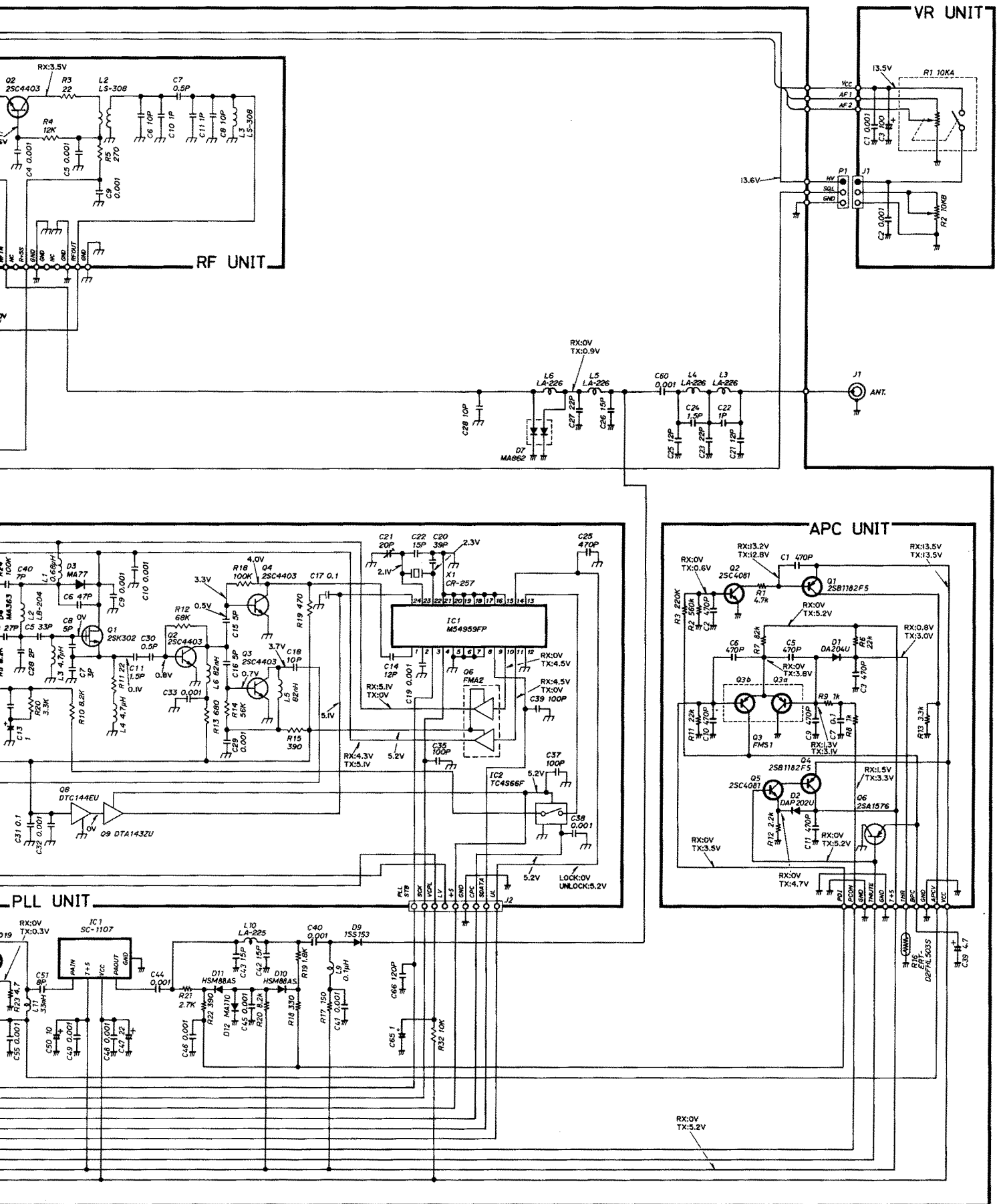
LGC UNIT











Icom Inc.

6-9-16, Kamihigashi, Hirano-ku, Osaka 547, Japan

Phone: 06 793 5301

Fax : 06 793 0013

Telex : 05277822 ICOMTR J

Icom America Inc.

<Corporate Headquarters>

2380 116th Avenue N.E., Bellevue, WA 98004, U.S.A.

Phone : (206) 454-8155

Fax : (206) 454-1509

Telex : 152210 ICOM AMER BVUE

<Customer Service>

Phone : (206) 454-7619

<Regional Customer Service Centers>

3150 Premier Drive, Suite 126, Irving, TX 75063, U.S.A.

Phone : (214) 550-7525

Fax : (214) 550-7423

1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349, U.S.A.

Phone : (404) 991-6166

Fax : (404) 991-6327

Icom Canada

A Division of Icom America Inc.

3071 #5 Road, Unit 9, Richmond, B.C., V6X 2T4, Canada

Phone : (604) 273-7400

Fax : (604) 273-1900

Icom (Europe) GmbH

Communication Equipment

Himmelgeister Str. 100, 4000 Düsseldorf 1, W. Germany

Phone: 0211 346047

Fax : 0211 333639

Telex : 8588082 ICOM D

Icom (Australia) Pty. Ltd.

Incorporated In Victoria

7 Duke Street, Windsor, Victoria, 3181, Australia

Phone: 03 529 7582

Fax : 03 529 8485

Telex : AA 35521 ICOM AS

Icom (UK) Ltd.

Unit 9, Sea St., Herne Bay, Kent, CT6 8LD, U.K.

Phone: 0227 363859

Fax : 0227 360155

Telex : 965179 ICOM G

Icom France Sa

120 Route de Revel, BP4063, 31029 Toulouse Cedex, France

Phone: 61. 20. 31. 49

Fax : 61. 34. 05. 91

Telex : 521515 ICOM FRA

Count on us!
