ICOM

SERVICE MANUAL

VHF/UHF
DUAL BAND FM TRANSCEIVER

IC-901A
IC-901E

Icom Inc.

INTRODUCTION

This service manual describes the latest information for the following transceivers at the time of publication.

MODEL	VERSION NO.	VERSION	SYMBOL
IC-901E UX-R91E UX-S92E	#02	Europe	EUR
IC-901A UX-R91A UX-S92A	#05	U.S.A.	USA
	#07	Australia	AUS

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>

1150000760	IC	SC1091	IC-901A MAIN-A UNIT	5 pieces
8810006010	Screw	FH M3×5 ZK BS	IC-901A Top cover	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 40 dB～50 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.
9. Each band unit **MUST** be serviced after the IC-901A/E adjustments have been completed.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

- Frequency coverage :

MODEL	VERSION	VHF	UHF
IC-901A	U.S.A.	136.00～174.00 MHz*(Rx) 140.00～150.00 MHz*(Tx)	440.00～450.00 MHz
IC-901A	Australia	144.00～148.00 MHz	430.00～440.00 MHz
IC-901E	Europe	144.00～146.00 MHz	430.00～440.00 MHz

*Specifications apply to only 144.00～148.00 MHz.

- Mode : F3 (FM)
- Selectable tuning step : 5, 10, 12.5, 15, 20 or 25 kHz (VHF)
  5, 10, 12.5, 20 or 25 kHz (UHF)
- Memory channels : 12 memory channels and 1 call channel for each band
- Antenna impedance : 50 Ω (unbalanced)
- Power supply requirement : 13.8 V DC±15 % (negative ground)
- Current drain (at 13.8 V DC) :

CONDITION \ BAND		VHF	UHF
Transmit	High	12.0 A	11.0 A
	Low	5.0 A	5.0 A
Receive	Squelched	850 mA	850 mA
	Max. audio output	1.4 A	1.4 A

- Usable temperature range : −10 °C～+60 °C (+14 °F～+140 °F)
- Frequency stability : ±10 ppm (−10 °C～+60 °C)
- Dimensions : 150(W)×50(H)×191(D) mm
  5.9(W)×2.0(H)×7.5(D) in
  (Projections not included)
- Weight : 1.6 kg (3.5 lb)

■ TRANSMITTER

- Output power :

	VHF	UHF
High	50 W	35 W
Low	5 W	5 W

- Modulation system : Variable reactance frequency modulation
- Max. frequency deviation : ±5 kHz
- Spurious emissions : Less than −60 dB
- Microphone impedance : 600 Ω

■ RECEIVER

- Receive system : Double-conversion superheterodyne
- Intermediate frequency :

	VHF	UHF
1st	17.2 MHz	30.875 MHz
2nd	455 kHz	455 kHz

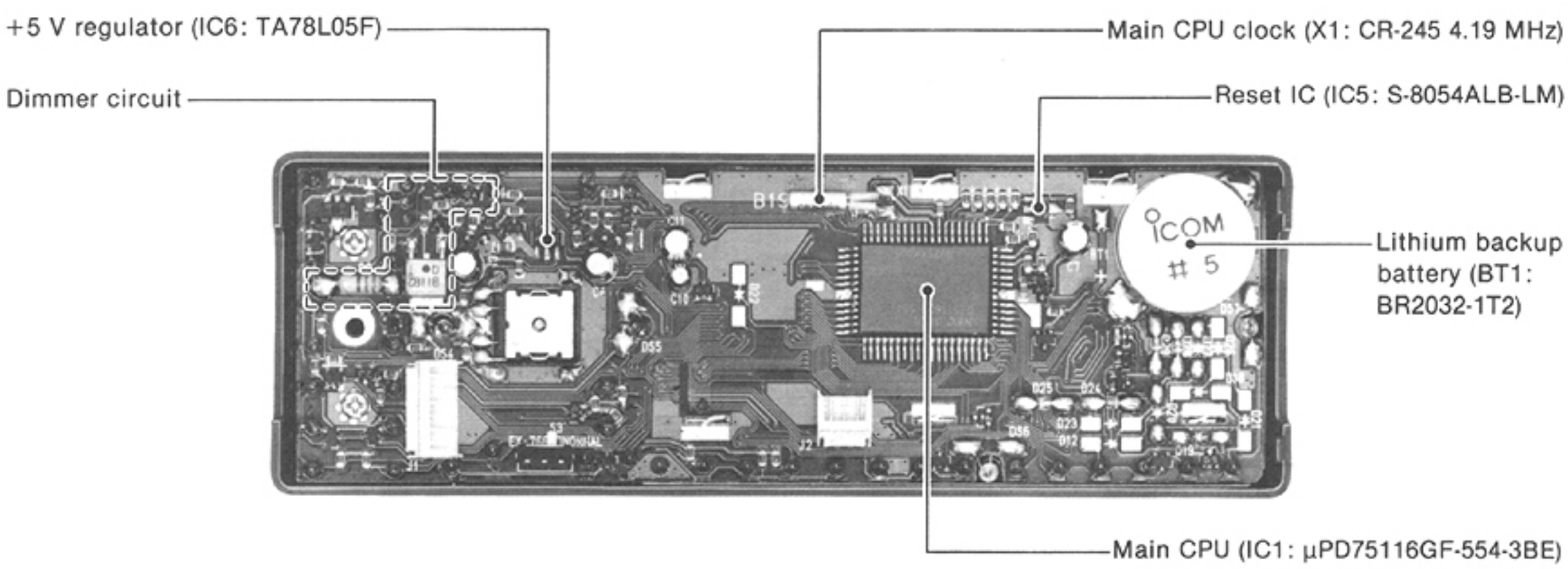
- Sensitivity : Less than 0.18 μV for 12 dB SINAD
- Selectivity : More than 12.5 kHz/−6 dB
  Less than 30.0 kHz/−60 dB
- Audio output power : More than 2.4 W at 10 % distortion with an 8 Ω load
- Audio output impedance : 4～8 Ω

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

SECTION 2 INSIDE VIEWS

2-1 REMOTE CONTROLLER

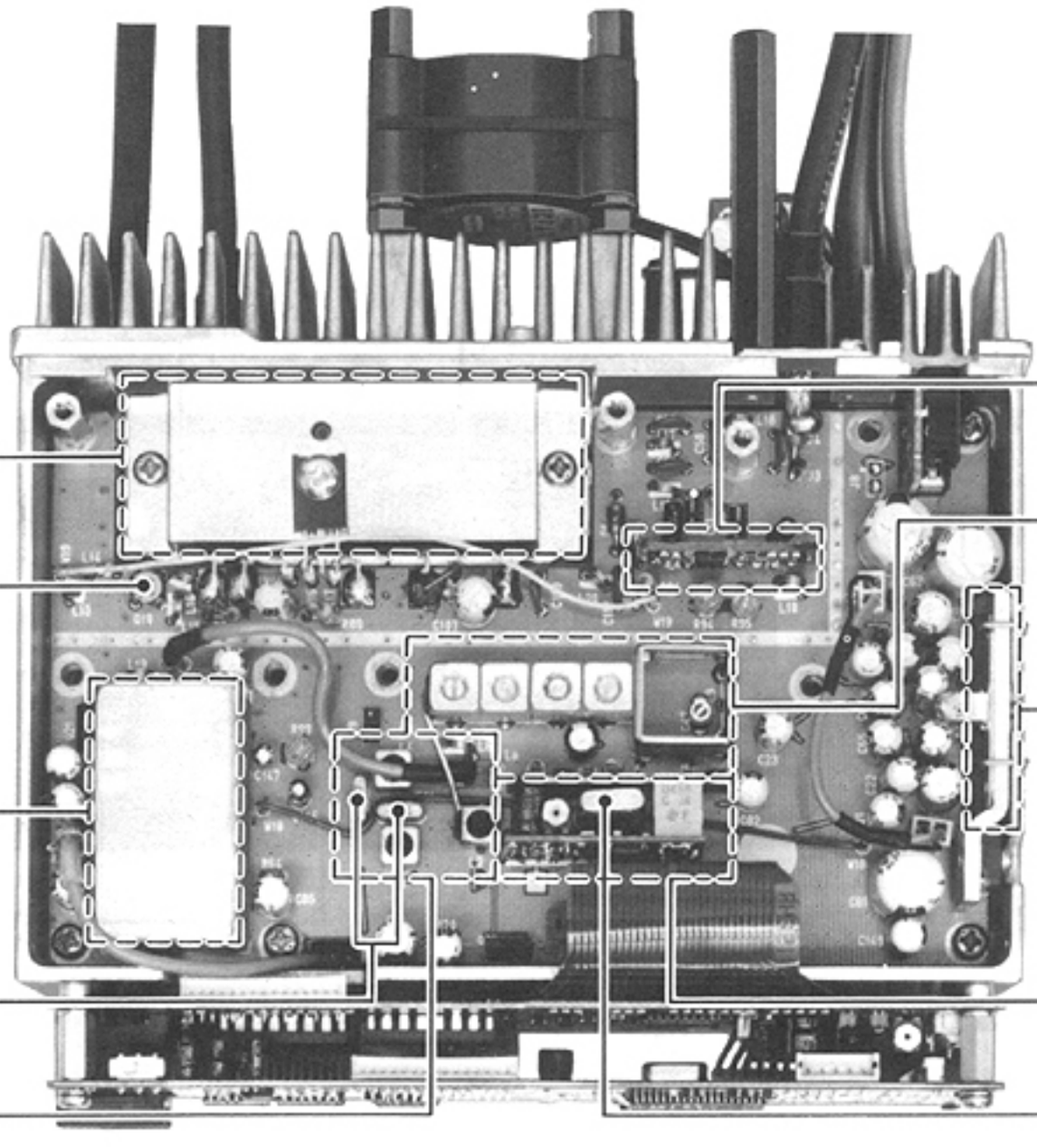
• CONTROL UNIT



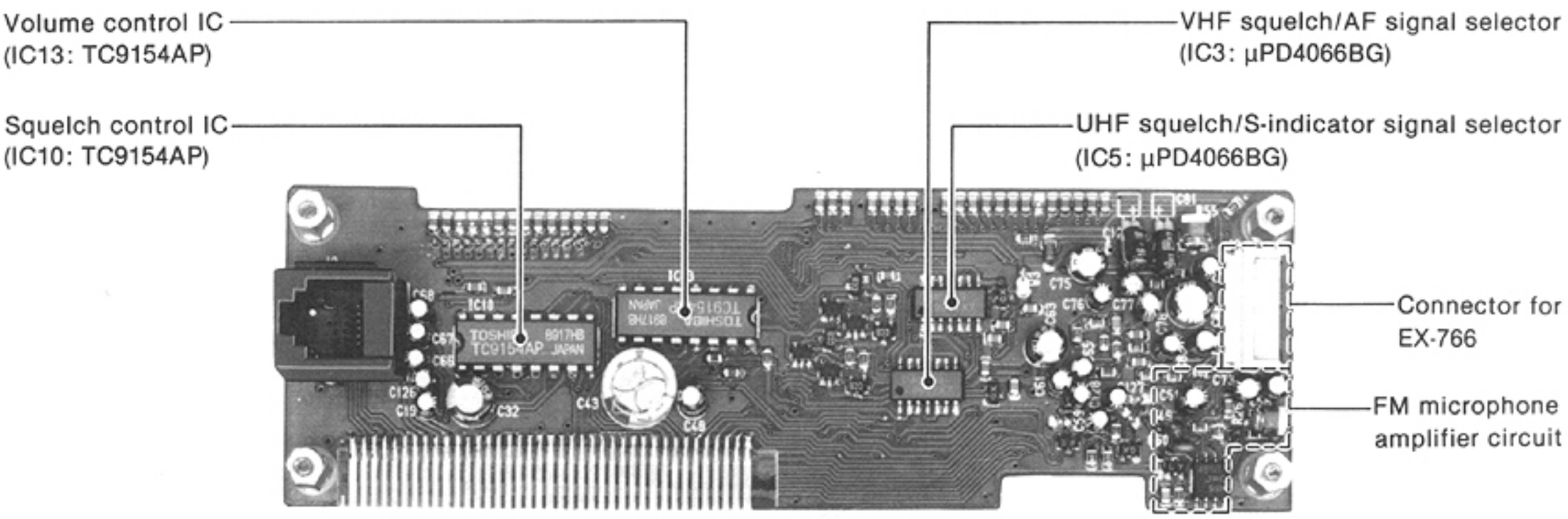
2-2 TRANSCEIVER

• MAIN-A UNIT

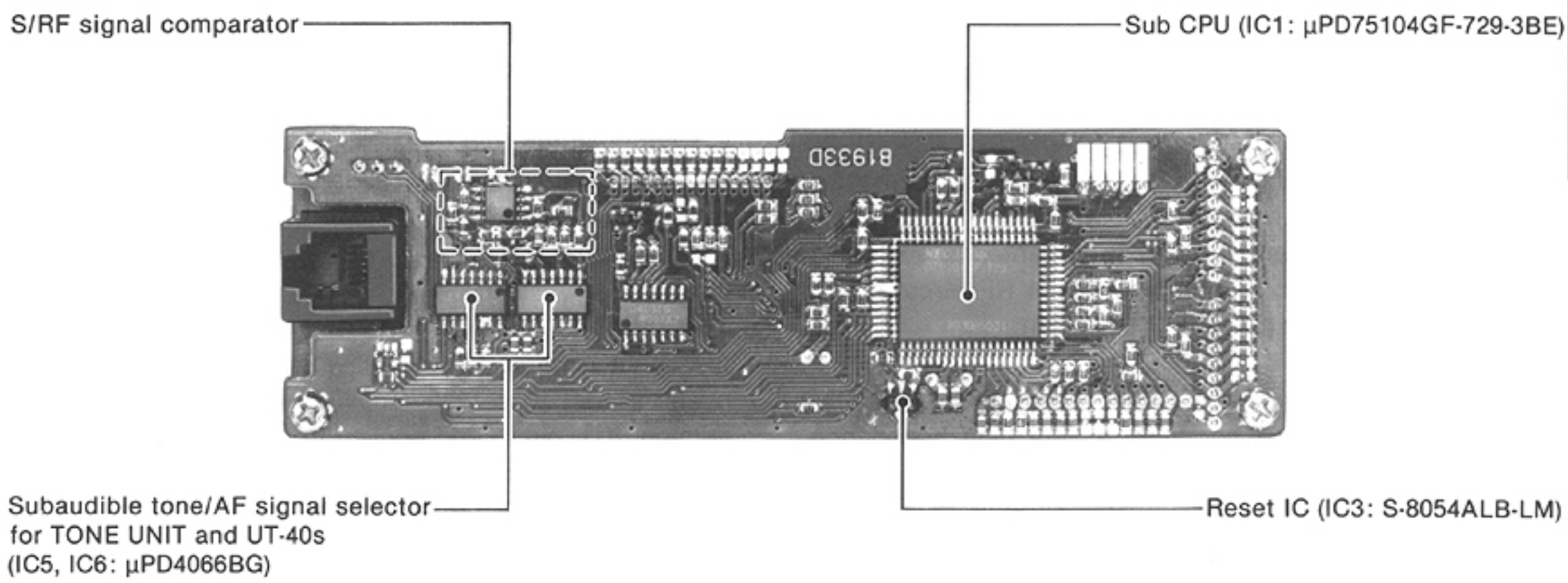
• MAIN-B UNIT



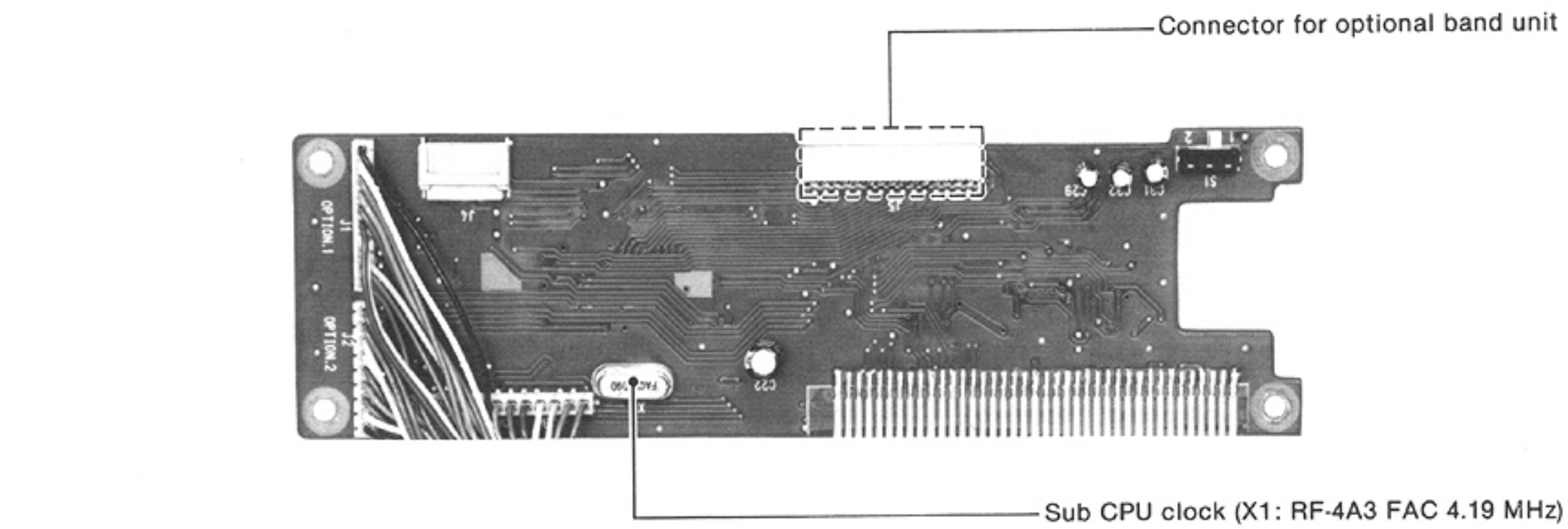
• CONNECTOR UNIT



• LOGIC UNIT (Front view)



• LOGIC UNIT (Rear View)



SECTION 3 CIRCUIT DESCRIPTION

3-1 VHF RECEIVER CIRCUITS

3-1-1 ANTENNA SWITCHING CIRCUIT (MAIN-A UNIT)

Received VHF signals enter the VHF antenna connector and pass through a low-pass filter (L16, L17, L21, C93~C96). The signals are applied to an antenna switching circuit (D16, D20, D21), and then to an RF circuit via a π-type low-pass filter (L9, L10, C54~C56).

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

3-1-2 RF CIRCUIT (MAIN-A UNIT)

The signals from the antenna switching circuit pass through a resonator circuit (L8, C50, C52, D8), and are applied to an RF amplifier (Q5). Amplified signals are applied to bandpass filters (L6, L7, C40, C41, C44, C45, D6, D7), and are then applied to a 1st mixer (Q4) via a resonator circuit (L5, C36, C37, D5). The bandpass filters suppress out-of-band signals.

D5~D8 are varactor diodes that track the bandpass filters and resonator circuits and are controlled by the lock voltage of the VHF PLL. These diodes tune the center frequency of RF circuits for wide bandwidth reception and good image response rejection.

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

The 1st mixer circuit converts the received signal to a fixed frequency of the 1st IF signal using a PLL output frequency. By changing a PLL frequency, only the desired frequency can be passed through a crystal filter located at the next stage of the 1st mixer.

The signals from the RF circuit are mixed with a 1st LO signal from the V-VCO BOARD to produce a 17.2 MHz 1st IF signal.

3-1-4 1ST IF CIRCUIT (MAIN-A UNIT)

After passing through a matching circuit (L3, C28), the 1st IF signal is applied to a pair of crystal filters (FI1) to suppress out-of-band signals. The 1st IF signal is amplified at an IF amplifier (Q3) and then enters the IF-A BOARD via a limiter (D3, D4).

3-1-5 2ND IF AND DEMODULATOR CIRCUITS (IF-A BOARD)

The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal. A double superheterodyne system (which converts receive signals twice) improves the image rejection ratio and obtains stable receiver gain.

The 1st IF signal from Q3 on the MAIN-A UNIT is applied to a 2nd mixer section of IC1, and is mixed with a 2nd LO signal to be converted to a 455 kHz 2nd IF signal.

IC1 contains the 2nd mixer, local oscillator circuit, limiter amplifier and quadrature detector circuits. The local oscillator section and X1 generate 16.745 MHz for the 2nd LO signal.

The 2nd IF signal from the 2nd mixer (IC1, pin 4) passes through a ceramic filter (FI1), 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 X2) to demodulate the 2nd IF signal into an AF signal.

AF signal output from IC1 pin 11 is applied to the CONNECTOR UNIT and then selected by a main or sub AF signal using an M/S1 signal line. The signal is adjusted with a volume control circuit (IC12~IC14) and then amplified at an AF power amplifier circuit (IC6) on the MAIN-B UNIT.

The selected signal (DETA, DETB) is applied to the optional UT-40 for tone squelch or pocket beep operation. The selected main band signal (DETA) is applied to the optional UT-48 for pager or code squelch operation. The selected and adjusted signal (DETM, DETS) is applied to the optional EX-766 for separate operation.

FM DEMODULATOR CIRCUIT

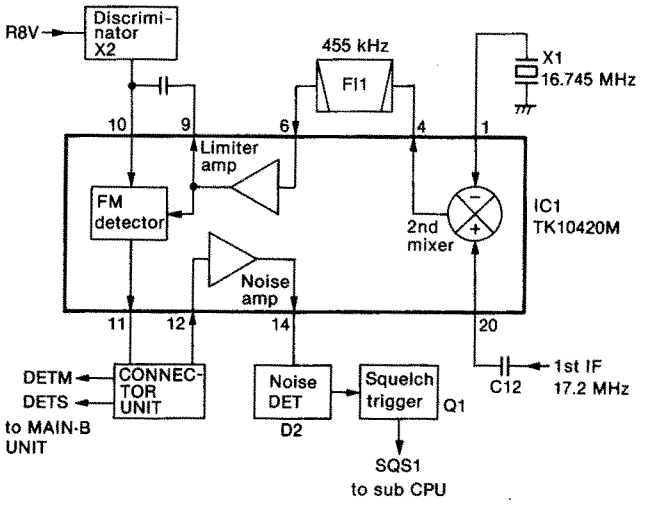


Fig. 1

3-1-6 AF CIRCUIT (MAIN-B UNIT)

Main and sub band AF signals from the CONNECTOR UNIT are applied to IC7 and IC8 on the MAIN-B UNIT. IC7 and IC8 are active filters that function as a high-pass filter to suppress tone signals for the tone squelch operation.

The filtered signal is applied to an active low-pass filter (Q30 or Q31) and an AF control circuit (Q2 or Q8). The AF signals are then power-amplified at a stereo AF power amplifier (IC6) to drive the main and sub band speakers.

The AFMA or AFMB signals from the sub CPU control Q2 or Q8 respectively, and mute main or sub band AF output while receiving no signal or no specified tone signal.

When the sub band speaker is not connected, the amplified sub band AF output is attenuated at R57, R58 and R100, and is then mixed with the main band AF input to provide 2 bands watching with 1 speaker.

3-1-7 SQUELCH CIRCUIT (IF-A AND IF-B BOARDS)

A squelch circuit cuts out AF signals when no RF signal is received. By detecting noise components in the AF signals, the squelch circuit switches the AF control circuits.

When the VHF band is in operation, the squelch circuit on the IF-A BOARD is activated. When the UHF band is in operation, the squelch circuit on the IF-B BOARD is activated.

Some of the noise components in the AF signals from IC1 pin 11 are selected at the CONNECTOR UNIT and then adjusted with a main or sub squelch control circuit (IC9~IC11). The signals are applied to IC1 pin 12 on the IF-A or IF-B BOARD.

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 D2, and are converted to DC voltage. This voltage is applied to the squelch trigger circuit (Q1).

The DC voltage triggers the squelch circuit. Q1 outputs a "LOW" signal as the squelch signal. The signal is applied to the sub CPU (IC1, pin 60 or 61) on the LOGIC UNIT. The sub CPU outputs AFMA and AFMB signals.

The AFMA signal activates the AF control circuit (Q8) on the MAIN-B UNIT to cut the main band AF signal from the CONNECTOR UNIT. The AFMB signal activates the AF control circuit (Q2) on the MAIN-B UNIT to cut the sub band AF signal from the CONNECTOR UNIT.

3-2 UHF RECEIVER CIRCUITS

3-2-1 ANTENNA SWITCHING CIRCUIT (MAIN-B UNIT)

Received UHF signals enter the UHF antenna connector and pass through a low-pass filter (L17, L18, C57~C59). The signals are applied to the antenna switching circuit (D1~D3), and then to the RF circuit via a π-type low-pass filter (L11, L12, C54~C56).

3-2-2 RF CIRCUIT (MAIN-B UNIT)

The signals from the antenna switching circuit are amplified at the RF amplifier (Q7), applied to the band-pass filter (L8) and are then amplified at Q6.

The amplified signals are reapplied to the other bandpass filter (L7). The bandpass filters consisting of helical coils suppress out-of-band signals. The signals are applied to a 1st mixer circuit (Q5).

3-2-3 1ST MIXER CIRCUIT (MAIN-B UNIT)

The signals from the RF circuit are mixed with the 1st LO signal from the U-VCO BOARD to produce a 30.875 MHz 1st IF signal.

3-2-4 1ST IF CIRCUIT (MAIN-B UNIT)

After passing through the matching circuit (L4, C26), the 1st IF signal is applied to a pair of crystal filters (FI1) to suppress out-of-band signals. The 1st IF signal is amplified at an IF amplifier (Q4) and then applied to a 2nd mixer circuit on the IF-B BOARD.

CURRENT OF THE MAIN BAND AF SIGNAL

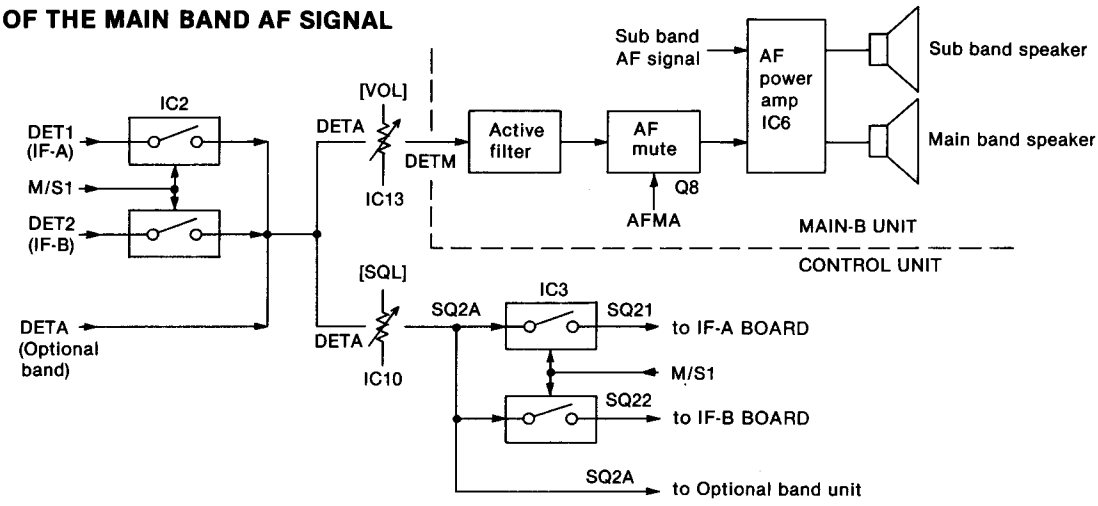


Fig. 2

3-2-5 2ND IF AND DEMODULATOR CIRCUITS (IF-B BOARD)

The 1st IF signal from Q4 on the MAIN-B UNIT is applied to the 2nd mixer section of IC1, and is mixed with a 2nd LO signal to be converted to a 455 kHz 2nd IF signal.

IC1 contains the 2nd mixer, local oscillator circuit, limiter amplifier and quadrature detector circuits. The local oscillator section and X1 generate 30.42 MHz for the 2nd LO signal.

The 2nd IF signal from the 2nd mixer (IC1, pin 4) passes through a ceramic filter (FI1), 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 X2) to demodulate the 2nd IF signal into an AF signal.

AF signal output from IC1 pin 11 is applied to the CONNECTOR UNIT and then selected by a main or sub AF signal using an M/S2 signal line. The signal is adjusted with the volume control circuit (IC12~IC14) and then amplified at an AF power amplifier circuit (IC6) on the MAIN-B UNIT. Refer to Section 3-1-6 AF CIRCUIT and Section 3-1-7 SQUELCH CIRCUIT for information on the path of the AF signal.

3-3 TRANSMITTER CIRCUITS

3-3-1 MICROPHONE AMPLIFIER (MIC UNIT)

The IC-901A/E has 2 microphone amplifier circuits for FM and SSB modes.

In FM mode, AF signals from the mic connector pass through a mic switch (IC8) and are amplified at Q6. The signals are applied to IC15 pin 5, and are pre-emphasized to +6 dB/octave through R24 and C55 connected to pin 6. IC15 functions as the microphone amplifier and the limiter. The output signals from IC15 pin 7 are applied to an FM mic switch (IC17) and then applied to an active low-pass filter (IC23 pin 3).

In optional SSB mode, AF signals from the mic connector pass through the mic switch (IC8) and an SSB mic switch (IC16), and are applied to an SSB mic amplifier (IC23 pin 5). The output signal is applied to the active low-pass filter.

The signals from the FM or SSB microphone amplifier are applied to the active low-pass filter (IC23 pin 3) and then to amplifiers (IC18a, IC18b). Tone signals from the optional UT-40 or UT-48 are also applied to the active low-pass filter. IC18a is controlled by an AGC circuit (D5, Q10, Q11) to obtain an average output power in SSB mode. The resulting signal is then applied to modulation circuits.

When the optional EX-766 is connected, the microphone signals from the EX-766 mic connector are applied to the FM or SSB microphone amplifier circuit. The FM and SSB mic switches and AGC switch (Q11) are controlled by an MMODE signal from the sub CPU.

The VCO circuit in the MAIN-A or MAIN-B UNIT or in the optional band unit oscillates the transmit frequency with AF signal modulation.

3-3-2 VHF DRIVE AMPLIFIER (MAIN-A UNIT)

The V-VCO output, buffer-amplified at Q3 on the V-VCO BOARD, is applied to the transmit/receive switching circuit (D12) on the MAIN-A UNIT. The V-VCO output is then amplified at the drive amplifier (Q10).

3-3-3 VHF RF POWER AMPLIFIER (MAIN-A UNIT)

IC1 is a power module which provides stable 50 W output power.

RF signal from the drive amplifier (Q10) 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 low-pass filter circuits.

MICROPHONE AMPLIFIER

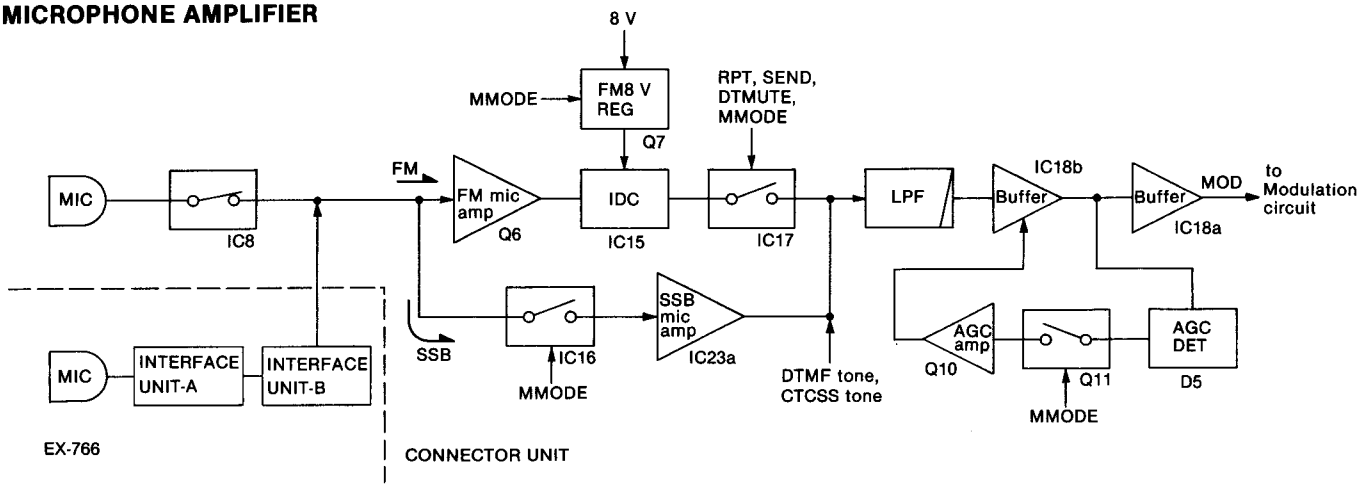


Fig. 3

Voltage controlled by a VHF APC circuit is applied to IC1 pin 2 to protect the RF power module from damage by an antenna mismatch.

3-3-4 VHF APC CIRCUIT (MAIN-A UNIT AND APC-A BOARD)

The VHF APC circuit protects the power module (IC1) from a mismatched output load and selects HIGH and LOW output power. This section mainly describes the VHF APC circuit, which has similar circuitry to the UHF APC circuit.

The output power level from the power module (IC1) is detected at the APC detector (D14, D15). 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 voltage of IC1 pin 2 on the APC-A BOARD is higher than pin 3 (reference voltage). IC1 decreases the collector current of Q11 on the MAIN-A UNIT using Q1. Collector current of Q11 on the MAIN-A UNIT is used at the power module (IC1). Hence, when the antenna impedance is mismatched, the output power is decreased.

The circuit which selects output power uses the APC circuit. Q14 selects the reference voltage using a H/L1 signal line, changing the output power to HIGH or LOW.

3-3-5 VHF ANTENNA SWITCHING CIRCUIT (MAIN-A UNIT)

The antenna switching circuit applies the received signal to the receiver circuits and the transmitter signal to the antenna connector.

When transmitting, D16, D20 and D21 are turned ON. The RF output signal is not applied to the receiver circuit, passing through D16, the low-pass filter (L16, L17, L21, C93~C96) and then to the antenna. The low-pass filter suppresses high harmonic components.

3-3-6 UHF DRIVE AMPLIFIER (MAIN-B UNIT)

The U-VCO output, buffer-amplified at Q17, is applied to the transmit/receive switching circuit (D15). The U-VCO output is then amplified at the predrive amplifier (Q18) and the drive amplifier (Q19).

Voltage controlled by a UHF APC circuit is applied to the collector of Q19 and IC5 pin 2 to protect the RF power module from damage by an antenna mismatch.

3-3-7 UHF RF POWER AMPLIFIER (MAIN-B UNIT)

IC5 is a power module which provides stable 35 W output power.

The RF signal from the drive amplifier (Q19) is applied to IC5 pin 1. The amplified signal is output from pin 5, and applied to the antenna connector through the diode switching and low-pass filter circuits.

3-3-8 UHF ANTENNA SWITCHING CIRCUIT (MAIN-B UNIT)

When transmitting, D1~D3 are turned ON. The RF output signal is not applied to the receiver circuit, passing through D1, the low-pass filter (L17, L18, C57~C59) and then to the antenna. The low-pass filter suppresses high harmonic components.

3-4 VHF PLL CIRCUITS

3-4-1 GENERAL (V-PLL AND V-VCO BOARDS)

A PLL circuit stably oscillates the transmit frequency and the receive local frequency. The PLL output frequency is controlled by the divided ratio (N-data) of the programmable divider.

VHF APC CIRCUIT

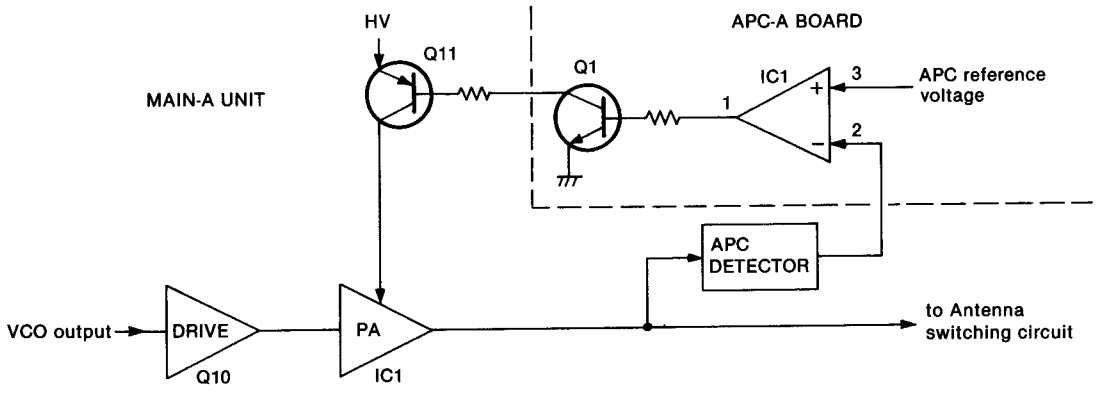


Fig. 4

The PLL circuit, using a one chip PLL IC (IC1) on the V-PLL BOARD, directly generates the transmit and 1st LO frequency with a Hartley VCO (Q1) on the V-VCO BOARD. The PLL IC sets the divided ratio based on serial data from the sub CPU, and compares the phases of a VCO signal and the reference oscillator frequency. The PLL IC detects the out-of-step phase and outputs from pin 5 and 12. The reference frequency is oscillated at X1 on the MAIN-A UNIT.

3-4-2 REFERENCE OSCILLATOR CIRCUIT (MAIN-A UNIT)

A reference frequency is produced by the oscillator (Q12) and X1. A buffer amplifier (Q13) provides a UHF PLL circuit.

3-4-3 CHARGE PUMP AND LOOP FILTER CIRCUITS (V-PLL BOARD)

Phase-detected signals from IC1 pins 5 and 12 are converted to DC voltage by a charge pump (Q5~Q7) and a loop filter (R1~R3, R8, C1~C4).

The frequency at which the VCO oscillates is controlled by varactor diodes (D1, D2) on the V-VCO BOARD. DC voltage (PLL lock voltage) is provided through the integrator circuit (C1, R1) on the V-VCO BOARD.

On the other hand, the output of the loop filter passes through a DC amplifier (Q1, Q4) and is used as the tuning voltage for the Rx bandpass filters.

3-4-4 VCO CIRCUIT (V-VCO BOARD)

The VCO circuit (Q1, D1, D2) generates the receive and transmit frequencies and makes an FM modulation. Varactor diodes (D1, D2) provide frequency control. The buffer amplifiers (Q2~Q4) protect the PLL output signal against VCO oscillation.

3-4-5 UNLOCK SENSOR CIRCUIT (V-PLL BOARD)

When the PLL circuit is unlocked, IC1 pin 7 is "LOW" and a "LOW" signal is applied to Q8 and then to the sub CPU pin 10 as an unlock signal.

3-5 UHF PLL CIRCUITS

3-5-1 GENERAL (U-PLL AND U-VCO BOARDS)

The PLL circuit, using a PLL IC (IC1) and dual modulus prescaler (IC2) on the U-PLL BOARD, generates the transmit and 1st LO frequency with a Colpitts VCO (Q1) on the U-VCO BOARD. The PLL IC sets the dividing ratio based on serial data from the sub CPU and controls the dual modulus prescaler. The PLL IC compares the phases of a VCO signal and the reference oscillator frequency, and then detects the out-of-step phase and outputs from pins 22 and 23. The reference frequency, buffer-amplified at Q13 on the MAIN-A UNIT, is applied to IC1 pin 2.

3-5-2 CHARGE PUMP AND LOOP FILTER CIRCUITS (U-PLL BOARD)

Phase-detected signals from IC1 pins 22 and 23 are converted to DC voltage by a loop filter consisting of an active filter (Q1, Q2).

The frequency at which the VCO oscillates is controlled by varactor diodes (D1, D2) on the U-VCO BOARD. DC voltage (PLL lock voltage) is provided through the integrator circuit (R1, C1).

3-5-3 VCO CIRCUIT (U-VCO BOARD)

The VCO circuit (Q1, D1, D2) generates the receive and transmit frequencies and makes an FM modulation. Varactor diodes (D1, D2) provide frequency control. The buffer amplifier (Q2) protects the PLL output signal against VCO oscillation.

3-5-4 UNLOCK SENSOR CIRCUIT (U-PLL BOARD)

When the PLL circuit is unlocked, IC1 pin 16 is "HIGH" and a "HIGH" signal is applied to Q32 and then to the sub CPU pin 11 as an unlock signal.

VHF PLL CIRCUIT

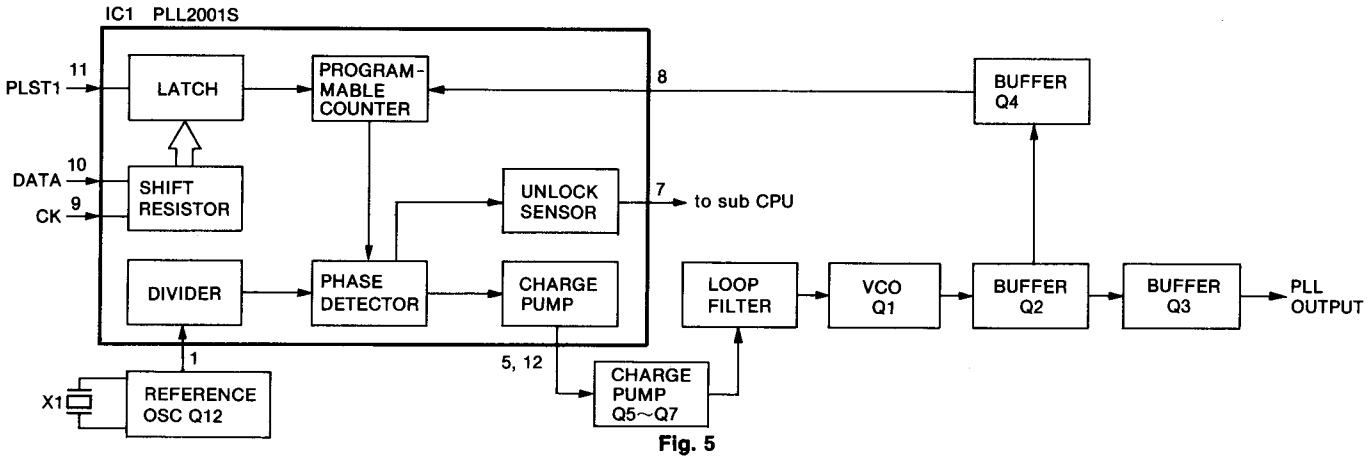


Fig. 5

3-6 POWER SUPPLY CIRCUITS

3-6-1 VOLTAGE LINES

LINE	DESCRIPTION
HV	The external DC power from the DC power connector.
5V	Common 5 V converted from the SHV line at IC3 on the MAIN-A UNIT.
13.8 V (VHF)	VHF 13.8 V DC controlled by the POW1 signal line.
V5V	VHF 5 V converted from the VHF 13.8 V line at IC2 on the MAIN-A UNIT.
V8V	VHF 8 V converted from the VHF 13.8 V line at Q24 and Q25 on the MAIN-A UNIT using IC2 output as the reference voltage.
13.8 V (UHF)	UHF 13.8 V DC controlled by the POW2 signal line.
U5V	UHF 5 V converted from the UHF 13.8 V line at IC4 on the MAIN-B UNIT.
U8V	UHF 8 V converted from the UHF 13.8 V line at Q14 and Q15 on the MAIN-B UNIT using IC4 output as the reference voltage.
AF 13.8 V	AF amp power source controlled by the common 5 V voltage line.
30 V	30 V DC converted from the HV line. IC6 on the MAIN-A UNIT is a switching regulator IC and converts Q8 output into approx. 30 V DC.

3-6-2 CPU POWER SUPPLY CIRCUIT (CONTROL UNIT)

When the power switch is turned OFF, voltage is applied to the RAM (IC2) pin 24 via D2 from the lithium backup battery (BT1) installed in the remote controller to provide backup for the memory contents.

3-7 OTHER CIRCUITS

3-7-1 S/RF INDICATOR CIRCUIT (LOGIC UNIT)

A portion of the 2nd IF signal is output from FI1 on the IF-A or IF-B BOARD. The signal is amplified at Q2 and Q3, and then rectified at D3 to obtain an S-indicator signal. The S-indicator signal is applied to the CONNECTOR UNIT and then selected to a main or sub S-indicator signal using M/S1 and M/S2 signal lines. The signal is applied to a comparator (IC2 pin 3 or 5) on the LOGIC UNIT.

IC2 pin 2 or 6 receives an S-indicator reference signal from the sub CPU AD0~3 terminals via the D/A converter (R41~R48). The sub CPU terminals increase the reference signal level.

When the D/A converted level becomes greater than the S-indicator level, IC2 pin 1 or 7 becomes "LOW." The sub CPU detects the signal strength level using the AD0~3 terminal outputs and the main CPU indicates the signal strength level on the function display when receiving the "LOW" signal.

While transmitting, the S/RF indicator indicates the detected output power in the APC circuit.

3-7-2 SUBAUDIBLE TONE CIRCUIT (TONE UNIT)

IC1 encodes subaudible tone frequency signals of 67.0 Hz~250.3 Hz. A tone is set by serial data from the sub CPU.

IC2 functions as a serial/parallel converter, applying 6-bit parallel data to IC1. The following table shows the relation between input data and the output frequency of IC1.

SUBAUDIBLE TONE ENCODER FREQUENCY TABLE

OUTPUT FREQUENCY [Hz]	IC1 INPUT PIN NUMBER						OUTPUT FREQUENCY [Hz]	IC1 INPUT PIN NUMBER						OUTPUT FREQUENCY [Hz]	IC1 INPUT PIN NUMBER					
	8	9	10	11	12	13		8	9	10	11	12	13		8	9	10	11	12	13
67.0	H	L	L	L	L	L	107.2	L	H	H	H	L	L	167.9	H	H	L	H	H	L
71.9	L	H	L	L	L	L	110.9	H	H	H	H	L	L	173.8	L	L	H	H	H	L
74.4	H	H	L	L	L	L	114.8	L	L	L	L	H	L	179.9	H	L	H	H	H	L
77.0	L	L	H	L	L	L	118.8	H	L	L	L	H	L	186.2	L	H	H	H	H	L
79.7	H	L	H	L	L	L	123.0	L	H	L	L	H	L	192.8	H	H	H	H	H	L
82.5	L	H	H	L	L	L	127.3	H	H	L	L	H	L	203.5	L	L	L	L	L	H
85.4	H	H	H	L	L	L	131.8	L	L	H	L	H	L	210.7	H	L	L	L	L	H
88.5	L	L	L	H	L	L	136.5	H	L	H	L	H	L	218.1	L	H	L	L	L	H
91.5	H	L	L	H	L	L	141.3	L	H	H	L	H	L	225.7	H	H	L	L	L	H
94.8	L	H	L	H	L	L	146.2	H	H	H	L	H	L	233.6	L	L	H	L	L	H
97.4	H	H	L	H	L	L	151.4	L	L	L	H	H	L	241.8	H	L	H	L	L	H
100.0	L	L	H	H	L	L	156.7	H	L	L	H	H	L	250.3	L	H	H	L	L	H
103.5	H	L	H	H	L	L	162.2	L	H	L	H	H	L							

H: HIGH L: LOW

3-8 MAIN CPU PORT ALLOCATIONS (CONTROL UNIT)

• INPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
RESET	7	Inputs a signal for main CPU resetting. The CPU program is reset when the port becomes "LOW."
P12	28	Inputs serial data from the sub CPU which are synchronized with the SCK or INT4 signal.
P10, P11 [UP/DOWN]	30, 29	Input ports for the up/down signal of the main dial.
PTH03 [MU/D2]	31	Input port for the microphone up/down signal from the optional EX-766 mic connector. This port goes to ground when the [UP] switch is pushed. This port becomes approx. 1.6 V when the [DN] switch is pushed.
PTH00~ PTH02	34~32	These are input ports for the [CHECK] , [LOCK] and [S.MUTE] switches.
TI1	36	Detects a start bit of serial data from the sub CPU. The main CPU latches the serial data using a baud rate (4800 bps).
PTT	34	Inputs a signal on the PTT line of the optional EX-766 mic connector. This port becomes "HIGH" when the PTT switch is pushed.
P123~P120, P133~P130	45~52	These are input ports for the initial and key matrices.

• OUTPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
P83	18	Outputs a signal for controlling intensity of the function display.
P92, P93	23, 22	Outputs a strobe signal for the LCD drivers.
P91 [DATA]	24	Outputs serial data for the LCD drivers synchronized with the CLK signal.
P90 [CLK]	25	Outputs clock signals for the LCD drivers.
P22, P23	38, 37	Outputs a strobe signal for key matrix.
P21	39	Outputs a signal for lighting up in green the [RX] indicator. This port becomes "LOW" while sub band receiving. (squelch opens)

• OUTPUT PORT (CONTINUED)

PORT NAME	PIN NUMBER	DESCRIPTION
P20 [BEEP]	40	Outputs a 0.8/1.6 kHz beep tone.
SO	42	Outputs serial data for the sub CPU synchronized with the SCK signal.
SCK	43	Outputs clock signals for the serial data (SO).
P140~P143	56~53	Outputs a strobe signal for initial matrix.
P33	59	Outputs a signal for lighting up in green the [T/R] indicator. This port becomes "LOW" while main band receiving. (squelch opens)
P32	60	Outputs a signal for lighting up in red the [T/R] indicator. This port becomes "LOW" while main band transmitting.

3-9 SUB CPU PORT ALLOCATIONS (LOGIC UNIT)

• INPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
RESET	7	Inputs a signal for sub CPU resetting. The CPU program is reset when the port becomes "LOW."
UNLKV	10	Detects a VHF band PLL unlock signal. When the signal is "HIGH," the PLL is unlocked.
UNLKU	11	Detects a UHF band PLL unlock signal. When the signal is "HIGH," the PLL is unlocked.
UNLK12	12	Detects a 1200 MHz band PLL unlock signal. When the signal is "HIGH," the PLL is unlocked.
D1, D2, D4, D8	17~14	These are input ports for the DTMF code from the UT-48.
DV	18	This port becomes "HIGH," when the optional UT-48 detects the DTMF code in the received signal.
DTMF	19	Input port for the optional UT-48. This port becomes "LOW" when the UT-48 is installed.
BUSY	20	Inputs an optional band connection signal. The signal is "LOW" when the accessed band unit is connected.
ENC	21	Input port for the TONE UNIT. This port becomes "LOW" when the TONE UNIT is installed.
OPT1, OPT2	29, 27	Input ports for the optional UT-40. This port becomes "LOW" when the UT-40 is installed.
DATAI	30	Inputs serial data from the remote controller or optional EX-766 which are synchronized with the CK signal.

• INPUT PORT (CONTINUED)

PORT NAME	PIN NUMBER	DESCRIPTION
SRFI1, SRFI2	32, 31	Inputs an S-meter-compared signal from IC2 on the LOGIC UNIT to indicate the sub CPU counting level to the S-indicator in the function display.
MU/D	33	Input port for the microphone up/down signal from the mic connector. This port goes to ground when the [UP] switch is pushed. This port becomes approx. 1.6 V when the [DN] switch is pushed.
PTT	34	Inputs a signal on the PTT line. This port becomes "LOW" when the PTT switch is pushed.
CK	36	Inputs clock signals for the serial data (DATAI).
SQSA, SQSB	61, 60	Detects a main or sub squelch signal. The signal is "HIGH" when the squelch opens.
TSQ1, TSQ2	62, 28	Input port for the optional UT-48. This port becomes "HIGH" when the tone squelch opens.

• OUTPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
BAND1~ BAND6	6~1	Outputs a data which selects a signal for serial data to the IC-901A/E optional band unit.
DTST	13	Outputs a strobe signal for the DTMF serial data to the optional UT-48.
AD0~AD3	25~22	Outputs a D/A converter counting signal as S-indicator reference signal.
TST2	37	Outputs a strobe signal for serial data to the optional UT-40, connected to OPT2 socket (LOGIC UNIT P2).
TST1	38	Outputs a strobe signal for serial data to the TONE UNIT or optional UT-40, connected to socket OPT1 (LOGIC UNIT P1).
DTCK	39	Outputs clock signals for the DTMF serial data (DTDAT).
DTDAT	40	Outputs DTMF serial data for the optional UT-48 synchronized with the DTCK signal.
DATAO	42	Outputs serial data for the main CPU synchronized with the CK signal.

• OUTPUT PORT (CONTINUED)

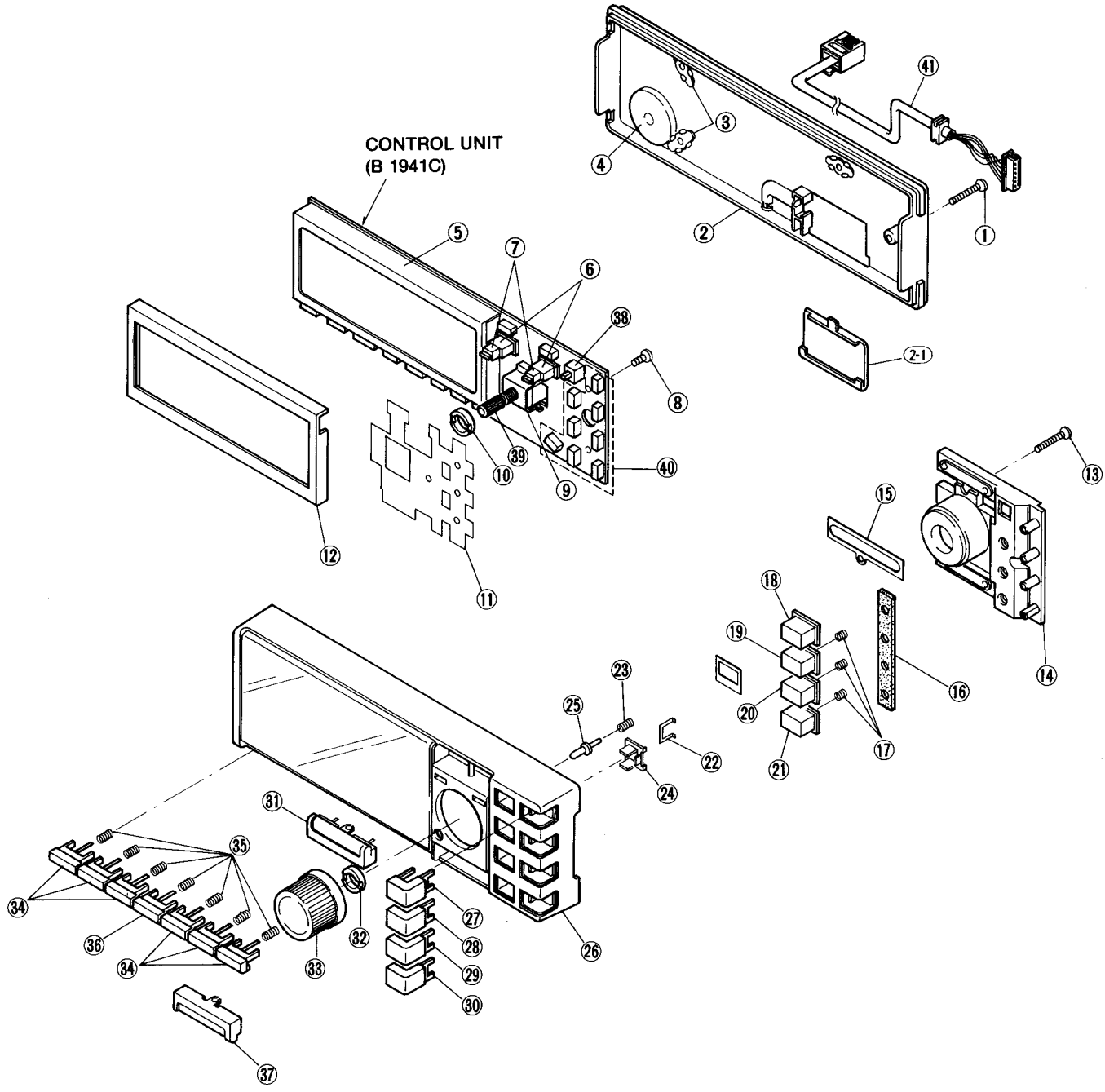
PORT NAME	PIN NUMBER	DESCRIPTION
RITST	45	Outputs a strobe signal for serial data to the RIT/VXO control circuit.
SSBST	46	Outputs a strobe signal for serial data to the SSB control circuit.
PLST	47	Outputs a strobe signal for serial data to the PLL IC in the IC-901A/E optional band unit.
CTRLST	48	Outputs a strobe signal for serial data to the control IC in the IC-901A/E optional band unit.
SQST	49	Outputs a strobe signal for serial data to the squelch volume control IC.
VOST	50	Outputs a strobe signal for serial data to the AF volume control IC.
RLST	51	Outputs a strobe signal for the DTMF serial data.
STB	52	Outputs a strobe signal for serial data to the IC-900A/E optional band unit.
AFMA, AFMB	54, 53	Outputs a main or sub band receive mute signal for the AF mute circuit.
OPT1/2	55	Outputs a band selecting signal for the optional UT-48. This port becomes "HIGH" when the main band signal is applied to the OPT1 socket.
RPT	56	Outputs a repeater mode signal.
MMODE	59	Outputs a control signal for the mic amplifier. This port becomes "HIGH" when an optional SSB band unit is selected to the main band.
SEND	63	Outputs transmit/receive switching signals. This port becomes "HIGH" while transmitting.
TMUTE	64	Outputs a control signal for R8V/T8V regulator.

SECTION 4 MECHANICAL PARTS AND DISASSEMBLY

4-1 REMOTE CONTROLLER

LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810005720	Screw PH B0 M2×20 ZK	1
②	8010009560	Control case (rear) (incl.backpanel cover)	1
②-1	8010008840	Backpanel cover	1
③	8930015510	Screw plate	3
④	2520000030	Buzzer EFBR49C02Y	1
⑤	8930015470	LCD holder	1
⑥	8930015490	LED spacer	1
⑦	8930016390	LED cover	1
⑧	8810001020	Screw PH B0 M2.6×4	2
⑨	8930015461	MD plate-1	1
⑩	8830000550	VR Nut (E)	1
⑪	8930016200	674 seat	1
⑫	8930015501	LCD rubber-1	1
⑬	8810005010	Screw PH B0 M2×10	2
⑭	8010008851	Reflector plate-1	1
⑮	8930017170	137 seat	1
⑯	8930017070	Switch sponge	1
⑰	8930006450	Release spring (H)	7
⑱	8610005940	Button K137 [PWR]	1
⑲	8610005870	Button K134 [MHz]	1
⑳	8610005880	Button K134 (A) [H/L]	1
㉑	8610005890	Button K134 (B) [SET]	1
㉒	8930016600	135 spring	4
㉓	8930006440	Release spring (F)	1
㉔	8930016630	135 stopper	4
㉕	8610005810	Button K136 [LOCK]	1
㉖	8010009010	Control case (front) (IC-901A)	1
	8010009020	Control case (front) (IC-901E)	1
㉗	8610005900	Button K135 [V/M]	1
㉘	8610005910	Button K135 (A) [CALL]	1
㉙	8610005920	Button K135 (B) [M/S]	1
㉚	8610005930	Button K135(C) [SUB]	1
㉛	8610005860	Button K133 (A) [SQUELCH]	1
㉜	8830000550	VR Nut (E)	1
㉝	8610005800	Knob N145 [MAIN DIAL]	1
㉞	8610005830	Button K131 [BAND], [MODE], [T/TSQL], etc.	6
㉟	8930014820	Release spring (M)	7
㊱	8610005820	Button K132 [TS]	1
㊲	8610005850	Button K133 [VOLUME]	1
㊳	2230000550	Switch SPPH23079A [PWR]	1
㊴	2260000400	Switch SRBM1L011A [MAIN DIAL]	1
㊵	2260000390	Switch SKHLAB064A [BAND], [MODE], [T/TSQL], etc.	19
㊶	8900002410	Remote control cable OPC-213	1

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


CONTROL UNIT
(B 1941C)
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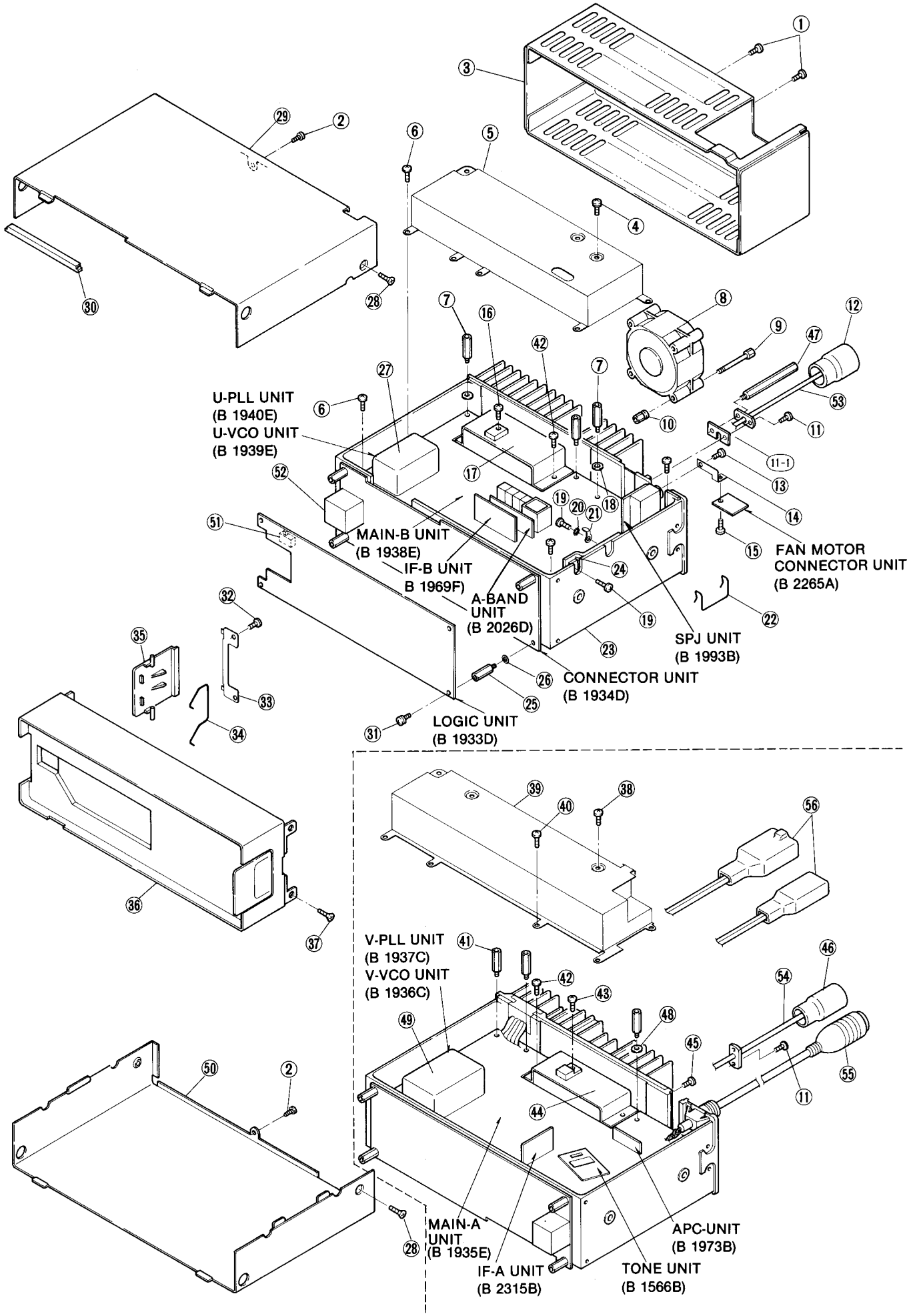
4-2 TRANSCEIVER

LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.	LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810003720	Icom screw B 6	5	㉙	8110003680	Cover (upper)	1
②	8810003700	Icom screw B 4	2	㉚	8930017100	722 Bushing	1
③	8010008890	723 Fan cover	1	㉛	8810003150	Setscrew A M3×5	4
④	8810002170	Screw FH M3×6	3	㉜	8810000980	Screw PH B0 M2×4	2
⑤	8010008870	PA Shield	1	㉝	8930015550	Switch plate	1
⑥	8810003150	Setscrew A M3×5	9	㉞	8930016610	722 spring	1
⑦	8930000270	Standoff (W)	3	㉟	8930015540	Lock button	1
⑧	2710000240	Fan motor 0420-12	1	㊱	8210004860	Front panel	1
⑨	8930015600	723 Fan Standoff	4	㊲	8810002450	Screw FH M2.6×5 ZK BS	4
⑩	8930015900	723 Fan Spacer	4	㊳	8810002170	Screw FH M3×6	3
⑪	8810001910	Screw PH M3×6 Ni BS	1	㊴	8010008860	PA Shield (A)	1
⑪-1	8930009080	ANT plate	1	㊵	8810003150	Setscrew A M3×5	8
⑫	6950000030	N type cap-1	1	㊶	8930000270	Standoff (W)	3
⑬	8810001280	Screw PH B1 M2.6×6	1	㊷	8810001920	Screw PH M3×8 Ni BS	4
⑭	8930016150	723 Fan plate	1	㊸	8810003670	Icom screw A 6	1
⑮	8810000010	Screw PH M2×4	1	㊹	8930015530	Module plate	1
⑯	8810003670	Icom screw A 6	1	㊺	8810001910	Screw PH M3×6 Ni BS	1
⑰	8930015530	Module shield plate	1	㊻	6950000040	M Type cap (ZK)	1
⑱	8850000420	Spring washer M 3 Ni	3	㊼	8930015590	Standoff (AX)	1
⑲	8810000230	Screw PH M3×6	2	㊽	8850000420	Spring washer M3 Ni	1
⑳	8850000570	Starwasher M 3	1	㊾	8510005710	722 VCO case (A)	1
㉑	8860000130	Ground lag B 5 (M3) AG BS	1	㊿	8110003690	Cover (bottom)	1
㉒	8930015580	U clip (A)	1	(51)	2220000050	Switch SSSS21148A	1
㉓	8010008881	722 Chassis-1	1	(52)	6450000850	Remote jack HJC0178-01-022	1
㉔	8410001350	AF Heatsink	1	(53)	8900002430	ANT cable OPC-224	1
㉕	8930000130	Standoff (I)	4	(54)	8900001890	ANT cable OPC-186	1
㉖	8850000420	Spring washer M 3 Ni	4	(55)	8900002790	MIC cable OPC-267 (length: 1 m)	1
㉗	8510005800	722 VCO case	1	(56)	8900002380	DC cable OPC-225	1
㉘	8810006010	Screw FH M3×5 ZK BS	4				

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

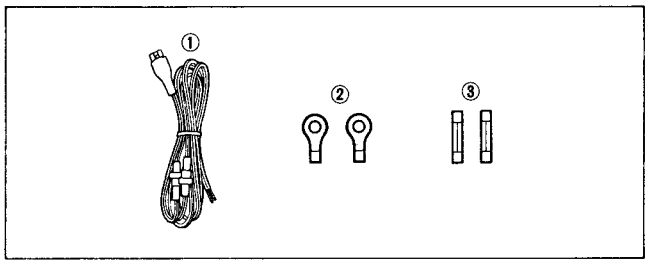

U-PLL UNIT
(B 1940E)
U-VCO UNIT
(B 1939E)
MAIN-B UNIT
(B 1938E)
IF-B UNIT
B 1969F)
A-BAND
UNIT
(B 2026D)
SPJ UNIT
(B 1993B)
CONNECTOR UNIT
(B 1934D)
LOGIC UNIT
(B 1933D)
FAN MOTOR
CONNECTOR UNIT
(B 2265A)
V-PLL UNIT
(B 1937C)
V-VCO UNIT
(B 1936C)
MAIN-A
UNIT
(B 1935E)
IF-A UNIT
(B 2315B)
TONE UNIT
(B 1566B)
APC-UNIT
(B 1973B)

4-3 ACCESSORIES

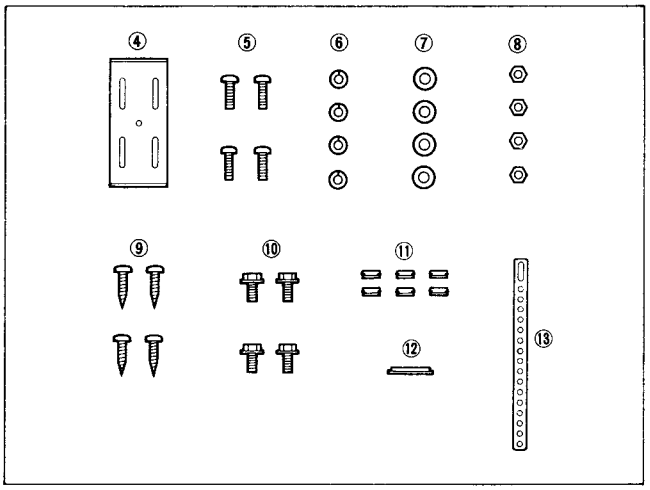
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	Optional product	DC power cable OPC-025 A	1
②	6510003070	Battery terminals R5.5-8	2
③	5210000080	Fuses FGB 20A	2
④	8010008710	150 Mounting bracket	1
⑤	8810000470	Screw PH M5 × 12 (+ −)	4
⑥	8850000440	Spring washer M 5 Ni	4
⑦	8850000150	Flat washer M 5 Ni BS	4
⑧	8830000120	Nut M 5	4
⑨	8810000950	Screw PH A M5 × 16	4
⑩	8820000530	Mounting bolt	4
⑪	8930010830	Rubber bushing	6
⑫	8930010980	Rubber bushing (A)	1
⑬	8010004060	Mounting support bracket	1
⑭	Optional product	Remote control cable OPC-214	1
⑮	8930011450	Remote control support Blakets	2
⑯	8810003710	Icom screw B 5	3
⑰	8810004680	Screw PH A M3 × 8 ZK	2
⑱	Optional product	Microphone HM-12 IC-901A (AUS)	1
	Optional product	Microphone HM-14 IC-901A (USA)	1
	Optional product	Microphone HM-15 IC-901E (EUR)	1
⑲	8930007300	Microphone hanger	1
⑳	8930007970	Mic connector holder	1
㉑	8810003901	Screw PH A M4 × 10	1
㉒	Optional product	Speaker SP-12	1
㉓	8930017080	Metal grip	1
㉔	8810004680	Screw PH A M3 × 8 ZK	2
㉕	8930008050	Double-sided tape (A)	2
㉖	5610000020	AP313 3.5φ CS plug	1

Screw abbreviations PH: Pan head ZK: Black
Ni: Nickel BS: Brass

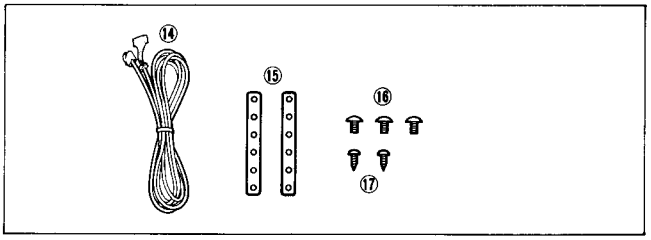
• Power cable connections



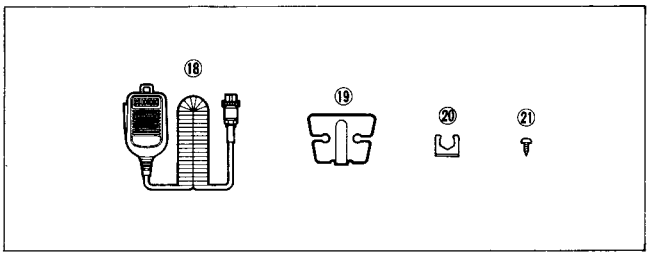
• Transceiver mounting



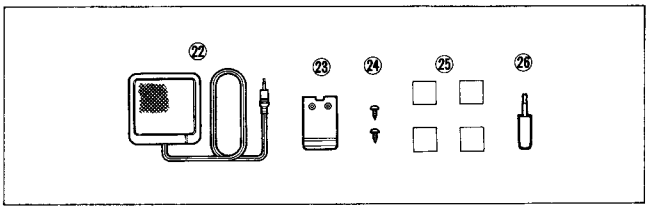
• Remote controller installation



• Microphone



• Speaker



SECTION 5 PARTS LIST

[CONTROL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140001190	IC	μPD75116GF-554-3BE
IC2	1130004050	IC	LC3517AML-15
IC3	1130004190	IC	LC7582A
IC4	1130004190	IC	LC7582A
IC5	1110001550	IC	S-8054ALB-LM-T1
IC6	1180000420	IC	TA78L05F (TE12R)
IC7	1130003760	IC	TC4S81F (TE85R)
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1510000110	Transistor	2SA1162-Y (TE85R)
Q3	1510000110	Transistor	2SA1162-Y (TE85R)
Q4	1510000110	Transistor	2SA1162-Y (TE85R)
Q5	1590000420	Transistor	RN1404 (TE85R)
Q6	1590000410	Transistor	RN2404 (TE85R)
Q7	1530000160	Transistor	2SC2712-Y (TE85R)
Q8	1520000270	Transistor	2SB1182 T201 Q
Q9	1590000510	Transistor	RN1409 (TE85R)
Q10	1590000410	Transistor	RN2404 (TE85R)
Q11	1590000510	Transistor	RN1409 (TE85R)
Q12	1590000410	Transistor	RN2404 (TE85R)
Q13	1520000200	Transistor	2SB798-T2 DK
Q14	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000020	Diode	1SS184 (TE85R)
D3	1750000020	Diode	1SS184 (TE85R)
D4	1750000020	Diode	1SS184 (TE85R)
D5	1750000020	Diode	1SS184 (TE85R)
D6	1750000020	Diode	1SS184 (TE85R)
D7	1750000020	Diode	1SS184 (TE85R)
D8	1750000020	Diode	1SS184 (TE85R)
D9	1750000020	Diode	1SS184 (TE85R)
D10	1750000020	Diode	1SS184 (TE85R)
D11	1750000050	Diode	1SS193 (TE85R)
D19	1710000600	Diode	1SS254 (Europe), (Australia)
D20	1710000600	Diode	1SS254 (Europe), (Australia)
D24	1710000600	Diode	1SS254
D25	1710000600	Diode	1SS254
D27	1710000600	Diode	1SS254 (Europe), (Australia)
D28	1710000600	Diode	1SS254
D29	1710000600	Diode	1SS254
D30	1750000050	Diode	1SS193 (TE85R) (Europe)
D34	1750000060	Diode	1SS196 (TE85R) (Europe), (U.S.A.)
	1750000050	Diode	1SS193 (TE85R) (Australia)
D35	1750000060	Diode	1SS196 (TE85R) (U.S.A.), (Australia)
D36	1750000060	Diode	1SS196 (TE85R) (U.S.A.), (Australia)
	1750000050	Diode	1SS193 (TE85R) (Europe)
D38	1750000050	Diode	1SS193 (TE85R)
D39	1750000050	Diode	1SS193 (TE85R)
X1	6050005090	Crystal	CR-245
R1	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R3	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000550	Resistor	MCR10EZHJ 27 kΩ (273)
R6	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R7	7030000390	Resistor	MCR10EZHJ 1.2 kΩ (122)
R8	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)

REF. NO.	ORDER NO.	DESCRIPTION	
R9	7010004750	Resistor	R50XJ 220 Ω
R10	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R11	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R12	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R13	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R14	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R15	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R16	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R17	7030000320	Resistor	MCR10EZHJ 330 Ω (331)
R18	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R19	7030000320	Resistor	MCR10EZHJ 330 Ω (331)
R20	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R21	7030000320	Resistor	MCR10EZHJ 330 Ω (331)
R22	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R23	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R24	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R25	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R26	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R27	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R28	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R29	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R30	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R31	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R32	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R33	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R34	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R35	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R36	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R37	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R38	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R39	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R40	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R41	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R42	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R43	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R44	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R45	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R46	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R47	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R48	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R49	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R50	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R51	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R52	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R53	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R54	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
C1	4510001360	Electrolytic	16 MS5 22 μF
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4510001320	Electrolytic	6R3 MS5 47 μF
C5	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C6	4030004690	Ceramic	C2012 SL 1H 331J-T-A
C7	4510001340	Electrolytic	10 MS5 33 μF
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4030004690	Ceramic	C2012 SL 1H 331J-T-A
C10	4510001350	Electrolytic	16 MS5 10 μF
C11	4510001340	Electrolytic	10 MS5 33 μF
C12	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C13	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C14	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C15	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C17	4030004720	Ceramic	C2012 JB 1H 102K-T-A

[CONTROL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
DS1	5030000470	LCD	LCD-9814J [FUNCTION DISPLAY]
DS2	5040001090	LED	SLP251D-50 [SUB RX]
DS3	5040001380	LED	SLP532D-40 [MAIN T/R]
DS4	5080000150	Lamp	HRS7219A
DS5	5080000150	Lamp	HRS7219A
DS6	5080000150	Lamp	HRS7219A
DS7	5080000150	Lamp	HRS7219A
BT1	3020000020	Lithium Battery	BR2032-1T2
S1	2230000550	Switch	SPPH23079A [PWR]
S2	2260000400	Encoder	SRBM1L011A [MAIN DIAL]
S3	2220000050	Switch	SSSS21148A
S4	2260000390	Switch	SKHLAB064A [CHECK]
S5	2260000390	Switch	SKHLAB064A [LOCK]
S6	2260000390	Switch	SKHLAB064A [S. MUTE]
S7	2260000390	Switch	SKHLAB064A [V/M]
S8	2260000390	Switch	SKHLAB064A [CALL]
S9	2260000390	Switch	SKHLAB064A [BAND]
S10	2260000390	Switch	SKHLAB064A [MODE]
S11	2260000390	Switch	SKHLAB064A [MHz]
S12	2260000390	Switch	SKHLAB064A [H/L]
S13	2260000390	Switch	SKHLAB064A [∧ SQUELCH]
S14	2260000390	Switch	SKHLAB064A [∨ SQUELCH]
S15	2260000390	Switch	SKHLAB064A [SUB]
S16	2260000390	Switch	SKHLAB064A [M/S]
S17	2260000390	Switch	SKHLAB064A [MW]
S18	2260000390	Switch	SKHLAB064A [SET]
S19	2260000390	Switch	SKHLAB064A [TS]
S20	2260000390	Switch	SKHLAB064A [T/T. SQL]
S21	2260000390	Switch	SKHLAB064A [∧ VOLUME]
S22	2260000390	Switch	SKHLAB064A [∨ VOLUME]
EP1	0910020853	P.C. Board	B 1941C (CONTROL)
EP2	8930015450	LCD contact strip	SRCN-674
EP3	8930015450	LCD contact strip	SRCN-674

[CONNECTOR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000830	IC	μPD4094BG-T1
IC2	1130001250	IC	μPD4066BG-T1
IC3	1130001250	IC	μPD4066BG-T1
IC4	1130000830	IC	μPD4094BG-T1
IC5	1130001250	IC	μPD4066BG-T1
IC6	1130001250	IC	μPD4066BG-T1
IC7	1130001880	IC	μPD4069UBG-T1
IC8	1130004200	IC	TC4S66F (TE85R)
IC9	1110001240	IC	μPC358G2-T1
IC10	1130003060	IC	TC9154AP
IC11	1110001240	IC	μPC358G2-T1
IC12	1110001240	IC	μPC358G2-T1
IC13	1130003060	IC	TC9154AP
IC14	1110001240	IC	μPC358G2-T1
IC15	1110000960	IC	NJM4558M (T1)
IC16	1130004200	IC	TC4S66F (TE85R)
IC17	1130004200	IC	TC4S66F (TE85R)
IC18	1110000960	IC	NJM4558M (T1)
IC19	1130004200	IC	TC4S66F (TE85R)
IC20	1130004200	IC	TC4S66F (TE85R)
IC21	1130004200	IC	TC4S66F (TE85R)
IC22	1130004200	IC	TC4S66F (TE85R)
IC23	1110000960	IC	NJM4558M (T1)
IC24	1130004170	IC	TC4S01F (TE85R)
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1590000420	Transistor	RN1404 (TE85R)
Q3	1590000420	Transistor	RN1404 (TE85R)
Q4	1590000460	Transistor	RN1402 (TE85R)
Q5	1590000480	Transistor	RN2402 (TE85R)
Q6	1530000160	Transistor	2SC2712-Y (TE85R)
Q7	1510000110	Transistor	2SA1162-Y (TE85R)
Q8	1590000420	Transistor	RN1404 (TE85R)
Q9	1590000420	Transistor	RN1404 (TE85R)
Q10	1530002550	Transistor	2SC3326-B (TE85R)
Q11	1590000380	FET	2SJ106-Y (TE85R)
Q12	1530002550	Transistor	2SC3326-B (TE85R)
Q13	1530002550	Transistor	2SC3326-B (TE85R)
Q14	1530002550	Transistor	2SC3326-B (TE85R)
Q15	1530002550	Transistor	2SC3326-B (TE85R)
Q16	1590000420	Transistor	RN1404 (TE85R)
Q17	1590000380	FET	2SJ106-Y (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000020	Diode	1SS184 (TE85R)
D3	1750000050	Diode	1SS193 (TE85R)
D4	1750000050	Diode	1SS193 (TE85R)
D5	1750000070	Diode	1SS226 (TE85R)
D6	1750000050	Diode	1SS193 (TE85R)
R1	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R3	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R4	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R5	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R6	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R7	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R8	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R9	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R10	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R11	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R12	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R13	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R14	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R15	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R16	7030000200	Resistor	MCR10EZHJ 33 Ω (330)
R17	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
R18	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R19	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R20	7030001600	Resistor	MCR10EZHJ 1.2 MΩ (125)
R21	7030000320	Resistor	MCR10EZHJ 330 Ω (331)
R22	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R23	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R24	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R25	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R26	7310002210	Trimmer	RH0422C15J06A (104)
R27	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R28	7030000640	Resistor	MCR10EZHJ 150 kΩ (154)
R29	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R30	7030000550	Resistor	MCR10EZHJ 27 kΩ (273)
R31	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R32	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R34	7030000640	Resistor	MCR10EZHJ 150 kΩ (154)
R35	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R36	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R37	7030000640	Resistor	MCR10EZHJ 150 kΩ (154)
R38	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R39	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R40	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R41	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R42	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R43	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R44	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R45	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R46	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)

[CONNECTOR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R47	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R48	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R49	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R50	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R51	7030000680	Resistor	MCR10EZHJ 330 kΩ (334)
R52	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R53	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R54	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R55	7310002150	Trimmer	RH0422C14J0AA (103)
R56	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R57	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R58	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R59	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R60	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R61	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R62	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R63	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R64	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R65	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R67	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R68	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R69	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R70	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R71	7030000550	Resistor	MCR10EZHJ 27 kΩ (273)
R72	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R73	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R74	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
C1	4030004760	Ceramic	C2012 JF 1E 104Z-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	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C8	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C9	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C10	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C11	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C12	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C13	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C14	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C15	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C16	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C17	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C18	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C19	4510001470	Electrolytic	50 MS5 1 µF
C20	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C21	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C22	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C23	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C24	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C25	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C26	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C27	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C28	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C29	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C30	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C31	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C32	4510002520	Electrolytic	10 MS7 47 µF
C33	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C34	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C35	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C36	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C37	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C38	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C39	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C40	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C41	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C42	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C43	4510001920	Electrolytic	10 MS9 470 µF
C44	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C45	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C46	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C47	4030004760	Ceramic	C2012 JF 1E 104Z-T-A

REF. NO.	ORDER NO.	DESCRIPTION	
C48	4510001100	Electrolytic	16 MS7 10 µF
C49	4550000350	Tantalum	DN 1V 010M
C50	4560000080	Ceramic	D33Y5V 1H 103Z21
C51	4510001350	Electrolytic	16 MS5 10 µF
C52	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C53	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C54	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C55	4550002860	Tantalum	TESVA 1V 224K1-8L
C56	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C57	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C58	4510001350	Electrolytic	16 MS5 10 µF
C59	4510001470	Electrolytic	50 MS5 1 µF
C60	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C61	4510001470	Electrolytic	50 MS5 1 µF
C62	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C63	4510001320	Electrolytic	6R3 MS5 47 µF
C64	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C65	4510001470	Electrolytic	50 MS5 1 µF
C66	4510001470	Electrolytic	50 MS5 1 µF
C67	4510001470	Electrolytic	50 MS5 1 µF
C68	4510001470	Electrolytic	50 MS5 1 µF
C69	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C70	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C71	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C72	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C73	4510001350	Electrolytic	16 MS5 10 µF
C74	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C75	4510001320	Electrolytic	6R3 MS5 47 µF
C76	4510001470	Electrolytic	50 MS5 1 µF
C77	4510001470	Electrolytic	50 MS5 1 µF
C78	4510001480	Electrolytic	50 MS5 2R2 µF
C79	4510001350	Electrolytic	16 MS5 10 µF
C80	4510001840	Electrolytic	10 MS5 47 µF
C81	4510001470	Electrolytic	50 MS5 1 µF
C82	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C83	4510001350	Electrolytic	16 MS5 10 µF
C84	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C86	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C87	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C88	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C94	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C95	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C96	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C97	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C98	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C99	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C100	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C101	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C102	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C103	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C104	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C105	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C106	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C107	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C108	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C109	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C110	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C111	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C112	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C113	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C114	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C115	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C116	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C117	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C118	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C120	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C121	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C122	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C123	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C124	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C125	4510001350	Electrolytic	16 MS5 10 µF
C126	4510001470	Electrolytic	50 MS5 1 µF
C127	4510001470	Electrolytic	50 MS5 1 µF
C128	4510001470	Electrolytic	50 MS5 1 µF
C129	4510001470	Electrolytic	50 MS5 1 µF

[CONNECTOR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C130	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C131	4550000530	Tantalum	TESVA 1V 104M1-8L
EP1	0910020524	P.C. Board	B 1934D (CONNECTOR)
EP2	0910020380	F.P.C. Board	B 1963 (CONNECTOR-LOGIC)
EP3	0910020371	F.P.C. Board	B 1964A (CONNECTOR-MAIN A)
EP4	0910020371	F.P.C. Board	B 1964A (CONNECTOR-MAIN B)

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140001200	IC	μPD75104GF-729-3BE
IC2	1120000430	IC	LA6393M-TP-T1
IC3	1110001550	IC	S-8054ALB-LM-T1
IC4	1130000590	IC	μPD4081BG-T1
IC5	1130001250	IC	μPD4066BG-T1
IC6	1130001250	IC	μPD4066BG-T1
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1590000410	Transistor	RN2404 (TE85R)
Q3	1590000510	Transistor	RN1409 (TE85R)
Q4	1590000420	Transistor	RN1404 (TE85R)
D1	1750000010	Diode	1SS181 (TE85R)
D2	1750000020	Diode	1SS184 (TE85R)
X1	6050003110	Crystal	RF-4A3 FAC NKD (4.194304M)
R1	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R2	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R3	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R4	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R5	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R6	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R7	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R8	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R9	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R10	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R11	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R12	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R13	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R14	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R15	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R16	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R17	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R18	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R19	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R20	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R21	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R22	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R23	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R24	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R25	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R26	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R27	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R28	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R29	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R30	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R31	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R32	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R33	7030000970	Resistor	MCR10EZHJ 2.2 MΩ (225)
R34	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R35	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R36	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R37	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R38	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R39	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R40	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R41	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R42	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R43	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R44	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R45	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R46	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R47	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R48	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R49	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R50	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R51	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R52	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R54	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R55	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R56	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R57	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R58	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R59	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
C1	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C2	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C3	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C4	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C5	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C6	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C8	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C9	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C10	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C11	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C12	4030005090	Ceramic	C2012 JB 1H 223K-T-A
C13	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C14	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C15	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C16	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C17	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C19	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C20	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C21	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C22	4510001320	Electrolytic	6R3 MS5 47 μF
C23	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C24	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C25	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C26	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C27	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C28	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C29	4510001890	Electrolytic	50 MS5 0R1 μF
C30	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C31	4510001350	Electrolytic	16 MS5 10 μF
C32	4510001890	Electrolytic	50 MS5 0R1 μF
C33	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C34	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C35	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C36	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C37	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C38	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C39	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C40	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C41	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C42	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C43	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C44	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C45	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C46	4030004760	Ceramic	C2012 JF 1E 104Z-T-A

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	2220000050	Switch	SSSS21148A
EP1	0910020514	P.C. Board	B 1933D (LOGIC)

[TONE UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000950	IC	S7116A
IC2	1130000830	IC	µPD4094BG-T1
X1	6050003120	Crystal	RF-4A3 FAA NKD (3.579545M)
R1	7310002460	Trimmer	RH04A1AS4X0NA (473)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
C1	4550000270	Tantalum	TESVA 1E 474M1-8L
C2	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C3	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C4	4030004560	Ceramic	C2012 SL 1H 390J-T-A
EP1	0910016652	P.C. Board	B 1566B (TONE)

[MAIN-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1150000760	IC	SC1091
IC2	1180000420	IC	TA78L05F (TE12R)
IC3	1180000420	IC	TA78L05F (TE12R)
IC4	1130004170	IC	TC4S01F (TE85R)
IC5	1130004170	IC	TC4S01F (TE85R)
IC6	1110001700	IC	TL499ACPS
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1520000200	Transistor	2SB798-T2 DK
Q3	1560000270	FET	2SK302-Y (TE85R)
Q4	1580000350	FET	3SK140-Y (TE85R)
Q5	1580000360	FET	3SK177-T2B U73
Q6	1590000460	Transistor	RN1402 (TE85R)
Q7	1590000380	FET	2SJ106-Y (TE85R)
Q8	1540000150	Transistor	2SD1225M R
Q9	1530002050	Transistor	2SC3661-TA
Q10	1590000390	Transistor	MRF559
Q11	1520000210	Transistor	2SB1019-O
Q12	1530002030	Transistor	2SC3772-3-TA
Q13	1530002030	Transistor	2SC3772-3-TA
Q14	1590000460	Transistor	RN1402 (TE85R)
Q15	1530000160	Transistor	2SC2712-Y (TE85R)
Q16	1520000200	Transistor	2SB798-T2 DK
Q17	1530000160	Transistor	2SC2712-Y (TE85R)
Q18	1520000200	Transistor	2SB798-T2 DK
Q19	1530000160	Transistor	2SC2712-Y (TE85R)
Q20	1510000110	Transistor	2SA1162-Y (TE85R)
Q21	1530000160	Transistor	2SC2712-Y (TE85R)
Q22	1520000200	Transistor	2SB798-T2 DK
Q23	1530000160	Transistor	2SC2712-Y (TE85R)
Q24	1530000160	Transistor	2SC2712-Y (TE85R)
Q25	1520000080	Transistor	2SB909M R
D1	1710000010	Diode	15CD11
D2	1730000510	Zener	RD3.9M-T2B2
D3	1750000050	Diode	1SS193 (TE85R)
D4	1750000050	Diode	1SS193 (TE85R)
D5	1720000050	Varicap	1SV50E
D6	1720000050	Varicap	1SV50E
D7	1720000050	Varicap	1SV50E
D8	1720000050	Varicap	1SV50E
D9	1730000510	Zener	RD3.9M-T2B2
D10	1730000510	Zener	RD3.9M-T2B2
D11	1750000050	Diode	1SS193 (TE85R)
D12	1790000450	Diode	MA862 (TX)
D13	1750000050	Diode	1SS193 (TE85R)
D14	1790000490	Diode	HSM88AS-TR
D15	1790000490	Diode	HSM88AS-TR
D16	1710000310	Diode	MI407
D17	1730000970	Zener	RD15M-T2B2
D18	1790000470	Diode	MA159 (TX)
D19	1750000050	Diode	1SS193 (TE85R)
D20	1710000290	Diode	MI308
D21	1710000290	Diode	MI308
D22	1790000470	Diode	MA159 (TX)
D23	1730000510	Zener	RD3.9M-T2B2
D24	1790000470	Diode	MA159 (TX)
D25	1730000800	Zener	RD8.2M-T2B1
D26	1750000060	Diode	1SS196 (TE85R)
D27	1730000840	Zener	RD9.1M-T2B2
D28	1750000170	Diode	DA115 T107
FI1	2010000580	Monolithic	17M15B (FL-78)
X1	6050003690	Crystal	CR-206
L1	6150003150	Coil	LS-331
L2	6150003150	Coil	LS-331
L3	6150003150	Coil	LS-331
L4	6180000670	Coil	LAL 02NA R22K
L5	6150002810	Coil	LS-291
L6	6150002810	Coil	LS-291
L7	6150002810	Coil	LS-291
L8	6150002810	Coil	LS-291
L9	6110001600	Coil	LA-243
L10	6110001600	Coil	LA-243
L11	6110001560	Coil	LA-236
L12	6110001560	Coil	LA-236
L13	6110001540	Coil	LA-234
L14	6110001610	Coil	LA-244
L15	6170000180	Coil	LW-19
L16	6110001610	Coil	LA-244
L17	6110001540	Coil	LA-234
L18	6180001300	Coil	LAL 02NA 100K
L19	6180001120	Coil	FL 5H 101K
L20	6190000220	Coil	S0971136-101K
L21	6110001600	Coil	LA-243
R1	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R2	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R3	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R4	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R5	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R6	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R7	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R8	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R9	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R10	7030000100	Resistor	MCR10EZHJ 4.7 Ω (4R7)
R11	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R12	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R13	7030000340	Resistor	MCR10EZHJ 470 Ω (471)

[MAIN-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
R14	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R15	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R16	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R17	7030000140	Resistor MCR10EZHJ 10 Ω (100)
R18	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R19	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R21	7030000220	Resistor MCR10EZHJ 47 Ω (470)
R22	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R23	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R24	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R25	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R26	7030000280	Resistor MCR10EZHJ 150 Ω (151)
R27	7030000440	Resistor MCR10EZHJ 3.3 kΩ (332)
R28	7030000310	Resistor MCR10EZHJ 270 Ω (271)
R29	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R30	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R31	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R32	7030000400	Resistor MCR10EZHJ 1.5 kΩ (152)
R33	7010004450	Resistor R20J 100 kΩ
R34	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R35	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R36	7030000220	Resistor MCR10EZHJ 47 Ω (470)
R37	7030000140	Resistor MCR10EZHJ 10 Ω (100)
R38	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R39	7030000550	Resistor MCR10EZHJ 27 kΩ (273)
R40	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R41	7030000540	Resistor MCR10EZHJ 22 kΩ (223)
R42	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R43	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R44	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R45	4610001230	Trimmer EVM-LGGA00B14 10 k
R46	7030000470	Resistor MCR10EZHJ 5.6 kΩ (562)
R47	7030000350	Resistor MCR10EZHJ 560 Ω (561)
R48	7010004070	Resistor R20J 100 Ω
R49	7030000470	Resistor MCR10EZHJ 5.6 kΩ (562)
R50	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R51	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R53	7030000220	Resistor MCR10EZHJ 47 Ω (470)
R54	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R55	7010004650	Resistor R50XJ 10 Ω
R56	7030000280	Resistor MCR10EZHJ 150 Ω (151)
R57	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R58	7030000540	Resistor MCR10EZHJ 22 kΩ (223)
R59	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R60	7030000540	Resistor MCR10EZHJ 22 kΩ (223)
R61	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R62	7010004720	Resistor R50XJ 100 Ω
R63	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R64	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R65	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R66	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R67	7030000440	Resistor MCR10EZHJ 3.3 kΩ (332)
R68	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R69	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R70	4610001020	Trimmer EVM-LGGA00B24 20 k
R71	4610001030	Trimmer EVM-LGGA00B53 5 k
C1	4030004520	Ceramic C2012 SL 1H 220J-T-A
C2	4030004520	Ceramic C2012 SL 1H 220J-T-A
C3	4030004570	Ceramic C2012 SL 1H 470J-T-A
C4	4030004710	Ceramic C2012 JB 1H 471K-T-A
C5	4030004710	Ceramic C2012 JB 1H 471K-T-A
C6	4030004710	Ceramic C2012 JB 1H 471K-T-A
C7	4030004710	Ceramic C2012 JB 1H 471K-T-A
C8	4030004710	Ceramic C2012 JB 1H 471K-T-A
C10	4030004710	Ceramic C2012 JB 1H 471K-T-A
C11	4030004710	Ceramic C2012 JB 1H 471K-T-A
C12	4030004710	Ceramic C2012 JB 1H 471K-T-A
C13	4030004710	Ceramic C2012 JB 1H 471K-T-A
C14	4030004710	Ceramic C2012 JB 1H 471K-T-A
C15	4030004710	Ceramic C2012 JB 1H 471K-T-A
C16	4030004710	Ceramic C2012 JB 1H 471K-T-A
C17	4030004710	Ceramic C2012 JB 1H 471K-T-A

REF. NO.	ORDER NO.	DESCRIPTION
C18	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C19	4030004710	Ceramic C2012 JB 1H 471K-T-A
C20	4030004590	Ceramic C2012 SL 1H 680J-T-A
C21	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C22	4030004710	Ceramic C2012 JB 1H 471K-T-A
C23	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C24	4030004710	Ceramic C2012 JB 1H 471K-T-A
C25	4030004590	Ceramic C2012 SL 1H 680J-T-A
C26	4030004400	Ceramic C2012 SL 1H 030C-T-A
C27	4030004710	Ceramic C2012 JB 1H 471K-T-A
C28	4030004590	Ceramic C2012 SL 1H 680J-T-A
C29	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C30	4030004710	Ceramic C2012 JB 1H 471K-T-A
C31	4030004710	Ceramic C2012 JB 1H 471K-T-A
C32	4030004440	Ceramic C2012 SL 1H 070D-T-A
C33	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C34	4030004410	Ceramic C2012 SL 1H 040C-T-A
C35	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C36	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C37	4030004420	Ceramic C2012 SL 1H 050C-T-A
C38	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C39	4030004710	Ceramic C2012 JB 1H 471K-T-A
C40	4030004380	Ceramic C2012 SL 1H 010C-T-A
C41	4030004420	Ceramic C2012 SL 1H 050C-T-A
C42	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C43	4030004710	Ceramic C2012 JB 1H 471K-T-A
C44	4030004380	Ceramic C2012 SL 1H 010C-T-A
C45	4030004450	Ceramic C2012 SL 1H 080D-T-A
C46	4030004720	Ceramic C2012 JB 1H 102K-T-A
C47	4030004720	Ceramic C2012 JB 1H 102K-T-A
C48	4030004720	Ceramic C2012 JB 1H 102K-T-A
C49	4030004610	Ceramic C2012 SL 1H 101J-T-A
C50	4030004470	Ceramic C2012 SL 1H 100D-T-A
C51	4030004710	Ceramic C2012 JB 1H 471K-T-A
C52	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C53	4030004440	Ceramic C2012 SL 1H 070D-T-A
C54	4030004490	Ceramic C2012 SL 1H 150J-T-A
C55	4030004540	Ceramic C2012 SL 1H 300J-T-A
C56	4010003880	Ceramic DD06 SL 150K 500V
C57	4030004710	Ceramic C2012 JB 1H 471K-T-A
C58	4030004710	Ceramic C2012 JB 1H 471K-T-A
C59	4030004710	Ceramic C2012 JB 1H 471K-T-A
C60	4030004710	Ceramic C2012 JB 1H 471K-T-A
C61	4510002930	Electrolytic 50 SS R47 µF
C62	4510002830	Electrolytic 25 SS 4R7 µF
C65	4030004720	Ceramic C2012 JB 1H 102K-T-A
C66	4030004710	Ceramic C2012 JB 1H 471K-T-A
C67	4030004720	Ceramic C2012 JB 1H 102K-T-A
C68	4510002710	Electrolytic 10 SS 33 µF
C69	4030004720	Ceramic C2012 JB 1H 102K-T-A
C70	4030004490	Ceramic C2012 SL 1H 150J-T-A
C71	4030004490	Ceramic C2012 SL 1H 150J-T-A
C72	4030004720	Ceramic C2012 JB 1H 102K-T-A
C73	4030004720	Ceramic C2012 JB 1H 102K-T-A
C74	4030004570	Ceramic C2012 SL 1H 470J-T-A
C75	4030004710	Ceramic C2012 JB 1H 471K-T-A
C76	4030004520	Ceramic C2012 SL 1H 220J-T-A
C77	4030004710	Ceramic C2012 JB 1H 471K-T-A
C78	4030004480	Ceramic C2012 SL 1H 120J-T-A
C79	4030004480	Ceramic C2012 SL 1H 120J-T-A
C80	4510002780	Electrolytic 16 SS 10 µF
C81	4030004720	Ceramic C2012 JB 1H 102K-T-A
C82	4030004720	Ceramic C2012 JB 1H 102K-T-A
C83	4030004720	Ceramic C2012 JB 1H 102K-T-A
C84	4510003040	Electrolytic 16 SS 100 µF
C86	4010003890	Ceramic DD06 SL 180K 500V
C87	4030004710	Ceramic C2012 JB 1H 471K-T-A
C88	4010003890	Ceramic DD06 SL 180K 500V
C89	4010004120	Ceramic DD07 B 102K 500V
C90	4030004720	Ceramic C2012 JB 1H 102K-T-A
C91	4030004710	Ceramic C2012 JB 1H 471K-T-A
C92	4030004720	Ceramic C2012 JB 1H 102K-T-A
C93	4010003890	Ceramic DD06 SL 180K 500V
C94	4010003950	Ceramic DD06 SL 330K 500V
C95	4010003950	Ceramic DD06 SL 330K 500V

[MAIN-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C96	4010003890	Ceramic	DD06 SL 180K 500V
C97	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C98	4510003040	Electrolytic	16 SS 100 µF
C99	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C100	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C101	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C102	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C103	4030004940	Ceramic	C2012 CH 1H 390J-T-A
C104	4610000920	Trimmer	ECRGA010A30
C105	4030004980	Ceramic	C2012 CH 1H 820J-T-A
C106	4030004950	Ceramic	C2012 CH 1H 470J-T-A
C107	4030004380	Ceramic	C2012 SL 1H 010C-T-A
C108	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C109	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C110	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C111	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C112	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C113	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C114	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C115	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C117	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C118	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C119	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C120	4510002790	Electrolytic	16 SS 22 µF
C121	4510002790	Electrolytic	16 SS 22 µF
C122	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C123	4510002790	Electrolytic	16 SS 22 µF
C124	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C125	4510002790	Electrolytic	16 SS 22 µF
C126	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C127	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C128	4510002790	Electrolytic	16 SS 22 µF
C129	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C130	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C131	4510002980	Electrolytic	50 SS 10 µF
C132	4510002630	Electrolytic	50 SS 47 µF
C133	4550000320	Tantalum	DN 1V 0R1M
C134	4510002780	Electrolytic	16 SS 10 µF
C135	4510002780	Electrolytic	16 SS 10 µF
C136	4510002780	Electrolytic	16 SS 10 µF
C137	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C138	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C139	4510002790	Electrolytic	16 SS 22 µF
C140	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C141	4510002790	Electrolytic	16 SS 22 µF
C142	4510002790	Electrolytic	16 SS 22 µF
C143	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C144	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C145	4510001470	Electrolytic	50 MS5 1 µF
C146	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C147	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C148	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C149	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C150	4510002780	Electrolytic	16 SS 10 µF
C151	4510001720	Electrolytic	16 SS 330 µF (8X12.5)
C153	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910020495	P.C. Board	B 1935E (MAIN-A)

[V-PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130003650	IC	PLL2001S
Q1	1560000360	FET	2SK209-Y (TE85R)
Q2	1560000360	FET	2SK209-Y (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
Q4	1510000110	Transistor	2SA1162-Y (TE85R)
Q5	1530001950	Transistor	2SC2712-GR (TE85R)
Q6	1510000500	Transistor	2SA1162-GR (TE85R)
Q7	1530001950	Transistor	2SC2712-GR (TE85R)
Q8	1510000110	Transistor	2SA1162-Y (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
L1	6180001300	Coil	LAL 02NA 100K
R1	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R2	7030000360	Resistor	MCR10EZHJ 680 Ω (681)
R3	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R4	7030000970	Resistor	MCR10EZHJ 2.2 MΩ (225)
R5	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R6	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R7	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R8	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R9	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R10	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R11	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R12	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R13	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R14	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R15	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R16	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R17	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R18	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R19	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R20	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
C1	4550000260	Tantalum	DN 1V 100M
C2	4550000260	Tantalum	DN 1V 100M
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4550002860	Tantalum	TESVA 1V 224K1-8L
C5	4510001850	Electrolytic	16 MS5 4R7 µF
C6	4510001470	Electrolytic	50 MS5 1 µF
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4510001470	Electrolytic	50 MS5 1 µF
C10	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C11	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C13	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910020263	P.C. Board	B 1937C (V-PLL)

[V-VCO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000130	FET	2SK125
Q2	1530002030	Transistor	2SC3772-3-TA
Q3	1530002030	Transistor	2SC3772-3-TA
Q4	1530002030	Transistor	2SC3772-3-TA
D1	1720000050	Varicap	1SV50E
D2	1720000050	Varicap	1SV50E
L1	6200000930	Coil	MLF3216A 3R3K-T
L2	6200000930	Coil	MLF3216A 3R3K-T
L3	6130002280	Coil	LB-248
L4	6180001940	Coil	LAL 02NA 3R3K
L5	6110001650	Coil	LA-248

[V-VCO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L6	6110001650	Coil	LA-248
R1	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R2	7030000180	Resistor	MCR10EZHJ 22 Ω (220)
R3	7030000180	Resistor	MCR10EZHJ 22 Ω (220)
R4	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R5	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R6	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R7	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R8	7030000360	Resistor	MCR10EZHJ 680 Ω (681)
R9	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R10	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R11	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R12	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R13	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R14	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R15	7030000360	Resistor	MCR10EZHJ 680 Ω (681)
R16	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R17	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R18	7030000410	Resistor	MCR10EZHJ 1.8 kΩ (182)
R19	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
C1	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C2	4510001850	Electrolytic	16 MS5 4R7 µF
C3	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C5	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C7	4030004380	Ceramic	C2012 SL 1H 010C-T-A
C8	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C9	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C10	4030004610	Ceramic	C2012 SL 1H 101J-T-A
C11	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C12	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C13	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C14	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C15	4010000120	Ceramic	DD104 SL 100D 50V
C16	4010000460	Ceramic	DD104 B 471K 50V
C17	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C18	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C19	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910020253	P.C. Board	B 1936C (V-VCO)

[IF-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001520	IC	TK10420M
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1530000160	Transistor	2SC2712-Y (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1730000730	Zener	RD6.2M-T2B2
D2	1750000070	Diode	1SS226 (TE85R)
D3	1750000070	Diode	1SS226 (TE85R)
FI1	2020000550	Ceramic Filter	CFUM455E
X1	6050003010	Crystal	CR-166
X2	6070000010	Discriminator	CDB455C7A
R1	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R2	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R3	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R6	7030000690	Resistor	MCR10EZHJ 390 kΩ (394)
R7	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R8	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R9	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R10	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R11	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R12	7030000280	Resistor	MCR10EZHJ 150 Ω (151)
R13	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R14	7030000650	Resistor	MCR10EZHJ 180 kΩ (184)
R15	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R16	7310002130	Trimmer	RH0422CS3J0CA (472)
R17	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R18	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R19	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R20	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R21	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R22	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R23	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
C1	4510001100	Electrolytic	16 MS7 10 µF
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C5	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C6	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4550000530	Tantalum	TESVA 1V 104M1-8L
C10	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C11	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C12	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C13	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C14	4030004530	Ceramic	C2012 SL 1H 270J-T-A
C15	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C17	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C18	4510001150	Electrolytic	50 MS7 R47 µF
C19	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C20	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C21	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C22	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C23	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C24	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C25	4510001160	Electrolytic	50 MS7 1 µF
C26	4510001100	Electrolytic	16 MS7 10 µF
EP1	0910024532	P.C. Board	B 2315B (IF-A)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[APC-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001240	IC	µPC358G2-T1
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
R1	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R3	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R4	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R5	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R6	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R7	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)

[APC-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R8	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R9	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R10	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R11	7030000730	Resistor	MCR10EZHJ 820 kΩ (824)
R12	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R13	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
C1	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4510001820	Electrolytic	10 MS5 10 µF
C4	4510001820	Electrolytic	10 MS5 10 µF
C5	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910024544	P.C. Board	B 1973D (APC-A)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[MAIN-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130003760	IC	TC4S81F (TE85R)
IC2	1130004170	IC	TC4S01F (TE85R)
IC3	1130004170	IC	TC4S01F (TE85R)
IC4	1180000420	IC	TA78L05F (TE12R)
IC5	1150000750	IC	M57788M / SC1054
IC6	1110001980	IC	TA8207K
IC7	1110000960	IC	NJM4558M (T1)
IC8	1110000960	IC	NJM4558M (T1)
Q1	1530002550	Transistor	2SC3326-B (TE85R)
Q2	1590000380	FET	2SJ106-Y (TE85R)
Q3	1530002550	Transistor	2SC3326-B (TE85R)
Q4	1560000270	FET	2SK302-Y (TE85R)
Q5	1580000350	FET	3SK140-Y (TE85R)
Q6	1530002030	Transistor	2SC3772-3-TA
Q7	1580000360	FET	3SK177-T2B U73
Q8	1590000380	FET	2SJ106-Y (TE85R)
Q9	1530002550	Transistor	2SC3326-B (TE85R)
Q10	1520000200	Transistor	2SB798-T2 DK
Q11	1530000160	Transistor	2SC2712-Y (TE85R)
Q12	1520000200	Transistor	2SB798-T2 DK
Q13	1530000160	Transistor	2SC2712-Y (TE85R)
Q14	1520000200	Transistor	2SB798-T2 DK
Q15	1530000160	Transistor	2SC2712-Y (TE85R)
Q16	1530002050	Transistor	2SC3661-TA
Q17	1530002030	Transistor	2SC3772-3-TA
Q18	1530002240	Transistor	2SC3775-3-TA
Q19	1590000390	Transistor	MRF559
Q20	1530000160	Transistor	2SC2712-Y (TE85R)
Q21	1520000080	Transistor	2SB909M R
Q22	1590000510	Transistor	RN1409 (TE85R)
Q23	1520000080	Transistor	2SB909M R
Q24	1510000370	Transistor	2SA1359-Y
Q25	1510000370	Transistor	2SA1359-Y
Q26	1590000420	Transistor	RN1404 (TE85R)
Q27	1590000460	Transistor	RN1402 (TE85R)
Q28	1590000460	Transistor	RN1402 (TE85R)
Q29	1590000380	FET	2SJ106-Y (TE85R)
Q30	1530000160	Transistor	2SC2712-Y (TE85R)
Q31	1530000160	Transistor	2SC2712-Y (TE85R)
Q32	1590000690	Transistor	IMD6 T108
D1	1710000310	Diode	MI407
D2	1710000290	Diode	MI308

REF. NO.	ORDER NO.	DESCRIPTION	
D3	1710000290	Diode	MI308
D4	1750000050	Diode	1SS193 (TE85R)
D5	1750000050	Diode	1SS193 (TE85R)
D6	1790000450	Diode	MA862 (TX)
D7	1790000470	Diode	MA159 (TX)
D8	1790000450	Diode	MA862 (TX)
D9	1730000510	Zener	RD3.9M-T2B2
D10	1730000510	Zener	RD3.9M-T2B2
D11	1730000510	Zener	RD3.9M-T2B2
D12	1730000510	Zener	RD3.9M-T2B2
D13	1790000470	Diode	MA159 (TX)
D14	1750000050	Diode	1SS193 (TE85R)
D15	1790000450	Diode	MA862 (TX)
D16	1750000050	Diode	1SS193 (TE85R)
D17	1790000490	Diode	HSM88AS-TR
D18	1790000490	Diode	HSM88AS-TR
D19	1750000060	Diode	1SS196 (TE85R)
FI1	2010000230	Monolithic	30M15B (FL-76)
L1	6170000180	Coil	LW-19
L2	6150003220	Coil	LS-320
L3	6150003220	Coil	LS-320
L4	6150003220	Coil	LS-320
L5	6110001980	Coil	LA-222
L6	6110001520	Coil	LA-232
L7	6190000050	Coil	252MX-1550A
L8	6190000050	Coil	252MX-1550A
L9	6110001830	Coil	LA-159
L10	6110001540	Coil	LA-234
L11	6110001980	Coil	LA-222
L12	6110001520	Coil	LA-232
L13	6110001540	Coil	LA-234
L14	6110001980	Coil	LA-222
L15	6110001520	Coil	LA-232
L16	6110001520	Coil	LA-232
L17	6110001980	Coil	LA-222
L18	6110001520	Coil	LA-232
L19	6110001530	Coil	LA-233
L20	6110001150	Coil	LA-153
R1	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R2	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R3	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R4	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R5	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R6	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R7	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R8	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R9	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R10	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R11	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R12	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R13	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R14	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R15	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R16	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R17	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R18	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R19	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R20	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R21	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R22	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R23	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R24	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R25	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R26	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R27	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R28	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R29	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R30	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R31	7030000300	Resistor	MCR10EZHJ 220 Ω (221)

[MAIN-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
R32	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R33	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R34	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R35	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R36	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R37	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R38	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R39	7030000440	Resistor MCR10EZHJ 3.3 kΩ (332)
R40	7030000530	Resistor MCR10EZHJ 18 kΩ (183)
R42	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R43	7030000140	Resistor MCR10EZHJ 10 Ω (100)
R44	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R45	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R46	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R47	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R48	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R49	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R50	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R51	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R52	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R53	7030000270	Resistor MCR10EZHJ 120 Ω (121)
R54	7030000270	Resistor MCR10EZHJ 120 Ω (121)
R55	7030000510	Resistor MCR10EZHJ 12 kΩ (123)
R56	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R57	7030000510	Resistor MCR10EZHJ 12 kΩ (123)
R58	7030000730	Resistor MCR10EZHJ 820 kΩ (824)
R59	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R60	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R61	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R62	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R63	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R64	7010004270	Resistor R20J 4.7 kΩ
R65	7030000470	Resistor MCR10EZHJ 5.6 kΩ (562)
R66	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R67	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R68	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R69	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R70	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R71	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R72	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R73	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R74	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R75	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R76	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R77	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R78	7010004650	Resistor R50XJ 10 Ω
R79	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R80	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R81	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R82	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R83	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R84	7010004720	Resistor R50XJ 100 Ω
R85	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R86	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R87	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R88	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R89	7010004770	Resistor R50XJ 330 Ω
R90	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R93	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R94	4610001020	Trimmer EVM-LGGA00B24 20 k
R95	4610001230	Trimmer EVM-LGGA00B14 10 k
R96	7030000300	Resistor MCR10EZHJ 220 Ω (221)
R97	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R98	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R99	4610001230	Trimmer EVM-LGGA00B14 10 k
R100	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R101	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R102	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
C1	4030004720	Ceramic C2012 JB 1H 102K-T-A
C2	4030004750	Ceramic C2012 JB 1H 103K-T-A
C3	4030004750	Ceramic C2012 JB 1H 103K-T-A
C4	4030004750	Ceramic C2012 JB 1H 103K-T-A
C5	4030004750	Ceramic C2012 JB 1H 103K-T-A

REF. NO.	ORDER NO.	DESCRIPTION
C6	4030004720	Ceramic C2012 JB 1H 102K-T-A
C7	4030004730	Ceramic C2012 JB 1H 222K-T-A
C8	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C9	4030004720	Ceramic C2012 JB 1H 102K-T-A
C10	4030004750	Ceramic C2012 JB 1H 103K-T-A
C11	4030004750	Ceramic C2012 JB 1H 103K-T-A
C12	4030004750	Ceramic C2012 JB 1H 103K-T-A
C13	4030004750	Ceramic C2012 JB 1H 103K-T-A
C14	4030004720	Ceramic C2012 JB 1H 102K-T-A
C15	4030004730	Ceramic C2012 JB 1H 222K-T-A
C16	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C17	4030004710	Ceramic C2012 JB 1H 471K-T-A
C18	4030004710	Ceramic C2012 JB 1H 471K-T-A
C19	4030004710	Ceramic C2012 JB 1H 471K-T-A
C20	4030004710	Ceramic C2012 JB 1H 471K-T-A
C21	4510002930	Electrolytic 50 SS R47 µF
C22	4510002830	Electrolytic 25 SS 4R7 µF
C23	4510002930	Electrolytic 50 SS R47 µF
C24	4510002830	Electrolytic 25 SS 4R7 µF
C25	4030004710	Ceramic C2012 JB 1H 471K-T-A
C26	4030004570	Ceramic C2012 SL 1H 470J-T-A
C27	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C28	4030004560	Ceramic C2012 SL 1H 390J-T-A
C29	4030004570	Ceramic C2012 SL 1H 470J-T-A
C30	4030004480	Ceramic C2012 SL 1H 120J-T-A
C31	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C32	4030004710	Ceramic C2012 JB 1H 471K-T-A
C33	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C34	4030004430	Ceramic C2012 SL 1H 060D-T-A
C35	4030004480	Ceramic C2012 SL 1H 120J-T-A
C36	4030004570	Ceramic C2012 SL 1H 470J-T-A
C37	4030004570	Ceramic C2012 SL 1H 470J-T-A
C38	4030004710	Ceramic C2012 JB 1H 471K-T-A
C39	4030004720	Ceramic C2012 JB 1H 102K-T-A
C40	4030004610	Ceramic C2012 SL 1H 101J-T-A
C41	4030004710	Ceramic C2012 JB 1H 471K-T-A
C42	4030004710	Ceramic C2012 JB 1H 471K-T-A
C43	4030004720	Ceramic C2012 JB 1H 102K-T-A
C44	4030004720	Ceramic C2012 JB 1H 102K-T-A
C45	4030004720	Ceramic C2012 JB 1H 102K-T-A
C46	4030004710	Ceramic C2012 JB 1H 471K-T-A
C47	4610000370	Trimmer ECRGA006A30
C48	4030004480	Ceramic C2012 SL 1H 120J-T-A
C49	4030004710	Ceramic C2012 JB 1H 471K-T-A
C50	4030004710	Ceramic C2012 JB 1H 471K-T-A
C51	4030004500	Ceramic C2012 SL 1H 180J-T-A
C52	4030004490	Ceramic C2012 SL 1H 150J-T-A
C53	4030004490	Ceramic C2012 SL 1H 150J-T-A
C54	4030004420	Ceramic C2012 SL 1H 050C-T-A
C55	4030004480	Ceramic C2012 SL 1H 120J-T-A
C56	4010003830	Ceramic DD06 SL 060D 500V
C57	4010003820	Ceramic DD06 SL 050C 500V
C58	4010003870	Ceramic DD06 SL 120K 500V
C59	4010003840	Ceramic DD06 SL 070D 500V
C60	4030004710	Ceramic C2012 JB 1H 471K-T-A
C61	4510002380	Electrolytic 16 SS 470 µF (10X12.5)
C62	4510003040	Electrolytic 16 SS 100 µF
C63	4550000390	Tantalum DN 1V R22M
C64	4510002810	Electrolytic 16 SS 47 µF
C65	4510002950	Electrolytic 50 SS 2R2 µF
C66	4510002950	Electrolytic 50 SS 2R2 µF
C67	4510002810	Electrolytic 16 SS 47 µF
C68	4510002810	Electrolytic 16 SS 47 µF
C69	4550000390	Tantalum DN 1V R22M
C70	4510003040	Electrolytic 16 SS 100 µF
C71	4510002380	Electrolytic 16 SS 470 µF (10X12.5)
C72	4510002380	Electrolytic 16 SS 470 µF (10X12.5)
C73	4510002830	Electrolytic 25 SS 4R7 µF
C74	4030004710	Ceramic C2012 JB 1H 471K-T-A
C75	4030004710	Ceramic C2012 JB 1H 471K-T-A
C76	4030004710	Ceramic C2012 JB 1H 471K-T-A
C77	4030004710	Ceramic C2012 JB 1H 471K-T-A
C78	4030004710	Ceramic C2012 JB 1H 471K-T-A
C79	4030004720	Ceramic C2012 JB 1H 102K-T-A
C80	4510001360	Electrolytic 16 MS5 22 µF

[MAIN-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C81	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C82	4510002790	Electrolytic	16 SS 22 µF
C83	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C84	4510003040	Electrolytic	16 SS 100 µF
C85	4510002790	Electrolytic	16 SS 22 µF
C86	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C87	4510002790	Electrolytic	16 SS 22 µF
C88	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C89	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C90	4510002780	Electrolytic	16 SS 10 µF
C91	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C92	4030004420	Ceramic	C2012 SL 1H 050C-T-A
C93	4030004450	Ceramic	C2012 SL 1H 080D-T-A
C94	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C95	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C96	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C97	4030004410	Ceramic	C2012 SL 1H 040C-T-A
C98	4030004440	Ceramic	C2012 SL 1H 070D-T-A
C99	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C100	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C101	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C102	4030004430	Ceramic	C2012 SL 1H 060D-T-A
C103	4030004430	Ceramic	C2012 SL 1H 060D-T-A
C104	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C105	4510002780	Electrolytic	16 SS 10 µF
C106	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C107	4510003040	Electrolytic	16 SS 100 µF
C108	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C109	4010003840	Ceramic	DD06 SL 070D 500V
C111	4010003880	Ceramic	DD06 SL 150K 500V
C112	4010003840	Ceramic	DD06 SL 070D 500V
C113	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C114	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C115	4510002830	Electrolytic	25 SS 4R7 µF
C116	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C117	4510002790	Electrolytic	16 SS 22 µF
C118	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C119	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C120	4510002790	Electrolytic	16 SS 22 µF
C121	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C122	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C123	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C124	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C125	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C126	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C127	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C128	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C129	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C130	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C131	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C132	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C133	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C134	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C136	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C137	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C138	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C139	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C140	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C141	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C142	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C143	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C144	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C145	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C146	4510001460	Electrolytic	50 MS5 R47 µF
C147	4510001850	Electrolytic	16 MS5 4R7 µF
C148	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C149	4510002940	Electrolytic	50 SS 1 µF
C150	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C151	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C152	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C153	4030004410	Ceramic	C2012 SL 1H 040C-T-A
C154	4030004380	Ceramic	C2012 SL 1H 010C-T-A
C155	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C156	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C157	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C158	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910020485	P.C. Board	B 1938E (MAIN-B)

[U-PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130003640	IC	TC9181F
IC2	1110001470	IC	MB504LPF-G-BND
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1560000360	FET	2SK209-Y (TE85R)
L1	6110001520	Coil	LA-232
L2	6180001300	Coil	LAL 02NA 100K
L3	6180001300	Coil	LAL 02NA 100K
R1	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R2	7030000410	Resistor	MCR10EZHJ 1.8 kΩ (182)
R3	7030000390	Resistor	MCR10EZHJ 1.2 kΩ (122)
R4	7030000350	Resistor	MCR10EZHJ 560 Ω (561)
R5	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R6	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R7	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R8	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
C1	4550000530	Tantalum	TESVA 1V 104M1-8L
C2	4550000410	Tantalum	DN 1V 4R7M
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C5	4550003030	Tantalum	TEMSVA 0J 475M-8L
C6	4030004440	Ceramic	C2012 SL 1H 070D-T-A
C7	4030004440	Ceramic	C2012 SL 1H 070D-T-A
C8	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C9	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C10	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C11	4550003030	Tantalum	TEMSVA 0J 475M-8L
C12	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C13	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C14	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C15	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910020285	P.C. Board	B 1940E (U-PLL)

[U-VCO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000130	FET	2SK125
Q2	1530002030	Transistor	2SC3772-3-TA
D1	1720000220	Varicap	1SV166-T2B
D2	1720000220	Varicap	1SV166-T2B
L1	6180002420	Coil	LAL 02KR R39K

[U-VCO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L2	6180002420	Coil	LAL 02KR R39K
L3	6180001380	Coil	LAL 02KR 1R0K
L4	6180001620	Coil	LAL 02KR R22K
L5	6110001530	Coil	LA-233
R1	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R2	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
R3	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R4	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R5	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R6	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R7	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R8	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R9	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R10	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R11	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
C1	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C2	4510001840	Electrolytic	10 MS5 47 µF
C3	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C4	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C5	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C6	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C7	4510001840	Electrolytic	10 MS5 47 µF
C8	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C9	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C10	4030004580	Ceramic	C2012 SL 1H 560J-T-A
C11	4030004440	Ceramic	C2012 SL 1H 070D-T-A
C12	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C13	4030004430	Ceramic	C2012 SL 1H 060D-T-A
C14	4030004370	Ceramic	C2012 SL 1H 0R5C-T-A
C15	4030004420	Ceramic	C2012 SL 1H 050C-T-A
C16	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910020275	P.C. Board	B 1939E (U-VCO)

[IF-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001520	IC	TK10420M
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1530000160	Transistor	2SC2712-Y (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1730000730	Zener	RD6.2M-T2B2
D2	1750000070	Diode	1SS226 (TE85R)
D3	1750000070	Diode	1SS226 (TE85R)
FI1	2020000550	Ceramic Filter	CFUM455E
X1	6050002550	Crystal	CR-125
X2	6070000010	Discriminator	CDB455C7A
L1	6180002420	Coil	LAL 02KR R39K
R1	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R2	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R3	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R6	7030000690	Resistor	MCR10EZHJ 390 kΩ (394)
R7	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R8	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R9	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R10	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R11	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R12	7030000280	Resistor	MCR10EZHJ 150 Ω (151)
R13	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R14	7030000650	Resistor	MCR10EZHJ 180 kΩ (184)
R15	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R16	7310002130	Trimmer	RH0422CS3J0CA (472)
R17	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R18	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R19	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R20	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R21	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R22	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R23	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
C1	4510001100	Electrolytic	16 MS7 10 µF
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C3	4030004630	Ceramic	C2012 SL 1H 151J-T-A
C4	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C5	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C6	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C7	4030004700	Ceramic	C2012 SL 1H 391J-T-A
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4550000530	Tantalum	TESVA 1V 104M1-8L
C10	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C11	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C12	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C13	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C14	4030004530	Ceramic	C2012 SL 1H 270J-T-A
C15	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C17	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C18	4510001150	Electrolytic	50 MS7 R47 µF
C19	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C20	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C21	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C22	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C23	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C24	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C25	4510001160	Electrolytic	50 MS7 1 µF
C26	4510001100	Electrolytic	16 MS7 10 µF
EP1	0910024526	P.C. Board	B 1969F (IF-B)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[APC-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001240	IC	µPC358G2-T1
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
R1	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R3	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R6	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R7	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R8	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)

[APC-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R9	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R10	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R11	7030000730	Resistor	MCR10EZHJ 820 kΩ (824)
R12	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R13	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
C1	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4510001820	Electrolytic	10 MS5 10 µF
C4	4510001820	Electrolytic	10 MS5 10 µF
C5	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910023951	P.C. Board	B 2316A (APC-B)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[A-BAND UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1530002030	Transistor	2SC3772-3-TA
Q2	1530002030	Transistor	2SC3772-3-TA
D1	1790000450	Diode	MA862 (TX)
L1	6110001990	Coil	LA-223
L2	6110001980	Coil	LA-222
L3	6110001990	Coil	LA-223
L4	6110001990	Coil	LA-223
R1	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R2	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R3	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R4	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R5	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R6	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R7	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R8	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R9	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
R10	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R11	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
C1	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C2	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C3	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C4	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C5	4030004410	Ceramic	C2012 SL 1H 040C-T-A
C6	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C7	4030004450	Ceramic	C2012 SL 1H 080D-T-A
C8	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C9	4030004390	Ceramic	C2012 SL 1H 020C-T-A
C10	4030004450	Ceramic	C2012 SL 1H 080D-T-A
C11	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C12	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910024514	P.C. Board	B 2026D (A-BAND)

[SPJ UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
EP1	0910020472	P.C. Board	B 1993B SPJ

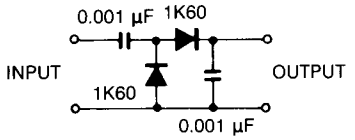
[CHASSIS UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
MF1	2710000240	Fan motor	0420-12
EP4	0910023181	P.C. Board	B 2265A (FAN MOTOR CONNECTOR UNIT)

SECTION 6 ADJUSTMENT PROCEDURES

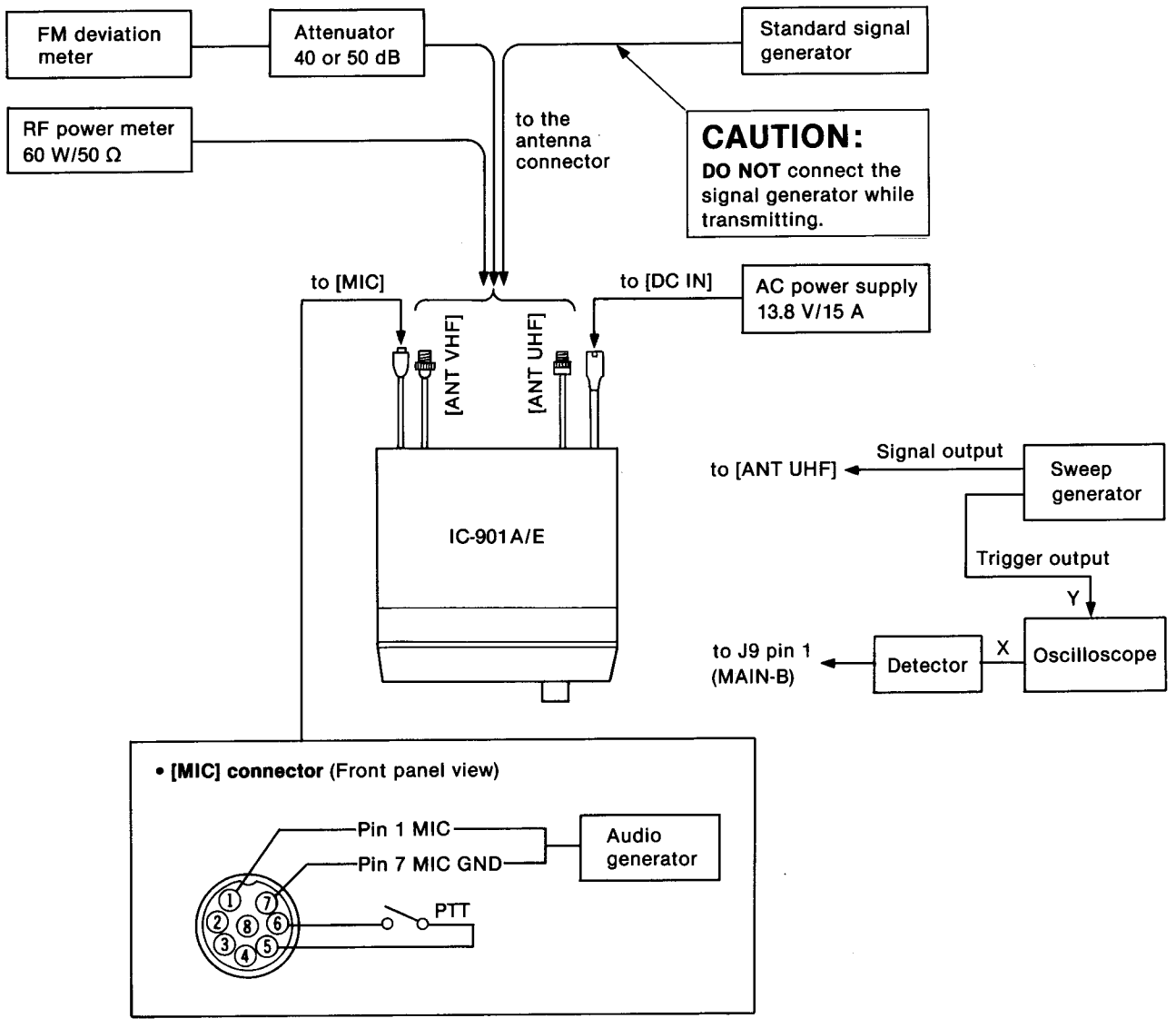
6-1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
AC power supply	Output voltage : 13.8 V DC Current capacity : 15 A or more	Audio generator	Frequency range : 300~3000 Hz Output level : 1~500 mV
RF power meter (terminated type)	Measuring range : 1~60 W Frequency range : 120~460 MHz Impedance : 50 Ω SWR : Less than 1.2: 1	Attenuator	Power attenuation : 40 or 50 dB Capacity : 60 W or more
Frequency counter	Frequency range : 0.1~460 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Sweep generator	Frequency range : 0.1~460 MHz Sweep bandwidth : At least 10 MHz Output impedance : 50 Ω
Oscilloscope	Frequency range : DC~20 MHz Measuring range : 0.01~10 V	Detector	
Standard signal generator (SSG)	Frequency range : 0.1~460 MHz Output level : −127~−17 dBm (0.1 µV~32 mV)	FM deviation meter	Frequency minimum : 460 MHz Measuring range : 0~±10 kHz
DC voltmeter	Input impedance : 50 kΩ/DC or better		

CW: Clockwise
CCW: Counterclockwise

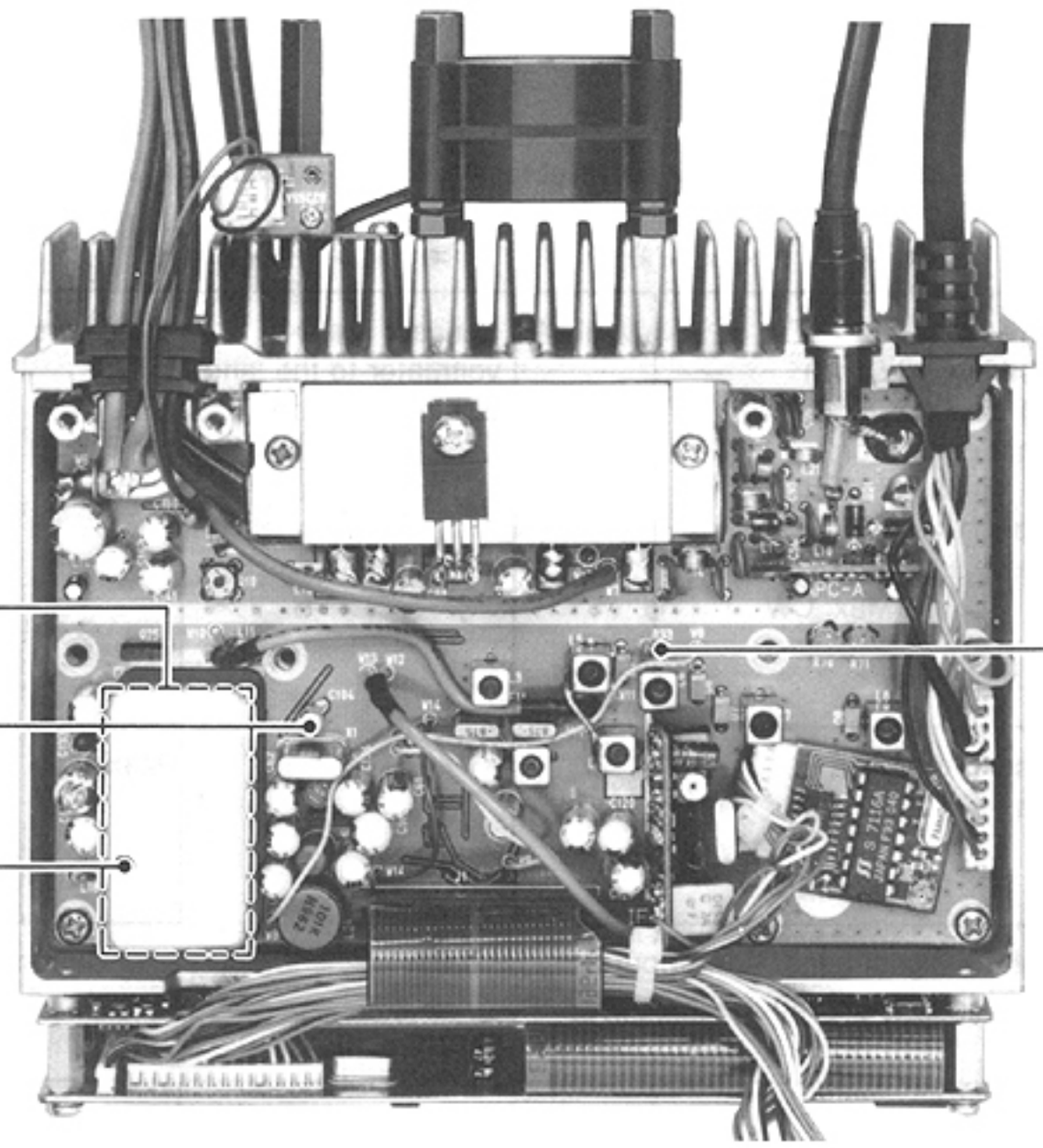
■ CONNECTION



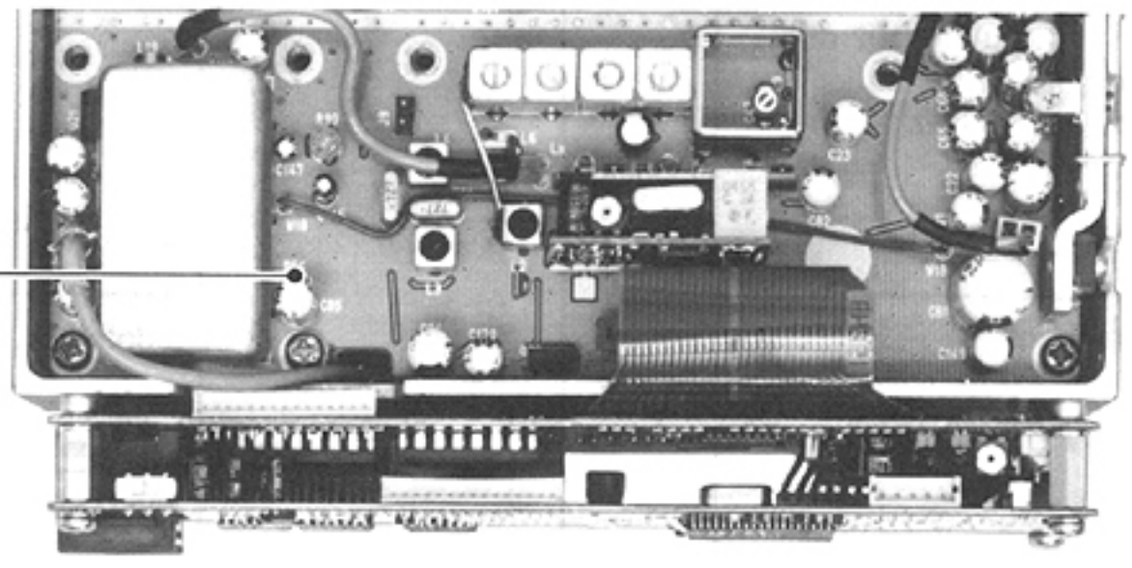
6-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
REFERENCE FREQUENCY	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Connect the RF power meter or a 50 Ω dummy load. • Simplex • Transmitting	Rear panel	Loosely couple the frequency counter to the [ANT UHF] connector.	445.0000 MHz (USA) 435.0000 MHz (EUR, AUS)	MAIN-A	C104
VHF LOCK VOLTAGE	1	• Displayed frequency: 145.0000 MHz • Receiving	MAIN-A	Connect the DC voltmeter to R33.	8.0 V	MAIN-A (V-VCO)	L3
UHF LOCK VOLTAGE	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Receiving	MAIN-B	Connect the DC voltmeter to R64.	7.0 V±0.5 V (USA) 6.0 V±0.5 V (EUR, AUS)		Verify

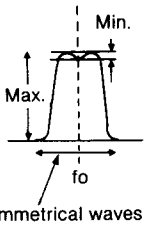
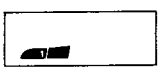
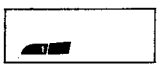
• MAIN-A UNIT



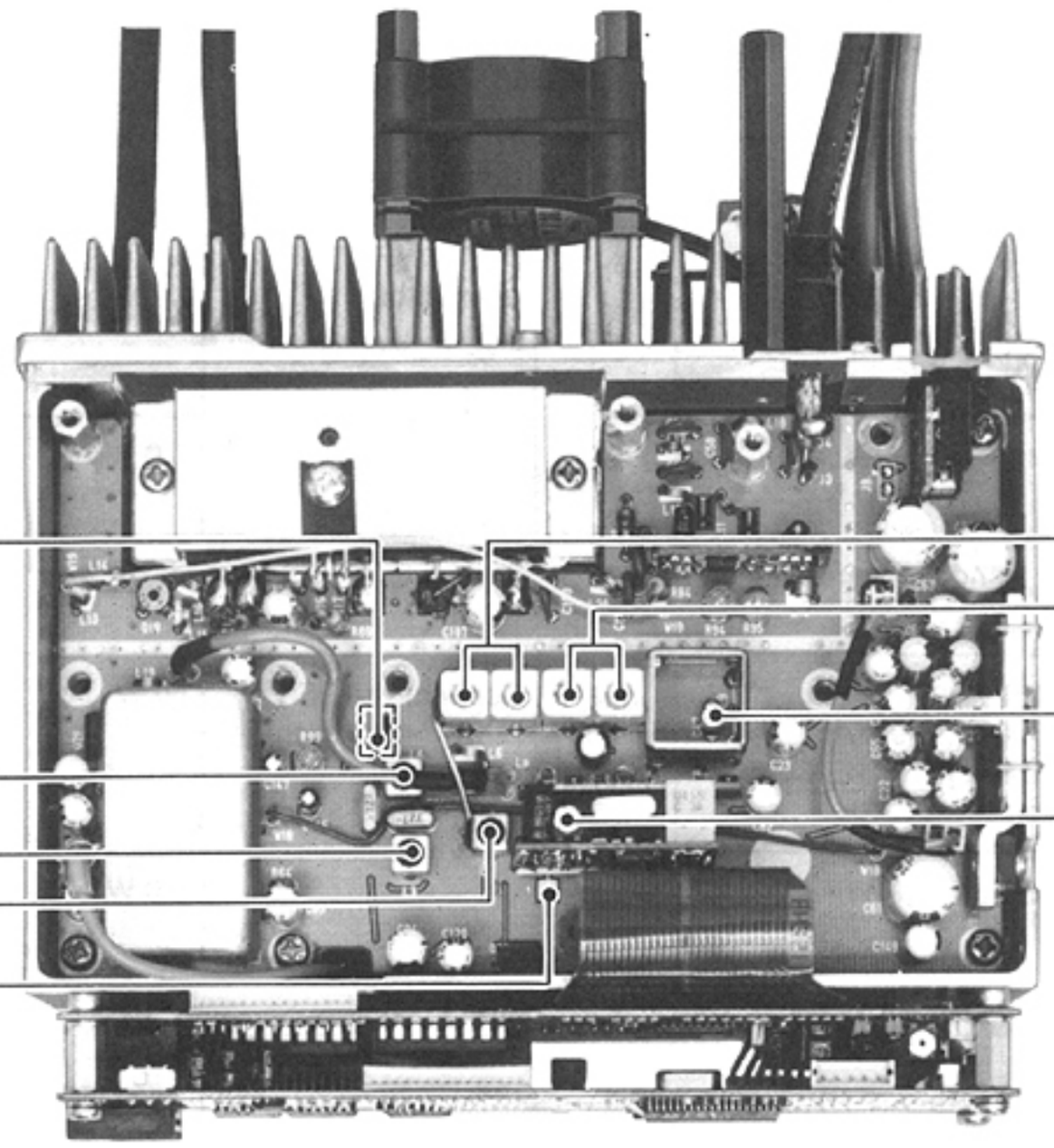
• MAIN-B UNIT



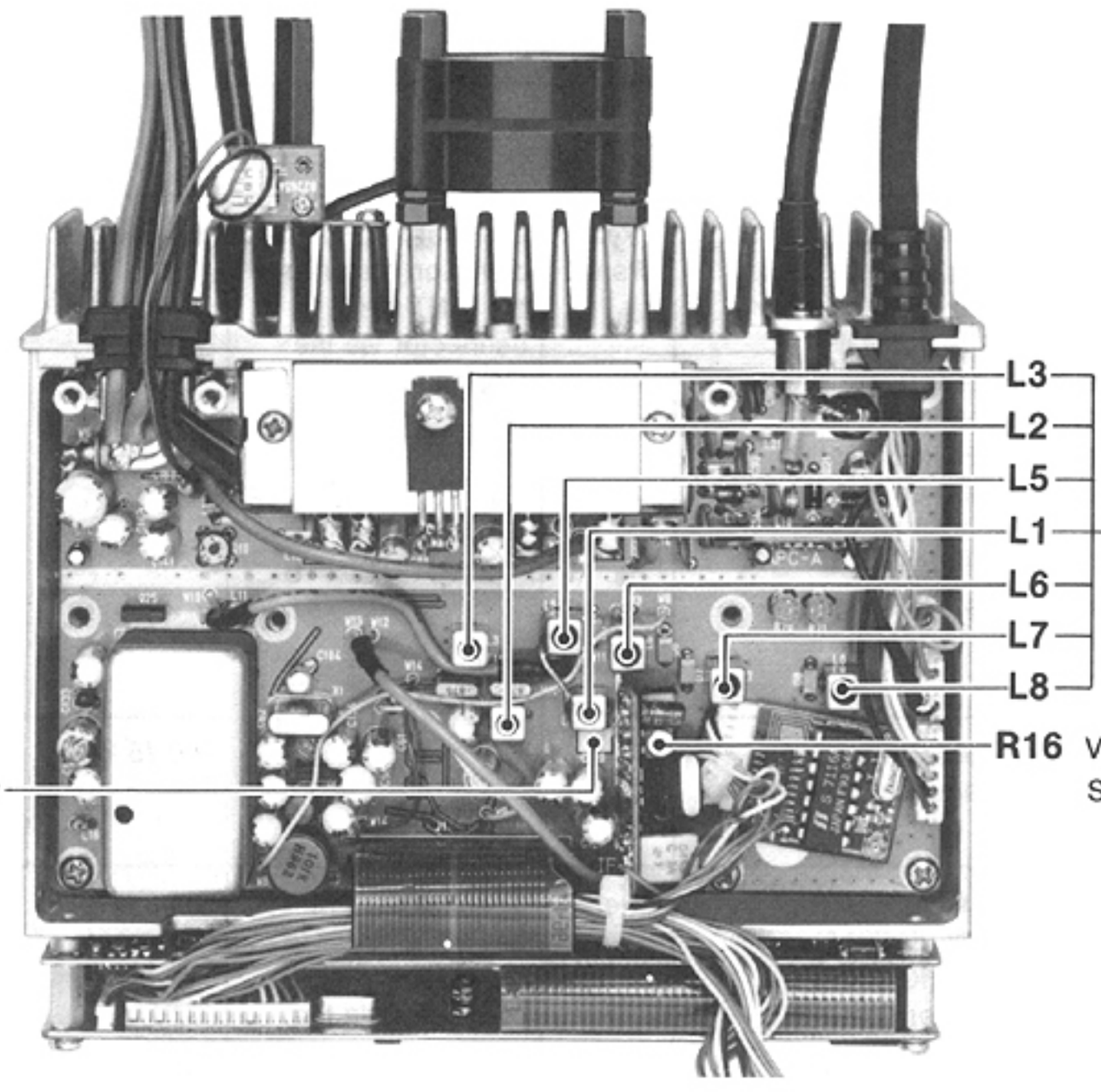
6-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
UHF BANDPASS FILTER	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Set the sweep generator; Sweep level: 22 mV (−20 dBm) Center frequency: Same as the displayed frequency Sweep band width: 10 MHz or 20 MHz • Receiving	MAIN-B	Connect the oscilloscope to J9 pin 1 via the detector.	Adjust as follows:  Symmetrical waves	MAIN-B	C47, L7, L8
UHF IF AMP	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Set the signal generator; Level : 1.0 µV (−107 dBm) Modulation : 1 kHz Deviation : ±6.0 kHz • R16 (IF-B) : Max. CW • Squelch control : Minimum • Receiving	MAIN-B	Connect the DC voltmeter to the land of the SRF2 line.	Maximum	MAIN-B	Adjust in sequence L4, L3, L2
		NOTE: Adjust the signal generator output level for each time showing the DC voltmeter at 30 % of the lowest range full scale.					
VHF SENSITIVITY	1	• Displayed frequency: 146.0000 MHz (IC-901A) 145.0000 MHz (IC-901E) • Set the signal generator; Level : 1.0 µV (−107 dBm) Modulation: 1 kHz Deviation : ±3.5 kHz • R16 (IF-A) : Max. CW • Receiving	MAIN-A	Connect the DC voltmeter to the land of the SRF1 line.	Maximum	MAIN-A	Adjust in sequence L8, L7, L6, L5
	2	• Set the signal generator; Deviation : ±6.0 kHz			Maximum		Adjust in sequence L3, L2, L1
		NOTE: Adjust the signal generator output level for each time showing the DC voltmeter at 30 % of the lowest range full scale.					
S-METER	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Set the signal generator; Level : 1.0 µV (−107 dBm) Modulation: 1 kHz Deviation : ±3.5 kHz • Receiving	Function display	S indicator	2 dots (S3) 	MAIN-B (IF-B)	R16
	2	• Displayed frequency: 146.0000 MHz (IC-901A) 145.0000 MHz (IC-901E)			2 dots (S3) 	MAIN-A (IF-A)	R16

• MAIN-B UNIT



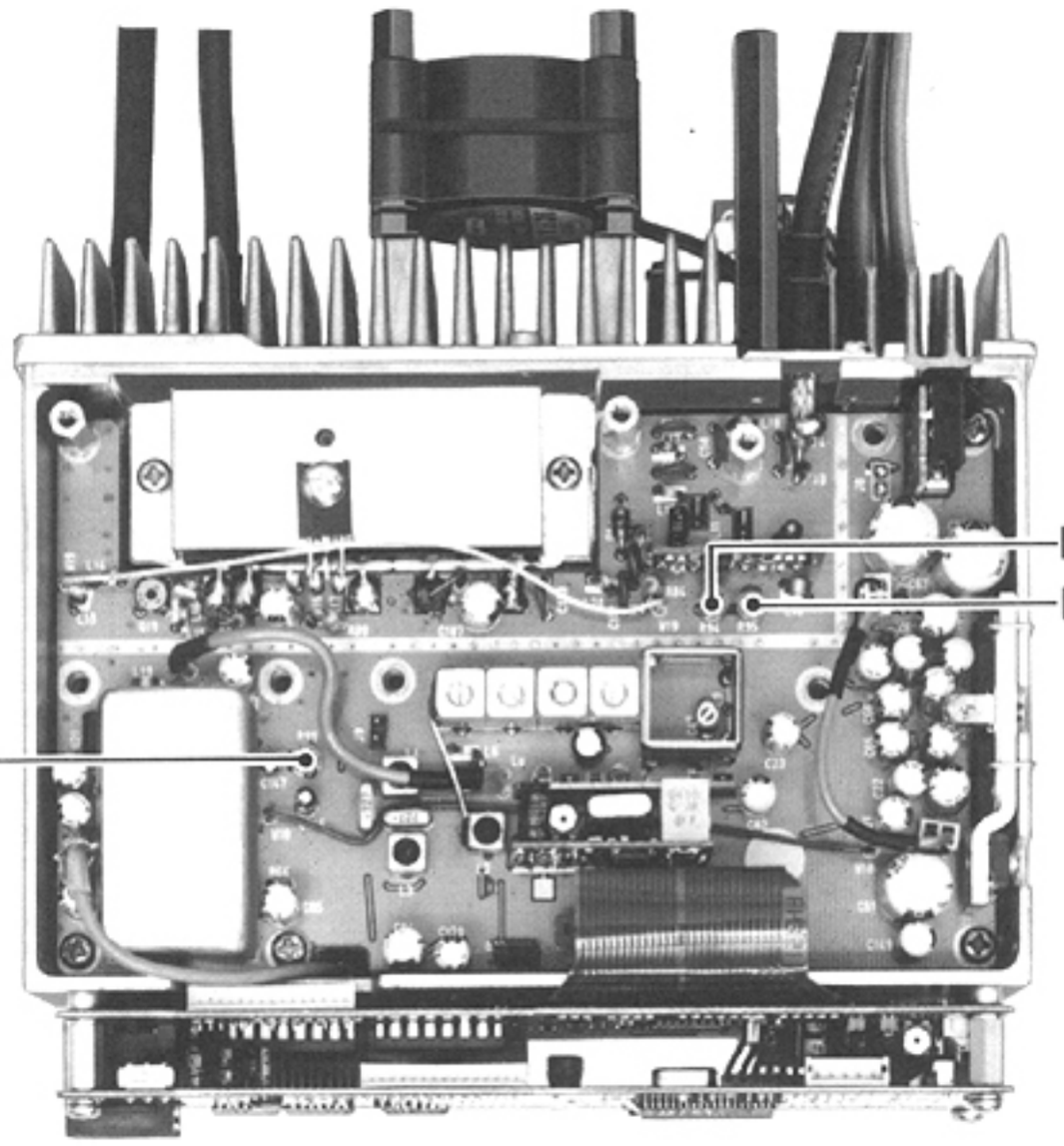
• MAIN-A UNIT



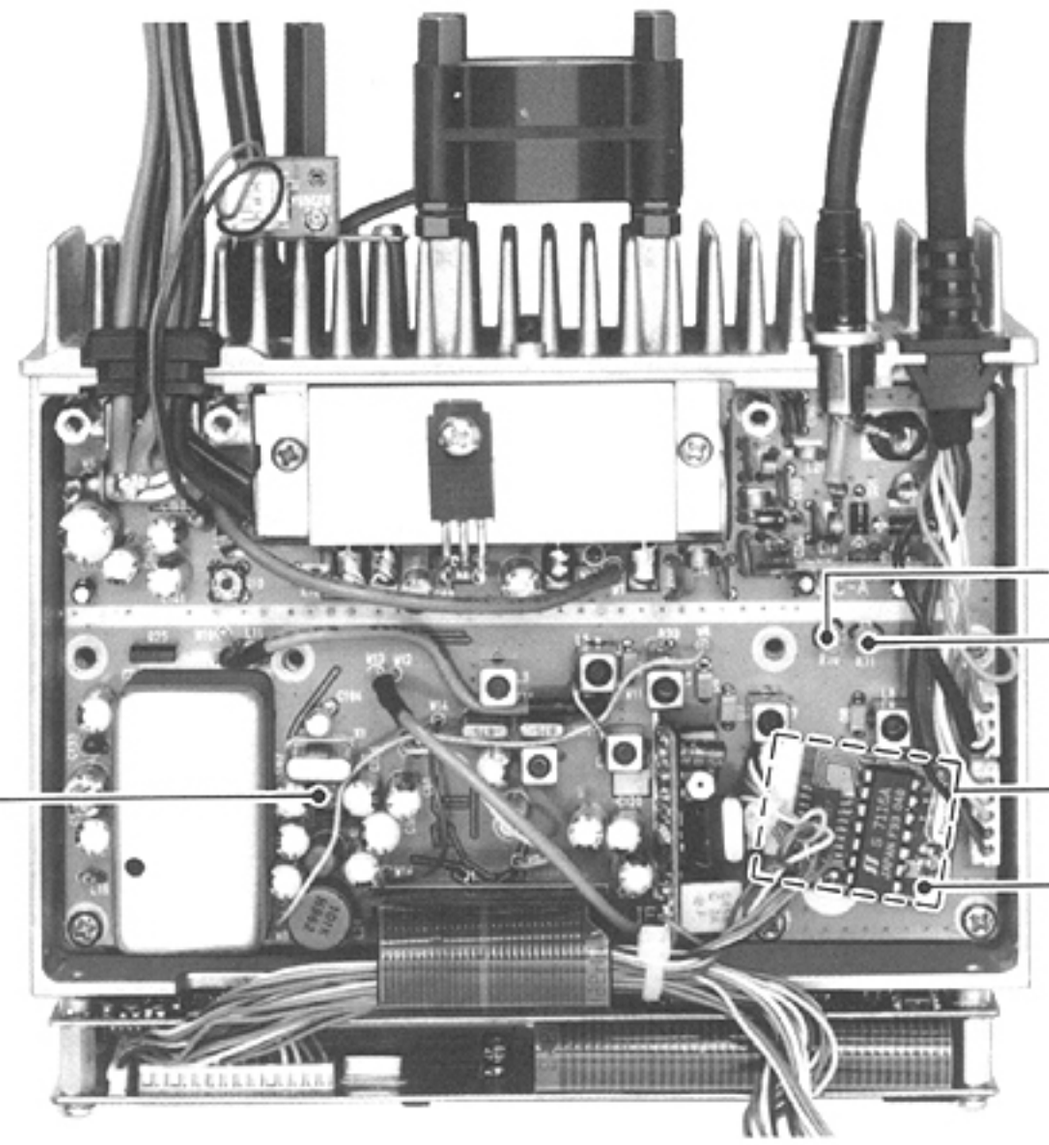
6-4 TRANSMITTER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Output power : HIGH • Simplex • Transmitting	Rear panel	Connect the RF power meter to the [ANT UHF] connector.	35 W	MAIN-B	R94
	2	• Output power : LOW			5.0 W		R95
	3	Repeat steps 1 and 2 several times.					
	4	• Displayed frequency: 146.0000 MHz (IC-901A) 145.0000 MHz (IC-901E) • Output power : HIGH	Rear panel	Connect the RF power meterto the [ANT VHF] connector.	50 W	MAIN-A	R70
	5	• Output power : LOW			5.0 W		R71
	6	Repeat steps 4 and 5 several times.					
MIC GAIN	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Set the audio generator; 65 mV/1.0 kHz (USA) 20 mV/1.0 kHz (EUR, AUS) • R26 (CONNECTOR): Max. CCW • Tone : OFF • Transmitting	CONNECTOR	Connect the DC voltmeter to W3.	155 mV	CONNECTOR	R55
	2	• Set the audio generator; 6.5 mV/1.0 kHz (USA) 2.0 mV/1.0 kHz (EUR, AUS)			94 mV		R26
	3	Repeat steps 1 and 2 several times.					
FREQUENCY DEVIATION	1	• Displayed frequency: 445.0000 MHz (USA) 435.0000 MHz (EUR, AUS) • Output power : HIGH • Set the audio generator; 65 mV/1.0 kHz (USA) 20 mV/1.0 kHz (EUR, AUS) • Set the FM deviation meter. HPF : 50 Hz LPF : 20 kHz De-emphasis: OFF Detector : (P-P)/2 • Transmitting	Rear Panel	Connect the FM deviation meter to the [ANT UHF] connector via the attenuator.	±4.8 kHz	MAIN-B	R99
	2	• Set the audio generator; OFF • Set the tone frequency to 88.5 Hz.			±0.75 kHz	TONE	R1
	3	• Displayed frequency: 146.0000 MHz (IC-901A) 145.0000 MHz (IC-901E) • Set the audio generator; 65 mV/1.0 kHz (USA) 20 mV/1.0 kHz (EUR, AUS) • Tone : OFF	Rear Panel	Connect the FM deviation meter to the [ANT VHF] connector via the attenuator.	±4.8 kHz	MAIN-A	R45

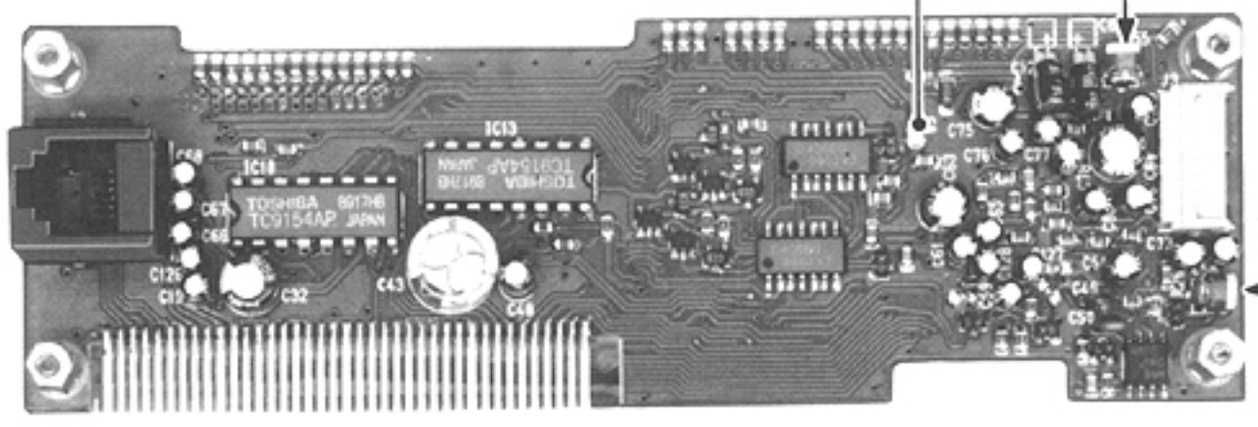
• MAIN-B UNIT



• MAIN-A AND TONE UNITS



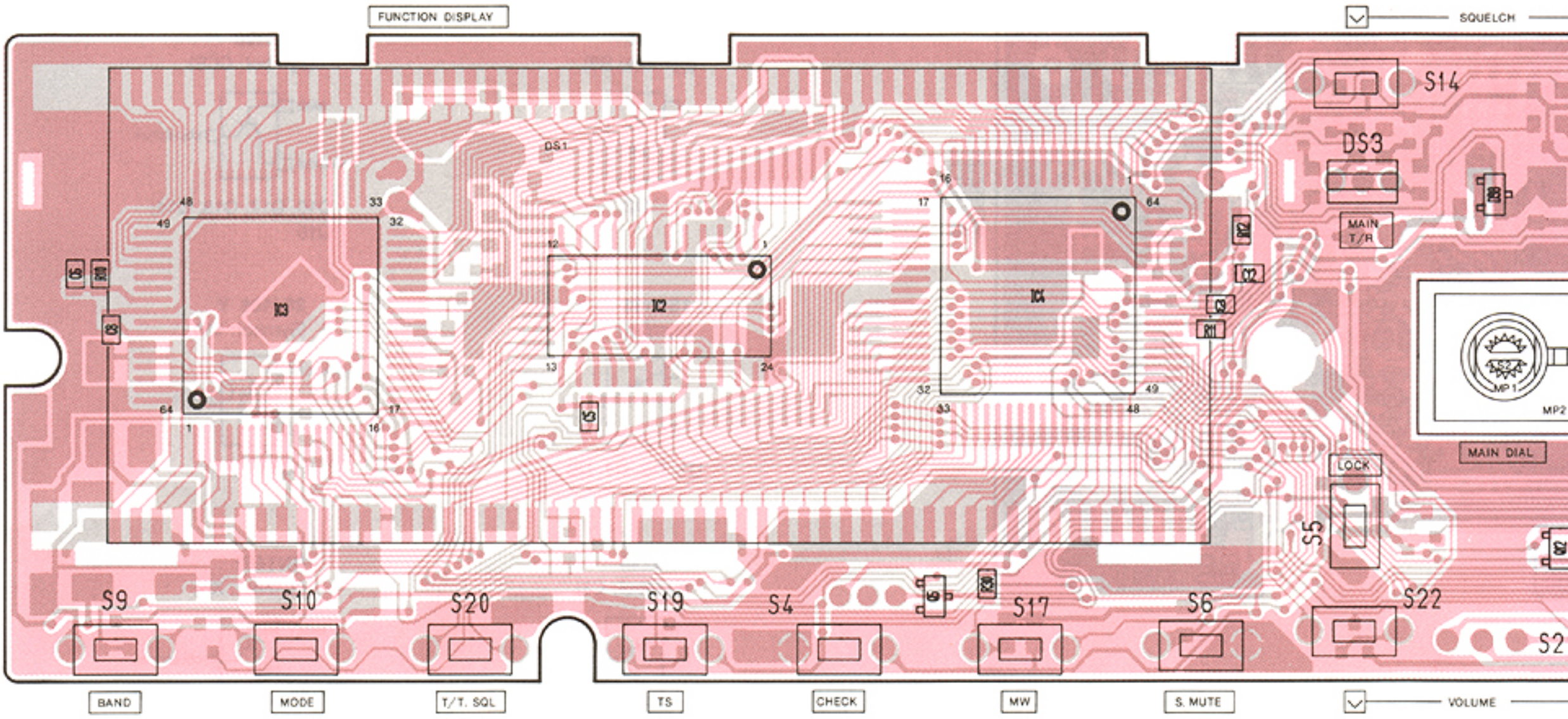
• CONNECTOR UNIT

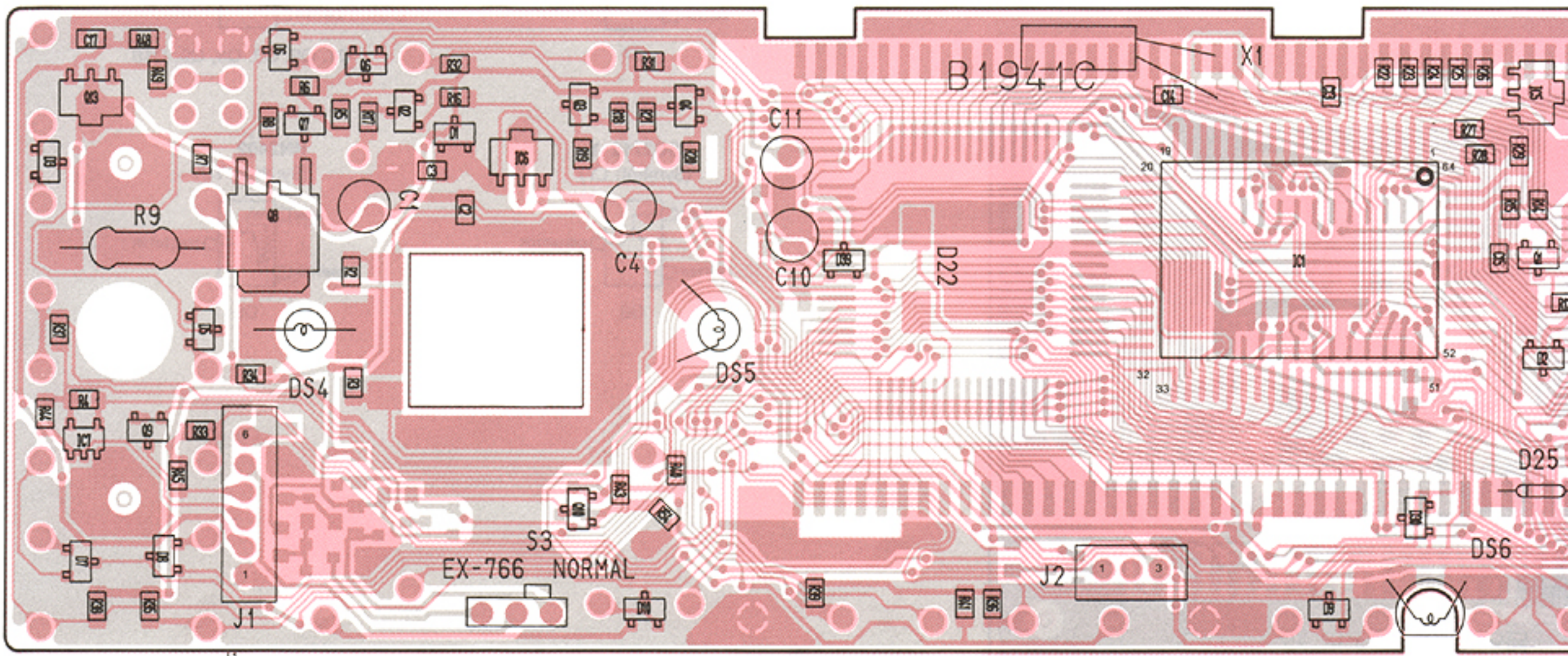


SECTION 7 BOARD LAYOUTS

7-1 REMOTE CONTROLLER

• CONTROL UNIT

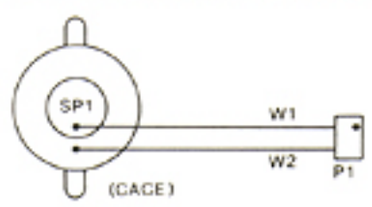


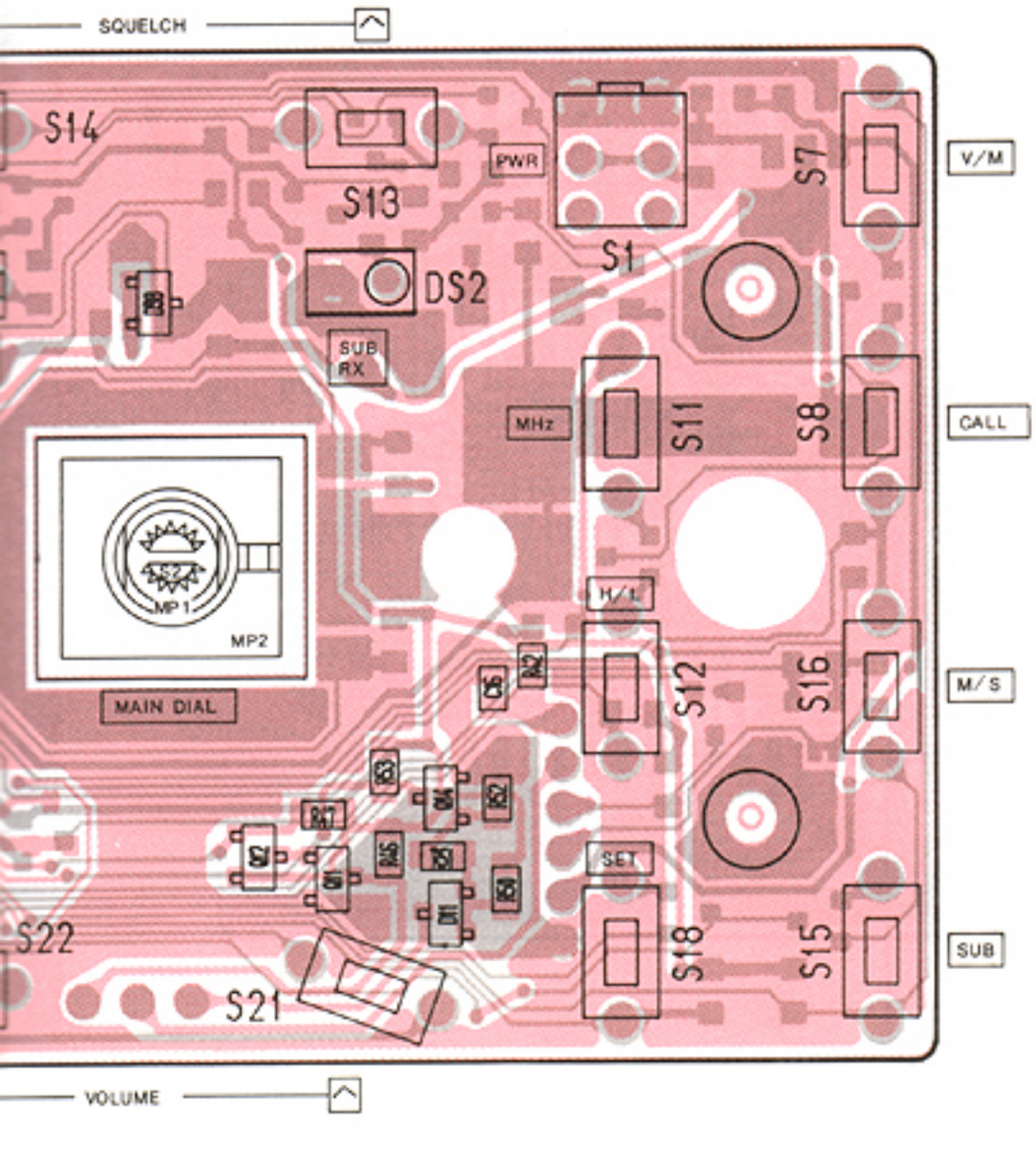


J1

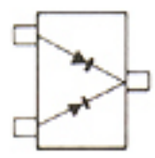
MU/D2
CK
DATA 1
DATA 2
HV
E

to CONNECT UNIT J2



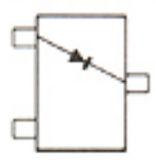


1SS184
(Symbol: B3)



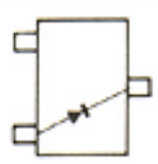
D2, D3, D4, D5, D6,
D7, D8, D9, D10

1SS193
(Symbol: F3)



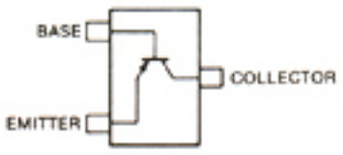
D1, D11, D30 (Europe),
D34 (Australia),
D36 (Europe), D38, D39

1SS196
(Symbol: G3)



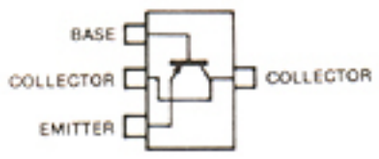
D34 (Europe) (U.S.A.),
D35 (U.S.A.) (Australia),
D36 (U.S.A.) (Australia)

2SA1162 Y
(Symbol: SY)



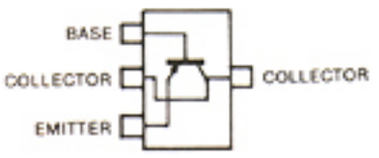
Q2, Q3, Q4

2SB1182 Q
(Symbol: B1182)



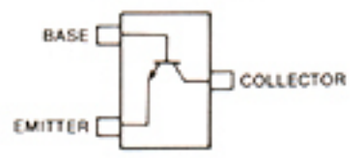
Q8

2SB798
(Symbol: DK)



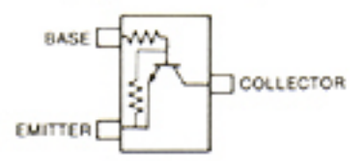
Q13

2SC2712 Y
(Symbol: LY)



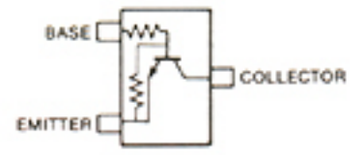
Q1, Q7, Q14

RN1404
(Symbol: XD)



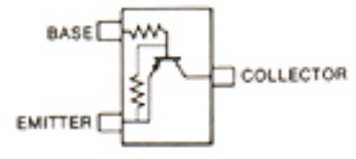
Q5

RN1409
(Symbol: XJ)

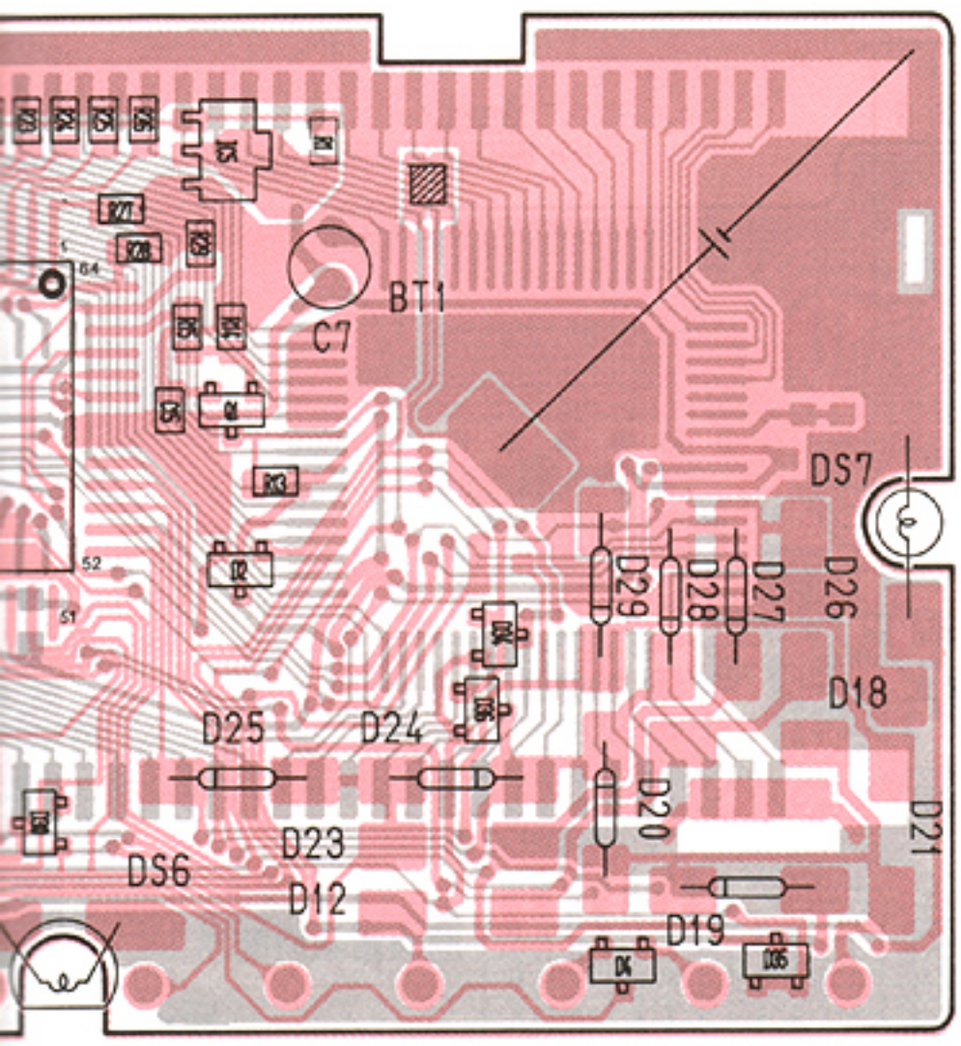


Q9, Q11

RN2404
(Symbol: YD)

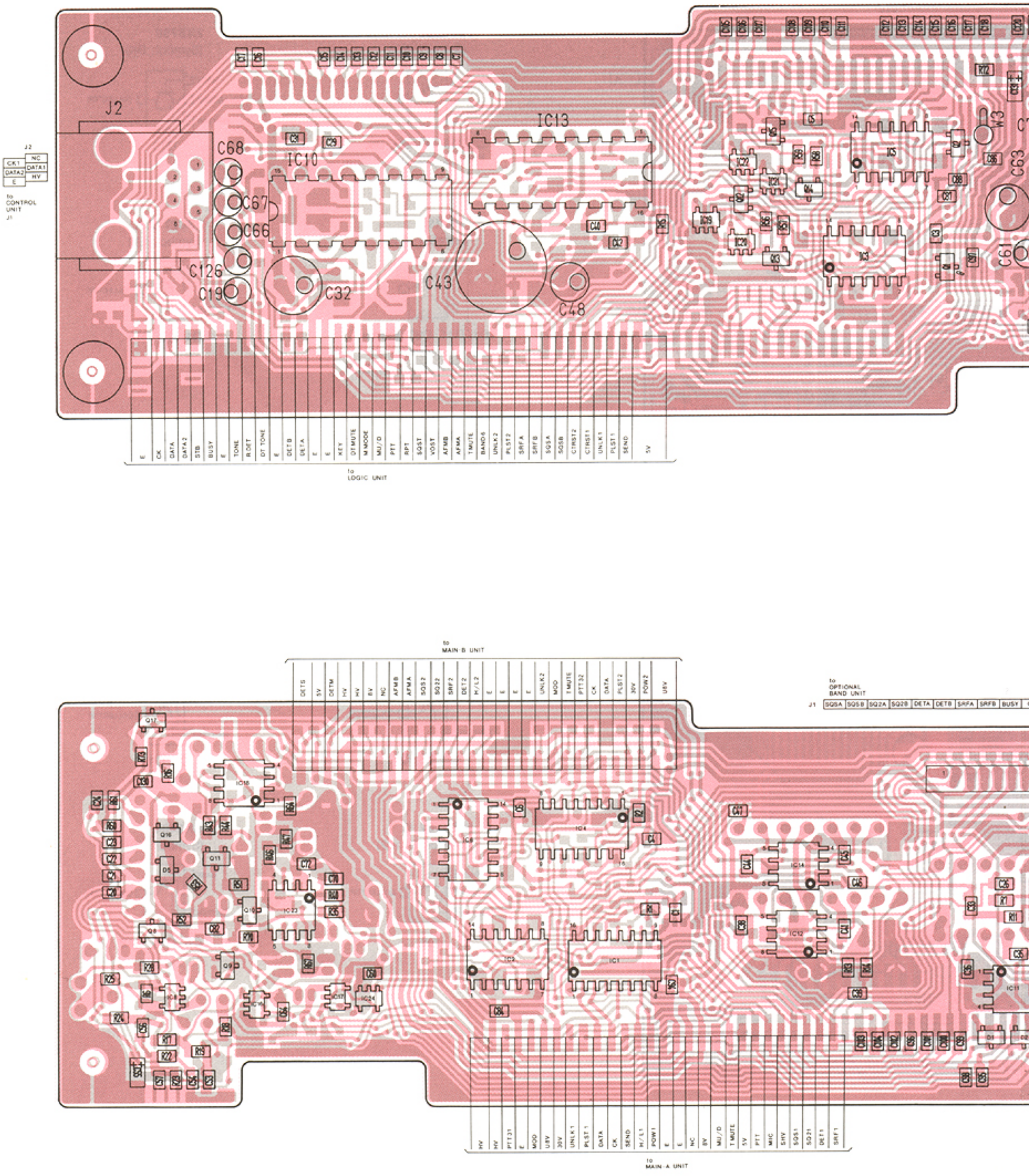


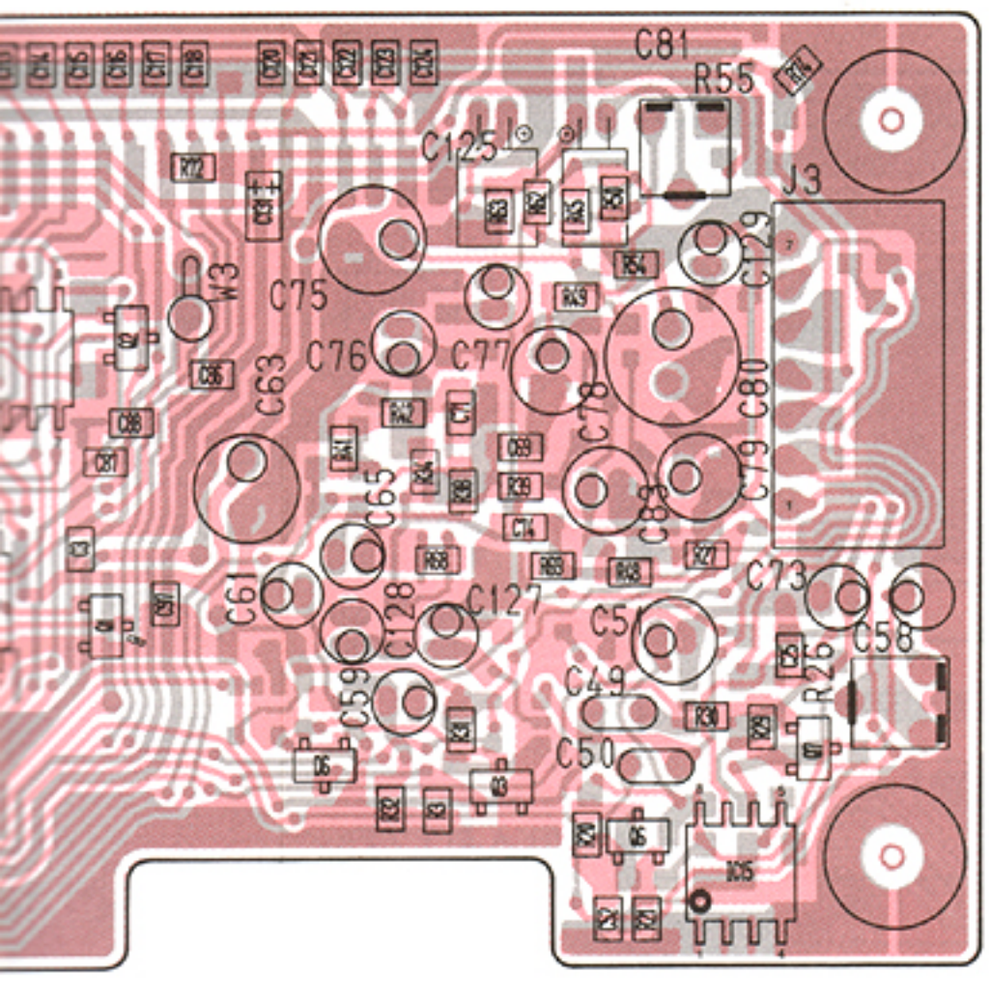
Q6, Q10, Q12

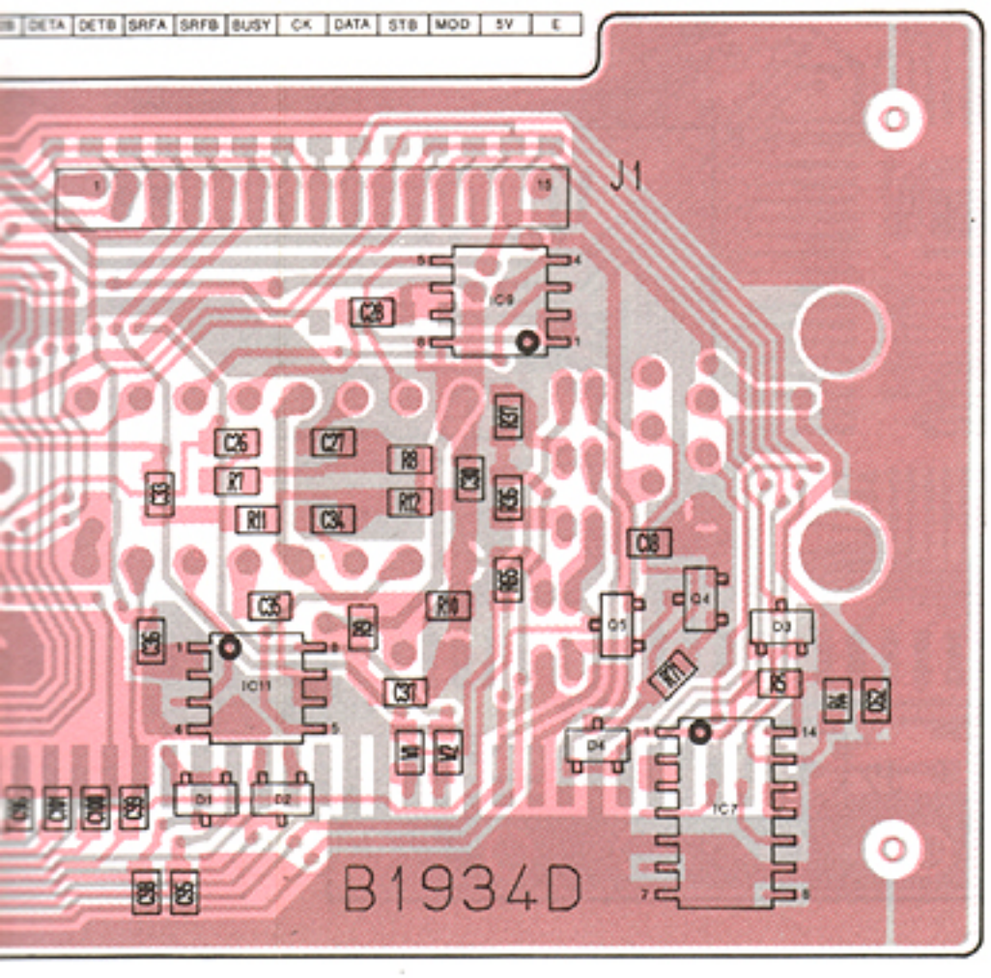


7-2 TRANSCEIVER (1)

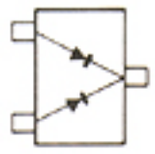
• CONNECTOR UNIT





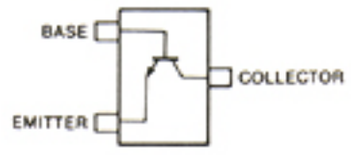


1SS184
(Symbol: B3)



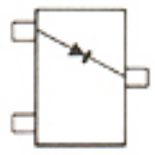
D2

2SC3326
(Symbol: CCB)



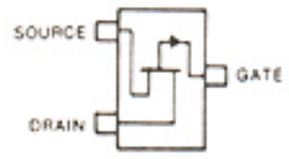
Q10, Q12, Q13, Q14, Q15

1SS193
(Symbol: F3)



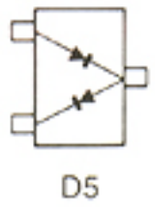
D1, D3, D4, D6

2SJ106 Y
(Symbol: VY)



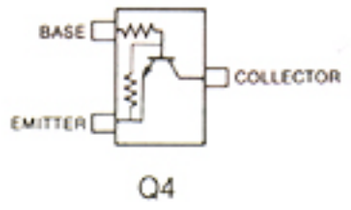
Q11, Q17

1SS226
(Symbol: C3)



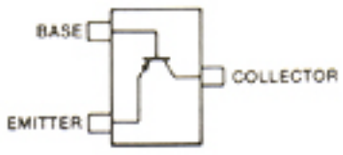
D5

RN1402
(Symbol: XB)



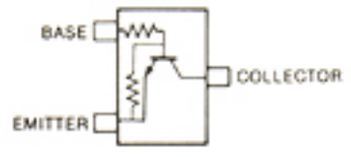
Q4

2SA1162 Y
(Symbol: SY)



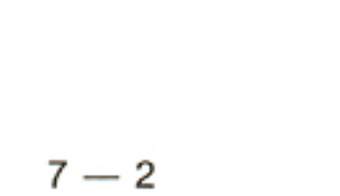
Q7

RN1404
(Symbol: XD)



Q1, Q2, Q3, Q8, Q9, Q16

2SC2712 Y
(Symbol: LY)

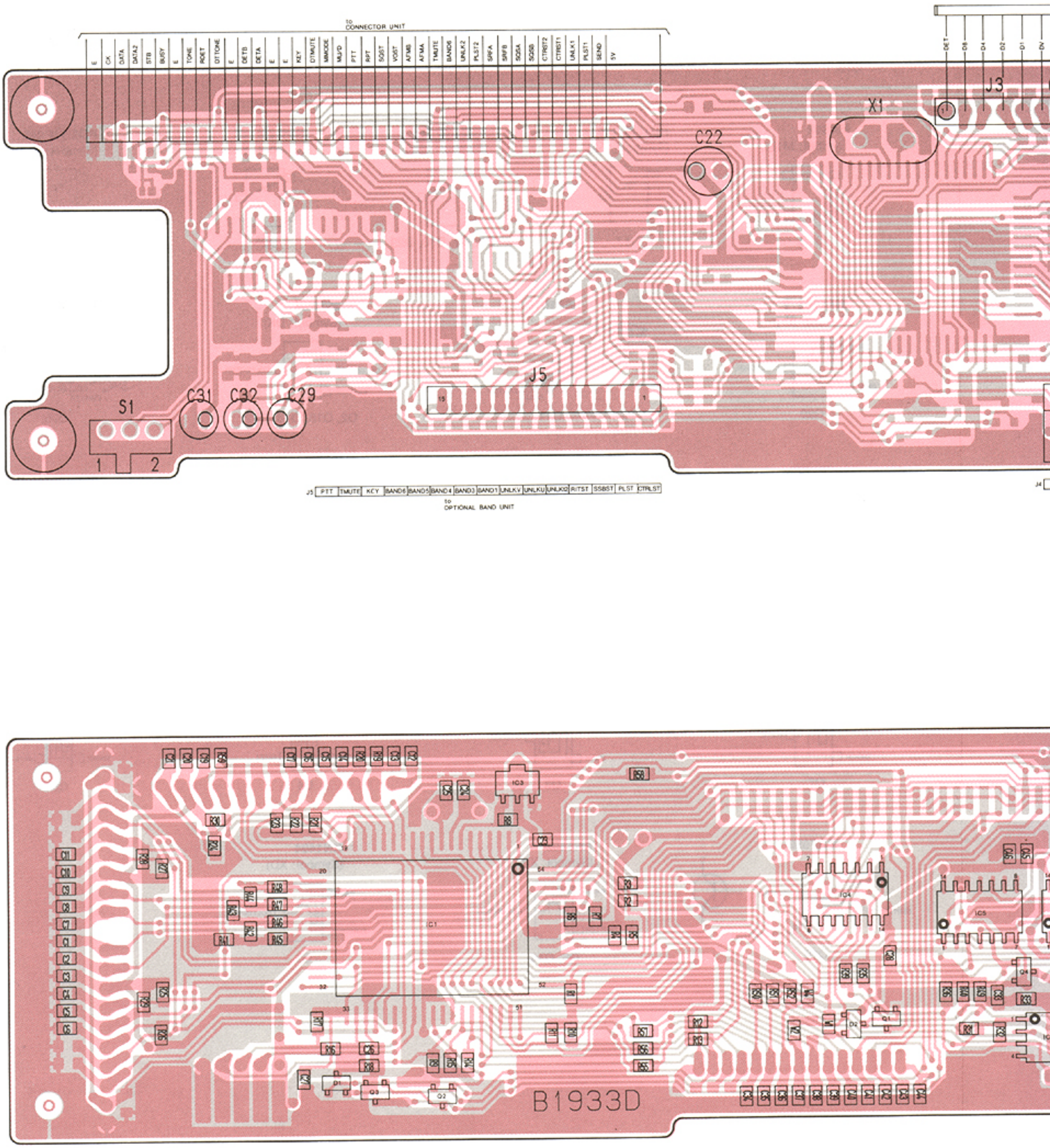


Q6

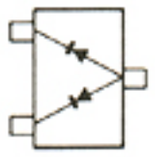
RN2402
(Symbol: YB)

Q5

• LOGIC UNIT

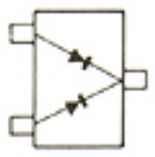

TO CONNECTOR UNIT
E
CK
DATA
DATA2
STB
BUSY
E
TONE
RDET
DTTONE
E
DETB
DETA
E
E
KEY
DTMUTE
MMODE
MUTD
PTT
RPT
SQST
VOST
AFMB
AFMA
TMUTE
BAND6
UNLK2
PLST2
SRFA
SRFB
SQSA
SQSB
CTRST2
CTRST1
UNLK1
PLST1
SEND
5V
DET
D8
D4
D2
D1
D0
J3
X1
C22
S1
C31
C32
C29
J5
15
1
1
2
J5 PTT TMUTE KEY BAND6 BAND5 BAND4 BAND3 BAND1 UNLKV UNLKU UNLK02 RITST SSBST PLST CTRLST
TO OPTIONAL BAND UNIT
J4
B1933D

1SS181
(Symbol: A3)



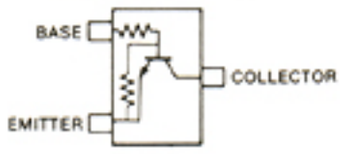
D1

1SS184
(Symbol: B3)



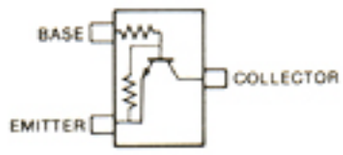
D2

RN1404
(Symbol: XD)



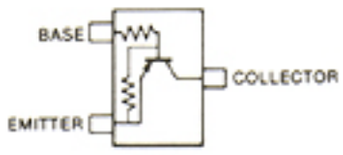
Q1, Q4

RN1409
(Symbol: XJ)

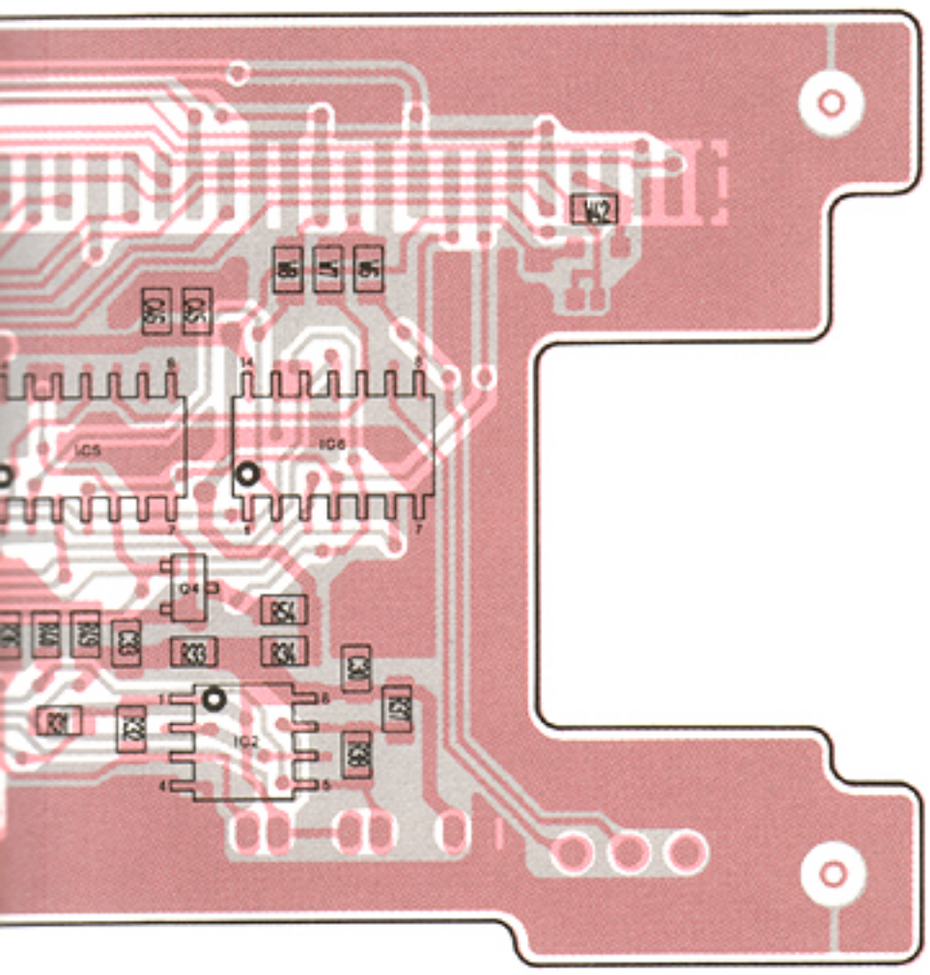


Q3

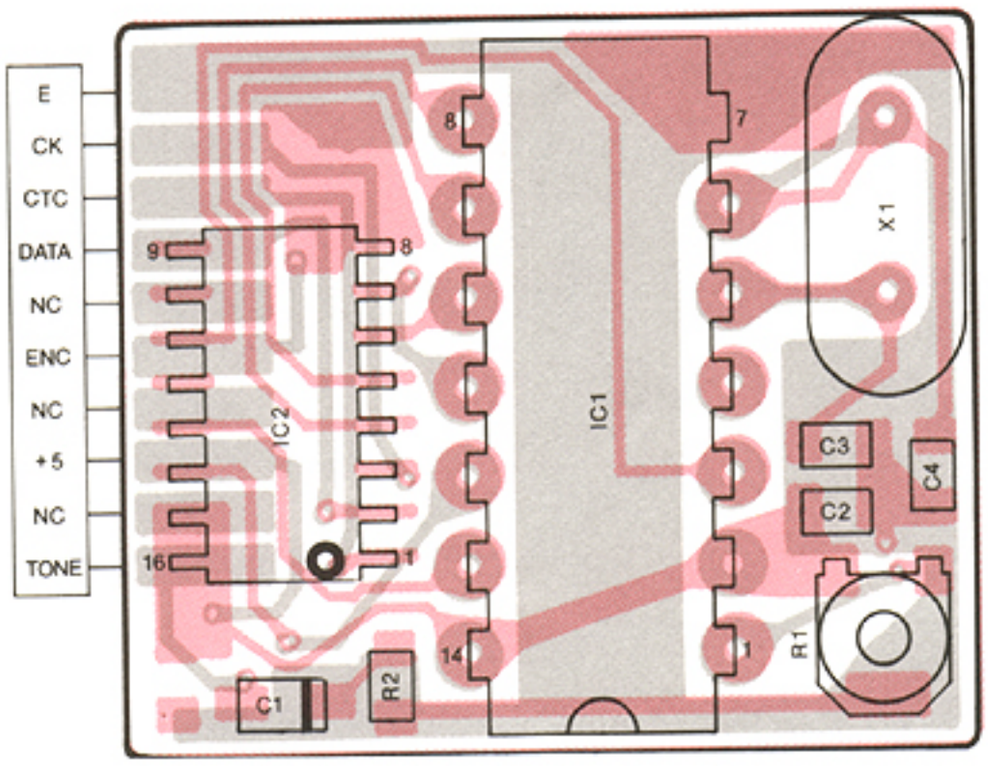
RN2404
(Symbol: YD)



Q2



• TONE UNIT



7-3 TRANSCEIVER (2)

• MAIN-A UNIT

1SS193
(Symbol: F3)

D3, D4, D11, D13, D19

1SS196
(Symbol: G3)

D26

DA115
(Symbol: AU)

D28

HSM88AS
(Symbol: C1)

D14, D15

MA159
(Symbol: M1A)

D18, D22, D24

MA862
(Symbol: M1I)

D12

RD15M B2
(Symbol: 152)

D17

RD3.9M B2
(Symbol: 392)

D2, D9, D10, D23

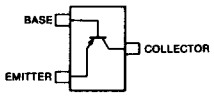
RD8.2M B1
(Symbol: 822)

D25

RD9.1M B2
(Symbol: 912)

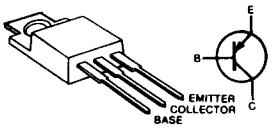
D27

2SA1162 Y
(Symbol: SY)



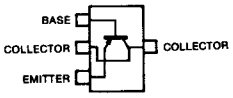
Q20

2SB1019



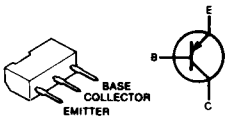
Q11

2SB798
(Symbol: DK)



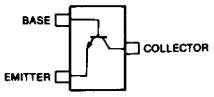
Q2, Q16, Q18, Q22

2SB909M R



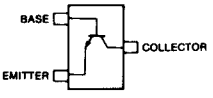
Q25

2SC2712 Y
(Symbol: LY)



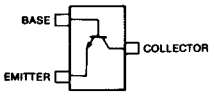
Q15, Q17, Q19, Q21, Q23, Q24

2SC3361 TA
(Symbol: CP)



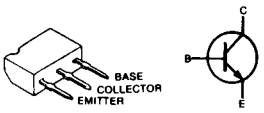
Q9

2SC3372 3
(Symbol: LY3)



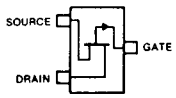
Q12, Q13

2SD1225M R



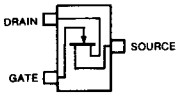
Q8

2SJ106 Y
(Symbol: VY)



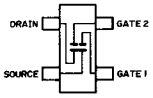
Q7

2SK302 Y
(Symbol: TY)



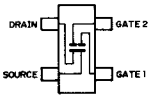
Q3

2SK140 Y
(Symbol: UG)



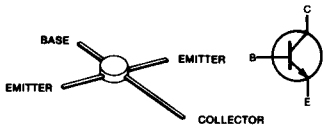
Q4

2SK177 U73
(Symbol: U73)



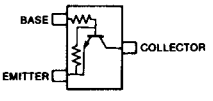
Q5

MRF559



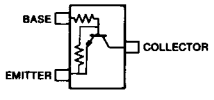
Q10

RN1402
(Symbol: XB)

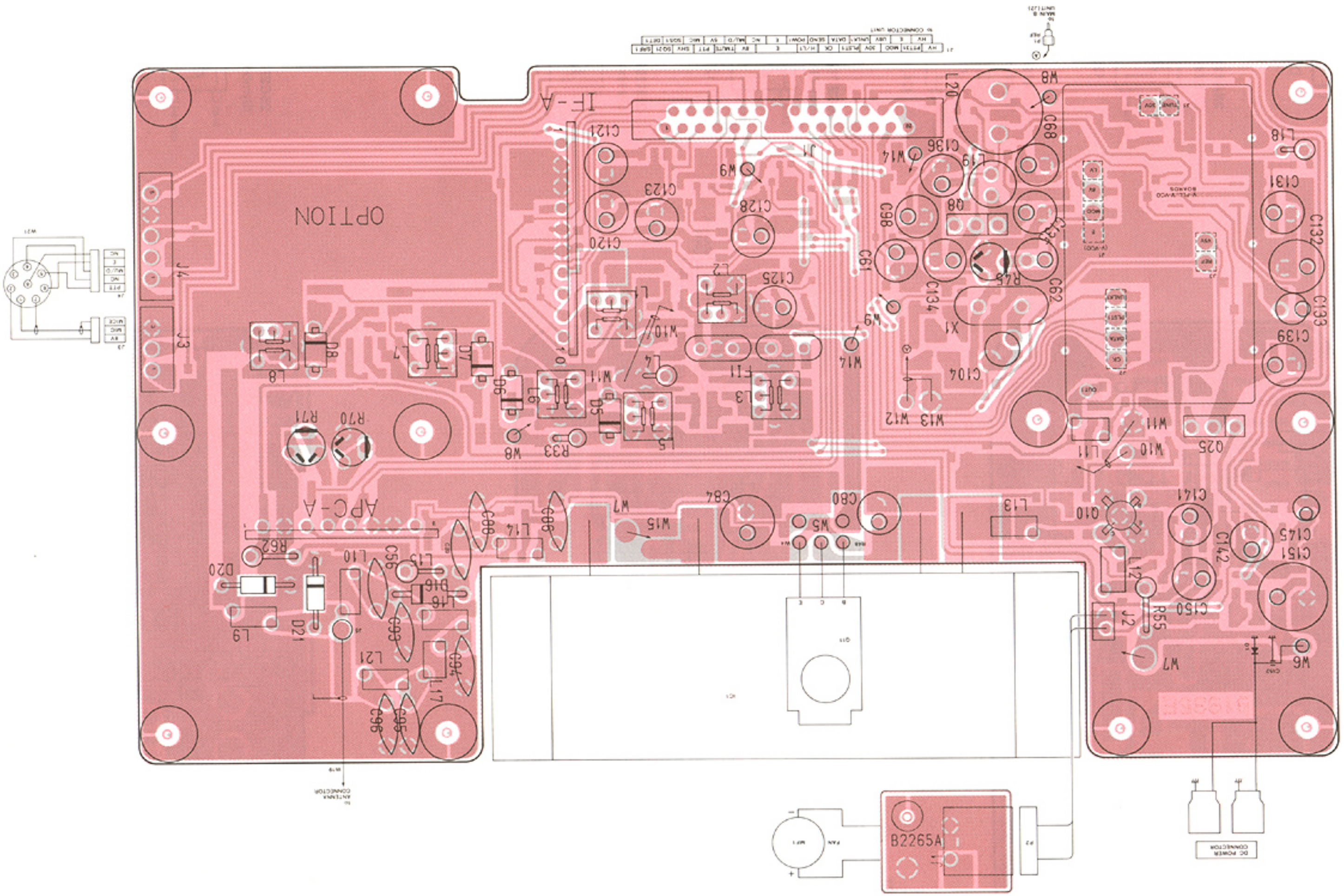


Q6, Q14

RN1404
(Symbol: XD)



Q1


OPTION
IF-A
APC-A
B2265A
J1
J2
J3
J4
L20
L18
L19
L14
L13
L12
L11
L10
L9
L8
L7
L6
L5
L4
L3
L2
L21
X1
Q8
Q10
Q25
D20
D21
C121
C123
C120
C128
C125
C136
C98
C91
C62
C134
C104
C131
C132
C133
C139
C141
C142
C150
C151
C145
C84
C80
R45
R62
R70
R71
R55
W1
W2
W3
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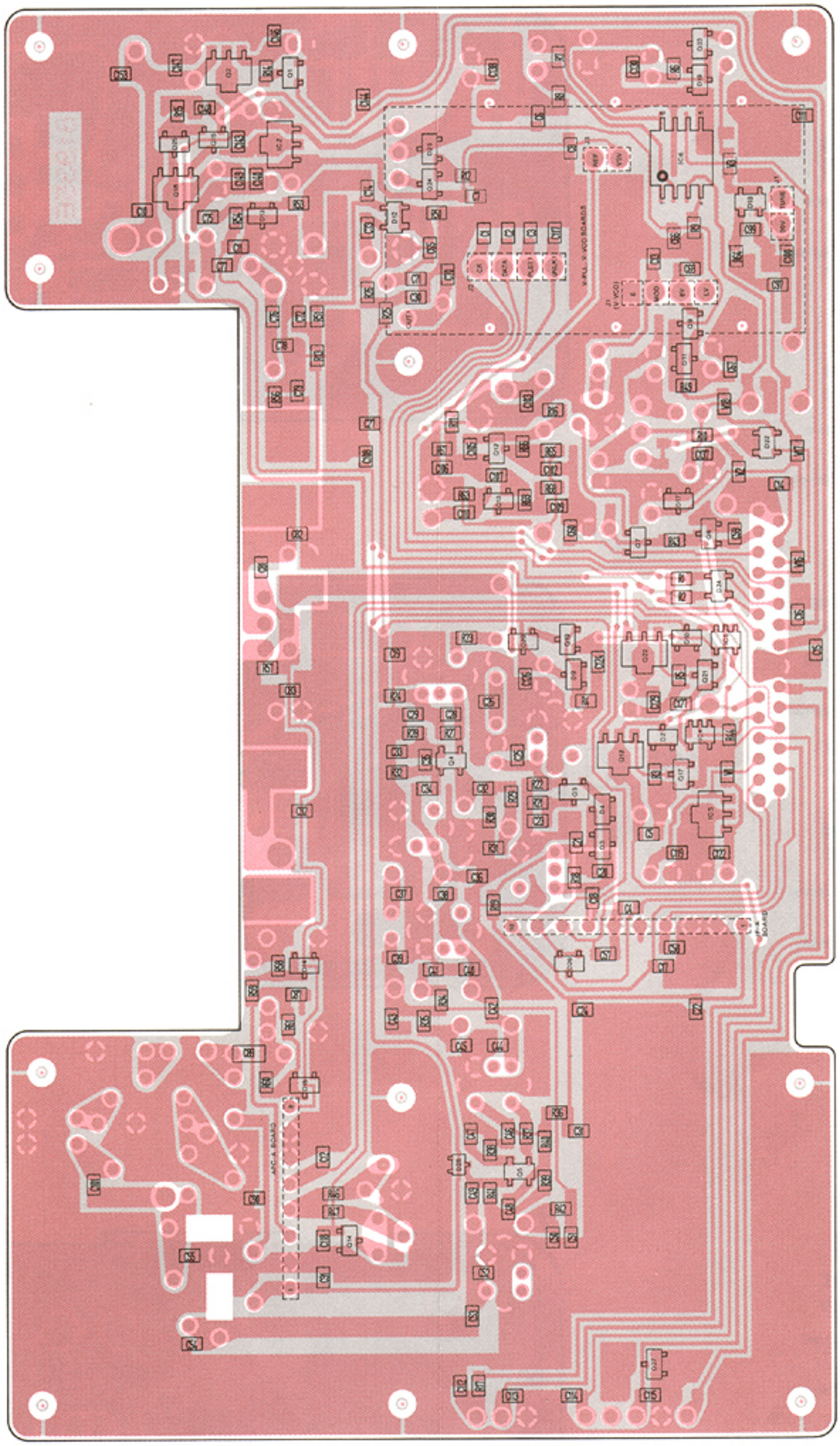
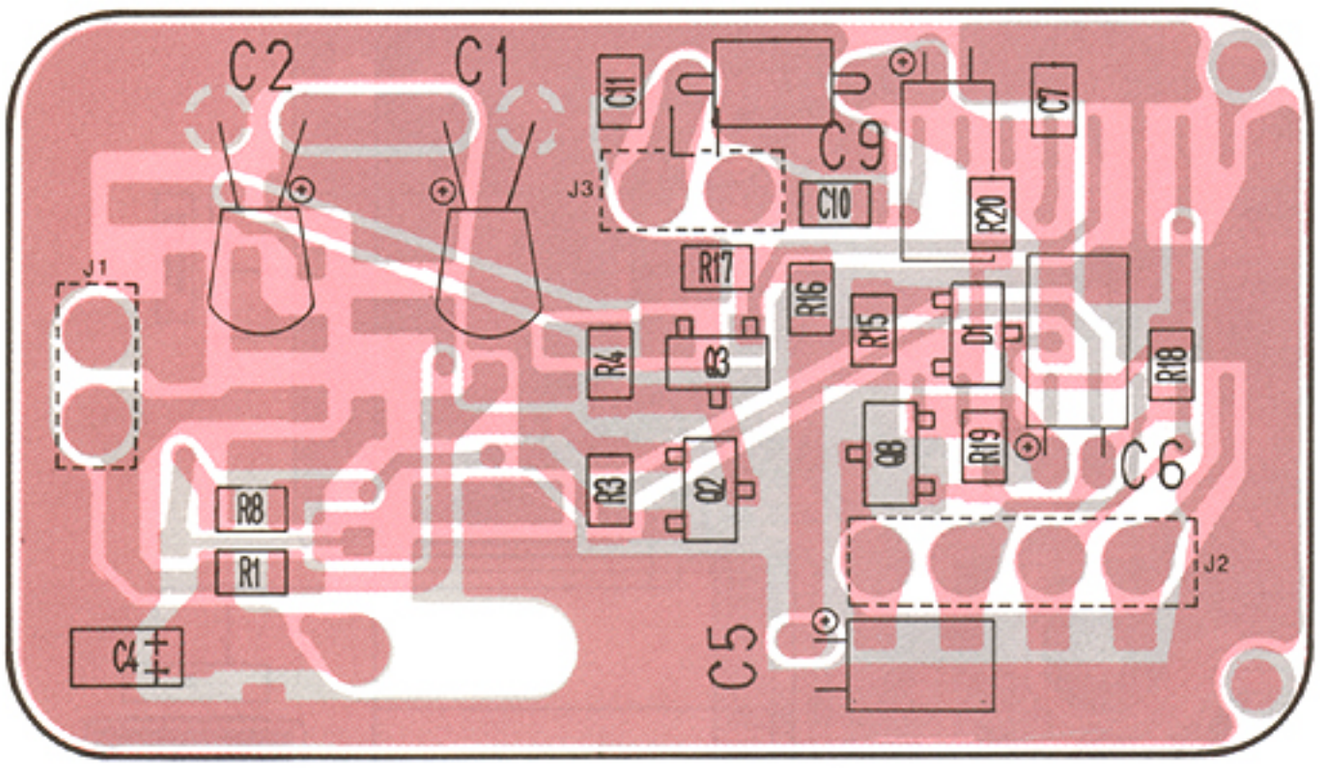
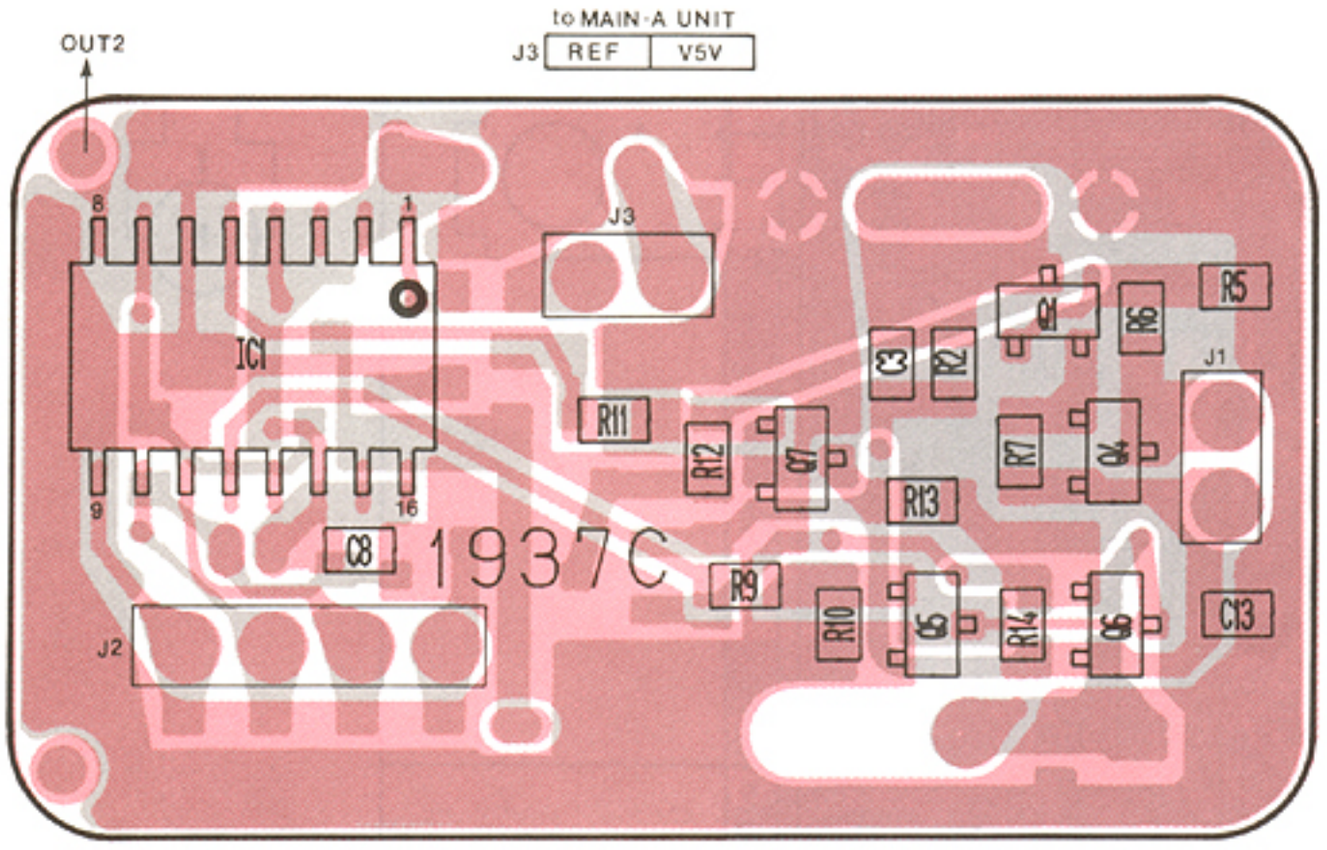
W5
W6
W7
W8
W9
W10
W11
W12
W13
W14
W15
F11



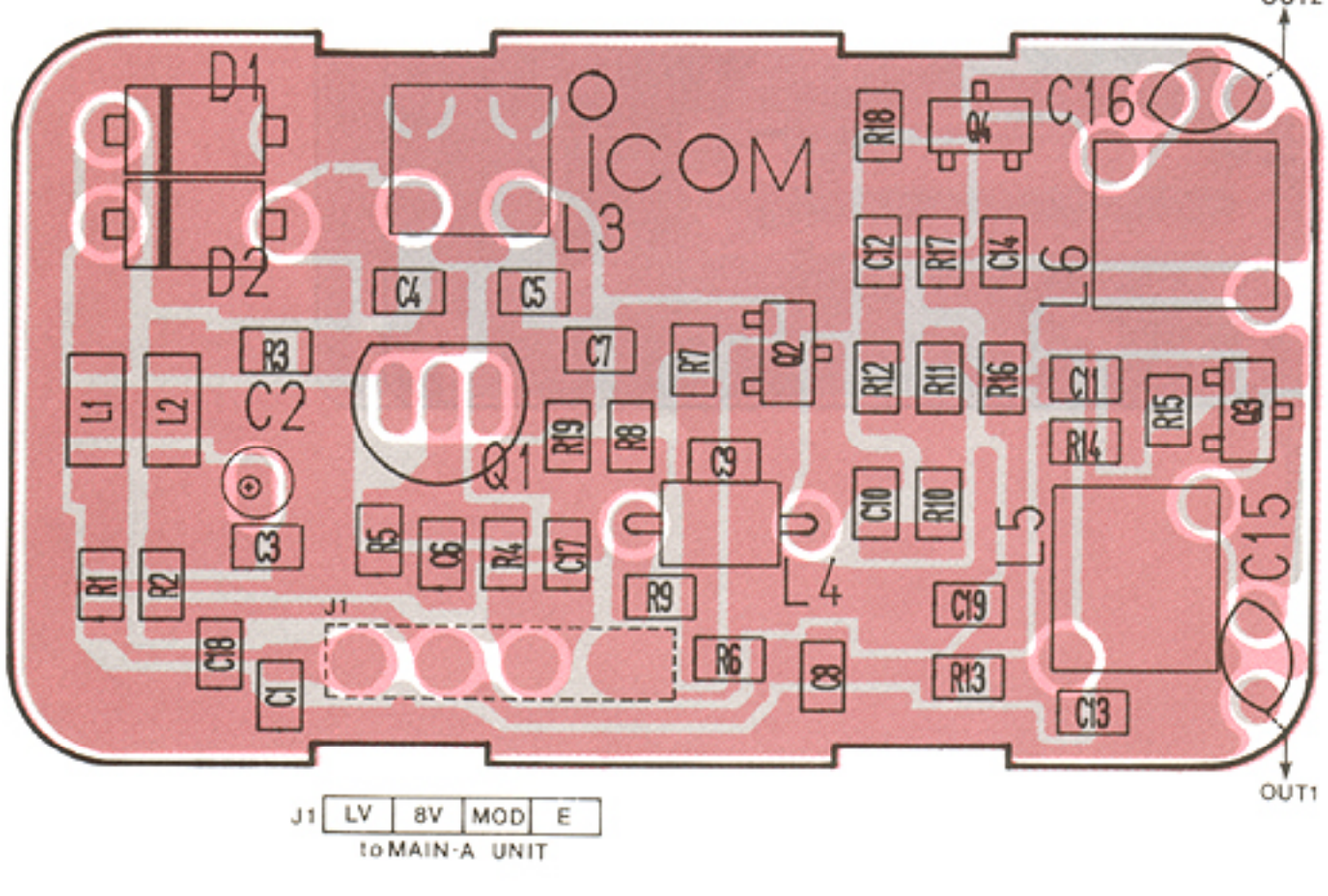
7-4 TRANSCEIVER (3)

• V-PLL BOARD

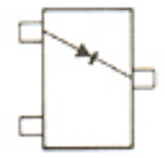




• V-VCO BOARD

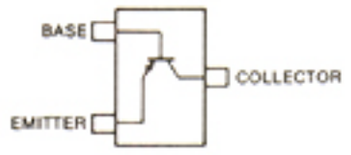


1SS193
(Symbol: F3)



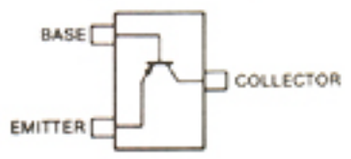
D1

2SA1162 GR
(Symbol: SG)



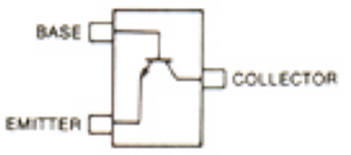
Q6

2SA1162 Y
(Symbol: SY)



Q4, Q8

2SC2712 GR/Y
(Symbol: LG, LY)

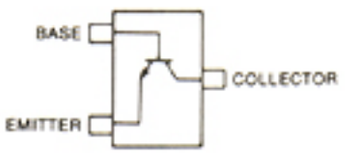


Q3, Q5, Q7

2SK209 Y
(Symbol: XY)

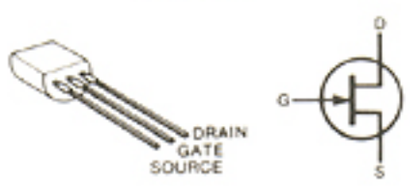
Q1, Q2

2SC3772 3
(Symbol: LY3)



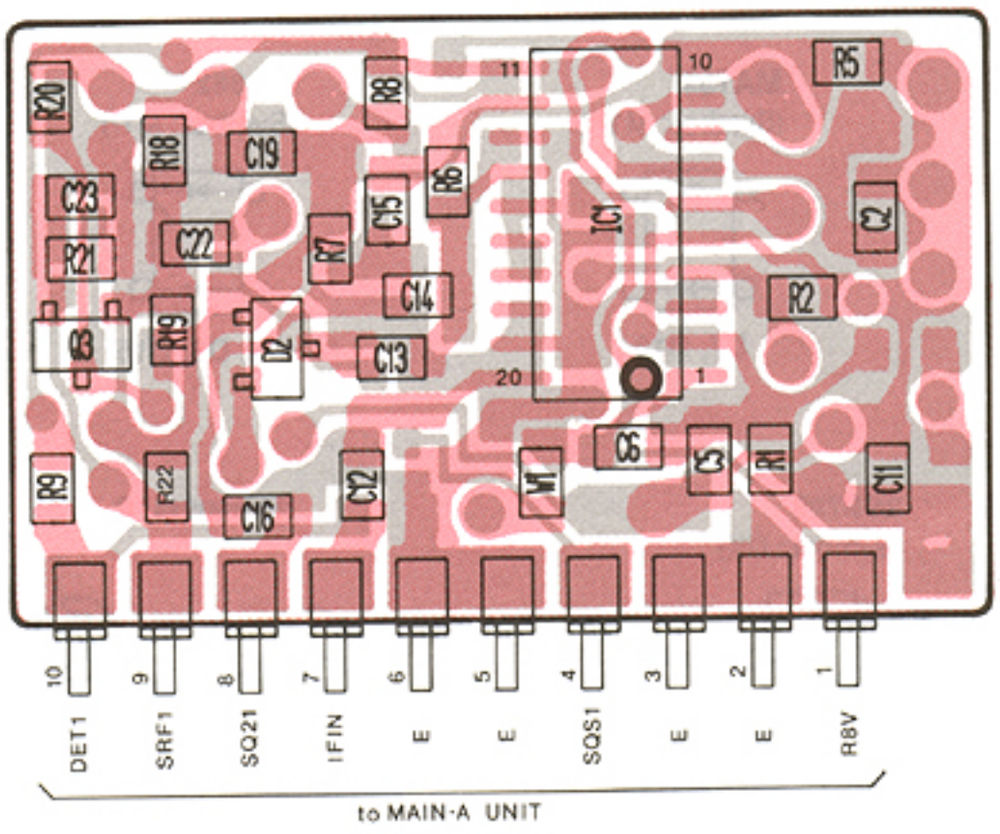
Q2, Q3, Q4

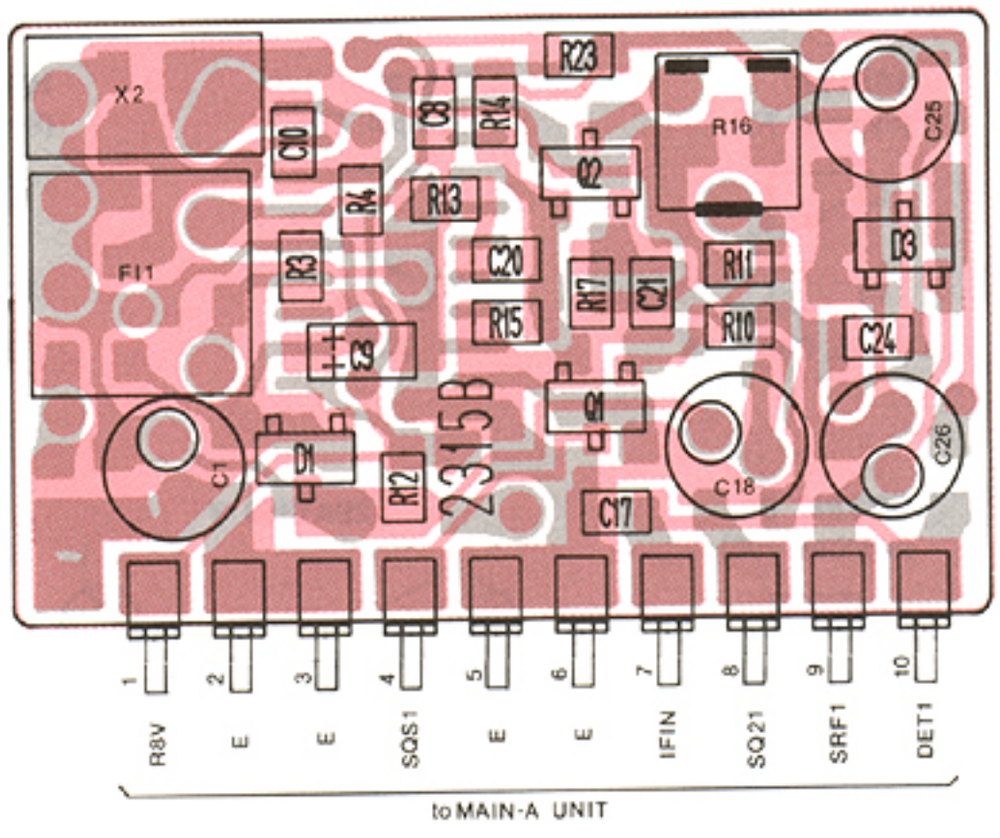
2SK125



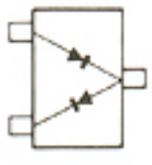
Q1

• IF-A BOARD



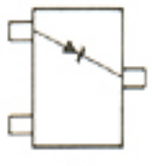


1SS226
(Symbol: C3)



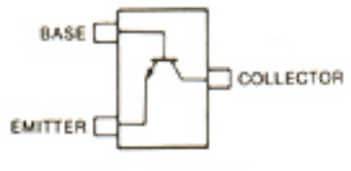
D2, D3

RD6.2M B2
(Symbol: 622)



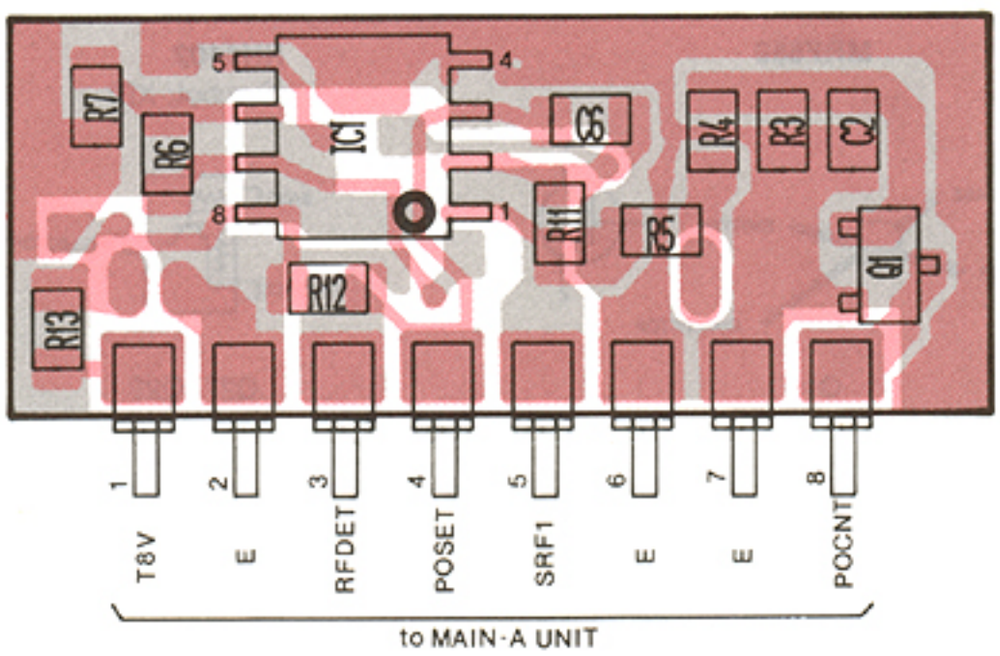
D1

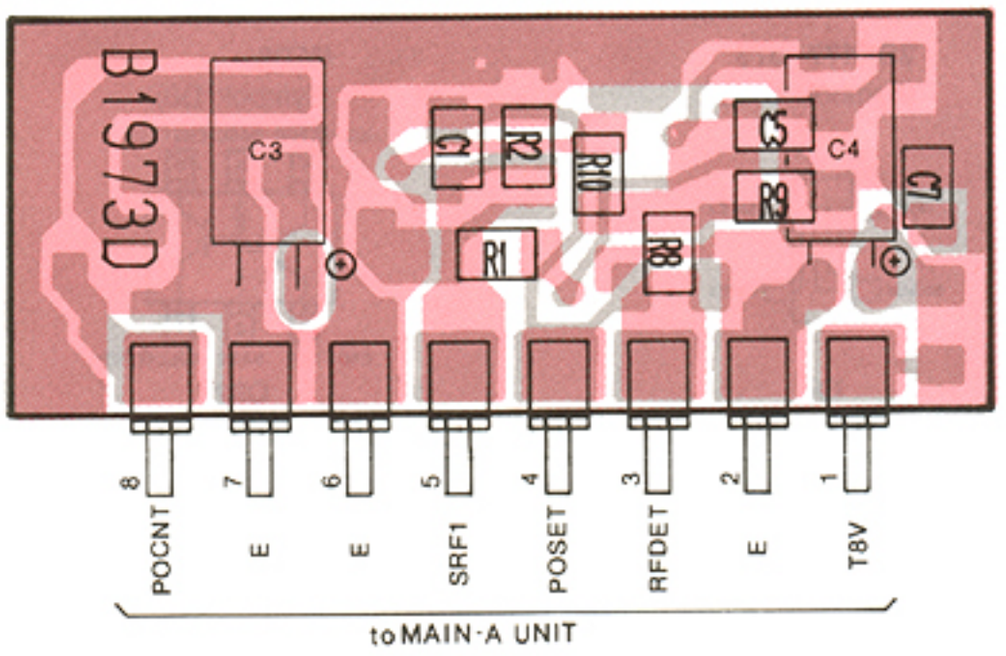
2SC2712 Y
(Symbol: LY)



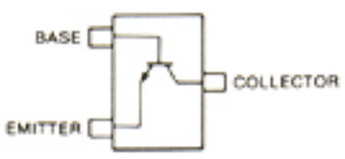
Q1, Q2, Q3

• APC-A BOARD





2SC2712 Y
(Symbol: LY)



Q1

7-5 TRANSCEIVER (4)

• MAIN-B UNIT

1SS193
(Symbol: F3)

D4, D5, D14, D16

1SS196
(Symbol: G3)

D19

HSM88AS
(Symbol: C1)

D17, D18

MA159
(Symbol: M1A)

D7, D13

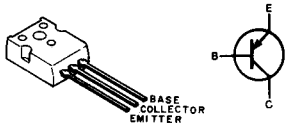
MA862
(Symbol: M1I)

D6, D8, D15

RD3.9M B2
(Symbol: 392)

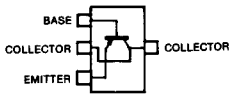
D9, D10, D11, D12

2SA1359 Y



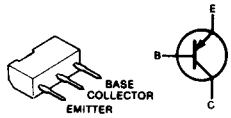
Q24, Q25

2SB798
(Symbol: DK)



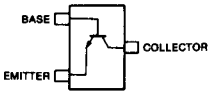
Q10, Q12, Q14

2SB909M R



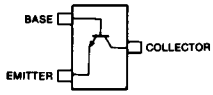
Q21, Q23

2SC2712 Y
(Symbol: LY)



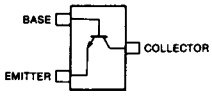
Q11, Q13, Q15, Q20, Q30, Q31

2SC3326
(Symbol: CCB)



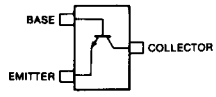
Q1, Q3, Q9

2SC3661 TA
(Symbol: CP)



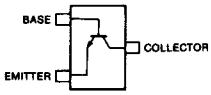
Q16

2SC3772 3
(Symbol: LY3)



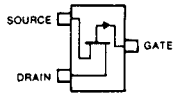
Q6, Q17

2SC3775 3
(Symbol: OY3)



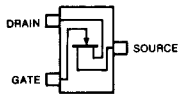
Q18

2SJ106 Y
(Symbol: VY)



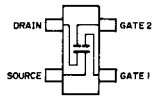
Q2, Q8, Q29

2SK302 Y
(Symbol: TY)



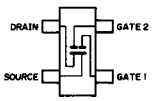
Q4

3SK140 Y
(Symbol: UG)



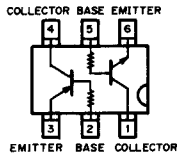
Q5

3SK177 U73
(Symbol: U73)



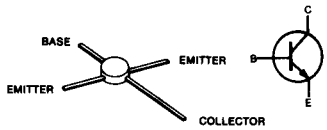
Q7

IMD6
(Symbol: D6)



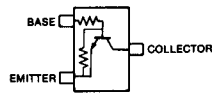
Q32

MRF559



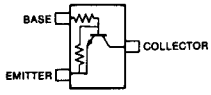
Q19

RN1402
(Symbol: XB)



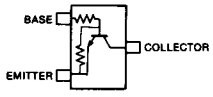
Q27, Q28

RN1404
(Symbol: XD)

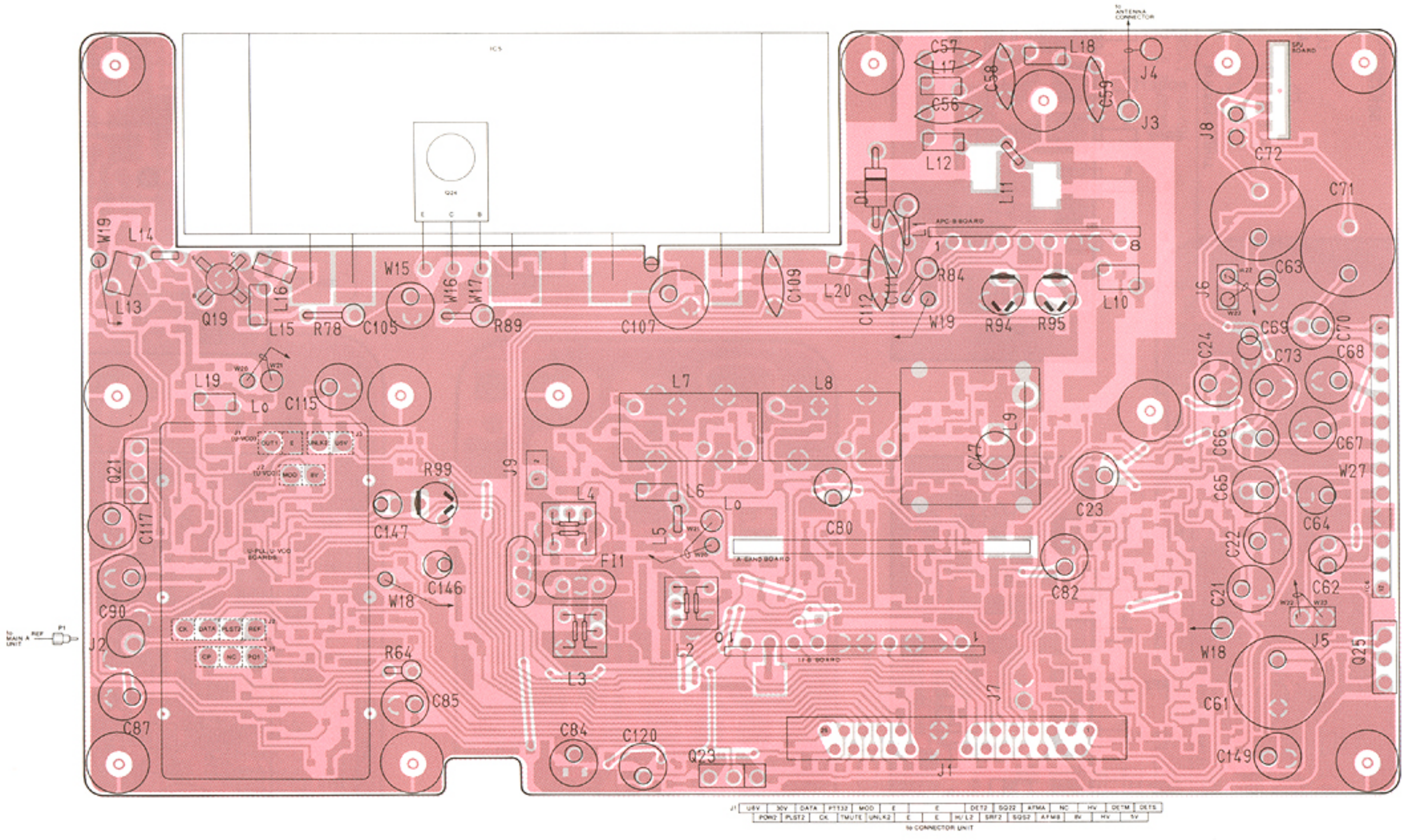


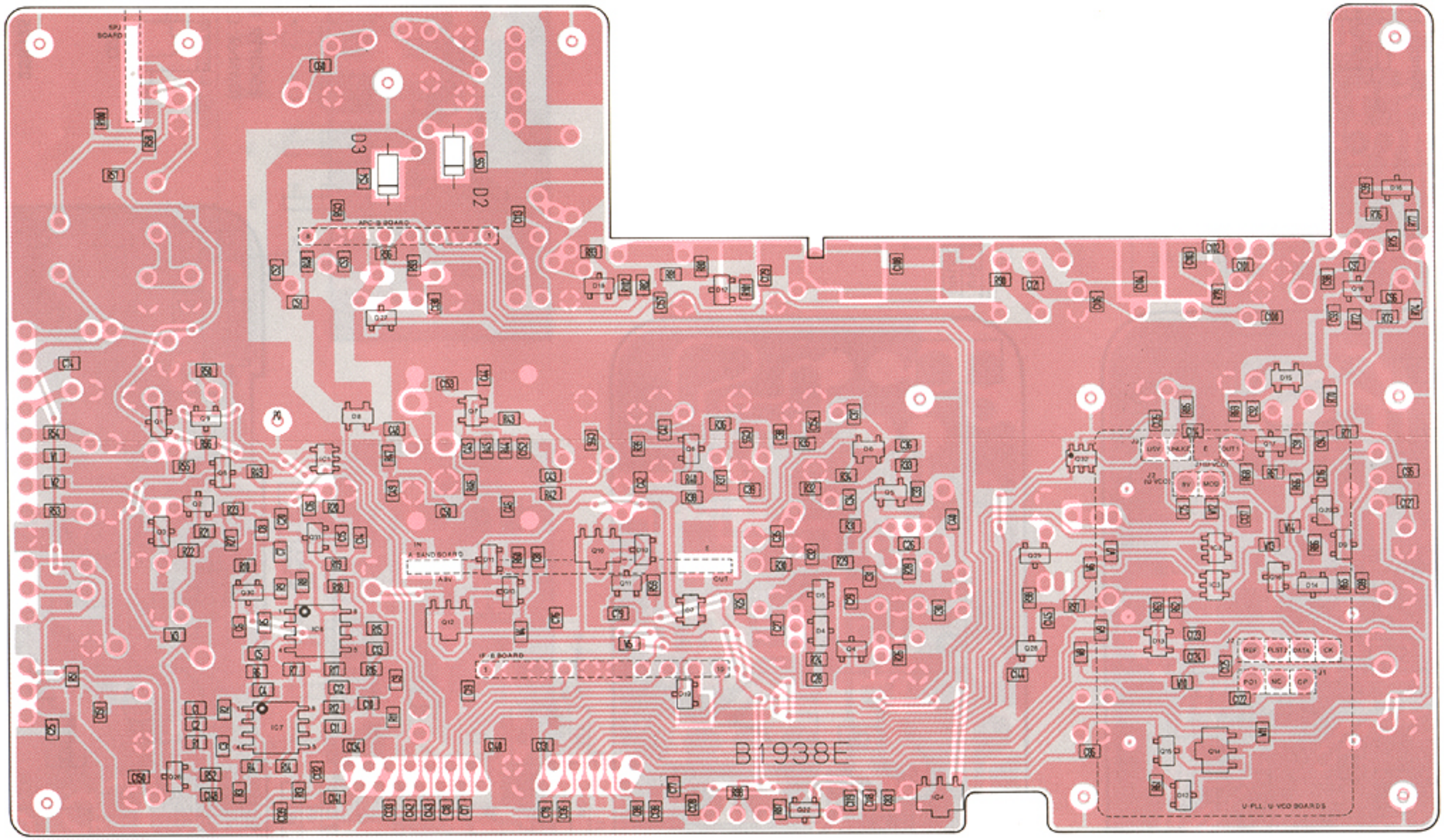
Q26

RN1409
(Symbol: XJ)



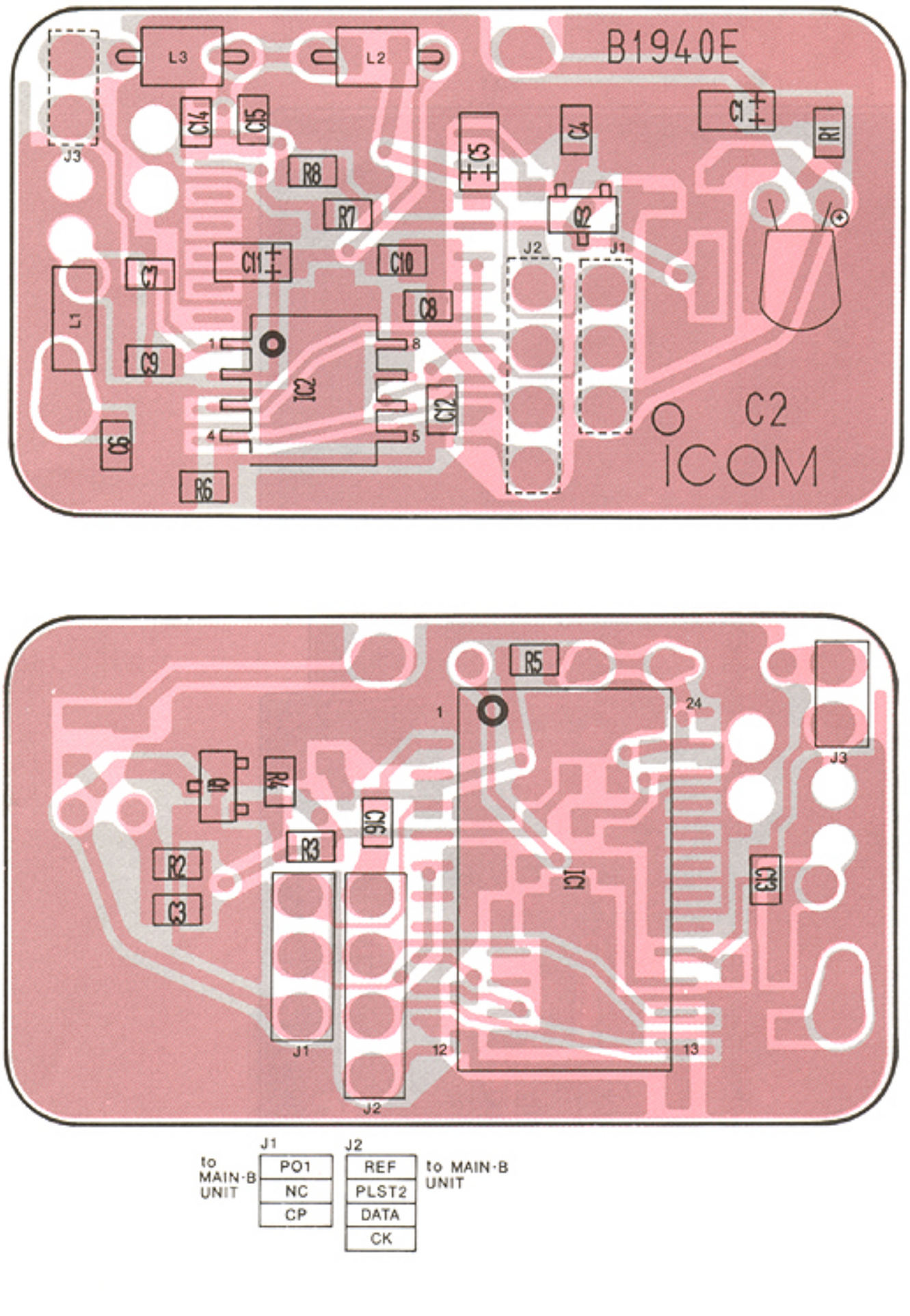
Q22


IC5
Q24
E C B
W19
L14
L13
Q19
L16
L15
R78
C105
W15
W16
W17
R89
C107
C109
L20
C112
C111
D1
W19
R84
R94
R95
L10
C57
L17
C56
L18
C58
C59
J4
J3
L12
L11
APC B BOARD
1
8
J8
C72
C71
SPU BOARD
J6
W22
W23
C63
C69
C70
C73
C68
C24
C67
C66
C65
C64
C22
C21
C62
W27
W18
J5
Q25
C61
C149
L7
L8
L9
C47
C23
C82
C80
A BAND BOARD
L6
L5
W21
W20
L4
FI1
L2
Q1
1
8
IF B BOARD
J7
J1
L3
C84
C120
Q23
L19
W20
W21
Lo
C115
J1
U-PLL/U VCO BOARD
Q21
C117
C90
J2
C87
R99
C147
W18
C146
R64
C85
J9
CK
DATA
PLST2
REF
ICP
NC
PO1
P1
REF
to MAIN A UNIT
J1 U8V 30V DATA PT132 MOD E E DET2 SQ22 AFMA NC HV DETM DETS
PON2 PLST2 CK TMUTE UNLK2 E E HI/L2 SRF2 SQS2 AFMB 8V HV 5V
to CONNECTOR UNIT

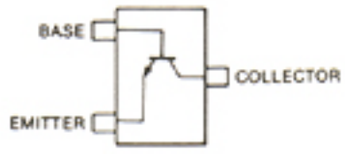

B1938E

7-6 TRANSCEIVER (5)

• U-PLL BOARD

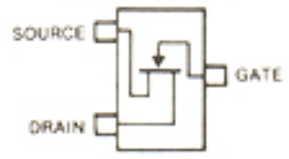


2SC2712 Y
(Symbol: LY)



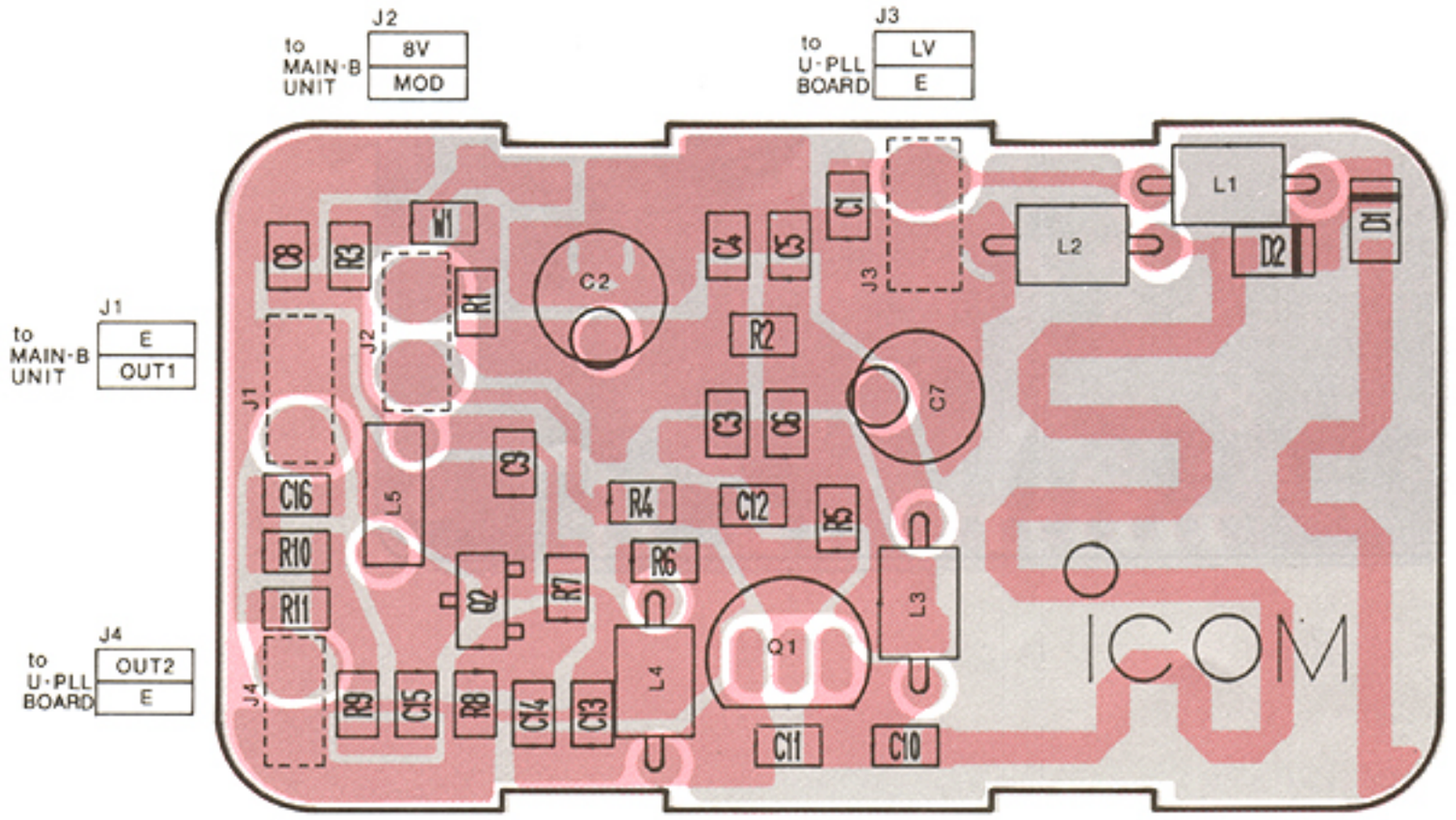
Q1

2SK209 Y
(Symbol: XY)

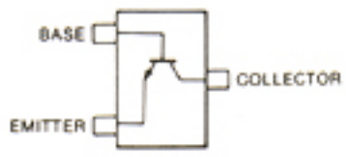


Q2

• U-VCO BOARD

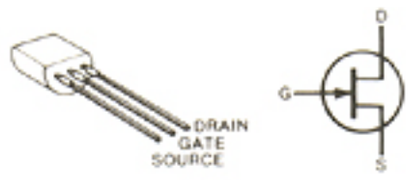


2SC3772 3
(Symbol: LY3)



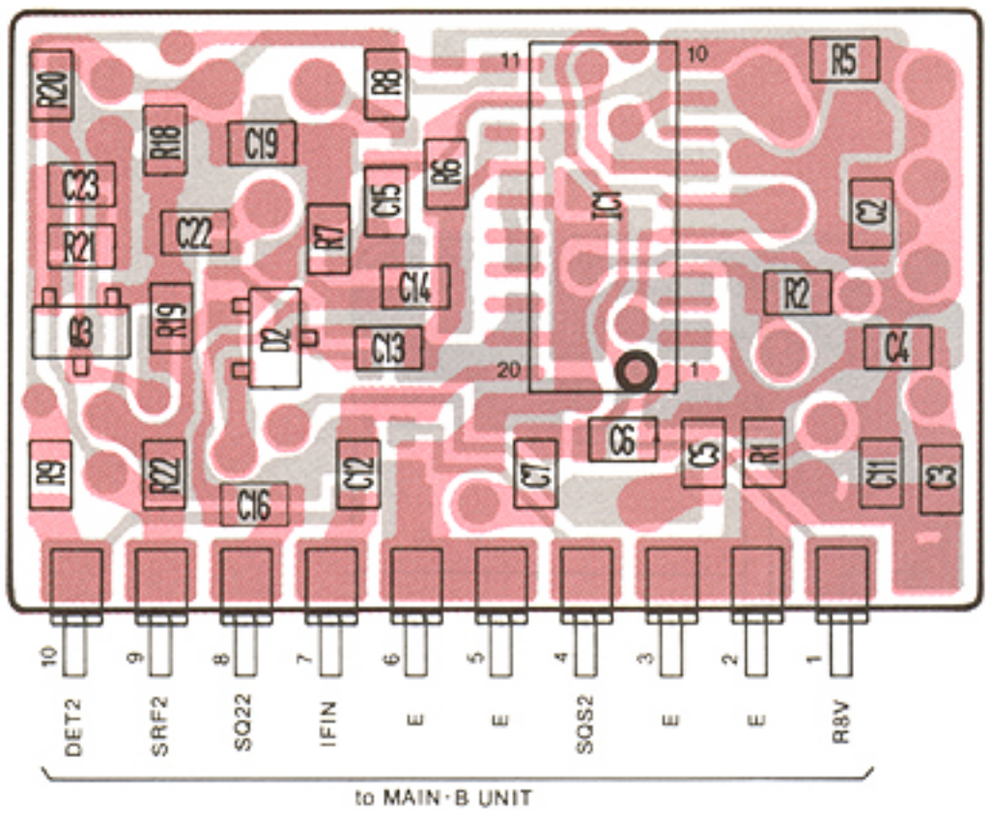
Q2

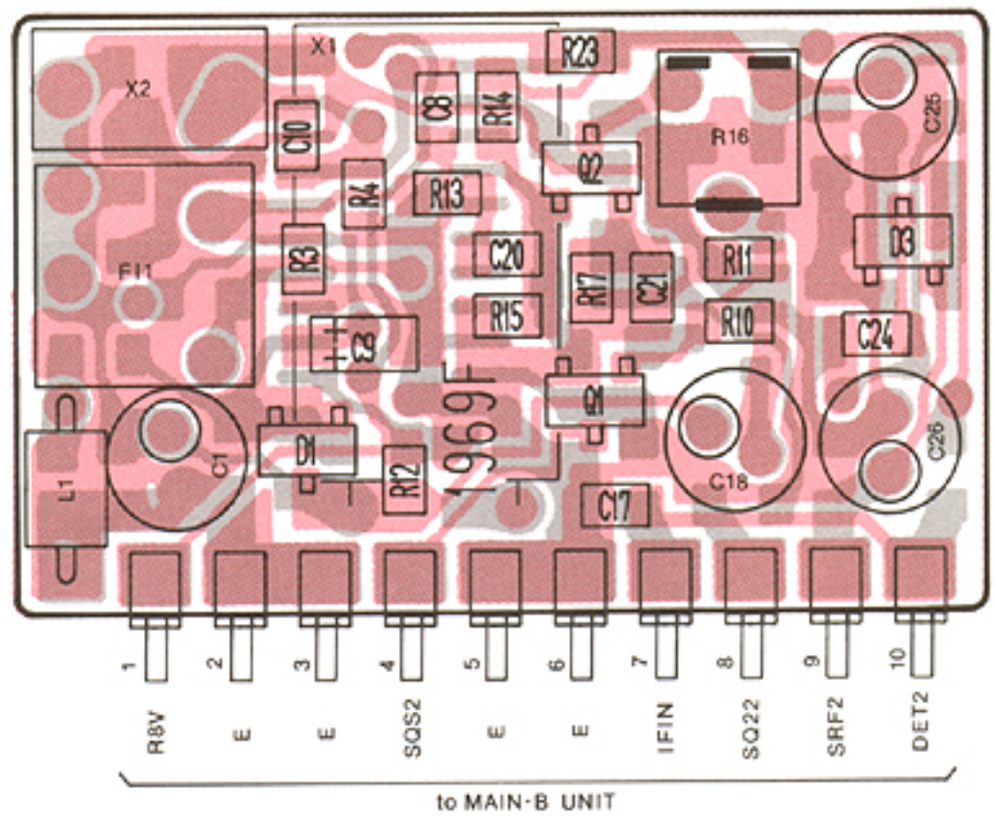
2SK125



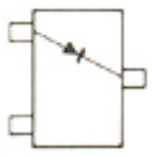
Q1

• IF-B BOARD



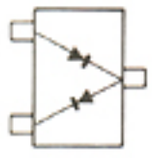


RD6.2M B2
(Symbol: 622)



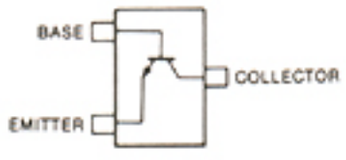
D1

1SS226
(Symbol: C3)



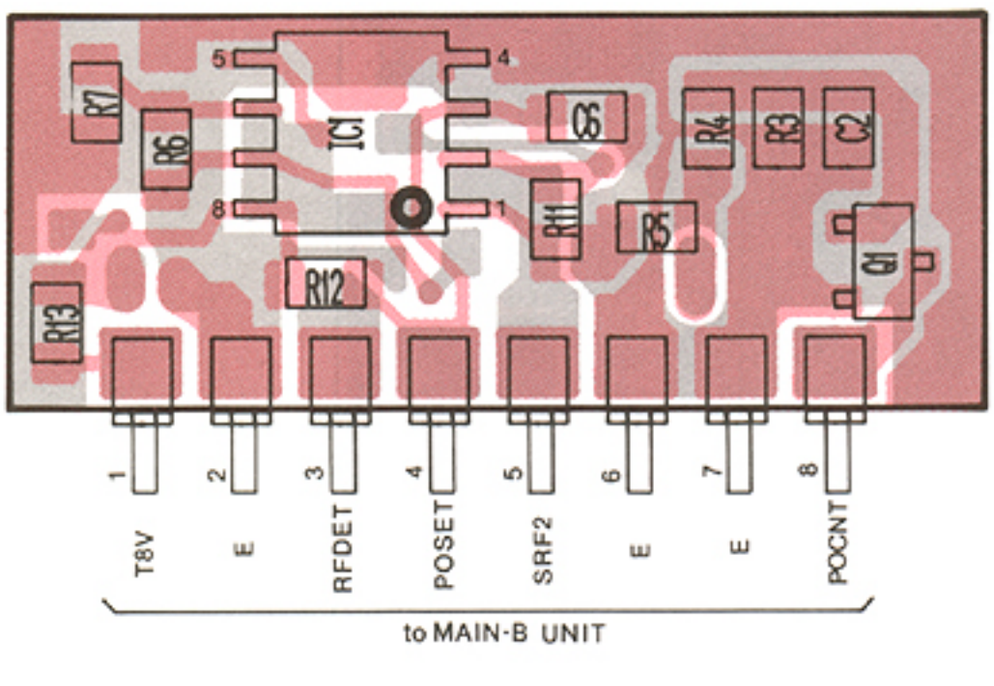
D2, D3

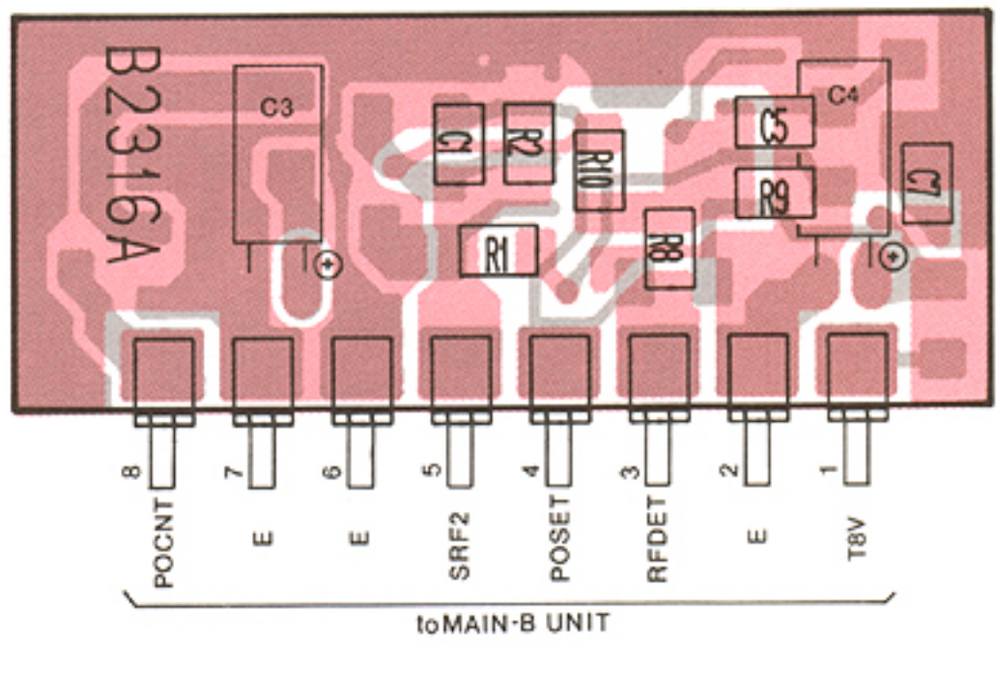
2SC2712 Y
(Symbol: LY)



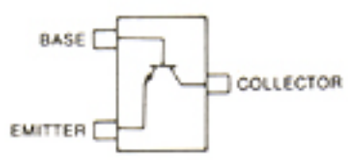
Q1, Q2, Q3

• APC-B BOARD



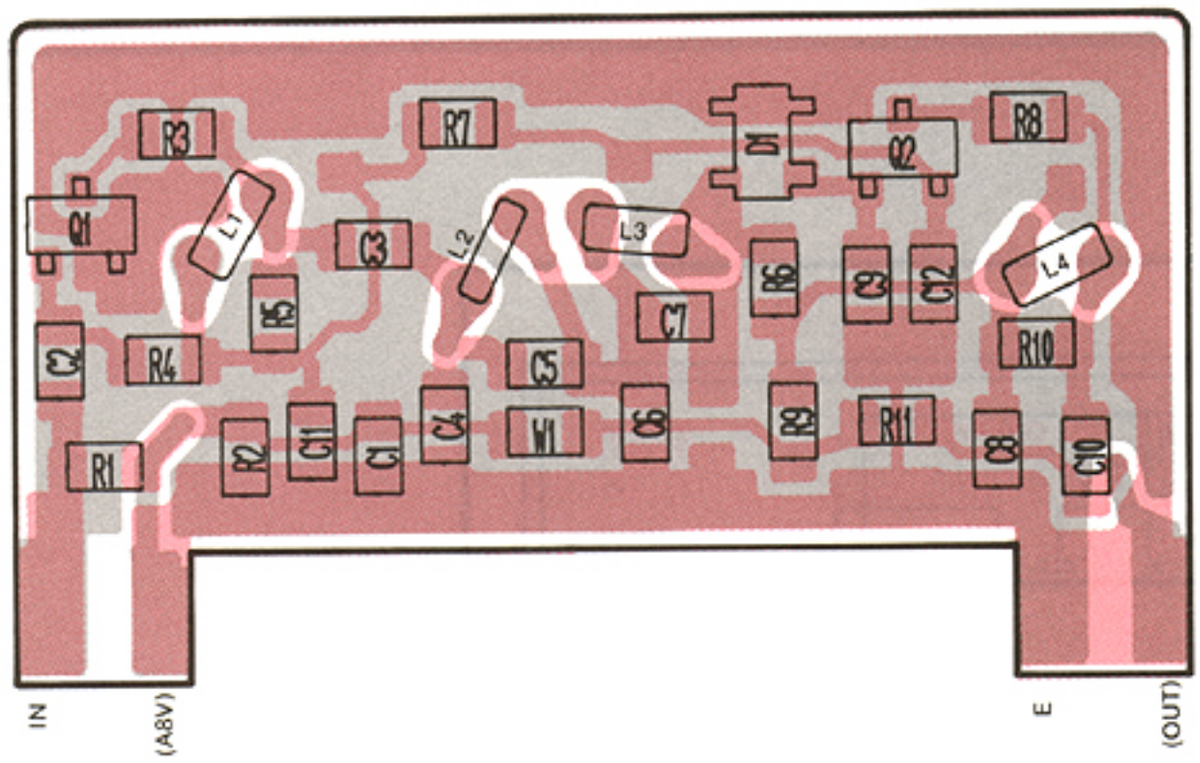


2SC2712 Y
(Symbol: LY)

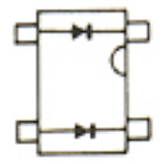


Q1

• A-BAND BOARD

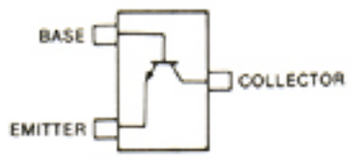


MA862
(Symbol: M1I)



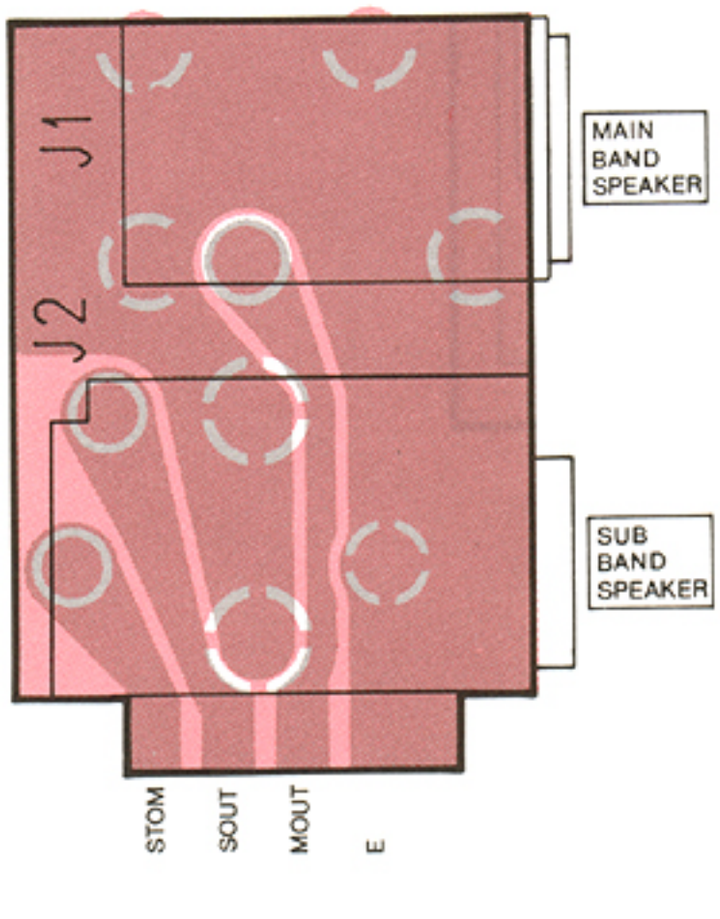
D1

2SC3772 3
(Symbol: LY3)



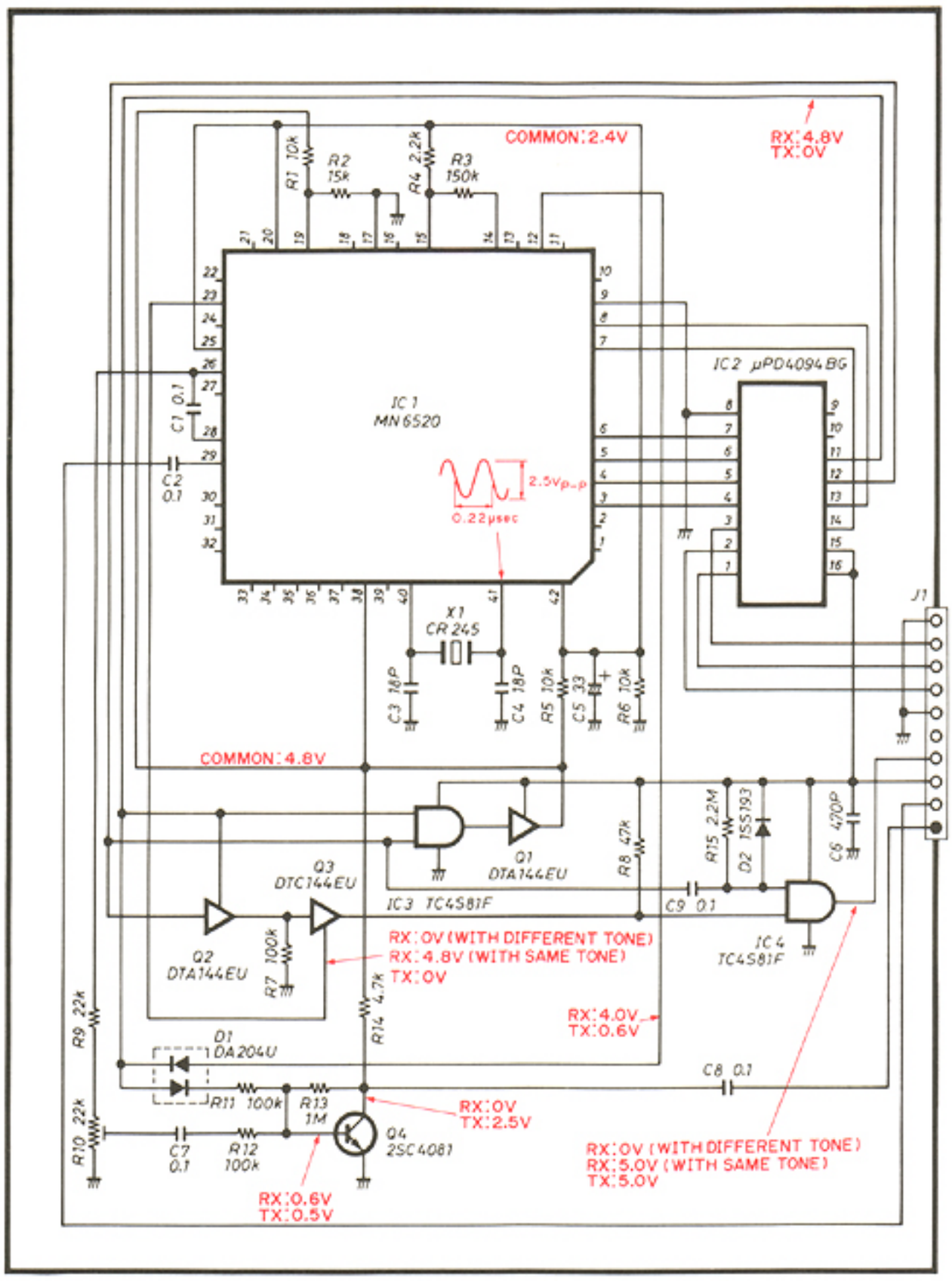
Q1, Q2

• SPJ BOARD

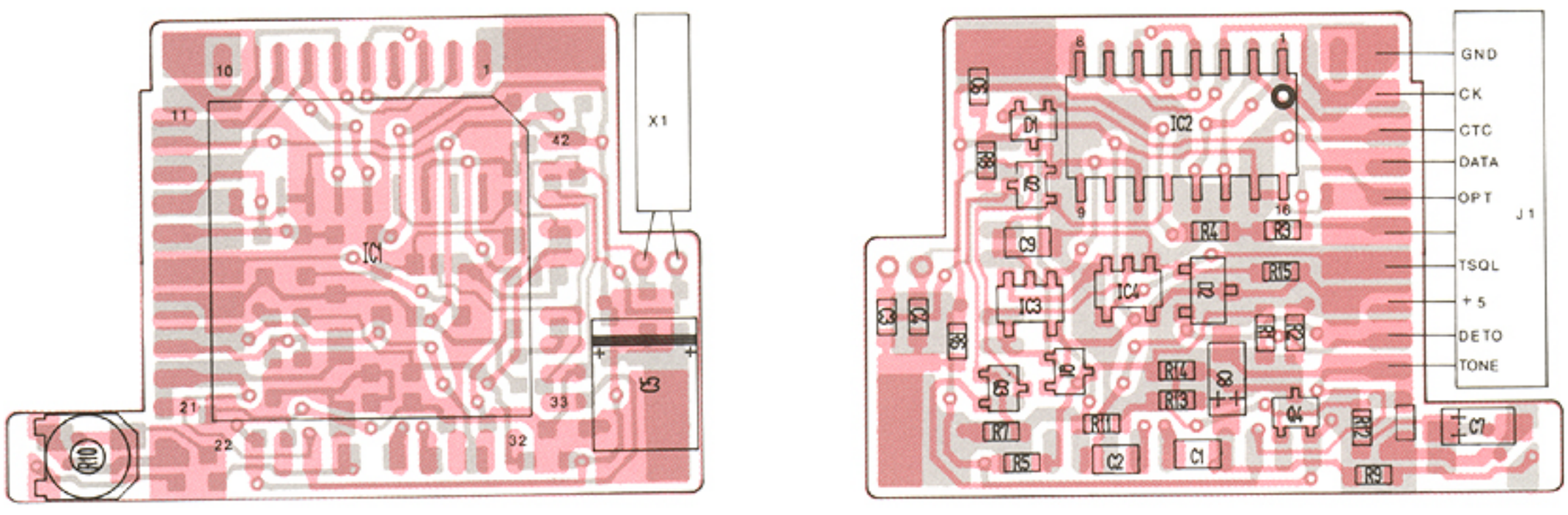


SECTION 8 UT-40 TONE SQUELCH UNIT

8-1 VOLTAGE DIAGRAM

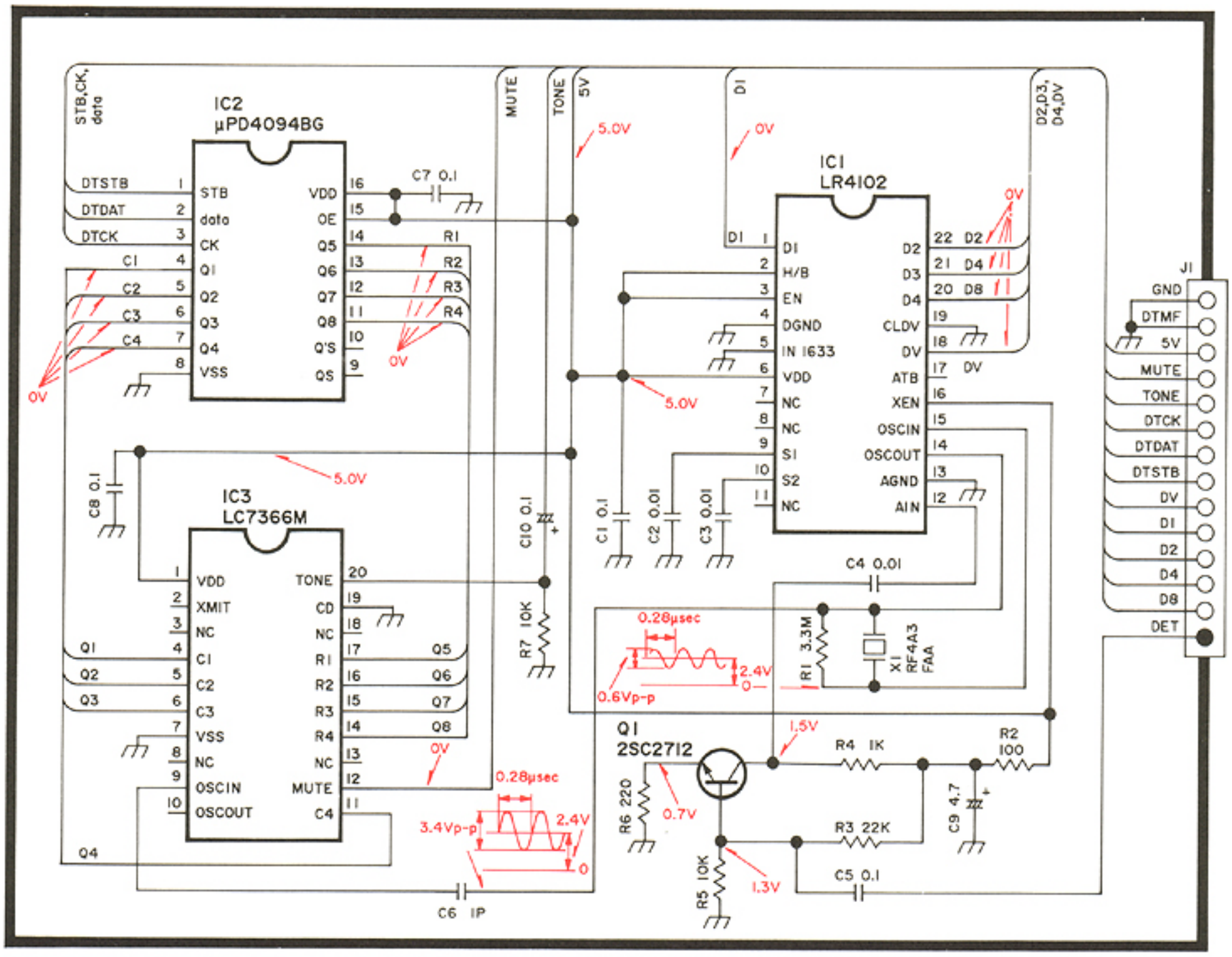


8-2 BOARD LAYOUTS

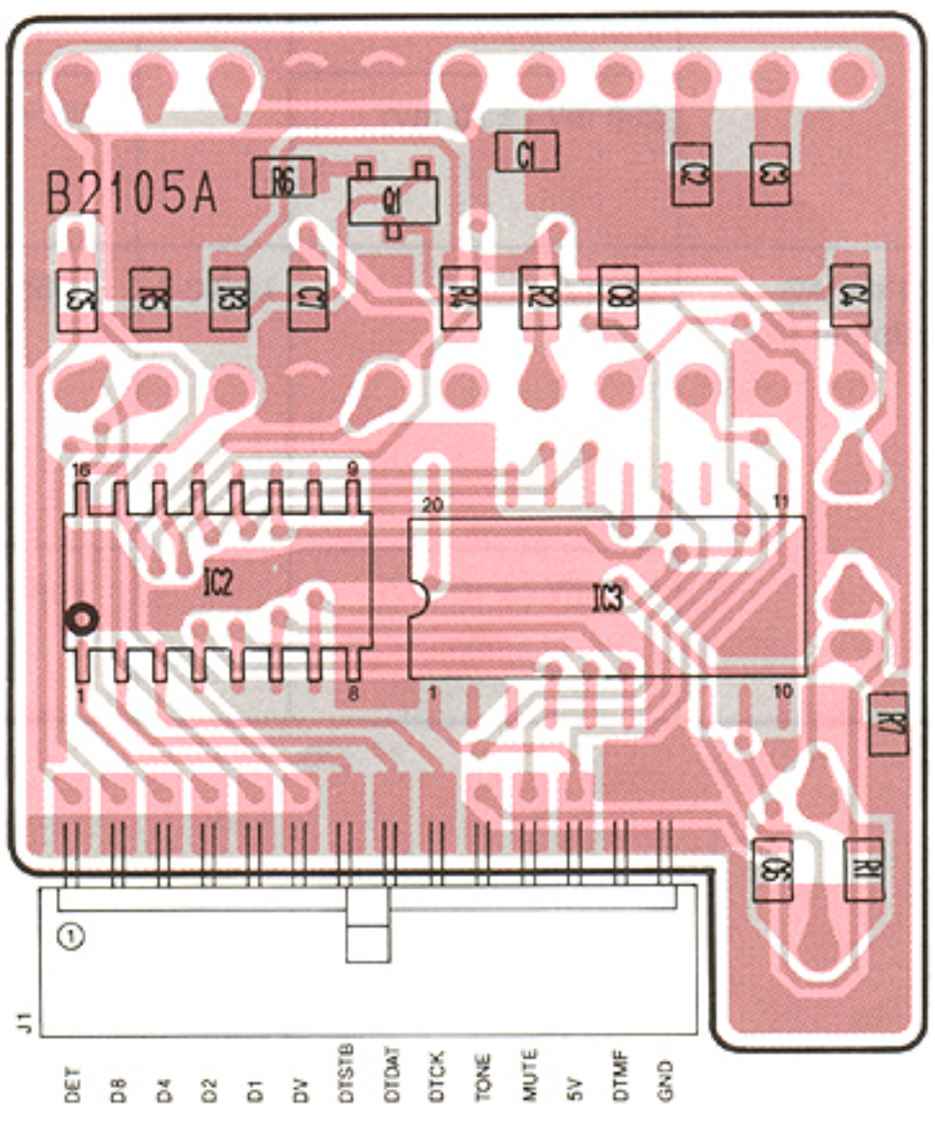


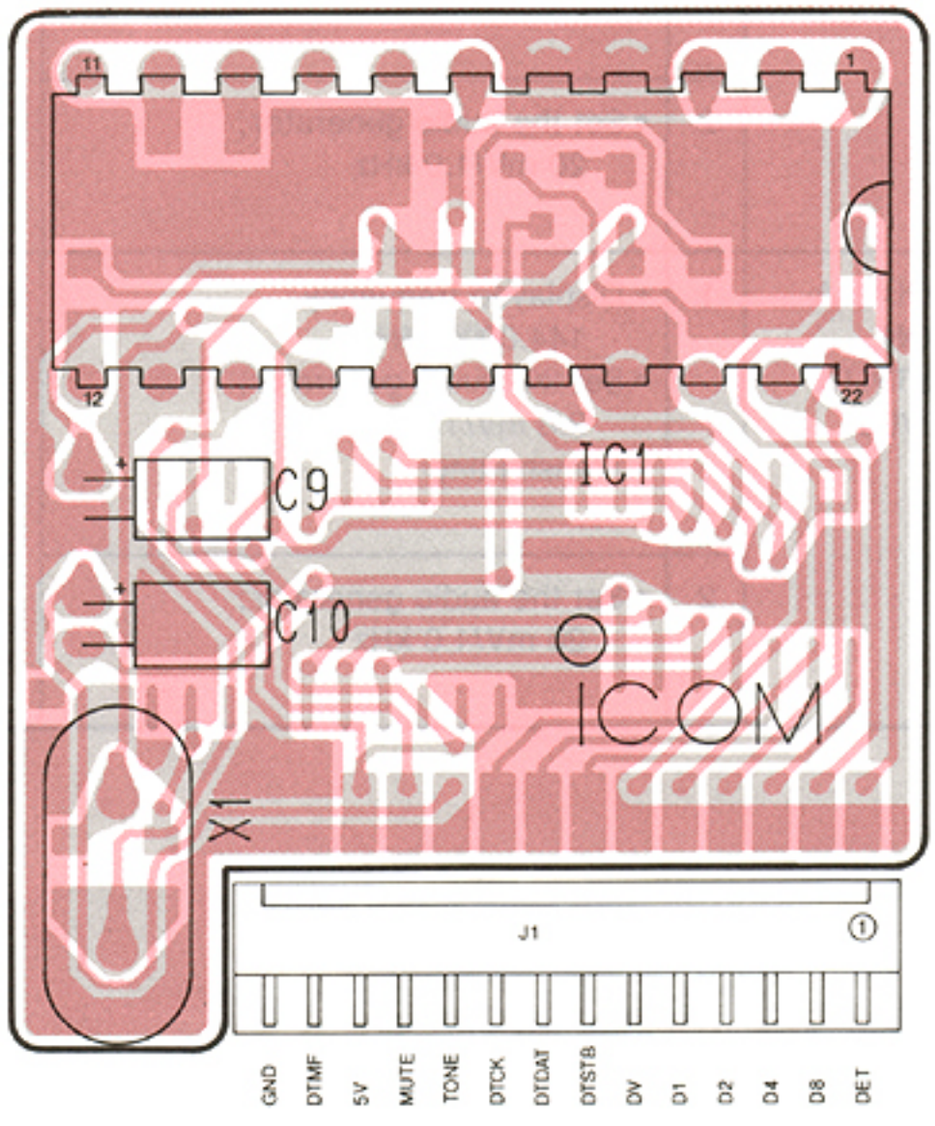
SECTION 9 UT-48 DTMF ENCODER/DECODER UNIT

9-1 VOLTAGE DIAGRAM



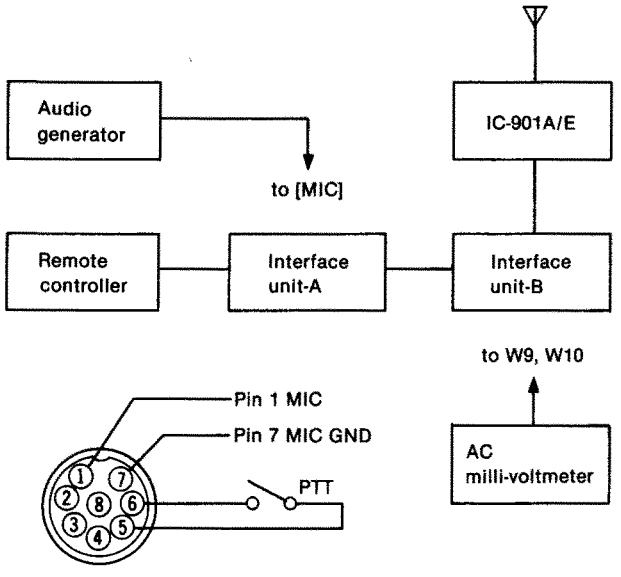
9-2 BOARD LAYOUTS





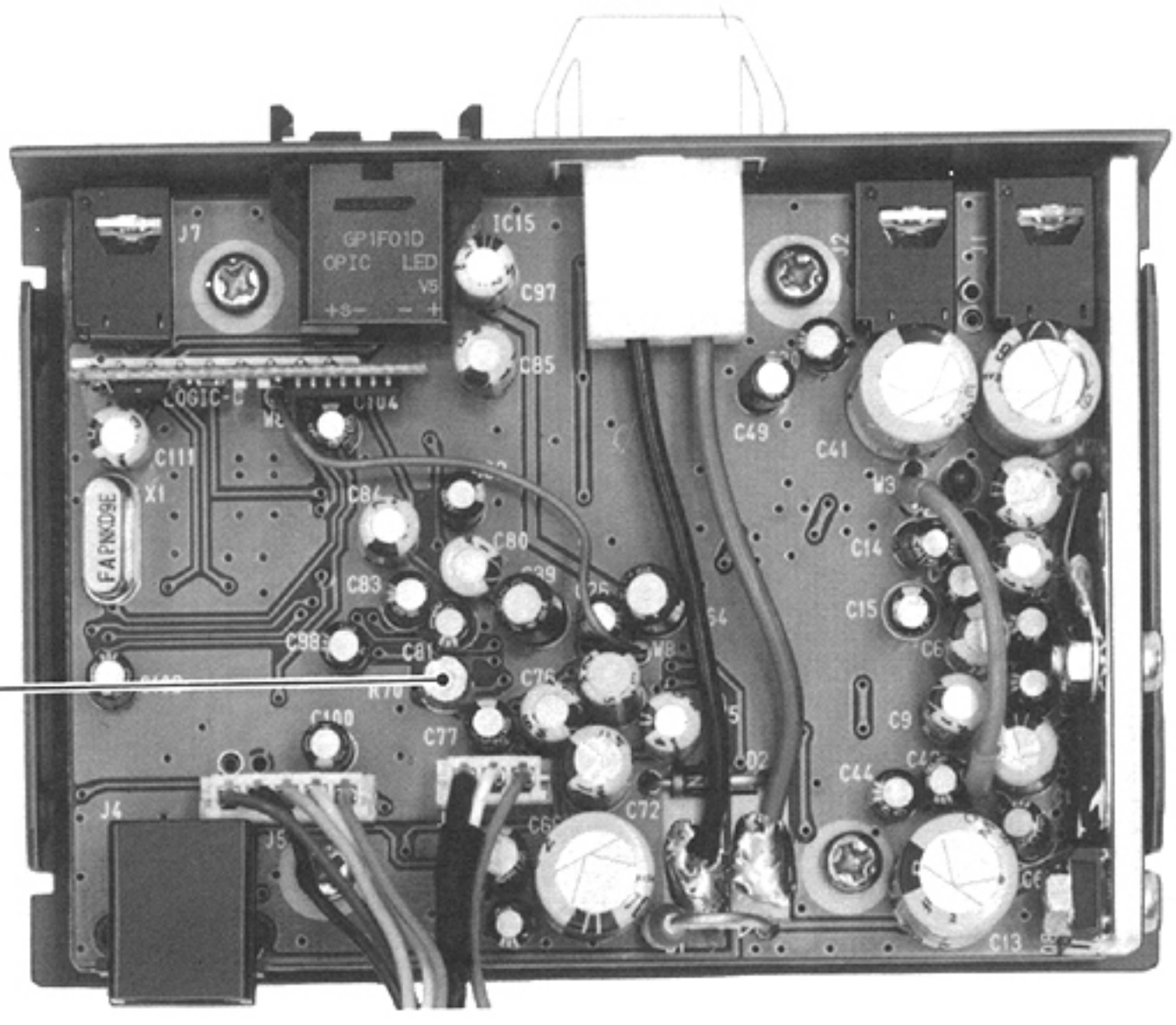
SECTION 10 EX-766 OPTICAL FIBER CABLE INTERFACE UNIT

10-1 ADJUSTMENT PROCEDURES

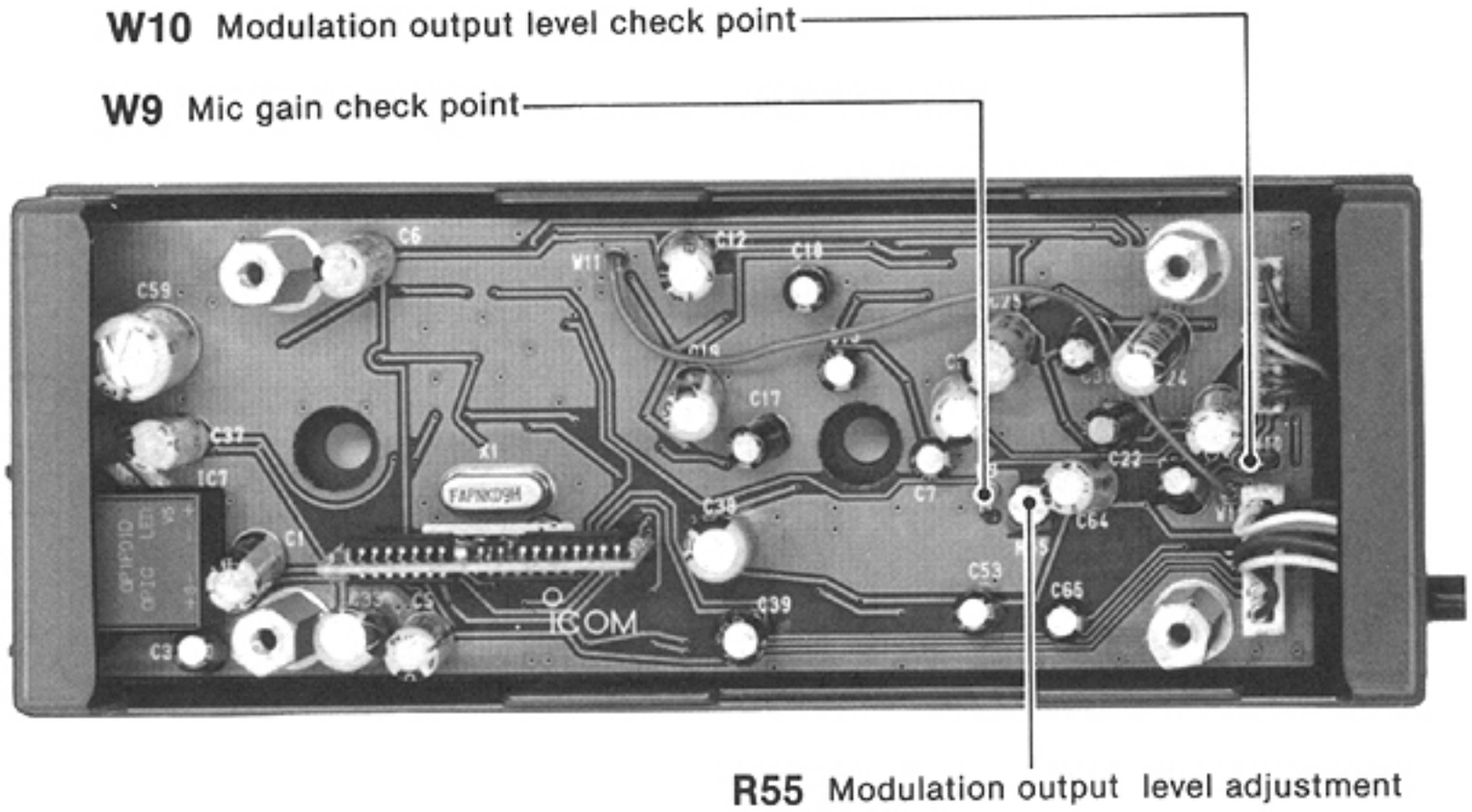
REQUIRED TEST EQUIPMENT	TEST EQUIPMENT HOOK-UP
(1) AC POWER SUPPLY • Output voltage : 13.8 V DC • Current capacity : 15 A or more (2) AUDIO GENERATOR • Frequency range : 300~3000 Hz • Output level : 0~100 mV (3) AC MILLI-VOLTMETER • Measuring range : 2~500 mV	 [MIC] connector (Front panel view)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
MIC GAIN	1	• Displayed frequency: 144.0000 MHz • Set the audio generator; 2.0 mV/1.0 kHz • Transmitting	LOGIC-B	Connect the AC milli-voltmeter to W9.	25 mV	LOGIC-A	R70
	2	• Set the audio generator; 20 mV/1.0 kHz			200 mV (±20 mV)		Verify
MODULATION OUTPUT LEVEL	1	• Displayed frequency: 144.0000 MHz • Set the audio generator; 2.0 mV/1.0 kHz • Transmitting	LOGIC-B	Connect the AC milli-voltmeter to W10.	12 mV	LOGIC-B	R55
	2	• Set the audio generator; 20 mV/1.0 kHz			100 mV (±10 mV)		Verify

• LOGIC-A UNIT



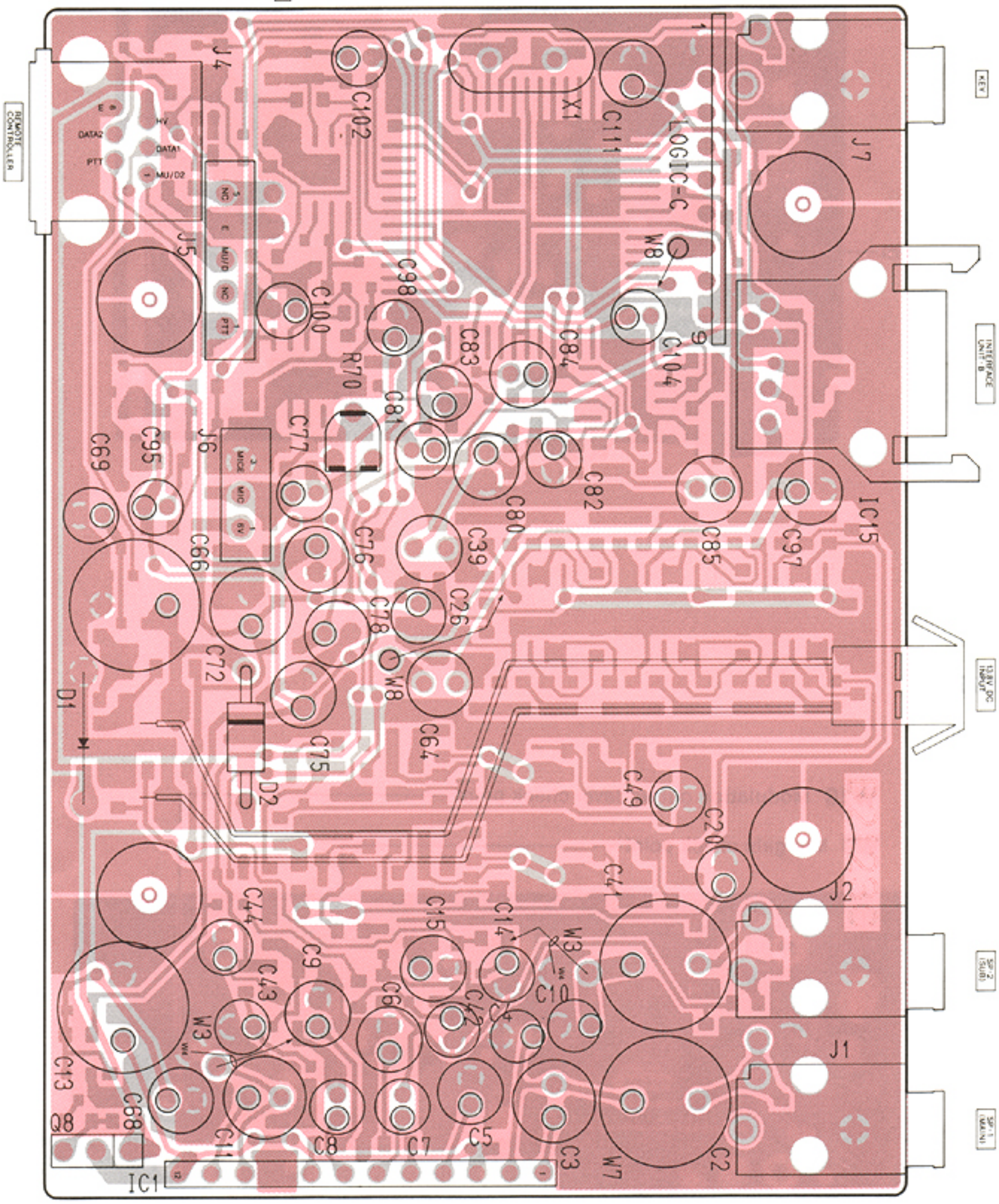
• LOGIC-B UNIT



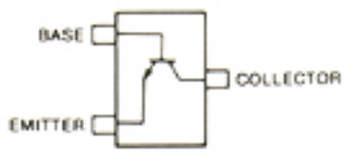
10-2 BOARD LAYOUTS

10-2-1 INTERFACE UNIT-A

• LOGIC-A UNIT

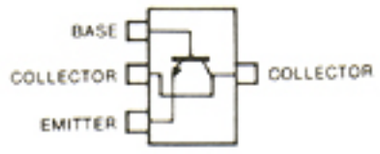


2SC3326
(Symbol: CCB)



Q1, Q5, Q15

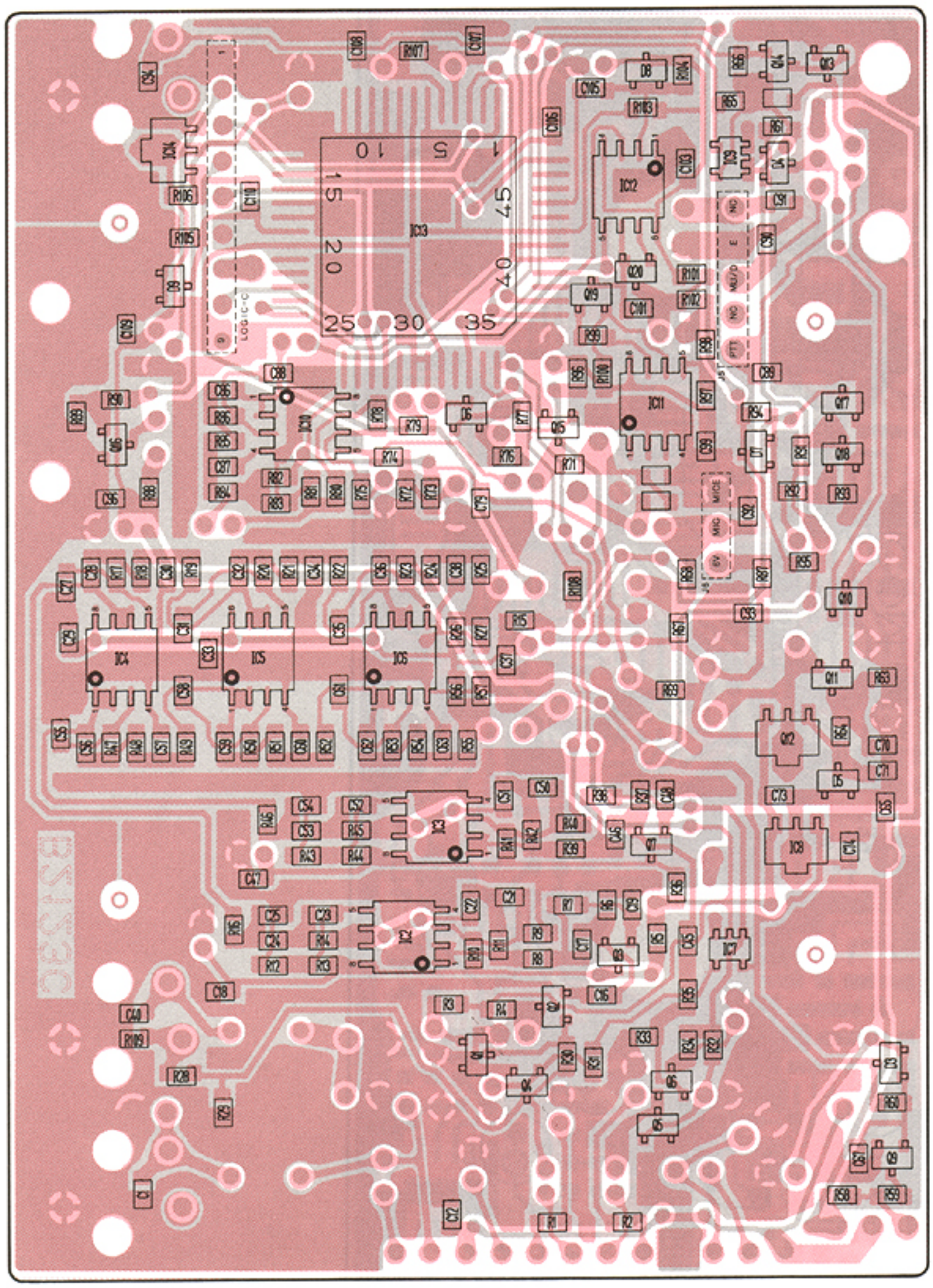
2SD999
(Symbol: CK)



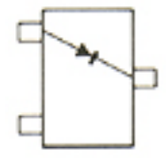
Q12

2SJ106 Y
(Symbol: VY)

Q2, Q6

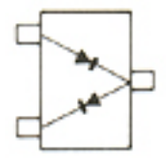


1SS193
(Symbol: F3)



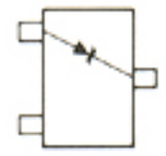
D3, D4, D7, D8, D9

1SS226
(Symbol: C3)



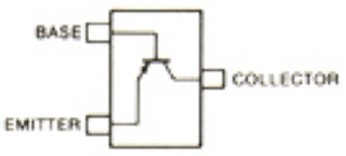
D6

RD9.1M B2
(Symbol: 912)



D5

2SA1162 Y
(Symbol: SY)

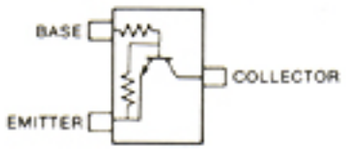


Q19

2SA1359 Y

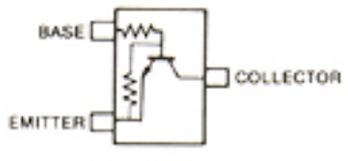
Q8

RN1402
(Symbol: XB)



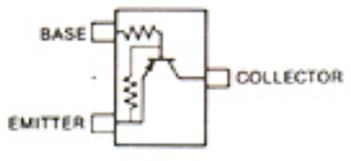
Q10

RN1409
(Symbol: XJ)



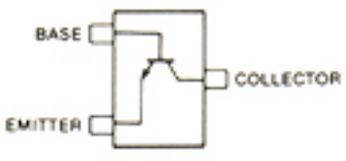
Q9, Q13

RN2404
(Symbol: YD)



Q11, Q14, Q20

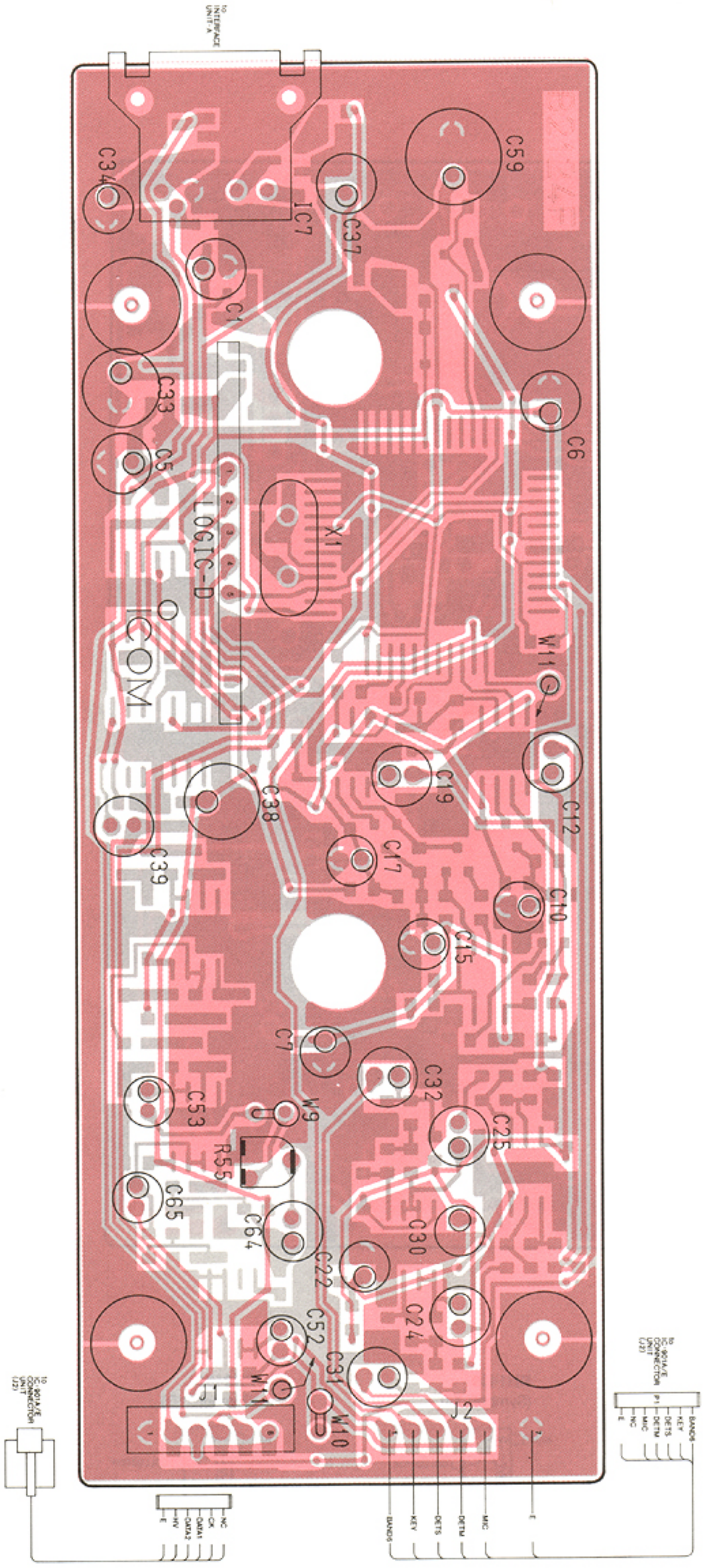
2SC2712 Y
(Symbol: LY)

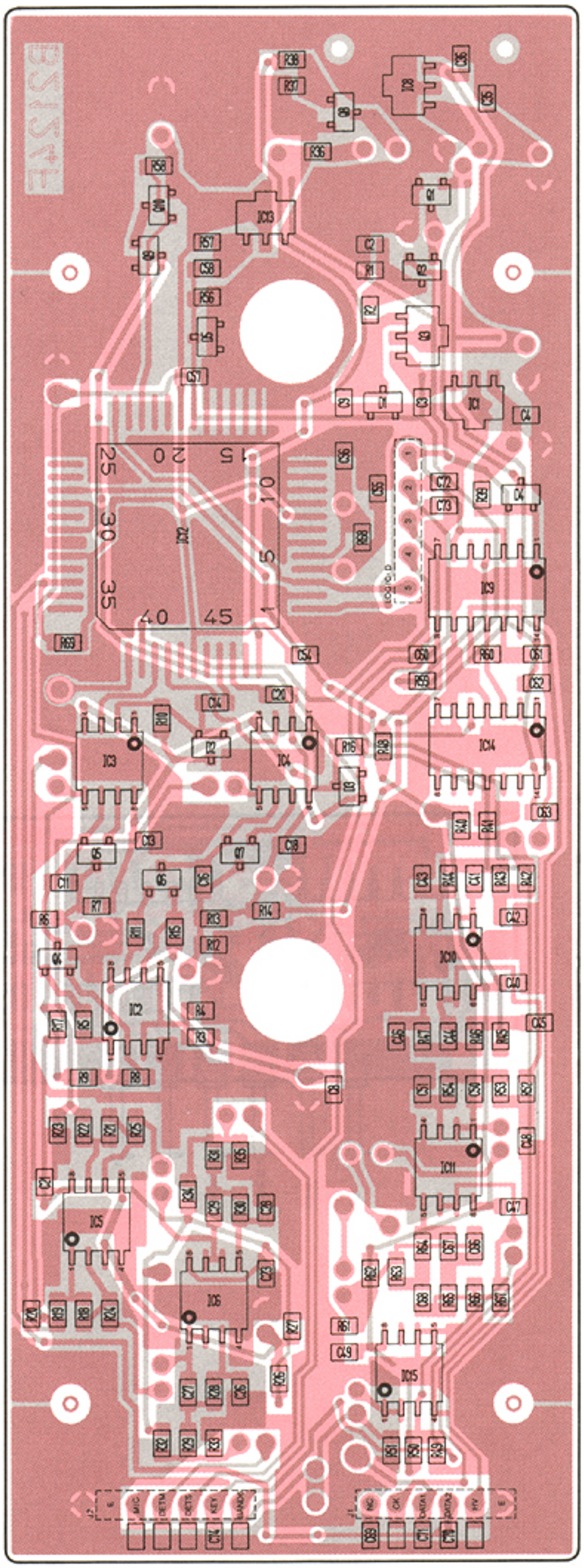


Q3, Q4, Q7, Q16,
Q17, Q18

10-2-2 INTERFACE UNIT-B

- **LOGIC-B UNIT**





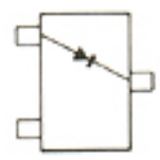
1SS153
(Symbol : A9)

D4

2SD999
(Symbol : CK)

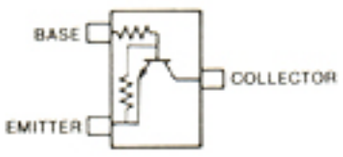
Q3

1SS193
(Symbol : F3)



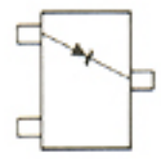
D2, D3, D5

RN1402
(Symbol : XB)



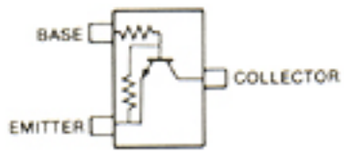
Q9

RD9.1M B2
(Symbol : 912)



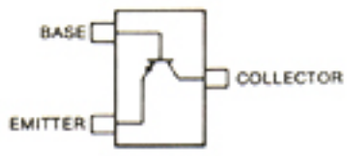
D1

RN1404
(Symbol : XD)



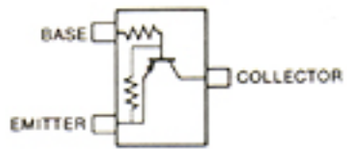
Q1

2SA1162 Y
(Symbol : SY)



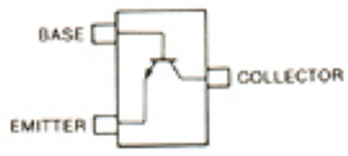
Q4, Q6

RN2404
(Symbol : YD)



Q2, Q5
Q7, Q10

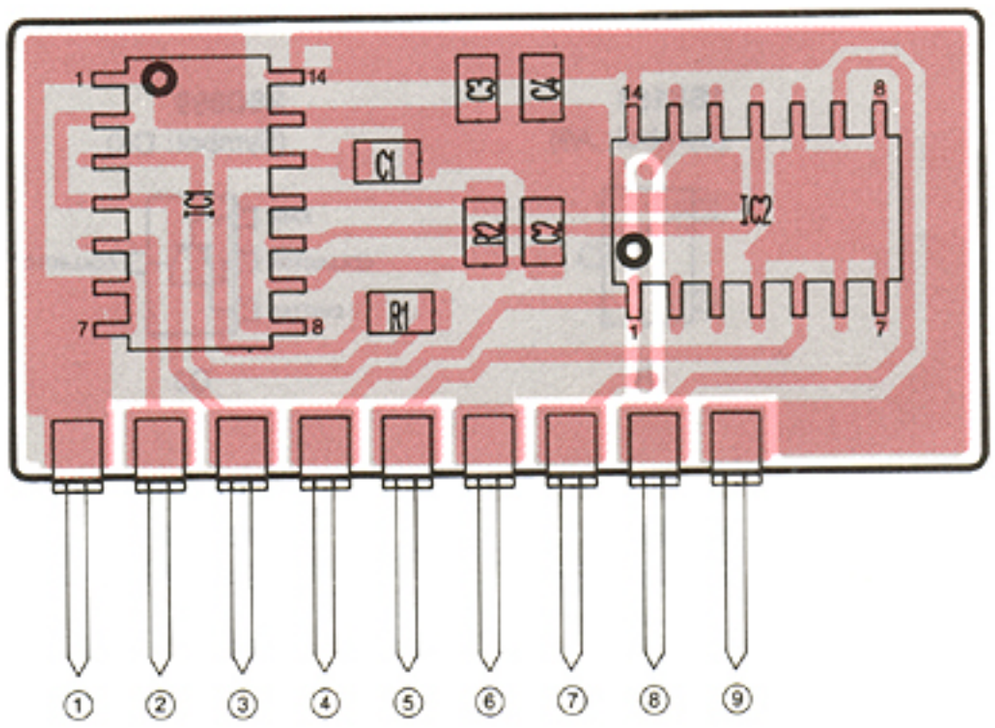
2SC2712 Y
(Symbol : LY)



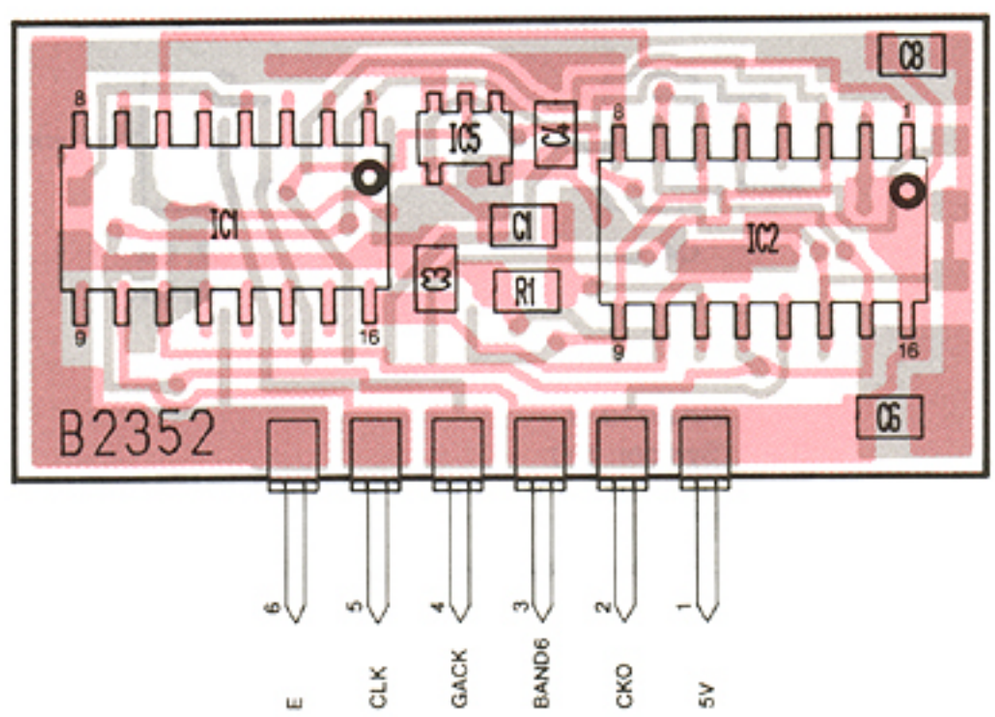
Q8

LOGIC-C AND LOGIC-D UNITS

• LOGIC-C UNIT



• LOGIC-D UNIT



10-3 PARTS LIST

[LOGIC A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001980	IC	TA8207K
IC2	1110000960	IC	NJM4558M (T1)
IC3	1110000960	IC	NJM4558M (T1)
IC4	1110000960	IC	NJM4558M (T1)
IC5	1110000960	IC	NJM4558M (T1)
IC6	1110000960	IC	NJM4558M (T1)
IC7	1130003760	IC	TC4S81F (TE85R)
IC8	1180000420	IC	TA78L05F (TE12R)
IC9	1130003760	IC	TC4S81F (TE85R)
IC10	1110000960	IC	NJM4558M (T1)
IC11	1110000960	IC	NJM4558M (T1)
IC12	1110001400	IC	µPC1555G2-T1
IC13	1140001050	IC	SC1105
IC14	1110001550	IC	S-8054ALB-LM-T1
IC15	1170000110	IC	GP1F01D
Q1	1530002550	Transistor	2SC3326-B (TE85R)
Q2	1590000380	FET	2SJ106-Y (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
Q4	1530000160	Transistor	2SC2712-Y (TE85R)
Q5	1530002550	Transistor	2SC3326-B (TE85R)
Q6	1590000380	FET	2SJ106-Y (TE85R)
Q7	1530000160	Transistor	2SC2712-Y (TE85R)
Q8	1510000370	Transistor	2SA1359-Y
Q9	1590000510	Transistor	RN1409 (TE85R)
Q10	1590000460	Transistor	RN1402 (TE85R)
Q11	1590000410	Transistor	RN2404 (TE85R)
Q12	1540000250	Transistor	2SD999-T2 CK
Q13	1590000510	Transistor	RN1409 (TE85R)
Q14	1590000410	Transistor	RN2404 (TE85R)
Q15	1530002550	Transistor	2SC3326-B (TE85R)
Q16	1530000160	Transistor	2SC2712-Y (TE85R)
Q17	1530000160	Transistor	2SC2712-Y (TE85R)
Q18	1530000160	Transistor	2SC2712-Y (TE85R)
Q19	1510000110	Transistor	2SA1162-Y (TE85R)
Q20	1590000410	Transistor	RN2404 (TE85R)
D1	1710000140	Diode	U05G
D2	1710000350	Diode	1N4002
D3	1750000050	Diode	1SS193(TE85R)
D4	1750000050	Diode	1SS193(TE85R)
D5	1730000840	Zener	RD9.1M-T2B2
D6	1750000070	Diode	1SS226(TE85R)
D7	1750000050	Diode	1SS193(TE85R)
D8	1750000050	Diode	1SS193(TE85R)
D9	1750000050	Diode	1SS193(TE85R)
X1	6050006480	Crystal	RF-4A5 FAP NDK (5.592384M)
R1	7030000270	Resistor	MCR10EZHJ 120 Ω (121)
R2	7030000270	Resistor	MCR10EZHJ 120 Ω (121)
R3	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R4	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R5	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R6	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R7	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R8	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R9	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)

REF. NO.	ORDER NO.	DESCRIPTION	
R10	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R11	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R12	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R13	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R14	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R15	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R16	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R17	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R18	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R19	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R20	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R21	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R22	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R23	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R24	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R25	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R26	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R27	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R28	7030000730	Resistor	MCR10EZHJ 820 kΩ (824)
R29	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R30	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R31	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R32	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R33	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R34	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R35	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R36	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R37	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R38	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R39	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R40	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R41	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R42	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R43	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R44	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R45	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R46	7030000530	Resistor	MCR10EZHJ 18 kΩ (183)
R47	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R48	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R49	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R50	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R51	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R52	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R53	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R54	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R55	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R56	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R57	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R58	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R59	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R60	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R61	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R63	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R64	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R65	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R66	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R67	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R68	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R69	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
R70	7310001710	Trimmer	RH0421C14J0KA (103)
R71	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R72	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R73	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)

[LOGIC A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R74	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R75	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R76	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R77	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R78	7030000680	Resistor	MCR10EZHJ 330 kΩ (334)
R79	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R80	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R81	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R82	7030000640	Resistor	MCR10EZHJ 150 kΩ (154)
R83	7030000640	Resistor	MCR10EZHJ 150 kΩ (154)
R84	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R85	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R86	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R87	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
R88	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
R89	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R90	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R91	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R92	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R93	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R94	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R95	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R96	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R97	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R98	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R99	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R100	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R101	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R102	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R103	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R104	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R105	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R106	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R107	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R108	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R109	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
C1	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C2	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C3	4510003040	Electrolytic	16 SS 100 µF
C4	4550000390	Tantalum	DN 1V R22M
C5	4510002810	Electrolytic	16 SS 47 µF
C6	4510002810	Electrolytic	16 SS 47 µF
C7	4510001170	Electrolytic	50 MS7 2R2 µF
C8	4510001170	Electrolytic	50 MS7 2R2 µF
C9	4510002810	Electrolytic	16 SS 47 µF
C10	4550000390	Tantalum	DN 1V R22M
C11	4510003040	Electrolytic	16 SS 100 µF
C12	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C13	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C14	4510001160	Electrolytic	50 MS7 1 µF
C15	4510001150	Electrolytic	50 MS7 R47 µF
C16	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C17	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C18	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C19	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C20	4510001100	Electrolytic	16 MS7 10 µF
C21	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C22	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C23	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C24	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C25	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C26	4510001100	Electrolytic	16 MS7 10 µF
C27	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C28	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C29	4030004760	Ceramic	C2012 JF 1E 104Z-T-A

REF. NO.	ORDER NO.	DESCRIPTION	
C30	4030003590	Ceramic	GRM40 B 152K 50PT
C31	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C32	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C33	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C34	4030003590	Ceramic	GRM40 B 152K 50PT
C35	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C36	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C37	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C38	4030003590	Ceramic	GRM40 B 152K 50PT
C39	4510001740	Electrolytic	50 RBP 1 µF
C40	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C41	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C42	4510001120	Electrolytic	25 MS7 4R7 µF
C43	4510001160	Electrolytic	50 MS7 1 µF
C44	4510001150	Electrolytic	50 MS7 R47 µF
C45	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C46	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C47	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C48	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C49	4510001100	Electrolytic	16 MS7 10 µF
C50	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C51	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C52	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C53	4030004750	Ceramic	C2012 JB 1H 103K-T-A
C54	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C55	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C56	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C57	4030003590	Ceramic	GRM40 B 152K 50PT
C58	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C59	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C60	4030003590	Ceramic	GRM40 B 152K 50PT
C61	4030004600	Ceramic	C2012 SL 1H 820J-T-A
C62	4030008490	Ceramic	C2012 JB 1H 682K-T-A
C63	4030003590	Ceramic	GRM40 B 152K 50PT
C64	4510001740	Electrolytic	50 RBP 1 µF
C65	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C66	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C67	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C68	4510001180	Electrolytic	50 MS7 3R3 µF
C69	4510001160	Electrolytic	50 MS7 1 µF
C70	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C71	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C72	4510003040	Electrolytic	16 SS 100 µF
C73	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C74	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C75	4510002810	Electrolytic	16 SS 47 µF
C76	4510002810	Electrolytic	16 SS 47 µF
C77	4510001170	Electrolytic	50 MS7 2R2 µF
C78	4510002790	Electrolytic	16 SS 22 µF
C79	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C80	4510002810	Electrolytic	16 SS 47 µF
C81	4510001160	Electrolytic	50 MS7 1 µF
C82	4510001170	Electrolytic	50 MS7 2R2 µF
C83	4510001100	Electrolytic	16 MS7 10 µF
C84	4510002810	Electrolytic	16 SS 47 µF
C85	4510002810	Electrolytic	16 SS 47 µF
C86	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C87	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C88	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C89	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C90	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C91	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C92	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C93	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C94	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C95	4510001940	Electrolytic	16 MS7 22 µF
C96	4030004760	Ceramic	C2012 JF 1E 104Z-T-A

[LOGIC A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C97	4510002730	Electrolytic	10 SS 100 µF
C98	4510001100	Electrolytic	16 MS7 10 µF
C99	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C100	4510001100	Electrolytic	16 MS7 10 µF
C101	4030008520	Ceramic	GRM40 SL 511J 50PT
C102	4510001100	Electrolytic	16 MS7 10 µF
C103	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C104	4510001160	Electrolytic	50 MS7 1 µF
C105	4030004610	Ceramic	C2012 SL 1H 101J-T-A
C106	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C107	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C108	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C109	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C110	4030004690	Ceramic	C2012 SL 1H 331J-T-A
C111	4510002810	Electrolytic	16 SS 47 µF
EP1	0910021943	P.C. Board	B 2123C (LOGIC A)

[LOGIC B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1180000420	IC	TA78L05F (TE12R)
IC2	1110000960	IC	NJM4558M (T1)
IC3	1110001400	IC	µPC1555G2-T1
IC4	1110001400	IC	µPC1555G2-T1
IC5	1110000960	IC	NJM4558M (T1)
IC6	1110000960	IC	NJM4558M (T1)
IC8	1180000420	IC	TA78L05F (TE12R)
IC9	1130002660	IC	µPD4030BG-T1
IC10	1110000960	IC	NJM4558M (T1)
IC11	1110000960	IC	NJM4558M (T1)
IC12	1140001050	IC	SC1105
IC13	1110001550	IC	S-8054ALB-LM-T1
IC14	1130002590	IC	LC4013BM-TP-T1
IC15	1110000960	IC	NJM4558M (T1)
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1590000410	Transistor	RN2404 (TE85R)
Q3	1540000250	Transistor	2SD999-T2 CK
Q4	1510000110	Transistor	2SA1162-Y (TE85R)
Q5	1590000410	Transistor	RN2404 (TE85R)
Q6	1510000110	Transistor	2SA1162-Y (TE85R)
Q7	1590000410	Transistor	RN2404 (TE85R)
Q8	1530000160	Transistor	2SC2712-Y (TE85R)
Q9	1590000460	Transistor	RN1402 (TE85R)
Q10	1590000410	Transistor	RN2404 (TE85R)
D1	1730000840	Zener	RD9.1M-T2B2
D2	1750000050	Diode	1SS193 (TE85R)
D3	1750000050	Diode	1SS193 (TE85R)
D4	1750000080	Diode	1SS153-T2
D5	1750000050	Diode	1SS193 (TE85R)

REF. NO.	ORDER NO.	DESCRIPTION	
X1	6050006480	Crystal	RF-4A5 FAP NDK (5.592384M)
R1	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R2	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R3	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R4	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R5	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R6	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R7	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R8	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R9	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R10	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R11	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R12	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R13	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R14	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R15	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R16	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R17	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R18	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R19	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R20	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R21	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R22	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R23	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R24	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R25	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R26	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R27	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R28	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R29	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R30	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R31	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R32	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R33	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R34	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R35	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R36	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
R37	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R38	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R39	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R40	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R41	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R42	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R43	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R44	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R45	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R46	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R47	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R48	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R49	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R50	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R51	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R52	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R53	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R54	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R55	7310001710	Trimmer	RH0421C14J0KA (103)
R56	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R57	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R58	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R59	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R60	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R61	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R62	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R63	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)

[LOGIC B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R64	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R65	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R66	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R67	7030000410	Resistor	MCR10EZHJ 1.8 kΩ (182)
R68	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R69	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
C1	4510002940	Electrolytic	50 SS 1 µF
C2	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C5	4510002720	Electrolytic	10 SS 47 µF
C6	4510002810	Electrolytic	16 SS 47 µF
C7	4510001100	Electrolytic	16 MS7 10 µF
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C10	4510001100	Electrolytic	16 MS7 10 µF
C11	4030008520	Ceramic	GRM40 SL 511J 50PT
C12	4510002940	Electrolytic	50 SS 1 µF
C13	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C14	4030004610	Ceramic	C2012 SL 1H 101J-T-A
C15	4510001100	Electrolytic	16 MS7 10 µF
C16	4030008520	Ceramic	GRM40 SL 511J 50PT
C17	4510001100	Electrolytic	16 MS7 10 µF
C18	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C19	4510002940	Electrolytic	50 SS 1 µF
C20	4030004610	Ceramic	C2012 SL 1H 101J-T-A
C21	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C22	4510001100	Electrolytic	16 MS7 10 µF
C23	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C24	4510002940	Electrolytic	50 SS 1 µF
C25	4510002940	Electrolytic	50 SS 1 µF
C26	4030004670	Ceramic	C2012 SL 1H 271J-T-A
C27	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C28	4030004670	Ceramic	C2012 SL 1H 271J-T-A
C29	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C30	4510001100	Electrolytic	16 MS7 10 µF
C31	4510002940	Electrolytic	50 SS 1 µF
C32	4510002940	Electrolytic	50 SS 1 µF
C33	4510003040	Electrolytic	16 SS 100 µF
C34	4510001100	Electrolytic	16 MS7 10 µF
C35	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C36	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C37	4510002720	Electrolytic	10 SS 47 µF
C38	4510003040	Electrolytic	16 SS 100 µF
C39	4510001740	Electrolytic	50 RBP 1 µF
C40	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C41	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C42	4030003830	Ceramic	GRM40 SL 821J 50PT
C43	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C44	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C45	4030003830	Ceramic	GRM40 SL 821J 50PT
C46	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C47	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C48	4030003830	Ceramic	GRM40 SL 821J 50PT
C49	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C50	4030004730	Ceramic	C2012 JB 1H 222K-T-A
C51	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C52	4510001100	Electrolytic	16 MS7 10 µF
C53	4510001100	Electrolytic	16 MS7 10 µF
C54	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C55	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C56	4030004490	Ceramic	C2012 SL 1H 150J-T-A
C57	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C58	4030004690	Ceramic	C2012 SL 1H 331J-T-A
C59	4510001720	Electrolytic	16 SS 330 µF (8X12.5)
C60	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C61	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C62	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C63	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C64	4510002940	Electrolytic	50 SS 1 µF
C65	4510001100	Electrolytic	16 MS7 10 µF
C66	4030008520	Ceramic	GRM40 SL 511J 50PT
C67	4030008520	Ceramic	GRM40 SL 511J 50PT
C68	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C69	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C70	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C71	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C72	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C73	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C74	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910021956	P.C. Board	B 2124F (LOGIC B)

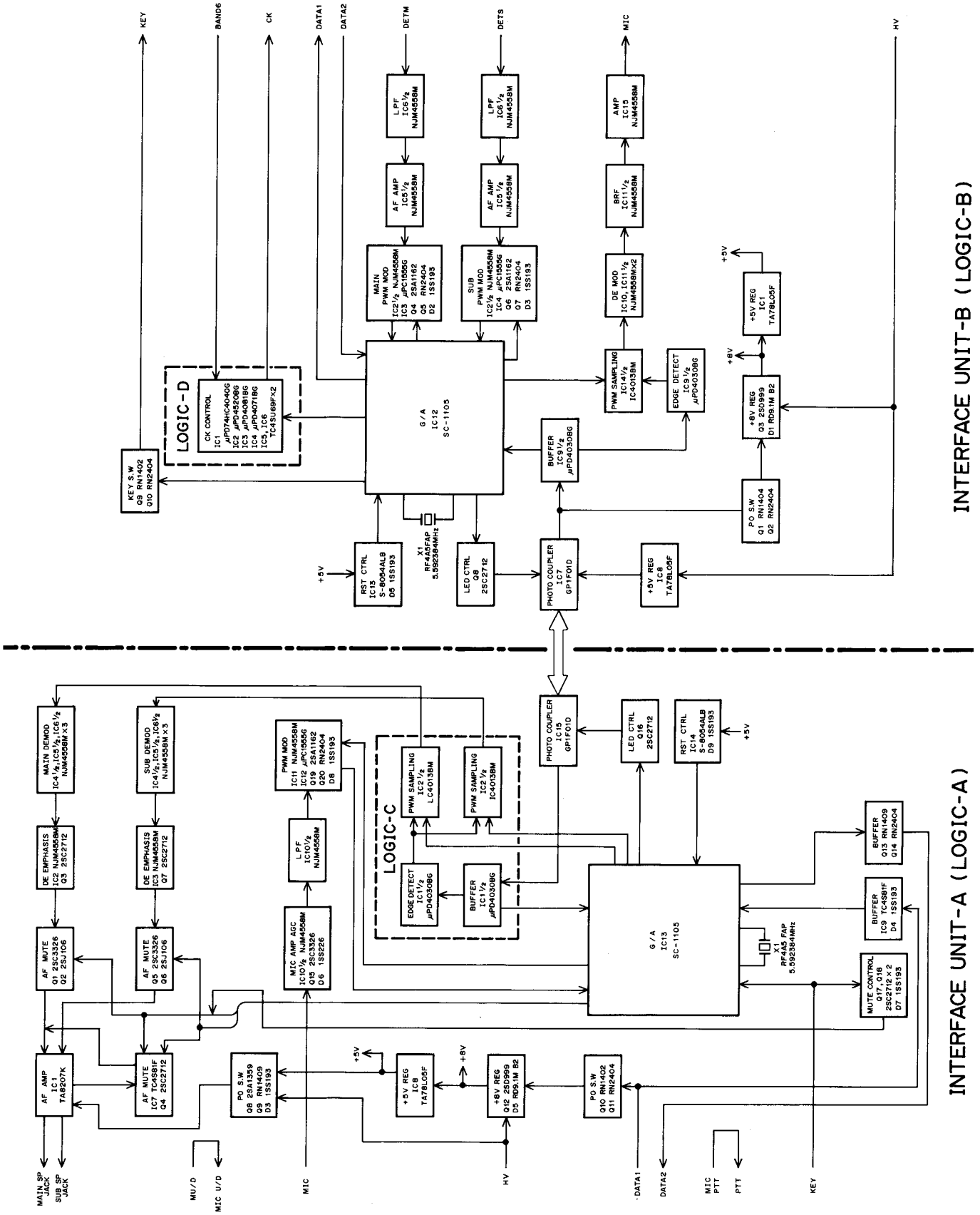
[LOGIC C UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130002660	IC	µPD4030BG-T1
IC2	1130002590	IC	LC4013BM-TP-T1
R1	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R2	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
C1	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C2	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
EP1	0910022281	P.C. Board	B 2162A (LOGIC C)
EP2	6910002240	Lead Frame	HSD2.54-0.9-8 (L)

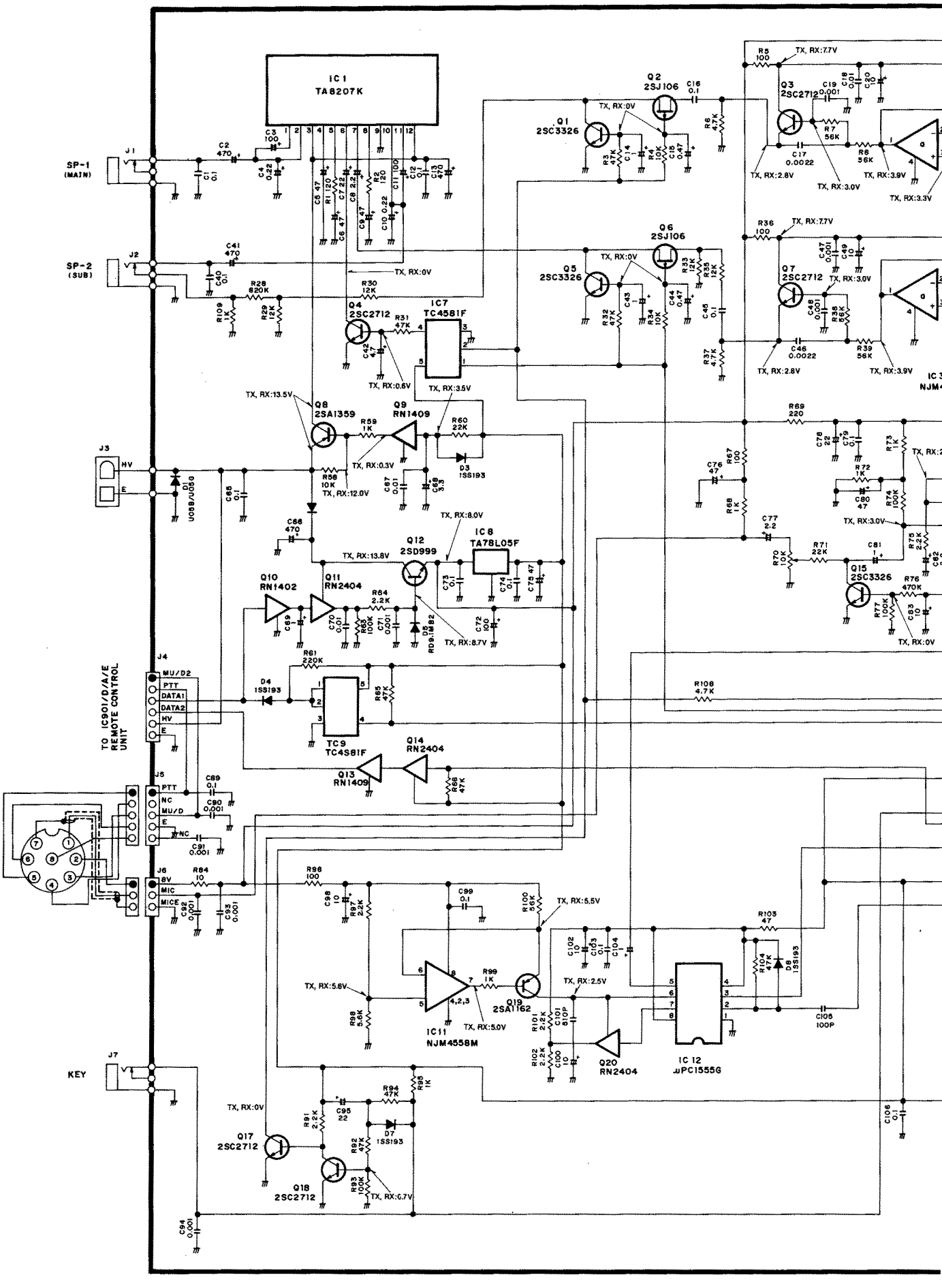
[LOGIC D UNIT]

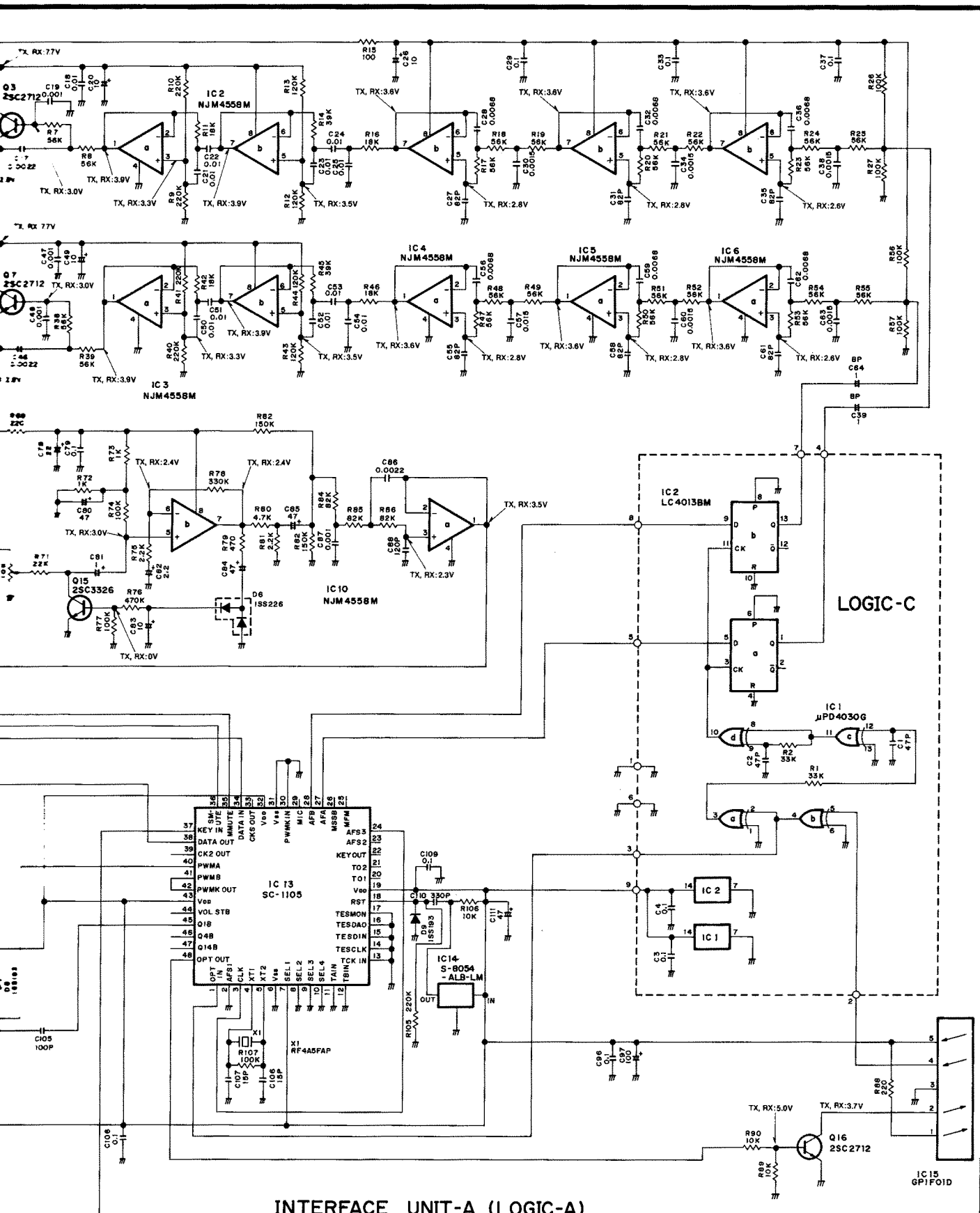
REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130003270	IC	µPD74HC4040G-T1
IC2	1130003260	IC	µPD4520BG-T1
IC3	1130000590	IC	µPD4081BG-T1
IC4	1130001920	IC	µPD4071BG-T1
IC5	1130003610	IC	TC4SU69F (TE85R)
IC6	1130003610	IC	TC4SU69F (TE85R)
R1	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R2	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
C1	4030004610	Ceramic	C2012 SL 1H 101J-T-A
C2	4030004990	Ceramic	C2012 CH 1H 101J-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	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C7	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
EP1	0910024440	P.C. Board	B 2352 (LOGIC D)
EP2	6910002240	Lead Frame	HSD2.54-0.9-8 (L)

10-4 BLOCK DIAGRAM

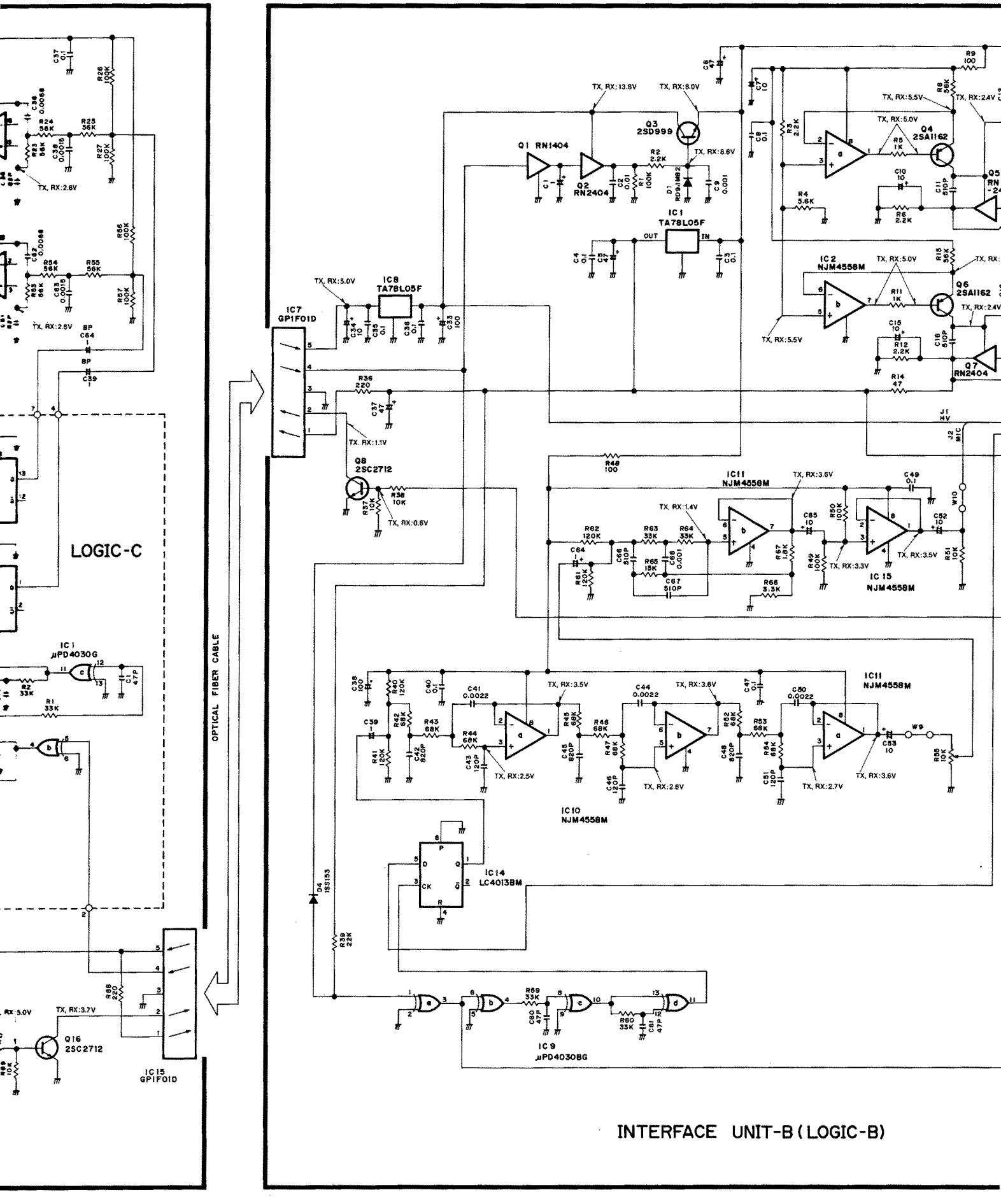


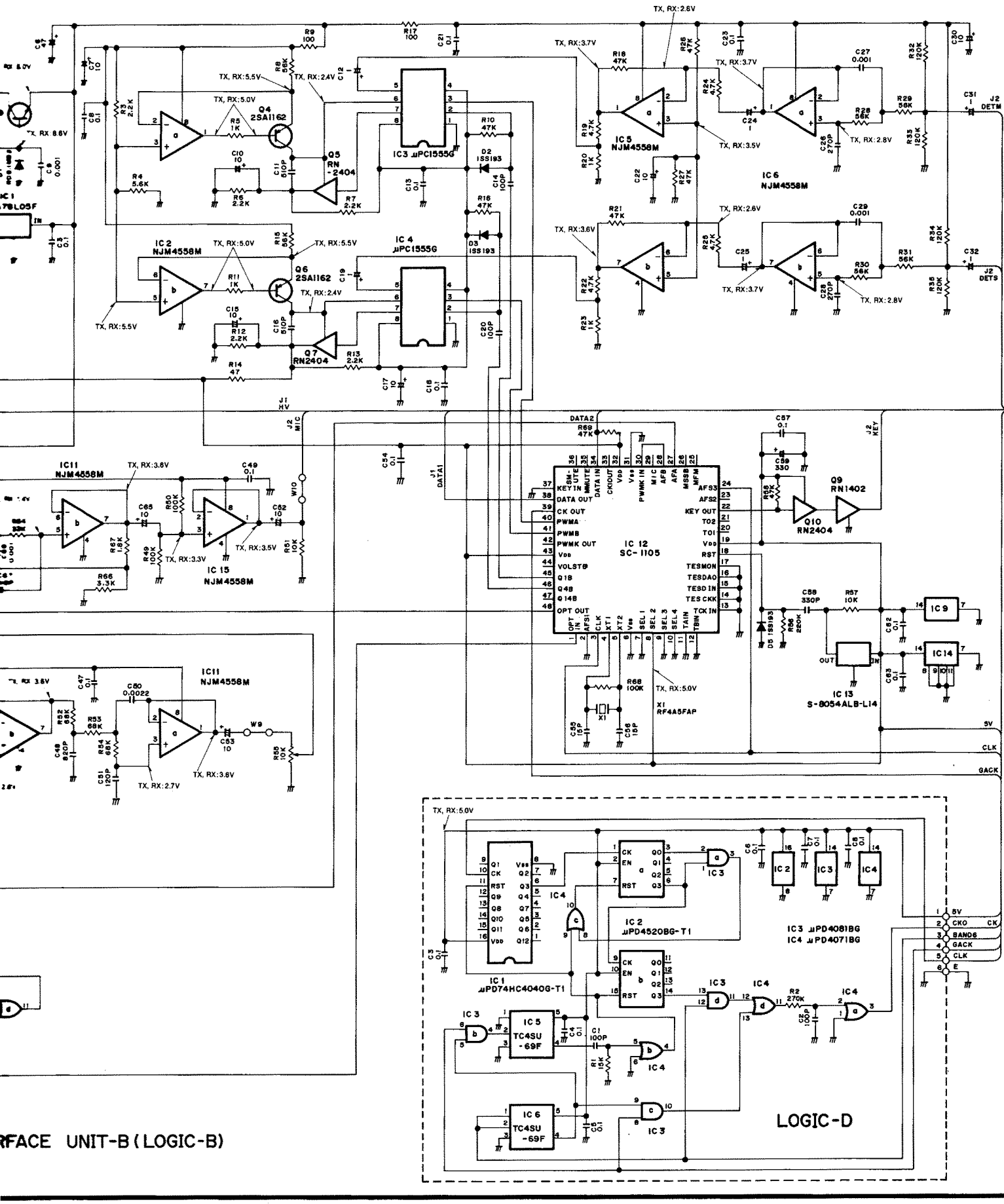
10-5 VOLTAGE DIAGRAM



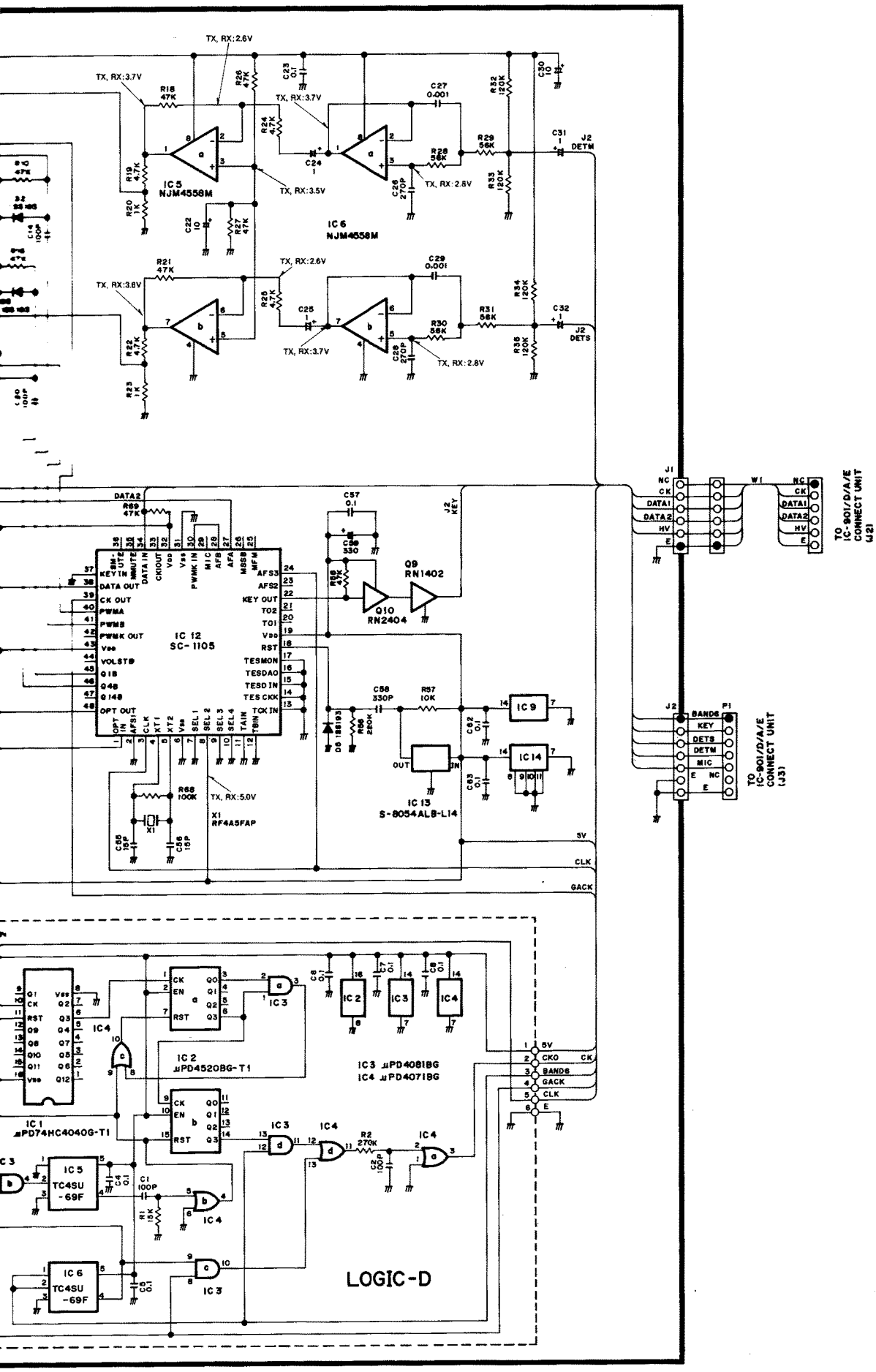


INTERFACE UNIT-A (LOGIC-A)

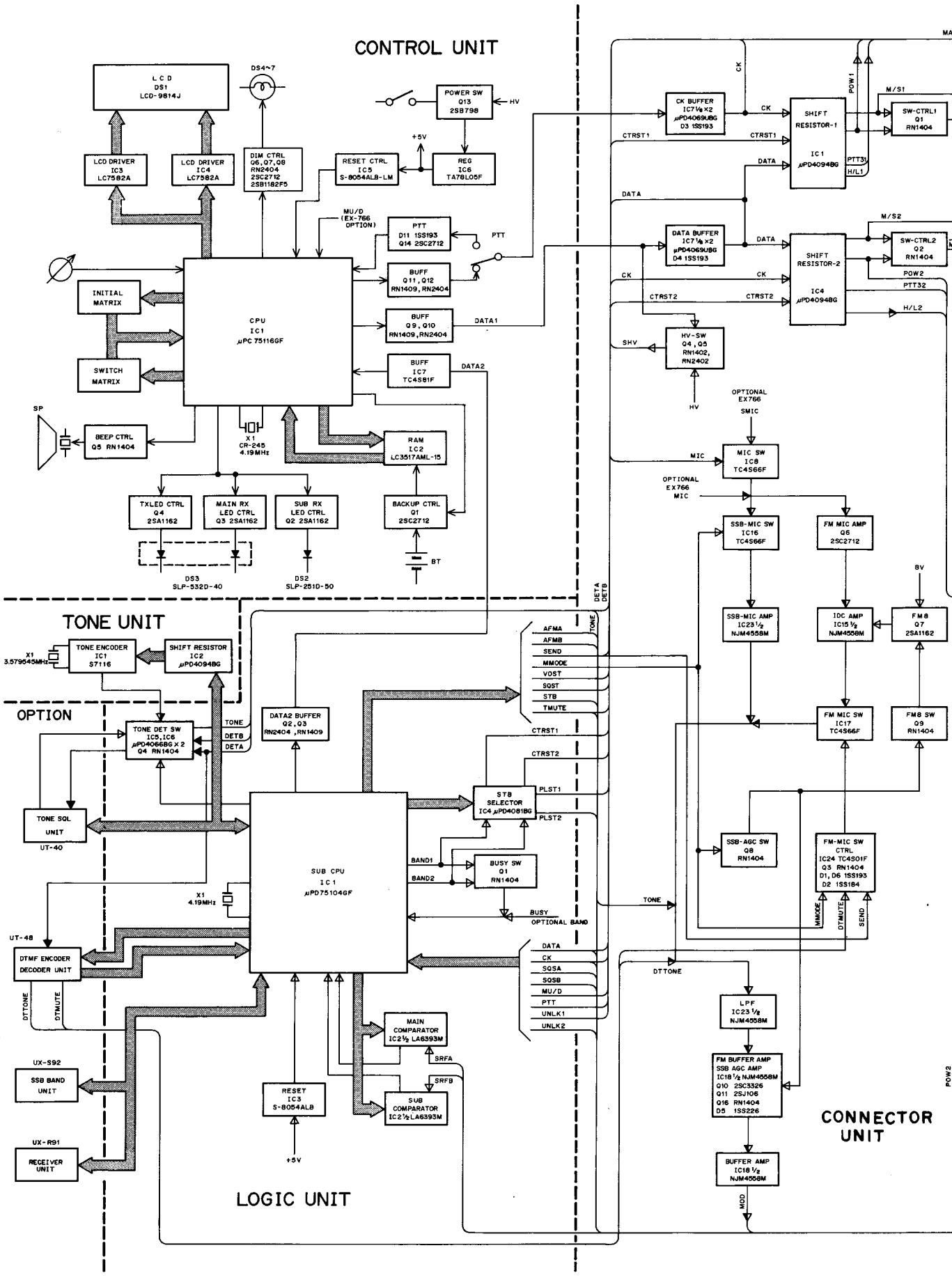

LOGIC-C
OPTICAL FIBER CABLE
INTERFACE UNIT-B (LOGIC-B)
IC7 GP1F01D
IC8 TA78L05F
IC1 TA78L05F
IC2 NJM4558M
IC11 NJM4558M
IC15 NJM4558M
IC10 NJM4558M
IC14 LC4013BM
IC9 μPD4030BG
IC1 μPD4030G
IC15 GP1F01D
Q1 RN1404
Q2 RN2404
Q3 2SD999
Q4 2SA1162
Q5 RN2404
Q6 2SA1162
Q7 RN2404
Q8 2SC2712
Q16 2SC2712
D1 RD9.1MB2
D4 1SS133
TX, RX:13.8V
TX, RX:8.0V
TX, RX:8.6V
TX, RX:5.5V
TX, RX:5.0V
TX, RX:2.4V
TX, RX:2.6V
TX, RX:1.1V
TX, RX:0.6V
TX, RX:1.4V
TX, RX:3.6V
TX, RX:3.3V
TX, RX:3.5V
TX, RX:2.5V
TX, RX:2.6V
TX, RX:2.7V
TX, RX:3.7V
J1 HV
J2 MIC
W9
W10

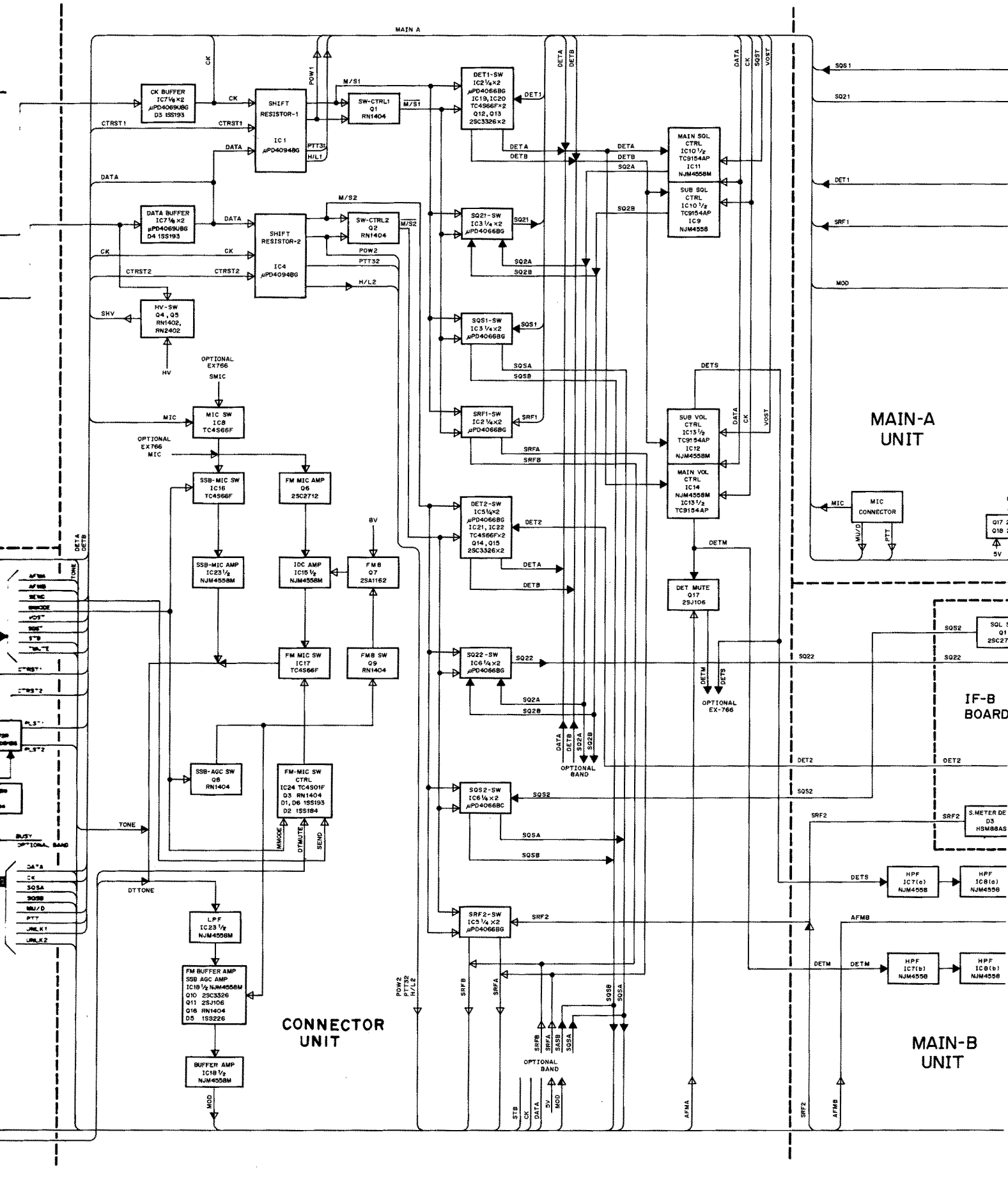


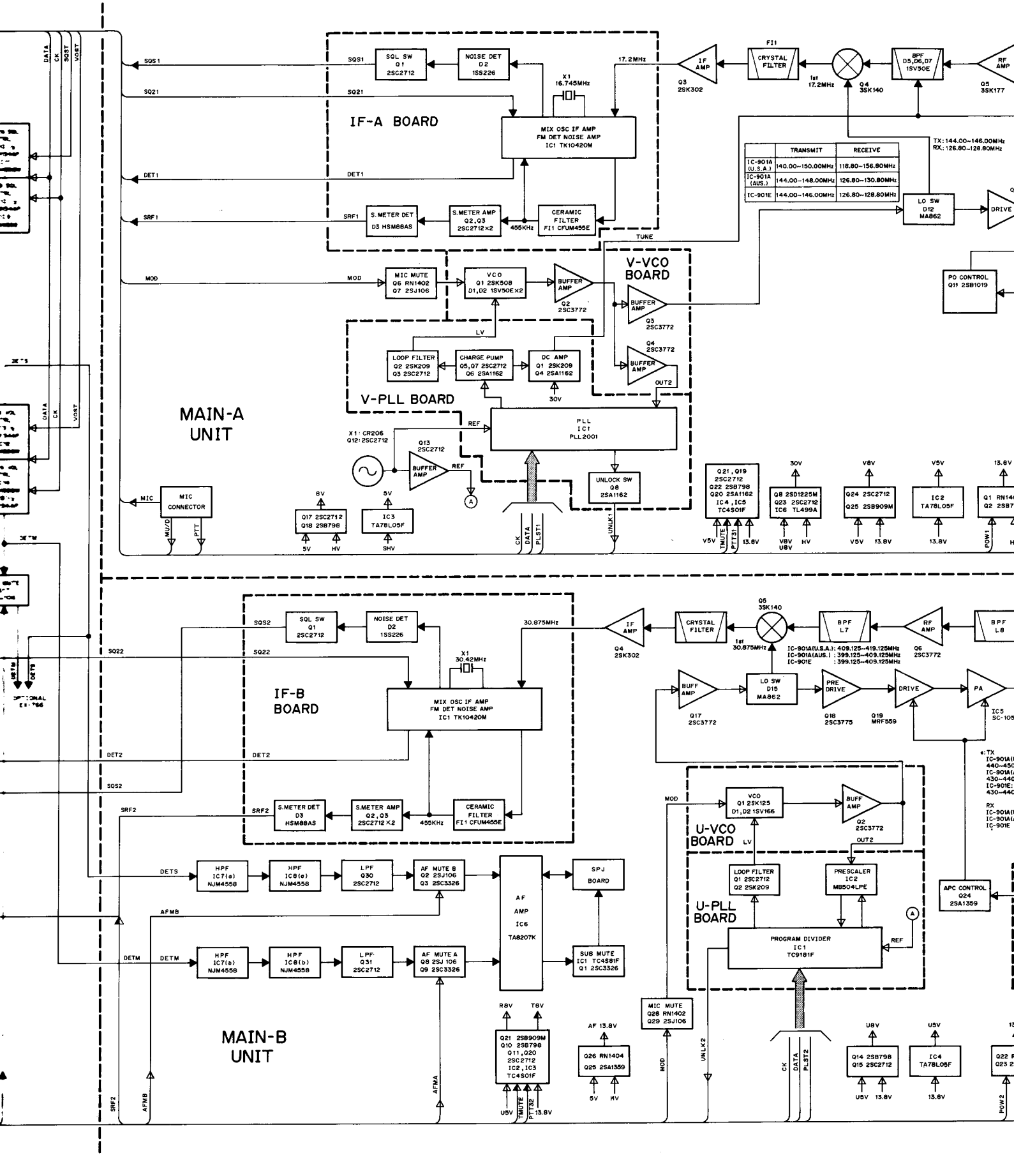
RFACE UNIT-B (LOGIC-B)

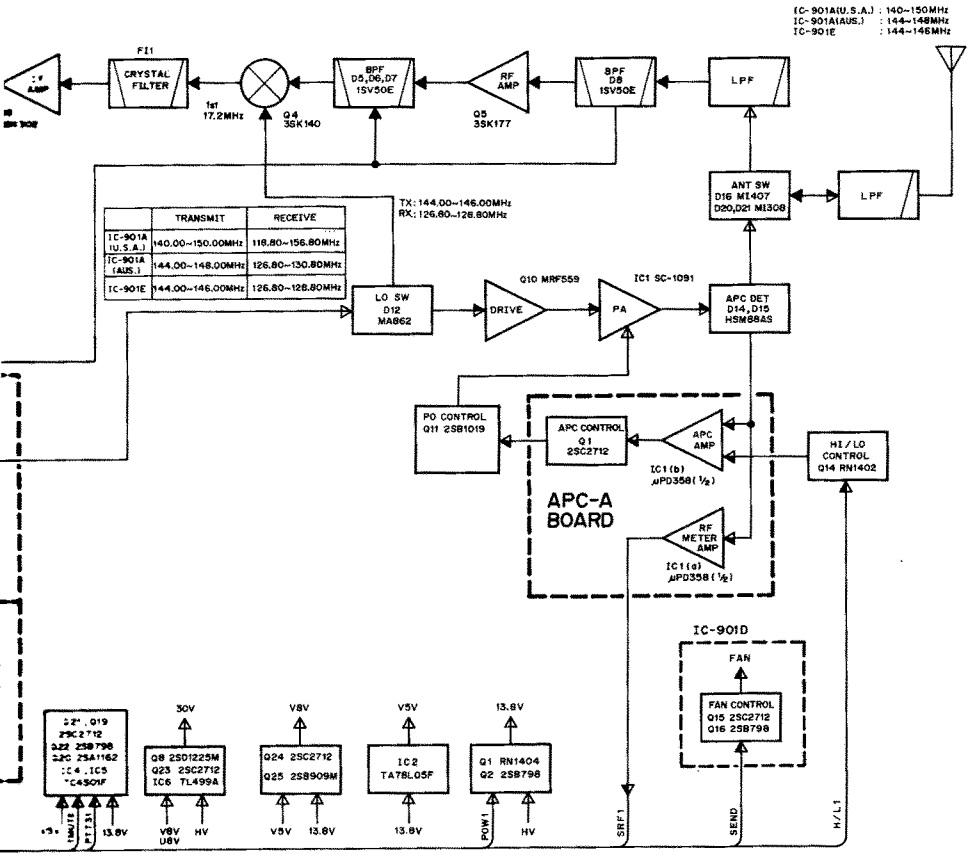

IC5 NJM4558M
IC6 NJM4558M
IC 12 SC-1105
IC 13 S-8054ALB-L14
X1 RF4A5FAP
Q9 RN1402
Q10 RN2404
IC 2 μPD4520BG-T1
IC3 μPD4081BG
IC4 μPD4071BG
IC1 μPD74HC4040G-T1
IC5 TC4SU -69F
IC6 TC4SU -69F
LOGIC-D
TO IC-901/D/A/E CONNECT UNIT (J21)
TO IC-901/D/A/E CONNECT UNIT (J3)

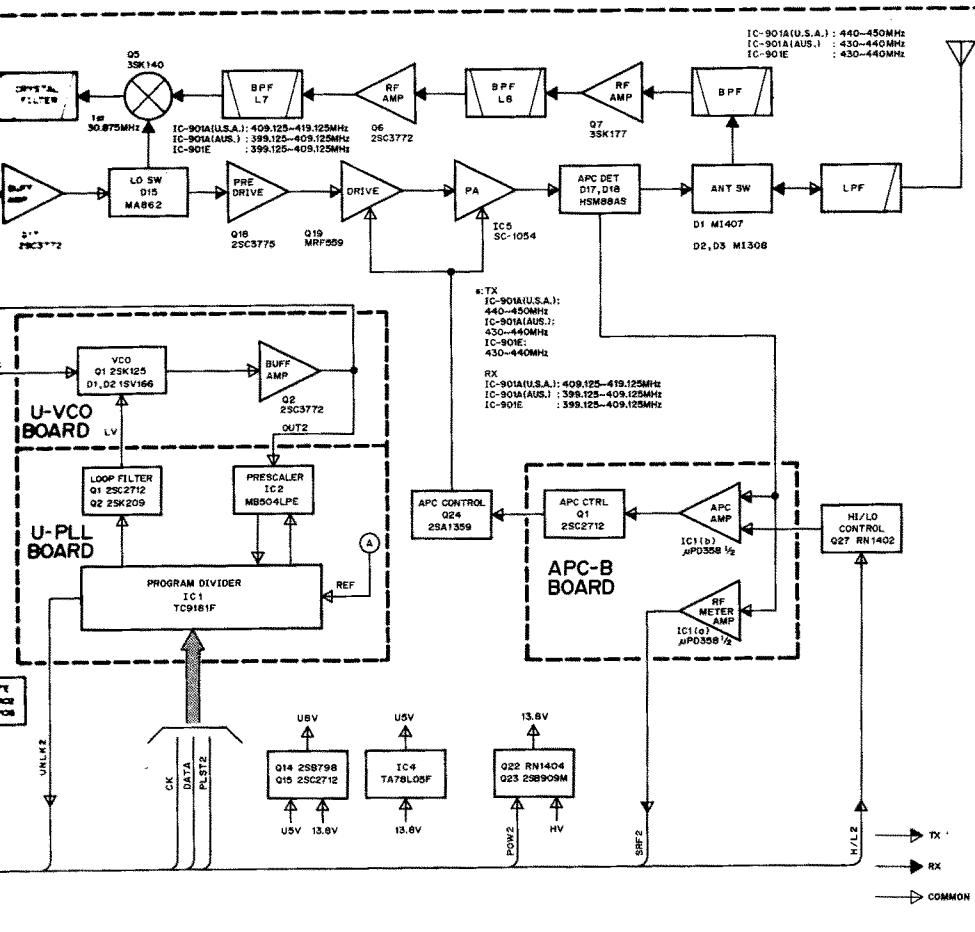
SECTION 11 BLOCK DIAGRAM



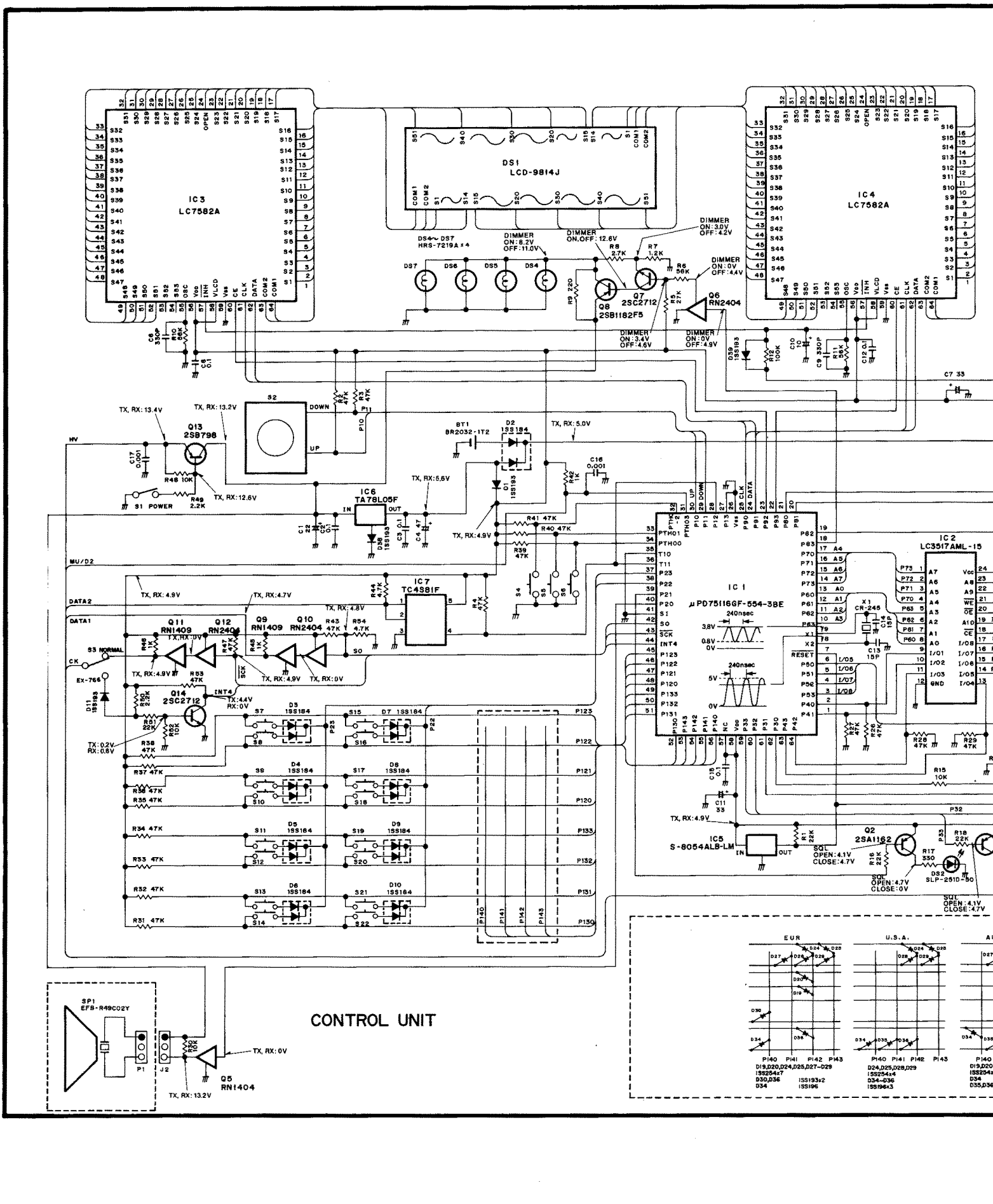

MAIN A
CK BUFFER IC7 1/8 ×2 µPD4069UBG D3 1SS193
SHIFT RESISTOR-1 IC1 µPD4094BG
SW-CTRL1 Q1 RN1404
DET1-SW IC2 1/4 ×2 µPD4066BG IC19, IC20 TC4S66F×2 Q12, Q13 2SC3326×2
DET1
DETA
DETB
MAIN SQL CTRL IC10 1/2 TC9154AP IC11 NJM4558M
SUB SQL CTRL IC10 1/2 TC9154AP IC9 NJM4558
SQ2A
SQ2B
DATA BUFFER IC7 1/8 ×2 µPD4069UBG D4 1SS193
SHIFT RESISTOR-2 IC4 µPD4094BG
SW-CTRL2 Q2 RN1404
SQ21-SW IC3 1/4 ×2 µPD4066BG
SQ21
HV-SW Q4, Q5 RN1402, RN2402
SQS1-SW IC3 1/4×2 µPD4066BG
SQS1
SQSA
SQSB
SRF1-SW IC2 1/4×2 µPD4066BG
SRF1
SRFA
SRFB
SUB VOL CTRL IC13 1/2 TC9154AP IC12 NJM4558M
MAIN VOL CTRL IC14 NJM4558M IC13 1/2 TC9154AP
DETS
DETM
DET2-SW IC5 1/4×2 µPD4066BG IC21, IC22 TC4S66F×2 Q14, Q15 2SC3326×2
DET2
MIC SW IC8 TC4S66F
FM MIC AMP Q6 2SC2712
SSB-MIC SW IC16 TC4S66F
SSB-MIC AMP IC23 1/2 NJM4558M
IDC AMP IC15 1/2 NJM4558M
FM8 Q7 2SA1162
8V
DET MUTE Q17 2SJ106
SQ22-SW IC6 1/4 ×2 µPD4066BG
SQ22
FM MIC SW IC17 TC4S66F
FM8 SW Q9 RN1404
SSB-AGC SW Q8 RN1404
FM-MIC SW CTRL IC24 TC4S01F Q3 RN1404 D1, D6 1SS193 D2 1SS184
SQS2-SW IC6 1/4 ×2 µPD4066BC
SQS2
SRF2-SW IC3 1/4 ×2 µPD4066BG
SRF2
LPF IC23 1/2 NJM4558M
FM BUFFER AMP SSB AGC AMP IC18 1/2 NJM4558M Q10 2SC3326 Q11 2SJ106 Q16 RN1404 D5 1SS226
BUFFER AMP IC18 1/2 NJM4558M
MOD
TONE
DTTONE
MMODE
DTMUTE
SEND
OPTIONAL EX766 SMIC
OPTIONAL EX766 MIC
OPTIONAL EX-766
OPTIONAL BAND
MAIN-A UNIT
MIC CONNECTOR
MU/D
PTT
5V
IF-B BOARD
SQS2
SRF2
DET2
S.METER DET D3 HSM88AS
HPF IC7(a) NJM4558
HPF IC8(a) NJM4558
HPF IC7(b) NJM4558
HPF IC8(b) NJM4558
AFMB
AFMA
CONNECTOR UNIT
MAIN-B UNIT
STB
CK
DATA
5V
MOD
POW2
PTT32
H/L2

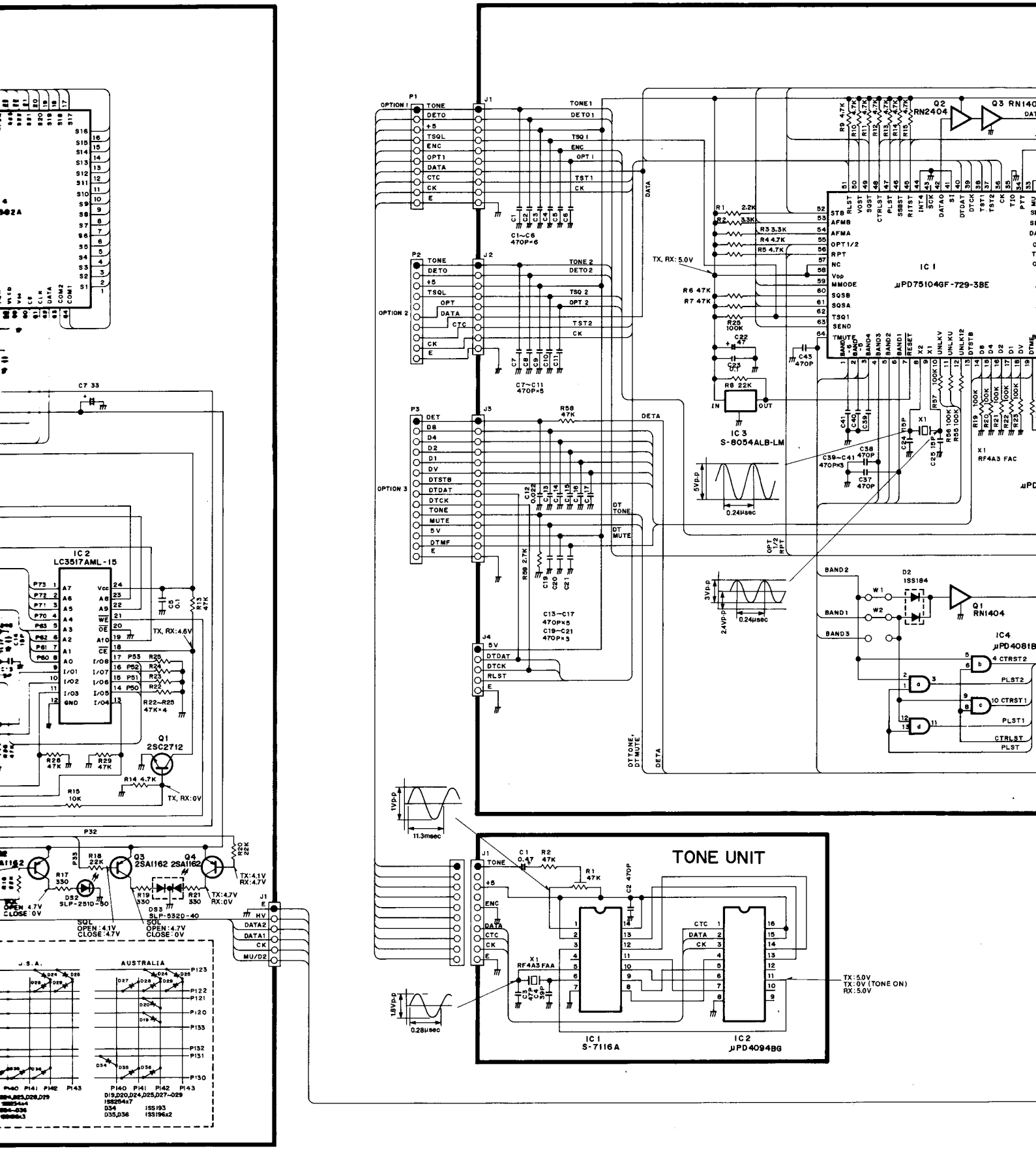

IF-A BOARD
MAIN-A UNIT
V-VCO BOARD
V-PLL BOARD
IF-B BOARD
MAIN-B UNIT
U-VCO BOARD
U-PLL BOARD
SQL SW Q1 2SC2712
NOISE DET D2 1SS226
MIX OSC IF AMP FM DET NOISE AMP IC1 TK10420M
X1 16.745MHz
17.2MHz
IF AMP Q3 2SK302
CRYSTAL FILTER FI1
1st 17.2MHz
Q4 3SK140
BPF D5,D6,D7 1SV50E
RF AMP Q5 3SK177
TRANSMIT
RECEIVE
IC-901A (U.S.A.) 140.00~150.00MHz 118.80~156.80MHz
IC-901A (AUS.) 144.00~148.00MHz 126.80~130.80MHz
IC-901E 144.00~146.00MHz 126.80~128.80MHz
TX:144.00~146.00MHz
RX:126.80~128.80MHz
LO SW D12 MA862
DRIVE
PO CONTROL Q11 2SB1019
S.METER DET D3 HSM88AS
S.METER AMP Q2,Q3 2SC2712×2
CERAMIC FILTER FI1 CFUM455E
455KHz
TUNE
MIC MUTE Q6 RN1402 Q7 2SJ106
VCO Q1 2SK508 D1,D2 1SV50E×2
BUFFER AMP Q2 2SC3772
BUFFER AMP Q3 2SC3772
BUFFER AMP Q4 2SC3772
LV
LOOP FILTER Q2 2SK209 Q3 2SC2712
CHARGE PUMP Q5,Q7 2SC2712 Q6 2SA1162
DC AMP Q1 2SK209 Q4 2SA1162
30V
OUT2
REF
PLL IC1 PLL2001
X1: CR206
Q12: 2SC2712
Q13 2SC2712
BUFFER AMP
UNLOCK SW Q8 2SA1162
MIC
MIC CONNECTOR
MU/D
PTT
8V
5V
Q17 2SC2712 Q18 2SB798
IC3 TA78L05F
5V HV
5V HV
CK DATA PLST1
UNLK1
Q21,Q19 2SC2712 Q22 2SB798 Q20 2SA1162 IC4,IC5 TC4S01F
Q8 2SD1225M Q23 2SC2712 IC6 TL499A
Q24 2SC2712 Q25 2SB909M
IC2 TA78L05F
Q1 RN14
Q2 2SB7
V5V
TMUTE
PTT31
13.8V
V8V U8V
HV
V5V 13.8V
13.8V
POW1
SQS2
SQ22
DET2
SRF2
30.875MHz
X1 30.42MHz
IF AMP Q4 2SK302
CRYSTAL FILTER
1st 30.875MHz
Q5 3SK140
BPF L7
RF AMP Q6 2SC3772
BPF L8
IC-901A(U.S.A.): 409.125~419.125MHz
IC-901A(AUS.) : 399.125~409.125MHz
IC-901E : 399.125~409.125MHz
BUFF AMP Q17 2SC3772
LO SW D15 MA862
PRE DRIVE Q18 2SC3775
DRIVE Q19 MRF559
PA IC5 SC-105
VCO Q1 2SK125 D1,D2 1SV166
BUFF AMP Q2 2SC3772
LOOP FILTER IC2 Q2 2SC2712 Q2 2SK209
PRESCALER IC2 MB504LPE
PROGRAM DIVIDER IC1 TC9181F
APC CONTROL Q24 2SA1359
DETS
DETM
AFMB
HPF IC7(a) NJM4558
HPF IC8(a) NJM4558
LPF Q30 2SC2712
AF MUTE B Q2 2SJ106 Q3 2SC3326
HPF IC7(b) NJM4558
HPF IC8(b) NJM4558
LPF Q31 2SC2712
AF MUTE A Q8 2SJ 106 Q9 2SC3326
AF AMP IC6 TA8207K
SPJ BOARD
SUB MUTE IC1 TC4S81F Q1 2SC3326
R8V T8V
Q21 2SB909M Q10 2SB798 Q11,Q20 2SC2712 IC2,IC3 TC4S01F
U5V TMUTE PTT32 13.8V
AF 13.8V
Q26 RN1404 Q25 2SA1359
5V HV
MIC MUTE Q28 RN1402 Q29 2SJ106
MOD
UNLK2
U8V U5V
Q14 2SB798 Q15 2SC2712
IC4 TA78L05F
U5V 13.8V
13.8V
POW2
AFMA
SRF2
AFMB


(IC-901A(U.S.A.) : 140~150MHz
IC-901A(AUS.) : 144~148MHz
IC-901E : 144~146MHz
FI1
CRYSTAL FILTER
1st 17.2MHz
Q4 3SK140
BPF D5,D6,D7 1SV50E
RF AMP
Q5 3SK177
BPF D8 1SV50E
LPF
ANT SW D16 MI407 D20,D21 MI308
LPF
TX: 144.00~146.00MHz
RX: 126.80~128.80MHz
TRANSMIT
RECEIVE
IC-901A (U.S.A.) 140.00~150.00MHz 118.80~156.80MHz
IC-901A (AUS.) 144.00~148.00MHz 126.80~130.80MHz
IC-901E 144.00~146.00MHz 126.80~128.80MHz
LO SW D12 MA862
Q10 MRF559
DRIVE
IC1 SC-1091
PA
APC DET D14,D15 HSM88AS
PO CONTROL Q11 2SB1019
APC CONTROL Q1 2SC2712
APC AMP
IC1(b) μPD358(1/2)
HI/LO CONTROL Q14 RN1402
APC-A BOARD
RF METER AMP
IC1(a) μPD358(1/2)
IC-901D
FAN
FAN CONTROL Q15 2SC2712 Q16 2SB798
30V
8V
5V
13.8V
Q8 2SD1225M Q23 2SC2712 IC6 TL499A
Q24 2SC2712 Q25 2SB909M
IC2 TA78L05F
Q1 RN1404 Q2 2SB798
V8V U8V
HV
V5V
13.8V
POW1
SRF1
SEND
H/L1

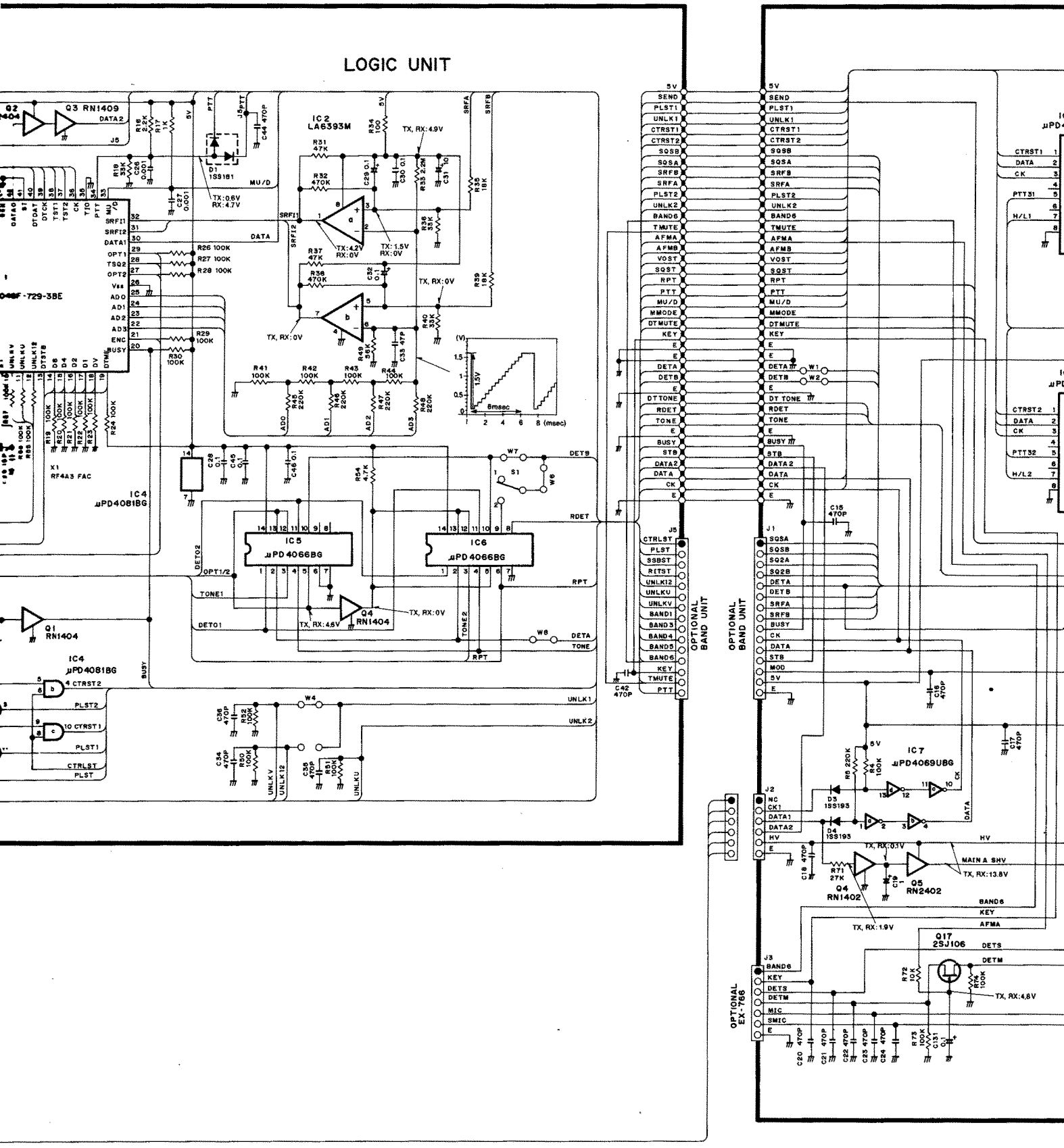

IC-901A(U.S.A.) : 440~450MHz
IC-901A(AUS.) : 430~440MHz
IC-901E : 430~440MHz
Q5 3SK140
1st 30.875MHz
BPF L7
RF AMP
BPF L6
RF AMP
BPF
Q7 3SK177
IC-901A(U.S.A.): 409.125~419.125MHz
IC-901A(AUS.) : 399.125~409.125MHz
IC-901E : 399.125~409.125MHz
Q6 2SC3772
LO SW D15 MA862
PRE DRIVE
DRIVE
PA
APC DET D17,D18 HSM88AS
ANT SW
LPF
Q18 2SC3775
Q19 MRF559
IC5 SC-1054
D1 MI407
D2,D3 MI308
s:TX
IC-901A(U.S.A.): 440~450MHz
IC-901A(AUS.): 430~440MHz
IC-901E: 430~440MHz
RX
IC-901A(U.S.A.): 409.125~419.125MHz
IC-901A(AUS.) : 399.125~409.125MHz
IC-901E : 399.125~409.125MHz
VCO Q1 2SK125 D1,D2 1SV166
BUFF AMP Q2 2SC3772
OUT2
U-VCO BOARD
LV
LOOP FILTER Q1 2SC2712 Q2 2SK209
PRESCALER IC2 MB504LPE
U-PLL BOARD
PROGRAM DIVIDER IC1 TC9181F
REF
APC CONTROL Q24 2SA1359
APC CTRL Q1 2SC2712
APC AMP
IC1(b) μPD358 1/2
HI/LO CONTROL Q27 RN1402
APC-B BOARD
RF METER AMP
IC1(a) μPD358 1/2
U8V
U5V
13.6V
Q14 2SB798 Q15 2SC2712
IC4 TA78L05F
Q22 RN1404 Q23 2SB909M
U5V 13.6V
13.6V
POW2
HV
SRF2
H/L2
CK
DATA
PLST2
TX
RX
COMMON

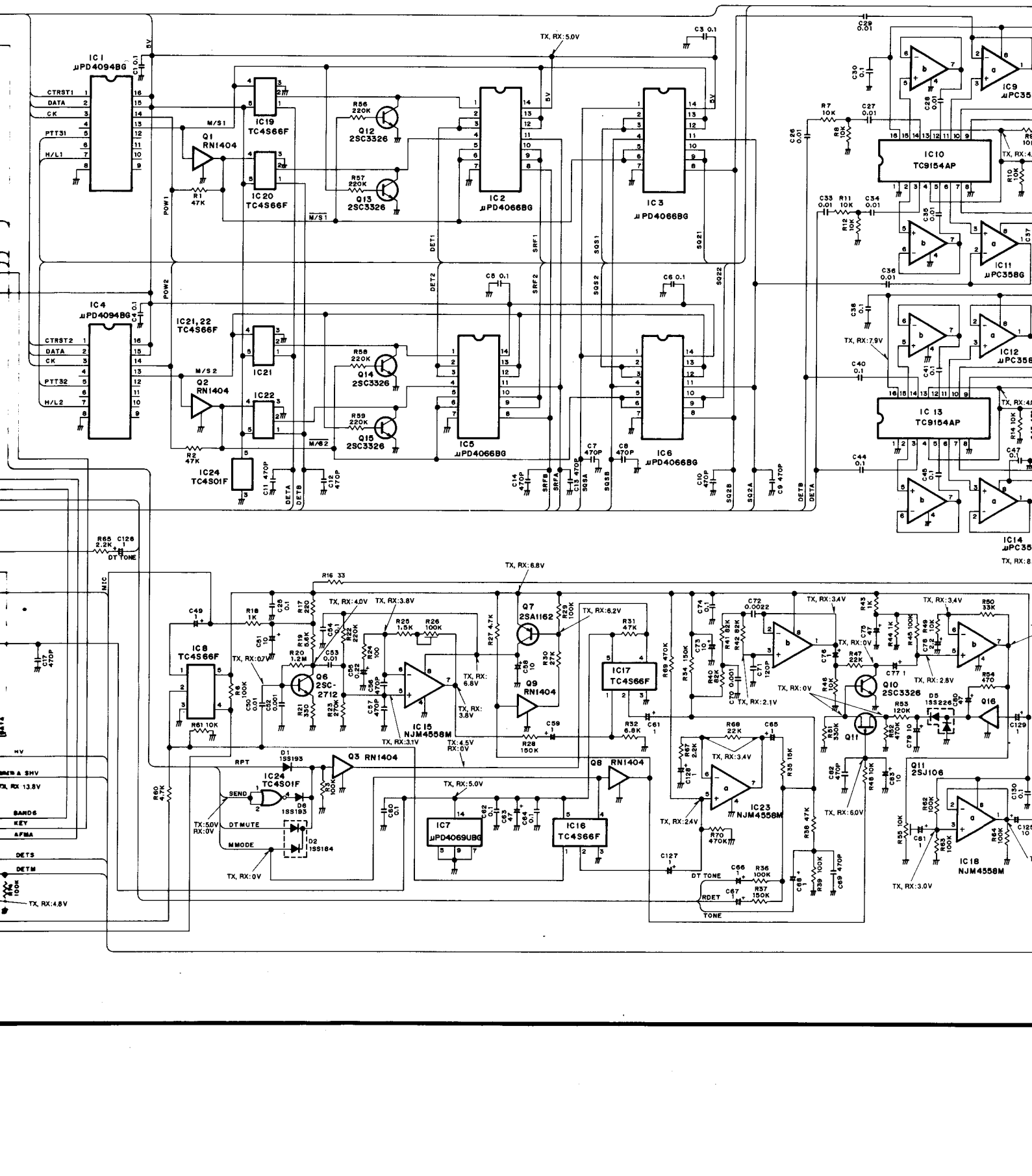
SECTION 12 VOLTAGE DIAGRAMS

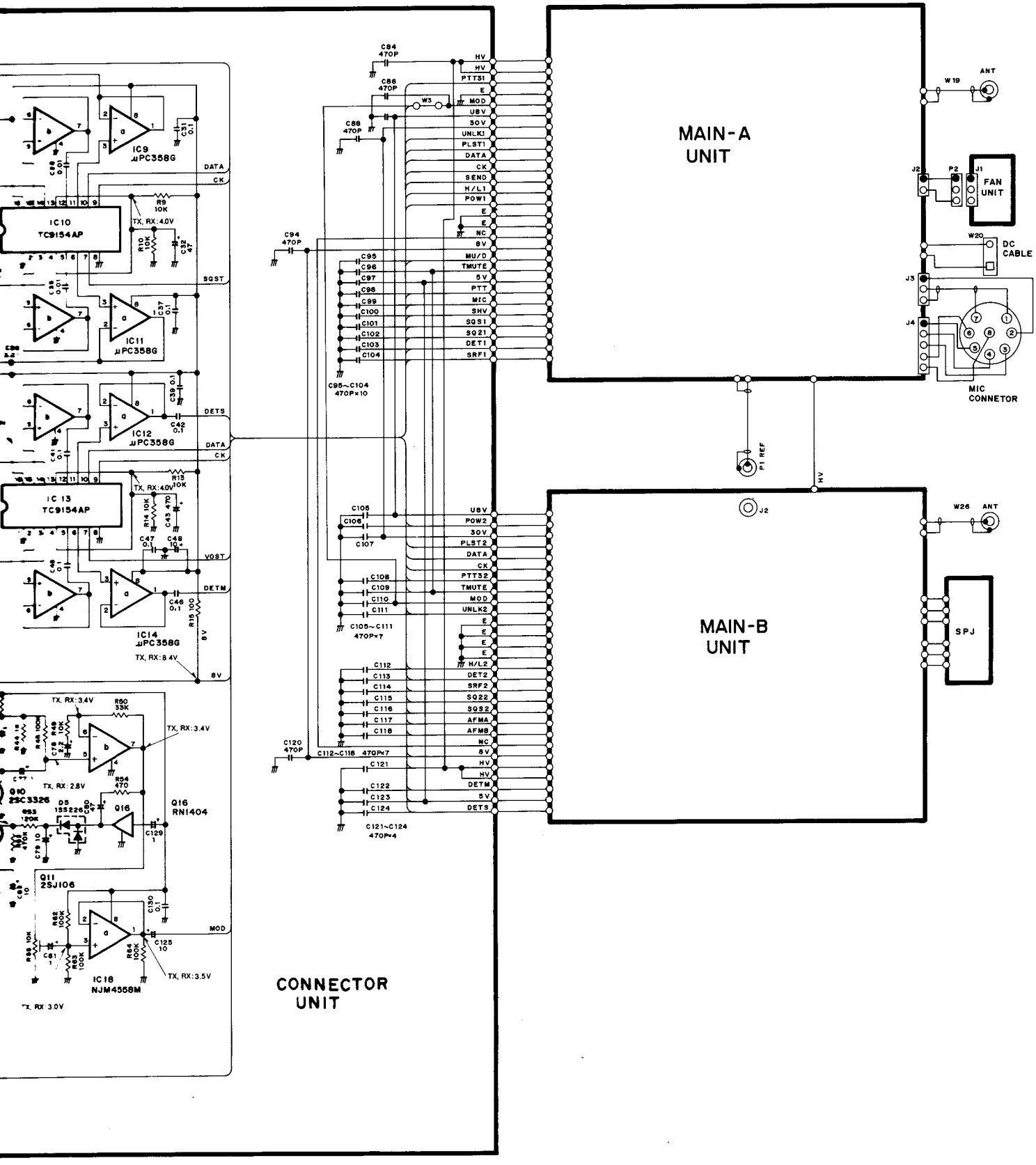


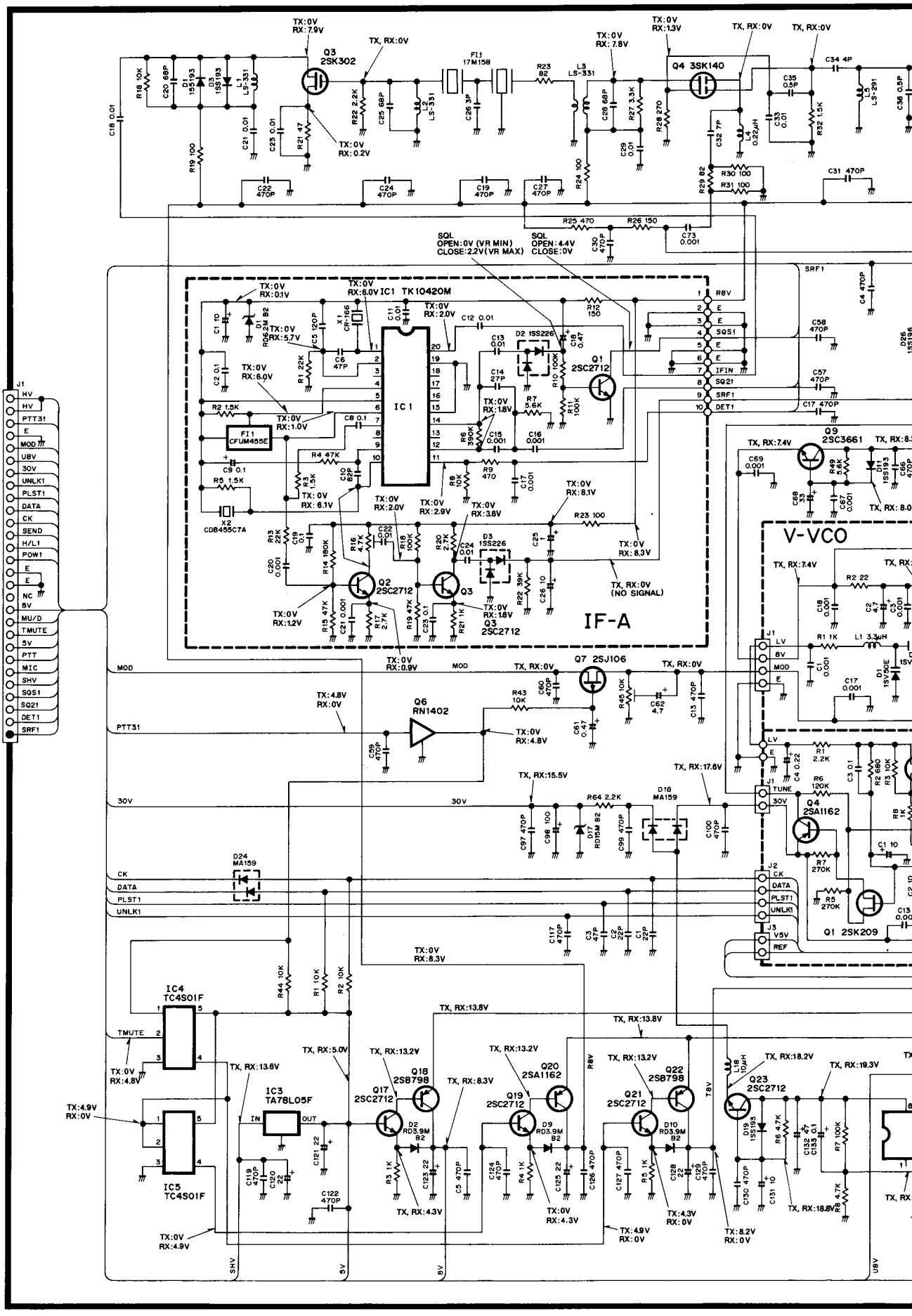

IC 2
LC3517AML-15
IC 1
μPD75104GF-729-38E
IC 3
S-8054ALB-LM
IC4
μPD4081B
Q1
2SC2712
Q1
RN1404
Q2
RN2404
Q3 RN140
D2
1SS184
TONE UNIT
IC1
S-7116A
IC2
μPD4094BG
X1
RF4A3 FAC
X1
RF4A3FAA
TX, RX: 5.0V
TX, RX: 4.6V
TX, RX: 0V
TX: 5.0V
TX: 0V (TONE ON)
RX: 5.0V
TX: 4.1V
RX: 4.7V
TX: 4.7V
RX: 0V
SQL
OPEN: 4.1V
CLOSE: 4.7V
SQL
OPEN: 4.7V
CLOSE: 0V
OPEN 4.7V
CLOSE 0V
0.24μsec
0.24μsec
11.3msec
0.28μsec
C1~C6
470P×6
C7~C11
470P×5
C13~C17
470P×5
C19~C21
470P×3
C39~C41
470P×3
R22~R25
47K×4
U.S.A.
AUSTRALIA
D19,D20,D24,D25,D27~D29
1SS254×7
D34
1SS193
D35,D36
1SS196×2

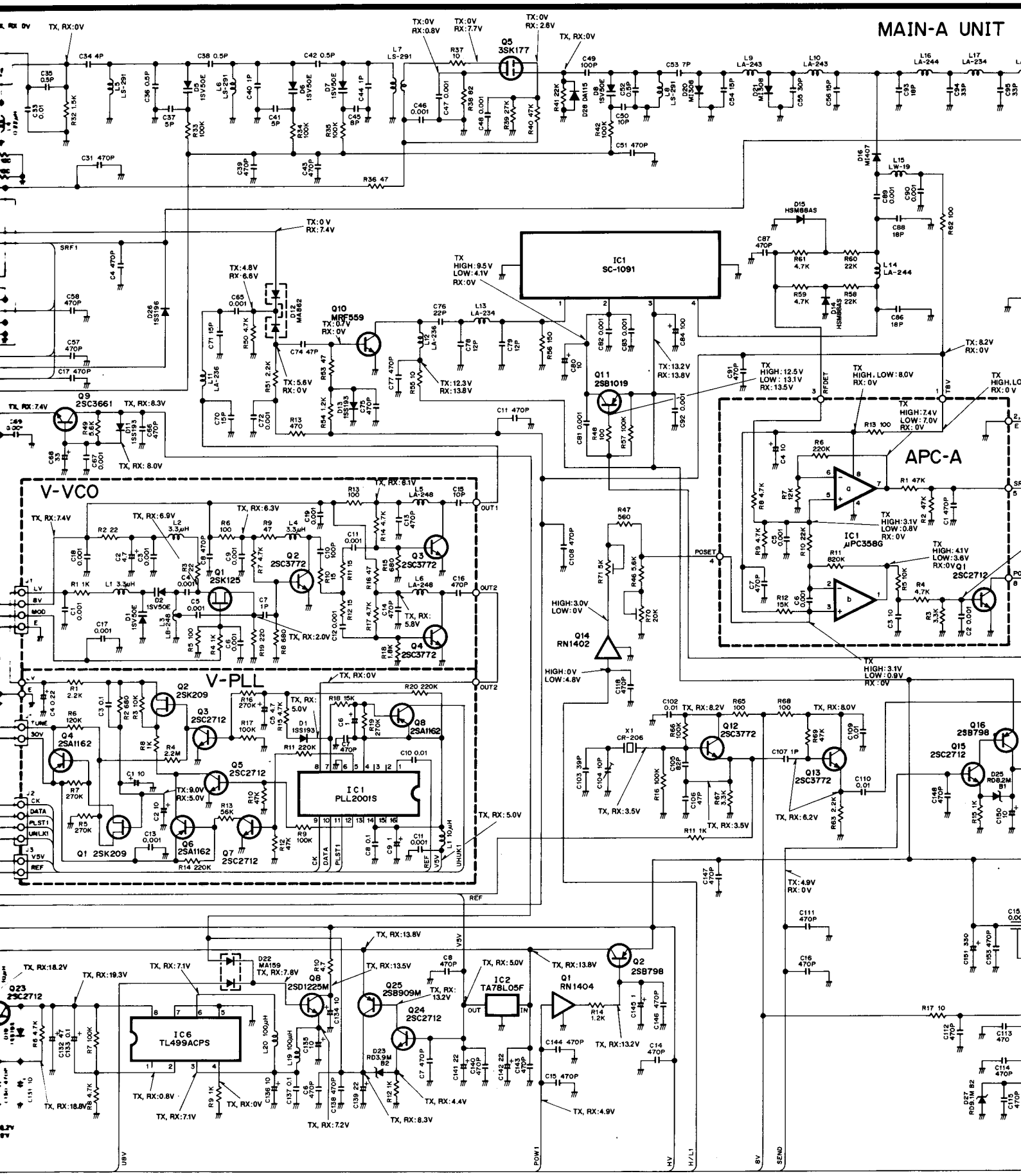
LOGIC UNIT

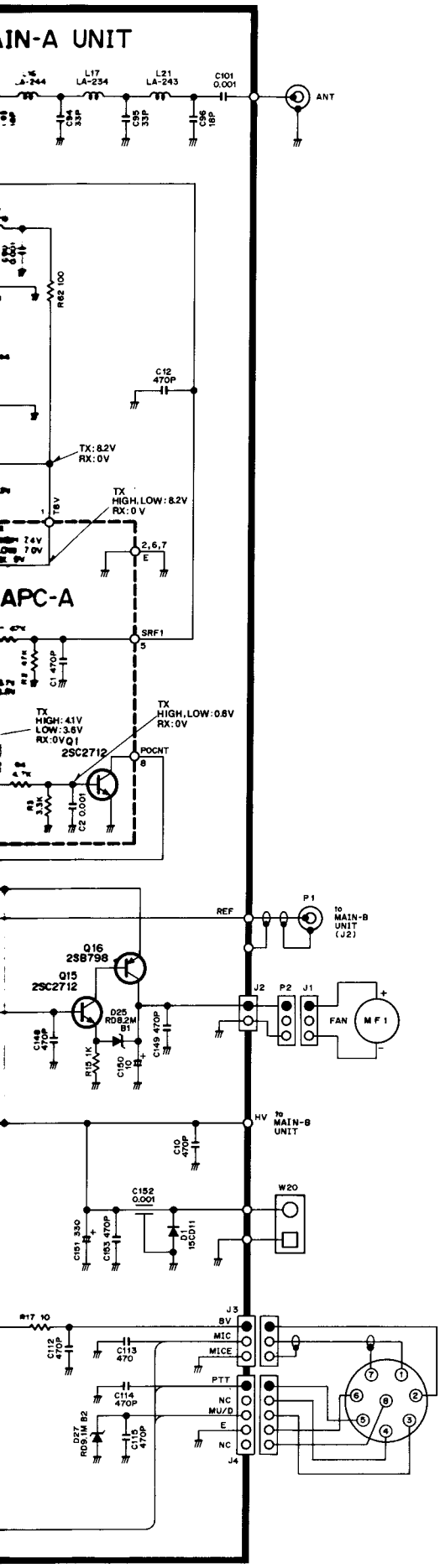

IC2 LA6393M
IC4 μPD4081BG
IC5 μPD4066BG
IC6 μPD4066BG
IC7 μPD4069UBG
Q1 RN1404
Q3 RN1409
Q4 RN1404
Q4 RN1402
Q5 RN2402
Q17 2SJ106
D1 1SS181
D3 1SS193
D4 1SS193
X1 RF4A3 FAC
OPTIONAL BAND UNIT
OPTIONAL EX-766
TX, RX: 4.9V
TX, RX: 0V
TX: 0.6V RX: 4.7V
TX: 4.2V RX: 0V
TX: 1.5V RX: 0V
TX, RX: 4.6V
TX, RX: 0.1V
TX, RX: 13.8V
TX, RX: 1.9V
TX, RX: 4.8V
8msec
DATA2
MU/D
DATA
DETB
RDET
RPT
TONE1
TONE2
DETO1
DETO2
OPT1/2
BUSY
UNLK1
UNLK2
PLST2
CTRST2
CTRST1
PLST1
CTRLST
PLST
MAIN & SHV
HV
BAND6
KEY
AFMA
DETS
DETM

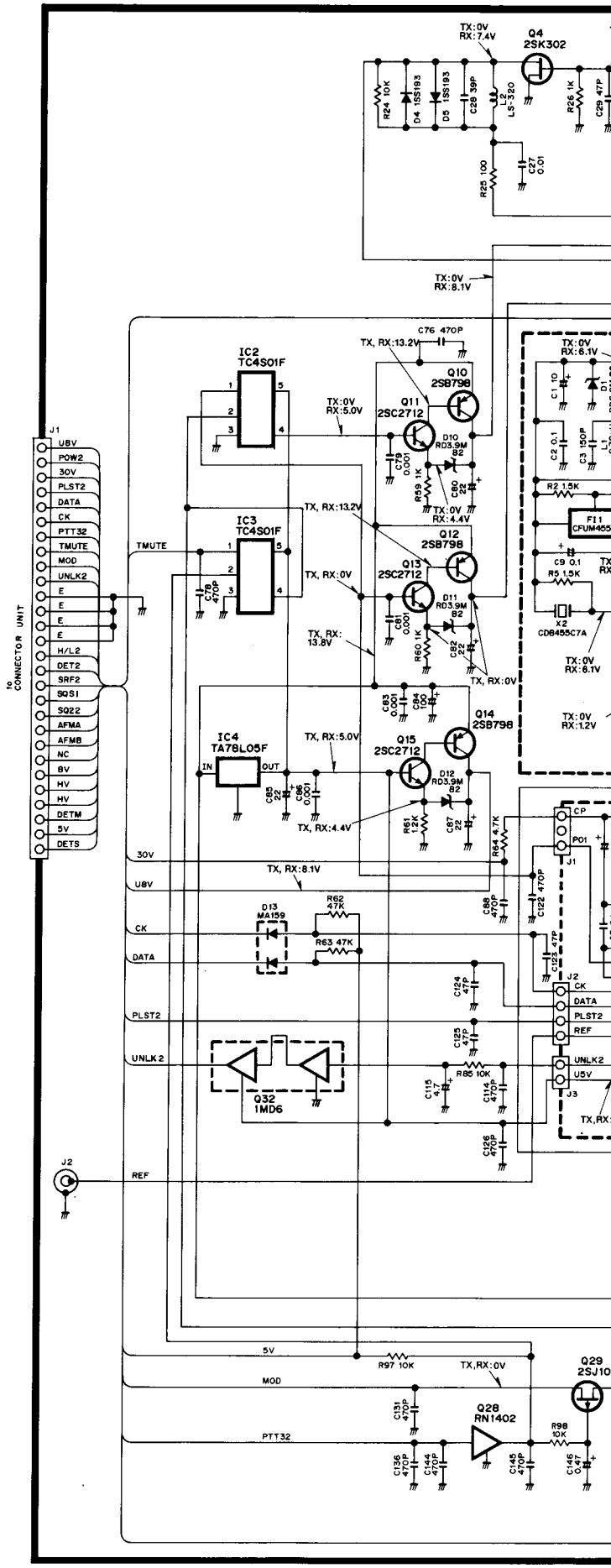

IC1 µPD4094BG
IC4 µPD4094BG
IC19 TC4S66F
IC20 TC4S66F
IC21,22 TC4S66F
IC21
IC22
IC24 TC4S01F
IC2 µPD4066BG
IC3 µPD4066BG
IC5 µPD4066BG
IC6 µPD4066BG
IC9 µPC35
IC10 TC9154AP
IC11 µPC358G
IC12 µPC358
IC13 TC9154AP
IC14 µPC35
IC8 TC4S66F
IC15 NJM4558M
IC16 TC4S66F
IC17 TC4S66F
IC7 µPD4069UBG
IC23 NJM4558M
IC18 NJM4558M
Q1 RN1404
Q2 RN1404
Q3 RN1404
Q8 RN1404
Q9 RN1404
Q12 2SC3326
Q13 2SC3326
Q14 2SC3326
Q15 2SC3326
Q6 2SC-2712
Q7 2SA1162
Q10 2SC3326
Q11 2SJ106
Q16
D1 1SS193
D2 1SS184
D5 1SS226
D6 1SS193
CTRST1
DATA
CK
PTT31
H/L1
CTRST2
PTT32
H/L2
M/S1
M/S2
POW1
POW2
DET1
DET2
SRF1
SRF2
SQS1
SQS2
SQ21
SQ22
SQ1A
SQ1B
SQ2A
SQ2B
DETA
DETB
SRFA
SRFB
MIC
DT TONE
RPT
SEND
DTMUTE
MMODE
TONE
RDET
TX, RX: 5.0V
TX, RX: 6.8V
TX, RX: 7.9V
TX, RX: 4.0V
TX, RX: 3.8V
TX, RX: 0V
TX, RX: 6.8V
TX, RX: 3.8V
TX, RX: 3.1V
TX: 4.5V RX: 0V
TX, RX: 6.2V
TX, RX: 2.1V
TX, RX: 3.4V
TX, RX: 0V
TX, RX: 2.8V
TX, RX: 3.4V
TX, RX: 6.0V
TX, RX: 5.0V
TX, RX: 3.4V
TX, RX: 2.4V
TX: 5.0V RX: 0V
TX, RX: 0V
TX, RX: 3.0V
TX, RX: 4.8V

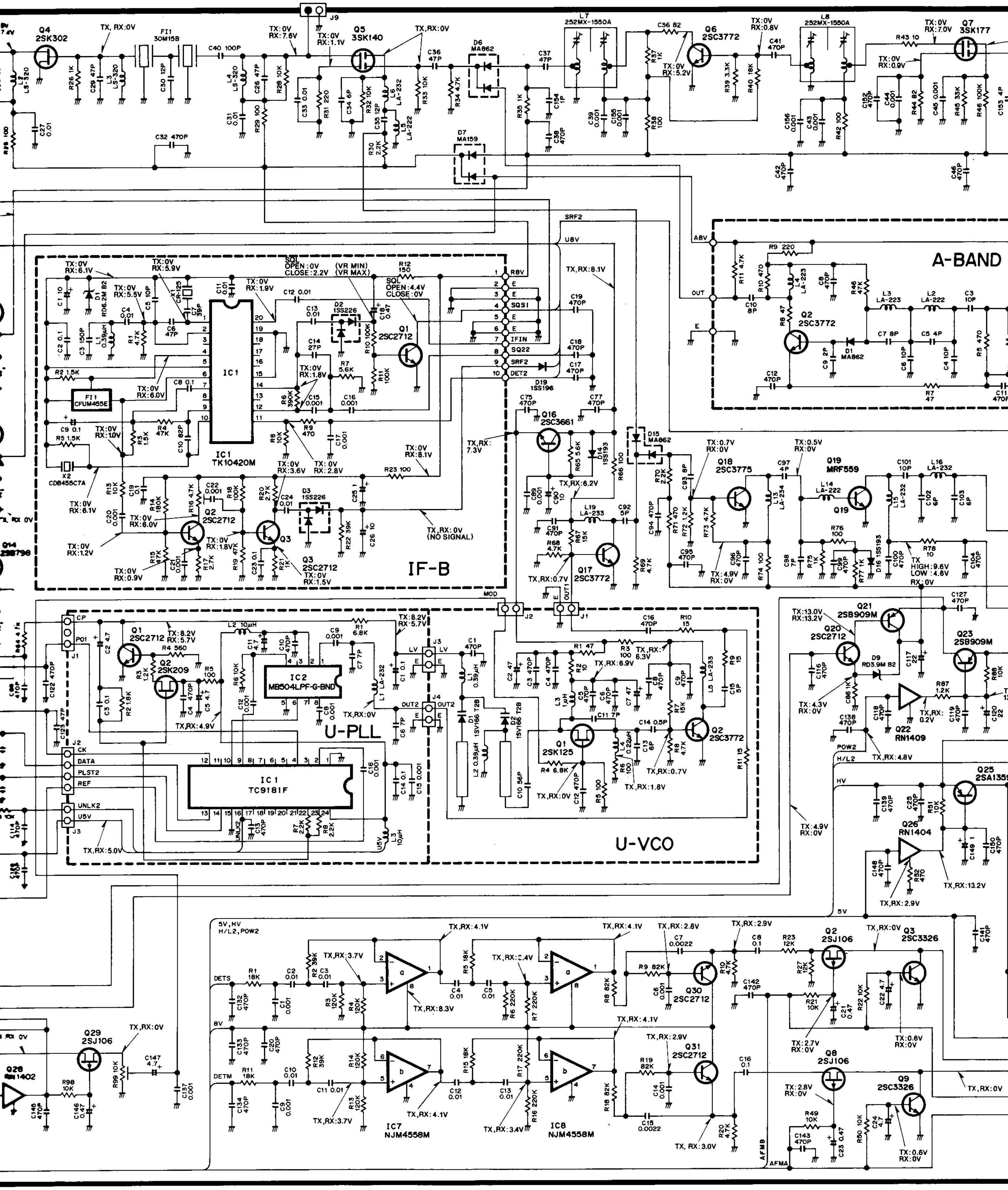

MAIN-A UNIT
MAIN-B UNIT
CONNECTOR UNIT
FAN UNIT
DC CABLE
MIC CONNETOR
SPJ
ANT
IC9 µPC358G
IC10 TC9154AP
IC11 µPC358G
IC12 µPC358G
IC 13 TC9154AP
IC14 µPC358G
IC16 NJM4558M
Q10 2SC3326
Q11 2SJ106
Q16 RN1404
DATA
CK
SQST
DETS
VOST
DETM
MOD
8V
HV
PTT31
E
MOD
UBV
30V
UNLK1
PLST1
SEND
H/L1
POW1
NC
MU/D
TMUTE
5V
PTT
MIC
SHV
SQS1
SQ21
DET1
SRF1
POW2
PLST2
PTT32
UNLK2
H/L2
DET2
SRF2
SQ22
SQS2
AFMA
AFMB
P1 REF
J1
J2
J3
J4
P2
W19
W20
W26
W3

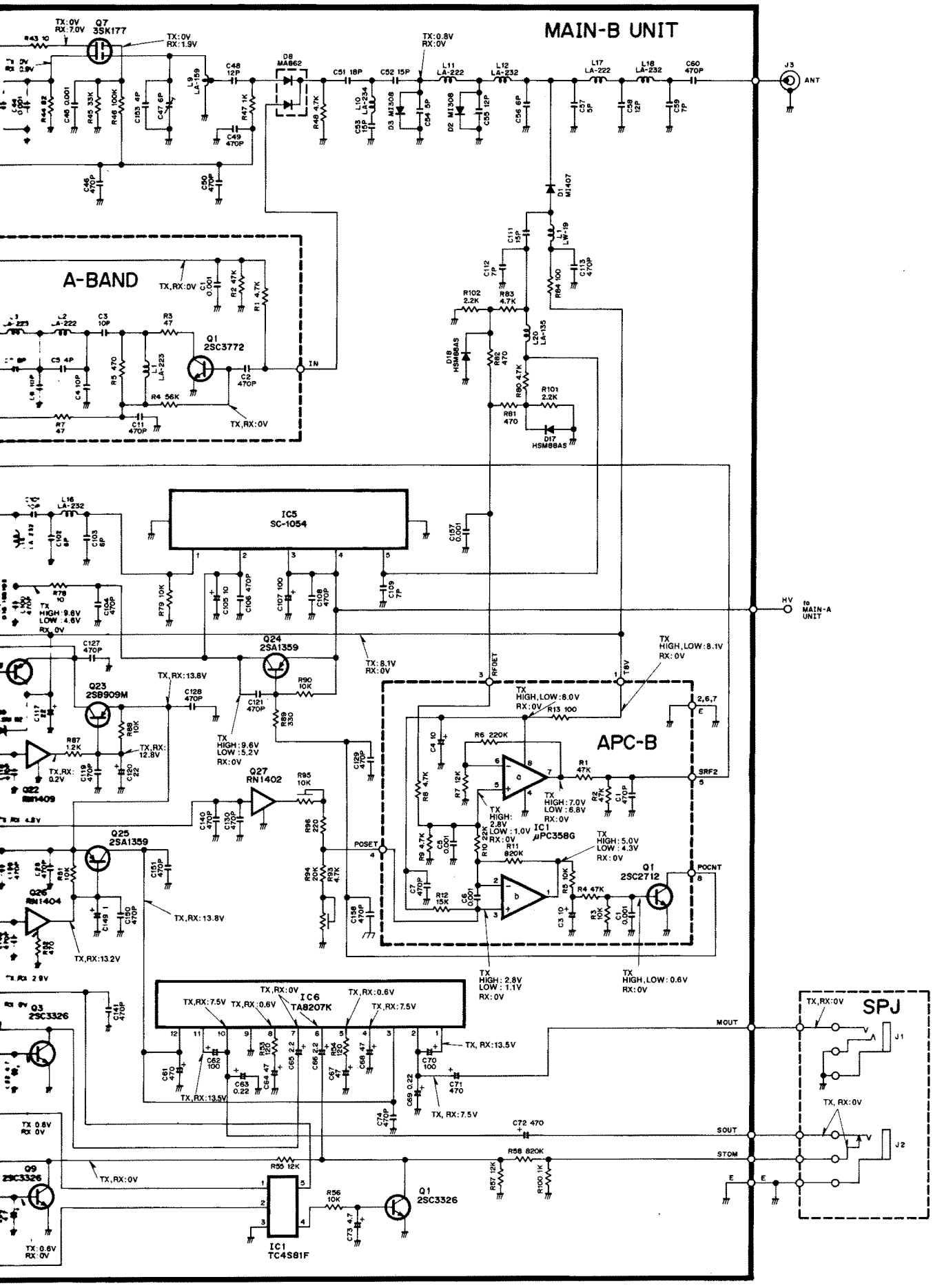

IF-A
V-VCO
IC1 TK10420M
IC4 TC4S01F
IC5 TC4S01F
IC3 TA78L05F
Q1 2SC2712
Q2 2SC2712
Q3 2SK302
Q4 3SK140
Q4 2SA1162
Q6 RN1402
Q7 2SJ106
Q9 2SC3661
Q1 2SK209
Q17 2SC2712
Q18 2SB798
Q19 2SC2712
Q20 2SA1162
Q21 2SC2712
Q22 2SB798
Q23 2SC2712
TO CONNECTOR UNIT
SQL OPEN:0V (VR MIN) CLOSE:2.2V(VR MAX)
SQL OPEN: 4.4V CLOSE:0V
TX, RX:0V (NO SIGNAL)


MAIN-A UNIT
V-VCO
V-PLL
APC-A
IC1 SC-1091
IC1 PLL2001S
IC1 μPC358G
IC2 TA78L05F
IC6 TL499ACPS
Q1 2SK125
Q2 2SC3772
Q3 2SC3772
Q4 2SA1162
Q5 3SK177
Q10 MRF559
Q11 2SB1019
Q12 2SC3772
Q13 2SC3772
Q14 RN1402
Q15 2SC2712
Q16 2SB798
Q1 RN1404
Q2 2SB798
Q8 2SD1225M
Q25 2SB909M
Q24 2SC2712
Q23 2SC2712
Q9 2SC3661
Q1 2SK209
Q2 2SK209
Q3 2SC2712
Q4 2SA1162
Q5 2SC2712
Q6 2SA1162
Q7 2SC2712
Q8 2SA1162
D1 1SS193
D2 1SV50E
D5 1SV50E
D6 1SV50E
D7 1SV50E
D12 MA862
D15 HSM88AS
D16 MI407
D22 MA159
D23 RD3.9M B2
D25 RD8.2M B1
D27 RD5.1M B2
D28 DA115
TX, RX:0V
TX:0V RX:0.8V
TX:0V RX:7.7V
TX:0V RX:2.6V
TX:0 V RX:7.4V
TX:4.8V RX:6.6V
TX:5.6V RX:0V
TX:12.3V RX:13.8V
TX:13.2V RX:13.8V
TX:8.2V RX:0V
TX HIGH:9.5V LOW:4.1V RX:0V
TX HIGH:12.5V LOW:13.1V RX:13.5V
TX HIGH, LOW:8.0V RX:0V
TX HIGH:7.4V LOW:7.0V RX:0V
TX HIGH:3.1V LOW:0.8V RX:0V
TX HIGH:4.1V LOW:3.6V RX:0V
TX HIGH:3.1V LOW:0.9V RX:0V
HIGH:3.0V LOW:0V
HIGH:0V LOW:4.8V
TX, RX:7.4V
TX, RX:8.3V
TX, RX: 8.0V
TX, RX:8.1V
TX, RX:6.9V
TX, RX:6.3V
TX, RX: 5.8V
TX, RX:2.0V
TX, RX:0V
TX, RX: 5.0V
TX, RX:9.0V RX:5.0V
TX, RX:8.2V
TX, RX:8.0V
TX, RX:3.5V
TX, RX:6.2V
TX:4.9V RX:0V
TX, RX:18.2V
TX, RX:19.3V
TX, RX:7.1V
TX, RX:7.8V
TX, RX:13.5V
TX, RX:13.8V
TX, RX:13.2V
TX, RX:0.8V
TX, RX:18.8V
TX, RX:7.2V
TX, RX:8.3V
TX, RX:4.4V
TX, RX:4.9V
OUT1
OUT2
REF
POSET
RFDET
TBV
SEND
POW1
HV
H/L1
8V
U8V


IN-A UNIT
L17 LA-234
L21 LA-243
C101 0.001
ANT
R62 100
C12 470P
TX: 8.2V RX: 0V
TX HIGH, LOW: 8.2V RX: 0 V
2,6,7 E
APC-A
SRF1
C1 470P
TX HIGH: 4.1V LOW: 3.6V RX: 0V
Q1 2SC2712
POCNT
C2 0.001
REF
P1
to MAIN-B UNIT (J2)
Q16 2SB798
Q15 2SC2712
D25 RD8.2M B1
J2 P2 J1
FAN
M F 1
HV
to MAIN-B UNIT
C10 470P
C152 0.001
W20
C151 330
C153 470P
D1 1SCD11
#17 10
J3
8V
MIC
MICE
PTT
NC
MU/D
E
NC
J4
C112 470P
C113 470
C114 470P
D27 RD5.1M B2
C115 470P


TX:0V RX:7.4V
Q4 2SK302
R24 10K
D4 1SS193
D5 1SS193
C28 39P
L2 LS-320
R25 100
C27 0.01
R26 1K
C29 47P
TX:0V RX:8.1V
C76 470P
TX, RX:13.2V
IC2 TC4S01F
Q10 2SB798
Q11 2SC2712
TX:0V RX:5.0V
D10 RD3.9M B2
C79 0.001
R59 1K
C80 2P
TX:0V RX:4.4V
IC3 TC4S01F
TX, RX:13.2V
Q12 2SB798
Q13 2SC2712
TX, RX:0V
D11 RD3.9M B2
C81 0.001
R60 1K
C82 22
TX, RX: 13.8V
TX, RX:0V
C83 0.01
C84 10P
IC4 TA78L05F
IN
OUT
C85 22
C86 0.001
TX, RX:5.0V
Q14 2SB798
Q15 2SC2712
D12 RD3.9M B2
R56 1.2K
C87 22
TX, RX:4.4V
R64 4.7K
TX, RX:8.1V
C68 470P
C122 470P
C123 47P
C124 47P
C125 47P
R85 10K
C115 4.7
C114 470P
C126 470P
Q32 1MD6
D13 MA159
R62 47K
R63 47K
J1
UBV
POW2
30V
PLST2
DATA
CK
PTT32
TMUTE
MOD
UNLK2
E
E
E
E
H/L2
DET2
SRF2
SQS1
SQ22
AFMA
AFMB
NC
8V
HV
HV
DETM
5V
DETS
to CONNECTOR UNIT
TMUTE
30V
U8V
CK
DATA
PLST2
UNLK2
J2
REF
CP
P01
J1
J2
CK
DATA
PLST2
REF
UNLK2
U5V
J3
TX,RX:
TX:0V RX:6.1V
TX:0V RX:1.2V
C1 10
C2 0.1
C3 150P
R2 1.5K
F11 CFUM455
C9 0.1
R5 1.5K
X2 CDB455C7A
5V
R97 10K
TX,RX:0V
MOD
PTT32
Q29 2SJ10
Q26 RN1402
C131 470P
C136 470P
C144 470P
C145 470P
R98 15K
C146 0.47


A-BAND
IF-B
U-PLL
U-VCO
IC1 TK10420M
IC1 TC9181F
IC2 MB504LPF-G-BND
IC7 NJM4558M
IC8 NJM4558M
Q4 2SK302
Q5 3SK140
Q6 2SC3772
Q7 3SK177
Q16 2SC3661
Q17 2SC3772
Q18 2SC3775
Q19 MRF559
Q20 2SC2712
Q21 2SB909M
Q22 RN1409
Q23 2SB909M
Q25 2SA1359
Q26 RN1404
Q29 2SJ106
Q30 2SC2712
Q31 2SC2712
L7 252MX-1550A
L8 252MX-1550A
FI1 30M15B
FI1 CFUM455E
X2 CDB455C7A
D6 MA862
D7 MA159
D15 MA862
D19 1SS196
R8V
SQS1
IFIN
SQ22
SRF2
DET2
U8V
A8V
OUT
MOD
CP
PO1
CK
DATA
PLST2
REF
UNLK2
U5V
DETS
DETM
5V, HV
H/L2, POW2
POW2
H/L2
HV
AFMA
AFMB


MAIN-B UNIT
A-BAND
APC-B
SPJ
IC5
SC-1054
IC6
TA8207K
IC1
TC4S81F
IC1
μPC358G
Q7
3SK177
Q1
2SC3772
Q24
2SA1359
Q23
2SB909M
Q27
RN1402
Q25
2SA1359
Q26
RN1404
Q22
RN1409
Q3
2SC3326
Q9
2SC3326
Q1
2SC3326
Q1
2SC2712
D8
MA862
D3 M1308
D2 M1308
D1
M1407
D18
HSM88AS
D17
HSM88AS
J3
ANT
IN
HV
to
MAIN-A
UNIT
MOUT
SOUT
STOM
J1
J2
TX:0V
RX:7.0V
TX:0V
RX:1.9V
TX:0.8V
RX:0V
TX,RX:0V
TX,RX:13.8V
TX,RX:12.8V
TX,RX:13.2V
TX,RX:7.5V
TX,RX:0.6V
TX,RX:13.5V
TX:8.1V
RX:0V
TX
HIGH,LOW:8.1V
RX:0V
TX
HIGH,LOW:8.0V
RX:0V
TX
HIGH:9.6V
LOW :5.2V
RX:0V
TX
HIGH:9.6V
LOW :4.6V
RX:0V
TX
HIGH: 2.8V
LOW : 1.0V
RX:0V
TX
HIGH:7.0V
LOW : 6.8V
RX:0V
TX
HIGH: 5.0V
LOW : 4.3V
RX:0V
TX
HIGH: 2.8V
LOW : 1.1V
RX:0V
TX
HIGH,LOW: 0.6V
RX:0V
TX:0.6V
RX:0V
RFDET
T8V
POSET
POCNT
SRF2
2,6,7
E

UX-R91A
UX-R91E

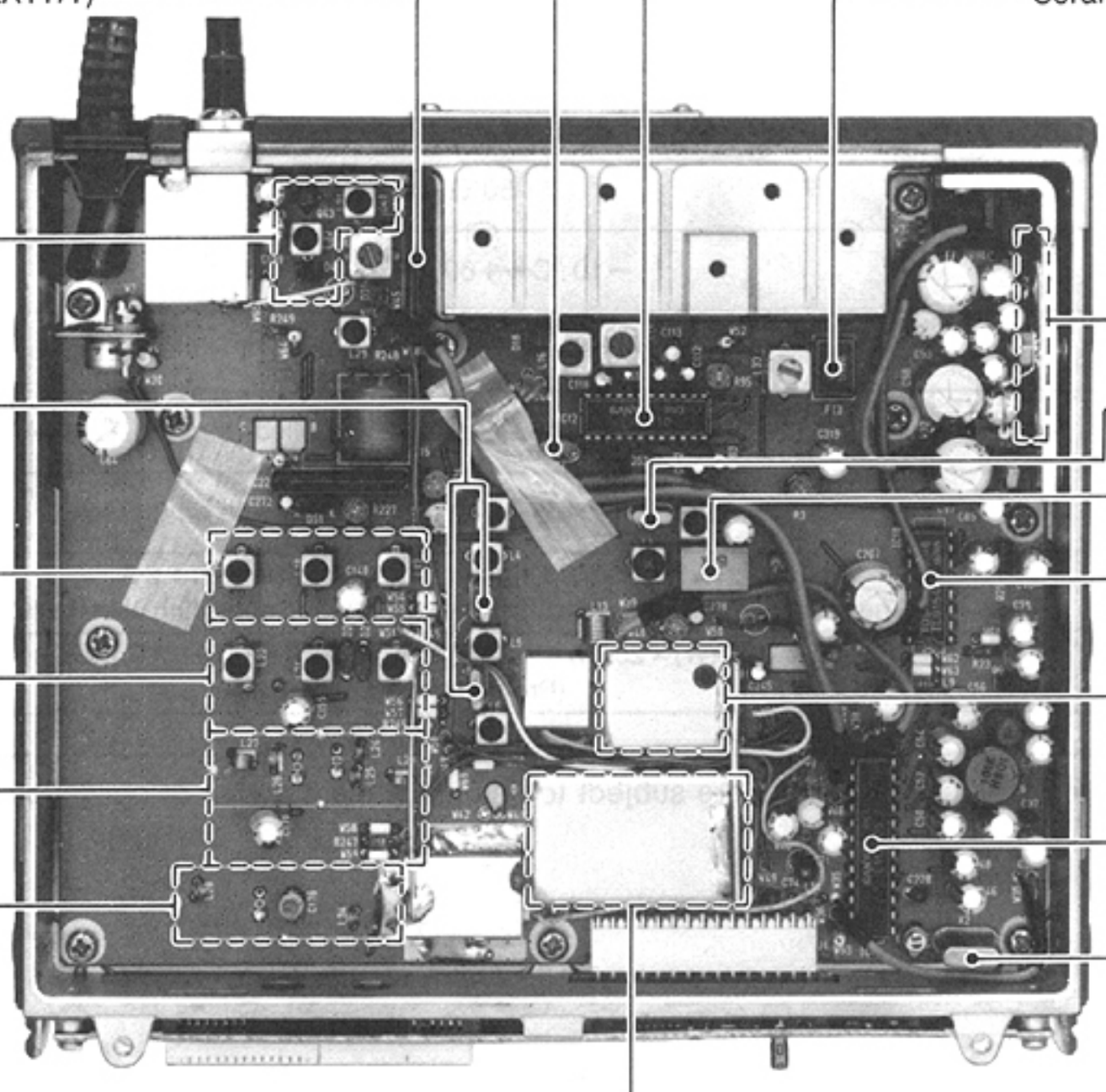
TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

		MW BAND	VHF BAND				UHF BAND	
FREQUENCY COVERAGE		520 kHz ∫ 1630 kHz	76.00 MHz ∫ 108.00 MHz	108.00 MHz ∫ 137.00 MHz	137.00 MHz ∫ 200.00 MHz	200.00 MHz ∫ 236.00 MHz	300.00 MHz ∫ 500.00 MHz	800.00 MHz ∫ 950.00 MHz
MODE		AM	WIDE-FM	AM	FM			
SENSITIVITY		Less than 18 µV for 10 dB S/N	Less than 2.0 µV for 12 dB SINAD	Less than 3.2 µV for 10 dB S/N	Less than 0.5 µV for 12 dB SINAD			
RECEIVE SYSTEM		Single-conversion superheterodyne		Double-conversion superheterodyne				
IF FREQ.	1st	455 kHz	10.7 MHz	59.55 MHz				
	2nd	–	–	455 kHz				
SELECTIVITY		More than 6 kHz/−6 dB	More than 200 kHz/−6 dB	More than 12.5 kHz/−6 dB				
		Less than 20 kHz/ −40 dB	Less than 600 kHz/ −20 dB	Less than 30 kHz/−60 dB				
SQUELCH SENSITIVITY		56 µV (Fixed)	32 µV (Fixed)	0.56 µV (Fixed)	0.22 µV	0.22 µV	0.4 µV	0.32 µV
ANTENNA IMPEDANCE		50 Ω unbalanced						
USABLE TEMP. RANGE		−10 °C∼+60 °C; +14 °F∼140 °F						
FREQUECY STABILITY		±10 ppm (−10 °C∼+60 °C; +14 °F∼+140 °F)						
POWER SUPPLY REQUIREMENT		13.8 V DC±15 % (The DC power is applied from the IC-901A/E.)						
AUDIO OUTPUT POWER		More than 2.4 W at 10 % distortion with an 8 Ω load						
CURRENT DAIN		Max. audio output: 1.8 A Squelched: 1.2 A (The current drain includes all current drain when operating with the IC-901A/E.)						
DIMENSIONS		177 (W)×25 (H)×171 (D) mm; 7.0 (W)×1.0 (H)×6.7 (D) in (Projections not included)						
WEIGHT		1.0 kg; 2.2 lb						

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

SECTION 2 INSIDE VIEW



SECTION 3 CIRCUIT DESCRIPTION

3-1 GENERAL

The UX-R91A/E is designed for the following bands and modes. The abbreviation of the band name is used in the following sections.

BAND	MODE	FREQUENCY COVERAGE
MW	AM	520~1630 kHz
WFM	WFM	76.00~108.00 MHz
AIR	AM	108.00~137.00 MHz
144 MHz	FM	137.00~200.00 MHz
220 MHz	FM	200.00~236.00 MHz
400 MHz	FM	300.00~500.00 MHz
800 MHz	FM	800.00~950.00 MHz

3-2 RECEIVER CIRCUITS

3-2-1 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

Received signals enter the antenna connector and pass through the limiter circuit (D24, D25) and are then applied to an antenna switching circuit (D23, D30, D34, D38, D42).

3-2-2 RF CIRCUIT (MAIN UNIT)

(1) AIR AND 144 MHz BANDS

RF signals from D23 pass through a high-pass filter (L19, C134, C137) and an RF amplifier (Q33). The signals are applied to a bandpass filter (L17, L18, C127~C132, D20, D21) to suppress out-of-band signals. The filtered signals are applied to a 1st mixer (Q4).

The RF gain of Q33 is controlled by AGC voltage from Q51 to provide strong signal distortion during AIR band receiving.

D20 and D21 are varactor diodes that track the bandpass filter and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the bandpass filter for wide bandwidth reception and good image response rejection.

(2) 220 MHz BAND

RF signals from D30 pass through a high-pass filter (L22, C150, C153) and an RF amplifier (Q35). The signals are applied to a bandpass filter (L20, L21, C143~C148, D27, D28) to suppress out-of-band signals. The filtered signals are applied to the 1st mixer (Q4).

D27 and D28 are varactor diodes that track the bandpass filter and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the bandpass filter for wide bandwidth reception and good image response rejection.

(3) 400 MHz BAND

RF signals from D34 pass through a high-pass filter (L27, C167~C169) and an RF amplifier (Q38). The signals are applied to a bandpass filter (L24~L26, C161, C162, C164, C248, D32, D33) to suppress out-of-band signals. The filtered signals are amplified at Q37 and are then applied to the 1st mixer (Q4).

RECEIVER CIRCUITS

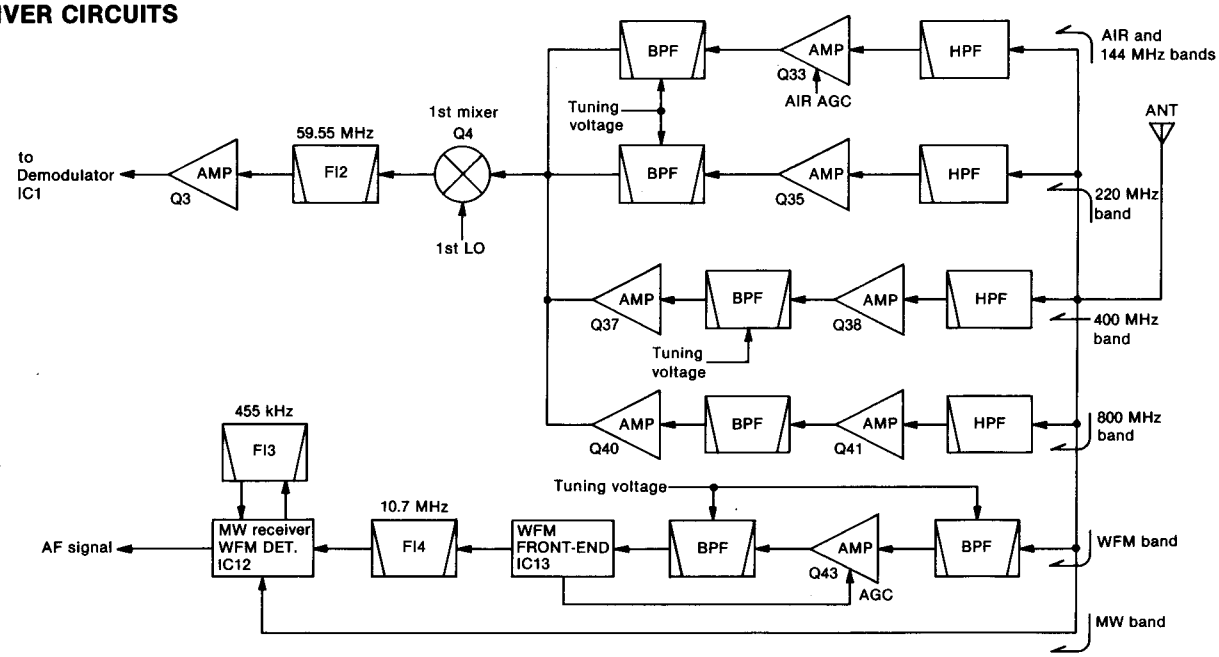


Fig. 1

D32 and D33 are varactor diodes that track the bandpass filter and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the bandpass filter for wide bandwidth reception and good image response rejection.

(4) 800 MHz BAND

RF signals from D38 pass through a high-pass filter (L28, C184~C186) and an RF amplifier (Q41). The signals are applied to a bandpass filter (C176, C178, strip lines) to suppress out-of-band signals. The filtered signals are amplified at Q40 and then applied to the 1st mixer (Q4).

(5) WFM BAND

RF signals from D42 pass through a bandpass filter (L32, C252, D41) and an RF amplifier (Q43). The signals are applied to another bandpass filter (L31, C251, D40) to suppress out-of-band signals. The filtered signals are applied to a WFM front-end IC (IC13).

D40 and D41 are varactor diodes that track the bandpass filters and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the bandpass filters for wide bandwidth reception and good image response rejection.

The RF gain of Q43 is controlled by AGC voltage from IC13 pin 3 to provide strong signal distortion.

(6) MW BAND

RF signals from D42 pass through an attenuator (R150, R249, R250) and are then applied to an MW receiver/ WFM demodulator IC (IC12).

3-2-3 1ST MIXER AND 1ST IF CIRCUITS (MAIN UNIT)

(1) AIR~800 MHz BANDS

The signals from 1 of the 4 RF circuits are applied to the 1st mixer (Q4) and mixed with the 1st LO signal from the PLL circuit to produce a 59.55 MHz 1st IF signal.

The 1st IF signal is applied to a pair of crystal filters (FI2) to suppress out-of-band signals. The 1st IF signal is amplified at an IF amplifier (Q3) and then applied to a 2nd mixer circuit.

(2) WFM BAND

The signals from the RF circuit are applied to the 1st mixer section of IC13 and are mixed with a 1st LO signal to be converted to a 10.7 MHz 1st IF signal.

IC13 contains the 1st mixer, local oscillator and AGC circuits. The local oscillator section generates 65.3~ 97.3 MHz for the 1st LO signal.

The 1st IF signal from the 1st mixer (IC13, pin 2) passes through a ceramic filter (FI4), where unwanted signals are suppressed. It is then applied to the MW receiver/WFM demodulator IC (IC12) to demodulate the 1st IF signal into a stereo AF signal.

3-2-4 2ND IF AND DEMODULATOR CIRCUITS (MAIN UNIT)

The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal. A double superheterodyne system (which converts receive signals twice) improves the image rejection ratio and obtains stable receiver gain.

The 1st IF signal from Q3 is applied to the 2nd mixer section of IC1, and is mixed with a 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 X1 generate 59.095 MHz for the 2nd LO signal.

The 2nd IF signal from the 2nd mixer (IC1, pin 3) passes through a ceramic filter (FI1), where unwanted signals are suppressed. It is then amplified at the limiter amplifier section (IC1, pin 5) and applied to the quadrature detector section (IC1, pin 8 and discriminator L1) to demodulate the 2nd IF signal into an AF signal.

AF signal output from pin 9 of IC1 is applied to an AF signal selector (IC16~IC18).

The AIR band signal from FI1 is amplified at Q45 and then detected at an AIR detector (D43) to demodulate the 2nd IF signal into an AF signal. The signal is also applied to the AF signal selector.

FM DEMODULATOR CIRCUIT

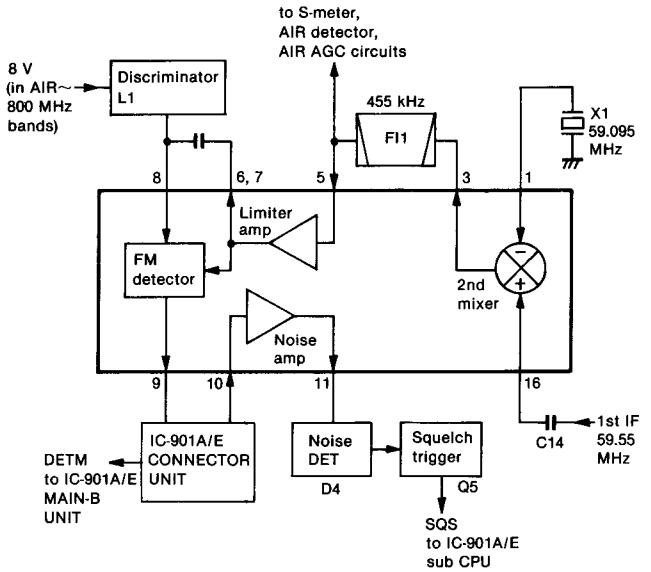


Fig. 2

3-2-5 WFM DEMODULATOR CIRCUIT (MAIN UNIT)

The 1st IF signal from FI4 is applied to the IF amplifier section of IC12 and then to the quadrature detector section to demodulate the 1st IF signal into an AF signal.

IC12 contains the IF amplifier, quadrature detector and PLL stereo decoder circuits for an FM signal. The AF signal output from IC12 pin 17 is applied to the PLL stereo decoder circuit (pin 16) to convert the AF signal into stereo signals.

The stereo signals are adjusted with a volume control circuit (IC9~IC11) and then applied to a stereo power amplifier to drive the speakers. IC10 sets the attenuation level based on serial data from the IC-901A/E sub CPU, and controls the volume and balance level.

3-2-6 MW BAND RECEIVER CIRCUIT (MAIN UNIT)

The received signals are applied to the MW receiver/WFM demodulator IC (IC12). The signals are applied to the RF amplifier section of IC12 and the mixer section. The signals are mixed with a 1st LO signal to be converted to a 455 kHz 1st IF signal.

IC12 contains the RF amplifier, 1st mixer, local oscillator, IF amplifier, AM detector and AGC circuits for an AM signal. The local oscillator section generates 0.977~2.084 MHz for the 1st LO signal.

The 1st IF signal from the 1st mixer (IC12, pin 3) passes through a ceramic filter (FI3), where unwanted signals are suppressed. The filtered signal is applied to the IF amplifier section (IC12, pin 5) and then to the AM detector section to demodulate the 1st IF signal into an AF signal.

MW RECEIVER CIRCUIT

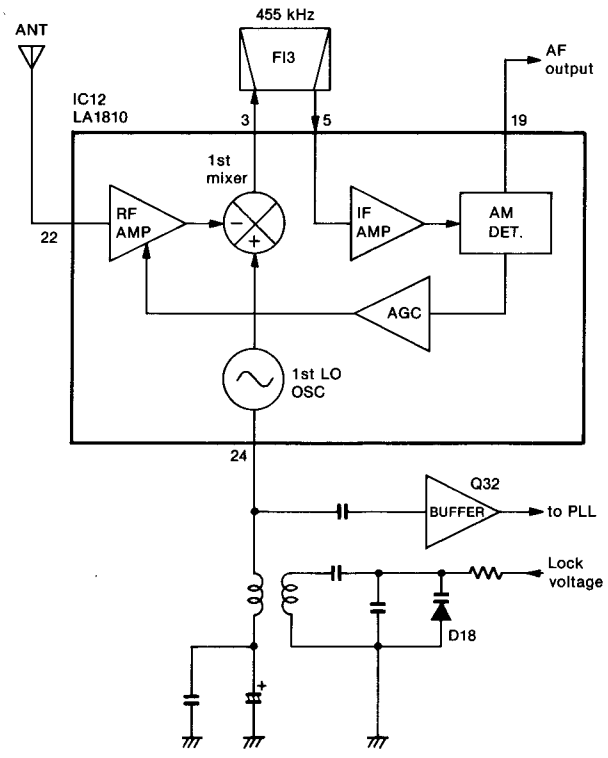


Fig. 3

3-2-7 S-METER CIRCUIT (MAIN UNIT)

(1) AIR~800 MHz BANDS

A portion of the 2nd IF signal from FI1 is amplified at Q45 and is then applied to the S-meter amplifier, AIR band detector and AGC circuits.

The signal, amplified at Q2 and Q1, is rectified at D1 to obtain S-meter voltage. The voltage is applied to the IC-901A/E sub CPU to indicate the signal strength level on the function display.

(2) WFM AND MW BANDS

A portion of the AGC voltage from IC12 pin 4 is buffer-amplified at Q59 and the voltage is applied to the IC-901A/E sub CPU to indicate the signal strength level on the function display.

In the WFM band, Q65 is turned ON to adjust the S-meter voltage level between the WFM and MW bands.

3-2-8 AGC CIRCUIT (MAIN UNIT)

(1) AIR BAND

In the AIR band, an AGC amplifier (Q46) is activated by an AIR 8 V line. The 2nd IF signal from Q45 is amplified at Q46 and is then detected at D44 to obtain AIR band AGC voltage.

The AGC voltage controls the gain of the RF amplifier (Q33) using Q47, Q50 and Q51.

(2) WFM BAND

A dual-gate FET is used on the RF amplifier (Q43). The 2nd gate of Q43 is controlled by AGC bias voltage from the AGC section of IC13 to provide stable WFM receiving.

(3) MW BAND

An MW AGC circuit is in the MW receiver/WFM demodulator IC (IC12). MW AGC voltage controls the IF amplifier section of IC12 to provide stable MW receiving.

3-2-9 SQUELCH CIRCUIT (MAIN UNIT)

A squelch circuit cuts out AF signals when no RF signal is received. By detecting noise components in the AF signals, the squelch circuit switches the AF control circuits.

(1) AIR~800 MHz BANDS

Some of the noise components in the AF signals from IC1 pin 9 are adjusted with the sub squelch control circuit (IC9, IC10) on the IC-901A/E CONNECTOR UNIT. The signals are applied to IC1 pin 10 via an SQ2 signal selector (IC14, IC15).

In the AIR band, the noise signal from the FM detector section (IC1 pin 9) is applied to the SQ2 signal selector and then to IC1 pin 10.

The active filter section in IC1 amplifies noise components of frequencies of 20 kHz and above, and outputs the resulting signals from pin 11. Output signals are rectified by D4 and are converted to DC voltage. This voltage is applied to the squelch trigger circuit (Q5).

The DC voltage triggers the squelch circuit. Q5 outputs a "LOW" signal as the squelch signal. The signal is applied to the IC-901A/E sub CPU (IC1, pin 60). The sub CPU outputs an AFMB signal as a sub band mute signal.

(2) MW AND WFM BANDS

The squelch circuit uses a tuning indicator section of IC12. When the MW or WFM band is tuned in to a station, the tuning indicator signal from IC12 pin 8 is applied to Q64, turning ON DS1.

In the MW band, the "HIGH" signal from Q64 is applied to Q62 and Q61, and Q61 outputs a squelch signal via the SQS signal line.

In the WFM band, an FM/AM tuning indicator IC (IC22) is activated by the WFM 8 V line. An S-curve signal from IC12 pin 17 is applied to IC22 and IC22 detects the center frequency of the received signal. The resulting signal from pin 7 is applied to Q63 and Q63 outputs a squelch signal via the SQS signal line.

3-3 PLL CIRCUITS

3-3-1 GENERAL

A PLL circuit stably oscillates the receive local frequency. The PLL output frequency is controlled by the divided ratio (N-data) of the programmable divider.

The PLL circuit, using a one chip modulus prescaler (IC6), directly generates the 1st LO frequency with a Colpitts VCO (Q1) on the VCO-A BOARD and a Hartley VCO (Q1) on the VCO-B BOARD. The prescaler sets the dividing ratio based on serial data from the IC-901A/E sub CPU and compares the phases of a VCO signal and the reference oscillator frequency. The prescaler detects the out-of-step phase and outputs from pin 21. The reference frequency is oscillated at X2 on the MAIN UNIT.

In the WFM band, the PLL circuit generates the 1st LO frequency with the local oscillator section of IC13. In the MW band, the PLL circuit generates the 1st LO frequency with the local oscillator section of IC12.

3-3-2 REFERENCE OSCILLATOR CIRCUIT (MAIN UNIT)

A reference frequency is produced by the oscillator (Q8) and X2. C41 provides frequency control.

3-3-3 CHARGE PUMP AND LOOP FILTER CIRCUITS (MAIN UNIT)

Phase-detected signals from IC6 pin 21 are converted to DC voltage by a charge pump (Q18, Q19, Q52, Q53) and a loop filter (R52, C74).

The frequency at which the VCO-A oscillates is controlled by varactor diodes (D1~D8) on the VCO-A BOARD. DC voltage (PLL lock voltage) is provided through a buffer amplifier (Q22).

The frequency at which the VCO-B oscillates is controlled by varactor diodes (D1, D2) on the VCO-B BOARD. PLL lock voltage is provided through a buffer amplifier (Q20).

The frequency at which the WFM local oscillator section of IC13 oscillates is controlled by a pair of varactor diodes (D39). PLL lock voltage is provided through a buffer amplifier (Q44).

PLL CIRCUIT

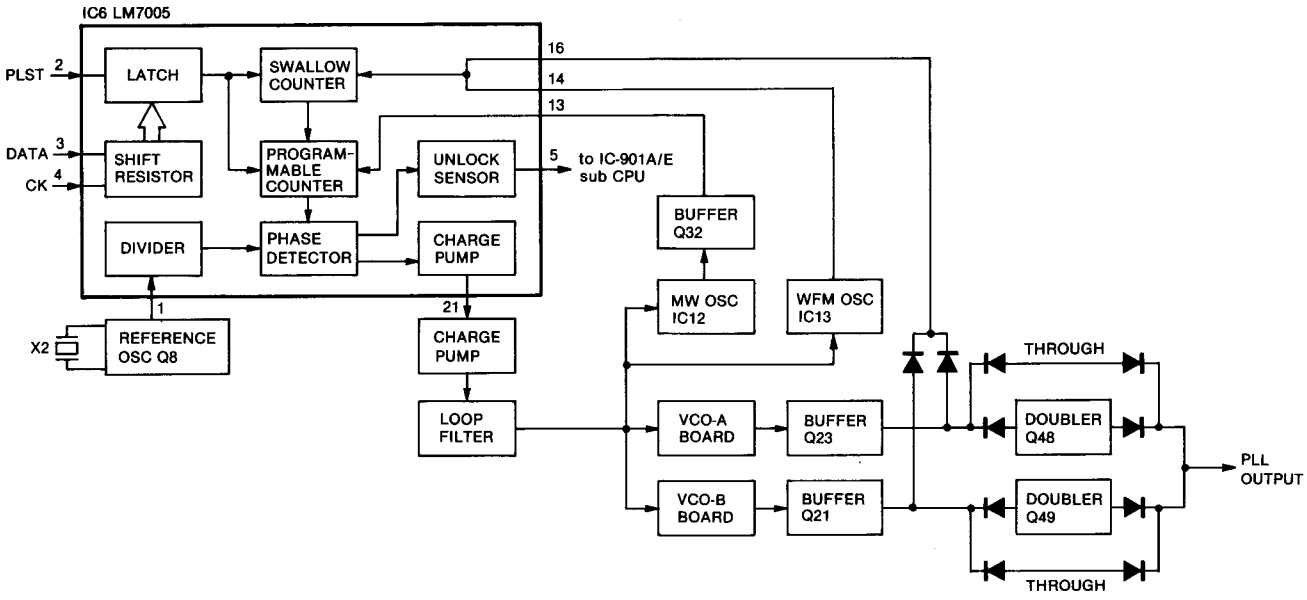


Fig. 4

The frequency at which the MW local oscillator section of IC12 oscillates is controlled by a varactor diode (D18). PLL lock voltage is provided through the buffer amplifier (Q44).

On the other hand, the output of the loop filter passes through buffer amplifiers (Q34, Q36, Q39, Q44) and is used as the tuning voltage for the Rx bandpass filters.

3-3-4 VCO-A CIRCUIT (VCO-A BOARD)

The VCO circuit (Q1, D1~D8) generates the 1st LO frequency of the AIR~220 MHz bands. Varactor diodes (D1~D8) provide frequency control. The buffer amplifier (Q2) protects the PLL output signal against VCO oscillation.

3-3-5 VCO-B CIRCUIT (VCO-B BOARD)

The VCO circuit (Q1, D1, D2) generates the 1st LO frequency of the 400 MHz and 800 MHz bands. Varactor diodes (D1, D2) provide frequency control. The buffer amplifier (Q2) protects the PLL output signal against VCO oscillation.

3-3-6 DOUBLER CIRCUITS (MAIN UNIT)

In the AIR band, a doubler circuit (Q48) is activated. The VCO-A output frequency is doubled to expand the VCO-A oscillation range.

In the 800 MHz band, a doubler circuit (Q49) is activated. The VCO-B output frequency is doubled to expand the VCO-B oscillation range.

In the other bands, the VCO-A or VCO-B output frequency is bypassed through diode switching circuits (D47~D50).

3-3-7 UNLOCK SENSOR CIRCUIT (MAIN UNIT)

When the PLL circuit is unlocked, IC6 pin 5 is "HIGH" and a "HIGH" signal is applied to Q52. Q52 and Q53 change the loop filter characteristics to obtain a rapid lockup speed when the frequency is greatly changed.

3-4 POWER SUPPLY CIRCUITS

3-4-1 VOLTAGE LINES

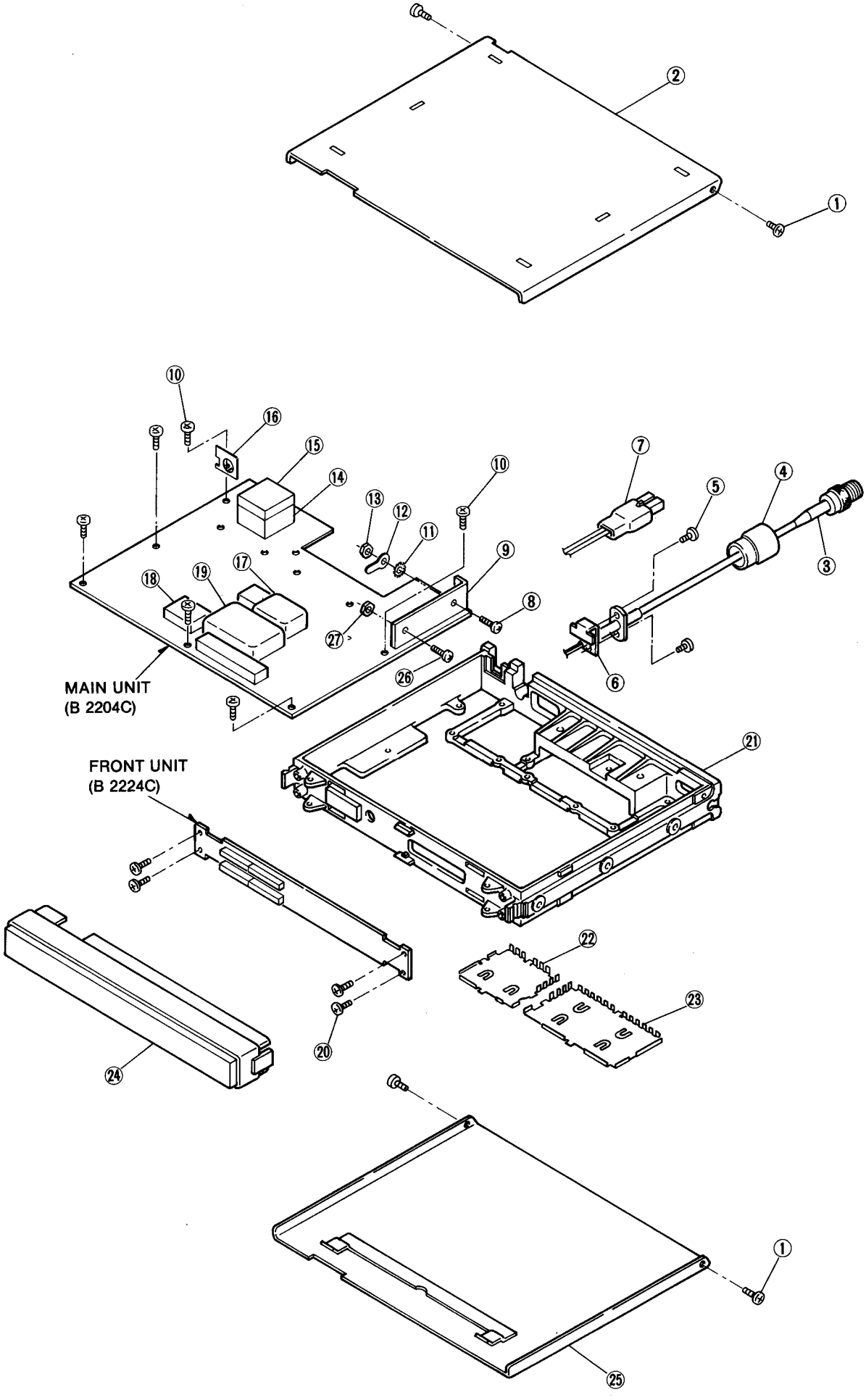
LINE	DESCRIPTION
HV	The external DC power from the DC power connector.
13.8 V	13.8 V DC controlled by the POW signal line.
5 V	Common 5 V converted from the 13.8 V line at IC7 on the MAIN UNIT.
8 V	Common 8 V converted from the 13.8 V line at Q24 and Q25 on the MAIN UNIT.
MW 8 V	MW 8 V converted from +8 V line at Q12.
WFM 8 V	WFM 8 V converted from +8 V line at Q13.
AIR 8 V	AIR band 8 V converted from +8 V line at Q27.
144M 8 V	AIR and 144 MHz bands 8 V converted from +8 V line at Q14.
220M 8 V	220 MHz band 8 V converted from +8 V line at Q15.
400M 8 V	400 MHz band 8 V converted from +8 V line at Q16.
800M 8 V	800 MHz band 8 V converted from +8 V line at Q17.
30 V	30 V DC converted from the 13.8 V line. IC2 on the MAIN UNIT is a switching regulator IC and converts Q6 output into approx. 30 V DC.

SECTION 4 MECHANICAL PARTS AND DISASSEMBLY

CHASSIS UNIT

LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810002730	Screw BuH M2.6×4 ZK BS	4
②	8110003570	Cover (G)-2 (top)	1
③	8900001900	Connector cable OPC-187	1
④	6950000030	N type cap-1	1
⑤	8810003670	Icom screw A 6	2
⑥	8930017210	720 ANT plate	1
⑦	8900001830	DC power cable OPC-169	1
⑧	8810002190	Screw FH M3×10	1
⑨	8410001510	720 Heatsink	1
⑩	8810003160	Set screw A M3×6	11
⑪	8850000570	Starwasher M 3	1
⑫	8860000120	Ground lag B 4 (M3) AG BS	1
⑬	8830000100	Nut M 3	1
⑭	8510006550	ANT shield case	1
⑮	8510006610	ANT shield cover	1
⑯	8930012170	Plate AS-304	1
⑰	8510001010	499 VCO case	1
⑱	8510006630	Doubler case	1
⑲	8510005340	637 VCO case	1
⑳	8810003960	Setscrew A M2.6×5	4
㉑	8010009120	720 Chassis	1
㉒	8510004440	Filter shield plate	1
㉓	8510004452	PA shield plate-2	1
㉔	8210004960	Front panel (G) UX-R91E (EUR)	1
	8210004970	Front panel (H) UX-R91A (USA, AUS)	1
㉕	8110004110	Cover (F)-2 (bottom)	1
㉖	8810002190	Screw FH M3×10	1
㉗	8830000100	Nut M 3	1

Screw abbreviations PH: Pan head BuH: Button head FH: Flat head ZK: Black Ni: Nickel


MAIN UNIT
(B 2204C)
FRONT UNIT
(B 2224C)

SECTION 5 PARTS LIST

[FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130001250	IC	μPD4066BG-T1
IC2	1130000830	IC	μPD4094BG-T1
IC3	1130000590	IC	μPD4081BG-T1
IC4	1130002750	IC	μPD4538BG
IC5	1130000590	IC	μPD4081BG-T1
IC6	1130003760	IC	TC4S81F (TE85R)
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1590000420	Transistor	RN1404 (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
Q4	1530000160	Transistor	2SC2712-Y (TE85R)
Q5	1590000510	Transistor	RN1409 (TE85R)
Q6	1590000480	Transistor	RN2402 (TE85R)
Q7	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000050	Diode	1SS193 (TE85R)
R1	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R2	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R3	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R4	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R5	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R6	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R7	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R8	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R9	7030000670	Resistor	MCR10EZHJ 270 kΩ (274)
R10	7030000660	Resistor	MCR10EZHJ 220 kΩ (224)
R11	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R12	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R13	7030000550	Resistor	MCR10EZHJ 27 kΩ (273)
R15	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R16	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
C1	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C5	4510001470	Electrolytic	50 MS5 1 μF
C6	4030004990	Ceramic	C2012 CH 1H 101J-T-A
C7	4550000270	Tantalum	TESVA 1E 474M1-8L
C8	4550000510	Tantalum	TESVA 1V 473M1-8L
C9	4550000550	Tantalum	TESVA 1V 224M1-8L
C10	4550000560	Tantalum	TESVA 1V 334M1-8L
C12	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C13	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C14	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C15	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
EP1	0910022863	P.C. Board	B 2224C (FRONT)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001670	IC	MC3361D
IC2	1110001700	IC	TL499ACPS
IC6	1130004340	IC	LM7005
IC7	1180000420	IC	TA78L05F (TE12R)
IC8	1110001980	IC	TA8207K

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC9	1110000960	IC	NJM4558M (T1)
IC10	1130003060	IC	TC9154AP
IC11	1110000960	IC	NJM4558M (T1)
IC12	1120001670	IC	LA1810
IC13	1120001660	IC	LA1177
IC14	1130004200	IC	TC4S66F (TE85R)
IC15	1130004200	IC	TC4S66F (TE85R)
IC16	1130004200	IC	TC4S66F (TE85R)
IC17	1130004200	IC	TC4S66F (TE85R)
IC18	1130004200	IC	TC4S66F (TE85R)
IC19	1130003760	IC	TC4S81F (TE85R)
IC20	1130004170	IC	TC4S01F (TE85R)
IC21	1130004500	IC	TC4S11F (TE85R)
IC22	1110001160	IC	BA695
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1530000160	Transistor	2SC2712-Y (TE85R)
Q3	1560000270	FET	2SK302-Y (TE85R)
Q4	1580000360	FET	3SK177-T2B U73
Q5	1530000160	Transistor	2SC2712-Y (TE85R)
Q6	1540000150	Transistor	2SD1225M R
Q7	1530002050	Transistor	2SC3661-TA
Q8	1530000160	Transistor	2SC2712-Y (TE85R)
Q12	1510000110	Transistor	2SA1162-Y (TE85R)
Q13	1510000110	Transistor	2SA1162-Y (TE85R)
Q14	1510000110	Transistor	2SA1162-Y (TE85R)
Q15	1510000110	Transistor	2SA1162-Y (TE85R)
Q16	1510000110	Transistor	2SA1162-Y (TE85R)
Q17	1510000110	Transistor	2SA1162-Y (TE85R)
Q18	1560000360	FET	2SK209-Y (TE85R)
Q19	1530000160	Transistor	2SC2712-Y (TE85R)
Q20	1560000360	FET	2SK209-Y (TE85R)
Q21	1530002030	Transistor	2SC3772-3-TA
Q22	1560000360	FET	2SK209-Y (TE85R)
Q23	1530002240	Transistor	2SC3775-3-TA
Q24	1530000160	Transistor	2SC2712-Y (TE85R)
Q25	1520000080	Transistor	2SB909M R
Q26	1590000420	Transistor	RN1404 (TE85R)
Q27	1510000110	Transistor	2SA1162-Y (TE85R)
Q28	1530000160	Transistor	2SC2712-Y (TE85R)
Q29	1510000370	Transistor	2SA1359-Y
Q31	1560000270	FET	2SK302-Y (TE85R)
Q32	1530000160	Transistor	2SC2712-Y (TE85R)
Q33	1530002240	Transistor	2SC3775-3-TA
Q34	1560000360	FET	2SK209-Y (TE85R)
Q35	1530002240	Transistor	2SC3775-3-TA
Q36	1560000360	FET	2SK209-Y (TE85R)
Q37	1530002030	Transistor	2SC3772-3-TA
Q38	1530002240	Transistor	2SC3775-3-TA
Q39	1560000360	FET	2SK209-Y (TE85R)
Q40	1530002180	Transistor	2SC4095-T2
Q41	1530002180	Transistor	2SC4095-T2
Q43	1580000230	FET	3SK122 K
Q44	1560000360	FET	2SK209-Y (TE85R)
Q45	1560000270	FET	2SK302-Y (TE85R)
Q46	1530000160	Transistor	2SC2712-Y (TE85R)
Q47	1530002050	Transistor	2SC3661-TA
Q48	1530002240	Transistor	2SC3775-3-TA
Q49	1530002240	Transistor	2SC3775-3-TA
Q50	1560000360	FET	2SK209-Y (TE85R)
Q51	1510000110	Transistor	2SA1162-Y (TE85R)
Q52	1530000160	Transistor	2SC2712-Y (TE85R)
Q53	1560000360	FET	2SK209-Y (TE85R)
Q54	1530002050	Transistor	2SC3661-TA
Q57	1590000420	Transistor	RN1404 (TE85R)
Q58	1590000410	Transistor	RN2404 (TE85R)
Q59	1590000410	Transistor	RN2404 (TE85R)
Q61	1530000160	Transistor	2SC2712-Y (TE85R)
Q62	1590000420	Transistor	RN1404 (TE85R)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q63	1590000420	Transistor	RN1404 (TE85R)
Q64	1590000410	Transistor	RN2404 (TE85R)
Q65	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1790000490	Diode	HSM88AS-TR
D2	1750000050	Diode	1SS193 (TE85R)
D3	1750000050	Diode	1SS193 (TE85R)
D4	1790000490	Diode	HSM88AS-TR
D5	1750000050	Diode	1SS193 (TE85R)
D6	1790000470	Diode	MA159 (TX)
D10	1790000450	Diode	MA862 (TX)
D11	1750000020	Diode	1SS184 (TE85R)
D12	1750000020	Diode	1SS184 (TE85R)
D13	1730000510	Zener	RD3.9M-T2B2
D14	1710000010	Diode	15CD11
D18	1720000030	Varicap	1SV149C
D19	1750000080	Diode	1SS153-T2
D20	1720000270	Varicap	1SV217 (TPH2)
D21	1720000270	Varicap	1SV217 (TPH2)
D23	1750000080	Diode	1SS153-T2
D24	1710000290	Diode	MI308
D25	1710000290	Diode	MI308
D26	1750000080	Diode	1SS153-T2
D27	1720000200	Varicap	1SV88
D28	1720000200	Varicap	1SV88
D30	1750000080	Diode	1SS153-T2
D31	1750000080	Diode	1SS153-T2
D32	1720000260	Varicap	1SV214 (TPH2)
D33	1720000260	Varicap	1SV214 (TPH2)
D34	1750000080	Diode	1SS153-T2
D35	1750000080	Diode	1SS153-T2
D36	1790000490	Diode	HSM88AS-TR
D38	1750000080	Diode	1SS153-T2
D39	1720000280	Varicap	SVC203
D40	1720000280	Varicap	SVC203
D41	1720000280	Varicap	SVC203
D42	1790000450	Diode	MA862 (TX)
D43	1790000490	Diode	HSM88AS-TR
D44	1790000490	Diode	HSM88AS-TR
D45	1750000050	Diode	1SS193 (TE85R)
D46	1750000050	Diode	1SS193 (TE85R)
D47	1790000450	Diode	MA862 (TX)
D48	1790000450	Diode	MA862 (TX)
D49	1790000450	Diode	MA862 (TX)
D50	1790000450	Diode	MA862 (TX)
D51	1750000050	Diode	1SS193 (TE85R)
D52	1750000050	Diode	1SS193 (TE85R)
D53	1750000020	Diode	1SS184 (TE85R)
D54	1750000050	Diode	1SS193 (TE85R)
D55	1750000020	Diode	1SS184 (TE85R)
D56	1730000970	Zener	RD15M-T2B2
FI1	2030000030	Ceramic Filter	KBF-455R-15A
FI2	2010000640	Filter	59M15B (FL-82)
FI3	2020000710	Ceramic Filter	CFWM455G
FI4	2020000540	Ceramic Filter	SFE10.7MMH-A
X1	6050003160	Crystal	CR-176
X2	6050003690	Crystal	CR-206
L1	6150002770	Coil	LS-293
L2	6150002760	Coil	LS-299
L3	6150002750	Coil	LS-289
L4	6150002740	Coil	LS-285
L5	6150002740	Coil	LS-285
L6	6150002740	Coil	LS-285
L7	6180001120	Coil	FL 5H 101K
L8	6190000220	Coil	S0971136-101K
L9	6180001300	Coil	LAL 02NA 100K
L10	6180001510	Coil	LAL 02NA 101K
L12	6110001530	Coil	LA-233

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L13	6110001640	Coil	LA-247
L14	6150003480	Coil	LS-385 (YT-30103)
L15	6180002610	Coil	FL 11H 393J
L16	6150003460	Coil	LS-383 (HW-6193)
L17	6150003560	Coil	LS-402
L18	6150001930	Coil	LS-182
L19	6150003560	Coil	LS-402
L20	6150003560	Coil	LS-402
L21	6150001930	Coil	LS-182
L22	6150003560	Coil	LS-402
L23	6110001520	Coil	LA-232
L24	6110001980	Coil	LA-222
L25	6110001980	Coil	LA-222
L26	6110001520	Coil	LA-232
L27	6110001540	Coil	LA-234
L28	6110001980	Coil	LA-222
L29	6150002740	Coil	LS-285
L30	6150003490	Coil	LS-386 (YT-30224)
L31	6150002740	Coil	LS-285
L32	6150002740	Coil	LS-285
L33	6150003550	Coil	LS-406
L34	6110001980	Coil	LA-222
L35	6180001460	Coil	LAL 03NA 681K
L36	6180001460	Coil	LAL 03NA 681K
L37	6110001620	Coil	LA-245
L38	6110001530	Coil	LA-233
L39	6110001540	Coil	LA-234
L40	6110001530	Coil	LA-233
L41	6110001980	Coil	LA-222
L42	6110001980	Coil	LA-222
L43	6110001530	Coil	LA-233
L44	6200000110	Coil	LQN 2A 33NM
R1	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R2	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R3	4610001030	Trimmer	EVM-LGGA00B53 (502)
R4	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R7	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R8	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R9	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R10	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R11	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R12	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R13	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R14	7030000350	Resistor	MCR10EZHJ 560 Ω (561)
R15	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R16	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R17	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R18	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R19	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R20	7030000720	Resistor	MCR10EZHJ 680 kΩ (684)
R21	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R22	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R23	7010003950	Resistor	R20J 10 Ω
R24	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R25	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R26	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R27	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R28	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R29	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R30	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R33	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R34	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R36	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R37	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R38	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R39	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R40	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R41	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R42	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R43	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R44	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R45	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R46	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
R47	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R48	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R51	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R52	7030000480	Resistor MCR10EZHJ 6.8 kΩ (682)
R53	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R54	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R55	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R56	7030000350	Resistor MCR10EZHJ 560 Ω (561)
R57	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R58	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R59	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R60	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R61	7030000160	Resistor MCR10EZHJ 15 Ω (150)
R62	7030000160	Resistor MCR10EZHJ 15 Ω (150)
R63	7030000160	Resistor MCR10EZHJ 15 Ω (150)
R64	7030000390	Resistor MCR10EZHJ 1.2 kΩ (122)
R65	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R66	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R67	7030000300	Resistor MCR10EZHJ 220 Ω (221)
R68	7030000360	Resistor MCR10EZHJ 680 Ω (681)
R69	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R70	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R71	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R72	7030000430	Resistor MCR10EZHJ 2.7 kΩ (272)
R73	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R74	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R75	7030000700	Resistor MCR10EZHJ 470 kΩ (474)
R76	7030000510	Resistor MCR10EZHJ 12 kΩ (123)
R77	7030000700	Resistor MCR10EZHJ 470 kΩ (474)
R78	7030000270	Resistor MCR10EZHJ 120 Ω (121)
R79	7030000270	Resistor MCR10EZHJ 120 Ω (121)
R80	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R81	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R87	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R88	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R89	7030000440	Resistor MCR10EZHJ 3.3 kΩ (332)
R90	7030000440	Resistor MCR10EZHJ 3.3 kΩ (332)
R94	7030000550	Resistor MCR10EZHJ 27 kΩ (273)
R95	4610001230	Trimmer EVM-LGGA00B14 (103)
R96	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R97	7030000530	Resistor MCR10EZHJ 18 kΩ (183)
R98	7030000450	Resistor MCR10EZHJ 3.9 kΩ (392)
R99	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R100	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R101	7030000590	Resistor MCR10EZHJ 56 kΩ (563)
R102	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R103	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R104	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R105	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R106	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R107	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R108	7030000140	Resistor MCR10EZHJ 10 Ω (100)
R109	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R110	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R112	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R113	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R114	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R115	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R116	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R117	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R118	7030000180	Resistor MCR10EZHJ 22 Ω (220)
R119	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R120	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R122	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R123	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R124	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R125	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R126	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R127	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R128	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R129	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R130	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R131	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R132	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R133	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
R134	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R135	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R136	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R139	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R140	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R141	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R142	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R143	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R144	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R145	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R146	7030000220	Resistor MCR10EZHJ 47 Ω (470)
R147	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R148	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R149	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R150	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R151	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R152	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R153	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R154	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R155	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R156	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R157	7030000650	Resistor MCR10EZHJ 180 kΩ (184)
R158	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R159	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R160	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R161	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R162	7030000340	Resistor MCR10EZHJ 470 Ω (471)
R163	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R164	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R165	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R166	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R167	7030000560	Resistor MCR10EZHJ 33 kΩ (333)
R168	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R169	7030000660	Resistor MCR10EZHJ 220 kΩ (224)
R170	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R171	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R172	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R173	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R174	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R175	4610001230	Trimmer EVM-LGGA00B14 (103)
R176	7030000660	Resistor MCR10EZHJ 220 kΩ (224)
R177	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R178	7030000670	Resistor MCR10EZHJ 270 kΩ (274)
R179	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R180	7030000970	Resistor MCR10EZHJ 2.2 MΩ (225)
R181	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R182	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R183	7030000250	Resistor MCR10EZHJ 82 Ω (820)
R184	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R185	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R186	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R187	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R188	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R189	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R190	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R191	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R192	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R193	7030000260	Resistor MCR10EZHJ 100 Ω (101)
R194	7030000520	Resistor MCR10EZHJ 15 kΩ (153)
R195	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R196	7030000420	Resistor MCR10EZHJ 2.2 kΩ (222)
R197	7030000460	Resistor MCR10EZHJ 4.7 kΩ (472)
R198	7030000620	Resistor MCR10EZHJ 100 kΩ (104)
R199	7030000670	Resistor MCR10EZHJ 270 kΩ (274)
R200	7030000670	Resistor MCR10EZHJ 270 kΩ (274)
R201	7030000590	Resistor MCR10EZHJ 56 kΩ (563)
R202	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R203	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R204	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R205	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R206	7030000500	Resistor MCR10EZHJ 10 kΩ (103)
R207	7030000280	Resistor MCR10EZHJ 150 Ω (151)
R208	7030000580	Resistor MCR10EZHJ 47 kΩ (473)
R214	7030000380	Resistor MCR10EZHJ 1 kΩ (102)
R215	7030000580	Resistor MCR10EZHJ 47 kΩ (473)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R216	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R217	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R218	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R219	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R220	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R221	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R222	7030000590	Resistor	MCR10EZHJ 56 kΩ (563)
R223	7030000250	Resistor	MCR10EZHJ 82 Ω (820)
R224	7030000270	Resistor	MCR10EZHJ 120 Ω (121)
R226	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R227	4610001040	Trimmer	EVM-LGGA00B54 (503)
R228	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R229	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R230	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R231	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R232	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R233	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R234	4610001030	Trimmer	EVM-LGGA00B53 (502)
R235	7030000520	Resistor	MCR10EZHJ 15 kΩ (153)
R236	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R237	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R238	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R239	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R240	7030000970	Resistor	MCR10EZHJ 2.2 MΩ (225)
R241	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R242	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R243	7030000160	Resistor	MCR10EZHJ 15 Ω (150)
R244	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R245	7010004600	Resistor	R20J 2.2 MΩ
R246	7010004600	Resistor	R20J 2.2 MΩ
R247	7010004600	Resistor	R20J 2.2 MΩ
R248	7010004190	Resistor	R20J 1 kΩ
R249	7010004190	Resistor	R20J 1 kΩ
R250	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R251	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R252	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R253	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R254	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R255	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R256	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R257	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R258	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R259	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R260	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
C1	4510002780	Electrolytic	16 SS 10 µF
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C3	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C4	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C5	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C8	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C9	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C10	4030004450	Ceramic	C2012 SL 1H 080D-T-A
C11	4030004480	Ceramic	C2012 SL 1H 120J-T-A
C12	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C13	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C14	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C16	4030004420	Ceramic	C2012 SL 1H 050C-T-A
C17	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C18	4030004540	Ceramic	C2012 SL 1H 300J-T-A
C19	4030004550	Ceramic	C2012 SL 1H 330J-T-A
C20	4030004470	Ceramic	C2012 SL 1H 100D-T-A
C21	4030004540	Ceramic	C2012 SL 1H 300J-T-A
C22	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C23	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C24	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C25	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C26	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C28	4030004520	Ceramic	C2012 SL 1H 220J-T-A
C29	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C30	4510002780	Electrolytic	16 SS 10 µF
C31	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C32	4030004720	Ceramic	C2012 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C33	4510002780	Electrolytic	16 SS 10 µF
C34	4510002780	Electrolytic	16 SS 10 µF
C35	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C36	4510002630	Electrolytic	50 SS 47 µF
C37	4550000320	Tantalum	DN 1V 0R1M
C38	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C39	4510002980	Electrolytic	50 SS 10 µF
C40	4030002420	Ceramic	GRM40 TH 180J 50PT
C41	4610000380	Trimmer	ECRGA020E30
C42	4030005000	Ceramic	C2012 CH 1H 121J-T-A
C43	4030004960	Ceramic	C2012 CH 1H 560J-T-A
C44	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C45	4030004420	Ceramic	C2012 SL 1H 050C-T-A
C46	4510002780	Electrolytic	16 SS 10 µF
C47	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C48	4510002780	Electrolytic	16 SS 10 µF
C49	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C50	4510002780	Electrolytic	16 SS 10 µF
C51	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C52	4510002780	Electrolytic	16 SS 10 µF
C53	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C54	4510002780	Electrolytic	16 SS 10 µF
C55	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C56	4510002780	Electrolytic	16 SS 10 µF
C57	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C58	4030004420	Ceramic	C2012 SL 1H 050C-T-A
C62	4510002780	Electrolytic	16 SS 10 µF
C63	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C64	4030006450	Ceramic	C2012 JF 1H 103Z-T-A
C65	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C66	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C69	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C70	4030004570	Ceramic	C2012 SL 1H 470J-T-A
C71	4550000410	Tantalum	DN 1V 4R7M
C72	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C73	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C74	4550000390	Tantalum	DN 1V R22M
C75	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C76	4510002790	Electrolytic	16 SS 22 µF
C77	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C78	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C79	4510002790	Electrolytic	16 SS 22 µF
C80	4510002790	Electrolytic	16 SS 22 µF
C81	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C82	4510002810	Electrolytic	16 SS 47 µF
C84	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C85	4510002790	Electrolytic	16 SS 22 µF
C86	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C87	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C88	4510003040	Electrolytic	16 SS 100 µF
C89	4550000390	Tantalum	DN 1V R22M
C90	4510002810	Electrolytic	16 SS 47 µF
C91	4510002810	Electrolytic	16 SS 47 µF
C92	4510002950	Electrolytic	50 SS 2R2 µF
C93	4510002950	Electrolytic	50 SS 2R2 µF
C94	4510002810	Electrolytic	16 SS 47 µF
C95	4510003040	Electrolytic	16 SS 100 µF
C96	4550000390	Tantalum	DN 1V R22M
C97	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C98	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C99	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C100	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C101	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C102	4510001440	Electrolytic	50 MS5 R22 µF
C103	4510001460	Electrolytic	50 MS5 R47 µF
C104	4030008550	Ceramic	C2012 JF 1H 473Z-T-A
C107	4510002790	Electrolytic	16 SS 22 µF
C108	4030008550	Ceramic	C2012 JF 1H 473Z-T-A
C110	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C111	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C112	4510001470	Electrolytic	50 MS5 1 µF
C113	4510001490	Electrolytic	50 MS5 3R3 µF
C114	4030004690	Ceramic	C2012 SL 1H 331J-T-A
C115	4510001890	Electrolytic	50 MS5 0R1 µF
C116	4030004730	Ceramic	C2012 JB 1H 222K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C118	4510001350	Electrolytic 16 MS5 10 µF
C119	4030004700	Ceramic C2012 SL 1H 391J-T-A
C120	4030004490	Ceramic C2012 SL 1H 150J-T-A
C121	4030008550	Ceramic C2012 JF 1H 473Z-T-A
C122	4030008550	Ceramic C2012 JF 1H 473Z-T-A
C123	4030004720	Ceramic C2012 JB 1H 102K-T-A
C124	4030004400	Ceramic C2012 SL 1H 030C-T-A
C125	4030004710	Ceramic C2012 JB 1H 471K-T-A
C126	4030004720	Ceramic C2012 JB 1H 102K-T-A
C127	4030004420	Ceramic C2012 SL 1H 050C-T-A
C128	4030004610	Ceramic C2012 SL 1H 101J-T-A
C129	4030004520	Ceramic C2012 SL 1H 220J-T-A
C130	4030004470	Ceramic C2012 SL 1H 100D-T-A
C131	4030004610	Ceramic C2012 SL 1H 101J-T-A
C132	4030004420	Ceramic C2012 SL 1H 050C-T-A
C133	4030004720	Ceramic C2012 JB 1H 102K-T-A
C134	4030004710	Ceramic C2012 JB 1H 471K-T-A
C137	4030004710	Ceramic C2012 JB 1H 471K-T-A
C138	4030004720	Ceramic C2012 JB 1H 102K-T-A
C139	4030004720	Ceramic C2012 JB 1H 102K-T-A
C140	4510002940	Electrolytic 50 SS 1 µF
C141	4030004710	Ceramic C2012 JB 1H 471K-T-A
C142	4030004720	Ceramic C2012 JB 1H 102K-T-A
C143	4030004420	Ceramic C2012 SL 1H 050C-T-A
C144	4030004530	Ceramic C2012 SL 1H 270J-T-A
C145	4030004410	Ceramic C2012 SL 1H 040C-T-A
C146	4030004380	Ceramic C2012 SL 1H 010C-T-A
C147	4030004530	Ceramic C2012 SL 1H 270J-T-A
C148	4030004420	Ceramic C2012 SL 1H 050C-T-A
C149	4030004720	Ceramic C2012 JB 1H 102K-T-A
C150	4030004710	Ceramic C2012 JB 1H 471K-T-A
C153	4030004710	Ceramic C2012 JB 1H 471K-T-A
C154	4030004720	Ceramic C2012 JB 1H 102K-T-A
C155	4510002840	Electrolytic 25 SS 10 µF
C156	4030004430	Ceramic C2012 SL 1H 060D-T-A
C157	4030004720	Ceramic C2012 JB 1H 102K-T-A
C158	4030004720	Ceramic C2012 JB 1H 102K-T-A
C159	4030004480	Ceramic C2012 SL 1H 120J-T-A
C161	4030004480	Ceramic C2012 SL 1H 120J-T-A
C162	4030004410	Ceramic C2012 SL 1H 040C-T-A
C164	4030004480	Ceramic C2012 SL 1H 120J-T-A
C166	4030004720	Ceramic C2012 JB 1H 102K-T-A
C167	4030004480	Ceramic C2012 SL 1H 120J-T-A
C168	4030004480	Ceramic C2012 SL 1H 120J-T-A
C169	4030004520	Ceramic C2012 SL 1H 220J-T-A
C170	4030004720	Ceramic C2012 JB 1H 102K-T-A
C171	4510002840	Electrolytic 25 SS 10 µF
C172	4030004380	Ceramic C2012 SL 1H 010C-T-A
C173	4030004720	Ceramic C2012 JB 1H 102K-T-A
C174	4030004720	Ceramic C2012 JB 1H 102K-T-A
C175	4030004410	Ceramic C2012 SL 1H 040C-T-A
C176	4610000290	Trimmer ECRGA003A30
C178	4030004390	Ceramic C2012 SL 1H 020C-T-A
C182	4030004720	Ceramic C2012 JB 1H 102K-T-A
C183	4030004370	Ceramic C2012 SL 1H 0R5C-T-A
C184	4030004430	Ceramic C2012 SL 1H 060D-T-A
C185	4030004430	Ceramic C2012 SL 1H 060D-T-A
C186	4030004480	Ceramic C2012 SL 1H 120J-T-A
C187	4030004720	Ceramic C2012 JB 1H 102K-T-A
C189	4030004660	Ceramic C2012 SL 1H 221J-T-A
C192	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C193	4510002780	Electrolytic 16 SS 10 µF
C194	4030004720	Ceramic C2012 JB 1H 102K-T-A
C196	4030004730	Ceramic C2012 JB 1H 222K-T-A
C197	4030004730	Ceramic C2012 JB 1H 222K-T-A
C198	4030005090	Ceramic C2012 JB 1H 223K-T-A
C199	4510002930	Electrolytic 50 SS R47 µF
C201	4030004720	Ceramic C2012 JB 1H 102K-T-A
C202	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C204	4030008550	Ceramic C2012 JF 1H 473Z-T-A
C205	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C206	4030004720	Ceramic C2012 JB 1H 102K-T-A
C207	4030004730	Ceramic C2012 JB 1H 222K-T-A
C208	4510002780	Electrolytic 16 SS 10 µF
C209	4030004720	Ceramic C2012 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C210	4030004720	Ceramic C2012 JB 1H 102K-T-A
C211	4030004720	Ceramic C2012 JB 1H 102K-T-A
C212	4030004720	Ceramic C2012 JB 1H 102K-T-A
C213	4030004720	Ceramic C2012 JB 1H 102K-T-A
C214	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C215	4030004640	Ceramic C2012 SL 1H 181J-T-A
C216	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C217	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C218	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C219	4030004640	Ceramic C2012 SL 1H 181J-T-A
C220	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C221	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C222	4030004720	Ceramic C2012 JB 1H 102K-T-A
C223	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C224	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C226	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C227	4510002830	Electrolytic 25 SS 4R7 µF
C228	4550000320	Tantalum DN 1V 0R1M
C229	4030004720	Ceramic C2012 JB 1H 102K-T-A
C230	4030004720	Ceramic C2012 JB 1H 102K-T-A
C231	4030004450	Ceramic C2012 SL 1H 080D-T-A
C232	4030004480	Ceramic C2012 SL 1H 120J-T-A
C233	4030004560	Ceramic C2012 SL 1H 390J-T-A
C234	4030004720	Ceramic C2012 JB 1H 102K-T-A
C235	4030004720	Ceramic C2012 JB 1H 102K-T-A
C236	4030004720	Ceramic C2012 JB 1H 102K-T-A
C237	4030004720	Ceramic C2012 JB 1H 102K-T-A
C238	4030004720	Ceramic C2012 JB 1H 102K-T-A
C239	4030004480	Ceramic C2012 SL 1H 120J-T-A
C240	4030004390	Ceramic C2012 SL 1H 020C-T-A
C241	4030004390	Ceramic C2012 SL 1H 020C-T-A
C242	4030004410	Ceramic C2012 SL 1H 040C-T-A
C243	4030004720	Ceramic C2012 JB 1H 102K-T-A
C244	4030004720	Ceramic C2012 JB 1H 102K-T-A
C245	4510001350	Electrolytic 16 MS5 10 µF
C246	4030004720	Ceramic C2012 JB 1H 102K-T-A
C247	4030004720	Ceramic C2012 JB 1H 102K-T-A
C248	4030004530	Ceramic C2012 SL 1H 270J-T-A
C249	4030004720	Ceramic C2012 JB 1H 102K-T-A
C250	4030004480	Ceramic C2012 SL 1H 120J-T-A
C251	4030004480	Ceramic C2012 SL 1H 120J-T-A
C252	4030004530	Ceramic C2012 SL 1H 270J-T-A
C253	4030008550	Ceramic C2012 JF 1H 473Z-T-A
C258	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C259	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C260	4030004720	Ceramic C2012 JB 1H 102K-T-A
C261	4030004720	Ceramic C2012 JB 1H 102K-T-A
C262	4510002830	Electrolytic 25 SS 4R7 µF
C263	4030004720	Ceramic C2012 JB 1H 102K-T-A
C264	4030004740	Ceramic C2012 JB 1H 472K-T-A
C266	4030004720	Ceramic C2012 JB 1H 102K-T-A
C267	4510002380	Electrolytic 16 SS 470 µF (10X12.5)
C268	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C269	4030006470	Ceramic C2012 JB 1H 153K-T-A
C270	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C271	4030006470	Ceramic C2012 JB 1H 153K-T-A
C272	4510001890	Electrolytic 50 MS5 0R1 µF
C273	4030006450	Ceramic C2012 JF 1H 103Z-T-A
C274	4030004760	Ceramic C2012 JF 1E 104Z-T-A
C275	4030004720	Ceramic C2012 JB 1H 102K-T-A
C276	4030004720	Ceramic C2012 JB 1H 102K-T-A
C277	4030004720	Ceramic C2012 JB 1H 102K-T-A
C278	4510001460	Electrolytic 50 MS5 R47 µF
C279	4030004720	Ceramic C2012 JB 1H 102K-T-A
C280	4030004710	Ceramic C2012 JB 1H 471K-T-A
C281	4030004710	Ceramic C2012 JB 1H 471K-T-A
C282	4030005090	Ceramic C2012 JB 1H 223K-T-A
C283	4030005090	Ceramic C2012 JB 1H 223K-T-A
C286	4030004720	Ceramic C2012 JB 1H 102K-T-A
C287	4030004720	Ceramic C2012 JB 1H 102K-T-A
C288	4030004720	Ceramic C2012 JB 1H 102K-T-A
C289	4030004720	Ceramic C2012 JB 1H 102K-T-A
C290	4030004720	Ceramic C2012 JB 1H 102K-T-A
C291	4030004720	Ceramic C2012 JB 1H 102K-T-A
C292	4030004720	Ceramic C2012 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C293	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C294	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C295	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C296	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C297	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C298	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C299	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C300	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C301	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C302	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C303	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C304	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C305	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C306	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C307	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C308	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C309	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C310	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C311	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C312	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C313	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C314	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C315	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C316	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C317	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C318	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C319	4510002730	Electrolytic	10 SS 100 µF
C320	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C321	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C322	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C323	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
DS1	5040000270	LED	SLP151B
DS2	5040000270	LED	SLP151B
EP1	0910022843	P.C. Board	B 2204C (MAIN)

[VCO-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000130	FET	2SK125
Q2	1530002240	Transistor	2SC3775-3-TA
D1	1720000270	Varicap	1SV217 (TPH2)
D2	1720000270	Varicap	1SV217 (TPH2)
D3	1720000270	Varicap	1SV217 (TPH2)
D4	1720000270	Varicap	1SV217 (TPH2)
D5	1720000270	Varicap	1SV217 (TPH2)
D6	1720000270	Varicap	1SV217 (TPH2)
D7	1720000270	Varicap	1SV217 (TPH2)
D8	1720000270	Varicap	1SV217 (TPH2)
L1	6180001940	Coil	LAL 02NA 3R3K
L2	6130002340	Coil	LB-261
L3	6180001940	Coil	LAL 02NA 3R3K
L4	6180001940	Coil	LAL 02NA 3R3K
R1	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
R4	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R5	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R6	7010003280	Resistor	ELR20J 100 Ω
R7	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R8	7030000360	Resistor	MCR10EZHJ 680 Ω (681)
R9	7030000220	Resistor	MCR10EZHJ 47 Ω (470)

[VCO-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R10	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
C1	4010000460	Ceramic	DD104 B 471K 50V
C3	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C5	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C6	4030004380	Ceramic	C2012 SL 1H 010C-T-A
C7	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C8	4010000260	Ceramic	DD104 SL 470J 50V
C9	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C10	4510001340	Electrolytic	10 MS5 33 µF
EP1	0910026290	P.C. Board	B 2651 (VCO-A)

[VCO-B UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000130	FET	2SK125
Q2	1530002240	Transistor	2SC3775-3-TA
D1	1720000220	Varicap	1SV166-T2B
D2	1720000220	Varicap	1SV166-T2B
L1	6180002400	Coil	LAL 02NA 1R0K
L2	6180001290	Coil	LAL 02NA R33K
L3	6180001290	Coil	LAL 02NA R33K
L4	6180000670	Coil	LAL 02NA R22K
L5	6110001530	Coil	LA-233
L6	6110001980	Coil	LA-222
R4	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
R5	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R6	7030000180	Resistor	MCR10EZHJ 22 Ω (220)
R7	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R8	7030000440	Resistor	MCR10EZHJ 3.3 kΩ (332)
R9	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R10	7030000300	Resistor	MCR10EZHJ 220 Ω (221)
C1	4010000280	Ceramic	DD104 SL 560J 50V
C3	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C4	4030002600	Ceramic	GRM40 UJ 070D 50PT
C5	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C6	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C7	4510001840	Electrolytic	10 MS5 47 µF
C8	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C9	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C10	4510001840	Electrolytic	10 MS5 47 µF
C11	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C12	4030002590	Ceramic	GRM40 UJ 060D 50PT
C13	4030004370	Ceramic	C2012 SL 1H 0R5C-T-A
C14	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C15	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C16	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C17	4010000060	Ceramic	DD104 SL 040C 50V
EP1	0910026310	P.C. Board	B 2652 (VCO-B)

SECTION 6 ADJUSTMENT PROCEDURES

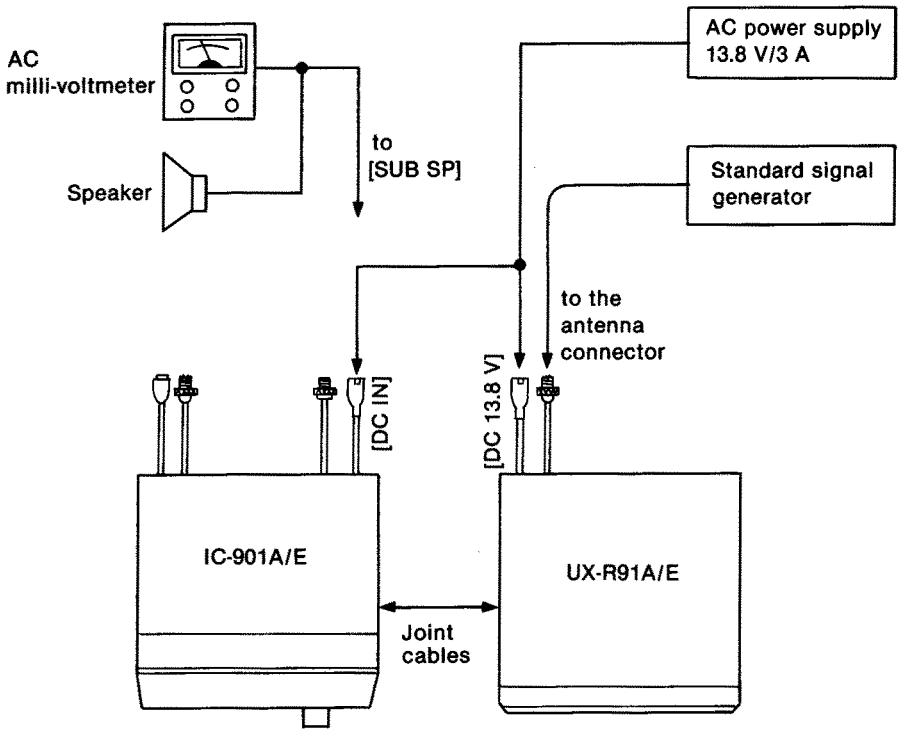
6-1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
AC power supply	Output voltage : 13.8 V DC Current capacity : 3 A or more	DC voltmeter	Input impedance : 50 kΩ/DC or better
		AC milli-voltmeter	Measuring range : 10 mV~10 V
Frequency counter	Frequency range : 0.1~450 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	External speaker	Impedance : 8 Ω
Standard signal generator (SSG)	Frequency range : 0.1~900 MHz Output level : −127~−17 dBm (0.1 μV~32 mV)		

CW: Clockwise
CCW: Counterclockwise

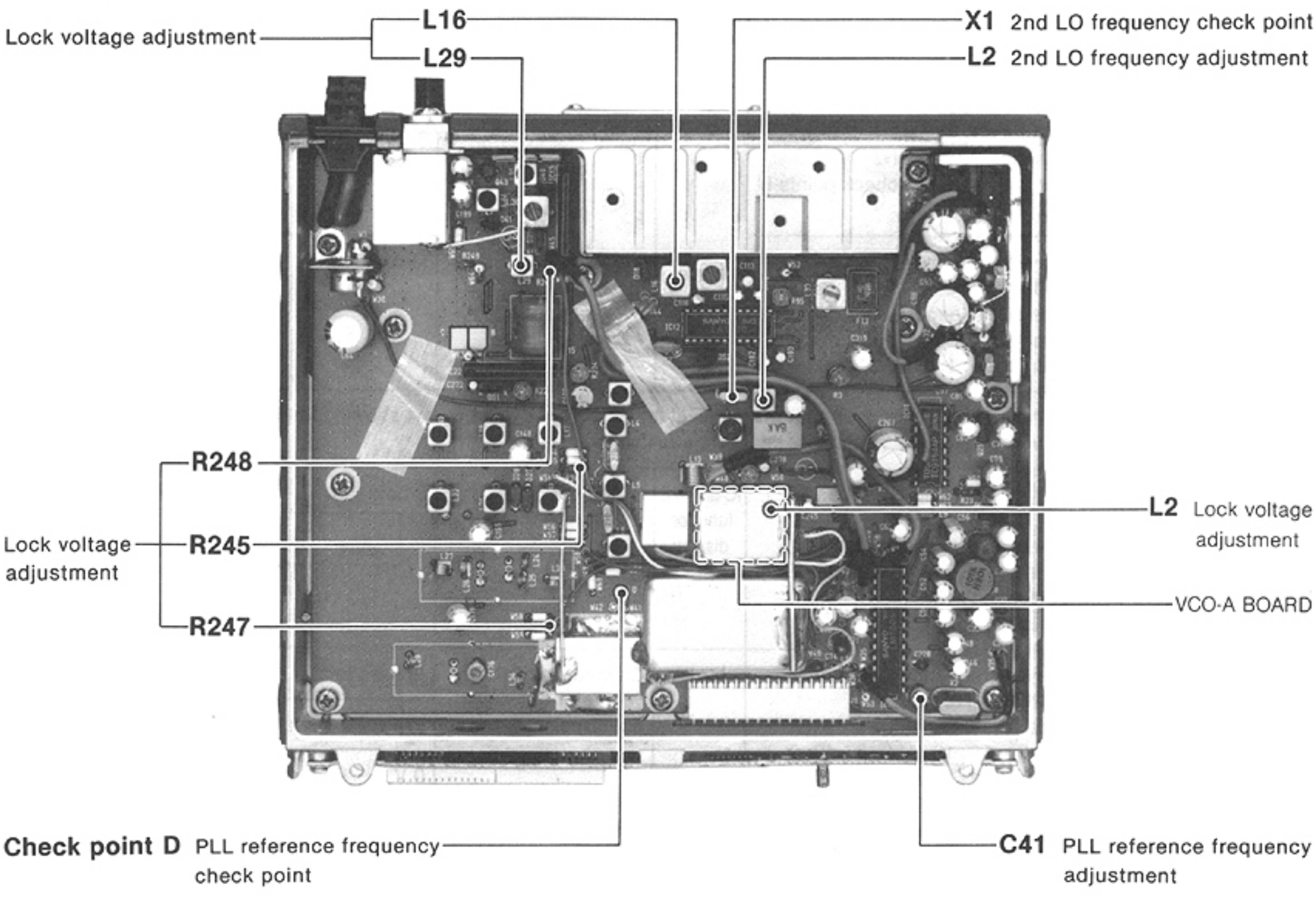
■ CONNECTION



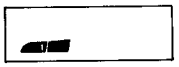
6-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
PLL REFERENCE FREQUENCY	1	• Displayed frequency (sub band): 500.0000 MHz • Receiving	MAIN	Connect the frequency counter to check point D.	440.45000 MHz	MAIN	C41
2ND LO FREQUENCY	1	• Displayed frequency (sub band): 500.0000 MHz	MAIN	Loosely couple the frequency counter to X1.	59.09500 MHz	MAIN	L2
LOCK VOLTAGE	1	• Displayed frequency (sub band): 145.0000 MHz	MAIN	Connect the DC voltmeter to R245 (FI2 side).	2.5 V	MAIN (VCO-A)	L2
	2	• Displayed frequency (sub band): 435.0000 MHz		Connect the DC voltmeter to R247 (W47 side).	Approx. 5.0 V		Verify
	3	• Displayed frequency (sub band): 92.0000 MHz		Connect the DC voltmeter to R248.	6.0 V	MAIN	L29
	4	• Displayed frequency (sub band): 1.0620 MHz			5.5 V		L16

• MAIN UNIT



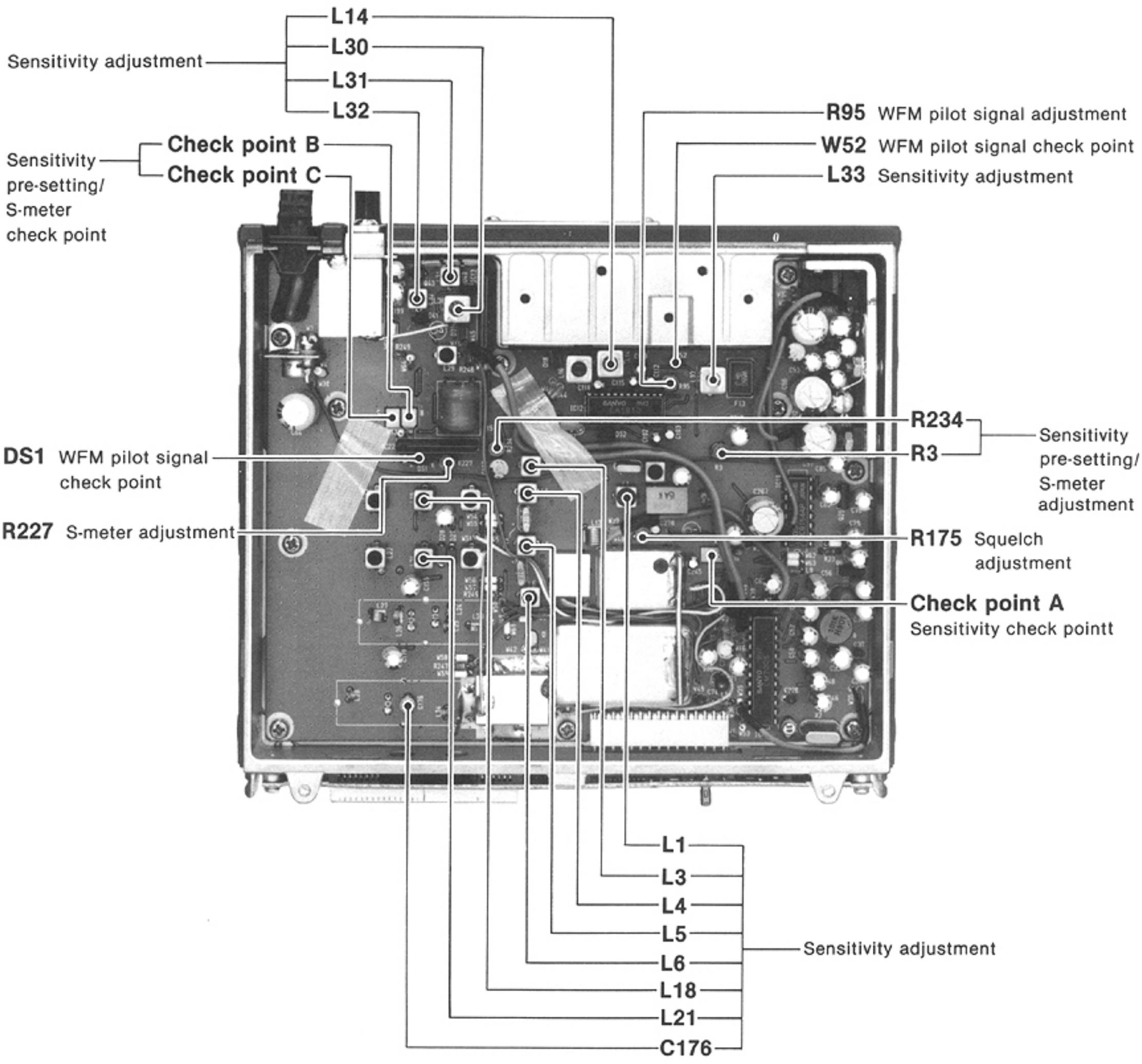
6-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	1	• Displayed frequency (sub band): 145.0200 MHz • Main band squelch control: Maximum • Main band volume control: Minimum • Sub band squelch control: Minimum • Set the signal generator; Level : 0.22 µV (−120 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	MAIN	Connect the DC voltmeter to check point A.	Pre-set to center.	MAIN	R3
	2				Maximum		L18
	3	• Set the signal generator; Deviation : ±6.0 kHz			Maximum		Adjust in sequence L6, L5, L4, L3
	4	• Set the signal generator; Level : 1 mV (−47 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz	IC-901A/E rear panel	Connect the AC millivoltmeter to the [SUB SP] jack with an 8 Ω load.	Maximum audio output level		L1
	5	• Displayed frequency (sub band): 218.0200 MHz • Set the signal generator; Level : 0.22 µV (−120 dBm)	MAIN	Connect the DC voltmeter to check point A.	Maximum		L21
	6	• Displayed frequency (sub band): 875.0250 MHz			Maximum		C176
	7	• Displayed frequency (sub band): 92.2000 MHz • Set the signal generator; Level : 32 µV (−77 dBm) Modulation : 1 kHz Deviation : ±50 kHz • Solder land between check points B and C.			Pre-set to max. CW.		R234
	8				Maximum		Adjust in sequence L32, L31, L30, L14
	9	• Displayed frequency (sub band): 1.0620 MHz • Set the signal generator; Level : 56 µV (−72 dBm) Modulation : 1 kHz/30 %/AM			Maximum		L33
		NOTE: Adjust the signal generator output level for each time except step 4 showing the DC voltmeter at 30 % of the lowest range full scale.					
S-METER	1	• Displayed frequency (sub band): 145.0200 MHz • Set the signal generator; Level : 0.79 µV (−109 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz	IC-901A/E function display	S indicator	2 dots (S3) 	MAIN	R3
	2	• Displayed frequency (sub band): 92.2000 MHz • Set the signal generator; Level : 10 µV (−87 dBm) Modulation : 1 kHz Deviation : ±50 kHz • Unsolder land between check points B and C.	MAIN	Connect the DC voltmeter between check points B and C.	Pre-set to max. CW.		R234
	3				Pre-set to max. CCW.		R227
	4				0 V		R227
	5		IC-901A/E function display	S indicator	2 dots (S3) 		R234

RECEIVER ADJUSTMENT (CONTINUED)

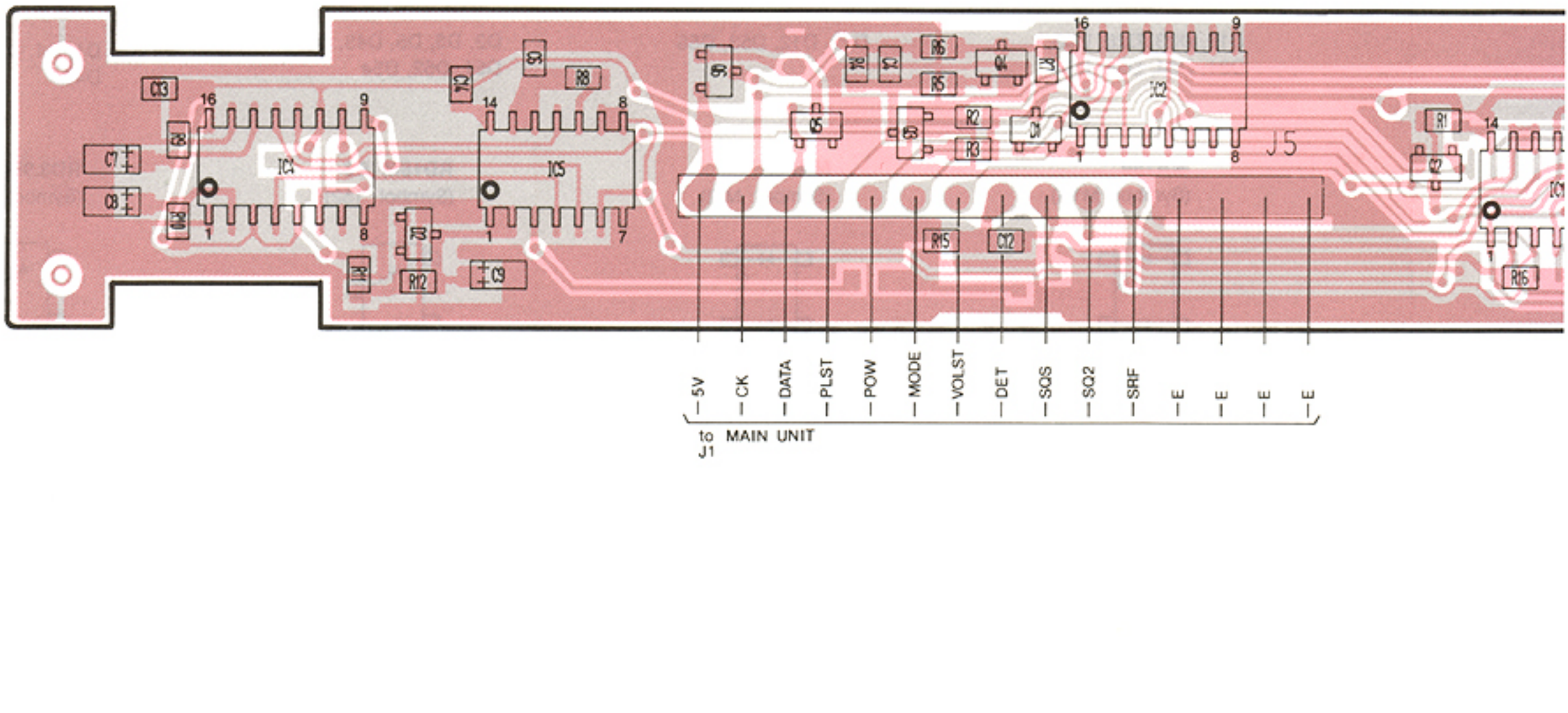
ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SQUELCH	1	• Displayed frequency (sub band): 122.0500 MHz • Set the signal generator; Level : 0.18 µV (−122 dBm) Modulation : 1 kHz/30 %/AM	IC-901A/E rear panel	Output signal from the sub band speaker	Pre-set to max. CW.	MAIN	R175
	2				Sequelch threshold point		R175
WFM PILOT SIGNAL	1	• Displayed frequency (sub band): 92.2000 MHz • Set the signal generator; Level : 1 mV (−47 dBm) Modulation : OFF	MAIN	Connect the frequency counter to W52.	DS1 lights up.		Verify
	2				76.000 kHz	MAIN	R95

• MAIN UNIT



SECTION 7 BOARD LAYOUTS

7-1 FRONT UNIT

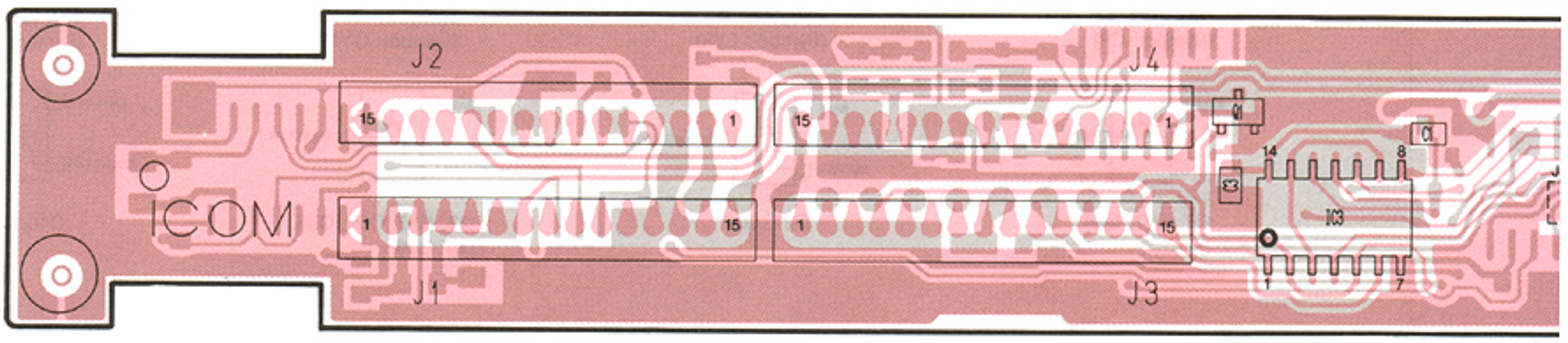


J2 to OPTIONAL UNIT

E	5V	MOD	STB	DATA	CK	BUSY	SRFB	SRFA	DETB	DETA	SQ2B	SQ2A	SQSB	SQSA

J4 to OPTIONAL UNIT

PTT	TMUTE	KEY	BAND6	BAND5	BAND4	BAND3	BAND1	UNLKV



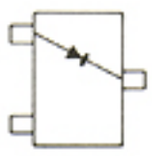
E	5V	MOD	STB	DATA	CK	BUSY	SRFB	SRFA	DETB	DETA	SQ2B	SQ2A	SQSB	SQSA

J1 to IC-901A/E

PTT	TMUTE	KEY	BAND6	BAND5	BAND4	BAND3	BAND1	UNLKV

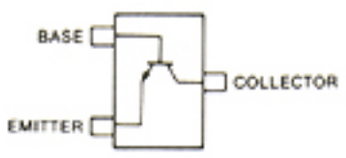
J3 to IC-901A/E

1SS193
(Symbol: F3)



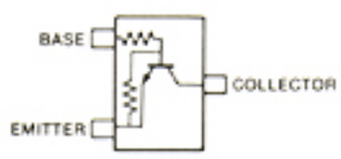
D1, D2

2SC2712 Y
(Symbol: LY)

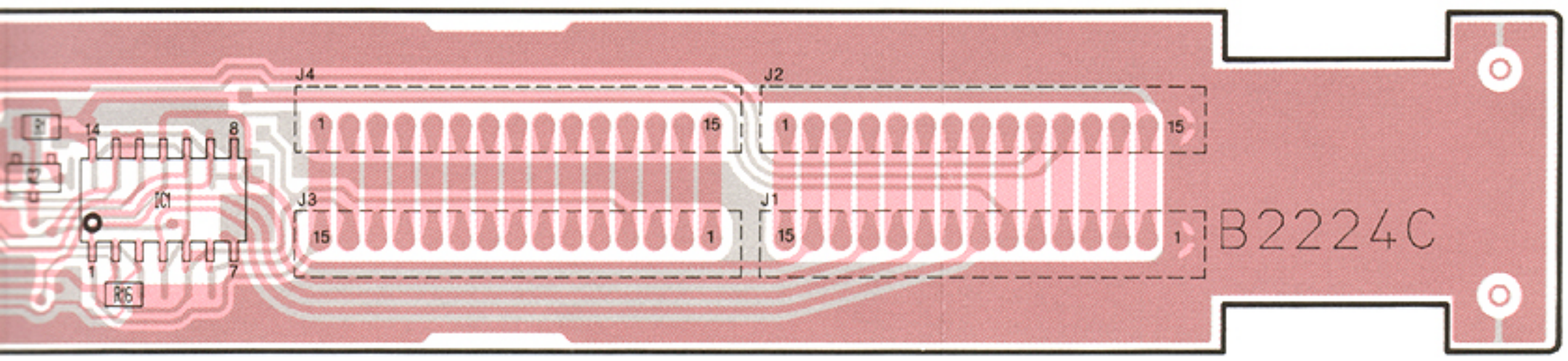


Q3, Q4, Q7

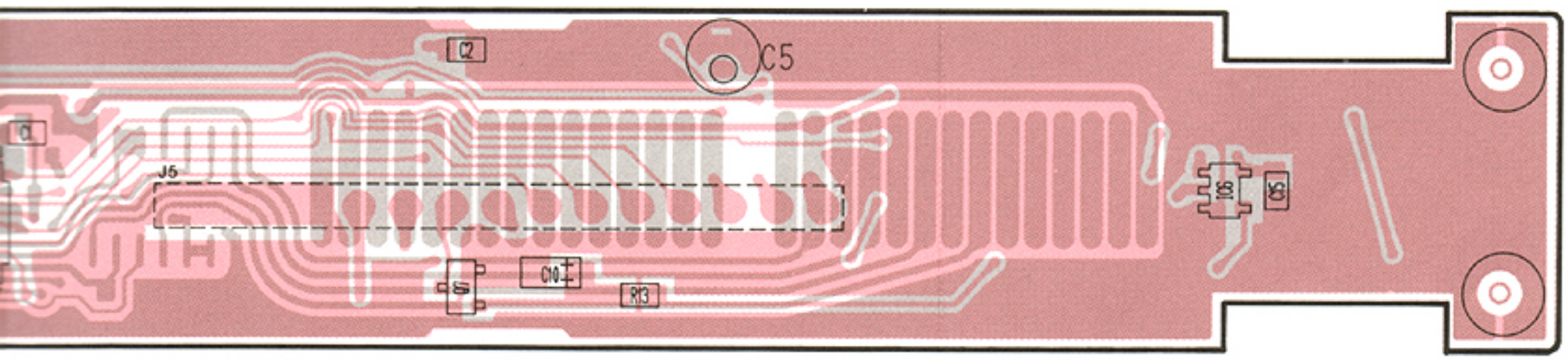
RN1404
(Symbol: XD)



Q1, Q2



D3	BAND1	UNLKV	UNLKU	UNLK12	RITST	SSBST	PLST	CTRLST

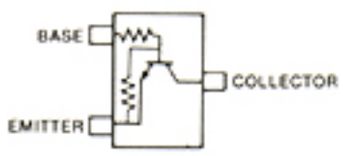


D3	BAND1	UNLKV	UNLKU	UNLK12	RITST	SSBST	PLST	CTRLST

D)

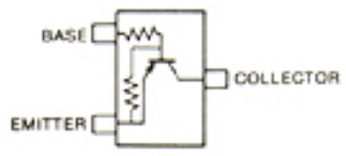
COLLECTOR

RN1409
(Symbol: XJ)



Q5

RN2402
(Symbol: YB)



Q6

7-2 MAIN, VCO-A AND VCO-B UNITS

• MAIN UNIT

1SS153
(Symbol: A9)

D19, D23, D26, D30, D31, D34, D35, D38

1SS184
(Symbol: B3)

D11, D12, D53, D55

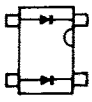
1SS193
(Symbol: F3)

D2, D3, D5, D45, D46, D51, D52, D54

HSM88AS
(Symbol: C1)

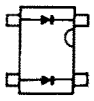
D1, D4, D36, D43, D44

MA159
(Symbol: M1A)



D6

MA862
(Symbol: M1I)



D10, D42, D47, D48, D49, D50

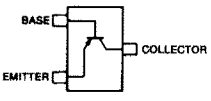
RD15M B2
(Symbol: 152)

D56

RD3.9M B2
(Symbol: 392)

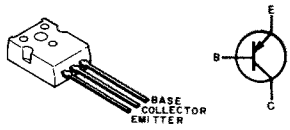
D13

2SA1162 Y
(Symbol: SY)



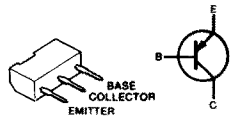
Q12, Q13, Q14, Q15, Q16, Q17, Q27, Q51

2SA1359 Y



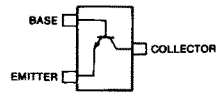
Q29

2SB909M R



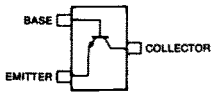
Q25

2SC2712 Y
(Symbol: LY)



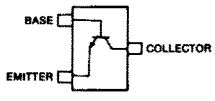
Q1, Q2, Q5, Q8, Q19, Q24, Q28, Q32, Q46, Q52, Q61, Q65

2SC3661 TA
(Symbol: CP)



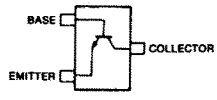
Q7, Q47, Q54

2SC3772 3
(Symbol: LY3)



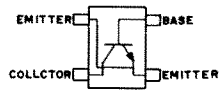
Q21, Q37

2SC3775 3
(Symbol: OY3)



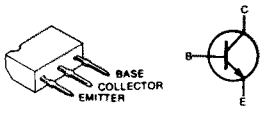
Q23, Q33, Q35, Q38, Q48, Q49

2SC4095
(Symbol: R47)



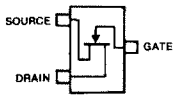
Q40, Q41

2SD1225M R



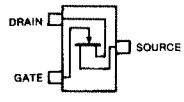
Q6

2SK209 Y
(Symbol: XY)



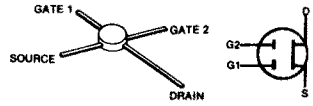
Q18, Q20, Q22, Q34, Q36, Q39, Q44, Q50, Q53

2SK302 Y
(Symbol: TY)



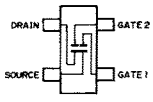
Q3, Q31, Q45

3SK122 K



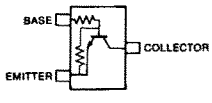
Q43

3SK177 U73
(Symbol: U73)



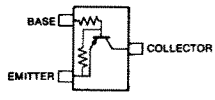
Q4

RN1404
(Symbol: XD)



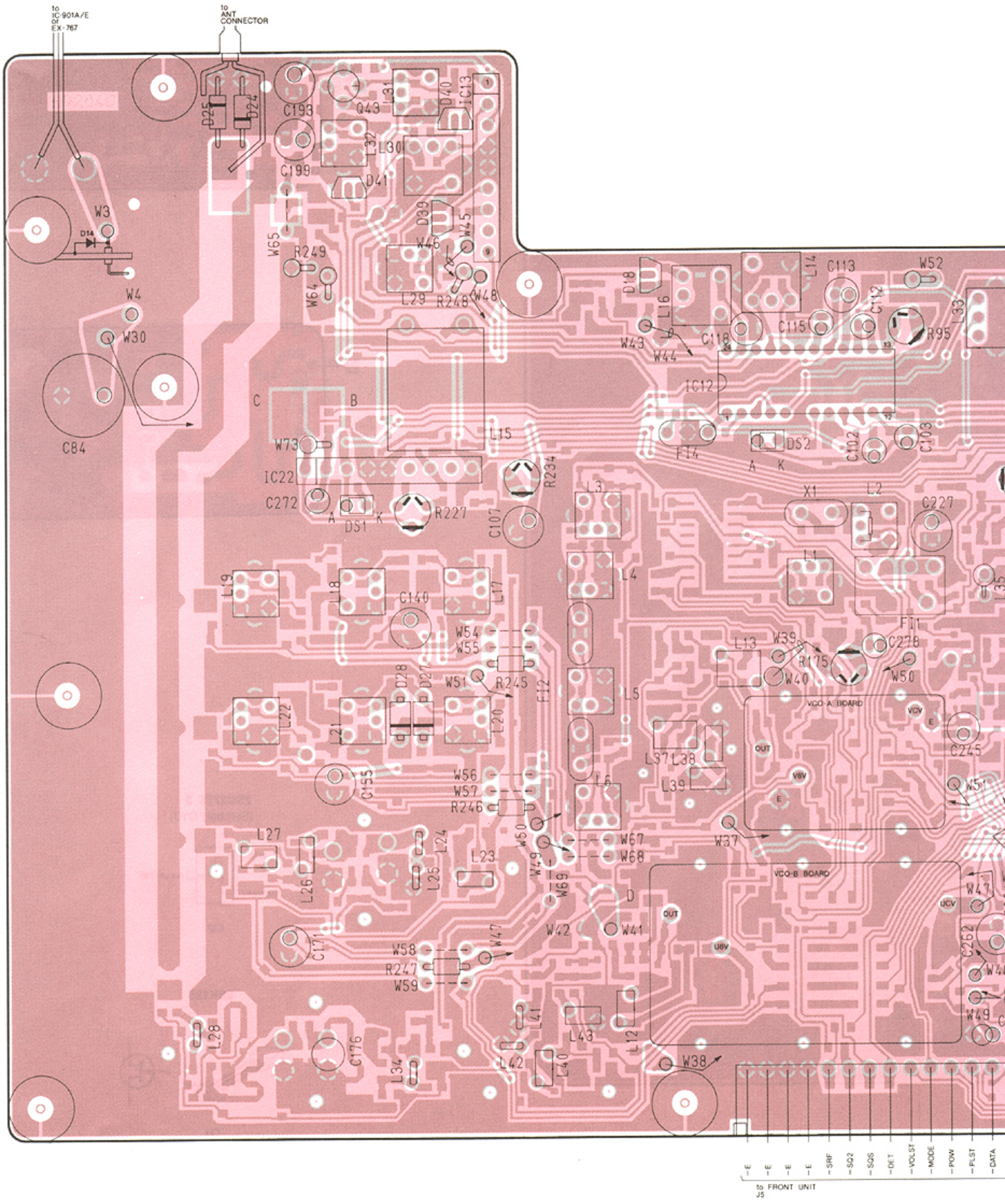
Q26, Q57, Q62, Q63

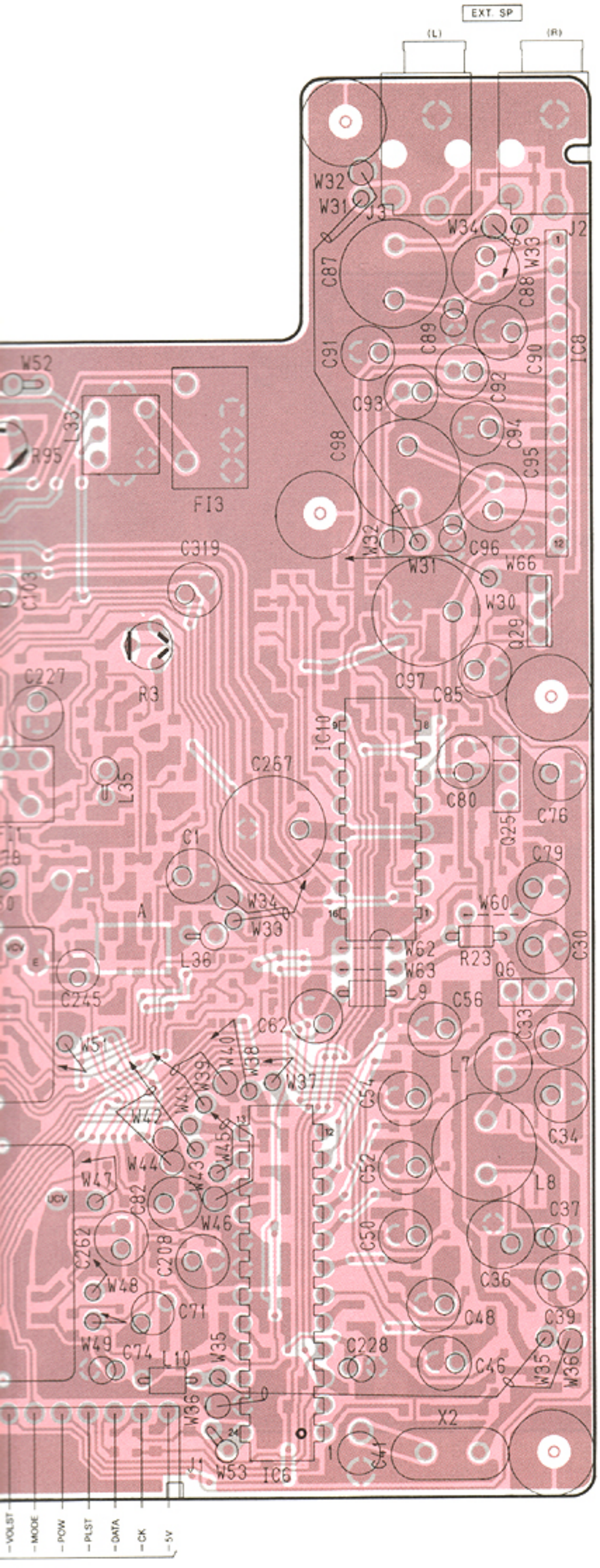
RN2404
(Symbol: YD)



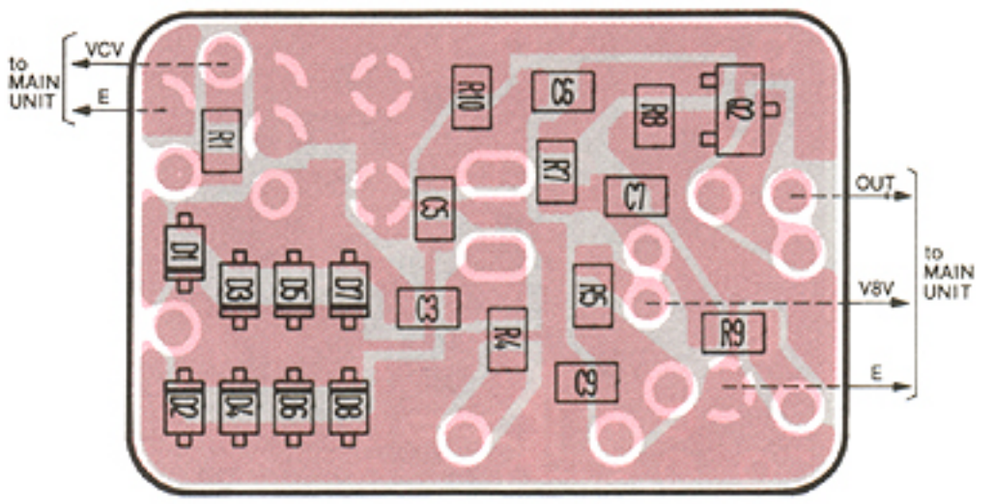
Q58, Q59, Q64

• MAIN UNIT

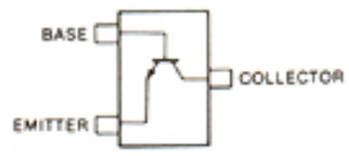

to IC-901A/E of EX-767
to ANT CONNECTOR
D25
D24
C193
Q43
L31
D40
IC13
L32
L30
C199
D41
D39
W45
W46
W65
R249
W64
L29
R248
W48
W3
D14
W4
W30
C84
D18
L16
W43
W44
L14
C113
W52
C112
C115
C118
R95
L33
IC12
FI4
DS2
A K
C102
C103
C
B
W73
L15
IC22
C272
A DS1 K
R227
R234
C107
L3
L4
X1
L2
C227
L1
FI1
C278
W39
R175
W40
W50
L13
VCO-A BOARD
VCV
E
OUT
VBV
C245
W51
L37 L38
L39
L5
L6
W37
W67
W68
VCO-B BOARD
UCV
W47
W42
W41
D
U8V
W38
L19
L18
C140
L17
W54
W55
W51
R245
F12
D28
D27
L22
L21
L20
C155
W56
W57
R246
W50
W49
W69
L27
L26
L24
L25
L23
C171
W58
R247
W59
W47
L28
C176
L34
L41
L43
L42
L40
L12
J5
-E -E -E -E -SRF -SQ2 -SQS -DET -VOLST -MODE -POW -PLST -DATA
to FRONT UNIT



• VCO-A UNIT

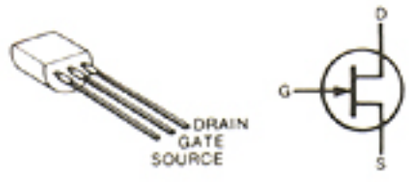


2SC3775 3
(Symbol: OY3)



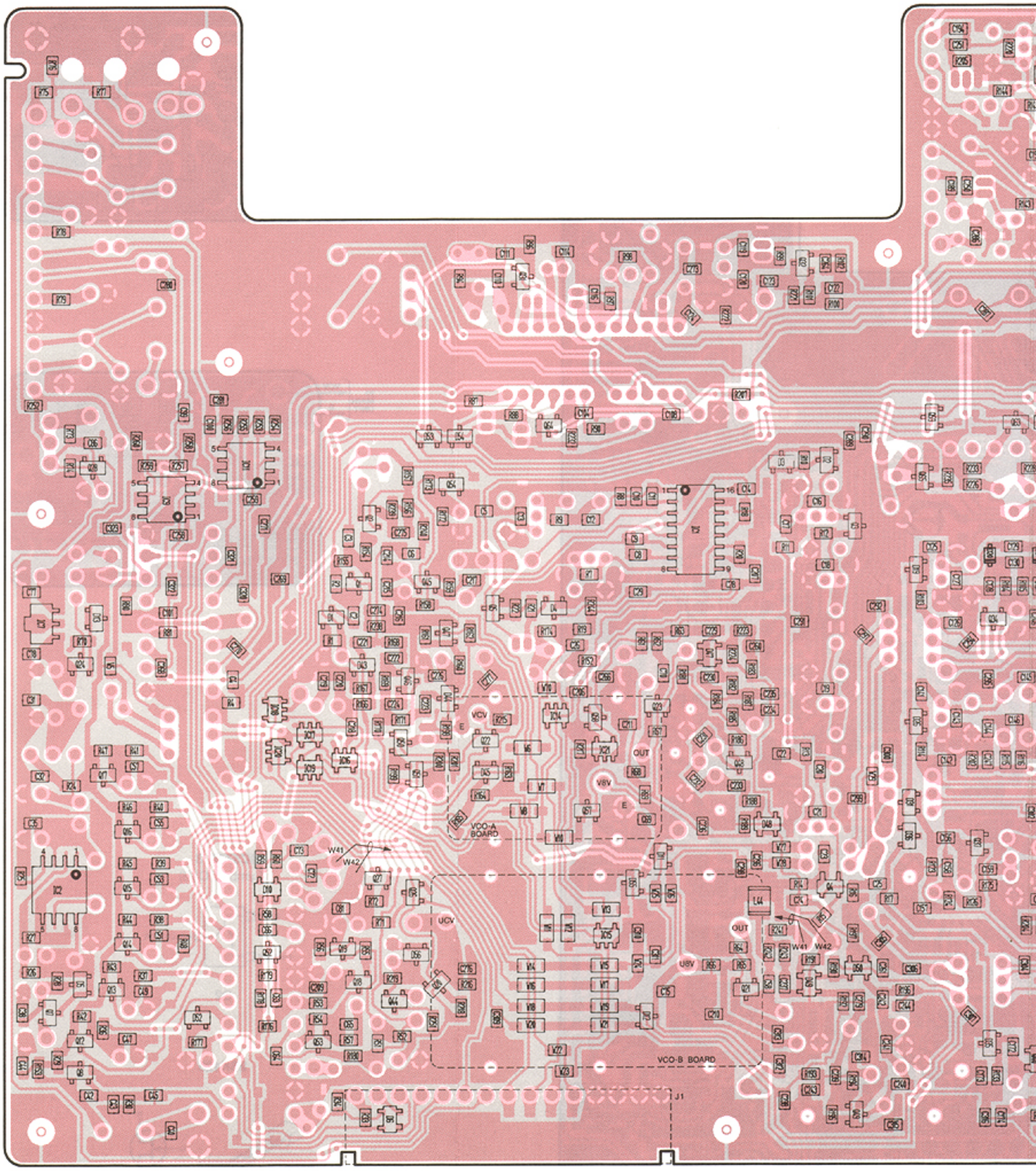
Q2

2SK125

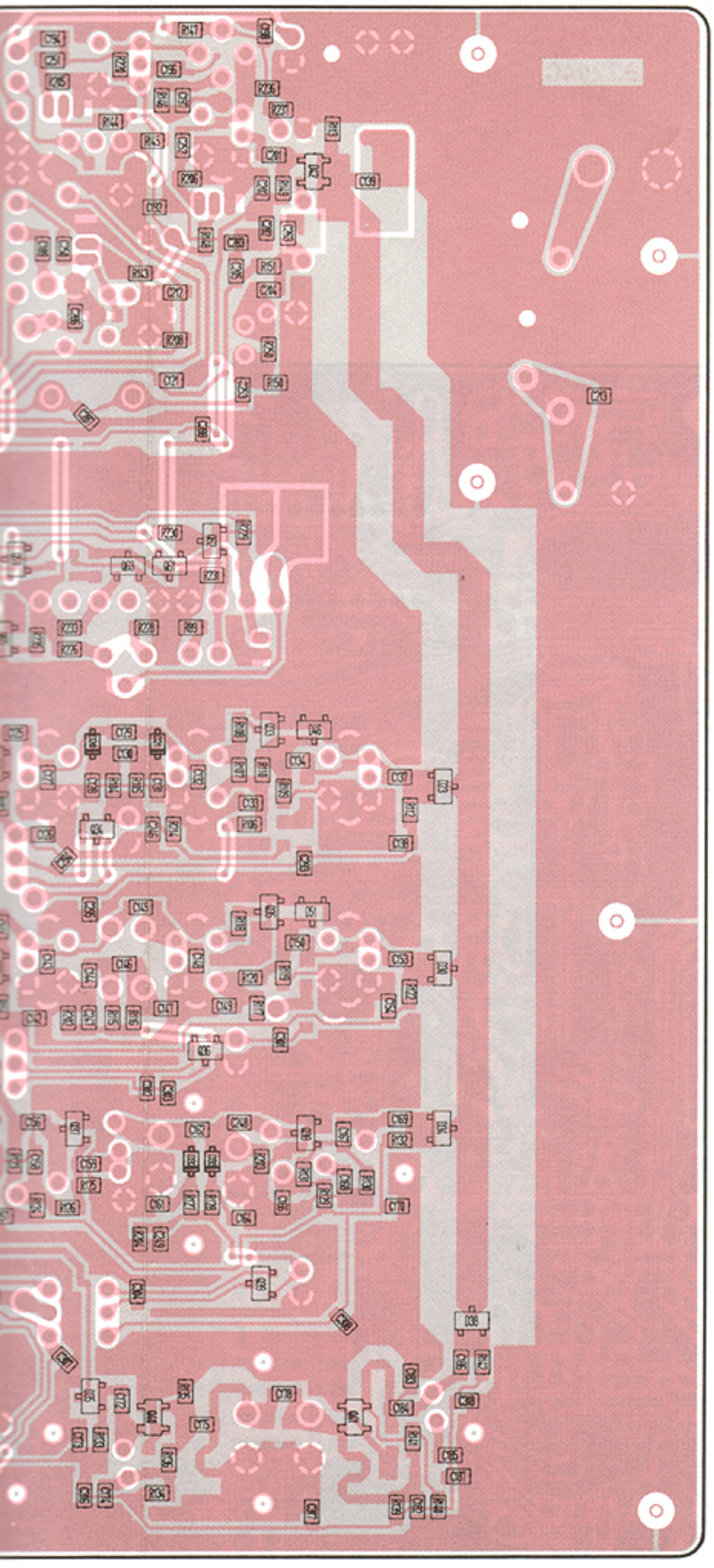


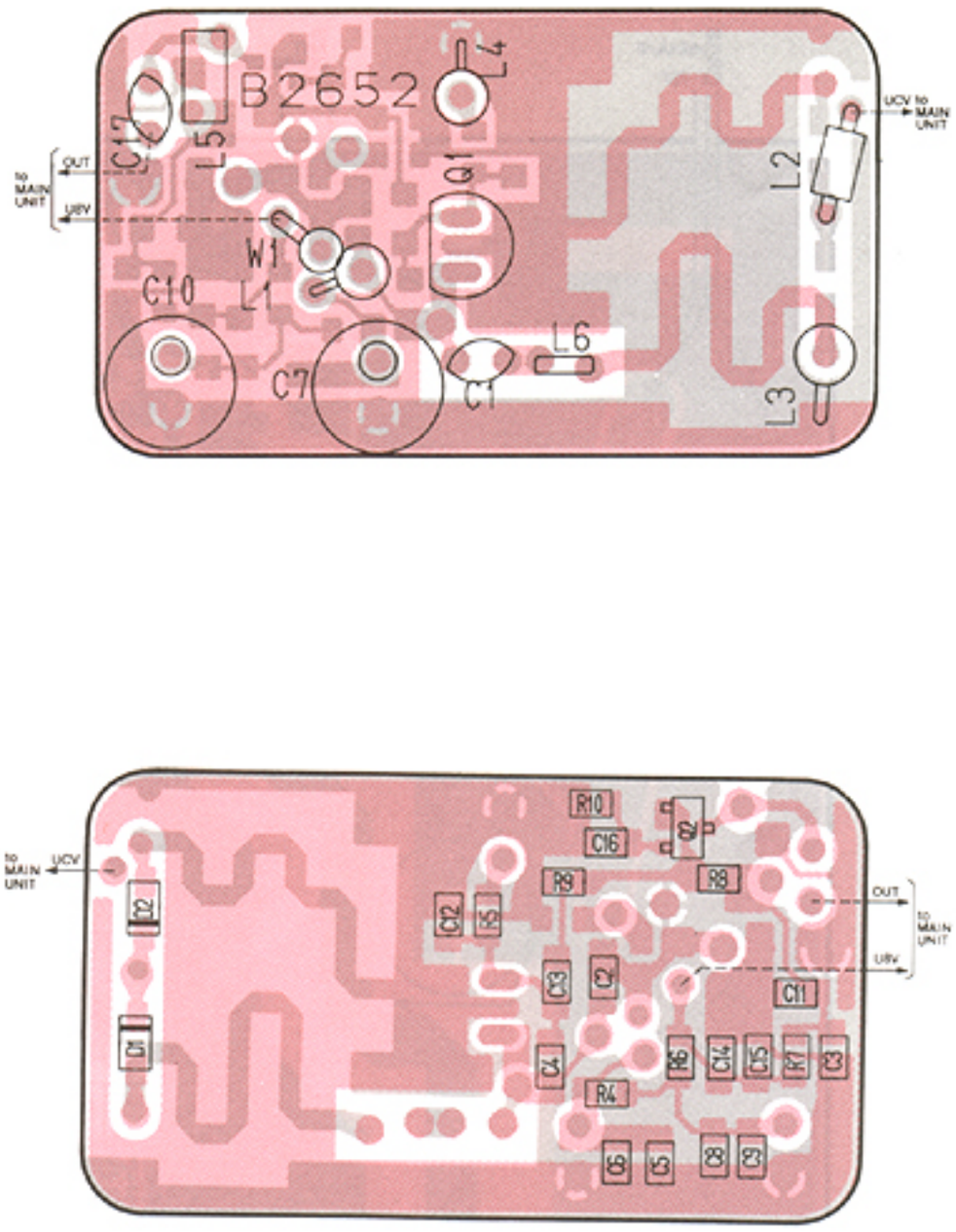
Q1

• MAIN UNIT

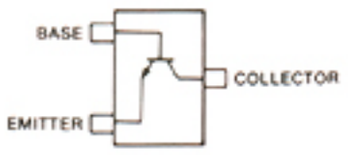


• VCO-B UNIT



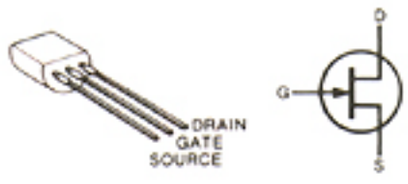


2SC3775 3
(Symbol: OY3)



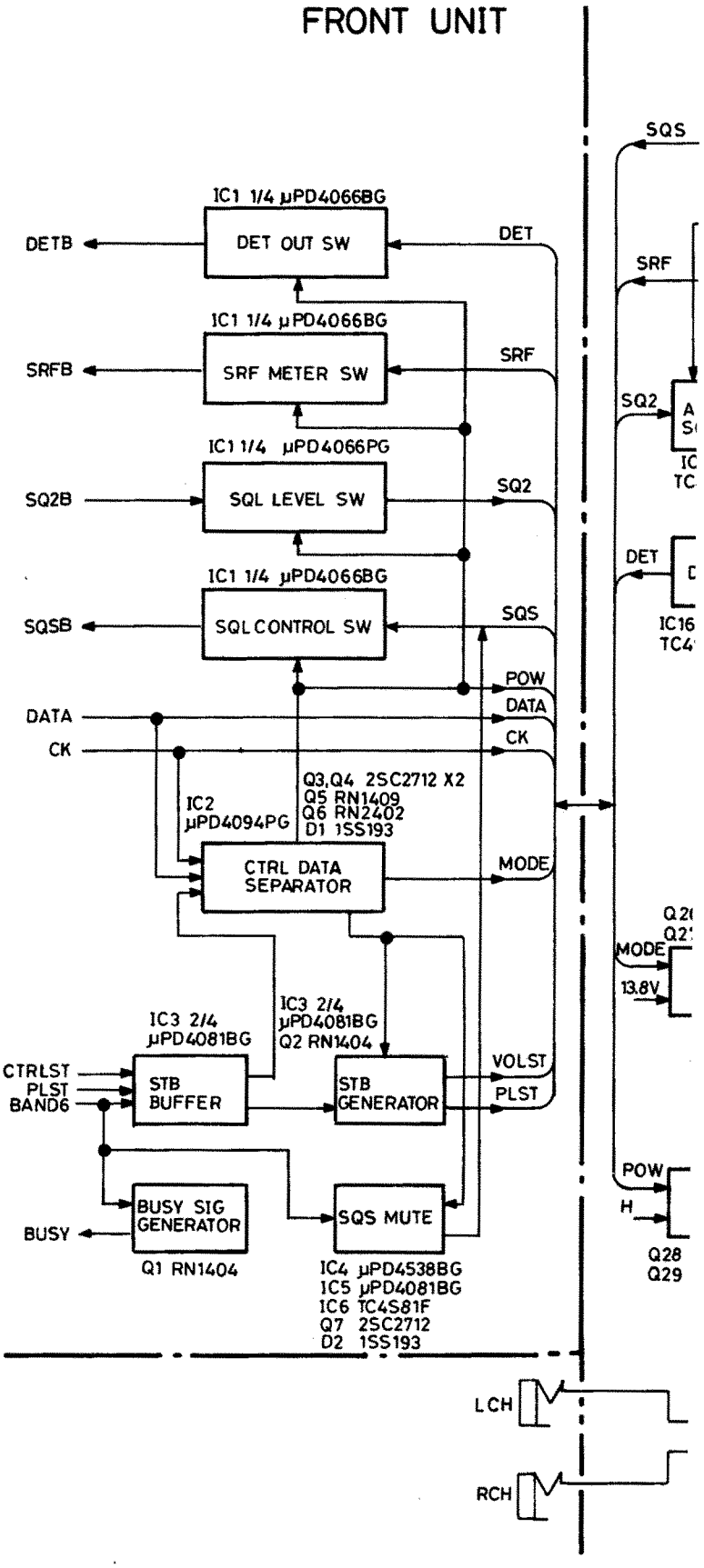
Q2

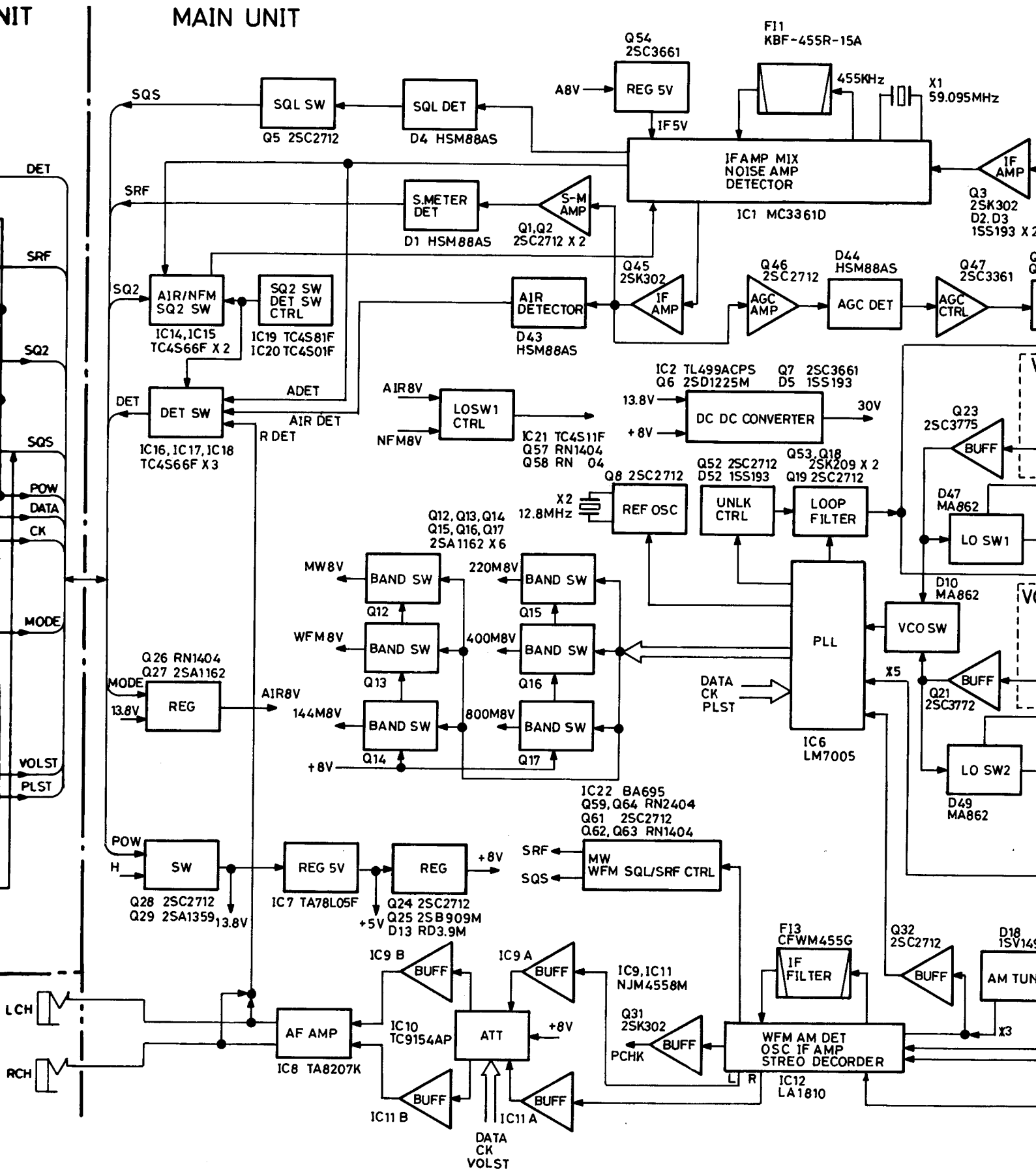
2SK125

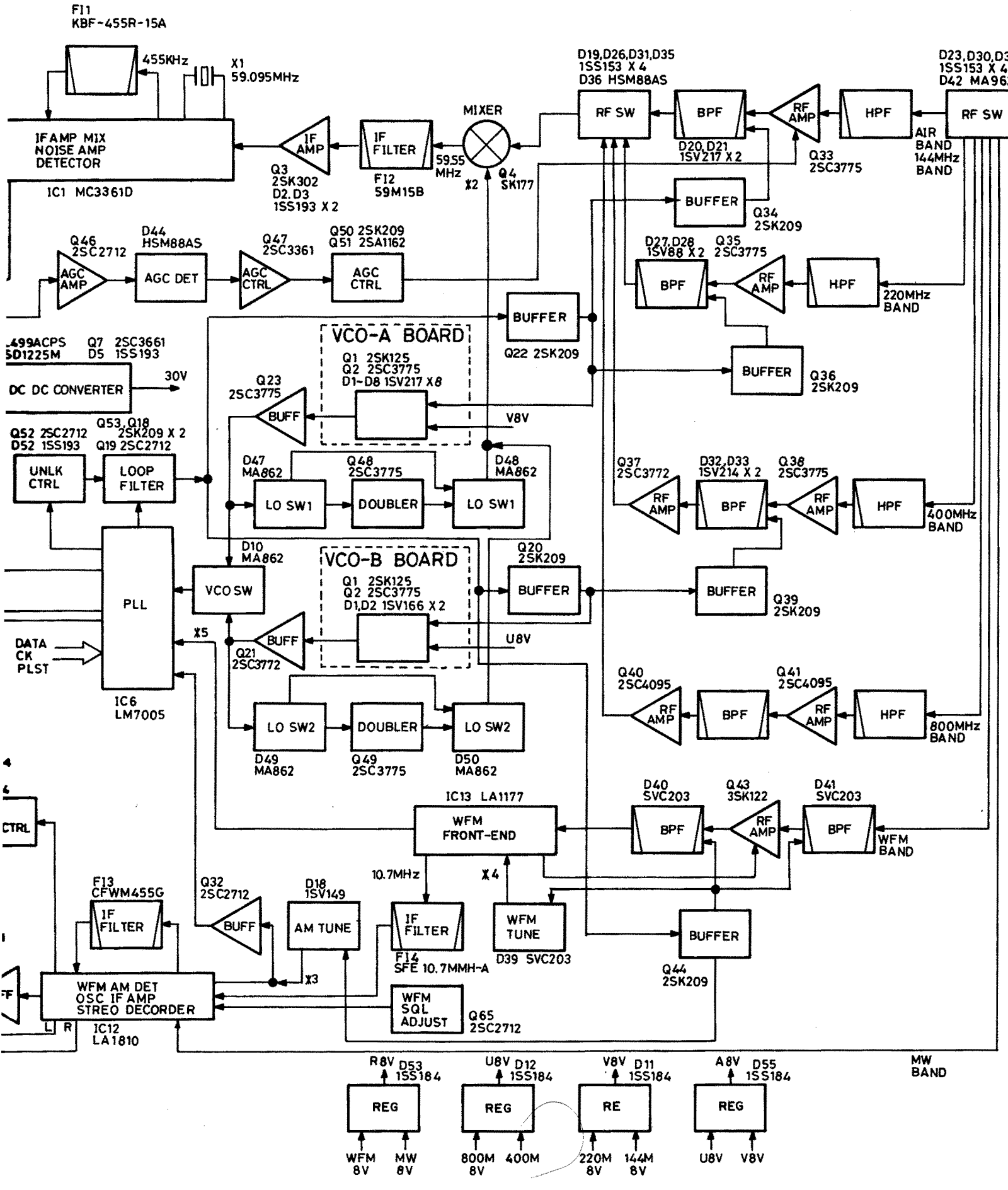


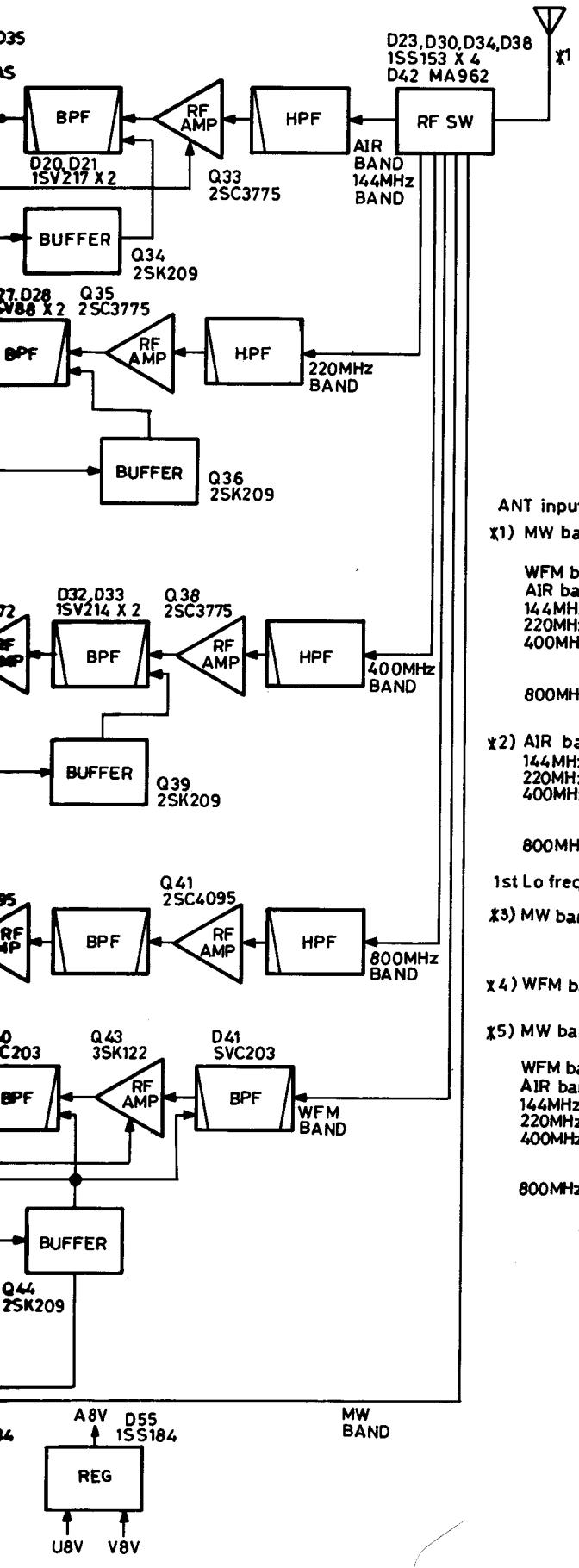
Q1

SECTION 8 BLOCK DIAGRAM




MAIN UNIT
NIT
DET
SRF
SQ2
SQS
POW
DATA
CK
MODE
VOLST
PLST
LCH
RCH
SQS
SQL SW
Q5 2SC2712
SQL DET
D4 HSM88AS
A8V
REG 5V
Q54
2SC3661
IF5V
F11
KBF-455R-15A
455KHz
X1
59.095MHz
IF AMP MIX
NOISE AMP
DETECTOR
IC1 MC3361D
IF AMP
Q3
2SK302
D2.D3
1SS193 X2
S.METER
DET
D1 HSM88AS
S-M
AMP
Q1,Q2
2SC2712 X2
SQ2
A1R/NFM
SQ2 SW
IC14,IC15
TC4S66F X2
SQ2 SW
DET SW
CTRL
IC19 TC4S81F
IC20 TC4S01F
A1R
DETECTOR
D43
HSM88AS
Q45
2SK302
IF
AMP
Q46
2SC2712
AGC
AMP
D44
HSM88AS
AGC DET
Q47
2SC3361
AGC
CTRL
DET
DET SW
IC16, IC17, IC18
TC4S66F X3
ADET
A1R DET
R DET
A1R8V
NFM8V
LOSW1
CTRL
IC21 TC4S11F
Q57 RN1404
Q58 RN 04
IC2 TL499ACPS
Q6 2SD1225M
Q7 2SC3661
D5 1SS193
13.8V
+8V
DC DC CONVERTER
30V
Q23
2SC3775
BUFF
D47
MA862
LO SW1
Q8 2SC2712
X2
12.8MHz
REF OSC
Q52 2SC2712
D52 1SS193
UNLK
CTRL
Q53, Q18
2SK209 X2
Q19 2SC2712
LOOP
FILTER
Q12, Q13, Q14
Q15, Q16, Q17
2SA1162 X6
MW8V
220M8V
BAND SW
Q12
Q15
WFM8V
400M8V
Q13
Q16
144M8V
800M8V
Q14
Q17
+8V
D10
MA862
VCO SW
PLL
DATA
CK
PLST
IC6
LM7005
X5
BUFF
Q21
2SC3772
LO SW2
D49
MA862
Q26 RN1404
Q27 2SA1162
MODE
13.8V
REG
A1R8V
IC22 BA695
Q59, Q64 RN2404
Q61 2SC2712
Q62, Q63 RN1404
POW
H
SW
Q28 2SC2712
Q29 2SA1359
13.8V
REG 5V
IC7 TA78L05F
REG
+5V
Q24 2SC2712
Q25 2SB909M
D13 RD3.9M
+8V
SRF
SQS
MW
WFM SQL/SRF CTRL
F13
CFWM455G
IF
FILTER
Q32
2SC2712
BUFF
D18
1SV149
AM TUN
IC9 B
IC9 A
BUFF
IC9, IC11
NJM4558M
AF AMP
IC8 TA8207K
IC10
TC9154AP
ATT
+8V
Q31
2SK302
PCHK
BUFF
WFM AM DET
OSC IF AMP
STREO DECORDER
IC12
LA1810
L R
X3
IC11 B
IC11 A
DATA
CK
VOLST


FI1
KBF-455R-15A
455KHz
X1
59.095MHz
IF AMP MIX
NOISE AMP
DETECTOR
IC1 MC3361D
IF AMP
Q3
2SK302
D2, D3
1SS193 X 2
IF FILTER
F12
59M15B
MIXER
59.55
MHz
X2
Q4
SK177
D19,D26,D31,D35
1SS153 X 4
D36 HSM88AS
RF SW
BPF
D20,D21
1SV217 X 2
RF AMP
Q33
2SC3775
HPF
AIR
BAND
144MHz
BAND
D23,D30,D3
1SS153 X 4
D42 MA96
RF SW
BUFFER
Q34
2SK209
Q46
2SC2712
AGC AMP
D44
HSM88AS
AGC DET
Q47
2SC3361
AGC CTRL
Q50 2SK209
Q51 2SA1162
AGC CTRL
D27,D28
1SV88 X 2
Q35
2SC3775
BPF
RF AMP
HPF
220MHz
BAND
BUFFER
Q22 2SK209
BUFFER
Q36
2SK209
VCO-A BOARD
Q1 2SK125
Q2 2SC3775
D1-D8 1SV217 X8
Q23
2SC3775
BUFF
V8V
499ACPS
5D1225M
Q7 2SC3661
D5 1SS193
DC DC CONVERTER
30V
Q52 2SC2712
D52 1SS193
Q53,Q18
2SK209 X 2
Q19 2SC2712
UNLK
CTRL
LOOP
FILTER
D47
MA862
Q48
2SC3775
LO SW1
DOUBLER
D48
MA862
LO SW1
Q37
2SC3772
D32,D33
1SV214 X 2
Q38
2SC3775
RF AMP
BPF
RF AMP
HPF
400MHz
BAND
D10
MA862
VCO-B BOARD
Q1 2SK125
Q2 2SC3775
D1,D2 1SV166 X 2
Q20
2SK209
BUFFER
BUFFER
Q39
2SK209
VCO SW
PLL
DATA
CK
PLST
X5
BUFF
Q21
2SC3772
U8V
IC6
LM7005
Q40
2SC4095
Q41
2SC4095
RF AMP
BPF
RF AMP
HPF
800MHz
BAND
LO SW2
DOUBLER
LO SW2
D49
MA862
Q49
2SC3775
D50
MA862
IC13 LA1177
WFM
FRONT-END
D40
SVC203
Q43
3SK122
D41
SVC203
BPF
RF AMP
BPF
WFM
BAND
10.7MHz
X4
F13
CFWM455G
IF FILTER
Q32
2SC2712
BUFF
D18
1SV149
AM TUNE
IF FILTER
F14
SFE 10.7MMH-A
WFM
TUNE
D39 SVC203
BUFFER
Q44
2SK209
WFM AM DET
OSC IF AMP
STREO DECORDER
X3
WFM
SQL
ADJUST
Q65
2SC2712
L
R
IC12
LA1810
R8V D53
1SS184
U8V D12
1SS184
V8V D11
1SS184
A8V D55
1SS184
MW
BAND
REG
REG
RE
REG
WFM
8V
MW
8V
800M
8V
400M
220M
8V
144M
8V
U8V
V8V



ANT input frequency & 1st Lo frequency

X1)	MW band	0.5220MHz-1.6290MHz	#01
		(0.5200MHz-1.6300MHz)	#02,05,07
	WFM band	76.0000MHz-108.0000MHz	
	AIR band	108.0000MHz-137.0000MHz	
	144MHz band	137.0000MHz-200.0000MHz	
	220MHz band	200.0000MHz-236.0000MHz	
	400MHz band	300.0000MHz-399.9950MHz	#01,05,07
		(300.0000MHz-399.9875MHz)	#02
		400.0000MHz-500.0000MHz	
	800MHz band	800.0000MHz-950.0000MHz	
X2)	AIR band	167.5500MHz-196.5500MHz	
	144MHz band	77.4500MHz-140.4500MHz	
	220MHz band	140.4500MHz-176.4500MHz	
	400MHz band	359.5500MHz-459.5450MHz	#01,05,07
		(359.5500MHz-459.5375MHz)	#02
		340.4500MHz-440.4500MHz	
	800MHz band	740.4500MHz-890.4500MHz	

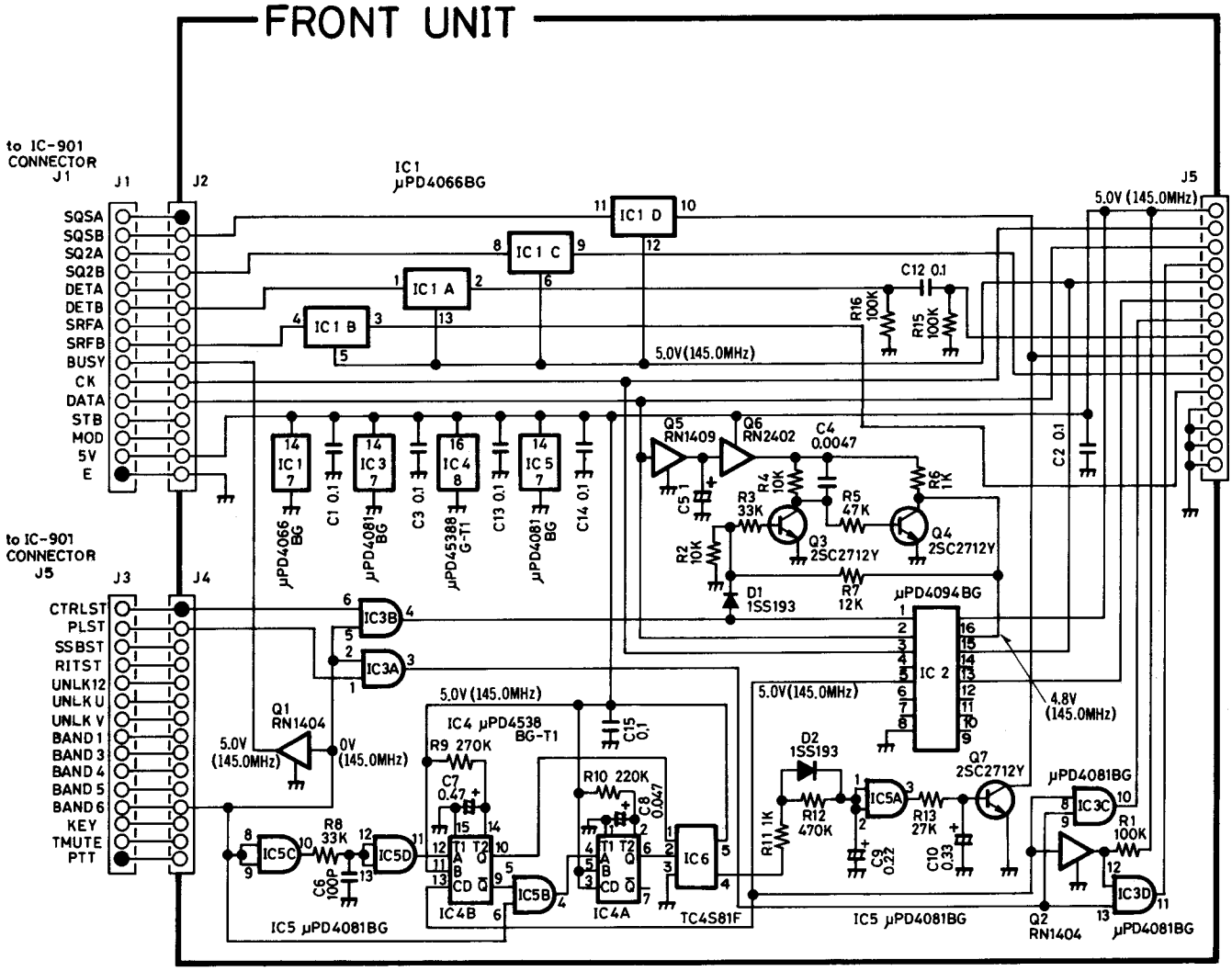
1st Lo frequency & PLL input frequency

X3)	MW band	0.9770MHz-2.0840MHz	#01
		(0.9750MHz-2.0850MHz)	#02,05,07
X4)	WFM band	65.300MHz-97.300MHz	
X5)	MW band	0.9770MHz-2.0840MHz	#01
		(0.9750MHz-2.0850MHz)	#02,05,07
	WFM band	65.3000MHz-97.3000MHz	
	AIR band	83.7750MHz-98.2750MHz	
	144MHz band	77.4500MHz-140.4500MHz	
	220MHz band	140.4500MHz-176.4500MHz	
	400MHz band	359.5500MHz-459.5450MHz	#01,05,07
		(359.5500MHz-459.5375MHz)	#02
		340.4500MHz-440.4500MHz	
	800MHz band	370.2250MHz-445.2250MHz	

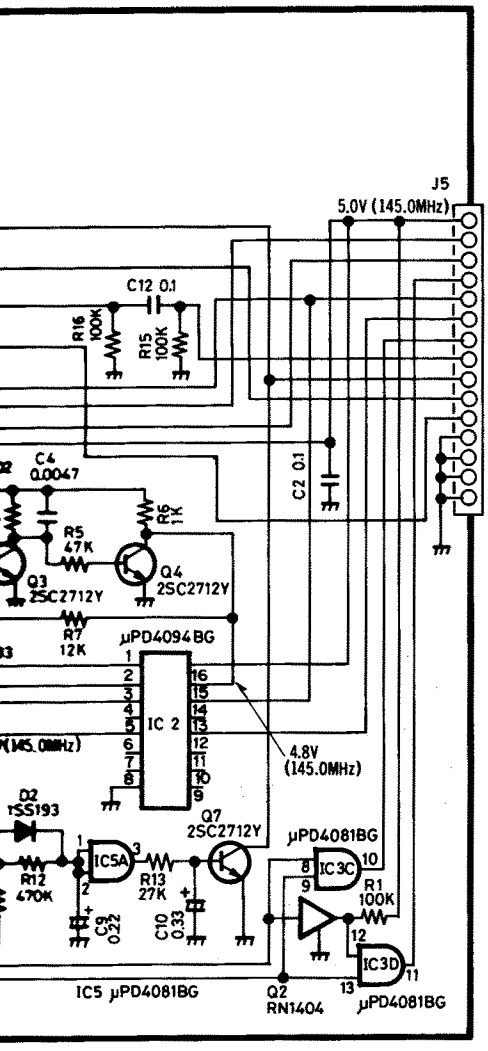
#01 JPN
#02 EUR
#05 USA
#07 AUS

SECTION 9 VOLTAGE DIAGRAM

FRONT UNIT

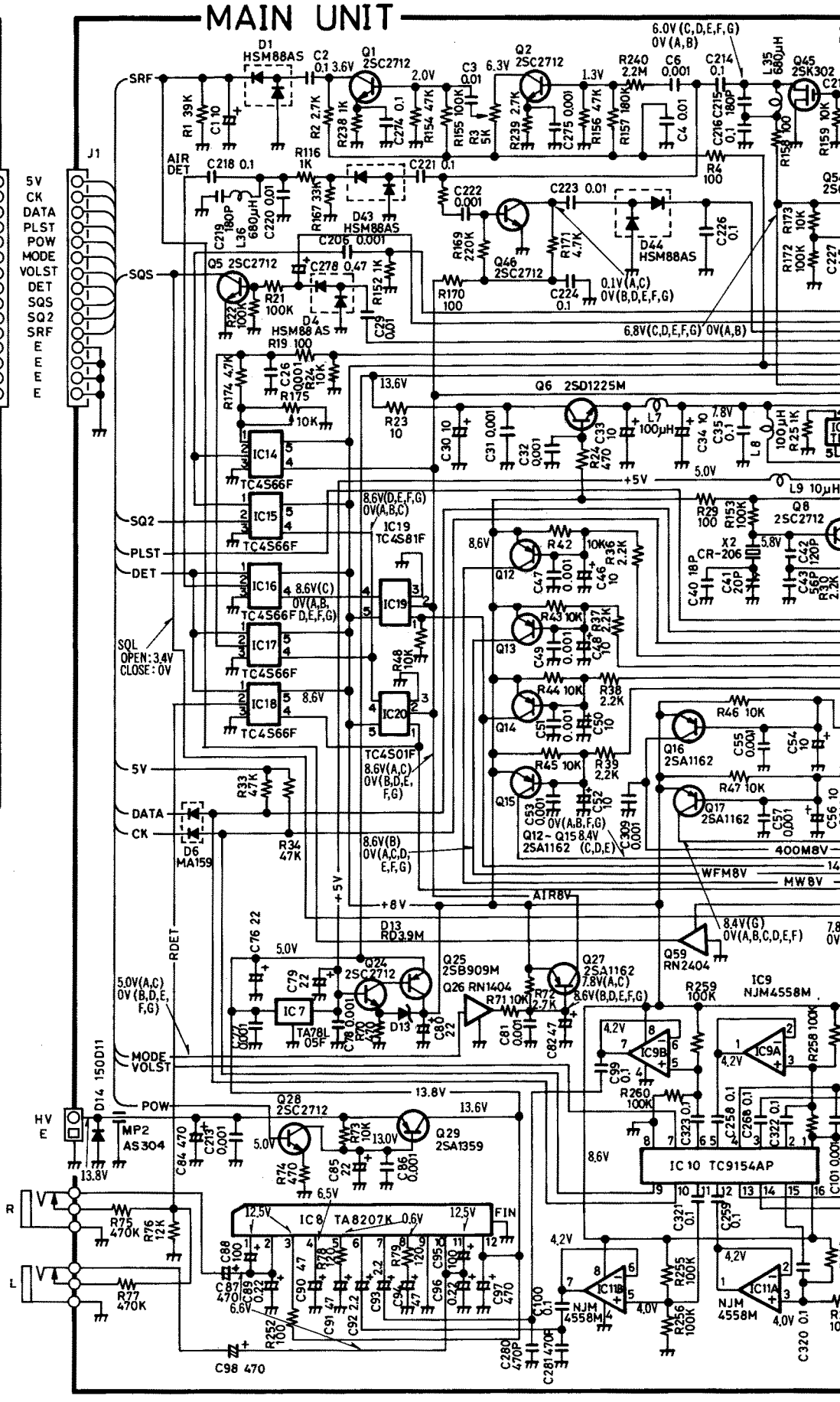


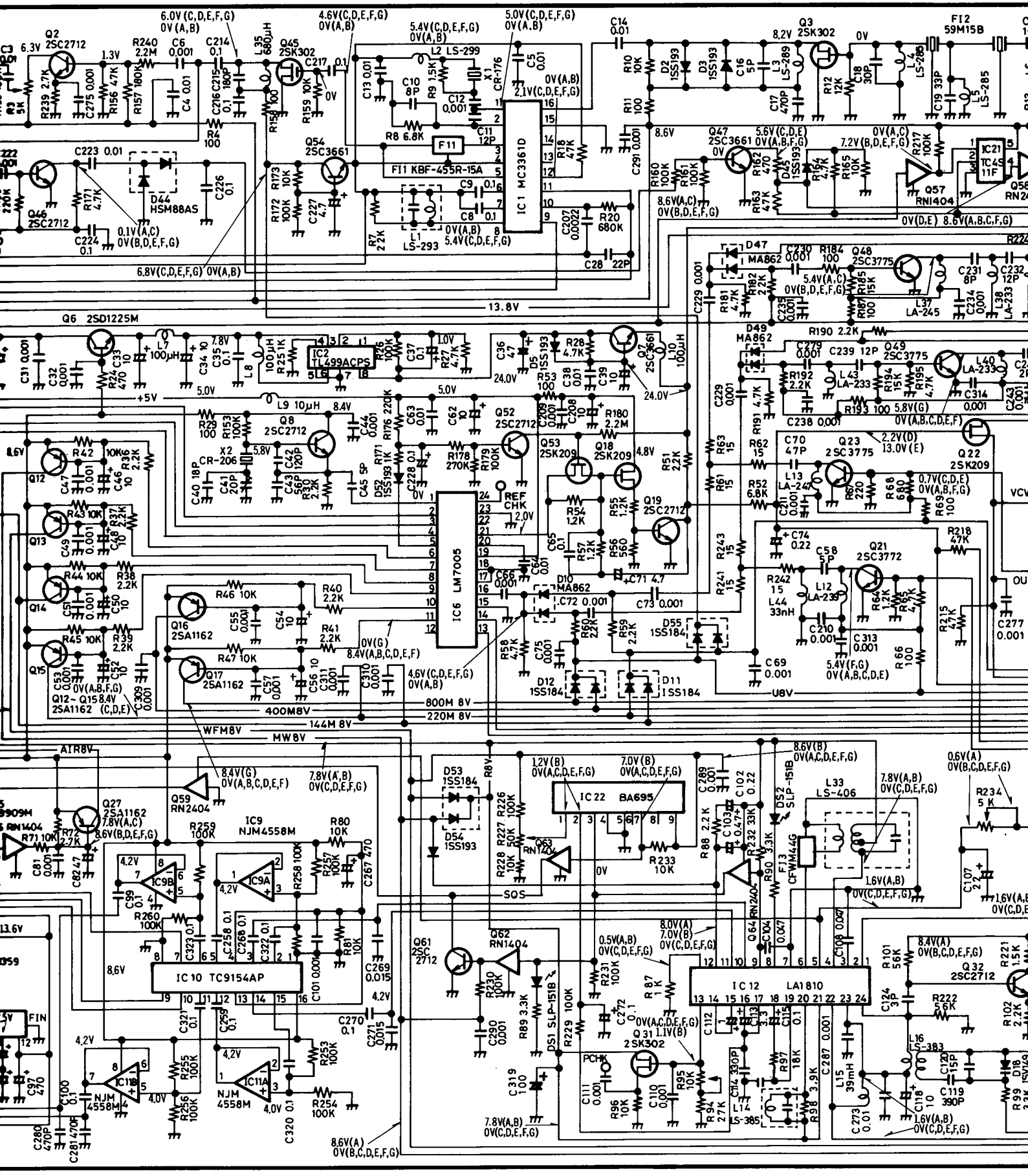
BAND(MHz)	
A	1.062
B	92.200
C	122.025
D	145.020
E	218.020
F	400.020
G	875.025

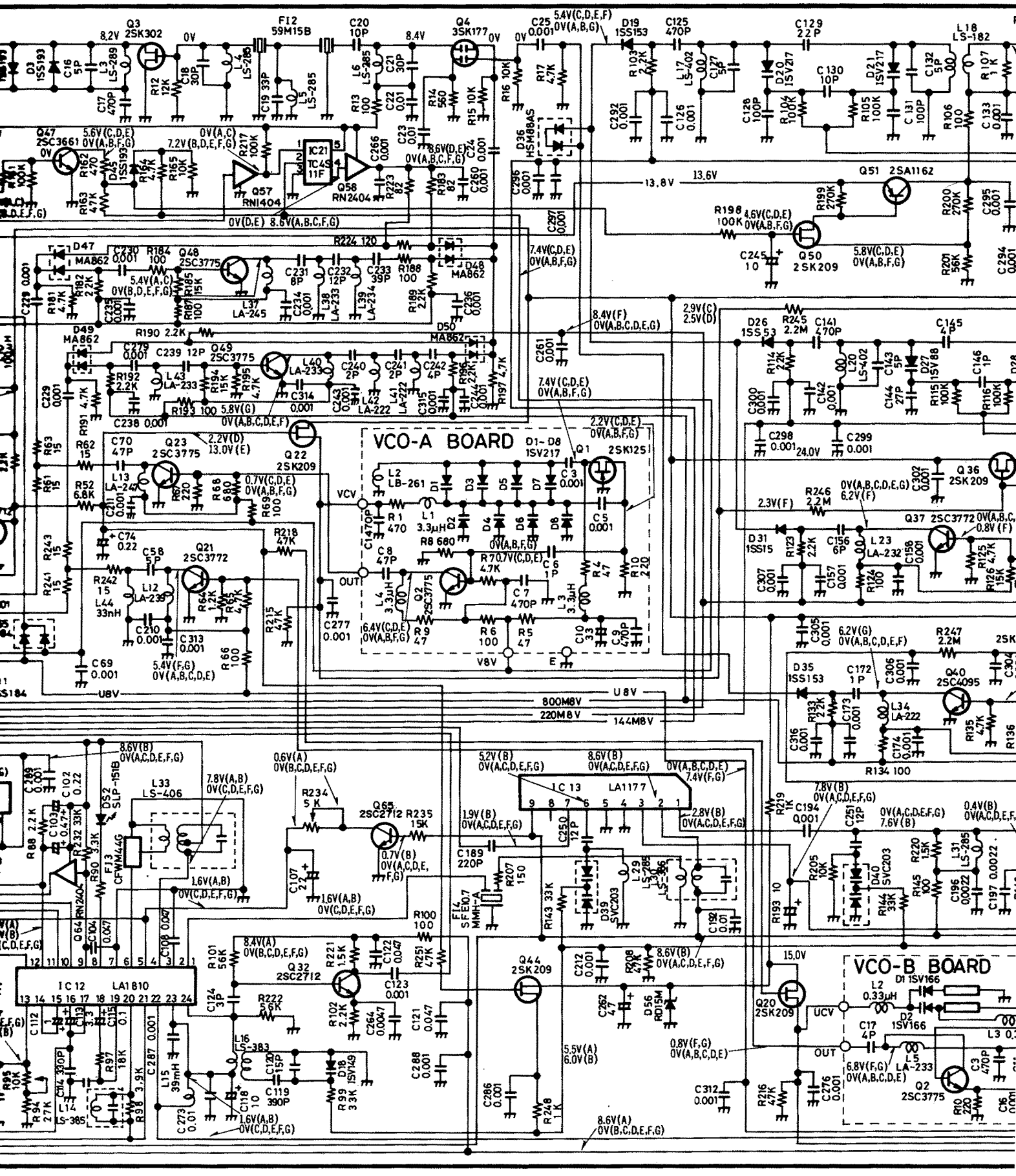


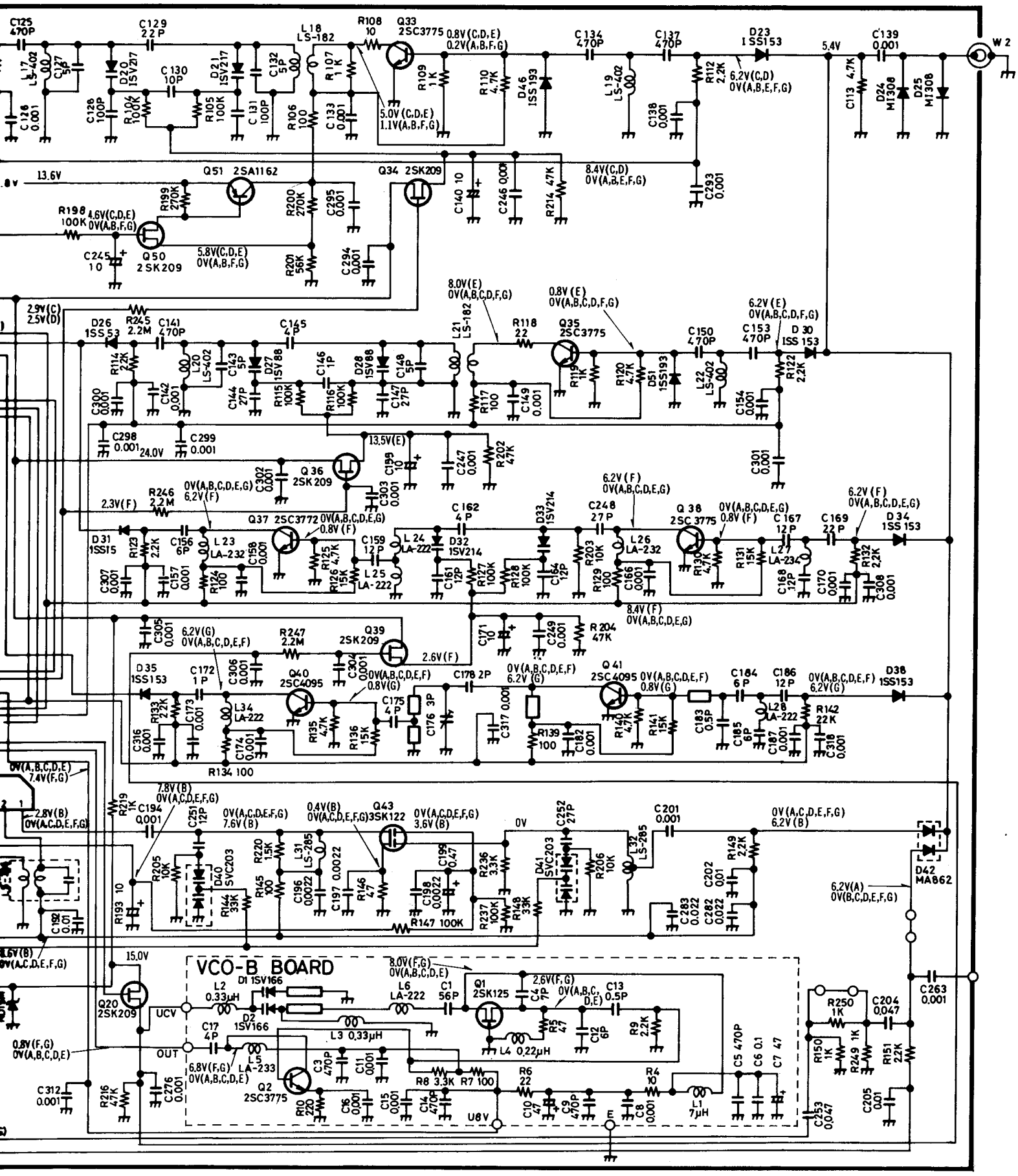
BAND(MHz)	
A	1.062
B	92.200
C	122.025
D	145.020
E	218.020
F	400.020
G	875.025

MAIN UNIT




IC1 MC3361D
IC2 TL499ACPS
IC6 LM7005
IC9 NJM4558M
IC10 TC9154AP
IC12 LA1810
IC22 BA695
IC9B
IC9A
IC11B
IC11A
NJM 4558M
IC21 TC4S 11F
F11
F11 KBF-455R-15A
F12 59M15B
F13 CFWM44G
X1 CR-176
X2 CR-206
L1 LS-293
L2 LS-299
L4 LS-285
L5 LS-285
L33 LS-406
L35 680μH
L37 LA-245
L38 LA-233
L40 LA-233
L43 LA-233
L44 33nH
L7 100μH
L8
L9 10μH
L10 100μH
L12 LA-236
L13 LA-247
L14 LS-385
L15 39mH
L16 LS-383
Q2 2SC2712
Q3 2SK302
Q45 2SK302
Q46 2SC2712
Q47 2SC3661
Q48 2SC3775
Q49 2SC3775
Q54 2SC3661
Q6 2SD1225M
Q8 2SC2712
Q52 2SC2712
Q53 2SK209
Q18 2SK209
Q19 2SC2712
Q22 2SK209
Q23 2SC3775
Q21 2SC3772
Q12
Q13
Q14
Q15
Q16 2SA1162
Q17 2SA1162
Q12~Q15 2SA1162 (C,D,E)
Q27 2SA1162
Q59 RN2404
Q57 RN1404
Q61 2SC2712
Q62 RN1404
Q63 RN1404
Q64 RN2402
Q31 2SK302
Q32 2SC2712
D44 HSM88AS
D47 MA862
D49 MA862
D10 MA862
D12 1SS184
D11 1SS184
D53 1SS184
D54 1SS193
D55 1SS184
D2 1SS193
D3 1SS193
D5 1SS193
D52 1SS193
DS1 SLP-151B
DS2 SLP-151B
REF CHK
6.3V
1.3V
6.0V(C,D,E,F,G) 0V(A,B)
4.6V(C,D,E,F,G) 0V(A,B)
5.4V(C,D,E,F,G) 0V(A,B)
5.0V(C,D,E,F,G) 0V(A,B)
2.1V(C,D,E,F,G)
8.2V
0V
8.6V
5.6V(C,D,E)
7.2V(B,D,E,F,G)
0V(A,C)
8.6V(A,C) 0V(B,D,E,F,G)
0V(D,E) 8.6V(A,B,C,F,G)
0.1V(A,C) 0V(B,D,E,F,G)
6.8V(C,D,E,F,G) 0V(A,B)
5.4V(A,C) 0V(B,D,E,F,G)
5.8V(G) 0V(A,B,C,D,E,F)
2.2V(D) 13.0V(E)
0.7V(C,D,E) 0V(A,B,F,G)
5.4V(F,G) 0V(A,B,C,D,E)
7.8V 5.0V 1.0V 24.0V
5.8V 4.8V 2.0V
8.4V 4.2V 4.0V
1.2V(B) 0V(A,C,D,E,F,G)
7.0V(B) 0V(A,C,D,E,F,G)
8.6V(B) 0V(A,C,D,E,F,G)
0.6V(A) 0V(B,C,D,E,F,G)
7.8V(A,B) 0V(C,D,E,F,G)
8.4V(G) 0V(A,B,C,D,E,F)
7.8V(A',B) 0V(C,D,E,F,G)
4.6V(C,D,E,F,G) 0V(A,B)
8.4V(A,B,C,D,E,F)
0V(G)
8.4V(A,B,F,G) 2SA1162 (C,D,E)
0.5V(A,B) 0V(C,D,E,F,G)
8.0V(A) 7.0V(B) 0V(C,D,E,F,G)
1.6V(A,B) 0V(C,D,E,F,G)
8.4V(A) 0V(B,C,D,E,F,G)
7.8V(A,B) 0V(C,D,E,F,G)
1.1V(B)
13.8V
+5V
5.0V
24.0V
800M 8V
400M8V
220M 8V
144M 8V
WFM8V
MW8V
AIR8V
U8V
SQS
PCHK
VCV
OU
FIN


VCO-A BOARD
D1~D8 1SV217
Q1 2SK125
VCO-B BOARD
D1 1SV166
D2 1SV166
IC 12 LA1810
IC 13 LA1177
Q44 2SK209
Q65 2SC2712
Q32 2SC2712
Q64 RN2402
Q57 RN1404
Q58 RN2404
Q47 2SC3661
Q48 2SC3775
Q49 2SC3775
Q3 2SK302
Q4 3SK177
Q50 2SK209
Q51 2SA1162
Q22 2SK209
Q23 2SC3775
Q21 2SC3772
Q36 2SK209
Q37 2SC3772
Q40 2SC4095
Q20 2SK209
Q2 2SC3775
F12 59M15B
F13 CFWM44G
F14 SFE10.7 MMH-A
D47 MA862
D48 MA862
D49 MA862
D50 MA862
D36 HSM88AS
D19 1SS153
D26 1SS53
D35 1SS153
D31 1SS15
D39 SVC203
D40 SVC203
D56 RD15M
IC21 TC4S 11F
VCV
UCV
OUT
V8V
E
U8V
800M8V
220M8V
144M8V
15.0V
13.8V
13.6V


VCO-B BOARD
Q1 2SK125
Q2 2SC3775
Q20 2SK209
D1 1SV166
D2 1SV166
Q33 2SC3775
Q34 2SK209
Q35 2SC3775
Q36 2SK209
Q37 2SC3772
Q38 2SC3775
Q39 2SK209
Q40 2SC4095
Q41 2SC4095
Q43 3SK122
Q50 2SK209
Q51 2SA1162
D42 MA862
W2
UCV
OUT
U8V
E

UX-S92A
UX-S92E

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

- Frequency coverage :

MODEL	VERSION	FREQUENCY COVERAGE
UX-S92A	U.S.A.	144.000~148.000 MHz
	Australia	
UX-S92E	Europe	144.000~146.000 MHz

- Mode : A1 (CW)
  A3J (LSB/USB)
- Selectable tuning step : 50 Hz, 100 Hz, 1 kHz and 5 kHz
- Memory channels : 12 plus a call channel
- Antenna impedance : 50 Ω (unbalanced)
- Power supply requirement : 13.8 V DC±15 %
- Current drain (at 13.8 V DC) : Receive 500 mA
  Transmit 3.5 A (LOW)
  7.0 A (HIGH)
- Usable temperature range : −10 °C~+60 °C (+14 °F~+140°F)
- Frequency stability : ±10 ppm (−10 °C~+60 °C) (+14 °F~+140°F)
- Dimensions : 117 (W)×25 (H)×191 (D) mm
  4.6 (W)×1.0 (H)×7.5 (D) in
  (Projections not included)
- Weight : 1.2 kg (2.6 lb)

■ TRANSMITTER

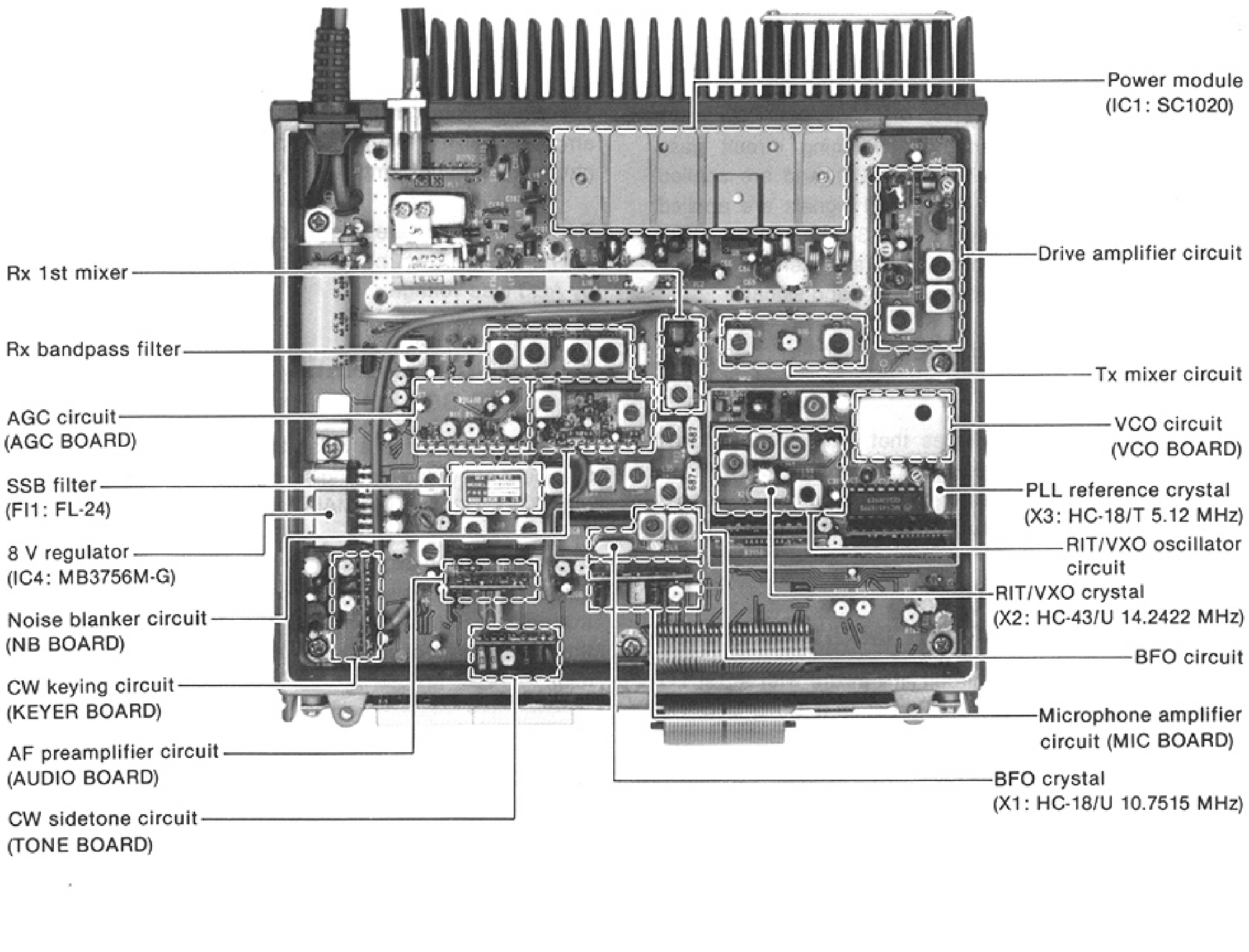
- Output power (at 13.8 V DC) : High 25 W
  Low 5 W
- Modulation system : Balanced modulation
- Spurious emissions : Less than −60 dB
- Carrier suppression : More than 40 dB
- Unwanted sideband : More than 40 dB

■ RECEIVER

- Receive system : Single-conversion superheterodyne
- Intermediate frequency : 10.75 MHz
- Sensitivity : Less than 0.11 μV for 10 dB S/N
- Selectivity : More than ±1.2 kHz/−6 dB
  Less than ±2.2 kHz/−60 dB
- Spurious rejection ratio : More than 60 dB

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

SECTION 2 INSIDE VIEW



SECTION 3 CIRCUIT DESCRIPTION

3-1 RECEIVER CIRCUITS

3-1-1 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

Received signals enter the antenna connector and pass through the ANT BOARD, RL1 and a low-pass filter (L18~L20, C101, C102, C105, C109). The signals are applied to an antenna switching circuit (D9~D11) and then to an RF circuit via a π-type low-pass filter (L21, L22, C98, C100, C400).

RL1 routes the received VHF signals to the UX-S92A/E or IC-901A/E using Q12.

3-1-2 RF CIRCUIT (MAIN UNIT)

The signals from the antenna switching circuit pass through a resonator circuit (L26, C128), and are applied to an RF amplifier (Q14). Amplified signals are applied to a 4-stage bandpass filter (L28~L31, D19~D22, C137 ~C147), and are then applied to a 1st mixer (Q15, Q16). The bandpass filter suppresses out-of-band signals.

Q14 is a GaAs FET which provides high-gain and low-noise amplification.

D19~D22 are varactor diodes that track the bandpass filter and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the bandpass filter for wide bandwidth reception and good image response rejection.

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

The signals from the RF circuit are mixed with a 1st LO signal from the VCO BOARD to produce a 10.75 MHz 1st IF signal.

The 1st mixer circuit employs a single balanced mixer using low-noise junction FETs (2SK125×2) to expand the dynamic range.

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

After passing through a matching circuit (L34, C157), the 1st IF signal is applied to a pair of crystal filters (FI2) to suppress out-of-band signals.

The signal output from FI2 passes through the noise blanker gate (D23, D24) and is amplified by a 1st IF amplifier (Q17). The signal enters the SSB filter (FI1) via D25. FI1 is a crystal filter which has ±1.2 kHz/−6 dB selectivity.

The signal from the SSB filter is amplified by the 1st IF amplifiers (Q18, Q19) and applied to the demodulator circuit via a buffer amplifier (Q20).

Dual-gate FETs are used on the 1st IF amplifiers (Q17~Q19). The 2nd gates of Q17~Q19 are controlled by AGC bias voltage.

3-1-5 NOISE BLANKER CIRCUITS (NB BOARD)

The UX-S92A/E uses a noise trigger noise blanker circuit that cuts out pulse-type noise signals at the noise blanker gate (D23, D24) on the MAIN UNIT.

A portion of the signals from FI2 on the MAIN UNIT is amplified at the noise amplifiers (Q1, IC1) and detected at the noise detector (D3, D4). The detected voltage from the noise detector is applied to the noise blanker switch (Q5).

RECEIVER IF CIRCUIT

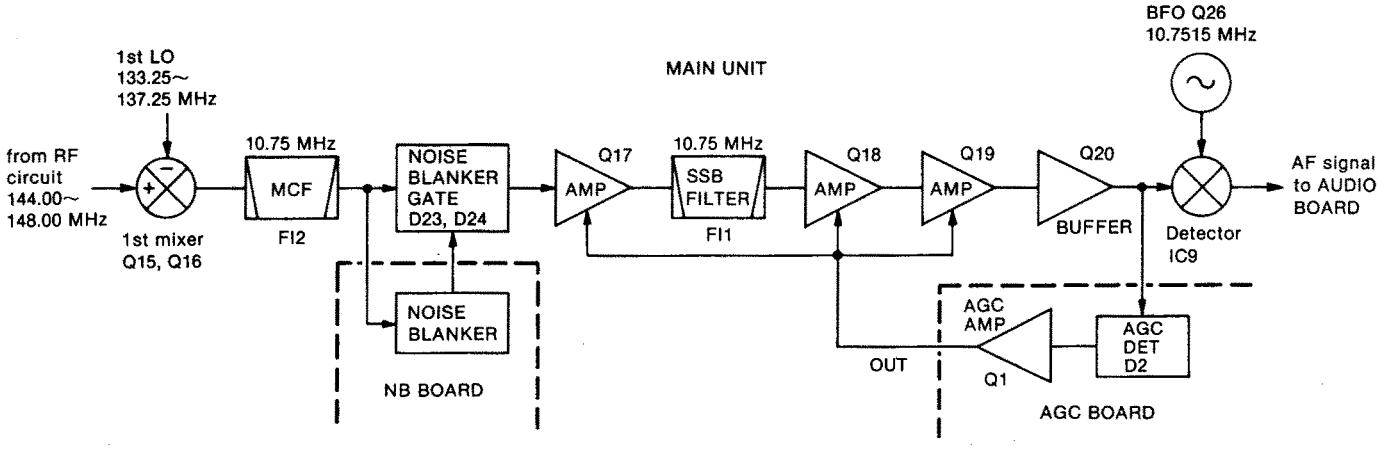


Fig. 1

The threshold level of the noise blanker switch is set at approx. 0.8 V. When the detected voltage exceeds the threshold level, Q6 outputs a blanking signal to activate the noise blanker gate.

A portion of the detected voltage is applied to the noise AGC circuit (Q2, Q4) and fed back to the noise amplifier (IC1) as noise AGC voltages. The time constant of the noise AGC circuit is determined by R8 and C9. This AGC circuit does not operate when detecting a pulse-type noise.

3-1-6 DEMODULATOR CIRCUITS (MAIN UNIT)

The 1st IF signal from the buffer amplifier (Q20) is mixed with a BFO signal at the double balanced demodulator (IC9) to demodulate the 1st IF signal into an AF signal. The detected signal are applied to the AF circuit on the AUDIO BOARD.

3-1-7 BFO CIRCUIT (MAIN UNIT)

A 10.75 MHz signal oscillated at the BFO circuit (Q26, X1) is buffer-amplified at Q25 and used at the balanced modulator (IC8) and balanced demodulator (IC9). The BFO frequency is shifted with a mode signal using D28, D29 and Q27.

In LSB mode, the LSB8 voltage line becomes +8 V, turning ON D28. The frequency is then adjusted with C248 to set the LSB carrier point.

In CW mode transmitting, the CW8 voltage line becomes +8 V and Q27 becomes OFF, turning ON the other part of D28. The frequency is then adjusted with L43 to set the CW transmit carrier point.

In USB mode or CW mode receiving, the USB8 or CW8 voltage line becomes +8 V, turning ON D29. The frequency is then adjusted with L44 to set the USB and CW carrier point.

BFO FREQUENCY IN EACH MODE

MODE	FREQUENCY (MHz)
LSB	10.7515
CW (Tx)	10.7493
USB	10.7485
CW (Rx)	10.7485

3-1-8 AGC AND S-INDICATOR CIRCUITS (AGC BOARD)

The receiver gain is determined by the voltage on the OUT line (Q1, collector). When strong signals are received, the AGC circuit decreases the voltage on this line.

The IF signal from the buffer amplifier (Q20) on the MAIN UNIT enters the AGC BOARD via C181, is detected at D2, and applied to the base of Q1. A time constant (C3, R2, R3, R16) is connected to the AGC line that determines an AGC attack/release time.

The time constant is controlled by the SLOW line. When the SLOW line is "HIGH," C4 and R4 are connected in parallel with the OUT line to obtain a slow AGC release time.

The AGC bias voltage is applied to the differential amplifier (IC1b) where the difference between the bias and reference voltages is detected. The resulting S-indicator signal is applied to a meter selector switch (IC2) on the FRONT UNIT. The reference voltage is adjusted with R6.

AGC CIRCUIT

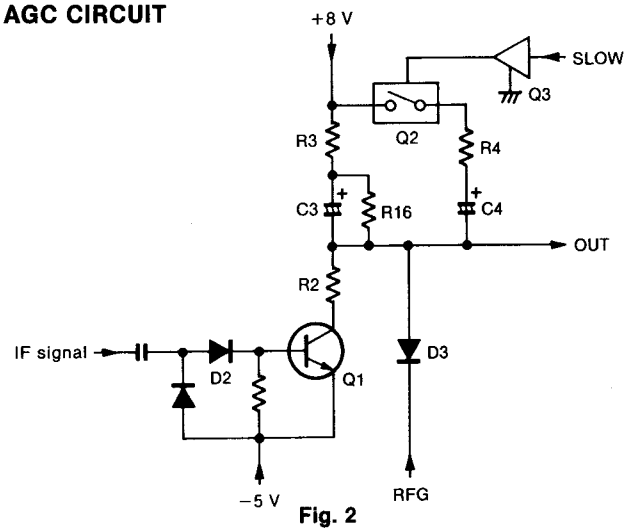


Fig. 2

3-1-9 SQUELCH CIRCUIT (AGC AND SDA BOARDS)

The squelch circuit mutes the audio output when the S-indicator signal is lower than the squelch setting level.

The S-indicator signal from IC1 pin 7 is applied to the comparator (IC1 pin 2) to be compared to a threshold level controlled by the SQLDA voltage. The squelch control signal is applied to the AUDIO BOARD.

The SDA BOARD generates the threshold voltage from the serial data of the IC-901A/E sub CPU using IC1 and R1. IC1 functions as a serial/parallel converter, applying 8-bit parallel data to R1. R1 is a ladder resistor and converts the parallel data into a squelch threshold voltage.

When the S-indicator signal is lower than the threshold level, the comparator turns "HIGH" and then Q4 turns ON to activate the AF mute switch (IC1) on the AUDIO BOARD. This signal is applied to the IC-901A/E sub CPU via the SQLS line, turning OFF the [T/R] or [RX] indicator.

3-1-10 AF AMP CIRCUIT (AUDIO BOARD)

The AF signal from the balanced demodulator is applied to the AF preamplifier (Q1) via an AF mute switch (IC1). The output from the AF preamplifier is applied to the buffer amplifier (Q2) and then to the IC-901A/E MAIN-B UNIT to drive the speaker.

The CW sidetone signal from the TONE BOARD is also applied to Q2.

3-2 TRANSMITTER CIRCUITS

3-2-1 MICROPHONE AMPLIFIER (MIC BOARD)

Audio signals from the FRONT UNIT are amplified at the mic amplifier (Q1). The signals pass through the mic mute switch (Q2), and are then applied to the balanced modulator (IC8).

In CW mode or receive mode, the audio signals are muted at Q2 using R8 and CW8 voltage lines.

3-2-2 BALANCED MODULATOR (MAIN UNIT)

Output signals from the mic amplifier are applied to the balanced modulator circuit (IC8) to be converted to a 10.7 MHz IF signal. The BFO signal, buffer-amplified at Q25, is applied to IC8 pin 7 as a carrier signal. IC8 outputs a double sideband signal which passes through the SSB filter (FI1) to create an SSB signal.

R90 and R92 adjust the balance level of IC8 for maximum carrier suppression. In CW mode, the CWT signal from the KEYER BOARD upsets the balance to create a CW carrier signal.

3-2-3 IF CIRCUITS (MAIN UNIT)

The 10.75 MHz IF signal is applied to the SSB filter (FI1) and then to the Tx buffer amplifier (Q1) via D26. The buffer amplifier is a dual-gate FET. The 1st gate of Q1 is controlled by an ALC bias voltage from the ALC circuit, changing the output power HIGH or LOW.

In CW mode, a keying control signal from the KEYER BOARD is applied to a mute switch (Q2) and intermits the CW IF signal to cut out unwanted signals. Q2 also turns ON, when the TMUTE or UNLK signal line becomes "HIGH."

3-2-4 RF CIRCUITS (MAIN UNIT)

The 10.75 MHz IF signal is converted to the displayed frequency at a double balanced mixer (Q3, Q4). The LO signal from the VCO BOARD is amplified at Q5 and then to the balanced mixer.

The signal is applied to a 4-stage tuned filter (L4~L7, D2~D5, C24~C26, C29~C35, C41, C42) to suppress spurious components. D2~D5 are varactor diodes that track the tuned filter and are controlled by the lock voltage of the PLL. These diodes tune the center frequency of the tuned filter for wide bandwidth transmission and good spurious rejection.

The signal from the tuned filter is amplified at the predrive amplifier (Q6) and the drive amplifier (Q7).

3-2-5 RF POWER AMPLIFIER (MAIN UNIT)

IC1 is a power module which provides stable 25 W output power.

The RF signal from the drive amplifier (Q7) is applied to IC1 pin 1. The amplified signal is output from pin 5, and applied to the antenna connector through the diode switching and low-pass filter circuits.

C64, C67, C68, L13 and L14 suppress LO signal leakage from the mixer.

3-2-6 ALC CIRCUIT (MAIN UNIT)

The ALC 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 ALC detector (D7, D8). 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 voltage of IC3 pin 6 is higher than pin 5 (reference voltage). IC1 controls the Tx buffer amplifier (Q1) until the detected and reference voltages are equalized. Hence, when the antenna impedance is mismatched, the output power is decreased.

The circuit which selects output power uses the ALC circuit. Q24 selects the reference voltage using a HILO signal line, changing the output power to HIGH or LOW.

TRANSMITTER IF CIRCUIT

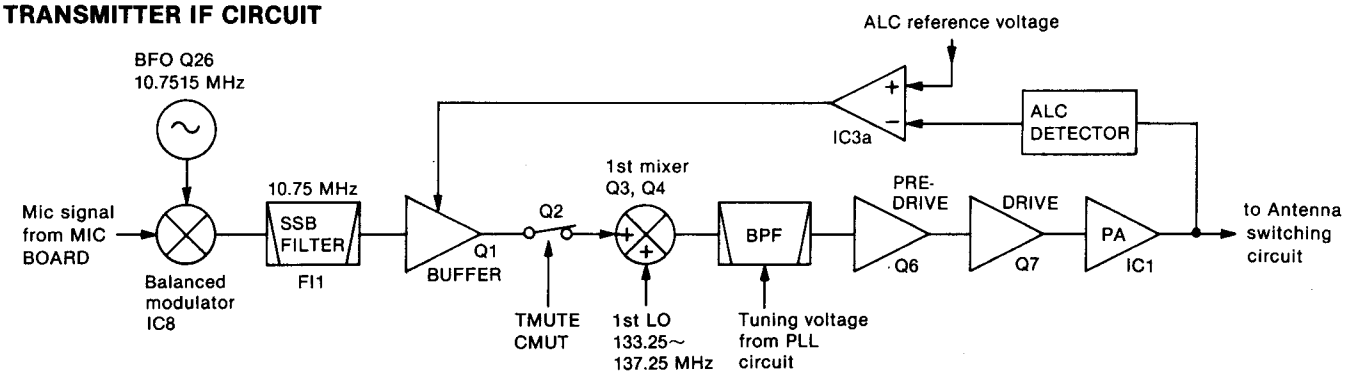


Fig. 3

3-2-7 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

When transmitting, D9~D11 are turned ON. The RF output signal is not applied to the receiver circuit, passing through D11, the low-pass filter (L18~L20, C101, C102, C105, C109) and then to the antenna. The low-pass filter suppresses high harmonic components.

3-2-8 CW KEYING CIRCUIT (KEYER BOARD)

A keying signal from the [KEY] jack enters the KEYER BOARD and is applied to Q1 via the KEY signal line. A keying signal from the EX-766 [KEY] jack is also applied to Q1.

When the CW key is closed, the KEY signal line becomes "LOW." Q1 outputs a "HIGH" signal to a CW sidetone, T/R switching and carrier switching circuits.

The "HIGH" signal from Q1 is applied to the CW sidetone circuit on the TONE BOARD, turning the CW sidetone oscillator ON and OFF via the CONT signal line. The "HIGH" signal from Q1 passes through C9, C10, R10 and R11, and is then applied to the balanced modulator circuit to create a CW signal. R10 adjusts the CW transmit power.

The T/R switching circuit (Q3~Q5) outputs a KPTT signal to control the break-in operation. R6 adjusts the CW delay time.

Q2 outputs a "LOW" signal to Q2 on the MAIN UNIT, turning the CW IF signal ON and OFF.

3-2-9 CW SIDETONE CIRCUIT (TONE BOARD)

A CW sidetone circuit outputs an approx. 800 Hz signal.

When the CW key is closed, the CW keying signal from the KEYER BOARD charges C1 and D2 is turned OFF, disconnecting C1 from Q1. Q1 then oscillates a sidetone signal. R1 prevents sidetone click noise.

CW SIDETONE CIRCUIT

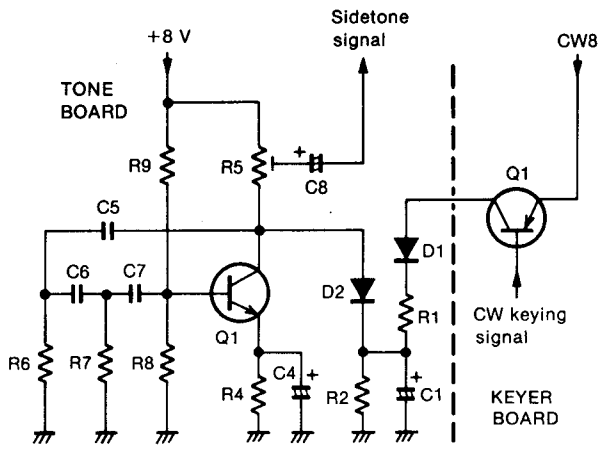


Fig. 4

3-3 PLL CIRCUITS

3-3-1 GENERAL (MAIN UNIT AND VCO BOARD)

A PLL circuit stably oscillates the transmit and receive local frequency. The PLL output frequency is controlled by the divided ratio (N-data) of the programmable divider and RIT/VXO oscillator output.

The PLL circuit, using a one chip PLL IC (IC7), directly generates the Tx/Rx LO frequency with a Hartley VCO (Q1) on the VCO BOARD. The PLL IC sets the divided ratio based on serial data from the IC-901A/E sub CPU, and compares the phases of a VCO signal and the reference oscillator frequency. The PLL IC detects the out-of-step phase and outputs from pin 5.

The PLL loop generates 133.25~137.25 MHz (EUR; 133.25~135.25 MHz) signals in 5 kHz steps. Because the RIT/VXO oscillator produces 50 Hz steps, the PLL produces a 4 MHz (EUR; 2 MHz) frequency range in 50 Hz steps.

3-3-2 PLL LOOP (MAIN UNIT)

The oscillated signal at the VCO BOARD is amplified at Q28 and Q32. The signal is mixed with the RIT/VXO oscillator output (f_{LO}: 128.18~128.18495 MHz) at Q33. Q32 is an isolator which ensures that the mixer input does not affect the VCO output.

The mixed signal is filtered at a 15 MHz cut-off low-pass filter (C319, L46, C320) and is then buffer-amplified at Q34. The amplified signal is then applied to the PLL IC (IC7).

The phase of the mixed signal is detected at the PLL IC (IC7) using a reference frequency (f_{REF}) of 5 kHz, is then output from pin 5. The 5 kHz frequency is obtained from the reference oscillator section of IC7. 5.12 MHz oscillated at X3, is divided by 1024 at the programmable divider section of IC7.

The phase detected signal is then converted to the lock voltage at a lag-lead loop filter (R142~R144, C297, C298), and applied to the VCO. Thus, the VCO output (PLL output) is locked to produce stable oscillation.

The PLL oscillation frequency is obtained by the following calculation:

$$f_V = f_{LO} + N_T \times f_{REF}$$

f_V: PLL loop output
f_{LO}: RIT/VXO oscillator output
N_T: Divided ratio from the IC-901A/E sub CPU
f_{REF}: Reference frequency (5 kHz)

3-3-3 REFERENCE OSCILLATOR CIRCUIT (MAIN UNIT)

A 5.12 MHz reference frequency is produced by the local oscillator section of IC7 and X3. C391 provides frequency control.

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

A phase-detected signal from IC7 pin 5 is converted to DC voltage by the lag-lead loop filter (R142~R144, C297, C298). When the operating frequency is greatly changed, D32 speeds up the PLL lock-up time.

The frequency at which the VCO oscillates is controlled by a varactor diode (D1) on the VCO BOARD. The DC voltage (PLL lock voltage) is applied to the VCO to lock the oscillating frequency.

On the other hand, the output of the loop filter passes through a DC amplifier (Q29, Q30) and is used as the tuning voltage for the Rx and Tx RF bandpass filters.

3-3-5 VCO CIRCUIT (VCO BOARD)

The VCO circuit (Q1, D1) generates the receive and transmit 1st LO frequencies. Varactor diode (D1) provides frequency control. The buffer amplifier (Q2) protects the PLL output signal against VCO oscillation.

3-3-6 RIT/VXO OSCILLATOR (MAIN UNIT)

A 14.2422 MHz frequency is oscillated at a Colpitts oscillator (Q37) using X2. The output is multiplied by 3 at Q36, multiplied by 3 at Q35 and is then filtered at a double tuned filter (L47, L48, C329~C331). The resulting signal (128.18~128.18495 MHz) is applied to the mixer (Q33).

Varactor diodes (D38, D39) are provided for the frequency control. DC voltage controlled by the FDA BOARD is applied to the cathode of the varactor diodes to track the oscillating frequency within 5 kHz.

Negative voltage controlled by the RDA BOARD is applied to the anode of the varactor diodes for the RIT/VXO operation. When the RIT function is activated, Q1 on the SW-A BOARD cancels the control voltage during transmitting. The variable range of the RIT/VXO operation is approx. ±1 kHz with ±63 steps.

3-3-7 UNLOCK SENSOR CIRCUIT (MAIN UNIT)

When the PLL circuit is unlocked, IC7 pin 7 is "LOW" and a "LOW" signal is applied to Q38 and then to the IC-901A/E sub CPU pin 10 as an unlock signal. Q38 also outputs the TMUTE signal to the mute switch (Q2) to cut-off the transmitter IF signal.

PLL CIRCUIT

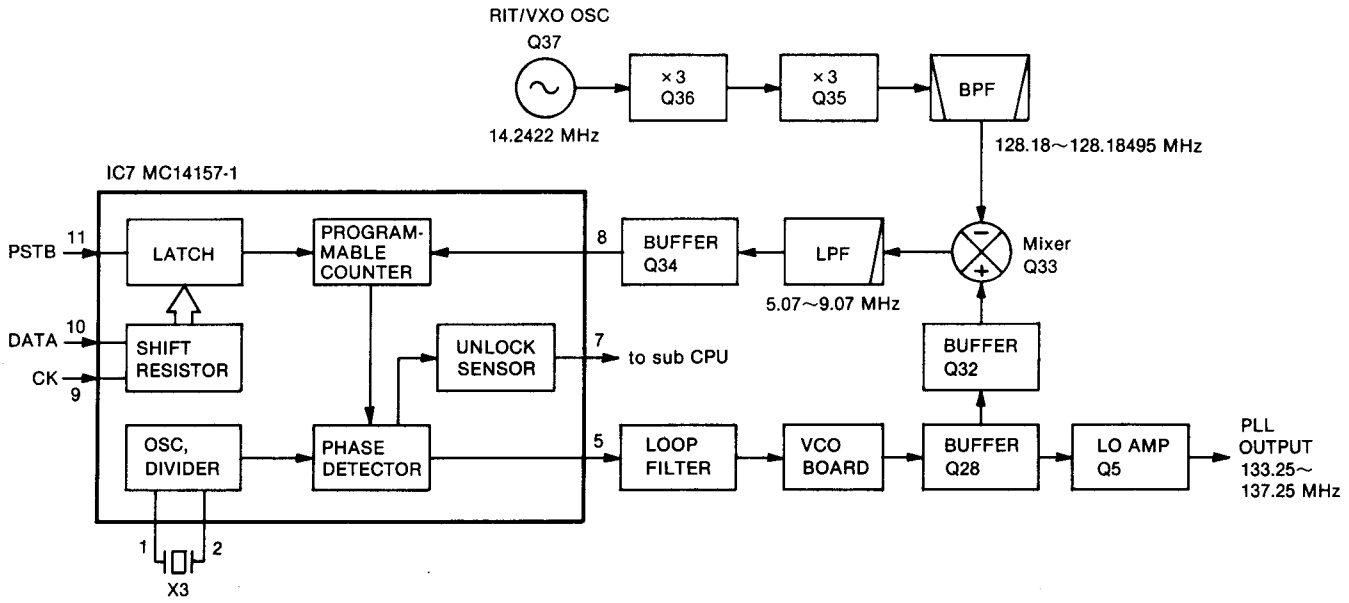


Fig. 5

3-4 OTHER CIRCUITS

3-4-1 VOLTAGE LINES

LINE	DESCRIPTION
HV	The external DC power from the DC power connector.
13.8 V	13.8 V DC controlled by the POW signal line. This voltage is converted from HV line at Q11.
+8 V	Common 8 V converted from 13.8 V line at IC4.
R8 V	Receive 8 V controlled by the PTT3 and KPTT signal lines. This voltage is converted from 13.8 V line at IC4.
T8 V	Transmit 8 V controlled by the PTT3 and KPTT signal line. This voltage is converted from 13.8 V line at IC4.
T13.8 V	Transmit 13.8 V controlled by the T8 V line. This voltage is converted from HV line at Q8.
T9 V	Transmit 9 V converted from T13.8 V line at IC2 and used at the power module as bias voltage.
−5 V	−5 V DC converted from 13.8 V line. IC6 is a switching regulator IC and IC10 is a −5 V regulator. IC10 and D14 converts the IC6 output into −5 V DC.
LSB8	LSB 8 V converted from +8 V line at Q42.
USB8	USB 8 V converted from +8 V line at Q43.
CW8	CW 8 V converted from +8 V line at Q44.

3-4-2 OUTPUT EXPANDER (SW-A BOARD)

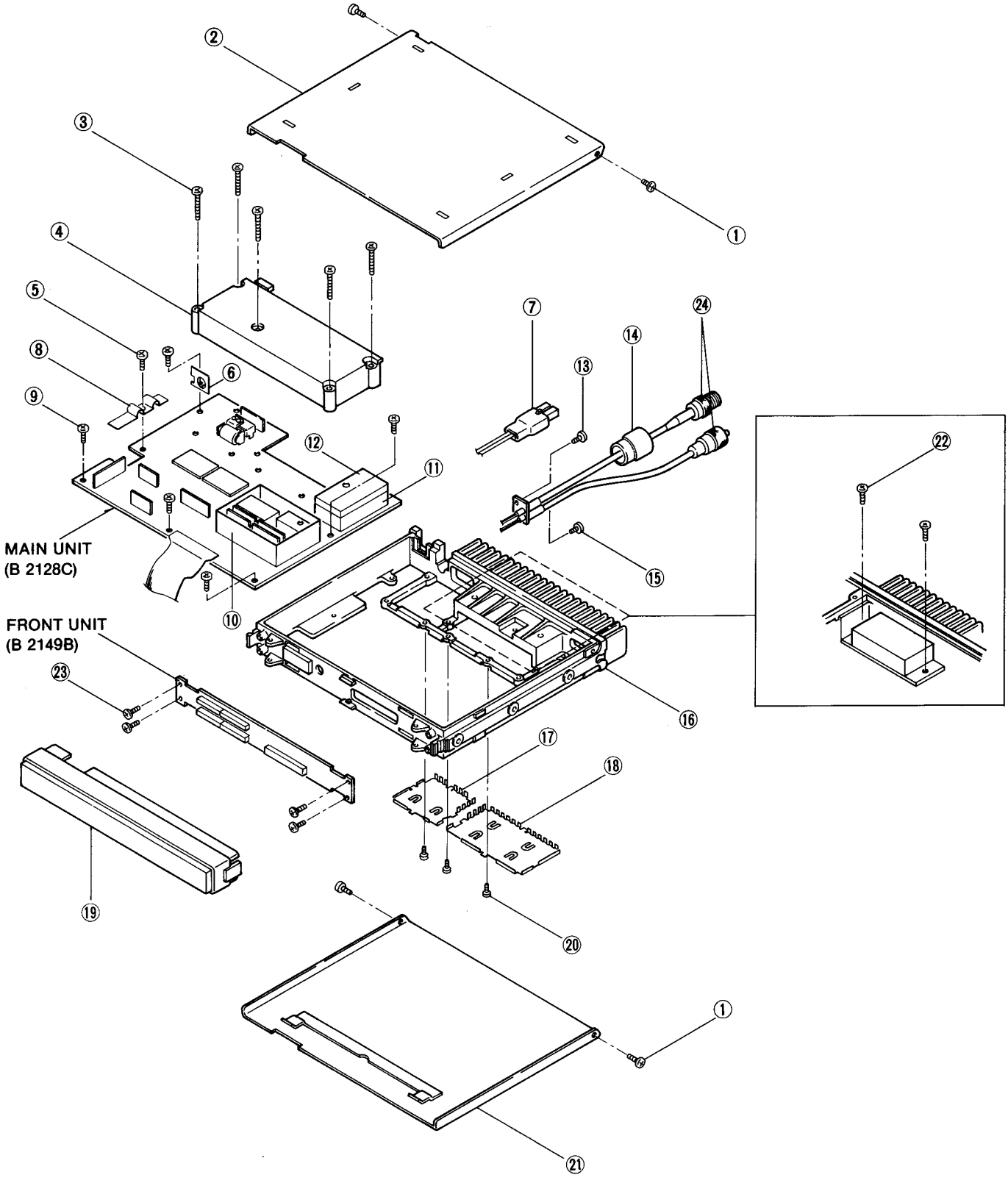
PORT NUMBER	PIN NUMBER	DESCRIPTION
Q1	4	Outputs a control signal for the RIT/VXO function.
Q2 [NBS]	5	Outputs a control signal for the noise blanker circuit. This port becomes "HIGH" while the noise blanker circuit is activated.
Q3, Q4 [RFGB, RFGA]	6, 7	Outputs a control signal for the RF gain selecting circuit. This signal is converted into RFG voltage (AGC reference voltage).
Q5 [SLOW]	14	Outputs a control signal for the AGC time constant selecting circuit.
Q6 [SQL]	13	Outputs a strobe signal for the SDA BOARD.
Q7 [RIT/VXO]	12	Outputs a strobe signal for the RDA BOARD.

SECTION 4 MECHANICAL PARTS AND DISASSEMBLY

CHASSIS UNIT

LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810002730	Screw BuH M2.6×4 ZK BS	4
②	8110003580	Cover (E)-2 (top)	1
③	8810003240	Set screw A M3×20	5
④	8010008990	PA shield cover (B)	1
⑤	8810003170	Set screw A M3×8	1
⑥	8930012170	Plate AS-304	1
⑦	8900001830	DC power cable OPC-169	1
⑧	8930010720	TR release plate	1
⑨	8810003160	Set screw A M3×6	5
⑩	8510006000	724 PLL case	1
⑪	8510000230	220 shield case	1
⑫	8510000241	220 shield case cover-1	1
⑬	8810001910	Screw PH M3×6 Ni BS	1
⑭	6950000040	M type cap (ZK)	1
⑮	8810001840	Screw PH M2.6×6 Ni BS	1
⑯	8010009031	175 Chassis (A)-2	1
⑰	8510004440	Filter shield plate	1
⑱	8510004452	PA shield plate-2	1
⑲	8210004900	Front panel (A) UX-S92E (EUR)	1
	8210004910	Front panel (B) UX-S92A (USA, AUS)	1
⑳	8810000160	Screw PH M2.6×8	3
㉑	8110003590	Cover (F)-2 (bottom)	1
㉒	8810003170	Set screw A M3×8	2
㉓	8810003960	Set screw A M2.6×5	4
㉔	8900002440	Connector cable OPC-230	1

Screw abbreviations PH: Pan head BuH: Button head
ZK: Black Ni: Nickel


MAIN UNIT
(B 2128C)
FRONT UNIT
(B 2149B)

SECTION 5 PARTS LIST

[FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130001250	IC	μPD4066BG-T1
IC2	1130001250	IC	μPD4066BG-T1
IC3	1130000830	IC	μPD4094BG-T1
IC4	1130000590	IC	μPD4081BG-T1
IC5	1130000590	IC	μPD4081BG-T1
IC6	1130003760	IC	TC4S81F (TE85R)
Q1	1590000420	Transistor	RN1404 (TE85R)
Q2	1590000420	Transistor	RN1404 (TE85R)
Q3	1590000420	Transistor	RN1404 (TE85R)
Q5	1590000420	Transistor	RN1404 (TE85R)
Q6	1590000420	Transistor	RN1404 (TE85R)
Q7	1590000410	Transistor	RN2404 (TE85R)
Q8	1590000420	Transistor	RN1404 (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000050	Diode	1SS193 (TE85R)
D3	1750000050	Diode	1SS193 (TE85R)
R1	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R2	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R3	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R4	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R5	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R6	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R7	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R8	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
C1	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C2	4030004760	Ceramic	C2012 JF 1E 104Z-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	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
EP1	0910022232	P.C. Board	B 2149B (FRONT)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1150000160	IC	SC1020
IC2	1180000040	IC	TA78L009AP
IC3	1110001540	IC	M5218FP-71A
IC4	1110000390	IC	MB3756M-G
IC5	1180000010	IC	TA78L005AP
IC6	1110000240	IC	BA222-V
IC7	1130004301	IC	MC145157P2
IC8	1110001320	IC	μPC1037HA
IC9	1110001320	IC	μPC1037HA
IC10	1180000320	IC	NJM79L05A
Q1	1580000370	FET	3SK179 K-T1
Q2	1590000460	Transistor	RN1402 (TE85R)
Q3	1560000270	FET	2SK302-Y (TE85R)
Q4	1560000270	FET	2SK302-Y (TE85R)
Q5	1530000810	Transistor	2SC2053
Q6	1530001810	Transistor	2SC3355
Q7	1530000810	Transistor	2SC2053

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q8	1520000080	Transistor	2SB909M R
Q9	1590000460	Transistor	RN1402 (TE85R)
Q10	1590000420	Transistor	RN1404 (TE85R)
Q11	1520000080	Transistor	2SB909M R
Q12	1590000420	Transistor	RN1404 (TE85R)
Q13	1590000420	Transistor	RN1404 (TE85R)
Q14	1580000350	FET	3SK140-Y (TE85R)
Q15	1560000130	FET	2SK125
Q16	1560000130	FET	2SK125
Q17	1580000380	FET	3SK179 M-T1
Q18	1580000380	FET	3SK179 M-T1
Q19	1580000370	FET	3SK179 K-T1
Q20	1530000160	Transistor	2SC2712-Y (TE85R)
Q21	1590000420	Transistor	RN1404 (TE85R)
Q22	1590000690	Transistor	IMD6 T108
Q24	1590000420	Transistor	RN1404 (TE85R)
Q25	1530000160	Transistor	2SC2712-Y (TE85R)
Q26	1530000160	Transistor	2SC2712-Y (TE85R)
Q27	1590000420	Transistor	RN1404 (TE85R)
Q28	1530002020	Transistor	2SC3770-3-TA
Q29	1560000360	FET	2SK209-Y (TE85R)
Q30	1510000110	Transistor	2SA1162-Y (TE85R)
Q31	1530002050	Transistor	2SC3661-TA
Q32	1530002020	Transistor	2SC3770-3-TA
Q33	1580000380	FET	3SK179 M-T1
Q34	1530002020	Transistor	2SC3770-3-TA
Q35	1530002020	Transistor	2SC3770-3-TA
Q36	1530002020	Transistor	2SC3770-3-TA
Q37	1530002370	Transistor	2SC2714-O (TE85R)
Q38	1510000110	Transistor	2SA1162-Y (TE85R)
Q39	1590000910	Transistor	IMZ2 T108
Q40	1590000910	Transistor	IMZ2 T108
Q41	1530001950	Transistor	2SC2712-GR (TE85R)
Q42	1590000690	Transistor	IMD6 T108
Q43	1590000690	Transistor	IMD6 T108
Q44	1590000690	Transistor	IMD6 T108
D1	1750000020	Diode	1SS184 (TE85R)
D2	1720000260	Varicap	1SV214 (TPH2)
D3	1720000260	Varicap	1SV214 (TPH2)
D4	1720000260	Varicap	1SV214 (TPH2)
D5	1720000260	Varicap	1SV214 (TPH2)
D6	1710000030	Diode	1S1555
D7	1790000490	Diode	HSM88AS-TR
D8	1790000490	Diode	HSM88AS-TR
D9	1710000290	Diode	MI308
D10	1710000290	Diode	MI308
D11	1710000310	Diode	MI407
D12	1750000050	Diode	1SS193 (TE85R)
D13	1750000040	Diode	1SS190 (TE85R)
D14	1790000490	Diode	HSM88AS-TR
D17	1790000490	Diode	HSM88AS-TR
D18	1750000030	Diode	1SS187 (TE85R)
D19	1720000260	Varicap	1SV214 (TPH2)
D20	1720000260	Varicap	1SV214 (TPH2)
D21	1720000260	Varicap	1SV214 (TPH2)
D22	1720000260	Varicap	1SV214 (TPH2)
D23	1790000450	Diode	MA862 (TX)
D24	1790000450	Diode	MA862 (TX)
D25	1790000450	Diode	MA862 (TX)
D26	1790000450	Diode	MA862 (TX)
D27	1790000450	Diode	MA862 (TX)
D28	1790000450	Diode	MA862 (TX)
D29	1790000450	Diode	MA862 (TX)
D30	1750000020	Diode	1SS184 (TE85R)
D31	1750000050	Diode	1SS193 (TE85R)
D32	1790000490	Diode	HSM88AS-TR
D34	1750000020	Diode	1SS184 (TE85R)
D35	1750000010	Diode	1SS181 (TE85R)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D36	1750000050	Diode	1SS193 (TE85R)
D38	1720000260	Varicap	1SV214 (TPH2)
D39	1720000260	Varicap	1SV214 (TPH2)
D40	1790000450	Diode	MA862 (TX)
FI1	2010000280	Monolithic	10M24D4 (FL-24)
FI2	2010000300	Monolithic	10M15B7 (FL-28)
X1	6050000400	Crystal	HC-18/U 10.7515MHz
X2	6050000460	Crystal	HC-43/U 14.242MHz
X3	6050000200	Crystal	HC-18/T 5.120MHz
L1	6150000780	Coil	LS-96
L2	6150000470	Coil	LS-66A
L3	6150001480	Coil	LS-164
L4	6150003450	Coil	LS-377
L5	6150003450	Coil	LS-377
L6	6150003450	Coil	LS-377
L7	6150003450	Coil	LS-377
L8	6170000230	Coil	LW-25
L9	6110001560	Coil	LA-236
L10	6110001570	Coil	LA-237
L11	6170000230	Coil	LW-25
L12	6110001520	Coil	LA-232
L13	6110001670	Coil	LA-253
L14	6110001660	Coil	LA-252
L15	6110001980	Coil	LA-222
L16	6110001540	Coil	LA-234
L17	6170000230	Coil	LW-25
L18	6110001600	Coil	LA-243
L19	6110001540	Coil	LA-234
L20	6110001600	Coil	LA-243
L21	6110001600	Coil	LA-243
L22	6110001600	Coil	LA-243
L23	6140001840	Coil	LR-220
L24	6110001540	Coil	LA-234
L25	6110001550	Coil	LA-235
L26	6150001870	Coil	LS-209
L27	6170000230	Coil	LW-25
L28	6150003450	Coil	LS-377
L29	6150003450	Coil	LS-377
L30	6150003450	Coil	LS-377
L31	6150003450	Coil	LS-377
L32	6140001200	Coil	LR-145
L33	6150002200	Coil	LS-228
L34	6150001480	Coil	LS-164
L35	6150001480	Coil	LS-164
L36	6150002890	Coil	LS-303
L37	6150002890	Coil	LS-303
L38	6150000780	Coil	LS-96
L39	6150000780	Coil	LS-96
L40	6150000950	Coil	LS-110A
L41	6180001410	Coil	LAL 02KR 100K
L42	6180001410	Coil	LAL 02KR 100K
L43	6150001360	Coil	LS-150A
L44	6150001350	Coil	LS-149A
L45	6150001310	Coil	LS-145
L46	6200000510	Coil	MLF3216E 5R6M-T
L47	6150001310	Coil	LS-145
L48	6150001310	Coil	LS-145
L49	6150001620	Coil	LS-178
L50	6150000930	Coil	LS-109
L51	6200000540	Coil	MLF3216E 100M-T
R1	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R2	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R3	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R4	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R5	7030002510	Resistor	MCR03EZHJ 470 kΩ (474)
R6	7030002510	Resistor	MCR03EZHJ 470 kΩ (474)
R7	7030002030	Resistor	MCR03EZHJ 100 Ω (101)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R8	7310001840	Trimmer	RH0421CS3J08A (472)
R9	7030002080	Resistor	MCR03EZHJ 270 Ω (271)
R10	7030001950	Resistor	MCR03EZHJ 22 Ω (220)
R11	7510000160	Thermistor	ERT-D2FGL301S
R12	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R13	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R14	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R15	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R16	7310001750	Trimmer	RH0421CJ3J09A (222)
R17	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R18	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R19	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R20	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R21	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R22	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R23	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R24	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R25	7010004180	Resistor	R20J 820 Ω
R26	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R28	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R29	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R30	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R31	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R32	7030002100	Resistor	MCR03EZHJ 390 Ω (391)
R33	7030002100	Resistor	MCR03EZHJ 390 Ω (391)
R34	7010004720	Resistor	R50XJ 100 Ω
R35	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R36	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R37	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R38	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R40	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R41	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R42	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R43	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R44	7010000630	Resistor	ELR25J 100 kΩ
R45	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R46	7030000020	Resistor	MCR10EZHJ 1 Ω (010)
R47	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R48	7030001970	Resistor	MCR03EZHJ 33 Ω (330)
R49	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R50	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R51	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R52	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R53	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R54	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R55	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R56	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R57	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R58	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R59	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R60	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R61	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R62	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R63	7030002510	Resistor	MCR03EZHJ 470 kΩ (474)
R66	7030001910	Resistor	MCR03EZHJ 10 Ω (100)
R67	7030000280	Resistor	MCR10EZHJ 150 Ω (151)
R68	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R69	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R70	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R71	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R72	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R73	7030002130	Resistor	MCR03EZHJ 680 Ω (681)
R74	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R75	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R76	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R77	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R78	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R79	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R80	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R81	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R82	7030002470	Resistor	MCR03EZHJ 220 kΩ (224)
R83	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R84	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R85	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R86	7030000220	Resistor	MCR10EZHJ 47 Ω (470)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R87	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R88	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R89	7030002470	Resistor	MCR03EZHJ 220 kΩ (224)
R90	7310001710	Trimmer	RH0421C14J0KA (103)
R91	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R92	7310001710	Trimmer	RH0421C14J0KA (103)
R93	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R94	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R95	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R96	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R97	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R98	7030002170	Resistor	MCR03EZHJ 1.5 kΩ (152)
R99	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R100	7030002230	Resistor	MCR03EZHJ 3.9 kΩ (392)
R101	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R102	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R103	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R104	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R105	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R106	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R107	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R108	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R109	7030001970	Resistor	MCR03EZHJ 33 Ω (330)
R110	7030002160	Resistor	MCR03EZHJ 1.2 kΩ (122)
R114	7030002590	Resistor	MCR03EZHJ 2.2 MΩ (225)
R115	7030001910	Resistor	MCR03EZHJ 10 Ω (100)
R116	7030002510	Resistor	MCR03EZHJ 470 kΩ (474)
R117	7030002440	Resistor	MCR03EZHJ 150 kΩ (154)
R118	7310001710	Trimmer	RH0421C14J0KA (103)
R119	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R120	7310001760	Trimmer	RH0421CJ4J09A (223)
R121	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R126	7030003900	Resistor	MCR03EZHJ 240 kΩ (244)
R127	7030002590	Resistor	MCR03EZHJ 2.2 MΩ (225)
R130	7030002220	Resistor	MCR03EZHJ 3.3 kΩ (332)
R131	7030002340	Resistor	MCR03EZHJ 33 kΩ (333)
R132	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R133	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
R134	7030002170	Resistor	MCR03EZHJ 1.5 kΩ (152)
R136	7030002480	Resistor	MCR03EZHJ 270 kΩ (274)
R137	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R138	7030002450	Resistor	MCR03EZHJ 180 kΩ (184)
R139	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R140	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R141	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R142	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R143	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R144	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R145	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R146	7030002410	Resistor	MCR03EZHJ 82 kΩ (823)
R147	7310001720	Trimmer	RH0421C15J06A (104)
R148	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R149	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R150	7310001710	Trimmer	RH0421C14J0KA (103)
R151	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R152	7030002270	Resistor	MCR03EZHJ 8.2 kΩ (822)
R153	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R154	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R155	7310001710	Trimmer	RH0421C14J0KA (103)
R156	7310001710	Trimmer	RH0421C14J0KA (103)
R157	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R158	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R159	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R160	7010004070	Resistor	R20J 100 Ω
R161	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R162	7030002220	Resistor	MCR03EZHJ 3.3 kΩ (332)
R163	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R164	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R165	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R166	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R167	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R168	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R169	7030002010	Resistor	MCR03EZHJ 68 Ω (680)
R170	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R171	7030002160	Resistor	MCR03EZHJ 1.2 kΩ (122)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R172	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R173	7030002400	Resistor	MCR03EZHJ 68 kΩ (683)
R174	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R175	7030002120	Resistor	MCR03EZHJ 560 Ω (561)
R176	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R177	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R178	7030002300	Resistor	MCR03EZHJ 15 kΩ (153)
R179	7030002380	Resistor	MCR03EZHJ 56 kΩ (563)
R180	7030002480	Resistor	MCR03EZHJ 270 kΩ (274)
R181	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R182	7030002360	Resistor	MCR03EZHJ 47 kΩ (473)
R183	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R184	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R185	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R186	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R187	7030002070	Resistor	MCR03EZHJ 220 Ω (221)
R188	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R189	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R190	7030002230	Resistor	MCR03EZHJ 3.9 kΩ (392)
R191	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R192	7030001990	Resistor	MCR03EZHJ 47 Ω (470)
R193	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R194	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R195	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R196	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R197	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R198	7030002030	Resistor	MCR03EZHJ 100 Ω (101)
R199	7310001850	Trimmer	RH0421CS4J08A (473)
R202	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R203	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R205	7030001910	Resistor	MCR03EZHJ 10 Ω (100)
R206	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R207	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R208	7030002570	Resistor	MCR03EZHJ 1.5 MΩ (155)
R209	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R210	7030002110	Resistor	MCR03EZHJ 470 Ω (471)
R211	7030002150	Resistor	MCR03EZHJ 1 kΩ (102)
R212	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R213	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R214	7030002270	Resistor	MCR03EZHJ 8.2 kΩ (822)
R215	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R216	7030002240	Resistor	MCR03EZHJ 4.7 kΩ (472)
R217	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
R218	7310001810	Trimmer	RH0421CN4J02A (333)
R219	7030002200	Resistor	MCR03EZHJ 2.2 kΩ (222)
R220	7030002250	Resistor	MCR03EZHJ 5.6 kΩ (562)
R221	7030002010	Resistor	MCR03EZHJ 68 Ω (680)
R222	7030002050	Resistor	MCR03EZHJ 150 Ω (151)
R223	7030002010	Resistor	MCR03EZHJ 68 Ω (680)
R224	7030002550	Resistor	MCR03EZHJ 1 MΩ (105)
R226	7030002550	Resistor	MCR03EZHJ 1 MΩ (105)
R227	7030002120	Resistor	MCR03EZHJ 560 Ω (561)
R228	7030002300	Resistor	MCR03EZHJ 15 kΩ (153)
R229	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R230	7030002280	Resistor	MCR03EZHJ 10 kΩ (103)
R231	7030002320	Resistor	MCR03EZHJ 22 kΩ (223)
R232	7030002420	Resistor	MCR03EZHJ 100 kΩ (104)
C1	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C2	4030006660	Ceramic	C1608 SL 1H 220J-T-A
C3	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C4	4510001490	Electrolytic	50 MS5 3R3 µF
C5	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C6	4030006890	Ceramic	C1608 JF 1H 103Z-T-A
C7	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C8	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C9	4510001490	Electrolytic	50 MS5 3R3 µF
C10	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C11	4510001450	Electrolytic	50 MS5 R33 µF
C12	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C13	4030006640	Ceramic	C1608 SL 1H 180J-T-A
C14	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C15	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C16	4030006670	Ceramic	C1608 SL 1H 270J-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C17	4030006610	Ceramic	C1608 SL 1H 100D-T-A
C18	4030006630	Ceramic	C1608 SL 1H 150J-T-A
C19	4030008360	Ceramic	C1608 UJ 1H 101J-T-A
C20	4030006690	Ceramic	C1608 SL 1H 330J-T-A
C21	4030006690	Ceramic	C1608 SL 1H 330J-T-A
C22	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C23	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C24	4030006930	Ceramic	C1608 CH 1H 020C-T-A
C25	4030007030	Ceramic	C1608 CH 1H 150J-T-A
C26	4030007030	Ceramic	C1608 CH 1H 150J-T-A
C27	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C28	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C29	4030007010	Ceramic	C1608 CH 1H 100D-T-A
C30	4030006940	Ceramic	C1608 CH 1H 030C-T-A
C31	4030006990	Ceramic	C1608 CH 1H 080D-T-A
C32	4030006910	Ceramic	C1608 CH 1H 0R5C-T-A
C33	4030006940	Ceramic	C1608 CH 1H 030C-T-A
C34	4030006990	Ceramic	C1608 CH 1H 080D-T-A
C35	4030007010	Ceramic	C1608 CH 1H 100D-T-A
C36	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C37	4030006890	Ceramic	C1608 JF 1H 103Z-T-A
C38	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C39	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C40	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C41	4030006920	Ceramic	C1608 CH 1H 010C-T-A
C42	4030006990	Ceramic	C1608 CH 1H 080D-T-A
C43	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C44	4030006980	Ceramic	C1608 CH 1H 070D-T-A
C45	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C46	4030006800	Ceramic	C1608 SL 1H 221J-T-A
C47	4610000780	Trimmer	CV38D 2001
C48	4030006610	Ceramic	C1608 SL 1H 100D-T-A
C49	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C50	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C51	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C52	4510001480	Electrolytic	50 MS5 2R2 µF
C53	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C54	4030006800	Ceramic	C1608 SL 1H 221J-T-A
C55	4510001720	Electrolytic	16 SS 330 µF (8X12.5)
C56	4510001350	Electrolytic	16 MS5 10 µF
C57	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C58	4610000380	Trimmer	ECRGA020E30
C60	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C61	4030006800	Ceramic	C1608 SL 1H 221J-T-A
C62	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C63	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C64	4030006630	Ceramic	C1608 SL 1H 150J-T-A
C65	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C66	4510001350	Electrolytic	16 MS5 10 µF
C67	4610000770	Trimmer	CV38D 1001
C68	4030006630	Ceramic	C1608 SL 1H 150J-T-A
C69	4550000260	Tantalum	DN 1V 100M
C70	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C71	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C72	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C73	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C74	4510001460	Electrolytic	50 MS5 R47 µF
C75	4510001720	Electrolytic	16 SS 330 µF (8X12.5)
C76	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C77	4510003040	Electrolytic	16 SS 100 µF
C78	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C79	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C80	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C81	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C82	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C83	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C84	4510001820	Electrolytic	10 MS5 10 µF
C85	4550000260	Tantalum	DN 1V 100M
C86	4010003890	Ceramic	DD06 SL 180K 500V
C86	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C88	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C89	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C90	4010003890	Ceramic	DD06 SL 180K 500V
C91	4010004120	Ceramic	DD07 B 102K 500V
C92	4030006860	Ceramic	C1608 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C93	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C94	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C95	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C96	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C97	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C98	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C100	4030004500	Ceramic	C2012 SL 1H 180J-T-A
C101	4010003890	Ceramic	DD06 SL 180K 500V
C102	4010003960	Ceramic	DD06 SL 390K 500V
C103	4030006800	Ceramic	C1608 SL 1H 221J-T-A
C104	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C105	4010003960	Ceramic	DD06 SL 390K 500V
C106	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C107	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C108	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C109	4010003890	Ceramic	DD06 SL 180K 500V
C110	4510003090	Electrolytic	16 SS 2200 µF
C111	4010004120	Ceramic	DD07 B 102K 500V
C112	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C113	4030006890	Ceramic	C1608 JF 1H 103Z-T-A
C114	4030006890	Ceramic	C1608 JF 1H 103Z-T-A
C116	4010000380	Ceramic	DD107 SL 221J 50V
C117	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C118	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C119	4510002950	Electrolytic	50 SS 2R2 µF
C120	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C121	4510002780	Electrolytic	16 SS 10 µF
C122	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C123	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C124	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C125	4510002780	Electrolytic	16 SS 10 µF
C126	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C127	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C128	4030006540	Ceramic	C1608 SL 1H 030C-T-A
C129	4030006620	Ceramic	C1608 SL 1H 120J-T-A
C130	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C131	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C132	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C133	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C134	4030006940	Ceramic	C1608 CH 1H 030C-T-A
C135	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C136	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C137	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C138	4030006530	Ceramic	C1608 SL 1H 020C-T-A
C139	4030007020	Ceramic	C1608 CH 1H 120J-T-A
C140	4030006530	Ceramic	C1608 SL 1H 020C-T-A
C141	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C142	4030006910	Ceramic	C1608 CH 1H 0R5C-T-A
C143	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C144	4030006530	Ceramic	C1608 SL 1H 020C-T-A
C145	4030007020	Ceramic	C1608 CH 1H 120J-T-A
C146	4030006510	Ceramic	C1608 SL 1H 0R5C-T-A
C147	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C148	4030006940	Ceramic	C1608 CH 1H 030C-T-A
C149	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C150	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C151	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C152	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C153	4030008110	Ceramic	C1608 TH 1H 101J-T-A
C154	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C155	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C156	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C157	4030008120	Ceramic	C1608 TH 1H 121J-T-A
C158	4030006550	Ceramic	C1608 SL 1H 040C-T-A
C159	4030007630	Ceramic	C1608 RH 1H 121J-T-A
C160	4030006940	Ceramic	C1608 CH 1H 030C-T-A
C161	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C162	4030007620	Ceramic	C1608 RH 1H 101J-T-A
C163	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C164	4030003360	Ceramic	GRM40 F 473Z 50PT
C165	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C166	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C167	4030006630	Ceramic	C1608 SL 1H 150J-T-A
C168	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C169	4510001460	Electrolytic	50 MS5 R47 µF

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C170	4030006630	Ceramic	C1608 SL 1H 150J-T-A
C171	4030005060	Ceramic	C2012 CH 1H 391J-T-A
C172	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C173	4030003360	Ceramic	GRM40 F 473Z 50PT
C174	4030007090	Ceramic	C1608 CH 1H 470J-T-A
C175	4030003360	Ceramic	GRM40 F 473Z 50PT
C176	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C177	4030003360	Ceramic	GRM40 F 473Z 50PT
C178	4030003360	Ceramic	GRM40 F 473Z 50PT
C179	4030007130	Ceramic	C1608 CH 1H 101J-T-A
C180	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C181	4030004930	Ceramic	C2012 CH 1H 330J-T-A
C182	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C183	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C184	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C185	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C186	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C187	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C188	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C189	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C190	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C191	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C192	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C193	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C194	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C196	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C197	4030006530	Ceramic	C1608 SL 1H 020C-T-A
C199	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C200	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C201	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C202	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C203	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C204	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C205	4510001460	Electrolytic	50 MS5 R47 µF
C206	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C207	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C208	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C209	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C210	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C211	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C213	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C214	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C215	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C216	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C217	4510001850	Electrolytic	16 MS5 4R7 µF
C218	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C219	4510001820	Electrolytic	10 MS5 10 µF
C220	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C221	4510001820	Electrolytic	10 MS5 10 µF
C222	4550000340	Tantalum	DN 1C 100M
C223	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C224	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C225	4510002700	Electrolytic	10 SS 22 µF
C226	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C227	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C228	4510002700	Electrolytic	10 SS 22 µF
C229	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C230	4510002810	Electrolytic	16 SS 47 µF
C231	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C232	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C233	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C234	4030006690	Ceramic	C1608 SL 1H 330J-T-A
C235	4030003360	Ceramic	GRM40 F 473Z 50PT
C236	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C237	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C238	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C239	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C240	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C241	4030006660	Ceramic	C1608 SL 1H 220J-T-A
C242	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C243	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C244	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C245	4030007170	Ceramic	C1608 CH 1H 221J-T-A
C246	4030007170	Ceramic	C1608 CH 1H 221J-T-A
C247	4030006680	Ceramic	C1608 SL 1H 300J-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C248	4610000790	Trimmer	CV38E 3001
C249	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C250	4030008430	Ceramic	C1608 JF 1H 223Z-T-A
C251	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C252	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C253	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C254	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C255	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C256	4030006660	Ceramic	C1608 SL 1H 220J-T-A
C257	4030006770	Ceramic	C1608 SL 1H 151J-T-A
C258	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C259	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C260	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C261	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C262	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C263	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C264	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C265	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C266	4510001480	Electrolytic	50 MS5 2R2 µF
C267	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C268	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C269	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C270	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C271	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C272	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C273	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C274	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C275	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C276	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C277	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C278	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C279	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C280	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C281	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C282	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C283	4510002730	Electrolytic	10 SS 100 µF
C284	4030006540	Ceramic	C1608 SL 1H 030C-T-A
C285	4030006540	Ceramic	C1608 SL 1H 030C-T-A
C286	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C287	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C288	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C289	4030003360	Ceramic	GRM40 F 473Z 50PT
C290	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C291	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C292	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C293	4550000340	Tantalum	DN 1C 100M
C294	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C295	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C296	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C297	4550000350	Tantalum	DN 1V 010M
C298	4550000530	Tantalum	TESVA 1V 104M1-8L
C299	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C300	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C301	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C302	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C303	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C304	4510002720	Electrolytic	10 SS 47 µF
C305	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C311	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C313	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C314	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C315	4510001470	Electrolytic	50 MS5 1 µF
C316	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C317	4030006800	Ceramic	C1608 SL 1H 221J-T-A
C318	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C319	4030006690	Ceramic	C1608 SL 1H 330J-T-A
C320	4030006690	Ceramic	C1608 SL 1H 330J-T-A
C321	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C322	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C323	4510002730	Electrolytic	10 SS 100 µF
C324	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C325	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C326	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C327	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C328	4030006880	Ceramic	C1608 JB 1H 472K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C329	4030006510	Ceramic	C1608 SL 1H 0R5C-T-A
C330	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C331	4030006580	Ceramic	C1608 SL 1H 070D-T-A
C332	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C333	4510002730	Electrolytic	10 SS 100 µF
C334	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C335	4030006550	Ceramic	C1608 SL 1H 040C-T-A
C336	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C337	4030006660	Ceramic	C1608 SL 1H 220J-T-A
C338	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C339	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C340	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C341	4510001350	Electrolytic	16 MS5 10 µF
C342	4030007150	Ceramic	C1608 CH 1H 151J-T-A
C343	4030007150	Ceramic	C1608 CH 1H 151J-T-A
C344	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C345	4030006460	Ceramic	C2012 SL 1H 102J-T-A
C346	4030007150	Ceramic	C1608 CH 1H 151J-T-A
C348	4510001820	Electrolytic	10 MS5 10 µF
C349	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C350	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C351	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C352	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C353	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C354	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C356	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C358	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C359	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C360	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C362	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C363	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C364	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C365	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C366	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C367	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C368	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C369	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C370	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C371	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C372	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C373	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C374	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C375	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C376	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C377	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C378	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C379	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C380	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C381	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C382	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C383	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C384	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C385	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C386	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C387	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C388	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C389	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C390	4030006660	Ceramic	C1608 SL 1H 220J-T-A
C391	4610000780	Trimmer	CV38D 2001
C392	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C393	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C395	4030006880	Ceramic	C1608 JB 1H 472K-T-A
C396	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C397	4030006850	Ceramic	C1608 JB 1H 471K-T-A
C398	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C400	4010003890	Ceramic	DD06 SL 180K 500V
C401	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C402	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C403	4030006760	Ceramic	C1608 SL 1H 121J-T-A
C404	4030007560	Ceramic	C1608 RH 1H 330J-T-A
C405	4030003360	Ceramic	GRM40 F 473Z 50PT
C406	4030003360	Ceramic	GRM40 F 473Z 50PT
C407	4030003360	Ceramic	GRM40 F 473Z 50PT
C408	4030007070	Ceramic	C1608 CH 1H 330J-T-A
C409	4030006750	Ceramic	C1608 SL 1H 101J-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C410	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C411	4030006750	Ceramic	C1608 SL 1H 101J-T-A
C412	4030007630	Ceramic	C1608 RH 1H 121J-T-A
C413	4030006860	Ceramic	C1608 JB 1H 102K-T-A
C414	4030006860	Ceramic	C1608 JB 1H 102K-T-A
RL1	6330000350	Relay	CX-1051 DC12V
EP1	0910022423	P.C. Board	B 2128C (MAIN)
EP3	0910020371	F.P.C. Board	B 1964A (FRONT-MAIN)
EP4	6910000970	Lead Frame	DL 2OP 2.6-3-1.2H
EP5	6910000970	Lead Frame	DL 2OP 2.6-3-1.2H

[FDA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000830	IC	µPD4094BG-T1
R1	7410000550	Resistor Array	RKM9L 104J
R2	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
C1	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	6910001400	Lead Frame	VD2.54-0.7-7
EP2	0910021982	P.C. Board	B 2134B (FDA)

[RDA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000830	IC	µPD4094BG-T1
IC2	1130003760	IC	TC4S81F (TE85R)
R1	7410000500	Resistor Array	RKM10L 103J
R2	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
C1	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	6910001400	Lead Frame	VD2.54-0.7-7
EP2	0910024730	P.C. Board	B 2322 (RDA)

[SDA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000830	IC	μPD4094BG-T1
IC2	1130003760	IC	TC4S81F (TE85R)
R1	7410000500	Resistor Array	RKM10L 103J
R2	7030000140	Resistor	MCR10EZHJ 10 Ω (100)
C1	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	6910001400	Lead Frame	VD2.54-0.7-7
EP2	0910024740	P.C. Board	B 2323 (SDA)

[MIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1530001950	Transistor	2SC2712-GR (TE85R)
R1	7310002150	Trimmer	RH0422C14J0AA (103)
R2	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R3	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R4	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R5	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R6	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R7	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
C1	4030004710	Ceramic	C2012 JB 1H 471K-T-A
C2	4510001850	Electrolytic	16 MS5 4R7 μF
C3	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C4	4510001470	Electrolytic	50 MS5 1 μF
C5	4510001370	Electrolytic	16 MS5 47 μF
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C7	4510001470	Electrolytic	50 MS5 1 μF
C8	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910022462	P.C. Board	B 2182B (MIC)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[KEYER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1510000110	Transistor	2SA1162-Y (TE85R)
Q2	1590000420	Transistor	RN1404 (TE85R)
Q3	1530000160	Transistor	2SC2712-Y (TE85R)
Q4	1530000160	Transistor	2SC2712-Y (TE85R)
Q5	1590000410	Transistor	RN2404 (TE85R)
D1	1750000010	Diode	1SS181 (TE85R)
D2	1750000010	Diode	1SS181 (TE85R)
D3	1790000490	Diode	HSM88AS-TR

[KEYER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R2	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R3	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R4	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R5	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R6	7310002270	Trimmer	RH0422C16J04A (105)
R7	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R8	7030000740	Resistor	MCR10EZHJ 1 MΩ (105)
R9	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R10	7310002030	Trimmer	RH0422CJ3J0AA (222)
R11	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
C1	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C2	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C3	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C4	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C5	4510001470	Electrolytic	50 MS5 1 μF
C7	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C8	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C9	4510001480	Electrolytic	50 MS5 2R2 μF
C10	4550002440	Tantalum	DN 1V R68M
EP1	0910022222	P.C. Board	B 2132B (KEYER)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[TONE UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000040	Diode	1SS190 (TE85R)
R1	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R2	7030000510	Resistor	MCR10EZHJ 12 kΩ (123)
R4	7030000320	Resistor	MCR10EZHJ 330 Ω (331)
R5	7310002100	Trimmer	RH0422C13J08A (102)
R6	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R7	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R8	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R9	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R10	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
C1	4510001470	Electrolytic	50 MS5 1 μF
C2	4510001820	Electrolytic	10 MS5 10 μF
C4	4550000380	Tantalum	DN 1A 100M
C5	4030005090	Ceramic	C2012 JB 1H 223K-T-A
C6	4030005090	Ceramic	C2012 JB 1H 223K-T-A
C7	4030005090	Ceramic	C2012 JB 1H 223K-T-A
C8	4510001820	Electrolytic	10 MS5 10 μF
C9	4030004740	Ceramic	C2012 JB 1H 472K-T-A
EP1	0910022453	P.C. Board	B 2175C (TONE)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[AGC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001540	IC	M5218FP-71A
Q1	1530001950	Transistor	2SC2712-GR (TE85R)
Q2	1510000110	Transistor	2SA1162-Y (TE85R)
Q3	1590000420	Transistor	RN1404 (TE85R)
Q4	1590000420	Transistor	RN1404 (TE85R)
Q5	1590000420	Transistor	RN1404 (TE85R)
D1	1750000050	Diode	1SS193 (TE85R)
D2	1790000490	Diode	HSM88AS-TR
D3	1750000050	Diode	1SS193 (TE85R)
D4	1750000060	Diode	1SS196 (TE85R)
D5	1750000060	Diode	1SS196 (TE85R)
D6	1750000040	Diode	1SS190 (TE85R)
R1	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R2	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R3	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R4	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R5	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R6	7310001710	Trimmer	RH0421C14J0KA (103)
R7	7030001560	Resistor	MCR10EZHJ 1.5 MΩ (155)
R8	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R9	7030001610	Resistor	MCR10EZHJ 1.8 MΩ (185)
R10	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R11	7310001760	Trimmer	RH0421CJ4J09A (223)
R12	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R13	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R15	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R16	7030001610	Resistor	MCR10EZHJ 1.8 MΩ (185)
R19	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R20	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
C1	4030005010	Ceramic	C2012 CH 1H 151J-T-A
C2	4510001840	Electrolytic	10 MS5 47 µF
C3	4510001470	Electrolytic	50 MS5 1 µF
C4	4510001820	Electrolytic	10 MS5 10 µF
C5	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C6	4030008540	Ceramic	C2012 JF 1H 223Z-T-A
C7	4510001850	Electrolytic	16 MS5 4R7 µF
EP1	0910022012	P.C. Board	B 2148B (AGC)
EP2	6510008510	Lead Frame	PT2.54-1.0-20 (L)

[AUDIO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130004200	IC	TC4S66F (TE85R)
Q1	1530000160	Transistor	2SC2712-Y (TE85R)
Q2	1530000160	Transistor	2SC2712-Y (TE85R)
D1	1750000060	Diode	1SS196(TE85R)
R1	7030000400	Resistor	MCR10EZHJ 1.5 kΩ (152)
R2	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R3	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000260	Resistor	MCR10EZHJ 100 Ω (101)

[AUDIO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R6	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R7	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R8	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R9	7030000560	Resistor	MCR10EZHJ 33 kΩ (333)
R10	7030000180	Resistor	MCR10EZHJ 22 Ω (220)
R11	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
C1	4510001440	Electrolytic	50 MS5 R22 µF
C2	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C3	4510001460	Electrolytic	50 MS5 R47 µF
C4	4030003360	Ceramic	GRM40 F 473Z 50PT
C5	4030003360	Ceramic	GRM40 F 473Z 50PT
C6	4510000960	Electrolytic	10 MS9 47 µF
C7	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C8	4030003360	Ceramic	GRM40 F 473Z 50PT
EP1	0910022432	P.C. Board	B 2131B (AUDIO)
EP2	6910001400	Lead Frame	VD2.54-0.7-7

[NB UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110001310	IC	µPC577HA
Q1	1560000340	FET	2SK210-Y (TE85R)
Q2	1510000110	Transistor	2SA1162-Y (TE85R)
Q4	1530000160	Transistor	2SC2712-Y (TE85R)
Q5	1530000160	Transistor	2SC2712-Y (TE85R)
Q6	1590000410	Transistor	RN2404 (TE85R)
Q7	1590000420	Transistor	RN1404 (TE85R)
D1	1750000070	Diode	1SS226 (TE85R)
D3	1710000330	Diode	1K60
D4	1710000330	Diode	1K60
L1	6150000470	Coil	LS-66A
L2	6150000470	Coil	LS-66A
R1	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R2	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R3	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R4	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R5	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R6	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R7	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R8	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R9	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R10	7030000700	Resistor	MCR10EZHJ 470 kΩ (474)
R11	7030000280	Resistor	MCR10EZHJ 150 Ω (151)
R12	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R13	7030000340	Resistor	MCR10EZHJ 470 Ω (471)
C1	4030004390	Ceramic	C2012 SL 1H 020C-T-A
C2	4510001820	Electrolytic	10 MS5 10 µF
C3	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C4	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C5	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C6	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C7	4030004740	Ceramic	C2012 JB 1H 472K-T-A
C8	4030004740	Ceramic	C2012 JB 1H 472K-T-A

[NB UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C9	4510001460	Electrolytic	50 MS5 R47 µF
C11	4030004620	Ceramic	C2012 SL 1H 121J-T-A
C12	4030004520	Ceramic	C2012 SL 1H 220J-T-A
C13	4510001850	Electrolytic	16 MS5 4R7 µF
C14	4030004710	Ceramic	C2012 JB 1H 471K-T-A
EP1	0910021972	P.C. Board	B 2133B (NB)
EP2	6510008510	Lead Frame	PT2.54-1.0-20 (L)

[VCO UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000130	FET	2SK125
Q2	1530002210	Transistor	2SC3776-D
D1	1720000041	Varicap	1SV153A
L1	6180001470	Coil	LAL 02KR 3R3K
L2	6130002220	Coil	LB-242
L3	6180001470	Coil	LAL 02KR 3R3K
L4	6180001470	Coil	LAL 02KR 3R3K
R1	7010003360	Resistor	ELR20J 470 Ω
R4	7010003240	Resistor	ELR20J 47 Ω
R5	7010003240	Resistor	ELR20J 47 Ω
R6	7010003280	Resistor	ELR20J 100 Ω
R7	7010003480	Resistor	ELR20J 4.7 kΩ
R8	7010003380	Resistor	ELR20J 680 Ω
R9	7010003240	Resistor	ELR20J 47 Ω
R10	7010003280	Resistor	ELR20J 100 Ω
C1	4010000460	Ceramic	DD104 B 471K 50V
C2	4010000780	Ceramic	DD104 CH 220J 50V
C3	4010000500	Ceramic	DD104 B 102K 50V
C4	4010000600	Ceramic	DD104 CK 010C 50V
C5	4010000500	Ceramic	DD104 B 102K 50V
C6	4040000470	Barrier Layer	RAU 04AK R35C
C7	4010000460	Ceramic	DD104 B 471K 50V
C8	4010000260	Ceramic	DD104 SL 470J 50V
C9	4010000460	Ceramic	DD104 B 471K 50V
C10	4510001340	Electrolytic	10 MS5 33 µF
EP1	0910021841	P.C. Board	B 2129A (VCO)

[SW-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000830	IC	µPD4094BG-T1
IC2	1130003760	IC	TC4S81F (TE85R)
Q1	1590000910	Transistor	IMZ2 T108
R1	7030000220	Resistor	MCR10EZHJ 47 Ω (470)
R4	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
C1	4030004760	Ceramic	C2012 JF 1E 104Z-T-A
C2	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C3	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C4	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C5	4030004720	Ceramic	C2012 JB 1H 102K-T-A
C6	4030004720	Ceramic	C2012 JB 1H 102K-T-A
EP1	0910022252	P.C. Board	B 2150B (SW-A)
EP2	6910003330	Lead Frame	PD2.0-0.9-8

[ANT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
EP1	0910022262	P.C. Board	B 2152B (ANT)

SECTION 6 ADJUSTMENT PROCEDURES

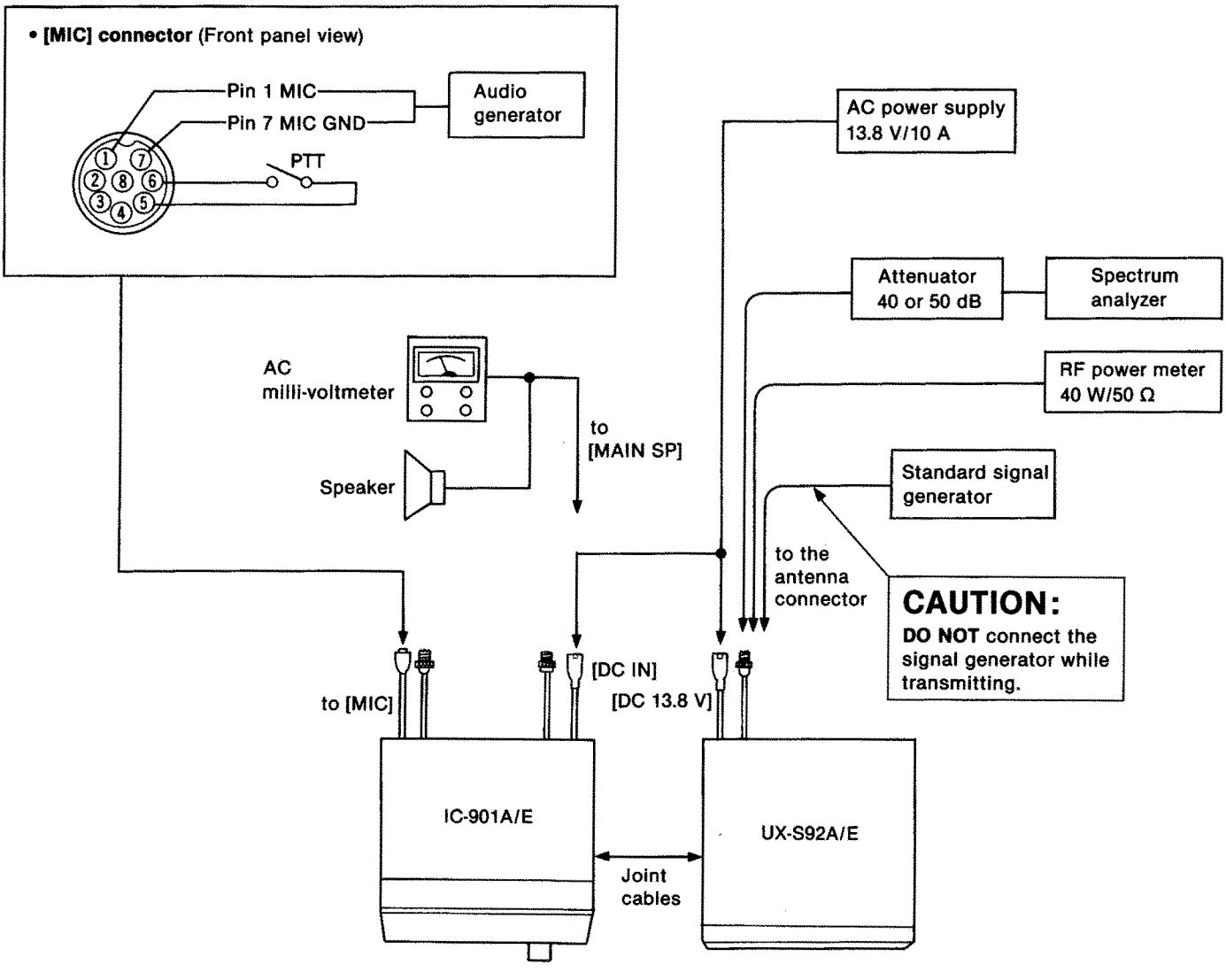
6-1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
AC power supply	Output voltage : 13.8 V DC Current capacity : 10 A or more	Digital DC voltmeter	Input impedance : 10 MΩ/DC or better
RF power meter (terminated type)	Measuring range : 10~40 W Frequency range : 120~160 MHz Impedance : 50 Ω SWR : Less than 1.2: 1	AC milli-voltmeter	Measuring range : 10 mV~10 V
		External speaker	Impedance : 8 Ω
		Audio generator	Frequency range : 300~3000 Hz Output level : 1~500 mV
Frequency counter	Frequency range : 0.1~160 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Attenuator	Power attenuation : 40 or 50 dB Capacity : 40 W or more
Oscilloscope	Frequency range : DC~20 MHz Measuring range : 0.01~10 V	Spectrum analyzer	Frequency minimum : At least 160 MHz Spectrum bandwidth : ±100 kHz or more
Standard signal generator (SSG)	Frequency range : 0.1~160 MHz Output level : −127~−17 dBm (0.1 μV~32 mV)		

CW: Clockwise
CCW: Counterclockwise

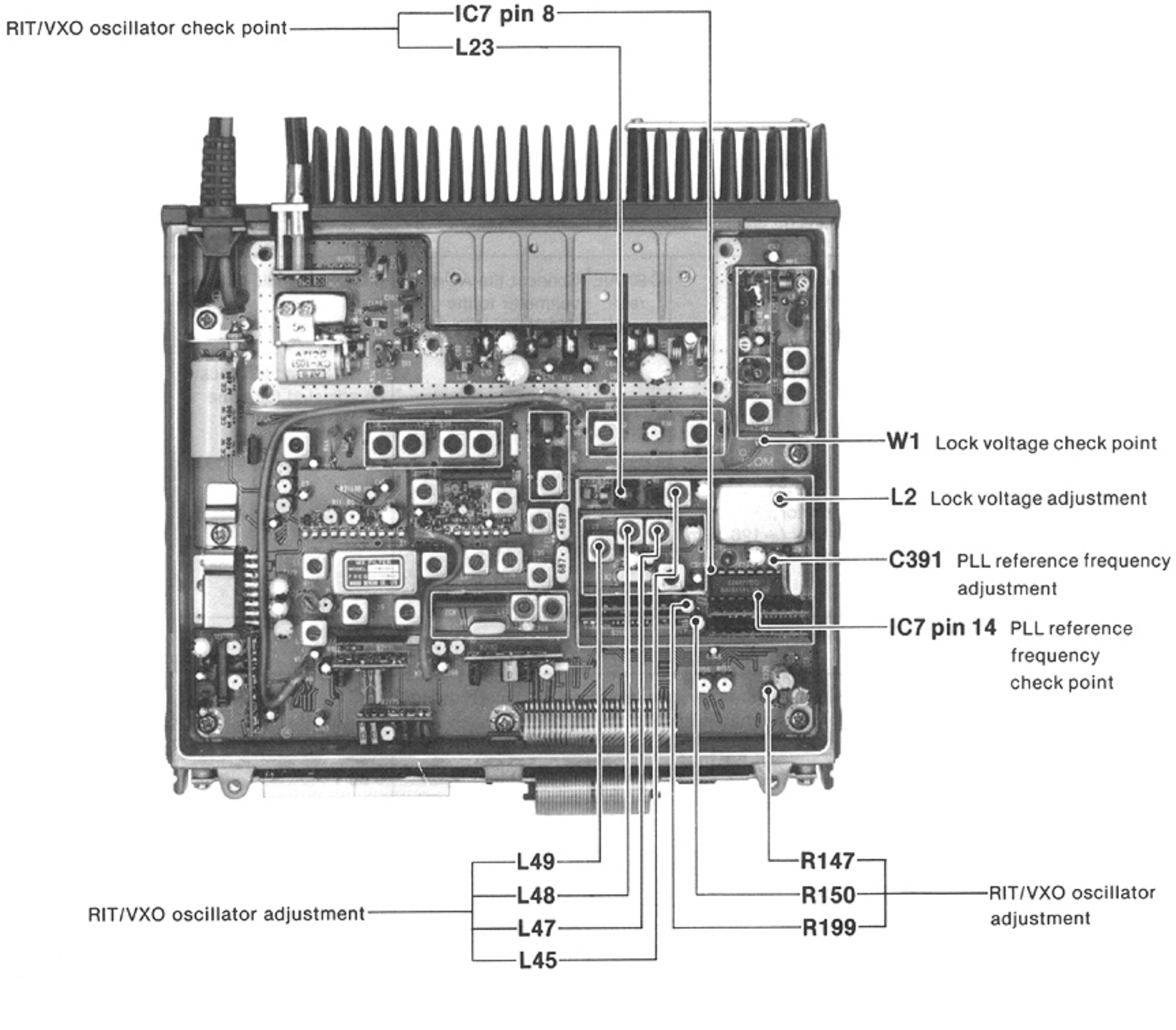
■ CONNECTION



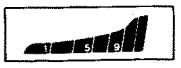
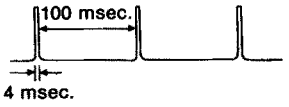
6-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
PLL REFERENCE FREQUENCY	1	• Displayed frequency: 144.0000 MHz • Receiving	MAIN	Connect the frequency counter to IC7 pin 14.	5.12000 MHz	MAIN	C391
RIT/VXO OSCILLATOR	1	• Displayed frequency: 146.0043 MHz (UX-S92A) 145.0043 MHz (UX-S92E) • Mode : CW • Simplex • Receiving	MAIN	Connect the oscilloscope to IC7 pin 8.	Maximum level	MAIN	L49, L48, L47, L45
	2	• Connect a key to the [KEY] jack. • RIT function : ON • Shift frequency : 00 (Center) • Connect the RF power meter or a 50 Ω dummy load. • Key down and key up.		Loosely couple the frequency counter to L23.	Key-up frequency is equal to the key-down frequency.		R147
	3	• Displayed frequency: 146.0043 MHz (UX-S92A) 145.0043 MHz (UX-S92E) • Receiving			135.25500 MHz (UX-S92A) 134.25500 MHz (UX-S92E)		R150
	4	• Displayed frequency: 146.00425 MHz (UX-S92A) 145.00425 MHz (UX-S92E)			135.25495 MHz (UX-S92A) 134.25495 MHz (UX-S92E)		R199
	5	Repeat steps 3 and 4 several times.					
LOCK VOLTAGE	1	• Displayed frequency: 144.0000 MHz • Receiving	MAIN	Connect the digital DC voltmeter to W1.	4.0 V	MAIN (VCO)	L2

- **MAIN UNIT**


RIT/VXO oscillator check point
IC7 pin 8
L23
W1 Lock voltage check point
L2 Lock voltage adjustment
C391 PLL reference frequency adjustment
IC7 pin 14 PLL reference frequency check point
L49
L48
L47
L45
R147
R150
R199
RIT/VXO oscillator adjustment
RIT/VXO oscillator adjustment

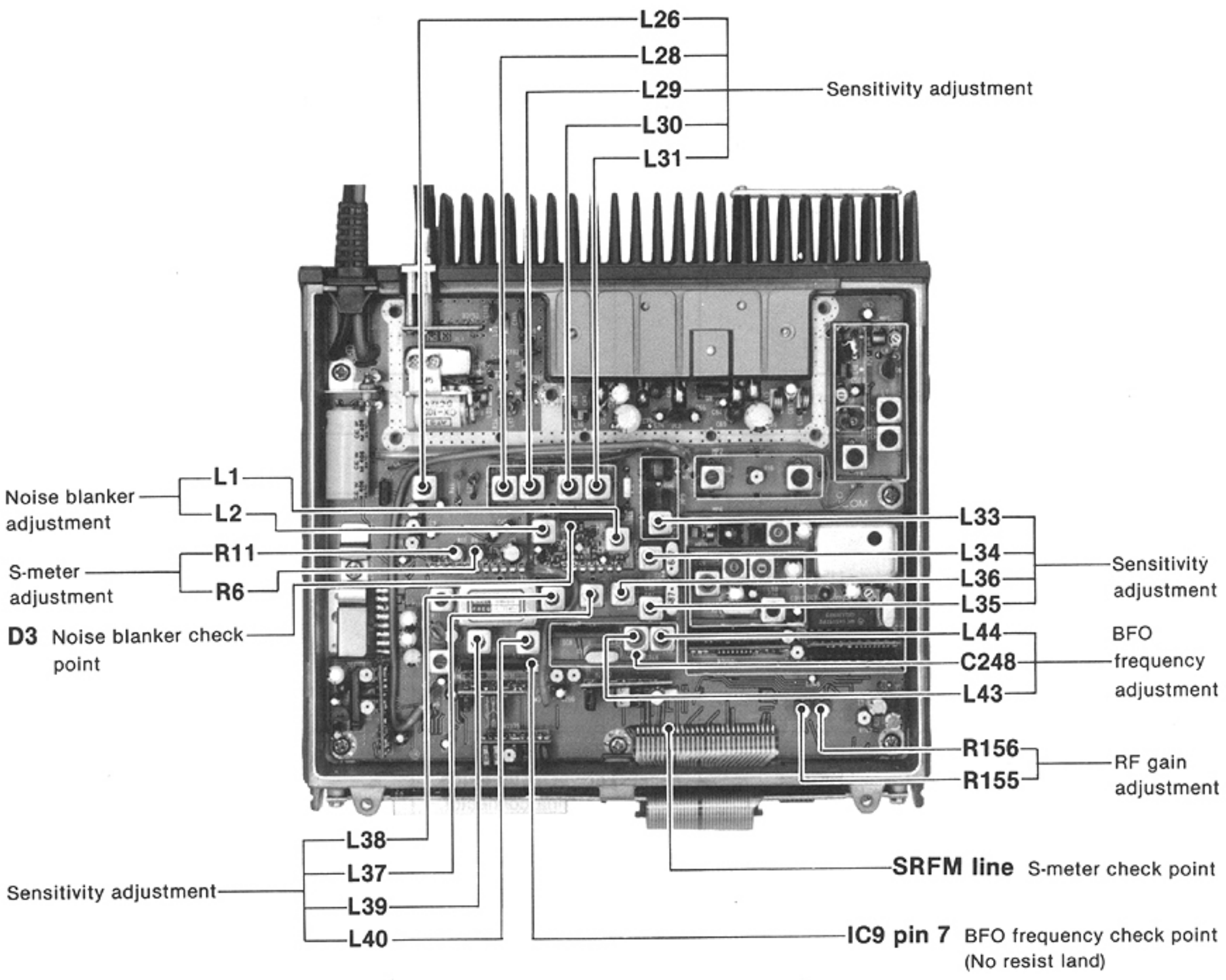
6-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
BFO FREQUENCY	1	• Displayed frequency: 144.0000 MHz • Mode : LSB • Receiving	MAIN	Connect the frequency counter to IC9 pin 7. (Check point)	10.75150 MHz	MAIN	C248
	2	• Mode : CW • Connect the RF power meter or a 50 Ω dummy load. • Transmitting			10.74930 MHz		L43
	3	• Receiving			10.74850 MHz		L44
	4	• Mode : USB			10.74850 MHz		Verify
	5	Repeat steps 1~4 several times.					
SENSITIVITY	1	• Displayed frequency: 146.0000 MHz (UX-S92A) 145.0000 MHz (UX-S92E) • Mode : USB • RIT function : OFF • VXO function : OFF • RF gain : Maximum • Noise blanker : OFF • Squelch control : Minimum • AGC function : FAST • Set the signal generator; Level : 0.11 µV (−126 dBm) Modulation: OFF • Receiving	IC-901A/E rear panel	Connect the AC milli-voltmeter to the [MAIN SP] jack with an 8 Ω load.	Maximum audio output level NOTE: Both L36 and L37 must be adjusted for same height.	MAIN	Adjust in sequence L26, L28, L29, L30, L31, L33, L34, L35, L36, L37, L38, L39, L40
	2	Repeat step 1 several times.					
		NOTE: Adjust the signal generator output level for each time showing the AC milli-voltmeter at 60 % of the lowest range full scale.					
S-METER	1	• Set the signal generator; Level : 3.2 µV (−97 dBm) Modulation: OFF • R11 (AGC BOARD) : Max. CW • Receiving	MAIN	Connect the digital DC voltmeter to the surface of the SRFM line.	0.68 V	MAIN (AGC)	R6
	2	• Set the signal generator; Level : 0.32 mV (−57 dBm)	IC-901A/E function display	S indicator	full scale 		R11
		NOTE: Make the above adjustments after the RF meter adjustments have been completed. (See p. 6-6 for details.)					
NOISE BLANKER	1	• Noise blanker : ON • Apply an RF signal including the following pulse noise to the antenna connector. RF signal level: 3.2 µV (−97 dBm)  • Receiving	MAIN (NB)	Connect the oscilloscope to the cathode of D3.	Adjust for maximum waveform on the oscilloscope.	MAIN (NB)	L1, L2

RECEIVER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
RF GAIN	1	• Displayed frequency: 146.0000 MHz (UX-S92A) 145.0000 MHz (UX-S92E) • Set the signal generator; Level: OFF • R155, 156 : Center • RF gain : RF gain-2 • Receiving	IC-901A/E function display	S indicator	3 dots (S5) 	MAIN	R156
	2	• RF gain : RF gain-3			5 dots (S9) 		R155

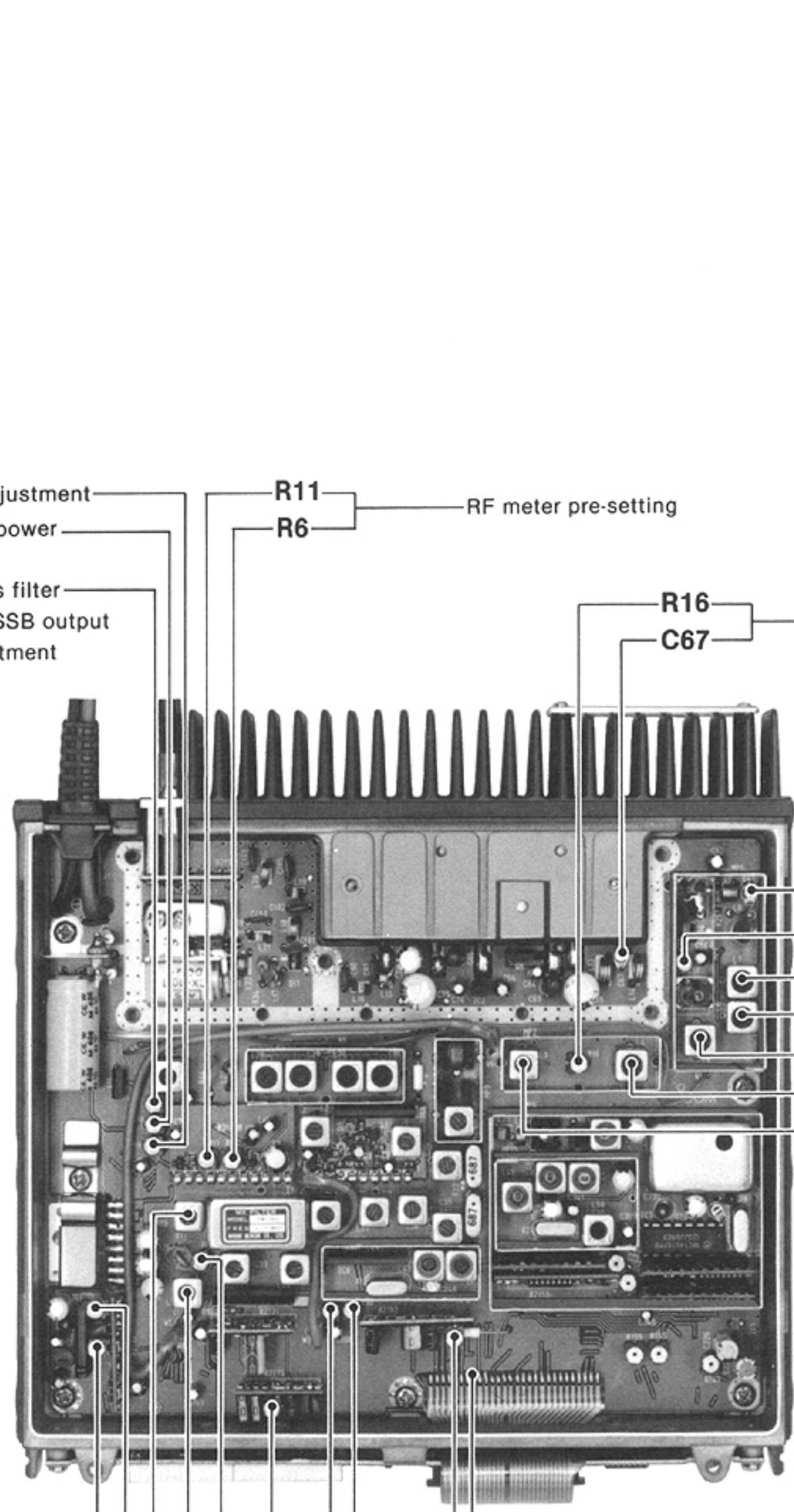
• MAIN UNIT



6-4 TRANSMITTER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
Tx BANDPASS FILTER	1	• Displayed frequency: 146.0000 MHz (UX-S92A) 145.0000 MHz (UX-S92E) • Mode : USB • VXO function : OFF • Output power : HIGH • Simplex • R1 (MIC BOARD) : Center • R8, R120 : Max. CW • Set the audio generator; 2 mV/1.5 kHz • Transmitting	Rear panel	Connect the RF power meter to the antenna connector.	Maximum	MAIN	Adjust in sequence L1, L2, L3, L4, L5, L6, L7, C47, C58
		NOTE: Adjust R1 on the MIC BOARD whenever necessary to keep the RF power meter at 25 W or less.					
CARRIER SUPPRES-SION	1	• Mode : USB and LSB • R1 (MIC BOARD) : Max. CW • Set the audio generator; OFF • Transmitting	Rear panel	Connect the spectrum analyzer to the antenna connector via an attenuator.	Minimum and same carrier level on both modes (Less than −40 dB)	MAIN	R90, R92
TRANSMIT SPURIOUS LEVEL	1	• Mode : USB • Set the audio generator; OFF • Transmitting	Rear panel	Connect the spectrum analyzer to the antenna connector via an attenuator.	Minimum spurious level of carrier frequency −10.75 MHz.	MAIN	R16, C67
SSB OUTPUT POWER	1	• Mode : USB • Output power : HIGH • Set the audio generator; 2 mV/1.5 kHz • Transmitting	Rear panel	Connect the RF power meter to the antenna connector.	25 W	MAIN (MIC)	R1
	2				13 W	MAIN	R8
	3	• Set the audio generator; 20 mV			25 W		R120
	4	• Output power : LOW			5 W		R118
	5	Repeat steps 1~4 several times.					
RF METER	1	• Mode : USB • Output power : LOW • R6, R11 (AGC BOARD): Max. CW • Set the audio generator; 20 mV/1.5 kHz • Transmitting	MAIN	Connect the digital DC voltmeter to the surface of the SRFM line.	0.55 V	MAIN	R218
CW OUTPUT POWER	1	• Mode : CW • Output power : HIGH • Connect a key to the [KEY] jack. • Key down	Rear panel	Connect the RF power meter to the antenna connector.	25 W	MAIN (KEYER)	R10
CW DELAY TIME	1				Center	MAIN (KEYER)	R6
CW SIDETONE	1				Center	MAIN (TONE)	R5

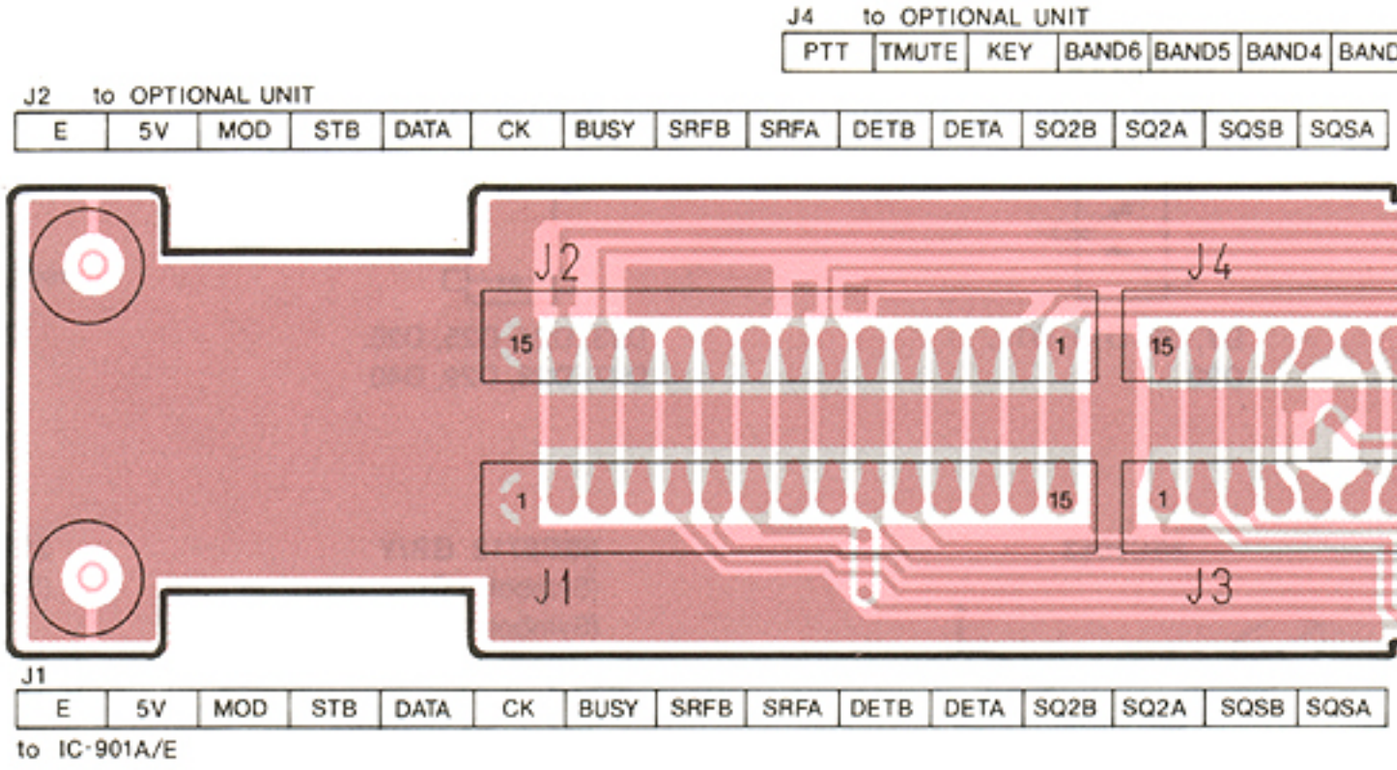
• MAIN UNIT



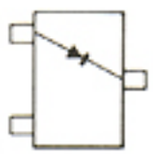
R218 RF meter adjustment
R118 SSB output power adjustment
R120 Tx bandpass filter pre-setting/SSB output power adjustment
R11
R6 — RF meter pre-setting
R16
C67 — Transmit spurious level adjustment
C47
C58
L7
L6
L5
L4
L3 — Tx bandpass filter adjustment
R6 CW delay time adjustment
R10 CW output power adjustment
Tx bandpass filter adjustment — **L1** **L2**
R8 Tx bandpass filter pre-setting/SSB output power adjustment
SRFM line RF meter check point
R1 Tx bandpass filter/Carrier suppression pre-setting and SSB output power adjustment
R90
R92 — Carrier suppression adjustment
R5 CW sidetone adjustment

SECTION 7 BOARD LAYOUTS

7-1 FRONT UNIT

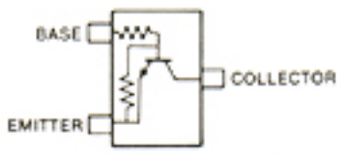


1SS193
(Symbol: F3)



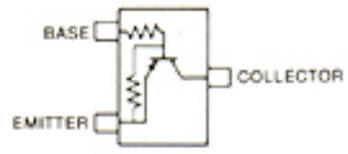
D1, D2, D3

RN1404
(Symbol: XD)

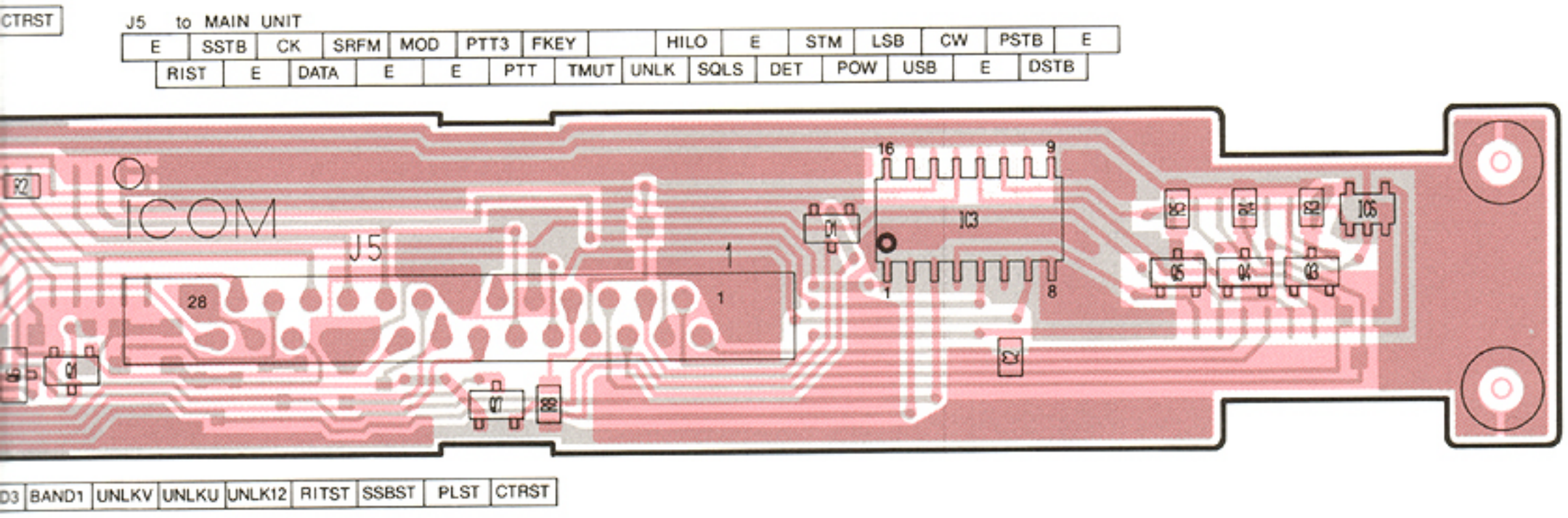


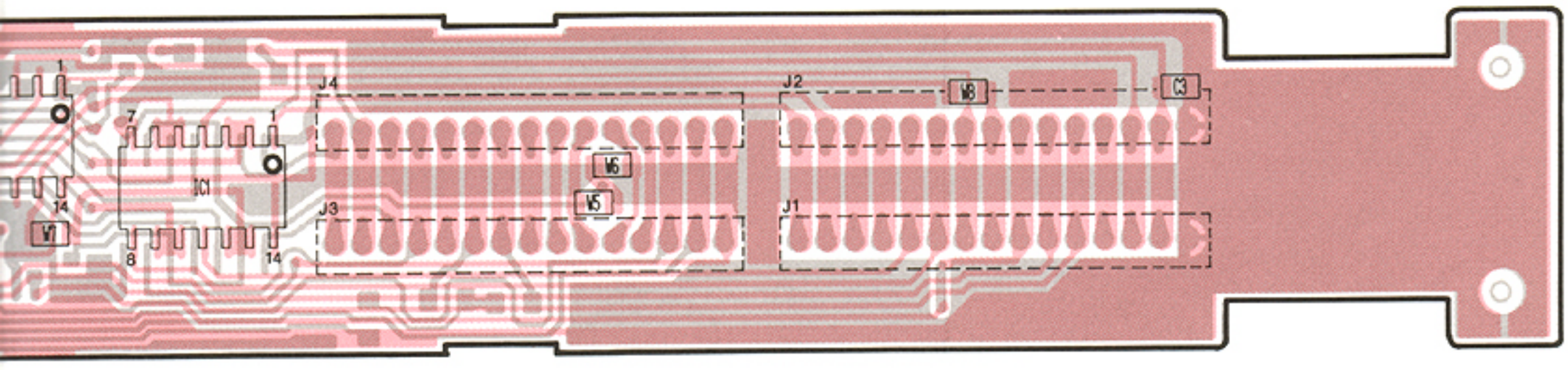
Q1, Q2, Q3, Q5, Q6, Q8

RN2404
(Symbol: YD)



Q7


J5 to MAIN UNIT
E SSTB CK SRFM MOD PTT3 FKEY HILO E STM LSB CW PSTB E
RIST E DATA E E PTT TMUT UNLK SQLS DET POW USB E DSTB
CTRST
ICOM
J5
28
1
1
16
9
1
8
IC3
D3 BAND1 UNLKV UNLKU UNLK12 RITST SSBST PLST CTRST


J4
J2
J3
J1
IC1
1
14
7
8
14
1

7-2 MAIN UNIT

1SS181
(Symbol: A3)

D35

1SS184
(Symbol: B3)

D1, D30, D34

1SS187
(Symbol: D3)

D18

1SS190
(Symbol: E3)

D13

1SS193
(Symbol: F3)

D12, D31, D36

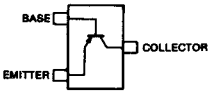
HSM88AS
(Symbol: C1)

D7, D8, D14, D17, D32

MA862
(Symbol: M1I)

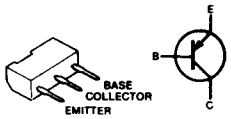
D23, D24, D25, D26, D27, D28, D29, D40

2SA1162 Y
(Symbol: SY)



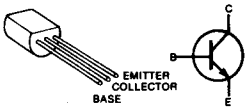
Q30, Q38

2SB909M R



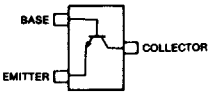
Q8, Q11

2SC2053



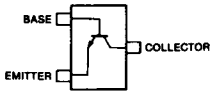
Q5, Q7

2SC2712 GR/Y
(Symbol: LG)
(Symbol: LY)



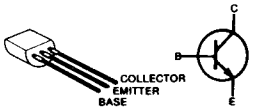
Q20, Q25, Q26, Q41

2SC2714 0
(Symbol: Q0)



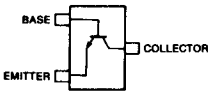
Q37

2SC3555



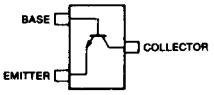
Q6

2SC3661 TA
(Symbol: FY)



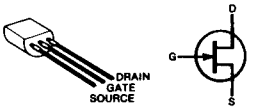
Q31

2SC3770 3
(Symbol: JY3)



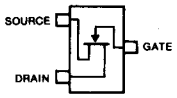
Q28, Q32, Q34, Q35, Q36

2SK125



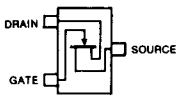
Q15, Q16

2SK209 Y
(Symbol: XY)



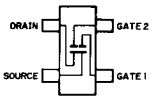
Q29

2SK302 Y
(Symbol: TY)



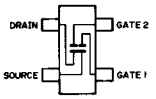
Q3, Q4

3SK140 Y
(Symbol: UG)



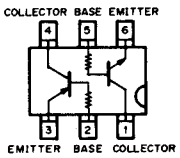
Q14

3SK179 K/M
(Symbol: V01)
(Symbol: V02)



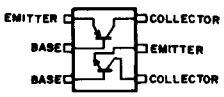
Q1, Q17, Q18, Q19, Q33

IMD6
(Symbol: D6)



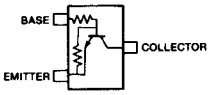
Q22, Q42, Q43, Q44

IMZ2
(Symbol: Z2)



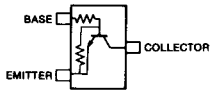
Q39, Q40

RN1402
(Symbol: XB)



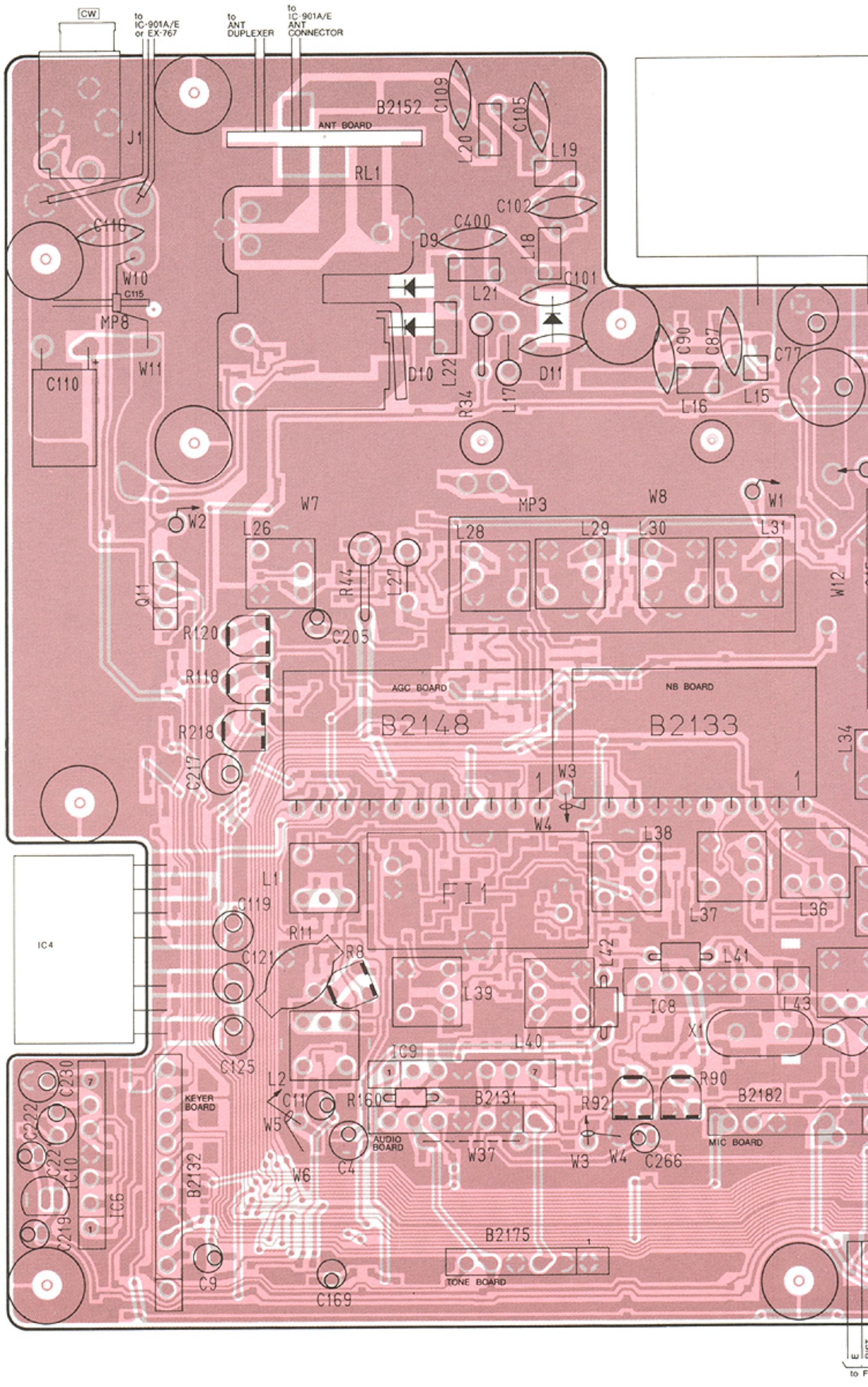
Q2, Q9

RN1404
(Symbol: XD)

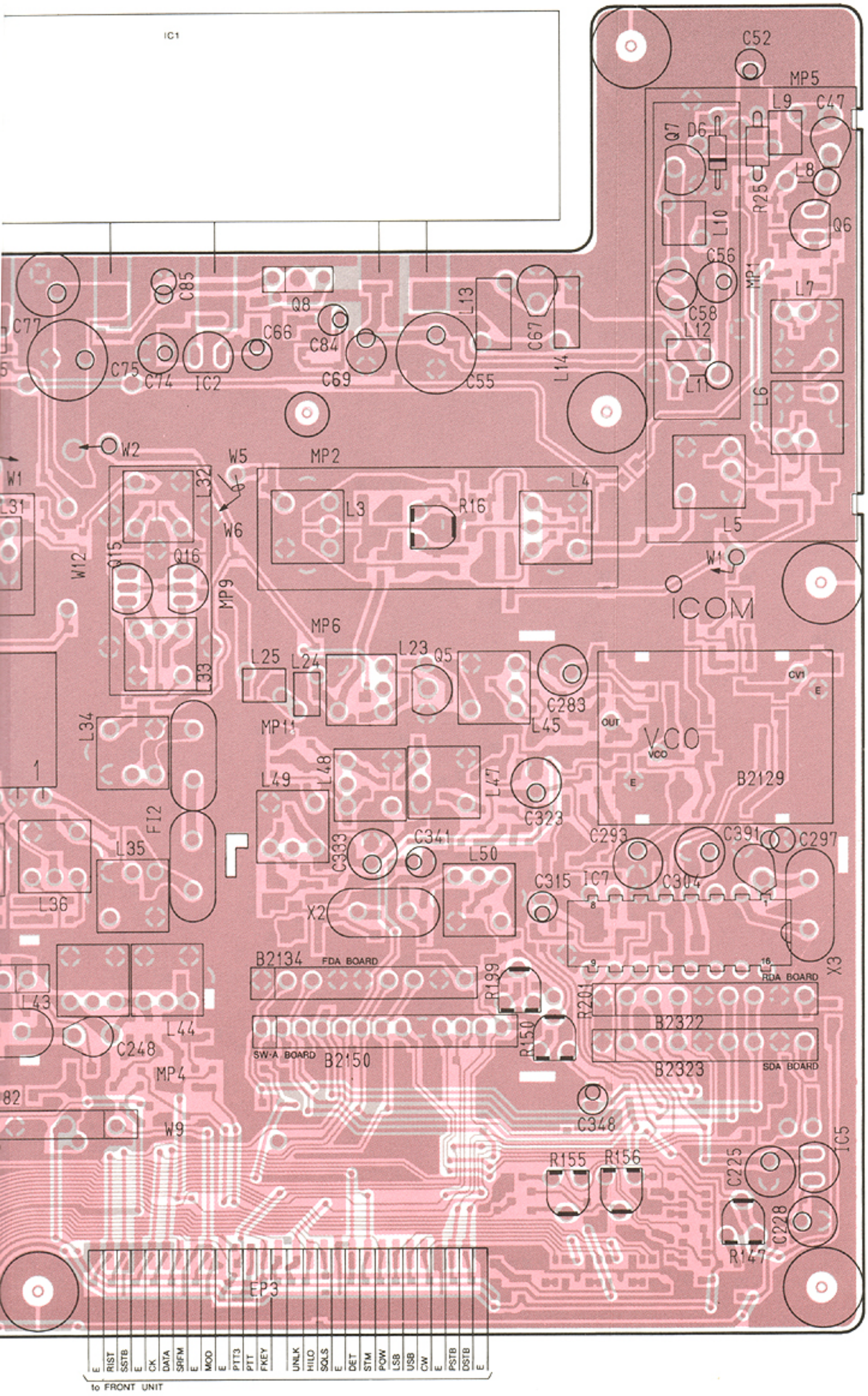


Q10, Q12, Q13, Q21, Q24, Q27

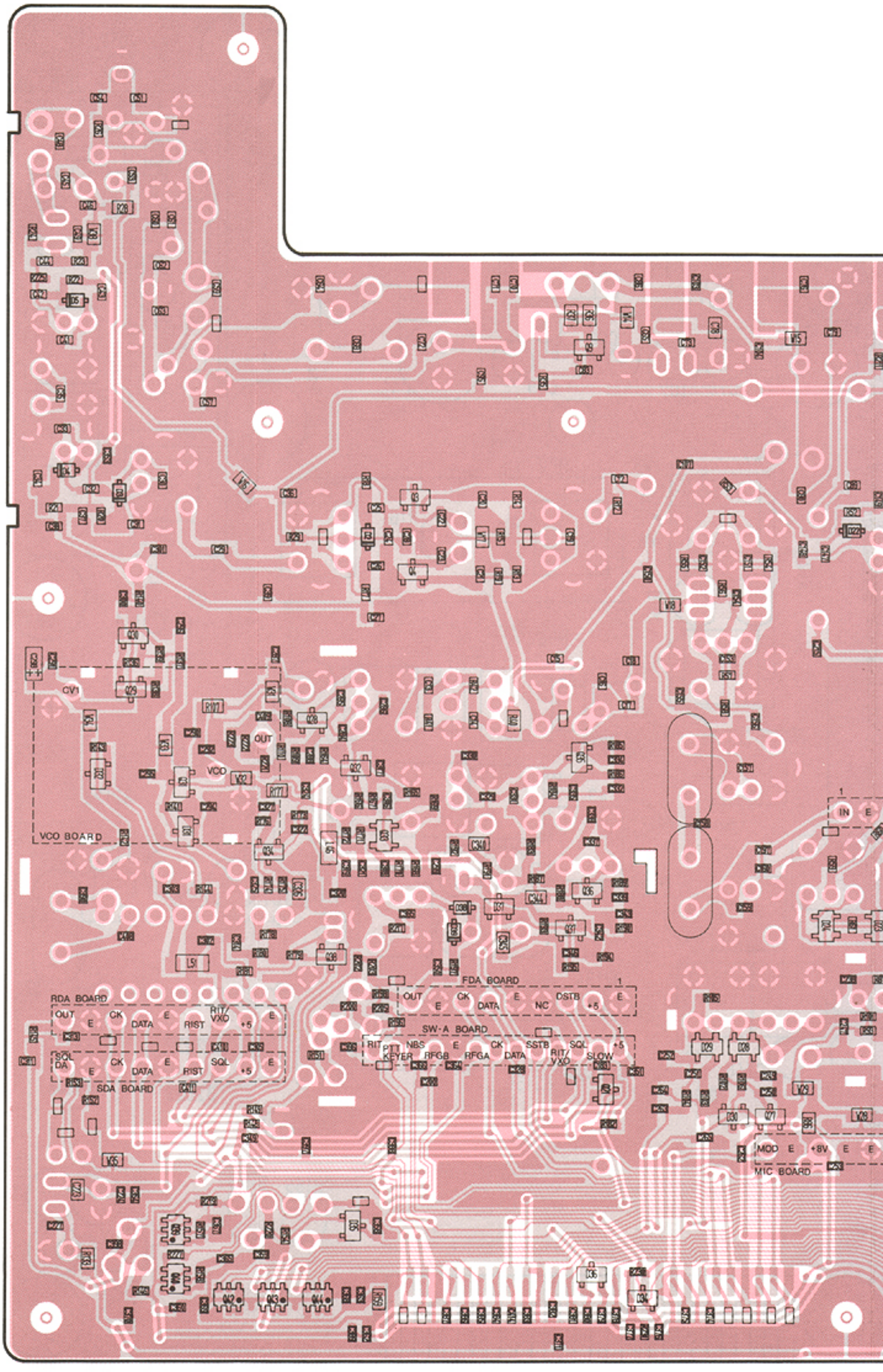
• MAIN UNIT

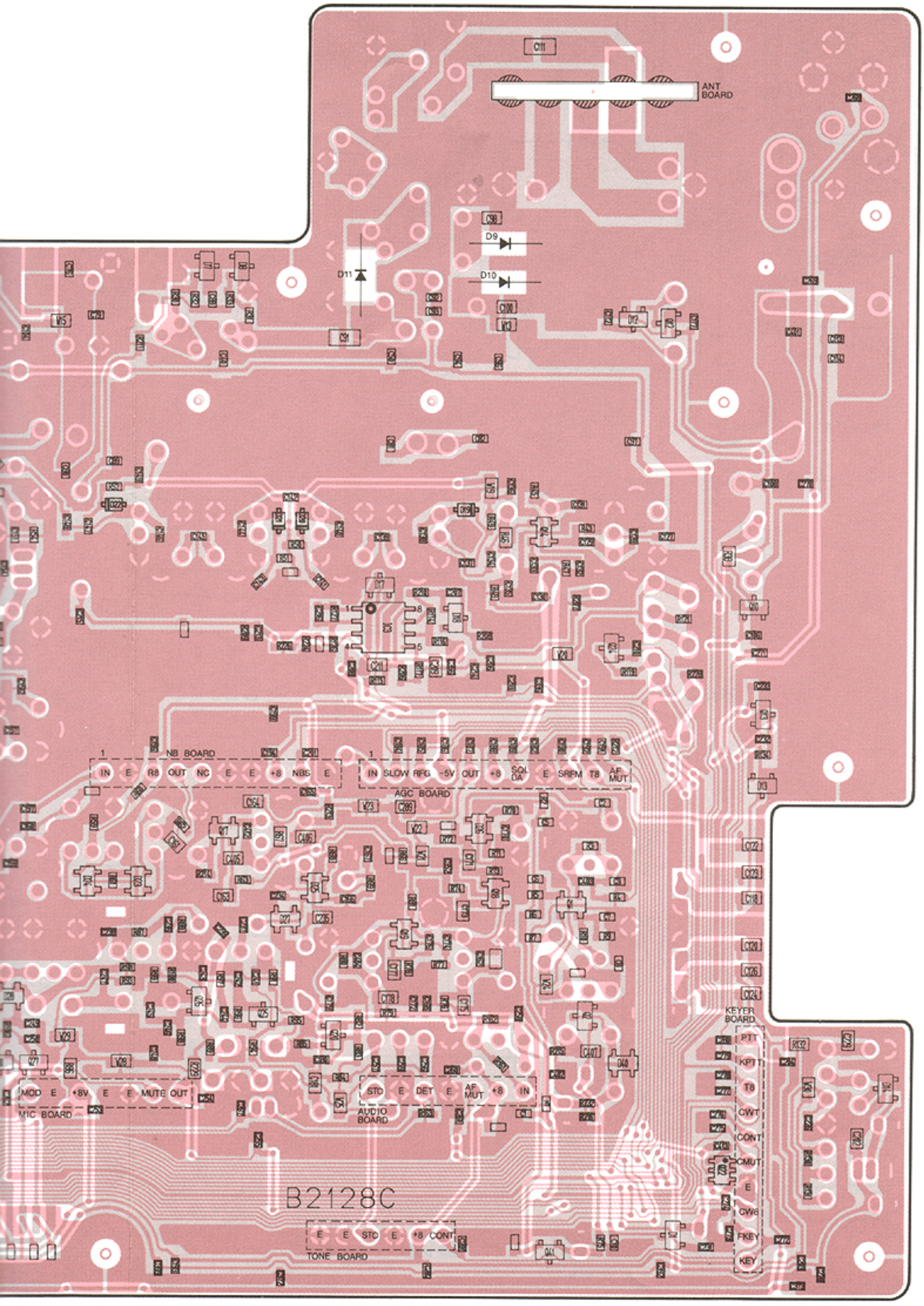

CW
to IC-901A/E or EX-767
to ANT DUPLEXER
to IC-901A/E ANT CONNECTOR
B2152
ANT BOARD
C109
C105
L20
L19
J1
RL1
C102
C400
D9
L18
C116
W10
C115
MP8
W11
C110
L21
C101
D10
L22
D11
C90
C87
C77
L16
L15
R34
L17
W7
W2
L26
MP3
W8
W1
L28
L29
L30
L31
W12
Q11
R44
L27
R120
C205
R118
R218
C217
AGC BOARD
B2148
NB BOARD
B2133
L34
W3
W4
L38
L1
FI1
L37
L36
C119
R11
R8
C121
L39
L42
L41
IC8
L43
X1
IC4
L40
IC9
C125
L2
C11
R160
B2131
R90
B2182
KEYER BOARD
W5
AUDIO BOARD
W37
R92
W3
W4
C266
MIC BOARD
C222
C221
C230
IC10
IC6
B2132
W6
C4
C219
C9
C169
B2175
TONE BOARD

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



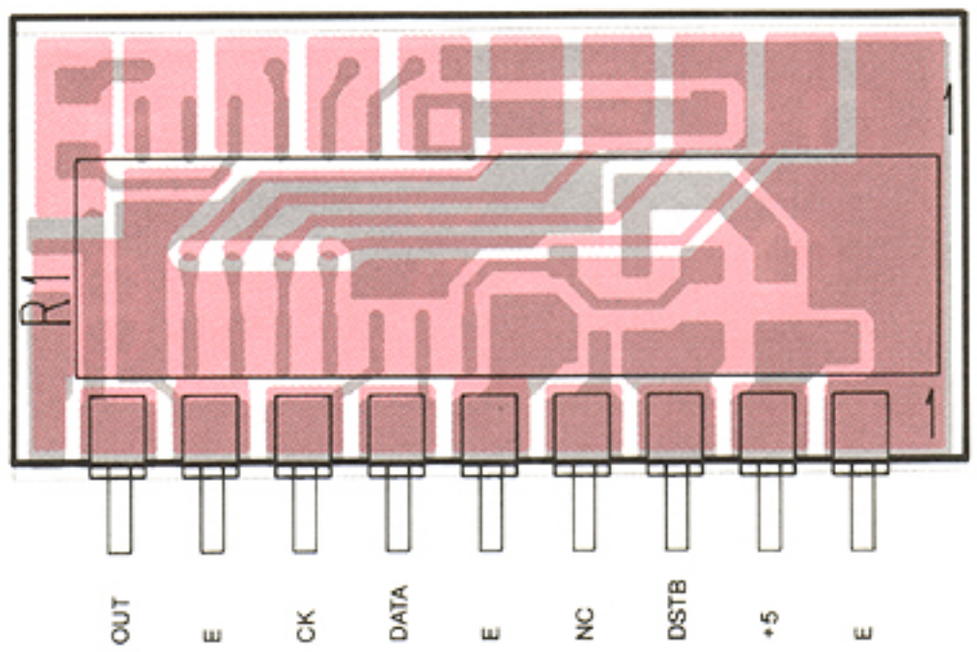
• MAIN UNIT

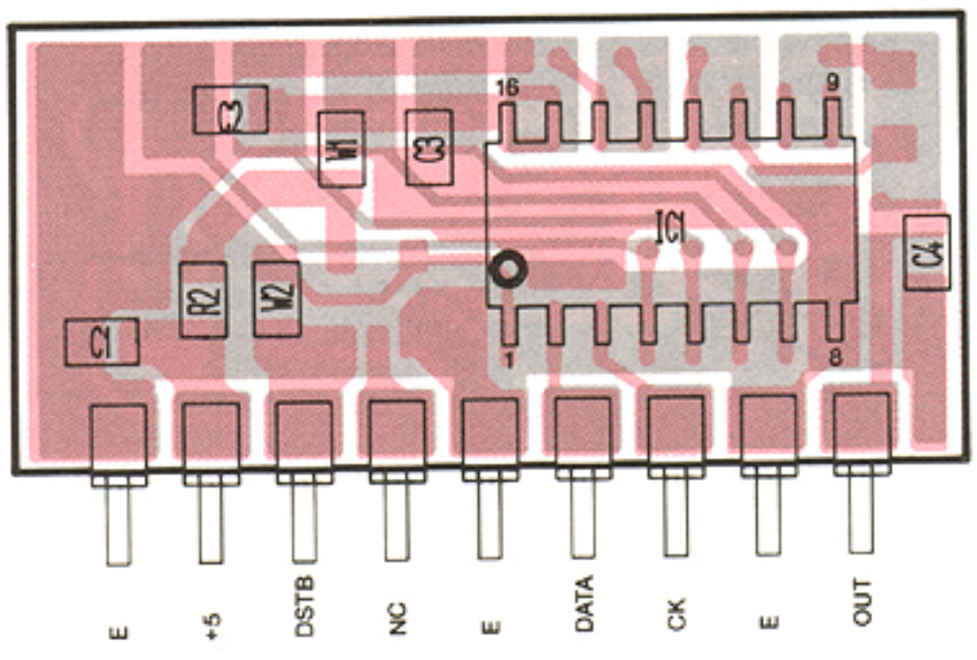

VCO BOARD
RDA BOARD
SDA BOARD
FDA BOARD
SW-A BOARD
MIC BOARD
OUT
CK
DATA
DSTB
SSTB
SQL
SLOW
RIT/
VXO
RIST
NBS
PTT
KEYER
RFGB
RFGA
MOD
+8V
+5
IN


C11
ANT BOARD
D9
D10
D11
NB BOARD
IN E R8 OUT NC E E +8 NBS E
IN SLOW RFG -5V OUT +8 SQL DA E SRPM T8 AF MUT
AGC BOARD
MOD E +8V E E MUTE OUT
MIC BOARD
STO E DET E AF MUT +8 IN
AUDIO BOARD
E E STO E +8 CONT
TONE BOARD
KEYER BOARD
PTT
KPT
T8
CWT
CONT
CMUT
E
CW8
FKEY
KEY
B2128C

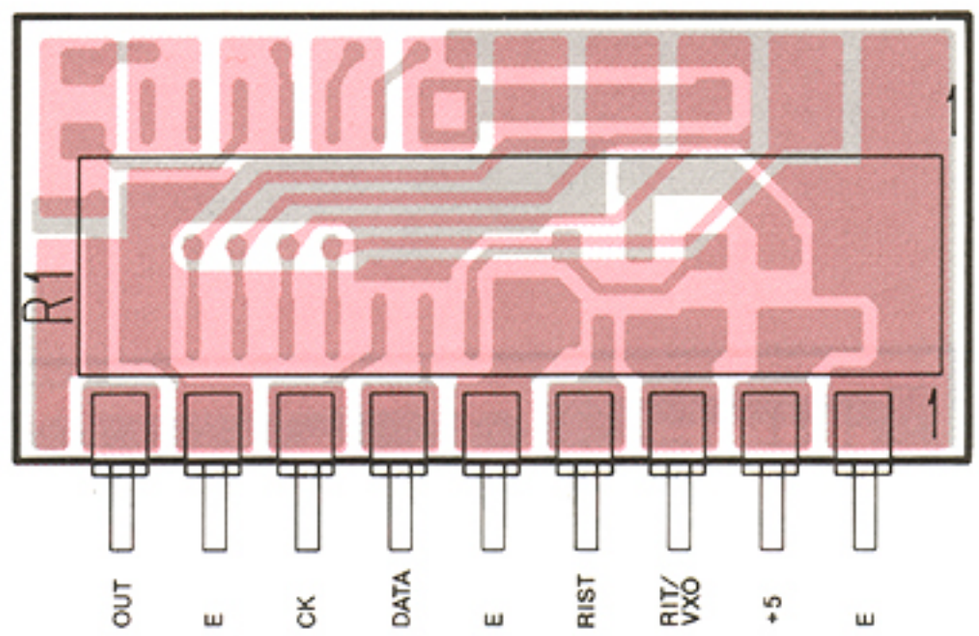
7-3 FDA, RDA AND SDA BOARDS

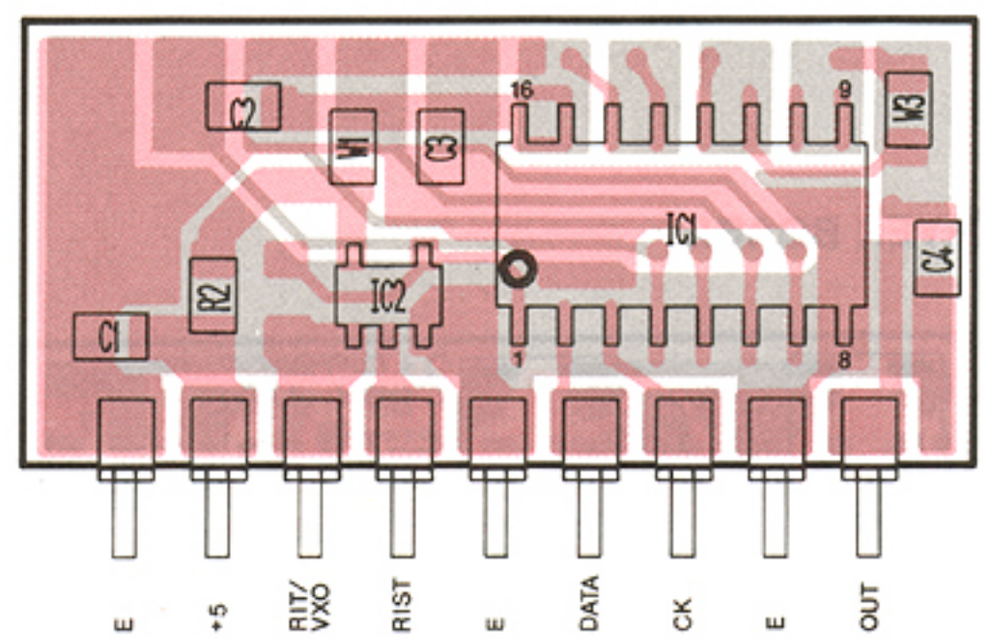
• FDA BOARD



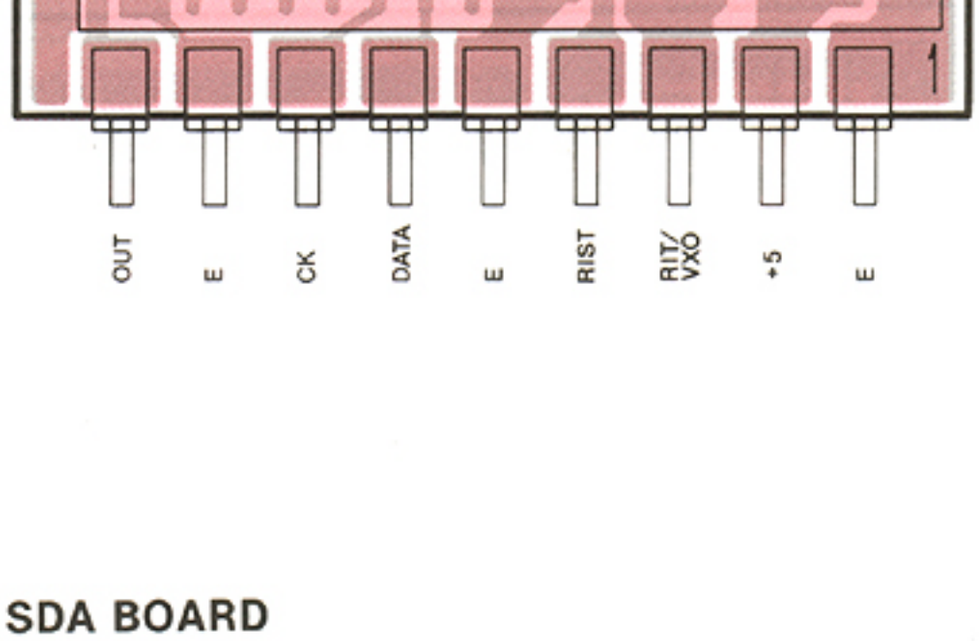


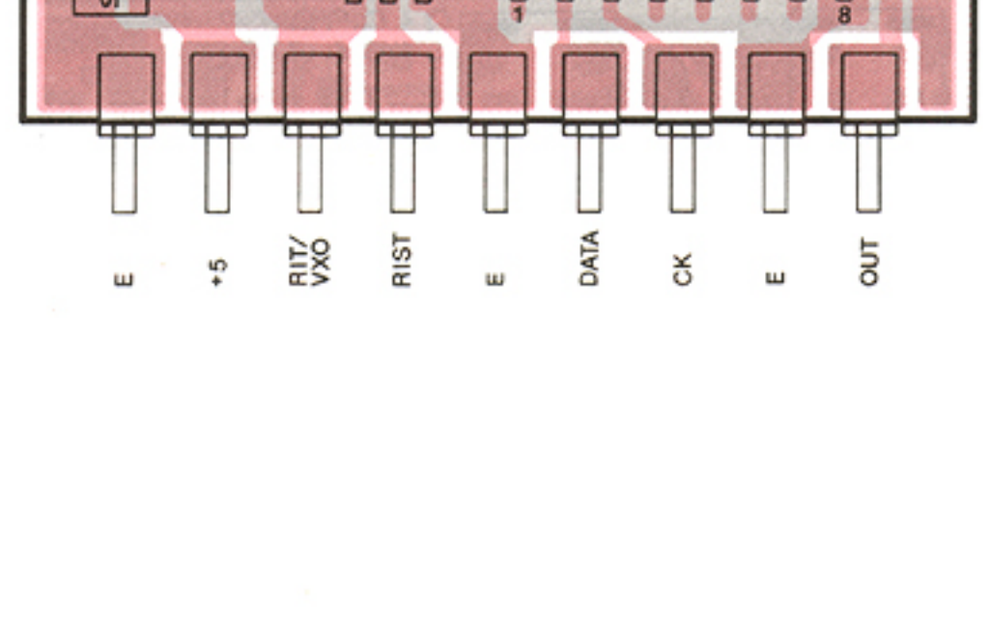
• RDA BOARD





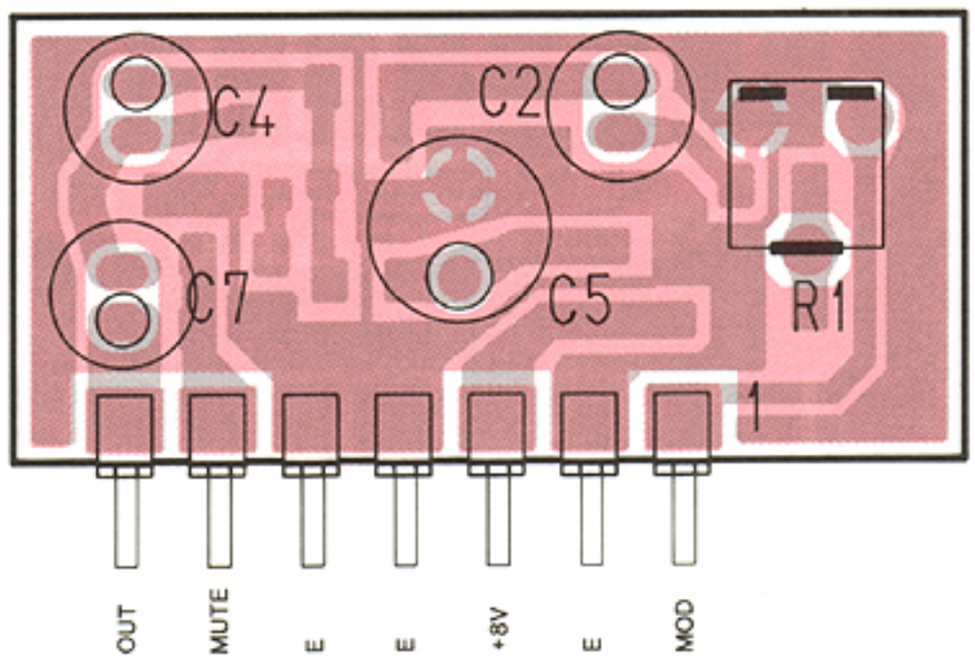
• SDA BOARD

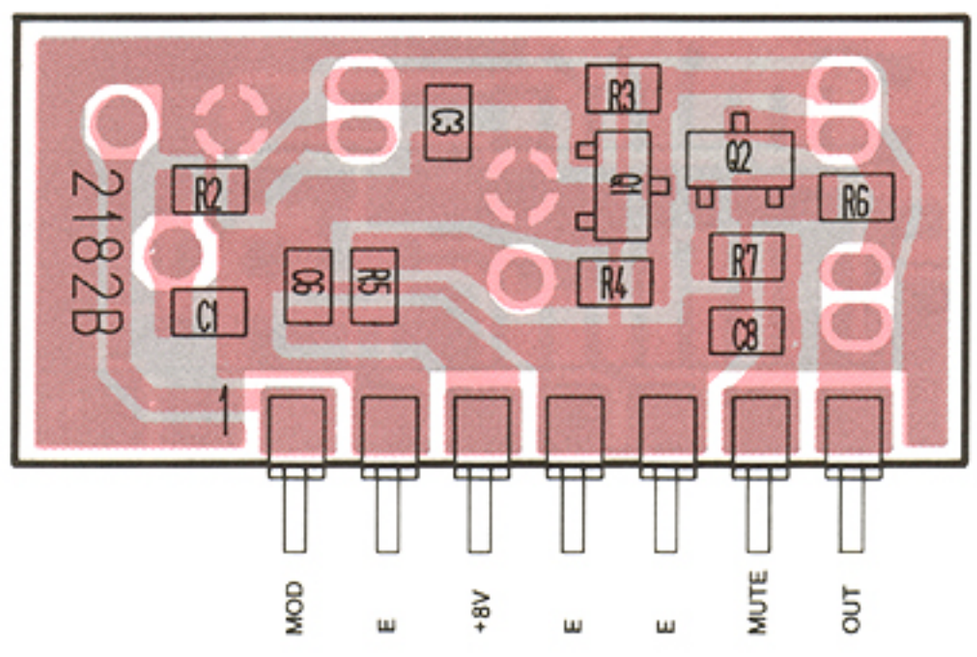




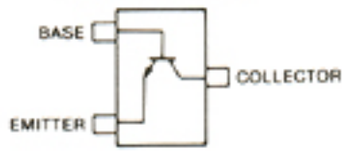
7-4 MIC AND KEYER BOARDS

• MIC BOARD



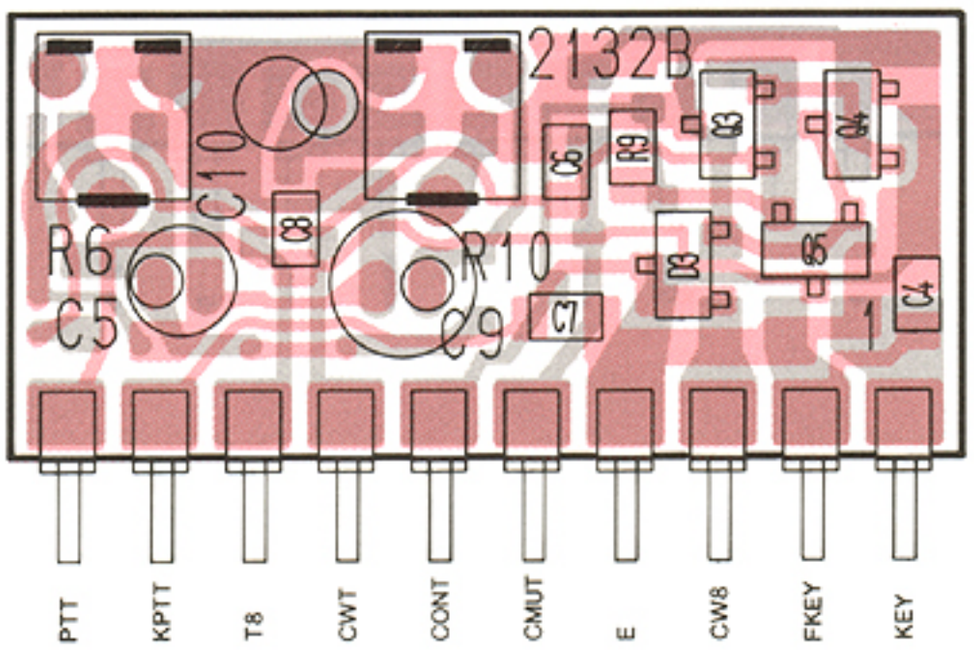


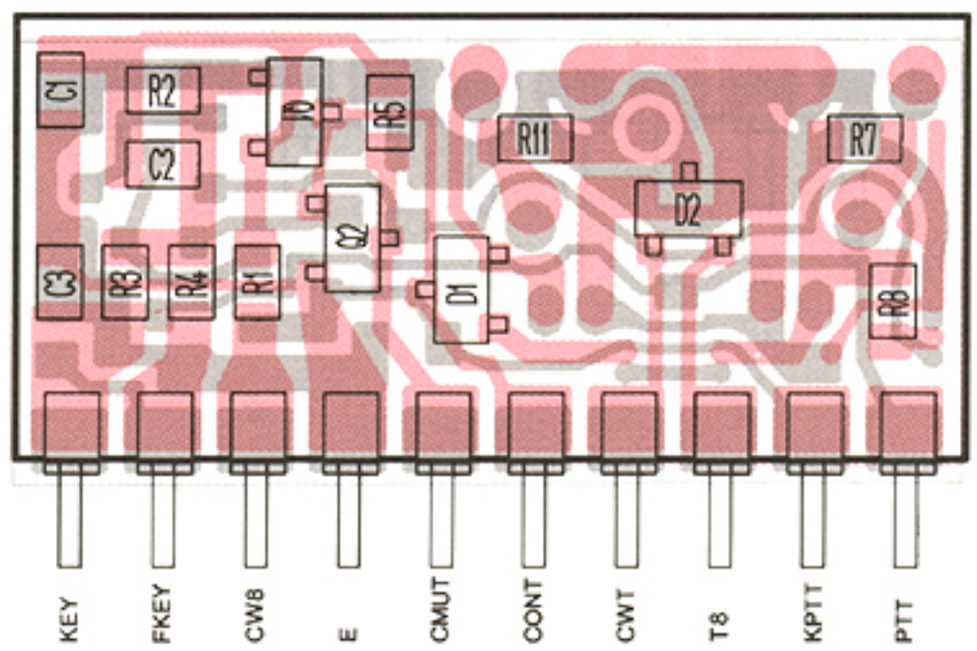
2SC2712 GR/Y
(Symbol: LG)
(Symbol: LY)



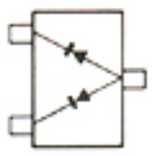
Q1, Q2

• KEYER BOARD



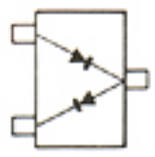


1SS181
(Symbol: A3)



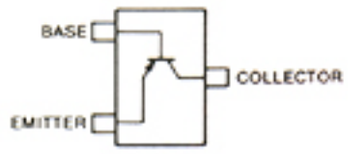
D1, D2

HSM88AS
(Symbol: C1)



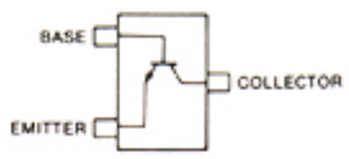
D3

2SA1162 Y
(Symbol: SY)



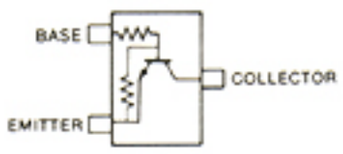
Q1

2SC2712 Y
(Symbol: LY)



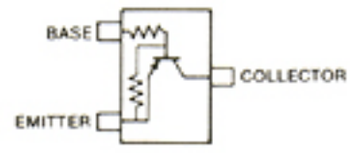
Q3, Q4

RN1404
(Symbol: XD)



Q2

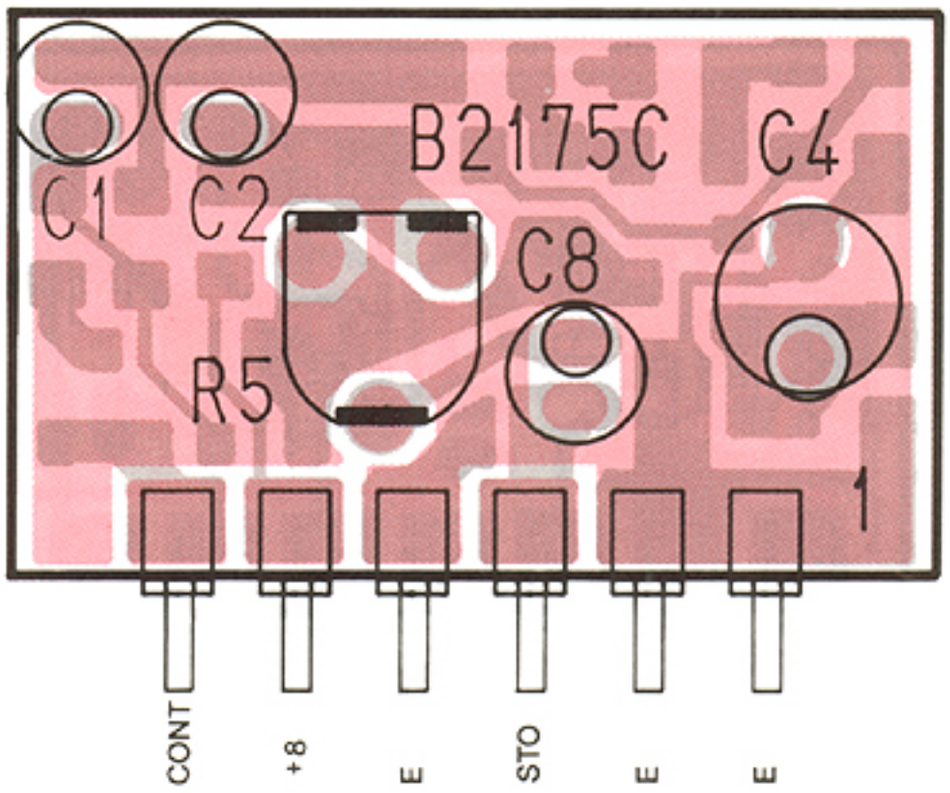
RN2404
(Symbol: YD)

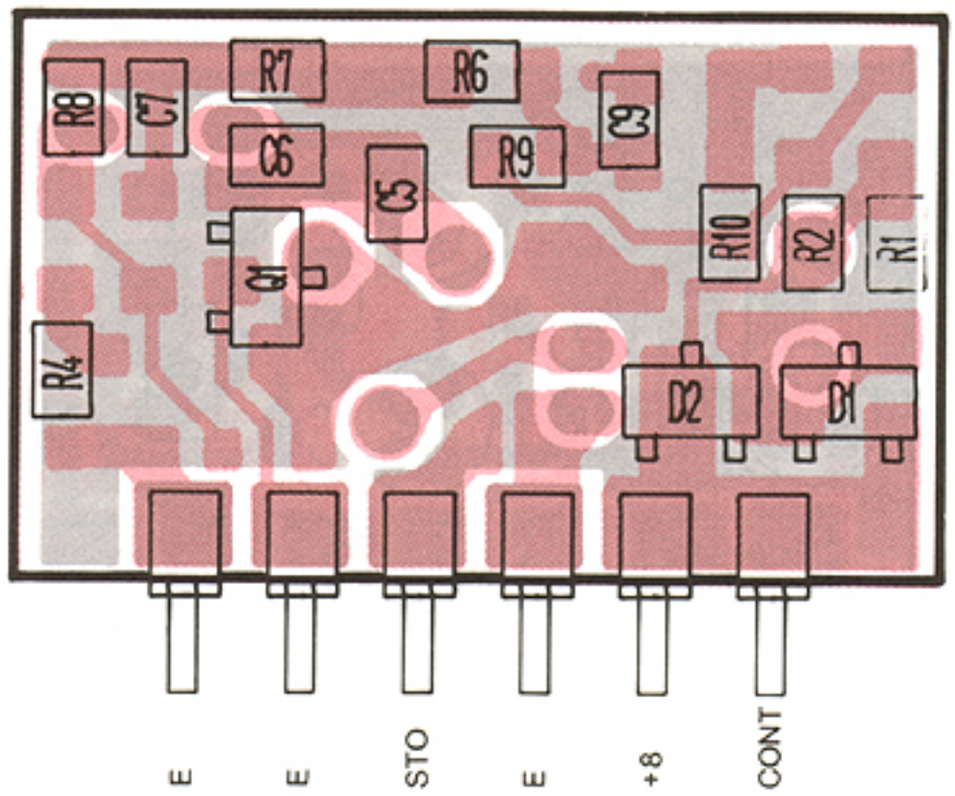


Q5

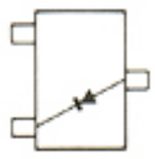
7-5 TONE AND AGC BOARDS

• TONE BOARD



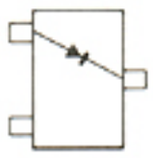


1SS190
(Symbol: E3)



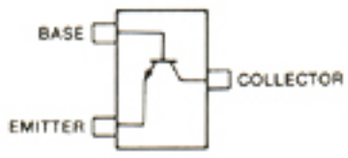
D2

1SS193
(Symbol: F3)



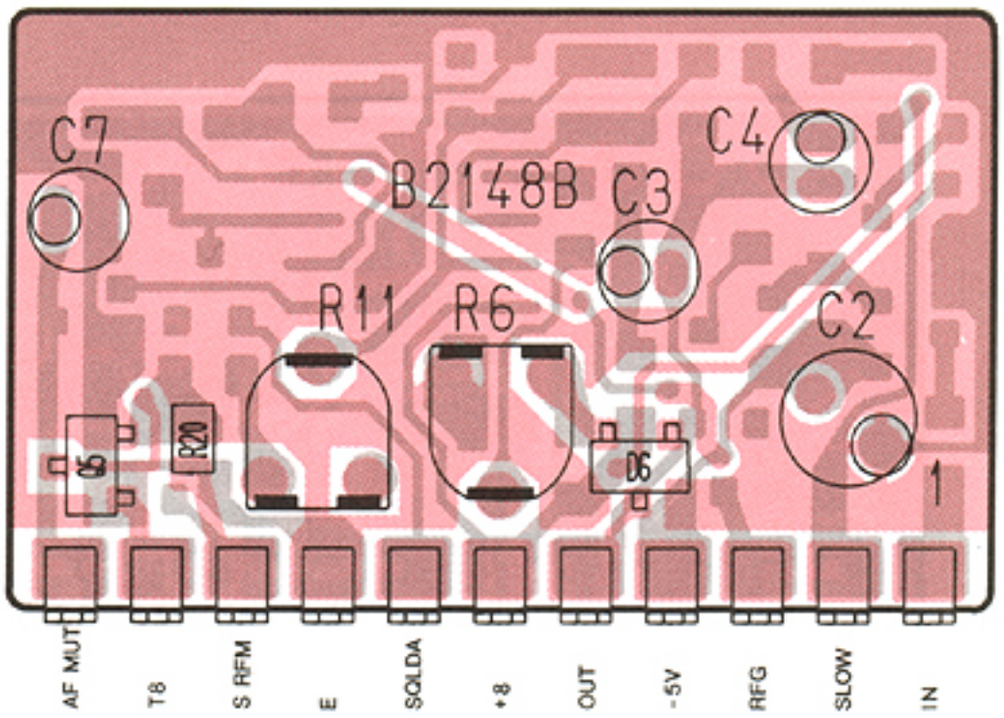
D1

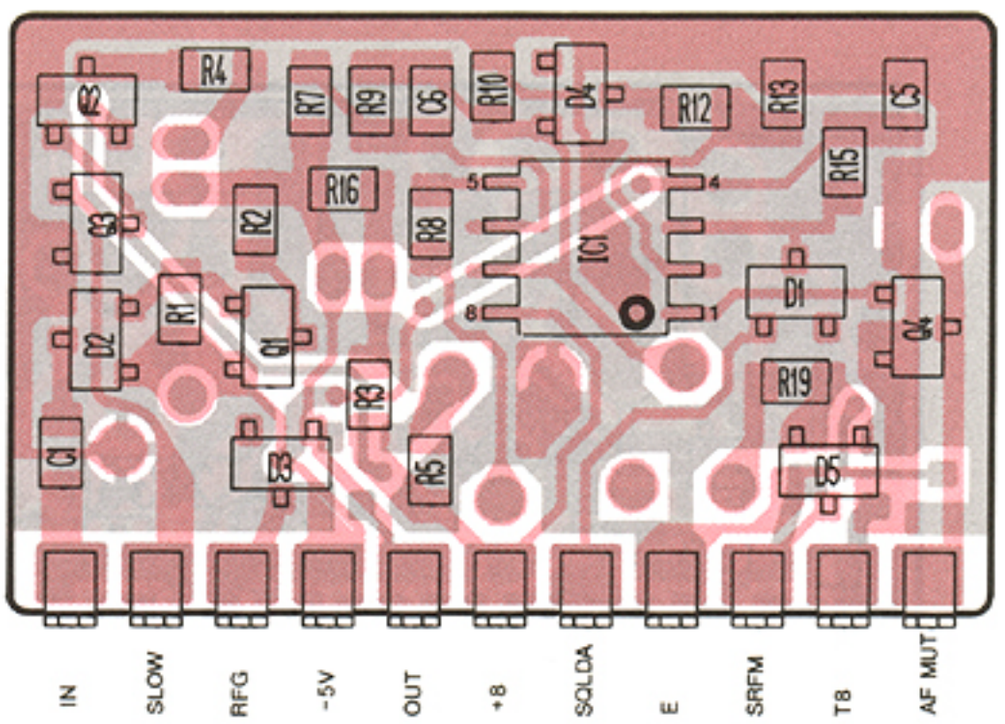
2SC2712 Y
(Symbol: LY)



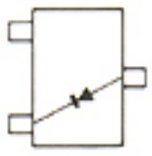
Q1

• AGC BOARD



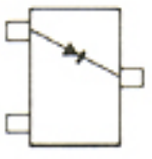


1SS190
(Symbol: E3)



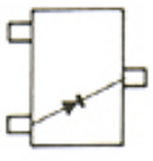
D6

1SS193
(Symbol: F3)



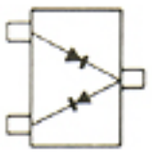
D1, D3

1SS196
(Symbol: G3)



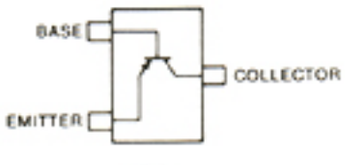
D4, D5

HSM88AS
(Symbol: C1)



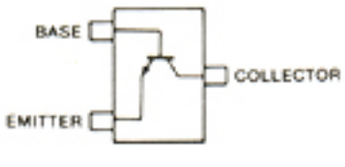
D2

2SA1162 Y
(Symbol: SY)



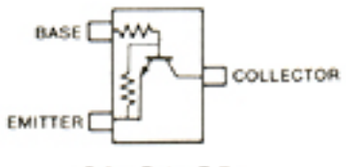
Q2

2SC2712 GR
(Symbol: LG)



Q1

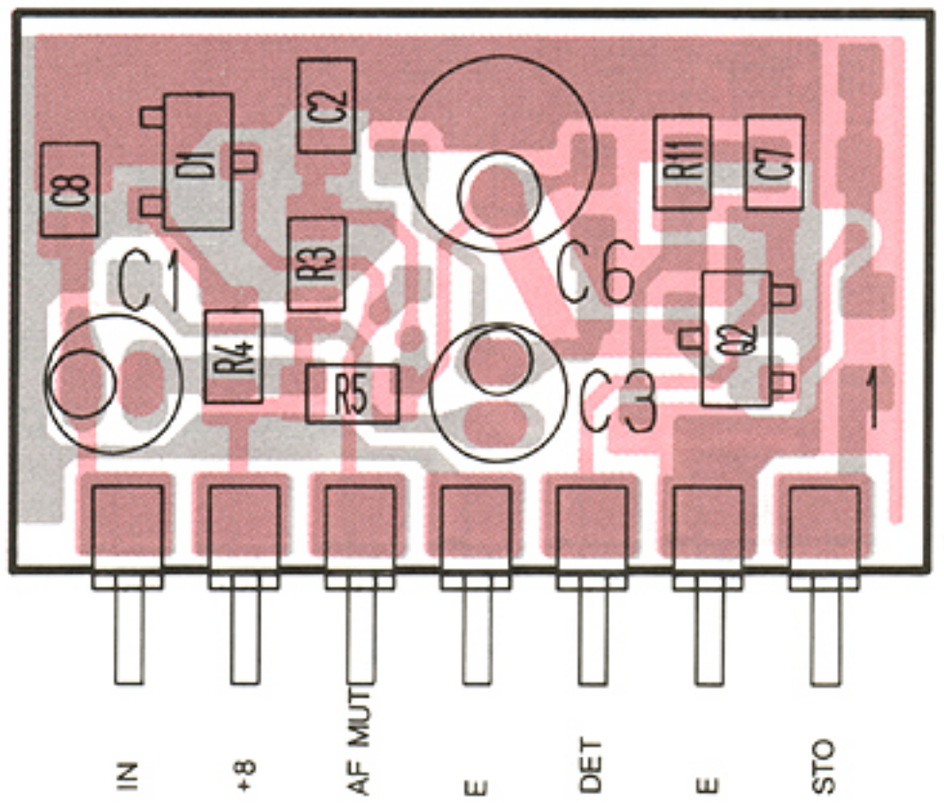
RN1404
(Symbol: XD)

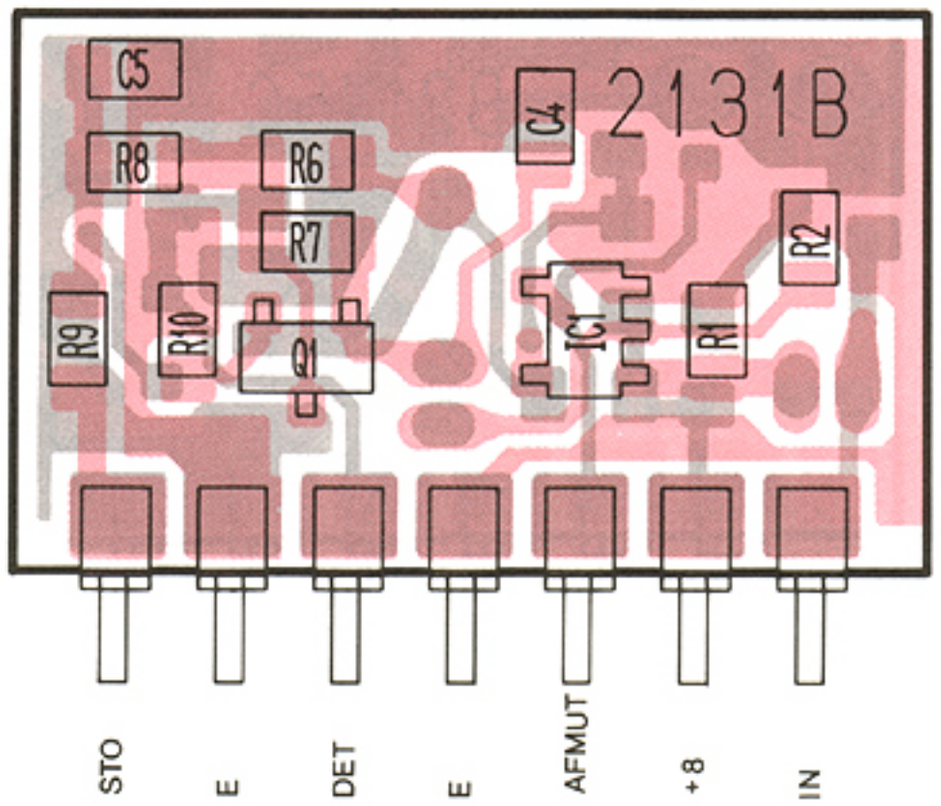


Q3, Q4, Q5

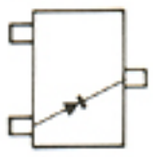
7-6 AUDIO AND NB BOARDS

•AUDIO BOARD



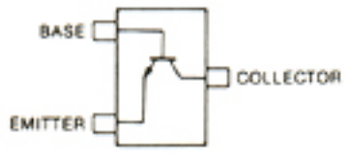


1SS196
(Symbol: G3)



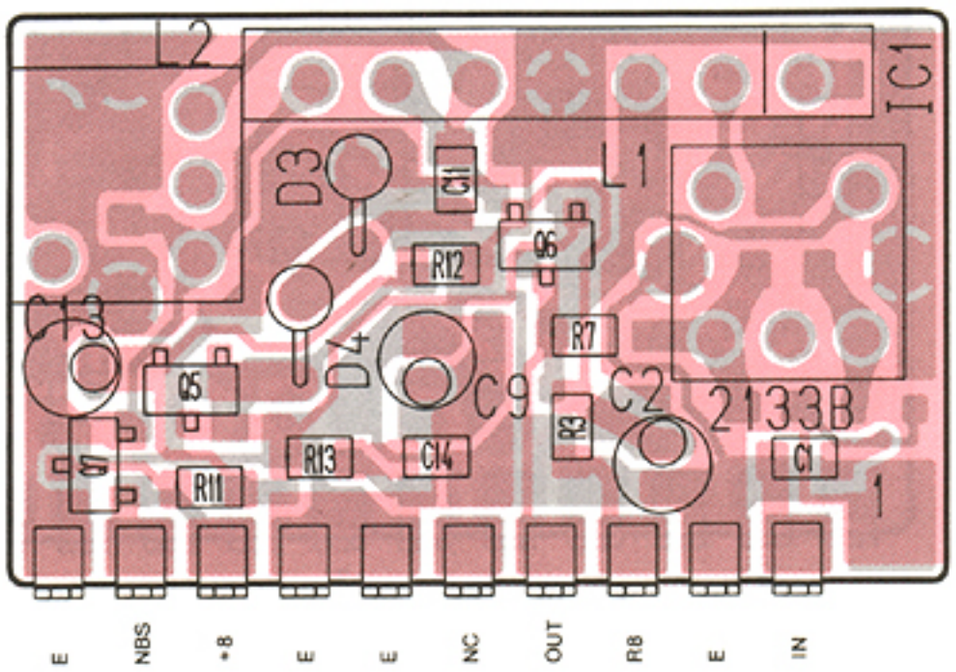
D1

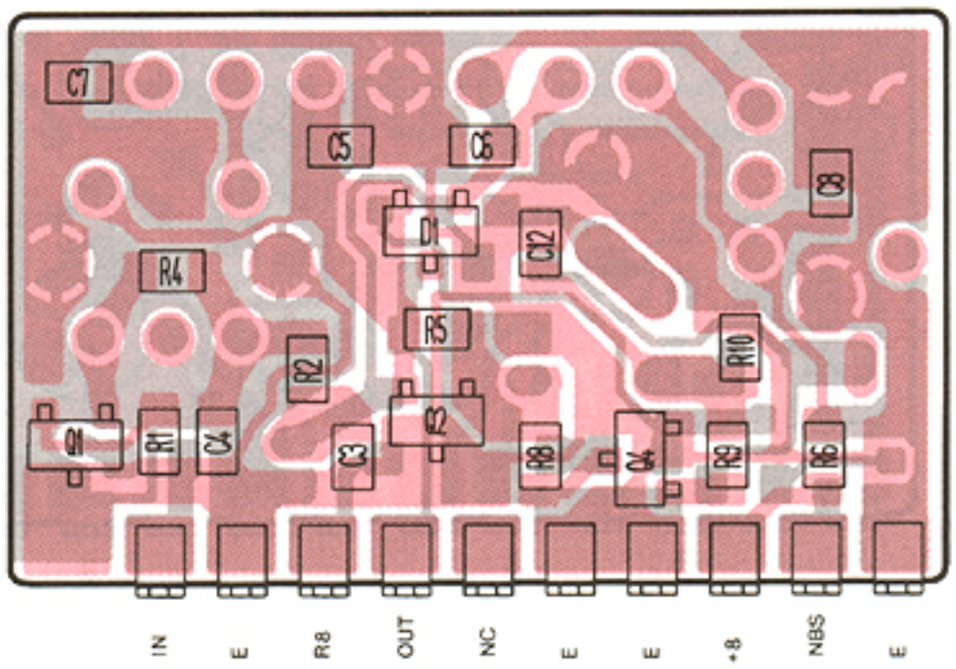
2SC2712 Y
(Symbol: LY)



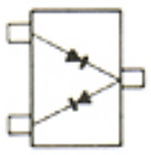
Q1, Q2

• NB BOARD



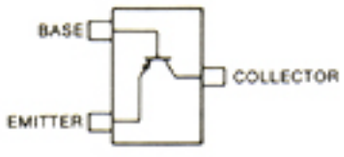


1SS226
(Symbol: C3)



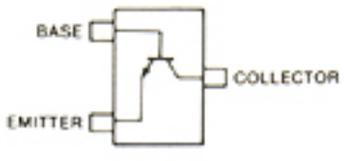
D1

2SA1162 Y
(Symbol: SY)



Q2

2SC2712 Y
(Symbol: LY)

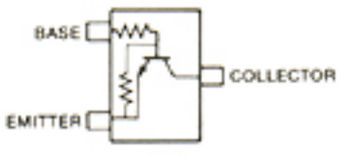


Q4, Q5

2SK210 Y
(Symbol: YY)

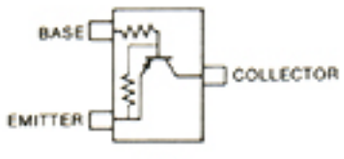
Q1

RN1404
(Symbol: XD)



Q7

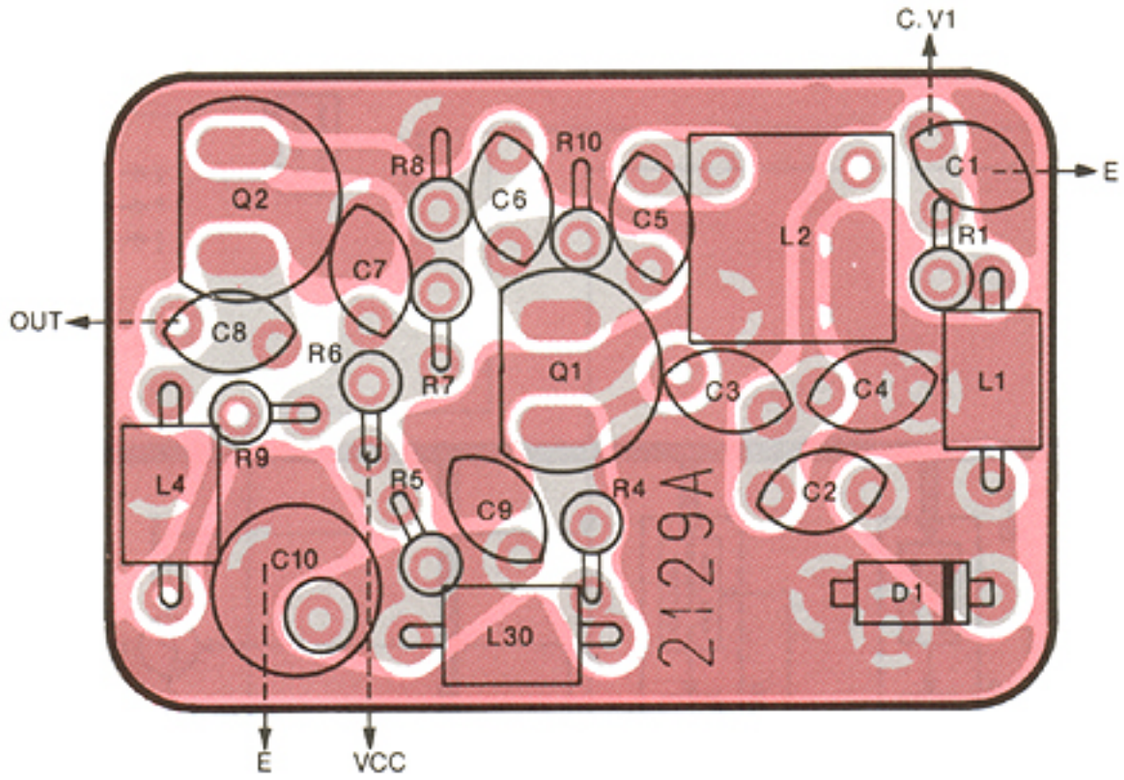
RN2404
(Symbol: YD)



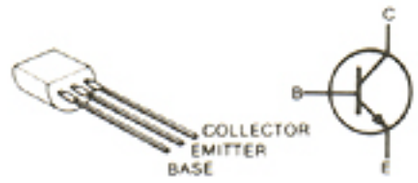
Q6

7-7 VCO, SW-A AND ANT BOARDS

•VCO BOARD

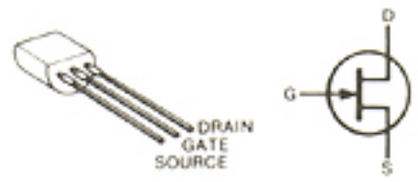


2SC3776 D



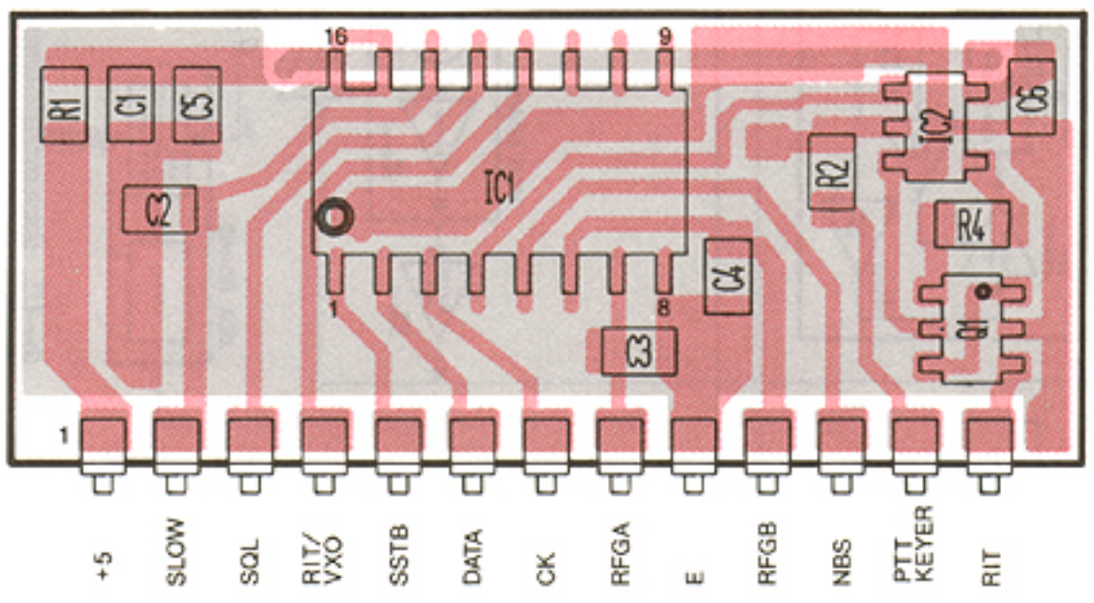
Q2

2SK125

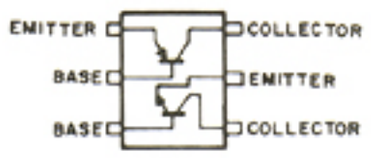


Q1

• SW-A BOARD

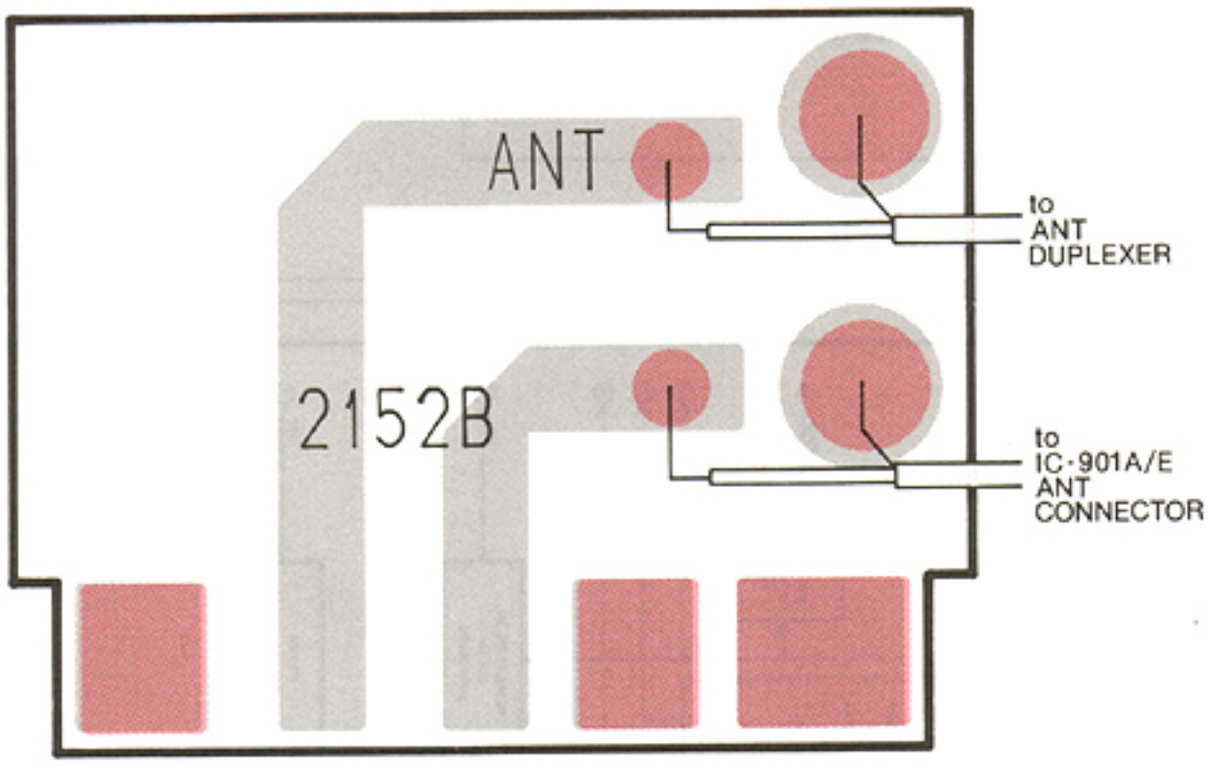


IMZ2
(Symbol: Z2)

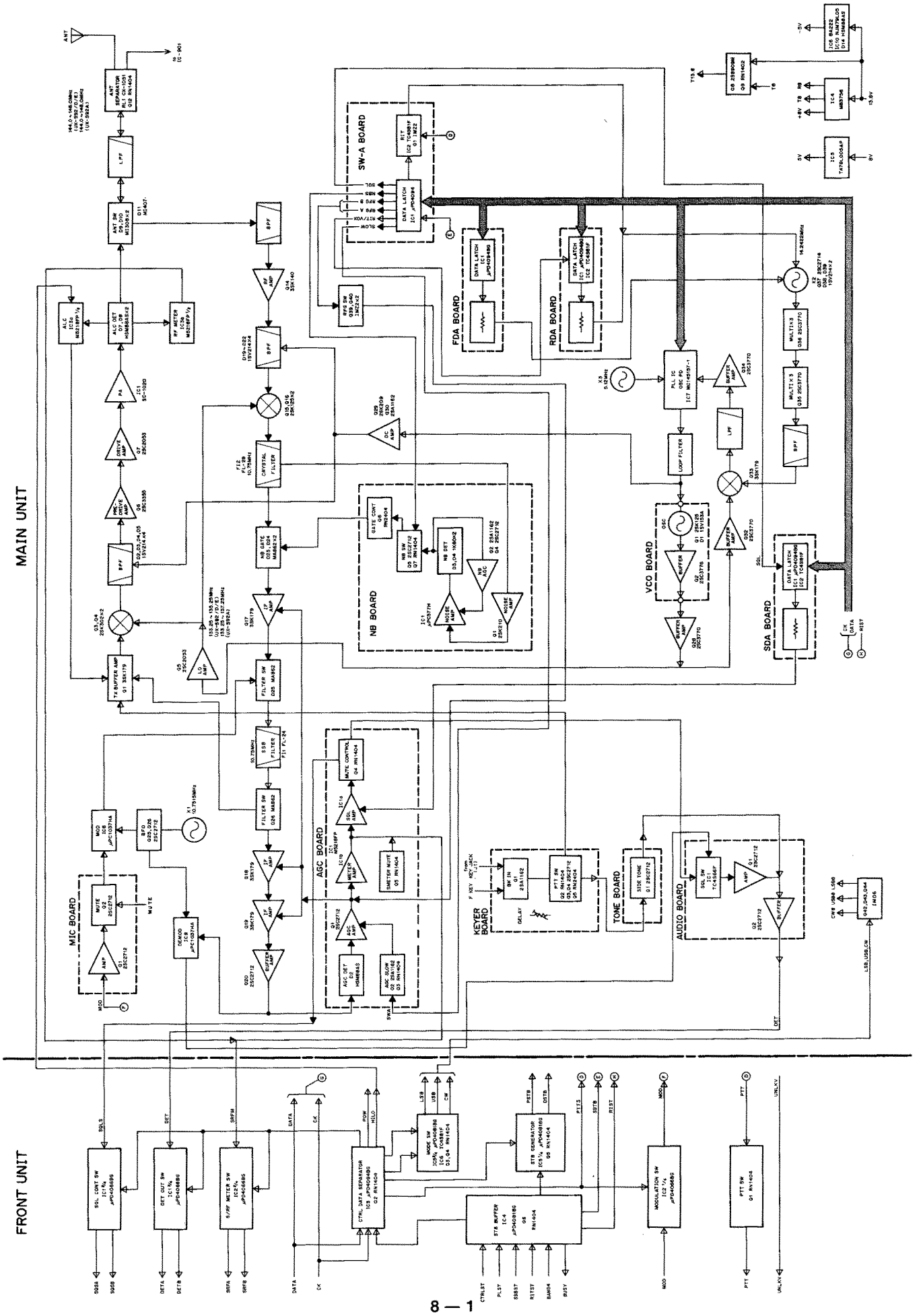


Q1

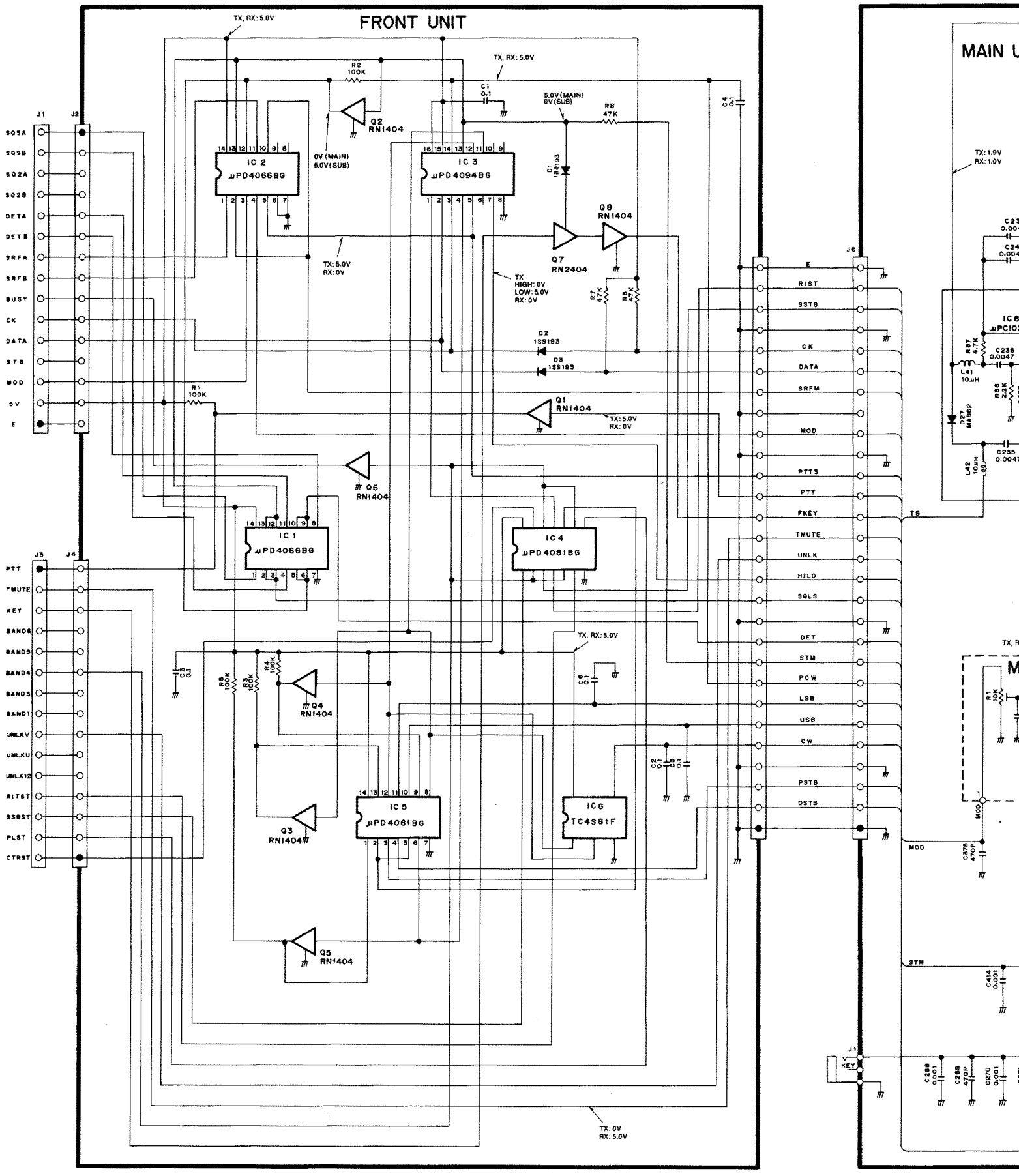
• ANT BOARD

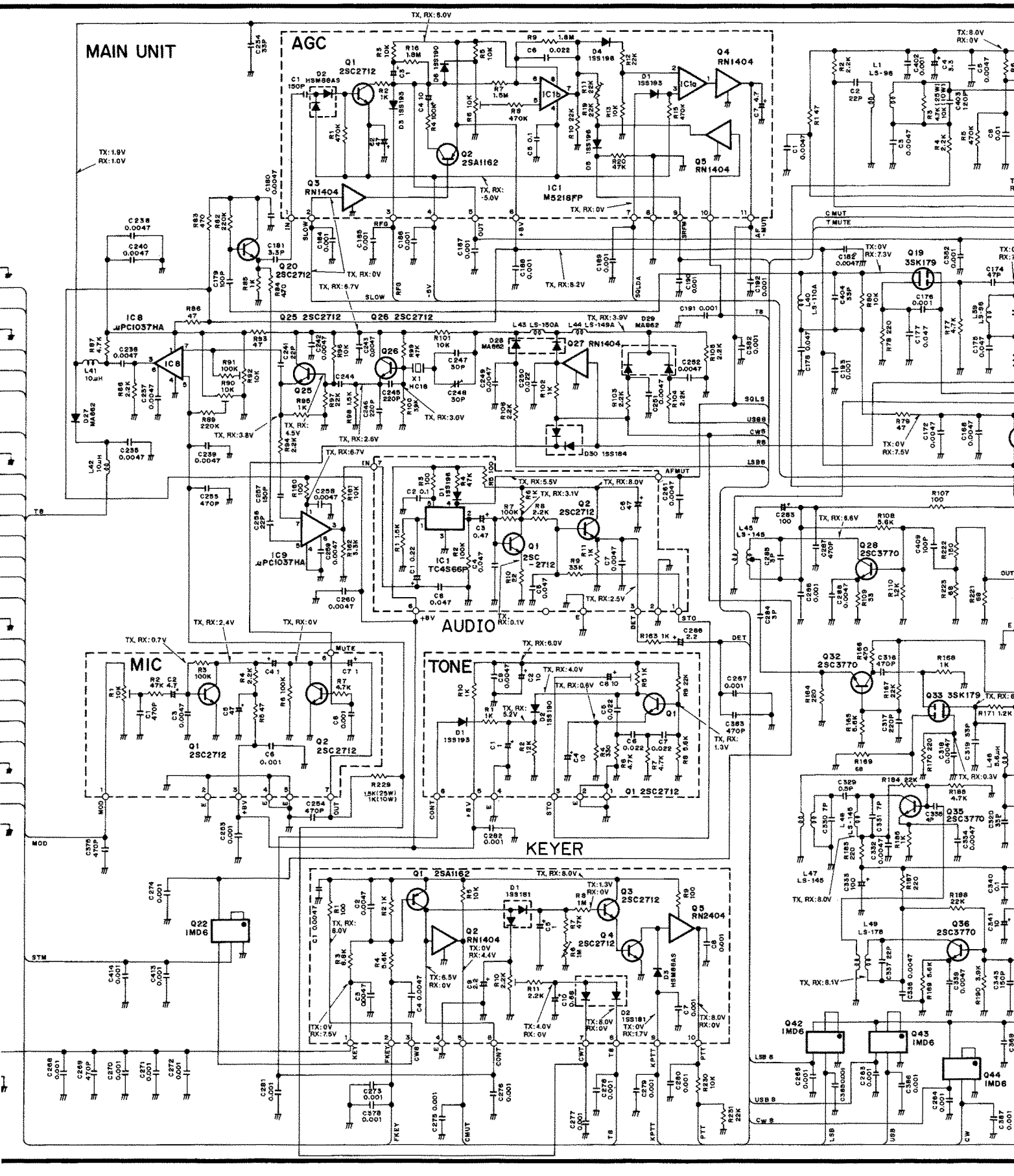


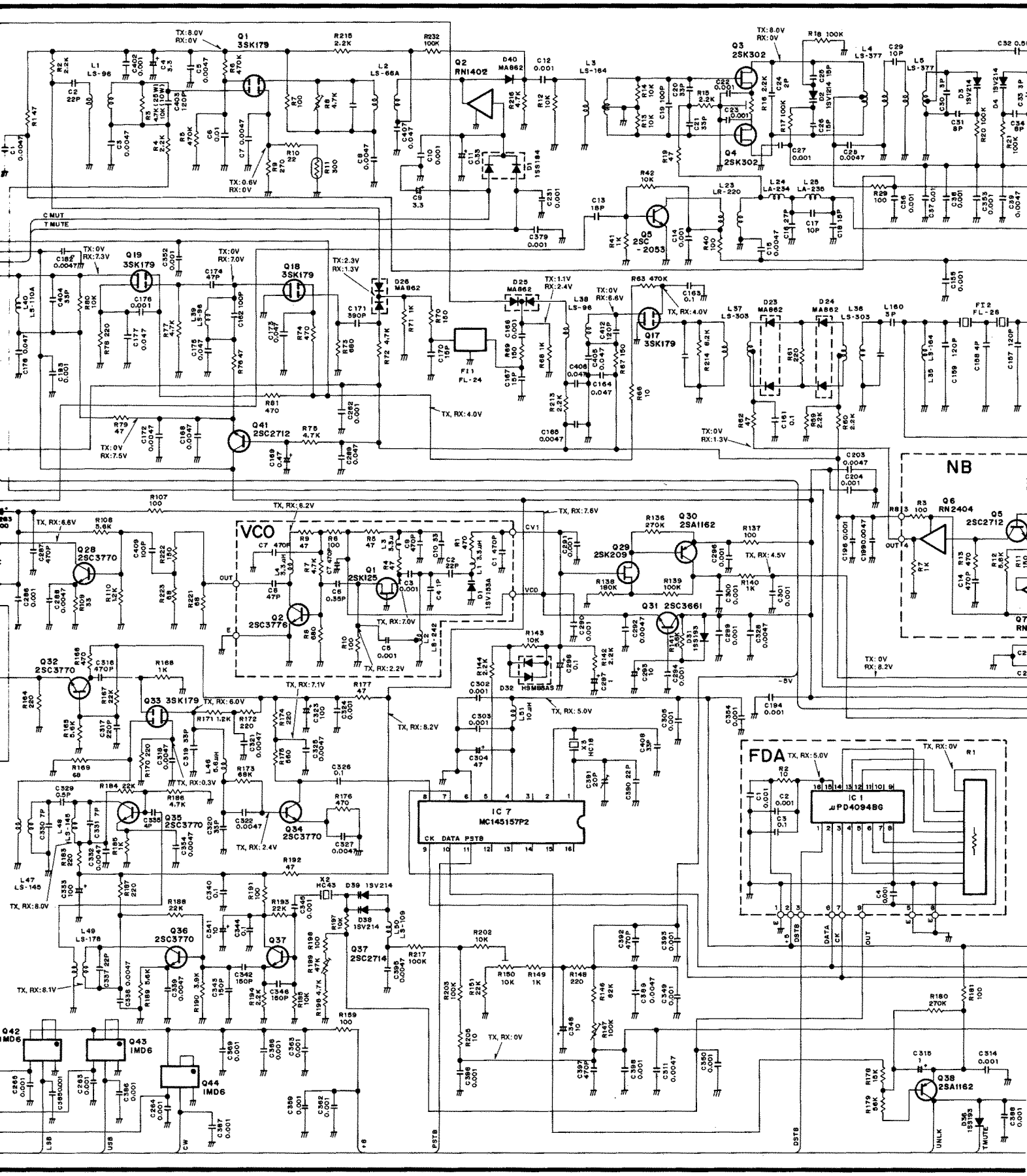
SECTION 8 BLOCK DIAGRAM

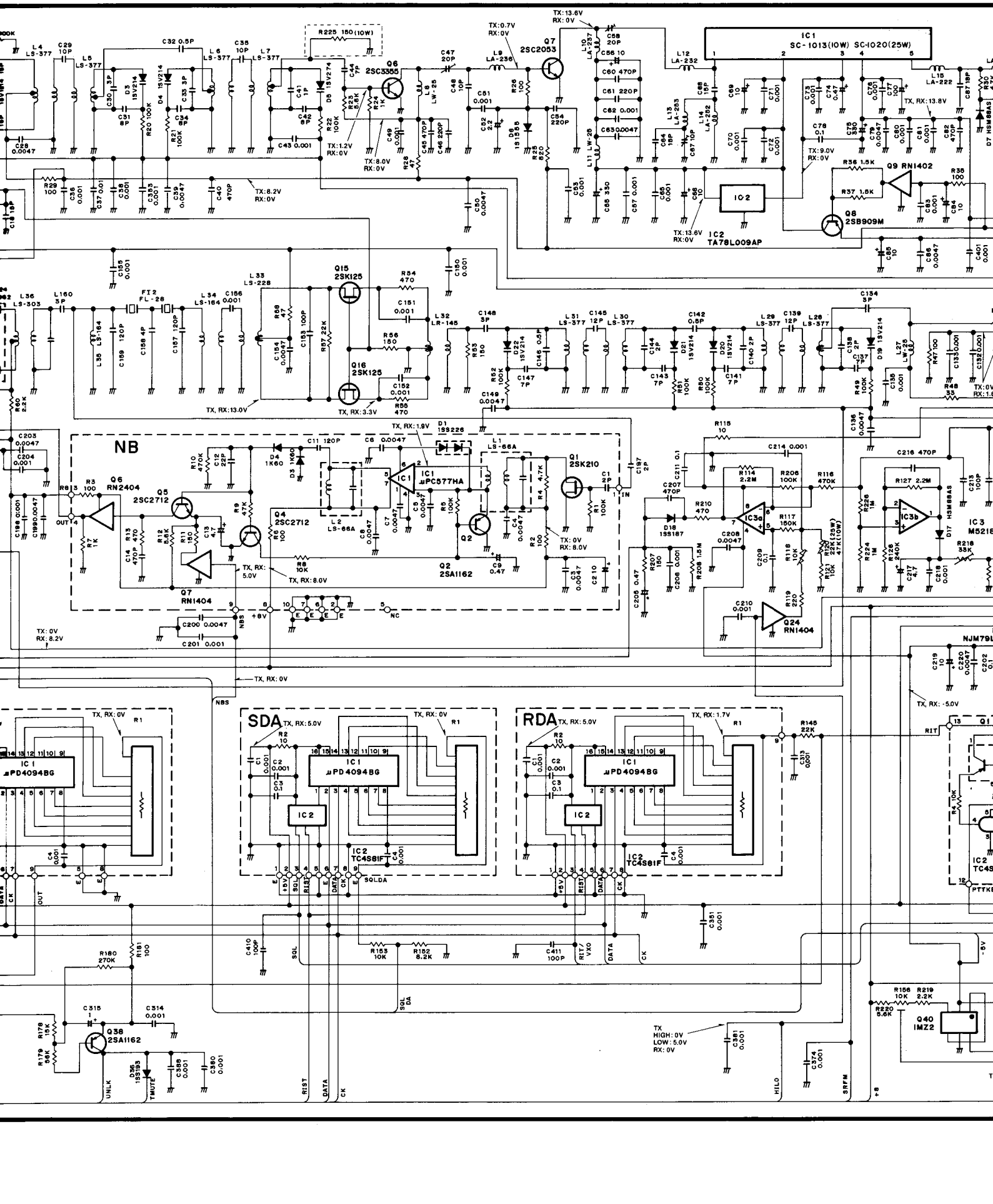


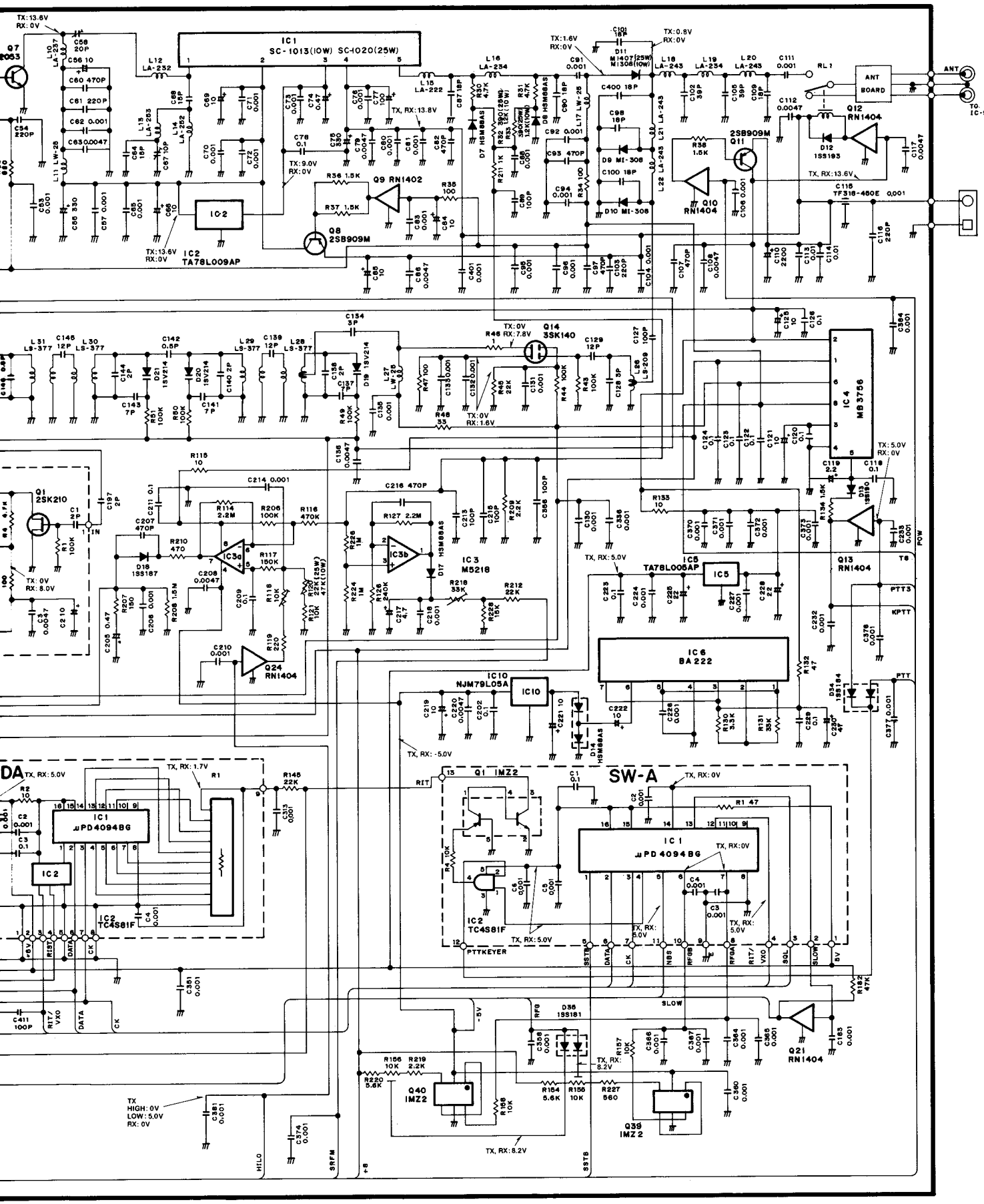
SECTION 9 VOLTAGE DIAGRAM




MAIN UNIT
AGC
AUDIO
MIC
TONE
KEYER
IC1 M5218FP
IC8 μPC1037HA
IC9 μPC1037HA
IC1 TC4S66P
Q1 2SC2712
Q2 2SC2712
Q3 RN1404
Q4 RN1404
Q5 RN1404
Q20 2SC2712
Q25 2SC2712
Q26 2SC2712
Q27 RN1404
Q28 2SC3770
Q32 2SC3770
Q33 3SK179
Q35 2SC3770
Q36 2SC3770
Q19 3SK179
Q22 IMD6
Q42 IMD6
Q43 IMD6
Q44 IMD6
Q1 2SA1162
Q2 RN2404
Q3 2SC2712
Q4 2SC2712
Q5 RN2404
D1 1SS193
D2 HSM88AS
D3 1SS193
D4 1SS198
D5 1SS196
D26 MA862
D27 MA862
D29 MA862
D30 1SS184
X1 HC18
L41 10μH
L42 10μH
L43 LS-150A
L44 LS-149A
L45 LS-145
L46 5.6μH
L47 LS-145
L48 LS-145
L49 LS-178
TX, RX: 6.0V
TX: 1.9V RX: 1.0V
TX, RX: -5.0V
TX, RX: 0V
TX, RX: 8.2V
TX, RX: 6.7V
TX, RX: 3.9V
TX, RX: 3.6V
TX, RX: 3.8V
TX, RX: 4.5V
TX, RX: 2.6V
TX, RX: 5.5V
TX, RX: 8.0V
TX, RX: 3.1V
TX, RX: 2.5V
TX, RX: 0.1V
TX, RX: 6.6V
TX, RX: 7.3V
TX: 0V RX: 7.5V
TX: 8.0V RX: 0V
TX, RX: 2.4V
TX, RX: 0.7V
TX, RX: 6.0V
TX, RX: 4.0V
TX, RX: 0.6V
TX, RX: 5.2V
TX, RX: 1.3V
TX, RX: 0.3V
TX, RX: 8.1V
TX, RX: 8.0V
TX: 1.3V RX: 0V
TX: 0V RX: 4.4V
TX: 6.5V RX: 0V
TX: 0V RX: 7.5V
TX: 4.0V RX: 0V
TX: 8.0V RX: 0V
TX: 8.0V RX: 1.7V
TX: 8.0V RX: 0V
MUTE
AFMUT
SQLA
SQLS
USB S
CW S
LSB S
T MUTE
C MUT
AF MUT
SLOW
RFG
+8V
+5V
MOD
STM
KEY
FKEY
CWS
CONT
KPTT
PTT
LSB
USB
CW
DET
STO
OUT
IN


VCO
NB
FDA
IC 7
MC145157P2
IC 1
μPD4094BG
Q1 3SK179
Q2 RN1402
Q3 2SK302
Q4 2SK302
Q5 2SC-2053
Q6 RN2404
Q7 2SC2712
Q17 3SK179
Q18 3SK179
Q19 3SK179
Q28 2SC3770
Q29 2SK209
Q30 2SA1162
Q31 2SC3661
Q32 2SC3770
Q33 3SK179
Q34 2SC3770
Q35 2SC3770
Q36 2SC3770
Q37 2SC2714
Q38 2SA1162
Q41 2SC2712
Q42 IMD6
Q43 IMD6
Q44 IMD6
2SK125
CMUT
TMUTE
TX: 0V RX: 7.3V
TX: 0V RX: 7.0V
TX: 2.3V RX: 1.3V
TX: 1.1V RX: 2.4V
TX: 0V RX: 8.6V
TX: 8.0V RX: 0V
TX: 0.6V RX: 0V
TX: 0V RX: 7.5V
TX: 0V RX: 1.3V
TX: 0V RX: 8.2V
TX, RX: 4.0V
TX, RX: 6.2V
TX, RX: 7.6V
TX, RX: 6.6V
TX, RX: 4.5V
TX, RX: 7.0V
TX, RX: 2.2V
TX, RX: 7.1V
TX, RX: 6.0V
TX, RX: 8.2V
TX, RX: 5.0V
TX, RX: 0.3V
TX, RX: 2.4V
TX, RX: 8.0V
TX, RX: 8.1V
TX, RX: 0V
TX, RX: 5.0V
CK DATA PSTB
DSTB DATA CK OUT
LSB USB CW PSTB +8 DSTB UNLK TMUTE


IC1
SC-1013(10W) SC-1020(25W)
IC2
TA78L009AP
Q6 2SC3355
Q7 2SC2053
Q8 2SB909M
Q9 RN1402
Q15 2SK125
Q16 2SK125
NB
Q6 RN2404
Q5 2SC2712
Q4 2SC2712
Q7 RN1404
IC1 μPC577HA
D1 1SS226
Q1 2SK210
Q2 2SA1162
IC3a
IC3b
IC3 M5218
Q24 RN1404
SDA
RDA
IC1 μPD4094BG
IC2 TC4S81F
Q38 2SA1162
Q40 IMZ2
TX, RX: 0V
TX: 13.6V RX: 0V
TX: 0.7V RX: 0V
TX: 1.2V RX: 0V
TX: 8.0V RX: 0V
TX: 8.2V RX: 0V
TX: 9.0V RX: 0V
TX, RX: 13.8V
TX: 13.6V RX: 0V
TX, RX: 13.0V
TX, RX: 3.3V
TX, RX: 1.9V
TX, RX: 5.0V
TX, RX: 8.0V
TX: 0V RX: 8.2V
TX, RX: 1.7V
TX, RX: -5.0V
TX HIGH: 0V LOW: 5.0V RX: 0V
NBS
SQL
RIST
DATA
CK
SQLDA
HILO
SRFM
UNLK
TMUTE
PTTKE


IC1
SC-1013(10W) SC-1020(25W)
IC2
TA78L009AP
IC3
M5218
IC4
MB3756
IC5
TA78L005AP
IC6
BA222
IC10
NJM79L05A
Q1
2SK210
Q8
2SB909M
Q9 RN1402
Q10 RN1404
Q11
2SB909M
Q12 RN1404
Q13 RN1404
Q14
3SK140
Q24 RN1404
Q40
IMZ2
Q39
IMZ2
Q21 RN1404
SW-A
ANT
ANT BOARD
TO IC-901
RL1
PTT3
KPTT
PTT
POW
T6
TX: 13.6V
RX: 0V
TX: 9.0V
RX: 0V
TX: 0V
RX: 8.0V
TX: 0V
RX: 7.8V
TX: 0V
RX: 1.6V
TX: 1.6V
RX: 0V
TX: 0.8V
RX: 0V
TX: 5.0V
RX: 0V
TX, RX: 13.8V
TX, RX: 13.6V
TX, RX: 5.0V
TX, RX: 1.7V
TX, RX: -5.0V
TX, RX: 8.2V
TX, RX: 0V
TX, RX: 5.0V
TX, RX: 5.0V
TX, RX: 5.0V
TX, RX: 8.2V
TX
HIGH: 0V
LOW: 5.0V
RX: 0V
HILO
SRFM
SSTB
SLOW
PTTKEYER
RIT
DATA
CK
-5V
+8

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