



# SERVICE MANUAL

144 MHz FM TRANSCEIVER

## IC-281H

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## INTRODUCTION

This service manual describes the latest information for the **IC-281H** 144 MHz FM TRANSCEIVER at the time of publication.

VERSION NO.	VERSION	SYMBOL
#02	Europe	EUR
#03	Italy	ITA
#05	U.S.A.	USA
#06	Korea	KOR
#07	Australia	AUS
#08	Asia	SEA

## 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>

1110003460 IC LA4422 IC-281H MAIN UNIT 5 pieces  
8810003100 Screw OH M2.6 x 5 ZK BS IC-281H Top cover 10 pieces

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

## REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits of 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 to 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.

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To upgrade quality, all electrical or mechanical parts and internal circuits are subject to change without notice or obligation.

# SECTION 1 SPECIFICATIONS

## ■ GENERAL

- Frequency coverage (MHz) :

Version	Frequency coverage (MHz)	
	VHF	UHF (Rx)
U.S.A.	144.00–148.00	440.00–450.00
Australia	144.00–148.00	430.00–440.00
Asia	144.00–148.00 (Rx: 136.00–174.00 <sup>*1</sup> )	430.00–440.00
Korea	144.00–146.00	435.075–440.00
Europe	144.00–146.00	430.00–440.00
Italy	144.00–148.00 (Rx: 136.00–174.00 <sup>*1</sup> )	400.00–479.00 <sup>*2</sup>

<sup>\*1</sup> Guaranteed 144–148; <sup>\*2</sup> Guaranteed 430–440.

- Mode : FM (F3)
- Tuning step increments : 5, 10, 12.5, 20, 25, 30 or 50 kHz
- Number of memory channels : 60 regular, 2 call, 10 scratch pads and 12 scan edges
- Power supply requirement : 13.8 V DC  $\pm$ 15 % (negative ground)
- Current drain (at 13.8 V DC) :
 

Transmit	High	10.5 A
	Mid	5.5 A
	Low	4.0 A
Receive	Max. audio	1.0 A
	Stand by	0.8 A
- Antenna impedance : 50  $\Omega$  (nominal)
- Usable temperature range :  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$  ( $+14^{\circ}\text{F}$  to  $+140^{\circ}\text{F}$ )
- Frequency stability :  $\pm$ 10 ppm ( $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ )
- Dimensions : 140 (W) x 40 (H) x 171 (D) mm; 5.5 (W) x 1.6 (H) x 6.7 (D) in  
(Projections not included)
- Weight : 930 g (2.1 lb)

## ■ TRANSMITTER

- Output power :
 

High	50 W
Mid	10 W
Low	5 W
- Modulation system : Variable reactance frequency modulation
- Microphone impedance : 600  $\Omega$
- Max. frequency deviation :  $\pm$ 5.0 kHz
- Spurious emissions : Less than  $-60$  dB

## ■ RECEIVER

- Receive system : Double-conversion superheterodyne
- Sensitivity :
 

VHF	Less than 0.16 $\mu\text{V}$ for 12 dB SINAD
UHF	Less than 0.2 $\mu\text{V}$ for 12 dB SINAD
- Intermediate frequencies :
 

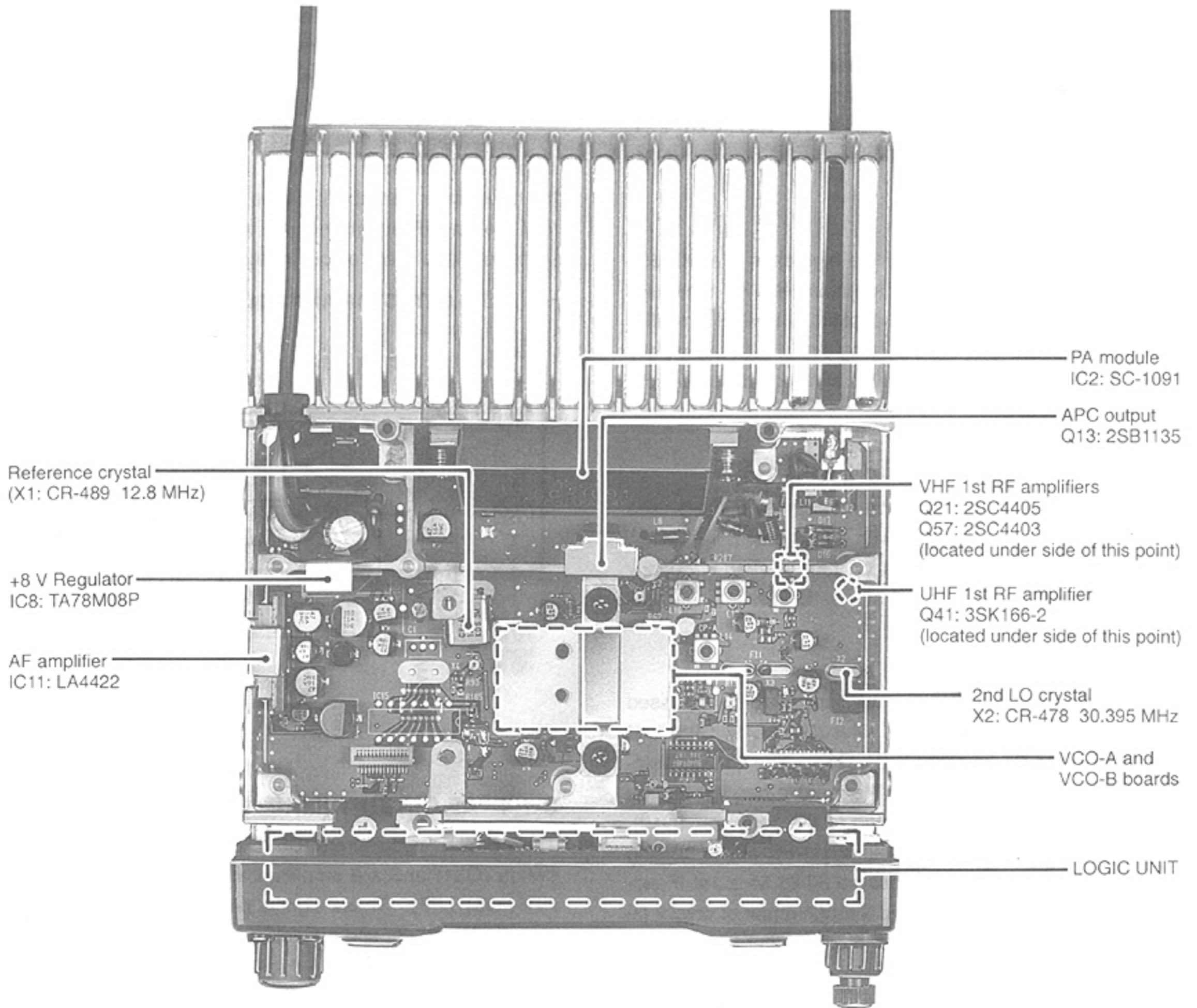
1st	30.85 MHz
2nd	455 kHz
- Squelch sensitivity (at threshold) : Less than 0.13  $\mu\text{V}$
- Spurious response rejection : More than 60 dB
- Audio output power : More than 2.4 W at 10% distortion with an 8  $\Omega$  load
- Audio output impedance : 4 to 8  $\Omega$

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

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# SECTION 2 INSIDE VIEWS

## • MAIN UNIT



## SECTION 3 CIRCUIT DESCRIPTION

### 3-1 RECEIVER CIRCUITS

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

The antenna switching circuit functions as a low-pass filter while receiving and a resonator circuit while transmitting. The circuit does not allow transmit signals to enter receiver circuits.

##### VHF CIRCUIT

Received signals enter the antenna connector and then pass through the low-pass filter (L11, L12, C60, C61), the  $\lambda/4$  type antenna switching circuit (D16, D17, L20, L21, C102, C264) and are then applied to the RF amplifier (Q21, Q57).

##### UHF CIRCUIT

Received signals pass through the high-pass filter (C189–C191, C265, C266, L37, L38) to suppress VHF band signals. The filtered signals are applied to the RF amplifier (Q41) through the antenna switching circuit (D27), low-pass filter circuit (L30, L31, C172–C174) and high-pass filter circuit (C169–C170, L29).

#### 3-1-2 RF AND 1ST MIXER CIRCUITS

The 1st mixer circuit converts the received signal to a fixed frequency of the 1st IF signal with a PLL output frequency. By changing the PLL frequency, only the desired frequency will be passed through a pair of crystal filters at the next stage of the 1st mixer.

##### VHF CIRCUIT

The signals from the antenna switching circuit are passed through the tunable band-pass filter (D14, L19, C98) and amplified at the RF amplifier (Q21, Q57). The amplified signals are again passed through the tunable band-pass filter (L16, L17, D11, D12) and applied to the 1st mixer (Q19). The signals are then mixed with a 1st LO signal coming from the VCO-A board to produce a 30.85 MHz 1st IF signal. The 1st IF signal is passed through a pair of crystal filters (F11) and is then applied to the IF amplifier (Q18).

##### UHF CIRCUIT

UHF signals are amplified at the RF amplifier (Q41, IC6), and are mixed at the 1st mixer (Q40) with a 1st LO signal coming from the VCO-B board to produce a 30.85 MHz 1st IF signal.

#### 3-1-3 2ND IF AND DEMODULATOR CIRCUITS

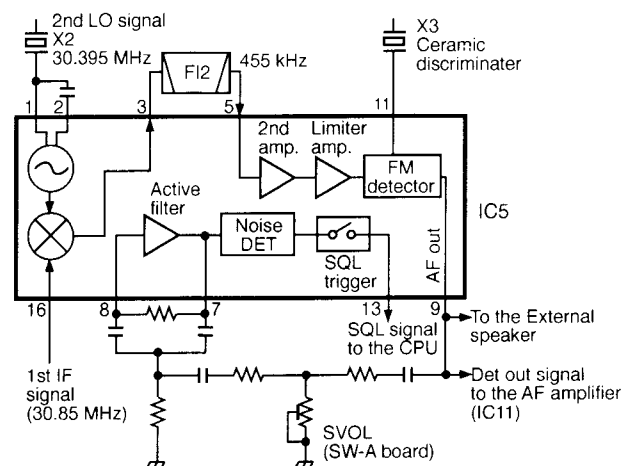
The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal. A double superheterodyne system (which converts

receive signal twice) improves the image rejection ratio and obtains stable receiver gain.

The 1st IF signal from the crystal filter (F11) is amplified at Q18 and applied to a 2nd mixer section of IC5 (pin 16). The signal is then mixed with a 2nd LO signal for conversion to a 455 kHz 2nd IF signal.

IC5 contains the 2nd mixer, local oscillator, limiter amplifier, quadrature detector, S-meter detector and active filter. The local oscillator section generates 30.395 MHz using X2. The 2nd IF signal from the 2nd mixer (IC5 pin 3) passes through ceramic filters (F12) to remove unwanted heterodyned frequencies and fix a passband width. It is then amplified at the limiter amplifier (IC5 pin 5) and applied to the quadrature detector (IC5 pins 9–11 and X3) to demodulate the 2nd IF signal into AF signals. The AF signals (detector signals) are output from pin 9.

#### FM DETECTOR AND SQUELCH CIRCUITS



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

The AF OUT signals from IC5 (pin 9) pass through the AF switch (Q31) and are amplified at the active filters (Q33 HPF; Q34 LPF). Those signals pass through the detector mute switch (Q38), and are adjusted with the volume control at the SW-A board.

The AF amplifier IC11 amplifies the signals to a sufficient level to drive the speaker. The AF mute switch (Q47) turns ON to cut the signal to be input to the AF amplifier (IC7) during transmission.

The AF OUT signals from the VR1 line are also amplified at the AF amplifier (LOGIC unit Q1) to output AF signal from the microphone connector.

### 3-1-5 SQUELCH CIRCUIT (MAIN and LOGIC UNITS)

A squelch circuit cuts out AF signals when no RF signals are being received. By detecting noise components in the AF signals, the squelch circuit turns the AF mute switch OFF.

A portion of the AF signals from the FM IF IC (IC5 pin 9) are applied to the active filter (IC5 pin 8) through the noise filter (C132, C133, R113, R114). The active filter section in IC5 amplifies noise components of frequencies of 20 kHz and above, and are rectified at the noise detector section in IC5 and then applied to the trigger section in IC5.

The trigger section in IC5 converts the rectified signals to a "High" or "Low" signal and applies this to the CPU (LOGIC unit IC6 pin 5) as the busy signal. When the CPU receives "High," the CPU outputs the mute signal through the I/O expander IC (MAIN unit IC13, pin 7) to cut the AF signals at the detector mute switch (Q38).

Even when the squelch is closed, the AF mute switch (Q47) is turned OFF to emit beep tones.

## 3-2 TRANSMITTER CIRCUITS

### 3-2-1 MICROPHONE AMPLIFIER (LOGIC UNIT)

The microphone amplifier circuit amplifies audio signals with +6 dB/octave pre-emphasis characteristics from the microphone to a level needed for the modulation circuit.

The AF signals from the microphone are amplified at the microphone amplifier (Q5) and the limiter amplifier (IC1a) which has a negative feedback circuit for +6 dB/octave pre-emphasis.

The amplified signals are applied to the splatter filter (IC1b) to filter out RF components and then applied to the VCO-A board (MAIN unit) as the "MOD" signal.

### 3-2-2 MODULATION CIRCUIT (VCO-A BOARD)

The modulation circuit modulates the VCO oscillating signal (RF signal) using the microphone audio signals.

The audio signals (MOD) change the reactance of D2 on the VCO-A board to modulate the oscillated signal at the transmitter VCO (Q1, Q2). The oscillated signal is amplified at the buffer amplifier (Q3, Q4, Q5), then applied to the drive amplifiers on the MAIN unit.

### 3-2-3 DRIVE/POWER AMPLIFIER CIRCUITS (MAIN UNIT)

The signal from the VCO-A board is passed through the transmit/receive switching circuit (D2) and amplified by the pre-driver (Q11), driver (Q12), and the power module (IC2) in sequence to obtain 50 W (at 13.8 V DC) of RF power. The amplified signal is passed through the antenna switching circuit (D7), APC detector circuit (L10, D8, D9), and low-pass filter (L11, L12, C60, C61) and is then applied to the antenna connector.

The collector current of the driver (Q12) are controlled by the APC circuit to protect the power module from a mismatched condition as well as to stabilize the output power.

### 3-2-4 APC CIRCUIT (MAIN UNIT)

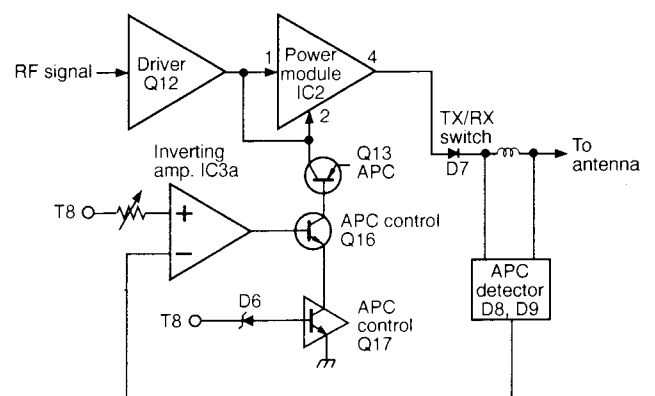
The APC circuit protects the power module (IC2) from a mismatched output load and selects High or Low output power.

The APC detector circuit (L10, D8, D9) detects forward signals and rectified signals at D8 and D9 respectively. The combined voltage is at a minimum level when the antenna is matched at 50  $\Omega$  and is increased when it is mismatched.

The detected voltage is applied to the inverting amplifier (IC3a) to control the collector of Q12 and bias voltage of IC2 (pin 2) using Q16 and Q17.

When the antenna impedance is mismatched,  $\ominus$  input voltage of the inverting amplifier (IC3a) increases, and the base voltage of Q16 and the collector current of Q13 decreases to reduce the output power.

#### APC CIRCUIT



### 3-3 PLL CIRCUITS

A PLL circuit provides stable oscillation of the transmit frequency and the receive local frequency. The PLL circuit compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) of a programmable divider.

The PLL ICs (VHF: IC1, RX UHF: IC4) contains a prescaler, two programmable dividers, and a phase detector, etc.

The entered signal is divided at the prescaler and programmable counter sections by the N-data ratio from the CPU. The divided signals are detected on phase at the phase detector using the reference frequency (X1, Q1, Q2: 12.8 MHz).

If the oscillated signal drifts, the phase of its frequency changes from the reference frequency, causing a lock voltage change to compensate for the drift in the oscillated frequency.

VCO signals are amplified at the buffer amplifiers and are then applied to the receive 1st mixers (Q19 for VHF, Q40 for UHF) or transmitter circuit (Q1, Q12).

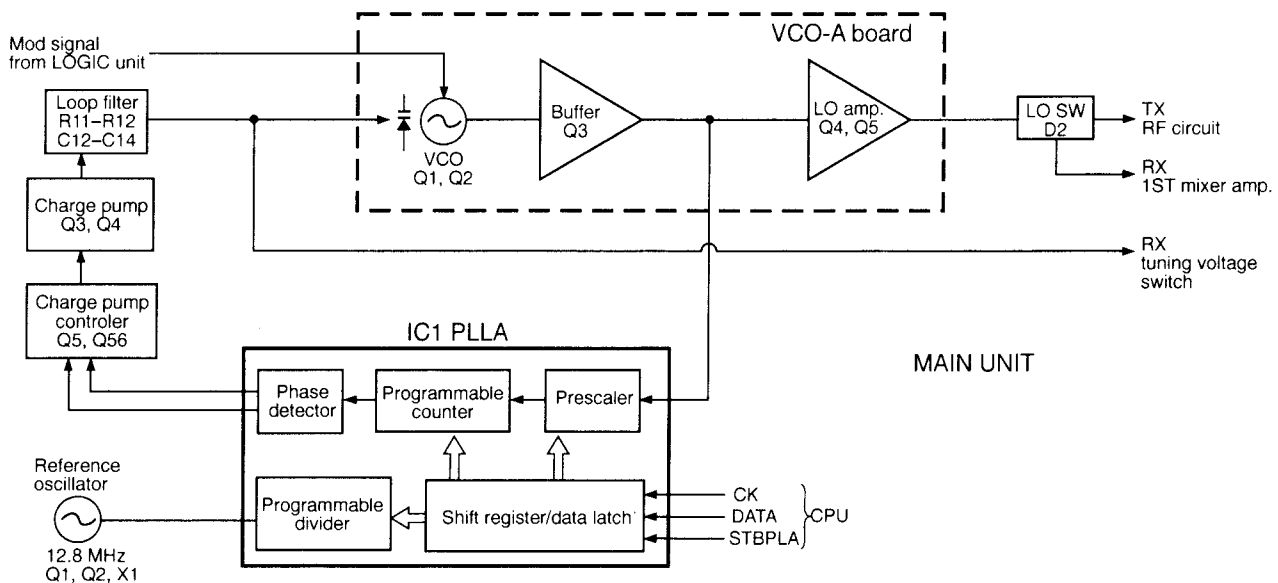
The lock voltage is also used for the receiver tunable band-pass filter of the VHF receiver circuit to match the filter's center frequency to the desired receive frequency. The lock voltage is amplified at the buffer amplifier Q8 and then applied to the tunable band-pass filter (D11, D12, D14).

### 3-4 POWER SUPPLY CIRCUITS

#### 3-4-1 VOLTAGE LINES

13.8 V	13.8 V controlled by the power switch. When the power is turned ON, the "STBPLB" and "STBPLA" are pulled up, so that Q45 and Q46 in the MAIN unit are turned ON.
+9 V	Common +9 V is converted from 13.8 V line by the +9 V regulator (IC10), and is used for the charge pump.
+8 V	Common +8 V is converted from 13.8 V line by the +8 V regulator (IC8).
T 8 V	T8 V is produced from +8 V at Q9 and Q10 on the MAIN unit. I/O expander (IC12 pin 4) controls Q9 and Q10.
R 8 B	Receive 8 V for the UHF receiver circuit. R8B is produced at Q52 and Q53 on the MAIN unit using a control signal, "3RX" from the I/O expander (IC12 pin 13).
R 8 M	Receive 8 V for the VHF receiver circuit. R8M is produced at Q48 and Q49 on the MAIN unit using a control signal "2RX" from the I/O expander (IC12 pin 14).
C 5 V	Common 8 V for the LOGIC unit and the [POWER] switch. C5 V is produced at IC14 on the MAIN unit from external DC input directly.
+5 V	Common +5 V is converted from 13.8 V line by the +5 V regulator (IC9).

#### VHF PLL CIRCUIT





### 3-5 PORT ALLOCATION

#### CPU (LOGIC UNIT IC6)

PIN NO.	PORT NAME	SIGNAL NAME	DESCRIPTION
2	AN0	UP/DOWN	Input ports for the channel selector from the microphone.
3	AN1	PTT	Input port for the [PTT] switch.
4	AN2	S/RF	Input port for the S/RF meter signal.
5	AN3	SQL	Input port for the noise squelch signal from the FM IF IC (MAIN unit IC5). When the squelch open: High
8 9	OSC1 OSC2	— —	Terminals for the CPU clock.
10	RESET	RESET	Input port for the CPU reset signal.
11 12	X1 X2	— —	Clock oscillator terminals for clock/timer function.
14 – 16	D0 – D2	STBI1 – STBI3	Outputs a strobe signal for the initial matrix.
17, 18	D3, D4	STBK1, STBK2	Outputs a strobe signal for the key matrix.
19	D5	MONI SW	Input port for the monitor switch.
20	D6	SBUSY	Outputs a voice synthesizer control signal to activate an optional UT-36.
22	D8	STBSP	Outputs a strobe signal for an optional UT-36 voice synthesizer unit.
23	D9	UNLKA	Input port for the VHF PLL unlock signal. When PLL unlocked : High.
24	D10/ STOPC	UNLKB	Input port for the UHF PLL unlock signal. When PLL unlocked : High.
25	D11/INT0	PWRSW	Input port for the power switch.
26	R00/INT1	BACK UP	Input port for the backup signal to save data before power is turned OFF.
27 28 29	R01/INT2 R02/INT3 R03/INT4	DIALCK DIALUP DIALDN	Input ports for the channel selector from the dial selector.
30	R10/TOB	BEEP	Outputs a beep tone signal.
31	R11/TOC	STONE	Outputs a 88.5 Hz tone signal
32 33	R12/TOD R13/EVNB	DIM0 DIM1	Outputs LCD backlight intensity signals.
34	R20/EVND	STBCO	Outputs a strobe signal for the I/O expander ICs (MAIN unit, IC12, IC13).
35	R21/SCK	CK	Outputs a serial clock signal.
36	R22/SI	SIN	Input port for the DTMF data.
37	R23/SO	DATA	Outputs serial data.
38	R30/SEG1	STBPLA	Outputs a strobe signal to the VHF PLL IC (MAIN unit IC1).
39	R31/SEG2	STBPLB	Outputs a strobe signal to the UHF PLL IC (MAIN unit IC4).
40	R32/SEG3	STBTO	Outputs a strobe signal for a tone encoder and a tone squelch.

PIN NO.	PORT NAME	SIGNAL NAME	DESCRIPTION
41	R33/SEG4	P/S OPT	Outputs a DTMF encoder power control signal.
42 – 45	R40/SEG5 – R43/SEG8	KEY10 – KEY13	Input ports for the initial matrix and key matrix.
46 – 89 90, 91	SEG9 – SEG52 COM1, COM2	LP46 – LP3 LP1, LP2	Outputs the LCD drive signal.
98 99	TONEC TONER	DTMFC DTMFR	Outputs DTMF row and column signals.

# SECTION 4 ADJUSTMENT PROCEDURES

## 4-1 PLL ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
LOCK VOLTAGE	<ul style="list-style-type: none"> <li>Displayed frequency: 145.000 MHz</li> <li>Receiving</li> </ul>	MAIN	Connect the DC voltmeter to CP-A.	2.0 V	VCO-A	L2
REFERENCE FREQUENCY	1 <ul style="list-style-type: none"> <li>Displayed frequency: 145.000 MHz</li> <li>Connect the RF power meter or a 50 Ω dummy load to the antenna connector</li> <li>Transmitting</li> </ul>	MAIN	Loosely couple the frequency counter to the antenna connector.	145.000 MHz	MAIN	C1

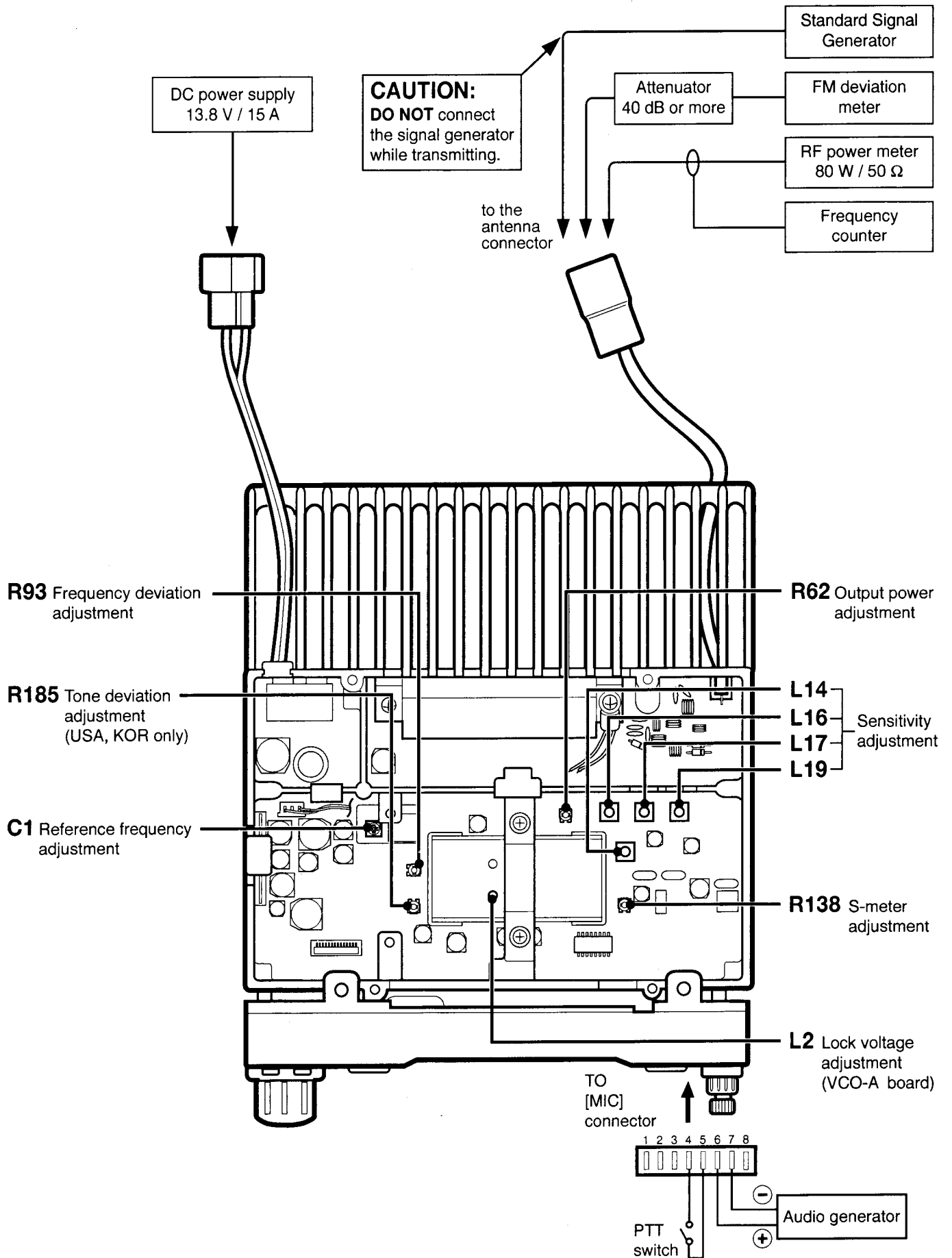
## 4-2 RECEIVER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	1 <ul style="list-style-type: none"> <li>Displayed frequency: Center of each band</li> <li>[SQL] control : Max. CCW</li> <li>[R138] : Max. CW</li> <li>Connect the SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Level : 1.0 μV* (-107 dBm)</li> <li>Modulation : 1 kHz</li> <li>Deviation : ±7 kHz</li> </ul> </li> <li>Receiving</li> </ul>	MAIN	Connect the DC voltmeter to CP-B.	Maximum DC voltage	MAIN	Adjust in sequence L19, L17, L16, L14
S-METER	1 <ul style="list-style-type: none"> <li>Displayed frequency: Center of each band</li> <li>Connect the SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Level : 1.0 μV* (-107 dBm)</li> <li>Modulation : 1 kHz</li> <li>Deviation : ±3.5 kHz</li> </ul> </li> <li>Receiving</li> </ul>	Front panel	LCD display	S3 (4 dots)	MAIN	R138

\* This output level of the standard signal generator (SSG) is indicated as the SSG's open circuit.

## 4-3 TRANSMITTER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1 <ul style="list-style-type: none"> <li>Displayed frequency: Center of each band</li> <li>Output power: High</li> <li>Transmitting</li> <li>Be sure the power supply voltage is 13.8 V</li> </ul>	MAIN	Connect the RF power meter to the antenna connector.	50 W	MAIN	R62
	2 <ul style="list-style-type: none"> <li>Output power: Low2</li> </ul>			8 W-15 W		Verify
	3 <ul style="list-style-type: none"> <li>Output power: Low1</li> </ul>			3.5 W-7.5 W		
FREQUENCY DEVIATION	1 <ul style="list-style-type: none"> <li>Displayed frequency: Center of each band</li> <li>Connect the audio generator to the [MIC] connector and set as:               <ul style="list-style-type: none"> <li>20 mV/1.0 kHz</li> </ul> </li> <li>Set the FM deviation meter as:               <ul style="list-style-type: none"> <li>HPF : 50 Hz</li> <li>LPF : 20 kHz</li> <li>De-emphasis : OFF</li> <li>Detector : (P-P)/2</li> </ul> </li> <li>Transmitting</li> </ul>	MAIN	Connect the FM deviation meter to the antenna connector through the attenuator.	±4.8 kHz	MAIN	R93
TONE DEVIATION (USA, KOR only)	<ul style="list-style-type: none"> <li>Displayed frequency: Center of each band</li> <li>Apply no signal to the microphone connector.</li> <li>Set the tone frequency as: 88.5 Hz</li> <li>Set the FM deviation meter as:               <ul style="list-style-type: none"> <li>HPF : 50 Hz</li> <li>LPF : 20 kHz</li> <li>De-emphasis : OFF</li> <li>Detector : (P-P)/2</li> </ul> </li> <li>Transmitting</li> </ul>	MAIN	Connect the FM deviation meter to the antenna connector through the attenuator.	±0.8 kHz	MAIN	R185



# SECTION 5 PARTS LIST

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	S.IC	NJM4558M(T1)
IC2	1130004670	S.IC	BU4021BF-T1
IC3	1130004330	S.IC	LC7385M
IC4	1110003240	S.IC	S-80740SL-A4-T1
IC5	1130003920	S.IC	TC4S69F (TE85R)
IC6	1140004210	S.IC	HD404629B32H
IC7	1130003760	S.IC	TC4S81F (TE85R)
Q1	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q2	1590001390	S.FET	2SJ144-Y (TE85R)
Q3	1590001390	S.FET	2SJ144-Y (TE85R)
Q4	1590000430	S.TRANSISTOR	DTC144EU T107
Q5	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q7	1590001390	S.FET	2SJ144-Y (TE85R)
Q8	1590000430	S.TRANSISTOR	DTC144EU T107
Q9	1590001390	S.FET	2SJ144-Y (TE85R)
Q10	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q11	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q12	1590001390	S.FET	2SJ144-Y (TE85R)
Q13	1590001390	S.FET	2SJ144-Y (TE85R)
Q14	1590000430	S.TRANSISTOR	DTC144EU T107
Q15	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q16	1590000430	S.TRANSISTOR	DTC144EU T107
Q17	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q18	1510000880	S.TRANSISTOR	2SA1622-8-TR
Q19	1530002840	S.TRANSISTOR	2SC4116-Y (TE85R)
Q20	1520000650	S.TRANSISTOR	2SB1201-S-TR
Q21	1530002840	S.TRANSISTOR	2SC4116-Y (TE85R)
Q22	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q23	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q24	1590001390	S.FET	2SJ144-Y (TE85R)
D1	1790001000	S.ZENER	MA8062-L(TX)
D2	1750000260	S.DIODE	1SS352 (TPH3)
D3	1750000260	S.DIODE	1SS352 (TPH3)
D4	1750000270	S.DIODE	1SS301 (TE85R)
D5	1750000270	S.DIODE	1SS301 (TE85R)
D6	1750000270	S.DIODE	1SS301 (TE85R)
D7	1750000270	S.DIODE	1SS301 (TE85R)
D8	1750000270	S.DIODE	1SS301 (TE85R)
D9	1750000260	S.DIODE	1SS352 (TPH3) (EUR, USA)
D10	1750000260	S.DIODE	1SS352 (TPH3) (EUR, ITA, USA, SEA)
D11	1750000260	S.DIODE	1SS352 (TPH3) (EUR, USA, SEA)
D12	1750000260	S.DIODE	1SS352 (TPH3) (EUR, ITA, USA, SEA)
D13	1750000260	S.DIODE	1SS352 (TPH3) (EUR, USA, AUS, SEA)
D14	1750000260	S.DIODE	1SS352 (TPH3) (EUR, AUS)
D15	1750000260	S.DIODE	1SS352 (TPH3)
D16	1750000260	S.DIODE	1SS352 (TPH3) (EUR, ITA, USA, SEA)
D17	1750000260	S.DIODE	1SS352 (TPH3) (KOR, AUS, SEA)
D18	1750000260	S.DIODE	1SS352 (TPH3) (KOR)
D19	1750000260	S.DIODE	1SS352 (TPH3) (EUR, ITA, KOR)
X1	6050006020	XTAL	CR-288
X2	6060000520	S.CERAMIC	CSAC2.00MGC200-TC
X3	6050005801	XTAL	DS-VT200 (32.768kHz)

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R2	7030003380	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R3	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R4	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R5	7030003580	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R6	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R7	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R8	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R9	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R10	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R11	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R12	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R13	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R14	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R15	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R16	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R17	7030003310	S.RESISTOR	ERJ3GEYJ 820 V (82 Ω)
R18	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R19	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R22	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R24	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R25	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R26	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R27	7030003730	S.RESISTOR	ERJ3GEYJ 274 V (270 kΩ)
R28	7030003790	S.RESISTOR	ERJ3GEYJ 824 V (820 kΩ)
R29	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R30	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R31	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R32	7030003550	S.RESISTOR	ERJ3GEYJ 823 V (8.2 kΩ)
R33	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R34	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R35	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R36	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R37	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R38	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R39	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R40	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R41	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R42	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R43	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R44	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R45	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R46	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R47	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R48	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R49	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R50	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R51	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R52	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R53	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R54	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R55	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R56	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R57	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R58	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R59	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R60	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R61	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R62	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R63	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R64	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R65	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R67	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R68	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R69	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R70	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R71	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R72	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R73	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R74	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)

S.=Surface mount

## [LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R75	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 k $\Omega$ )
R76	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 M $\Omega$ )
R77	7310003560	S.TRIMMER	RV-220 (RH03AVAJ4)223
R78	7030003840	S.RESISTOR	ERJ3GEYJ 225 V (2.2 M $\Omega$ )
R79	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R80	7030003840	S.RESISTOR	ERJ3GEYJ 225 V (2.2 M $\Omega$ )
R81	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R82	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R83	7030000180	S.RESISTOR	MCR10EZHZ 22 $\Omega$ (220)
R84	7030000060	S.RESISTOR	MCR10EZHZ 2.2 $\Omega$ (2R2)
R85	7030000060	S.RESISTOR	MCR10EZHZ 2.2 $\Omega$ (2R2)
R86	7030000180	S.RESISTOR	MCR10EZHZ 22 $\Omega$ (220)
R87	7030001170	S.RESISTOR	MCR50JZHJ 220 $\Omega$ (221)
R88	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 k $\Omega$ )
R89	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 k $\Omega$ )
R90	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 k $\Omega$ )
R91	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R92	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 k $\Omega$ )
R93	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R95	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R96	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R97	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R98	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R99	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R100	7030003580	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ )
R102	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 $\Omega$ )
R103	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ )
R104	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 k $\Omega$ )
R105	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 k $\Omega$ )
R106	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 k $\Omega$ )
R107	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 k $\Omega$ )
R108	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 k $\Omega$ )
R109	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 k $\Omega$ )
R110	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R111	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 k $\Omega$ )
R112	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ ) (EUR, ITA, KOR, AUS, SEA)
R113	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ ) (EUR, ITA, KOR, AUS, SEA)
R114	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 $\Omega$ )
R115	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R116	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ )
R117	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ )
R118	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 k $\Omega$ )
R119	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 k $\Omega$ )
R120	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R121	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 M $\Omega$ )
R122	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 k $\Omega$ )
R123	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 k $\Omega$ )
R124	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 k $\Omega$ )
C1	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C5	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C7	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C8	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C9	4510005300	S.ELECTROLITIC	ECEV1AA330P
C10	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C11	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C12	4510005600	S.ELECTROLITIC	ECEV1CS100SR
C13	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C14	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C15	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C16	4510005600	S.ELECTROLITIC	ECEV1CS100SR
C17	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C18	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C19	4030008660	S.CERAMIC	C2012 JB 1H 333K-T-A
C20	4550000460	S.TANTALUM	TESVA 1C 105M1-8L
C21	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C22	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C23	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C24	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C25	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A

## [LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C26	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C27	4030009490	S.CERAMIC	C1608 JB 1H 821K-T-A
C28	4030008650	S.CERAMIC	C1608 JB 1H 332K-T-A
C29	4030006740	S.CERAMIC	C1608 SL 1H 820J-T-A
C30	4030006750	S.CERAMIC	C1608 SL 1H 101J-T-A
C31	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C32	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C33	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C34	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C35	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C36	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C37	4550002950	S.TANTALUM	TESVA 0J 335M1-8L
C38	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C39	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C40	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C41	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C42	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C43	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C44	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C45	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C46	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C47	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C48	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C49	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C50	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A
C51	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C52	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C53	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C54	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C55	4030005110	S.CERAMIC	C2012 JB 1E 473K-T-A
C56	4030005110	S.CERAMIC	C2012 JB 1E 473K-T-A
C57	4030005090	S.CERAMIC	C2012 JB 1H 223K-T-A
C58	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C59	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C60	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C61	4030008760	S.CERAMIC	C2012 X7R 1C 104K-T-A
C62	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C63	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C64	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C65	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C66	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C67	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C68	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C69	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C70	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C71	4030006710	S.CERAMIC	C1608 SL 1H 470J-T-A
C72	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C73	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C74	4030006710	S.CERAMIC	C1608 SL 1H 470J-T-A
C75	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C76	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C77	4030006710	S.CERAMIC	C1608 SL 1H 470J-T-A
C78	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C79	4030006710	S.CERAMIC	C1608 SL 1H 470J-T-A
C80	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C81	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C82	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C83	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C84	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
BT1	3020000210	LITHIUM	BR2032-1F2
DS1	5080000330	LAMP	HRS-7219A-RE
DS2	5080000330	LAMP	HRS-7219A-RE
DS3	5080000330	LAMP	HRS-7219A-RE
DS4	5080000330	LAMP	HRS-7219A-RE
DS5	5030001050	LCD	FTD-12578AAH
W3	7030003860	S.JUMPER	ERJ3GE JPW V
W4	7030003860	S.JUMPER	ERJ3GE JPW V
W5	7030003860	S.JUMPER	ERJ3GE JPW V
W6	7030003860	S.JUMPER	ERJ3GE JPW V
W7	7120000380	JUMPER	JPW 01 R-01

S.=Surface mount

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
W8	7120000380	JUMPER	JPW 01 R-01
W9	7030003860	S.JUMPER	ERJ3GE JPW V
W10	7030000010	S.JUMPER	MCR10EZHZ JPW (000)
J1	6450001470	CONNECTOR	95003-2881
J2	6510012690	CONNECTOR	53020-0810
J3	6510012670	CONNECTOR	52022-3010
J4	6510016160	S.CONNECTOR	52465-1090
J5	6510016160	S.CONNECTOR	52465-1090
S1	2260001890	S.SWITCH	SKQDPA [LOW]
S2	2260001890	S.SWITCH	SKQDPA [SET-LOCK]
S3	2260001890	S.SWITCH	SKQDPA [DTMF]
S4	2260001890	S.SWITCH	SKQDPA [SPCH-MW]
S5	2260001890	S.SWITCH	SKQDPA [V/MHz]
S6	2260001890	S.SWITCH	SKQDPA [M/CALL]
S7	2260001890	S.SWITCH	SKQDPA [BAND]
S8	2260001890	S.SWITCH	SKQDPA [DUP]
EP1	0910041072	PCB	B 4066B
EP4	8930031680	LCD CONTACT	SRCN-1346W

[SW-A BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7210002380	VARIABLE	TP96D00A-10KB10KA20F (1481) [VOL · SQL]
J1	6510016090	S.CONNECTOR	53309-1090
EP1	0910041041	PCB	B 4120A

[SW-B BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
J1	6510016090	S.CONNECTOR	53309-1090
S1	2250000160	ENCODER	TP90N00AE20-15F (1352) [TUNING DIAL]
EP1	0910041052	PCB	B 4121B

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130005700	S.IC	M56760FP
IC2	1150000760	IC	SC1091
IC3	1110003340	S.IC	μPC358GR-T1
IC4	1130005700	S.IC	M56760FP
IC5	1110003200	S.IC	TA31136FN(EL)
IC6	1110001971	S.IC	μPC1676G-T1
IC7	1110001971	S.IC	μPC1676G-T1
IC8	1180001190	IC	TA78M08P
IC9	1180000420	S.IC	TA78L05F (TE12R)
IC10	1180001200	S.IC	LA5009M-TP-T1
IC11	1110003460	IC	LA4422
IC12	1130005810	S.IC	BU4094BF-T1
IC13	1130005810	S.IC	BU4094BF-T1
IC14	1180000420	S.IC	TA78L05F (TE12R)
IC15	1130000950	IC	S-7116A (USA, KOR)
IC16	1130005810	S.IC	BU4094BF-T1 (USA, KOR)
IC17	1130003920	S.IC	TC4S69F (TE85R)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC18	1130003710	S.IC	TC4S71F (TE85R)
Q1	1530002560	S.TRANSISTOR	2SC4403-3-TR
Q2	1530002560	S.TRANSISTOR	2SC4403-3-TR
Q3	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q4	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q5	1560000530	S.FET	2SK880-GR (TE85R)
Q6	1530002840	S.TRANSISTOR	2SC4116-Y (TE85R)
Q7	1590001540	S.TRANSISTOR	UMD6 TL
Q8	1560000530	S.FET	2SK880-GR (TE85R)
Q9	1510000690	S.TRANSISTOR	2SA1734 (TE12R)
Q10	1590000430	S.TRANSISTOR	DTC144EU T107
Q11	1530002340	S.TRANSISTOR	2SC2954-T2B
Q12	1530002340	S.TRANSISTOR	2SC2954-T2B
Q13	1520000390	TRANSISTOR	2SB1135 R
Q14	1590000430	S.TRANSISTOR	DTC144EU T107
Q15	1590000430	S.TRANSISTOR	DTC144EU T107
Q16	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q17	1590000430	S.TRANSISTOR	DTC144EU T107
Q18	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q19	1580000480	S.FET	3SK184-S (TX)
Q20	1590000430	S.TRANSISTOR	DTC144EU T107
Q21	1530002570	S.TRANSISTOR	2SC4405-3-TR
Q22	1530002940	S.TRANSISTOR	2SC4228-T2 R44
Q23	1590000660	S.TRANSISTOR	DTC144TU T107
Q24	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q25	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q26	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q27	1530002840	S.TRANSISTOR	2SC4116-Y (TE85R)
Q28	1590001540	S.TRANSISTOR	UMD6 TL
Q29	1560000530	S.FET	2SK880-GR (TE85R)
Q30	1590001390	S.FET	2SJ144-Y (TE85R)
Q31	1590001390	S.FET	2SJ144-Y (TE85R)
Q32	1590000430	S.TRANSISTOR	DTC144EU T107
Q33	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q34	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q35	1590000430	S.TRANSISTOR	DTC144EU T107
Q36	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q38	1590001390	S.FET	2SJ144-Y (TE85R)
Q39	1590000430	S.TRANSISTOR	DTC144EU T107
Q40	1580000480	S.FET	3SK184-S (TX)
Q41	1580000490	S.FET	3SK166-2-T7
Q42	1590000430	S.TRANSISTOR	DTC144EU T107
Q43	1580000480	S.FET	3SK184-S (TX)
Q44	1530002940	S.TRANSISTOR	2SC4228-T2 R44
Q45	1530002970	S.TRANSISTOR	2SC4684(TE16R)
Q46	1590001540	S.TRANSISTOR	UMD6 TL
Q47	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q48	1590001040	S.TRANSISTOR	DTA113ZU T107
Q49	1590000430	S.TRANSISTOR	DTC144EU T107
Q50	1590001040	S.TRANSISTOR	DTA113ZU T107
Q51	1590000430	S.TRANSISTOR	DTC144EU T107
Q52	1590001040	S.TRANSISTOR	DTA113ZU T107
Q53	1590000430	S.TRANSISTOR	DTC144EU T107
Q54	1590001040	S.TRANSISTOR	DTA113ZU T107
Q55	1590000430	S.TRANSISTOR	DTC144EU T107
Q56	1560000530	S.FET	2SK880-GR (TE85R)
Q57	1530002560	S.TRANSISTOR	2SC4403-3-TR
Q58	1560000530	S.FET	2SK880-GR (TE85R)
Q59	1590001390	S.FET	2SJ144-Y (TE85R)
Q60	1590001540	S.TRANSISTOR	UMD6 TL
Q61	1590001540	S.TRANSISTOR	UMD6 TL
D1	1750000260	S.DIODE	1SS352 (TPH3)
D2	1790000450	S.DIODE	MA862(TX)
D3	1750000260	S.DIODE	1SS352 (TPH3)
D4	1790000860	S.DIODE	MA133(TX)
D5	1750000260	S.DIODE	1SS352 (TPH3)
D6	1790001010	S.ZENER	MA8043-L(TX)
D7	1710000310	DIODE	MI407
D8	1790000980	S.DIODE	MA742(TX)
D9	1790000980	S.DIODE	MA742(TX)
D10	1790000620	S.DIODE	MA77(TW)
D11	1720000370	S.VARICAP	HVU350TRF

S.=Surface mount

## [MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D12	1720000370	S.VARICAP	HVU350TRF
D13	1790000620	S.DIODE	MA77(TW)
D14	1720000370	S.VARICAP	HVU350TRF
D15	1790000620	S.DIODE	MA77(TW)
D16	1710000290	DIODE	MI308
D17	1710000290	DIODE	MI308
D18	1790000450	S.DIODE	MA862(TX)
D19	1750000260	S.DIODE	1SS352 (TPH3)
D20	1790001010	S.ZENER	MA8043-L(TX)
D21	1790000980	S.DIODE	MA742(TX)
D23	1160000060	S.DIODE	DAN202U T107
D24	1160000060	S.DIODE	DAN202U T107
D25	1790001010	S.ZENER	MA8043-L(TX)
D26	1790001010	S.ZENER	MA8043-L(TX)
D27	1790000450	S.DIODE	MA862(TX)
D28	1790000700	DIODE	DSA3A1
D29	1160000060	S.DIODE	DAN202U T107
D30	1160000060	S.DIODE	DAN202U T107
D31	1750000260	S.DIODE	1SS352 (TPH3)
D32	1750000260	S.DIODE	1SS352 (TPH3)
D33	1790000980	S.DIODE	MA742(TX)
D34	1750000260	S.DIODE	1SS352 (TPH3)
D35	1750000260	S.DIODE	1SS352 (TPH3)
D36	1750000260	S.DIODE	1SS352 (TPH3)
FI1	2010001610	MONOLITHC	FL-202 UM-5 30.850MHz
FI2	2020000550	CERAMIC	CFUM455E
X1	6050009090	XTAL	CR-489 (12.800MHz)
X2	6050008950	XTAL	CR-478 UM-1 30.395MHz
X3	6070000130	DISCRIMINATOR	CDBM455C24
X4	6050003120	XTAL	RF-4A3 FAA NKD (3.579545M) (USA, KOR)
L1	6200001570	S.COIL	LER 015T 1R0M
L2	6200002420	S.COIL	NL 252018T-068J
L3	6200002580	S.COIL	NL 252018T-033J
L4	6200002420	S.COIL	NL 252018T-068J
L5	6200002580	S.COIL	NL 252018T-033J
L6	6200002420	S.COIL	NL 252018T-068J
L7	6200002420	S.COIL	NL 252018T-068J
L8	6170000180	COIL	LW-19
L9	6110001600	COIL	LA-243
L10	6110001550	COIL	LA-235
L11	6110001560	COIL	LA-236
L12	6110001600	COIL	LA-243
L13	6200003510	S.COIL	LER015T R82M
L14	6150003210	COIL	LS-319
L15	6200002640	S.COIL	NL 252018T-R15J
L16	6150003430	COIL	LS-378
L17	6150003120	COIL	LS-321
L19	6150003120	COIL	LS-321
L20	6110001560	COIL	LA-236
L21	6110001570	COIL	LA-237
L22	6200002740	S.COIL	LL2012-F8N8K
L23	6200003390	S.COIL	LL2012-F12NK
L24	6200001570	S.COIL	LER 015T 1R0M
L25	6200002090	S.COIL	ELJFB 681K-F
L26	6200003560	S.COIL	NL 252018T-018J
L27	6200003390	S.COIL	LL2012-F12NK
L28	6200002580	S.COIL	NL 252018T-033J
L29	6200003880	S.COIL	NL 252018T-022J
L30	6200003860	S.COIL	NL 252018T-010J
L31	6200003530	S.COIL	NL 252018T-012J
L32	6200002740	S.COIL	LL2012-F8N8K
L33	6200003460	S.COIL	LL2012-F3N9K
L34	6200002740	S.COIL	LL2012-F8N8K
L35	6200002440	S.COIL	LL2012-F10NK
L37	6200003870	S.COIL	NL 252018T-015J
L38	6200003870	S.COIL	NL 252018T-015J
L40	6200002740	S.COIL	LL2012-F8N8K
L41	6200002410	S.COIL	NL 252018T-056J
L42	6200002440	S.COIL	LL2012-F10NK

## [MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L43	6200004140	S.COIL	LL2012-F1N8S
L44	6200003490	S.COIL	LL2012-F2N2S
R1	7510000430	S.THERMISTOR	TN20-3K202LT
R2	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R3	7030003240	S.RESISTOR	ERJ3GEYJ 220 V (22 Ω)
R4	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R5	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R6	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R7	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R8	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R9	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R10	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R11	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R12	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R13	7030003550	S.RESISTOR	ERJ3GEYJ 222 V (8.2 kΩ)
R14	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R15	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R16	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R17	7030003450	S.RESISTOR	ERJ3GEYJ 222 V (1.2 kΩ)
R18	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R19	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R20	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R21	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R22	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R23	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R24	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R25	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R26	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R27	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R28	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R29	7030003520	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R30	7030003370	S.RESISTOR	ERJ3GEYJ 271 V (270 Ω)
R31	7030003230	S.RESISTOR	ERJ3GEYJ 180 V (18 Ω)
R32	7030003370	S.RESISTOR	ERJ3GEYJ 271 V (270 Ω)
R33	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R34	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R35	7030000210	S.RESISTOR	MCR10EZJH 39 Ω (390)
R36	7030000210	S.RESISTOR	MCR10EZJH 39 Ω (390)
R37	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R38	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R39	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R40	7030001090	S.RESISTOR	MCR50JZHJ 47 Ω (470)
R41	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R42	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R43	7030001130	S.RESISTOR	MCR50JZHJ 100 Ω (101)
R44	7030000460	S.RESISTOR	MCR10EZJH 4.7 kΩ (472)
R45	7030000220	S.RESISTOR	MCR10EZJH 47 Ω (470)
R46	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R47	7030000460	S.RESISTOR	MCR10EZJH 4.7 kΩ (472)
R48	7030000260	S.RESISTOR	MCR10EZJH 100 Ω (101)
R49	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R50	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R51	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R52	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R53	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R54	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R55	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R56	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R57	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R58	7030003790	S.RESISTOR	ERJ3GEYJ 824 V (820 kΩ)
R59	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R60	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R61	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R62	7310003770	S.TRIMMER	EVM-1XSX50 B34 (303)
R63	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R64	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R65	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R66	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R67	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R68	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R69	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R70	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R71	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R72	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R73	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R74	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R75	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R76	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R77	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R78	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R79	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R80	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R82	7030003240	S.RESISTOR	ERJ3GEYJ 220 V (22 Ω)
R83	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R84	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R85	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R86	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R87	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R88	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R89	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R90	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R91	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R92	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R93	7310003590	S.TRIMMER	EVM-1XSX50 B24 (203)
R94	7030003760	S.RESISTOR	ERJ3GEYJ 473 V (470 kΩ)
R95	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R97	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R98	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R99	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R100	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R101	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R102	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R103	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R104	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R105	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R106	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R107	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R108	7030003370	S.RESISTOR	ERJ3GEYJ 271 V (270 Ω)
R109	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R110	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R111	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R113	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R114	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R115	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R116	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R117	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R118	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R119	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R120	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R121	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R122	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R123	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R124	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R125	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R127	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R128	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R129	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R130	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R131	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R132	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R133	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R134	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R135	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R136	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R137	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R138	7310003580	S.TRIMMER	EVM-1XSX50 B15 (104)
R139	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R140	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ)
R141	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R142	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R144	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R145	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R146	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R153	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R154	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R155	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R156	7030000220	S.RESISTOR	MCR10EZJH 47 Ω (470)
R157	7030000220	S.RESISTOR	MCR10EZJH 47 Ω (470)
R158	7030003580	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R159	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R160	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R162	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R163	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R164	7030000220	S.RESISTOR	MCR10EZJH 47 Ω (470)
R165	7030000220	S.RESISTOR	MCR10EZJH 47 Ω (470)
R166	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R167	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R168	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R169	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R170	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R171	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R172	7030003440	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R173	7030001010	S.RESISTOR	MCR50JZHJ 10 Ω (100)
R174	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R175	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R176	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R177	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R178	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R180	7030003770	S.RESISTOR	ERJ3GEYJ 564 V (560 kΩ)
R181	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R182	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R183	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ) (USA, KOR)
R184	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω) (EUR, ITA, AUS, SEA)
R184	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ) (USA, KOR)
R185	7310003600	S.TRIMMER	EVM-1XSX50 B54 (503) (USA, KOR)
R186	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ) (USA, KOR)
R187	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R188	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R189	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R190	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R191	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R192	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R193	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R194	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R195	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R196	7030003370	S.RESISTOR	ERJ3GEYJ 271 V (270 Ω)
R197	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R198	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R199	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R200	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R201	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R203	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R205	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R206	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R207	7520000120	POSISTOR	PTH9M0 BC 222TS-2F333
R208	7510000180	S.THERMISTOR	TN20-3S223LT
C1	4610001260	S.TRIMMER	ECR-JA020 E12W
C2	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C3	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C4	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C5	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C6	4030006930	S.CERAMIC	C1608 CH 1H 020C-T-A
C7	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C8	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C9	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C12	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C13	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C14	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C15	4030008860	S.CERAMIC	C1608 JB 1C 153K-T-A
C16	4030008860	S.CERAMIC	C1608 JB 1H 102K-T-A
C17	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C18	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C19	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C20	4030006670	S.CERAMIC	C1608 SL 1H 270J-T-A
C21	4510005430	S.ELECTROLITIC	ECEV0JA220R
C22	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C23	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

S.=Surface mount



[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C24	4550002750	S.TANTALUM TESVD2 1A 336M-12L
C25	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C26	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C27	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C28	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C29	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C30	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C31	4550000450	S.TANTALUM TESVC 1C 106M-12L
C33	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C34	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C35	4030006660	S.CERAMIC C1608 SL 1H 220J-T-A
C36	4030006660	S.CERAMIC C1608 SL 1H 220J-T-A
C37	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C38	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C39	4030006630	S.CERAMIC C1608 SL 1H 150J-T-A
C40	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C41	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C42	4030006690	S.CERAMIC C1608 SL 1H 330J-T-A
C43	4030006540	S.CERAMIC C1608 SL 1H 030C-T-A
C44	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C45	4030006690	S.CERAMIC C1608 SL 1H 330J-T-A
C46	4030006540	S.CERAMIC C1608 SL 1H 030C-T-A
C47	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C48	4030006660	S.CERAMIC C1608 SL 1H 220J-T-A
C49	4030006640	S.CERAMIC C1608 SL 1H 180J-T-A
C50	4030006640	S.CERAMIC C1608 SL 1H 180J-T-A
C51	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C52	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C53	4010003880	CERAMIC DD06 SL 150K 500V
C54	4010004120	CERAMIC DD07 B 102K 500V
C55	4010003930	CERAMIC DD06 SL 270K 500V
C56	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C57	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C58	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C59	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C60	4010003920	CERAMIC DD06 SL 240K 500V
C61	4010003920	CERAMIC DD06 SL 240K 500V
C62	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C63	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C64	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C65	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C66	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C67	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C68	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C69	4550000450	S.TANTALUM TESVC 1C 106M-12L
C70	4550000450	S.TANTALUM TESVC 1C 106M-12L
C71	4550003080	S.TANTALUM TEMSVA 1A 335M-8L
C72	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C73	4550000450	S.TANTALUM TESVC 1C 106M-12L
C74	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C75	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C76	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C77	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C78	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C79	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C81	4030006610	S.CERAMIC C1608 SL 1H 100D-T-A
C82	4030006660	S.CERAMIC C1608 SL 1H 220J-T-A
C83	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C84	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C85	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C86	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C87	4030006620	S.CERAMIC C1608 SL 1H 120J-T-A
C88	4030006740	S.CERAMIC C1608 SL 1H 820J-T-A
C89	4030006520	S.CERAMIC C1608 SL 1H 010C-T-A
C90	4030006560	S.CERAMIC C1608 SL 1H 050C-T-A
C91	4030006740	S.CERAMIC C1608 SL 1H 820J-T-A
C92	4030006600	S.CERAMIC C1608 SL 1H 090D-T-A
C94	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C95	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C96	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C97	4030006860	S.CERAMIC C1608 SL 1H 330J-T-A
C98	4030006620	S.CERAMIC C1608 SL 1H 120J-T-A
C99	4030006600	S.CERAMIC C1608 SL 1H 090D-T-A
C100	4030006640	S.CERAMIC C1608 SL 1H 180J-T-A
C101	4030006520	S.CERAMIC C1608 SL 1H 010C-T-A
C102	4030006630	S.CERAMIC C1608 SL 1H 150J-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C103	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C104	4030006530	S.CERAMIC C1608 SL 1H 020C-T-A
C105	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C106	4030006560	S.CERAMIC C1608 SL 1H 050C-T-A
C107	4030006560	S.CERAMIC C1608 SL 1H 050C-T-A
C108	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C109	4550000550	S.TANTALUM TESVA 1V 224M1-8L
C110	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C111	4550003030	S.TANTALUM TEMSVA 0J 475M-8L
C112	4550003030	S.TANTALUM TEMSVA 0J 475M-8L
C113	4030008920	S.CERAMIC C1608 JB 1C 473K-T-A
C114	4030008920	S.CERAMIC C1608 JB 1C 473K-T-A
C115	4030006670	S.CERAMIC C1608 SL 1H 270J-T-A
C116	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C117	4510005430	S.ELECTROLITIC ECEVOJA220R
C118	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C119	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C120	4550002750	S.TANTALUM TESVD2 1A 336M-12L
C121	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C122	4030007010	S.CERAMIC C1608 JB 1C 473K-T-A
C123	4030007110	S.CERAMIC C1608 CH 1H 680J-T-A
C124	4030009990	S.CERAMIC C1608 CH 1H 200J-T-A
C125	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C126	4510004540	S.ELECTROLITIC ECEVOJA470P
C127	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C128	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C129	4030006780	S.CERAMIC C1608 SL 1H 181J-T-A
C130	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C131	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C132	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C133	4030008660	S.CERAMIC C1608 JB 1H 102K-T-A
C134	4030006860	S.CERAMIC C2012 JF 1C 105Z-T-A
C135	4030008660	S.CERAMIC C1608 JB 1H 102K-T-A
C136	4030006870	S.CERAMIC C1608 JB 1H 222K-T-A
C137	4030008660	S.CERAMIC C1608 JB 1H 472K-T-A
C138	4030009000	S.CERAMIC C2012 JB 1C 224K-T-A
C139	4030007120	S.CERAMIC C1608 CH 1H 820J-T-A
C140	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C141	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C142	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C143	4030008660	S.CERAMIC C2012 JF 1C 105Z-T-A
C144	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C145	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C146	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C147	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C148	4510005860	S.ELECTROLITIC ECEV1HA2R2SR
C149	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C150	4030006870	S.CERAMIC C1608 JB 1H 222K-T-A
C151	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C152	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C153	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C155	4030006860	S.CERAMIC C2012 JF 1C 105Z-T-A
C156	4030008660	S.CERAMIC C2012 JF 1C 105Z-T-A
C158	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C160	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C162	4030006570	S.CERAMIC C1608 SL 1H 060D-T-A
C164	4030006550	S.CERAMIC C1608 SL 1H 040C-T-A
C165	4510005430	S.ELECTROLITIC ECEVOJA220R
C166	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C167	4030006570	S.CERAMIC C1608 SL 1H 060D-T-A
C168	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C169	4030006620	S.CERAMIC C1608 SL 1H 120J-T-A
C170	4030006710	S.CERAMIC C1608 SL 1H 470J-T-A
C171	4030006620	S.CERAMIC C1608 SL 1H 120J-T-A
C172	4030006580	S.CERAMIC C1608 SL 1H 070D-T-A
C173	4030006630	S.CERAMIC C1608 SL 1H 150J-T-A
C174	4030006530	S.CERAMIC C1608 SL 1H 020C-T-A
C175	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C176	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C177	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C178	4030006540	S.CERAMIC C1608 SL 1H 030C-T-A
C180	4030006550	S.CERAMIC C1608 SL 1H 040C-T-A
C181	4510005430	S.ELECTROLITIC ECEVOJA220R
C182	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C183	4030006540	S.CERAMIC C1608 SL 1H 030C-T-A
C184	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C185	4030006550	S.CERAMIC C1608 SL 1H 040C-T-A
C186	4030006560	S.CERAMIC C1608 SL 1H 050C-T-A
C187	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C188	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C189	4030006600	S.CERAMIC C1608 SL 1H 090D-T-A
C190	4030006570	S.CERAMIC C1608 SL 1H 080D-T-A
C191	4030006570	S.CERAMIC C1608 SL 1H 060D-T-A
C192	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C193	4510005300	S.ELECTROLITIC ECEV1AA330P
C194	4510005820	S.ELECTROLITIC ECEV1CA101P
C195	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C196	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C197	4510004640	S.ELECTROLITIC ECEV1CA470P
C198	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C199	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C200	4510005300	S.ELECTROLITIC ECEV1AA330P
C202	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C203	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C204	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C205	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C206	4510004600	ELECTROLITIC 16 MV 1000 HC
C207	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C208	4510005300	S.ELECTROLITIC ECEV1AA330P
C210	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C211	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C212	4510005820	S.ELECTROLITIC ECEV1CA101P
C213	4510004650	S.ELECTROLITIC ECEV1EA4R7R
C214	4510004640	S.ELECTROLITIC ECEV1CA470P
C215	4510004540	S.ELECTROLITIC ECEV0JA470P
C216	4510004640	S.ELECTROLITIC ECEV1CA470P
C217	4510005880	S.ELECTROLITIC ECEV1AA471P
C218	4550000540	S.TANTALUM TESVA 1V 154M1-8L
C219	4030006860	S.CERAMIC C1608 JF 1C 104Z-T-A
C220	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C221	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C222	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C223	4030006850	S.CERAMIC C1608 JB 1H 471K-T-A
C224	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C225	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C226	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C227	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C228	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C229	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C230	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C231	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C232	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C233	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C234	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C235	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C236	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C237	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C238	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C239	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C240	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C241	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C242	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C243	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C244	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C245	4510004650	S.ELECTROLITIC ECEV1EA4R7R (USA, KOR)
C246	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A (USA, KOR)
C247	4030007080	S.CERAMIC C1608 CH 1H 390J-T-A (USA, KOR)
C248	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A (USA, KOR)
C249	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C250	4510004630	S.ELECTROLITIC ECEV1CA100R
C251	4510005310	S.ELECTROLITIC ECEV1CA220R
C252	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C253	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C254	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C255	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C256	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C257	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C258	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C261	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C262	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C263	4010003800	CERAMIC DD06 SL 030C 500V
C264	4030008710	S.MICA UC232H 0120F
C265	4030006710	S.CERAMIC C1608 SL 1H 470J-T-A
C266	4030006760	S.CERAMIC C1608 SL 1H 121J-T-A
C267	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C268	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C270	4030008440	S.CERAMIC C1608 SL 1H 1R5C-T-A
C271	4030006530	S.CERAMIC C1608 SL 1H 020C-T-A
C272	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C273	4030006860	S.CERAMIC C2012 JF 1C 105Z-T-A
C274	4510001850	ELECTROLITIC 16 MS5 4R7UF
W1	8900002450	CABLE OPC-223
W2	8900004880	CABLE OPC-465
W3	7030003860	S.JUMPER ERJ3GE JPW V
W4	7030003860	S.JUMPER ERJ3GE JPW V
W5	7030003860	S.JUMPER ERJ3GE JPW V
W8	7030003860	S.JUMPER ERJ3GE JPW V
W9	7030003860	S.JUMPER ERJ3GE JPW V
W10	7030003860	S.JUMPER ERJ3GE JPW V
W11	7030003860	S.JUMPER ERJ3GE JPW V
W12	7030003860	S.JUMPER ERJ3GE JPW V
W13	7030000010	S.JUMPER MCR10EZJH JPW (000)
W14	7030003860	S.JUMPER ERJ3GE JPW V
W16	7030003860	S.JUMPER ERJ3GE JPW V
W18	7030000010	S.JUMPER MCR10EZJH JPW (000)
W20	7030003860	S.JUMPER ERJ3GE JPW V (USA, KOR)
W21	7030003860	S.JUMPER ERJ3GE JPW V
J2	6510012800	CONNECTOR 53020-3010
J4	6510012880	S.CONNECTOR CEW9114-0201
J5	6510005020	CONNECTOR TXL-P03P-C1
J6	6450001460	CONNECTOR HSJ1468-01-010
EP1	0910040973	PCB B 4065C

[VCO-A BOARD]

REF. NO.	ORDER NO.	DESCRIPTION
Q1	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q2	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q3	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q4	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q5	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q6	1530002920	S.TRANSISTOR 2SC4226-T2 R25
Q7	1530002920	S.TRANSISTOR 2SC4226-T2 R25
D1	1720000370	S.VARICAP HVU350TRF
D2	1790000620	S.DIODE MA77(TW)
L1	6200001520	S.COIL MLF2012D R82K-T
L2	6130002480	S.COIL LB-277
L3	6200002840	S.COIL NL 252018T-R22J
L4	6200002840	S.COIL NL 252018T-R22J
L5	6200002580	S.COIL NL 252018T-033J
R1	7030003480	S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)
R2	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R3	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R4	7030003550	S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)
R5	7030003360	S.RESISTOR ERJ3GEYJ 221 V (220 Ω)
R6	7030003550	S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)
R7	7030003360	S.RESISTOR ERJ3GEYJ 221 V (220 Ω)
R8	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)

S.=Surface mount

[VCO-A BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
R9	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R10	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R11	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R12	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R13	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R14	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R15	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R16	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R17	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R18	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R19	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R20	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R21	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R22	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R23	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R24	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R25	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R27	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R28	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C4	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C5	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030006910	S.CERAMIC	C1608 CH 1H 0R5C-T-A
C7	4030006910	S.CERAMIC	C1608 CH 1H 0R5C-T-A
C8	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C12	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C13	4030006670	S.CERAMIC	C1608 SL 1H 270J-T-A
C14	4030006520	S.CERAMIC	C1608 SL 1H 010C-T-A
C15	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C16	4030008570	S.CERAMIC	C1608 SL 1H R75C-T-A
C17	4030006860	S.CERAMIC	C1608 SL 1H 220J-T-A
C18	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C19	4030006510	S.CERAMIC	C1608 SL 1H 0R5C-T-A
C20	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C21	4030006610	S.CERAMIC	C1608 SL 1H 100D-T-A
C22	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C23	4030006570	S.CERAMIC	C1608 SL 1H 060D-T-A
C24	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C25	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C26	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C27	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
J1	6910006500	CONNECTOR	IMSA-9210B-1-07Z204-T
J2	6910006200	CONNECTOR	IMSA-9210B-1-08Z 204T
EP1	0910040942	PCB	B 4067B

[VCO-B BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
L5	6200001530	S.COIL	LER 015T 3R3K
L6	6200000770	S.COIL	LQN 2A 68NM
L7	6200001550	S.COIL	LER 015T R56M
L8	6200001550	S.COIL	LER 015T R56M
L9	6200000110	S.COIL	LQN 2A 33NM
L10	6200001570	S.COIL	LER 015T 1R0M
L11	6200001550	S.COIL	LER 015T R56M
L12	6200000770	S.COIL	LQN 2A 68NM
R1	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R2	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)
R3	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R6	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R7	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R8	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R9	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R10	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R11	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R12	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R13	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R14	7030003290	S.RESISTOR	ERJ3GEYJ 560 V (56 Ω)
R15	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R16	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R17	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R18	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R19	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
C1	4550000550	S.TANTALUM	TESVA 1V 224M1-8L
C2	4030006670	S.CERAMIC	C1608 SL 1H 270J-T-A
C4	4030006930	S.CERAMIC	C1608 CH 1H 020C-T-A
C5	4030006960	S.CERAMIC	C1608 CH 1H 050C-T-A
C6	4030006940	S.CERAMIC	C1608 CH 1H 030C-T-A
C7	4030006520	S.CERAMIC	C1608 SL 1H 010C-T-A
C8	4030006550	S.CERAMIC	C1608 SL 1H 040C-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C12	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C13	4030006740	S.CERAMIC	C1608 SL 1H 820J-T-A
C14	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C15	4030006950	S.CERAMIC	C1608 CH 1H 040C-T-A
C16	4030006520	S.CERAMIC	C1608 SL 1H 010C-T-A
C17	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C18	4030006550	S.CERAMIC	C1608 SL 1H 040C-T-A
EP1	0910040951	PCB	B 4068A

[VCO-B BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1560000490	S.FET	2SK508 K52 T2B
Q2	1530003120	S.TRANSISTOR	2SC3120(TE85R)
Q3	1540000420	S.TRANSISTOR	2SD1851-TA
Q4	1590001330	S.TRANSISTOR	DTA114EU T107
Q5	1530003180	S.TRANSISTOR	2SC4211-7-TR
Q6	1560000490	S.FET	2SK508 K52 T2B
Q7	1530003120	S.TRANSISTOR	2SC3120(TE85R)
D1	1720000380	S.VARICAP	1T33C-T8
D2	1720000380	S.VARICAP	1T33C-T8
D3	1720000380	S.VARICAP	1T33C-T8
D4	1720000380	S.VARICAP	1T33C-T8
L1	6200003510	S.COIL	LER015T R82M
L2	6200003510	S.COIL	LER015T R82M
L3	6130002750	S.COIL	LB-310
L4	6200001570	S.COIL	LER 015T 1R0M

S.=Surface mount

# SECTION 6 MECHANICAL PARTS AND DISASSEMBLY

## 6-1 CHASSIS PARTS

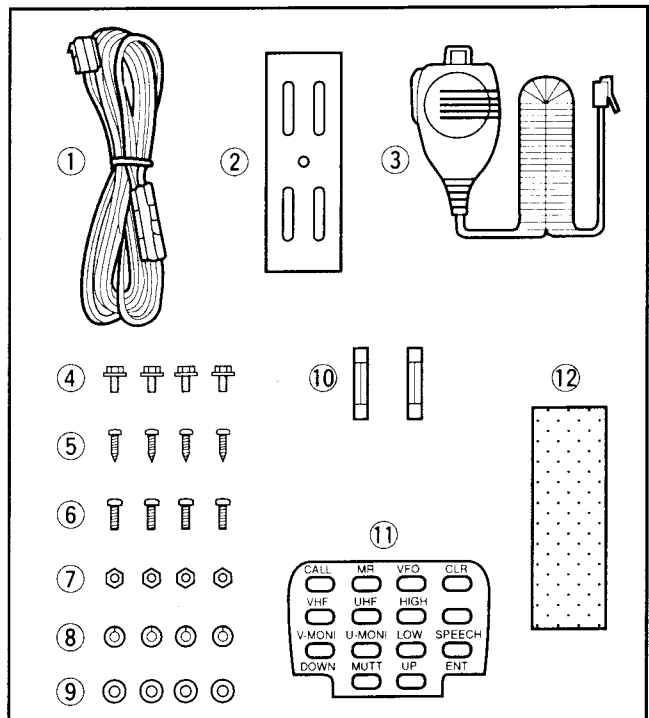
LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
①	8610009030	Knob N-211 (A) [VOLUME]	1
②	8610009040	Knob N-212 (A) [SQL]	1
③	8610008960	Knob N-210 [MAIN DIAL]	1
④	8210010980	1346 Front panel	1
⑤	8810002120	Screw FH M2.6 x 6	4
⑥	8930031450	1346 LCD rubber	1
⑦	8930030810	1346 LCD holder	1
⑧	5030001050	LCD FTD-12578AAH	1
⑨	8930031681	LCD contact SRCN-1346SC	1
⑩	8930031440	1346 LCD filter	1
⑪	8830000790	VR nut (H)	2
⑫	8210010030	1346 Reflector	1
⑬	8930007050	isolating plate (Z)	1
⑭	8930017940	AF-IC clip	1
⑮	8930031090	1346 SP holder	1
⑯	8930020650	IC clip	1
⑰	2510000690	Speaker VS-50-0820A	1
⑱	8930032430	Isolating sheet (DI)	1

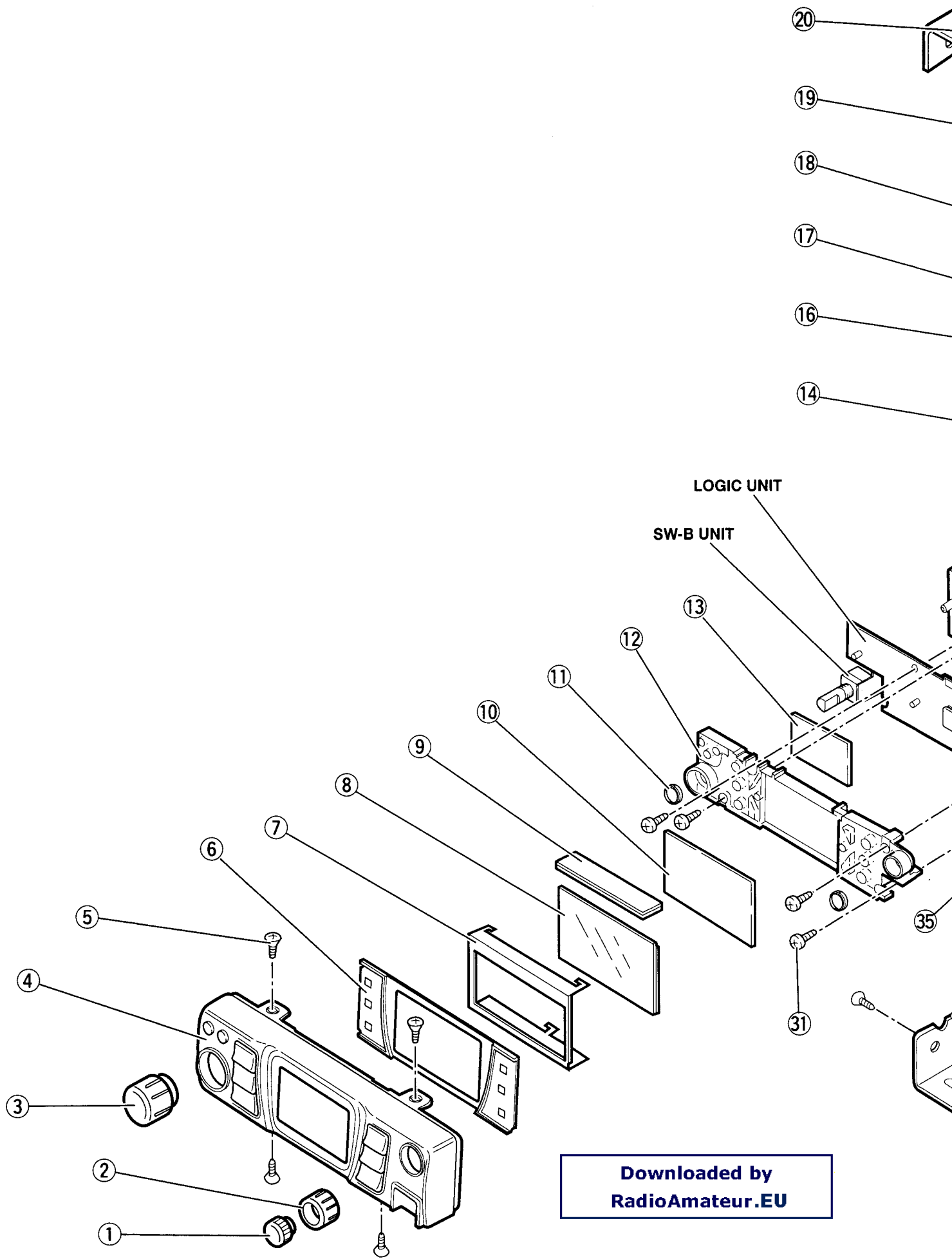
LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
⑲	8930031660	Sheet (AO)	1
⑳	8110005200	1346 Top cover	1
㉑	8810003100	Screw OH M2.6 x 5 BS ZK	8
㉒	8930032450	1346 SP-T sponge	1
㉓	8930032410	1346 V-plate	1
㉔	8810007730	Set screw (c) 2.6 x 5 ZK	2
㉕	8900004880	DC cable OPC-465	1
㉖	8930031650	1346 APC-TR clip	1
㉗	8010015380	1346 Chassis	1
㉘	8900002450	ANT cable OPC-223	1
㉙	6950000040	M-type cap (Black)	1
㉚	8810001170	Screw PH B0 3 x 6 NI	2
㉛	8810008200	Screw PH B0 2.6 x 6 NI (BT)	9
㉜	8110005210	1346 Bottom cover	1
㉝	8930031760	Rubber sheet (N)	1
㉞	8810007230	Set screw (H) 3 x 8	2
㉟	6450001470	Connector 95003-2881	1

Screw abbreviations: PH: Pan head OH: Oval countersunk head

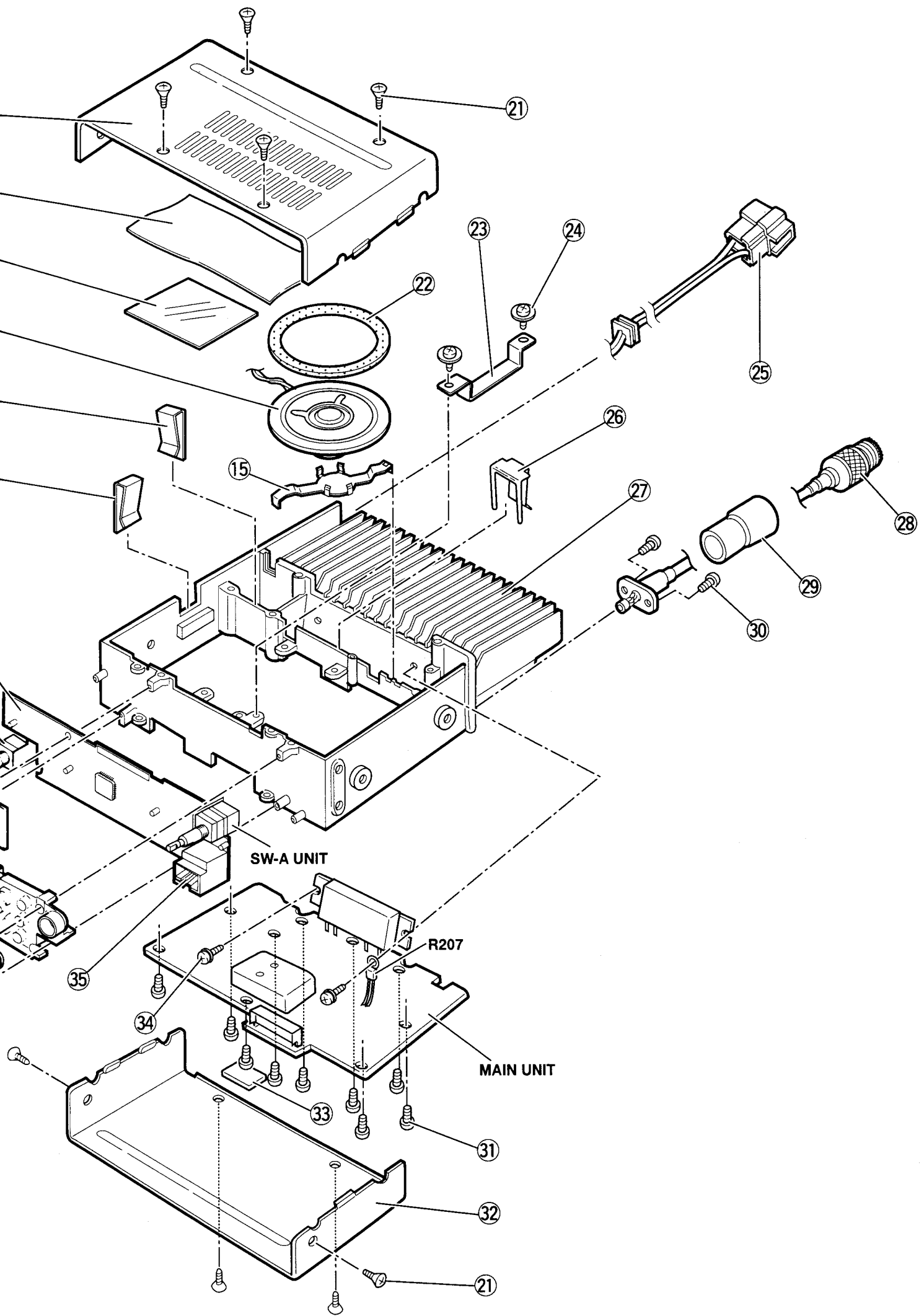
## 6-2 ACCESSORIES

LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
①	8930003760	DC power cable (OPC-346)	1
②	Optional product	Mounting bracket (MB-27)	1
③	Optional product	Microphone HM-77 (USA/KOR versions)	1
		Microphone HM-78 (AUS/SEA versions)	1
		Microphone HM-79 (EUR/ITA versions)	1
④	8820000530	Mounting bolt	4
⑤	8810000950	Screw PH A M5 x 16	4
⑥	8810000490	Screw PH (+, -) M5 x 12	4
⑦	8830000120	Nut (M5)	4
⑧	8850000390	Spring washer M5	4
⑨	8850000150	Flat washer M5 NI BS	4
⑩	5210000080	Fuses (20 A)	2
⑪	8310022240	Microphone sheet for HM-77	1
⑫	8930008050	Mounting felts (A): sponge	2





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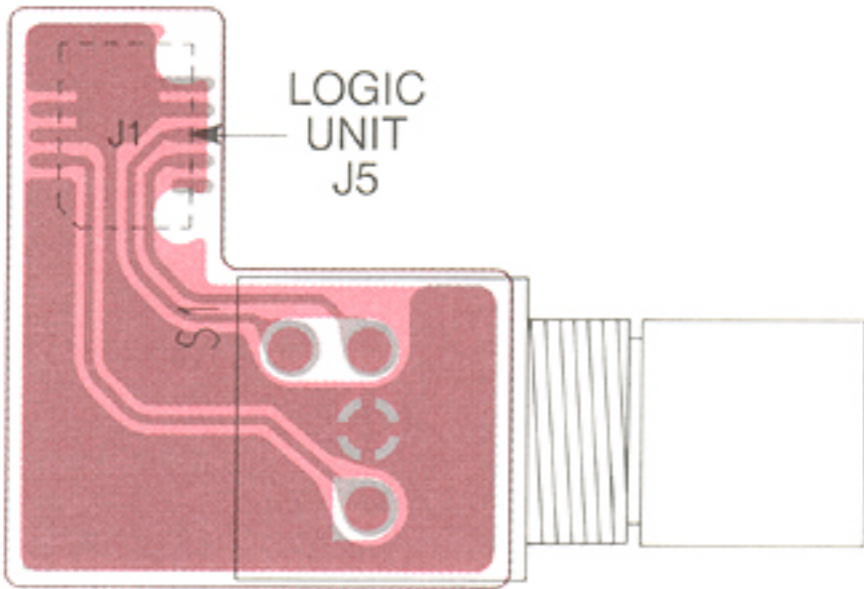


# SECTION 7 BOARD LAYOUTS

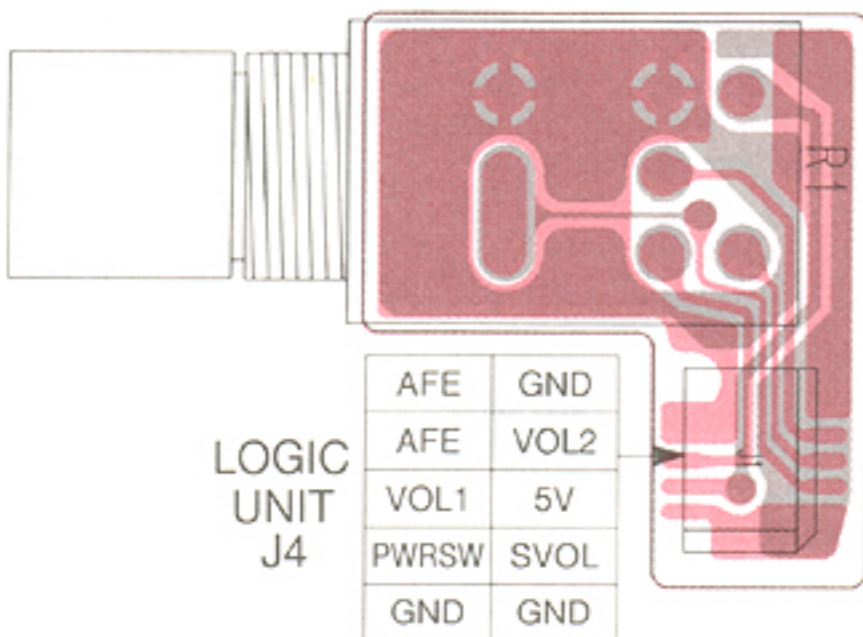
## 7-1 LOGIC UNIT

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

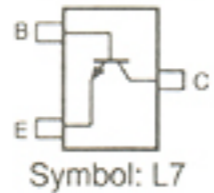
### • SW-B BOARD (TOP VIEW)



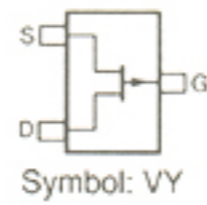
### • SW-A BOARD (TOP VIEW)



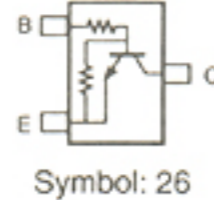
**2SC4211**  
Q1, Q10, Q11,  
Q15, Q23



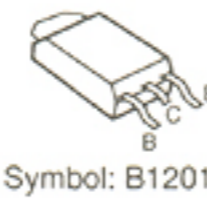
**2SJ144 Y**  
Q9, Q12, Q13



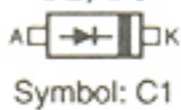
**DTC144 EU**  
Q4, Q14



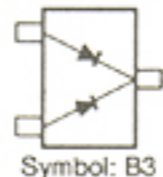
**2SB1201 S**  
Q8



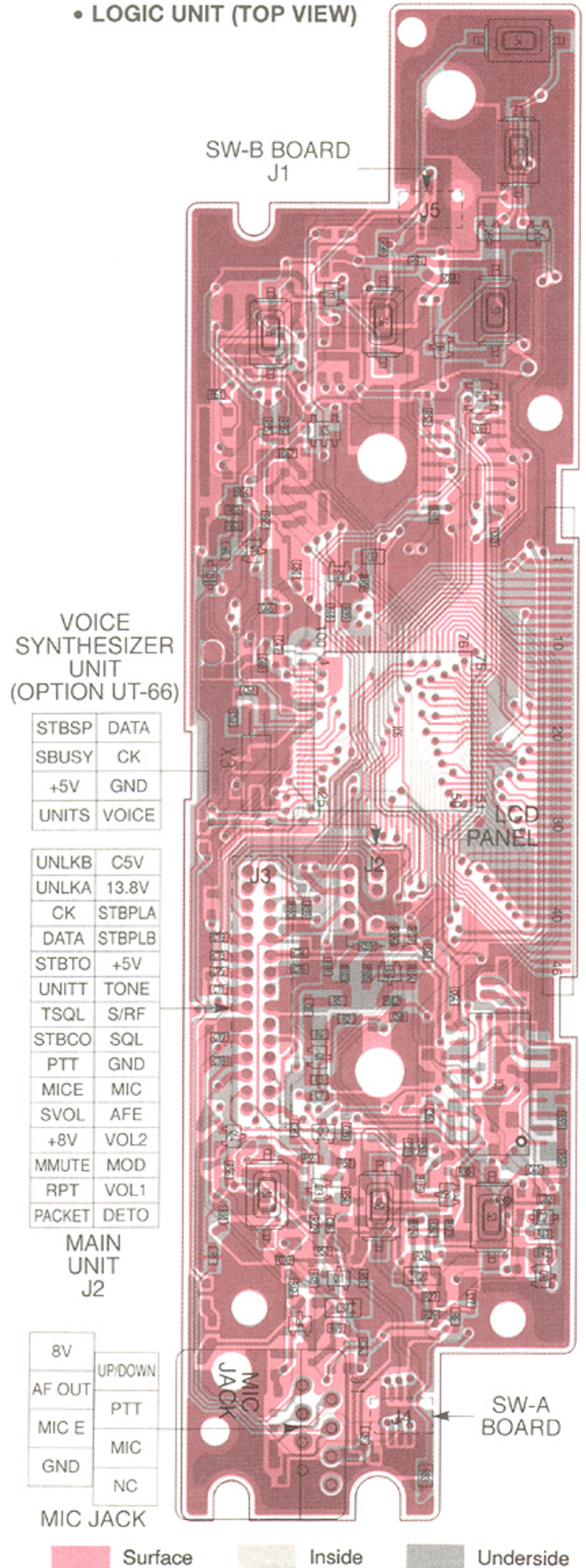
**1SS352**  
D2, D3



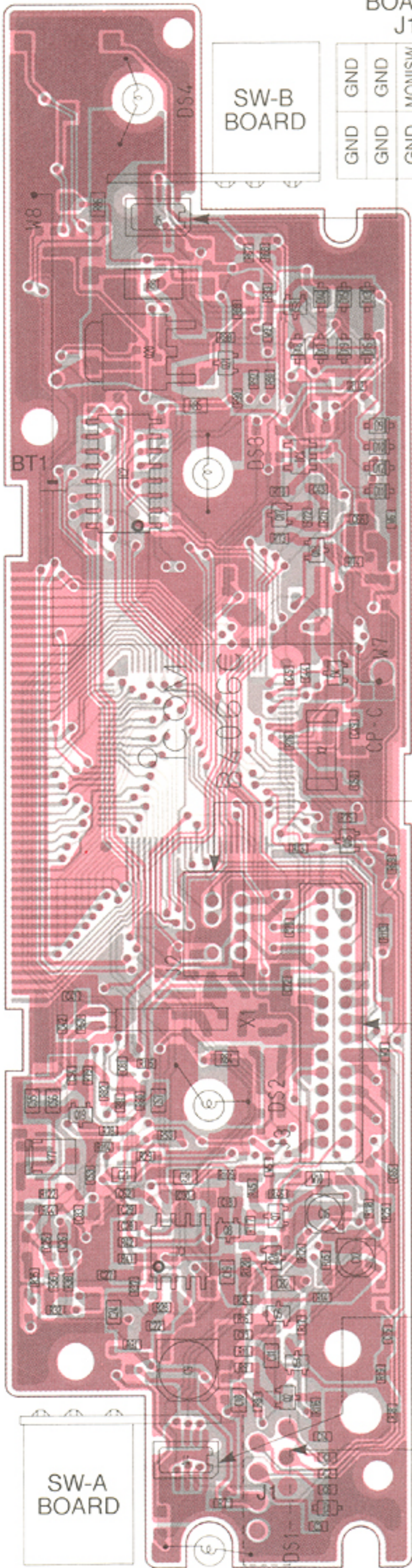
**1SS301**  
D5, D6, D7, D8



### • LOGIC UNIT (TOP VIEW)



• LOGIC UNIT (BOTTOM VIEW)



SW-B BOARD  
J1

GND	GND	MONISW	DUP	GND
GND	GND	DCK	GND	



- 1SS352  
D9 (EUR, USA)  
D10, D12 (except KOR, AUS)  
D11 (EUR, USA, SEA)  
D13 (except KOR, ITA)  
D14 (EUR, AUS)  
D15 (All versions)  
D16 (except KOR, AUS)  
D17 (KOR, AUS, SEA)  
D18 (KOR)  
D19 (EUR, ITA, KOR)



VOICE SYNTHESIZER UNIT  
(OPTION UT-66)

DATA	STBSP
CK	SBUSY
GND	+5V
VOICE	UNITS

C5V	UNLKB
13.8V	UNLKA
STBPLA	CK
STBPLB	DATA
+5V	STBTO
TONE	UNITT
S/RF	TSQ
SQL	STBCO
GND	PTT
MIC	MICE
AFE	SVOL
VOL2	+8V
MOD	MMUTE
VOL1	RPT
DETO	PACKET

MAIN UNIT  
J2

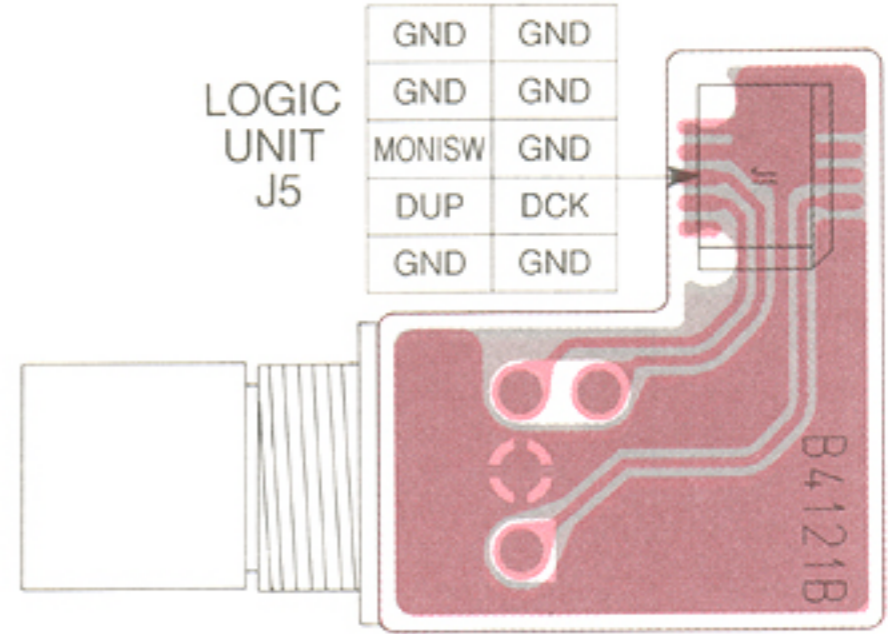
AFE	AFE	VOL1	PWRSW	GND
GND	VOL2	5V	SVOL	GND

SW-A BOARD  
J1

UP/DOWN	8V
PTT	AF OUT
MIC	MIC E
NC	GND

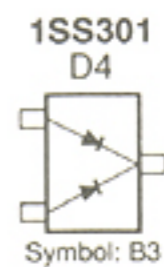
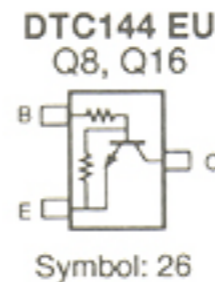
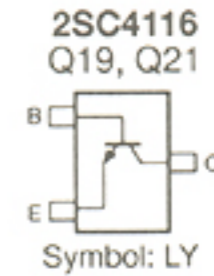
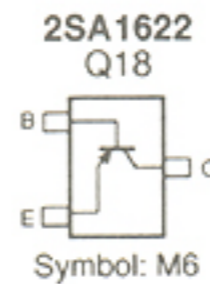
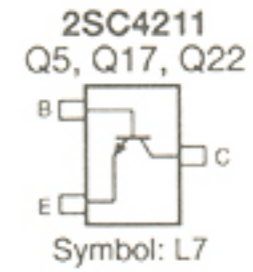
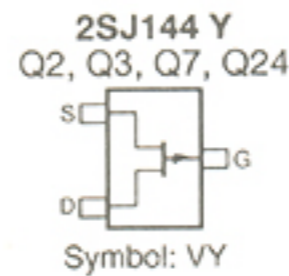
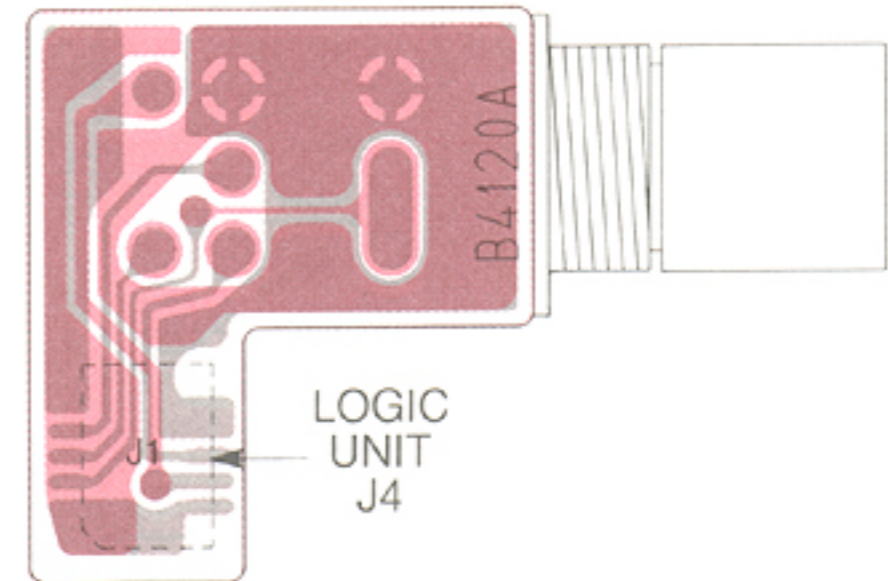
MIC JACK

• SW-B BOARD (BOTTOM VIEW)



GND	GND
GND	GND
MONISW	GND
DUP	DCK
GND	GND

• SW-A BOARD (BOTTOM VIEW)

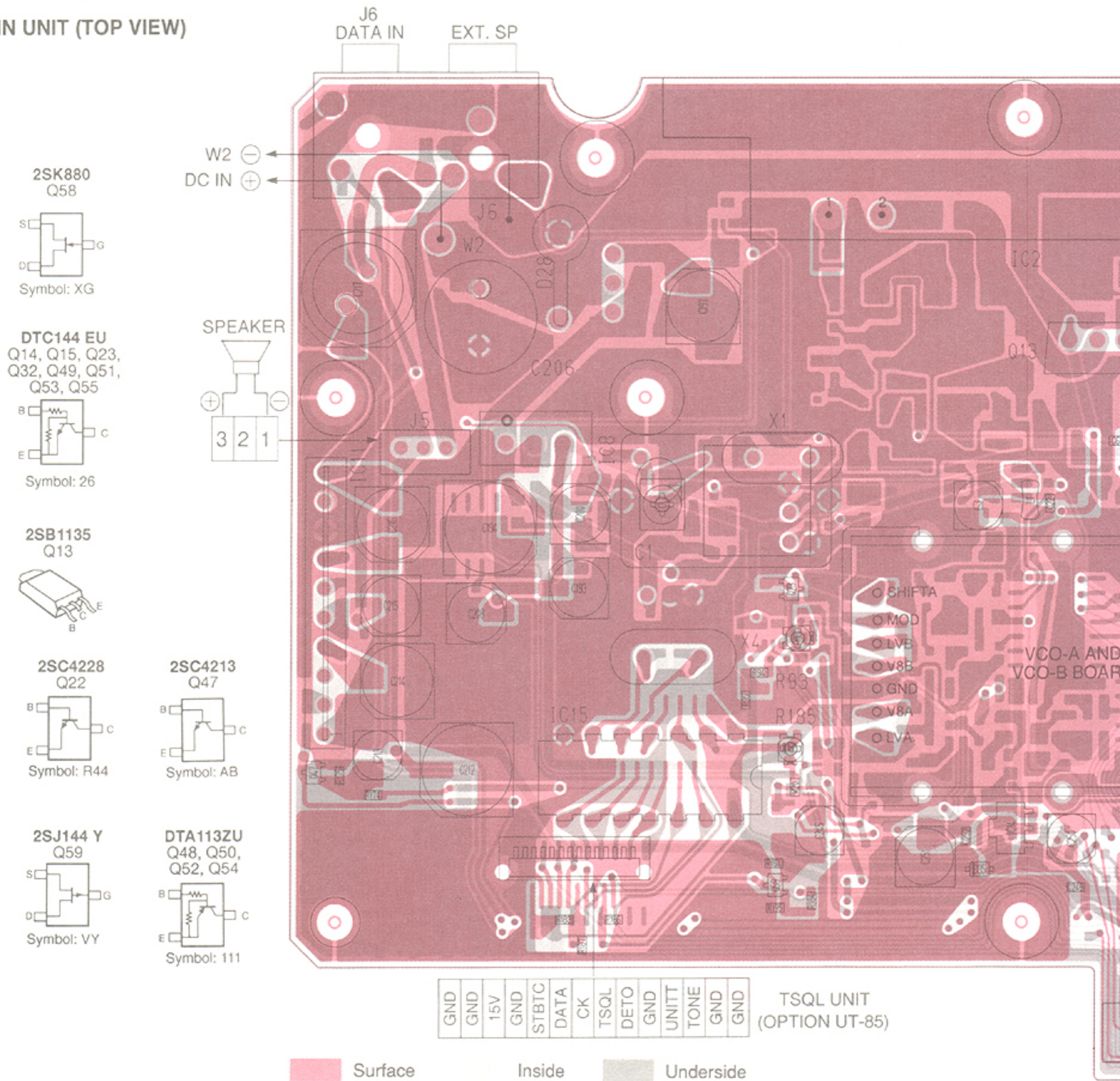


Surface Inside Underside

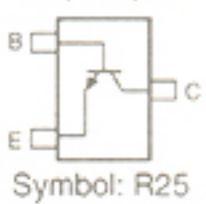


## 7-2 MAIN UNIT

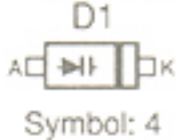
### • MAIN UNIT (TOP VIEW)



2SC4226 Q1, Q2, Q3, Q4, Q5, Q6, Q7



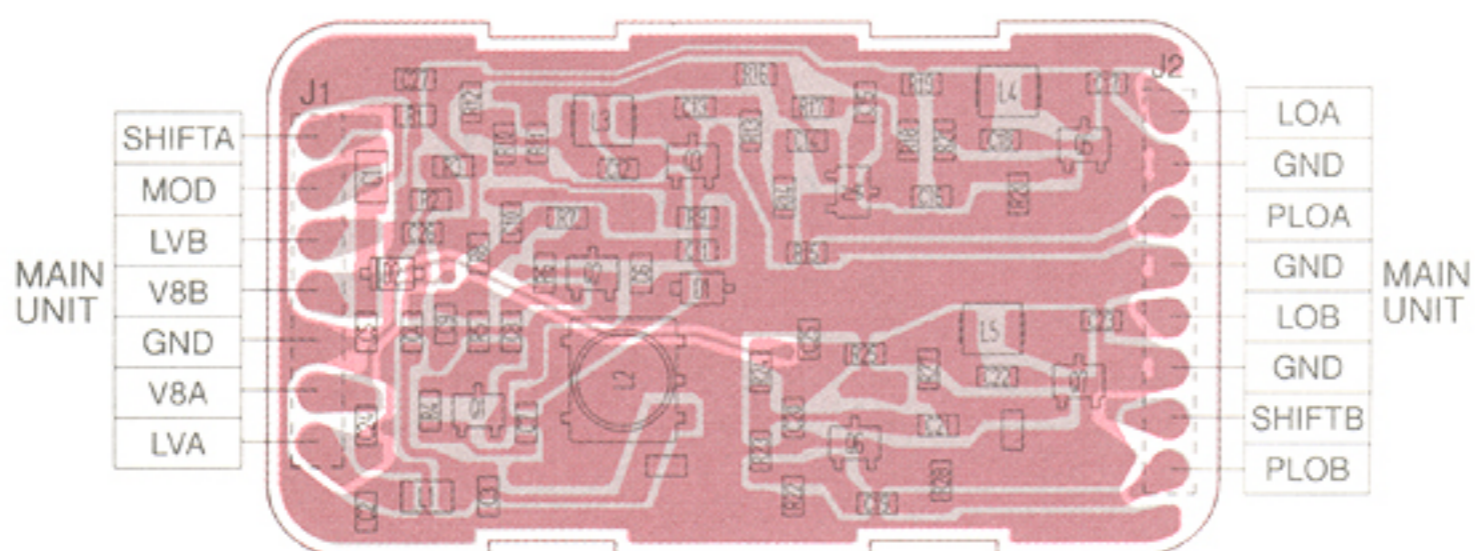
HVU350 D1



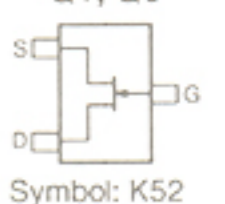
MA77 D2



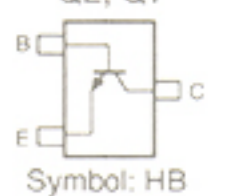
### • VCO-A BOARD (TOP VIEW)



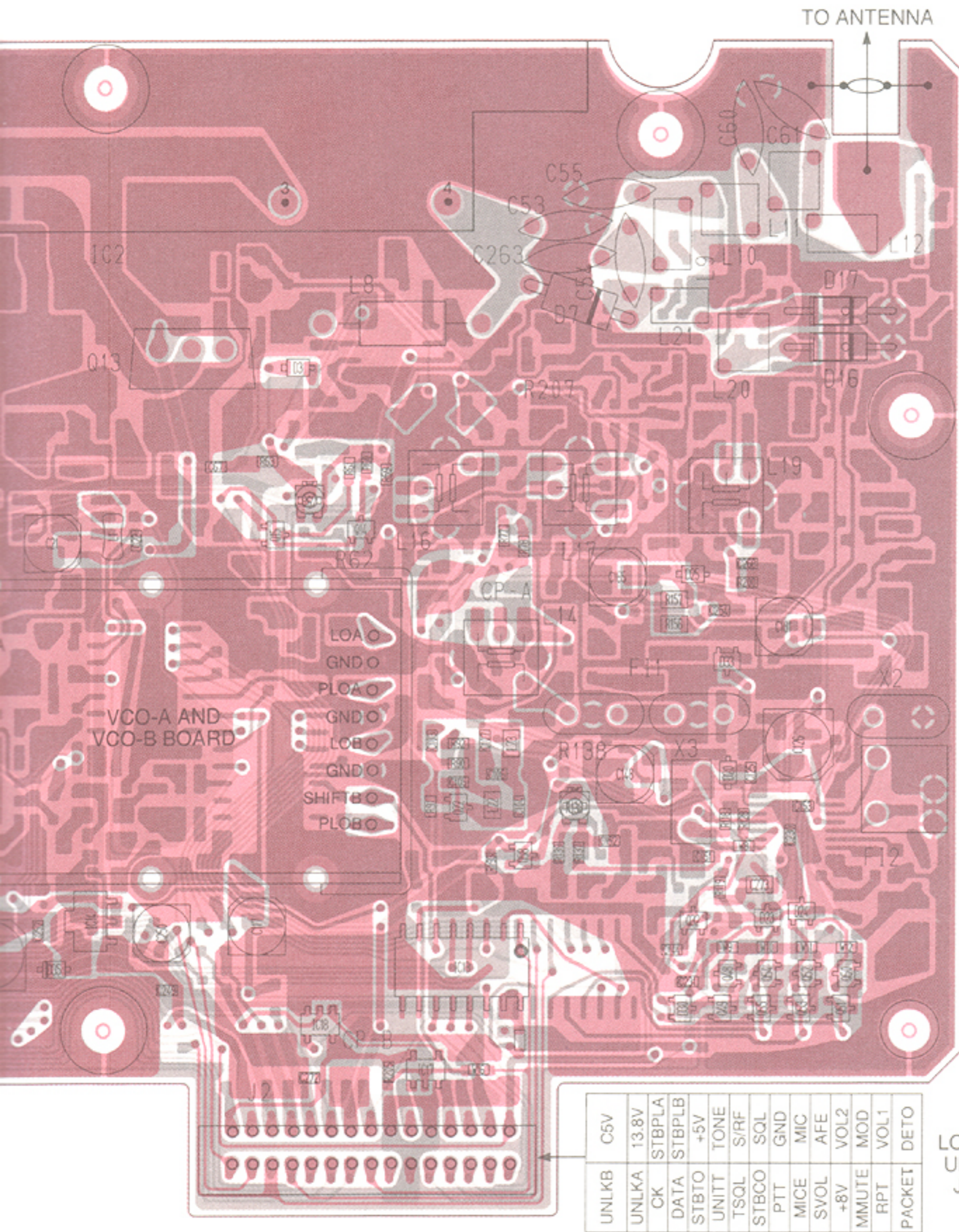
2SK508 Q1, Q6



2SC3120 Q2, Q7



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



**1SS352**  
D3, D35  
AC → K  
Symbol: C1

**MA8043**  
D20, D25  
AC → K  
Symbol: 4\_3

**MI407**  
D7  
**MI308**  
D16, D17  
**DSA3A1**  
D28

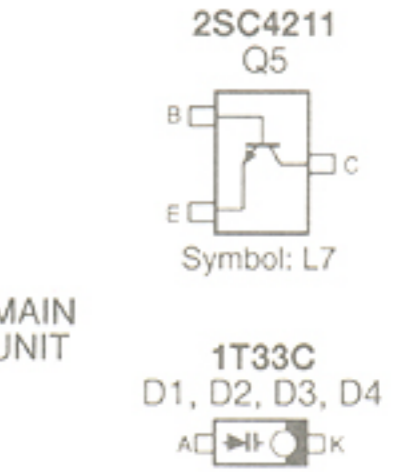
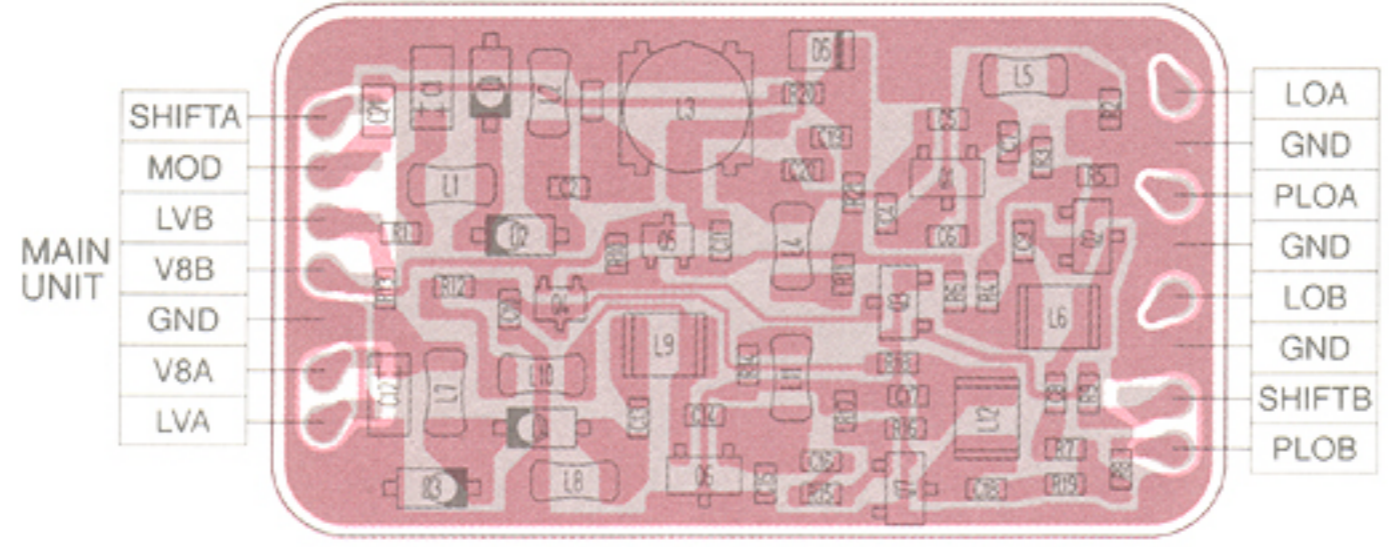
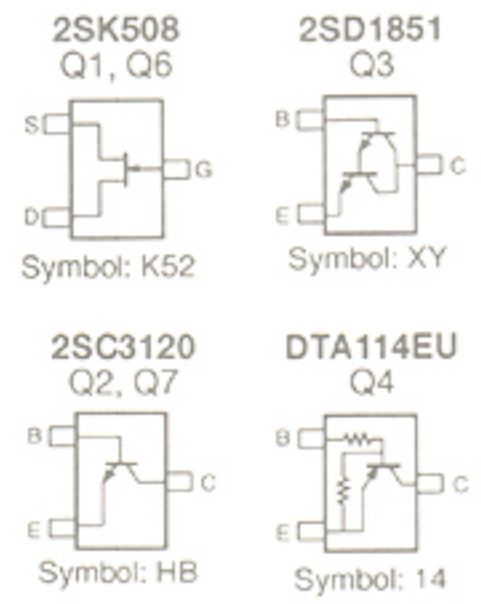
**MA742**  
D33  
AC → K  
Symbol: N1U

**DAN202U**  
D23, D24, D30  
A1 → A2 → K  
Symbol: N







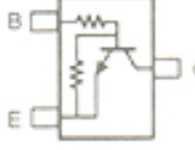
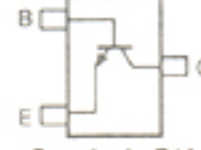

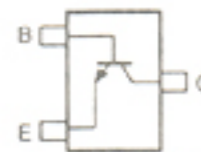
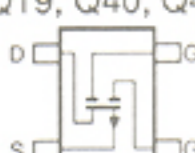
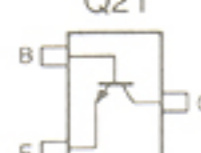
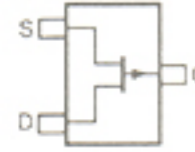

UNLKB	C5V
UNLKA	13.8V
CK	STBPLA
DATA	STBPLB
STBTO	+5V
UNIT	TSQ
TSQ	S/RF
STBCO	SQL
PTT	GND
MICE	MIC
SVOL	AFE
+8V	VOL2
MMUTE	MOD
RPT	VOL1
PACKET	DETO

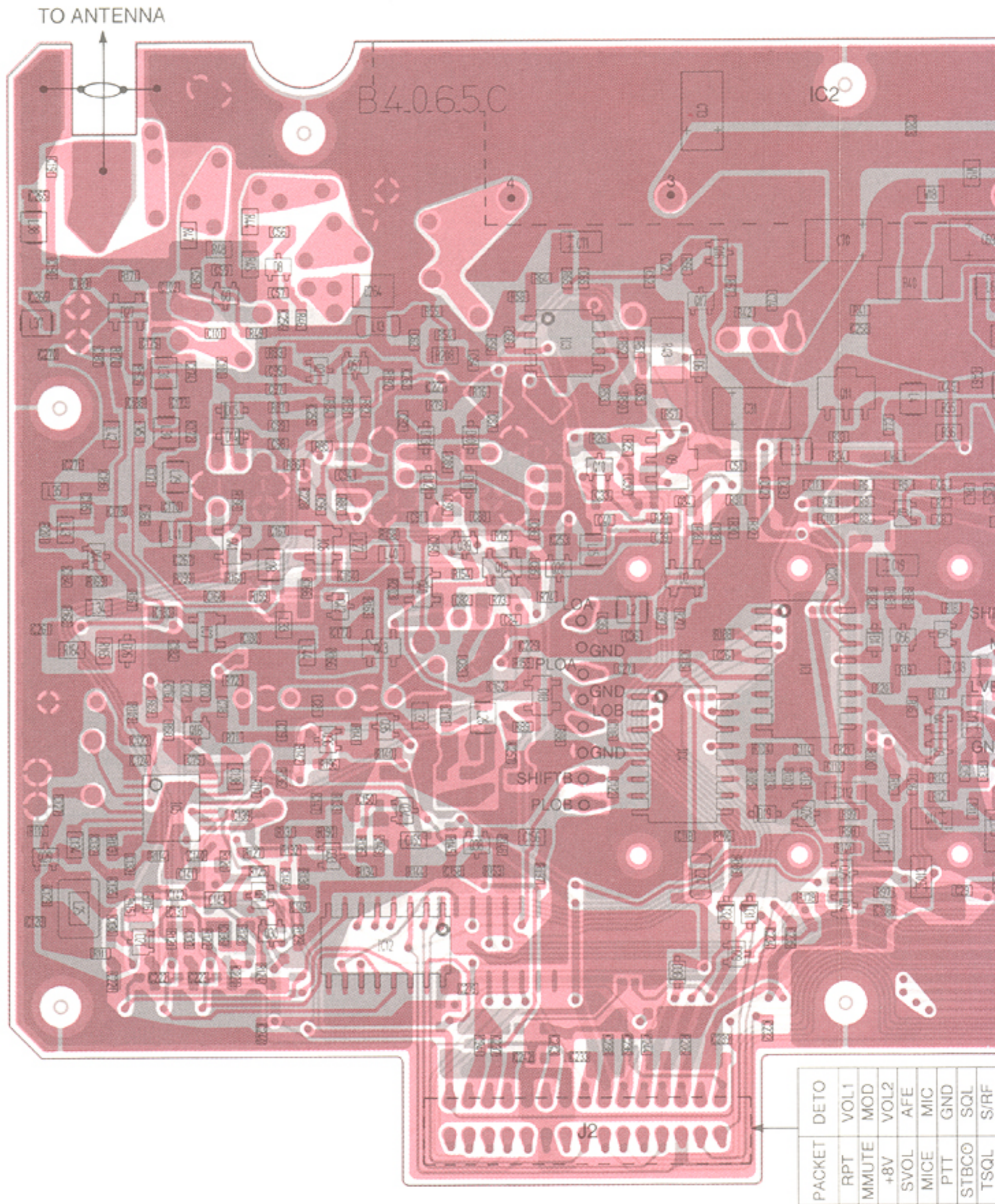
LOGIC UNIT J3

• VCO-B BOARD (TOP VIEW)

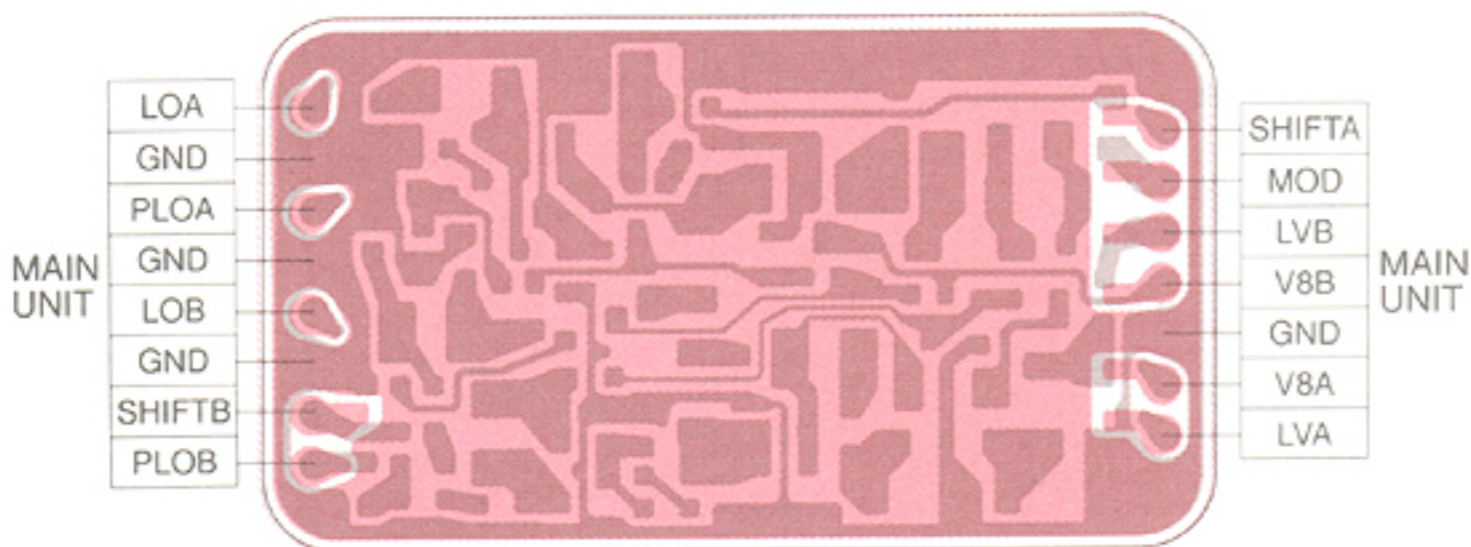


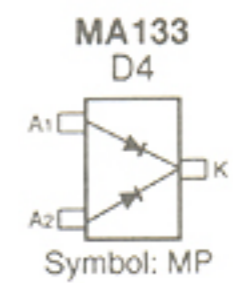
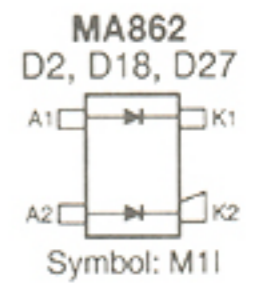
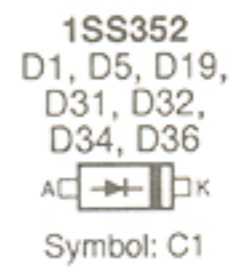
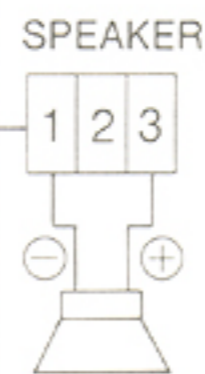
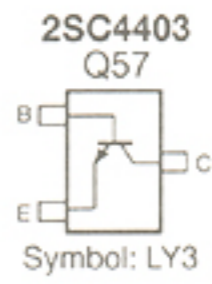
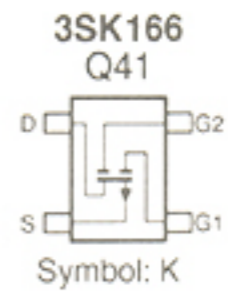
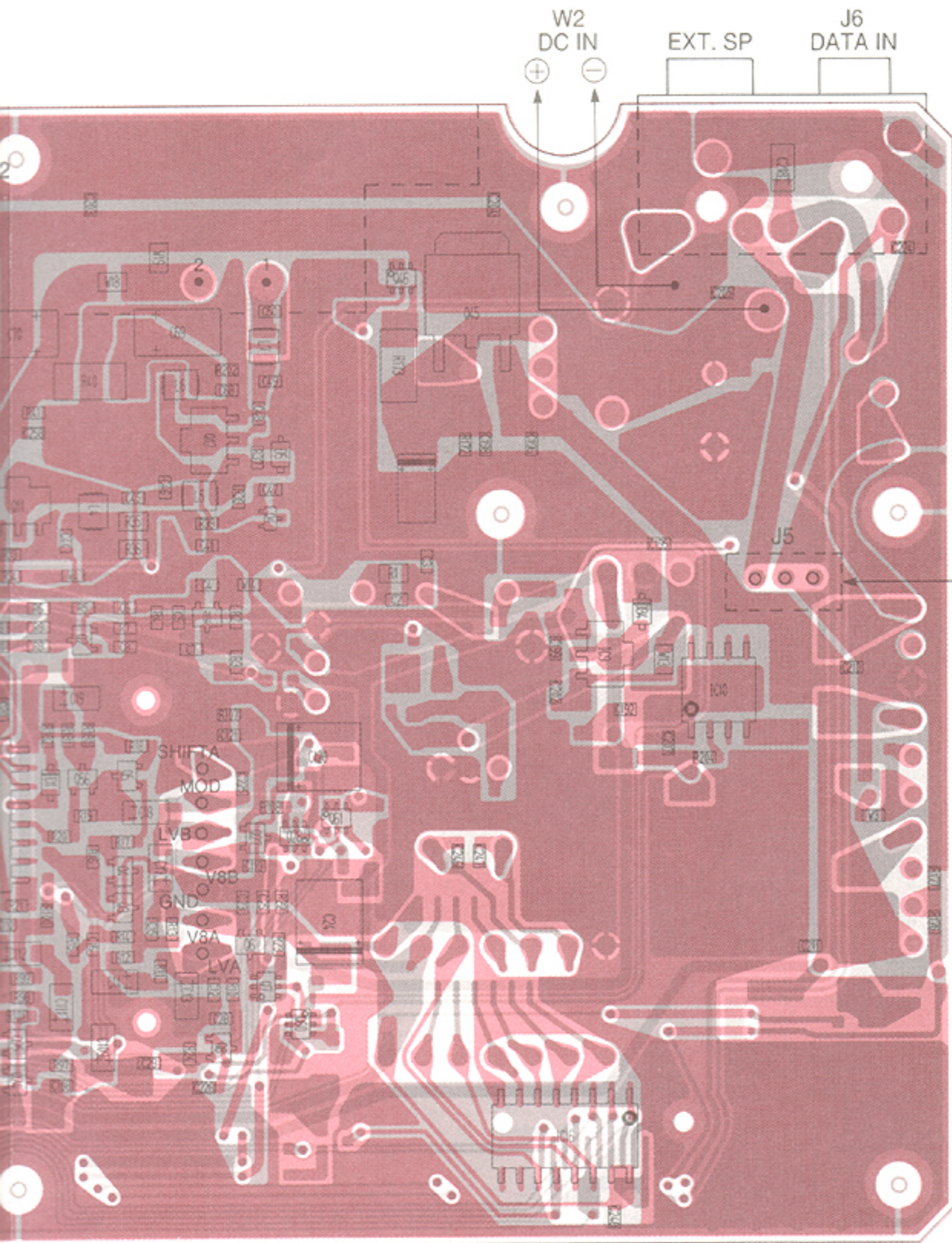
• MAIN UNIT (BOTTOM VIEW)

- |  |   |
|--|---|
| <p><b>2SC4403</b><br/>Q1, Q2</p>  <p>Symbol: LY3</p>                               | <p><b>2SC4117</b><br/>Q3, Q4, Q24,<br/>Q25, Q26</p>  <p>Symbol: CL</p> |
| <p><b>2SC4116</b><br/>Q6, Q27</p>  <p>Symbol: LY</p>                               | <p><b>2SK880</b><br/>Q5, Q8, Q29, Q56</p>  <p>Symbol: XG</p>           |
| <p><b>UMD6</b><br/>Q7, Q28, Q46,<br/>Q60, Q61</p>  <p>Symbol: TR</p>              | <p><b>2SA1734</b><br/>Q9</p>  <p>Symbol: LB</p>                       |
| <p><b>DTC144 EU</b><br/>Q10, Q17, Q20,<br/>Q35, Q39, Q42,</p>  <p>Symbol: 26</p> | <p><b>2SC2954</b><br/>Q11, Q12</p>  <p>Symbol: QK</p>                |
| <p><b>2SC4211</b><br/>Q16, Q33,<br/>Q34, Q36</p>  <p>Symbol: L7</p>              | <p><b>2SC4226</b><br/>Q18</p>  <p>Symbol: R25</p>                    |
| <p><b>3SK184</b><br/>Q19, Q40, Q43</p>  <p>Symbol: ??</p>                        | <p><b>2SC4405</b><br/>Q21</p>  <p>Symbol: OY3</p>                    |
| <p><b>2SJ144 Y</b><br/>Q30, Q31, Q38</p>  <p>Symbol: VY</p>                      | <p><b>2SC4228</b><br/>Q44</p>  <p>Symbol: R44</p>                    |



• VCO-B BOARD (BOTTOM VIEW)

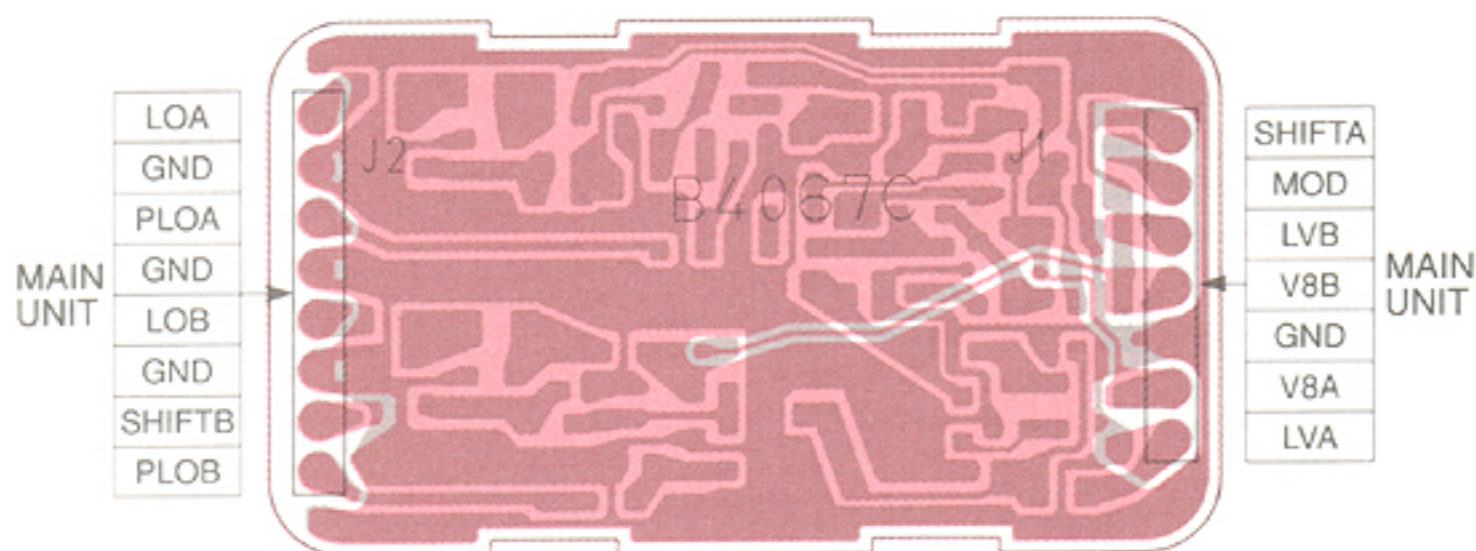




RPT	VOL1
MMUTE	MOD
+8V	VOL2
SVOL	AFE
MICE	MIC
PTT	GND
STBCO	SQL
TSQL	S/RF
UNITT	STONE
STBTO	+5V
DATA	STBPLB
CK	STBPLA
UNLKA	13.8V
UNLKB	C5V

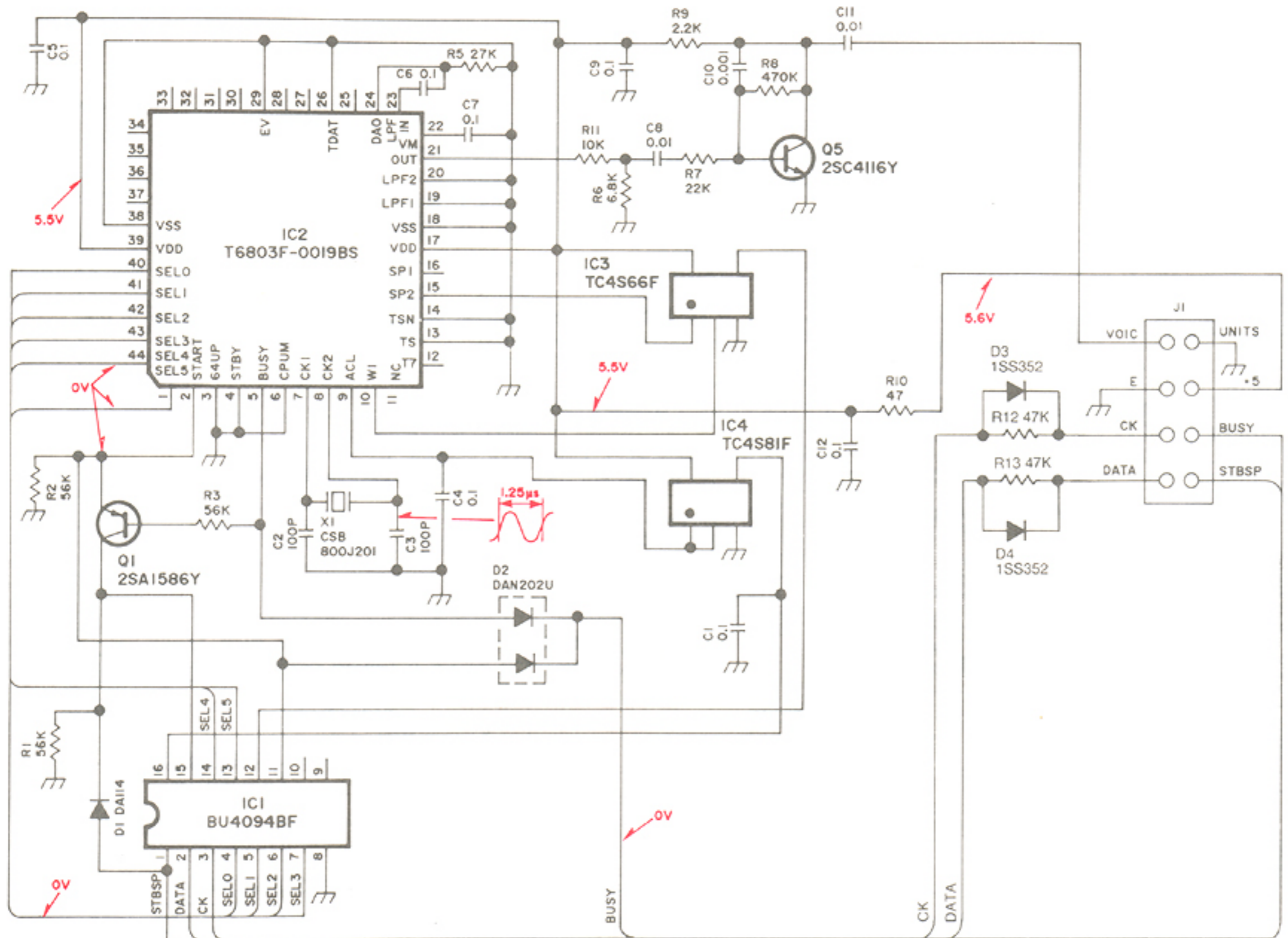


• VCO-A BOARD (BOTTOM VIEW)

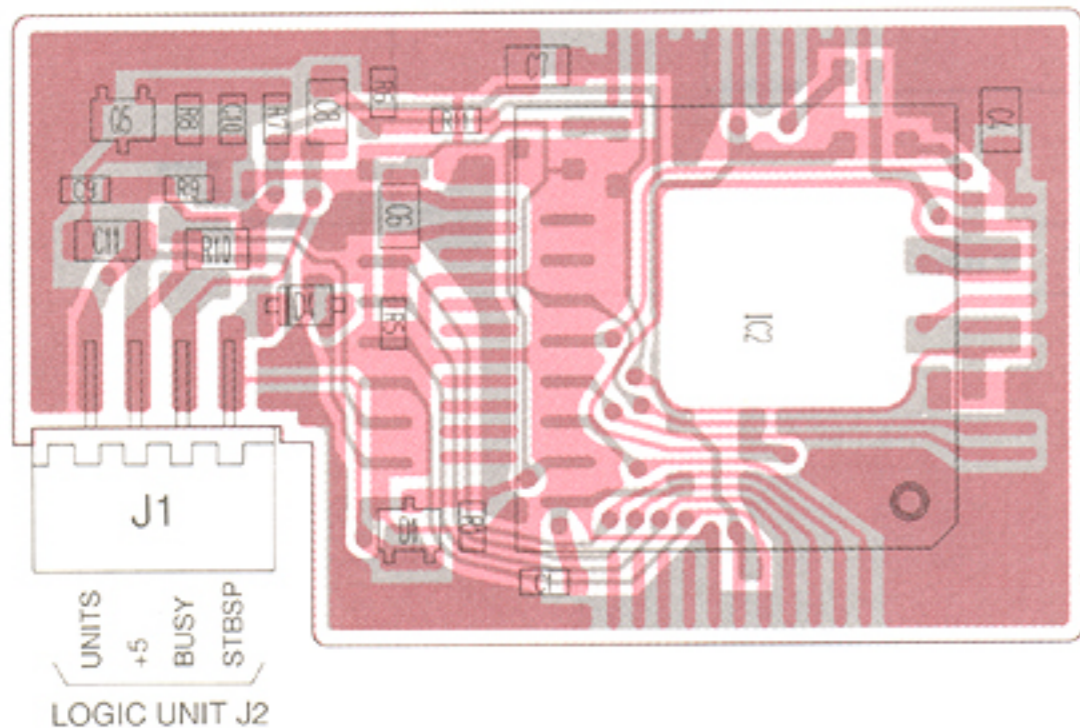


# SECTION 8 OPTIONAL UNITS

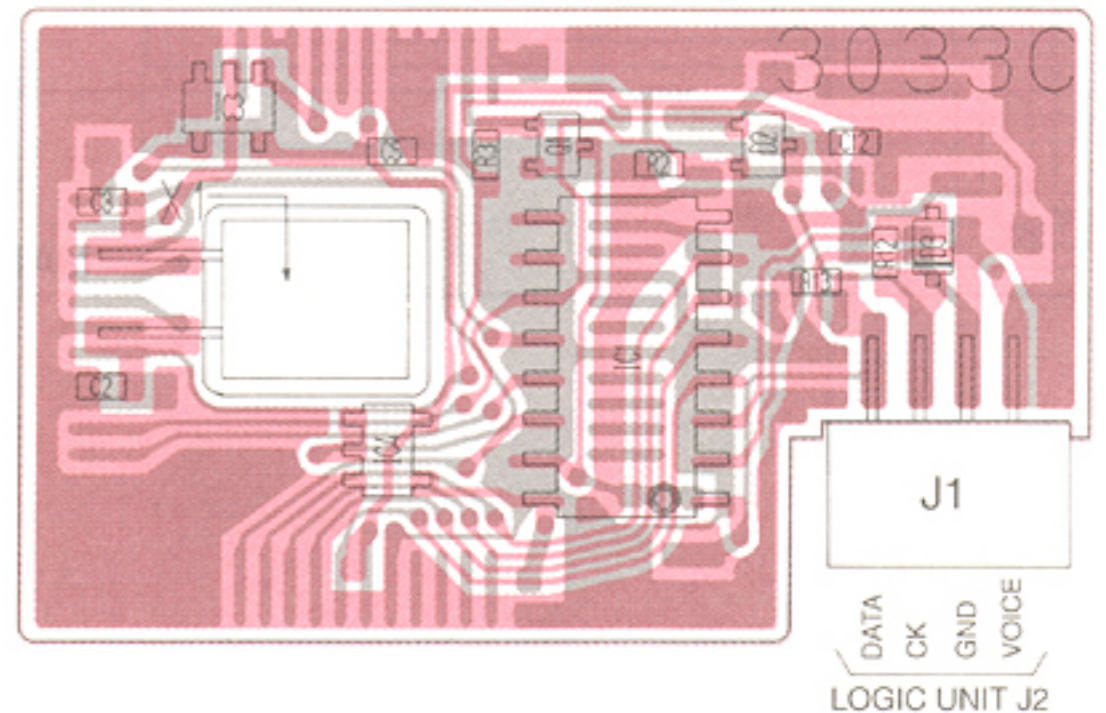
## 8-1 UT-66 VOICE SYNTHESIZER UNIT



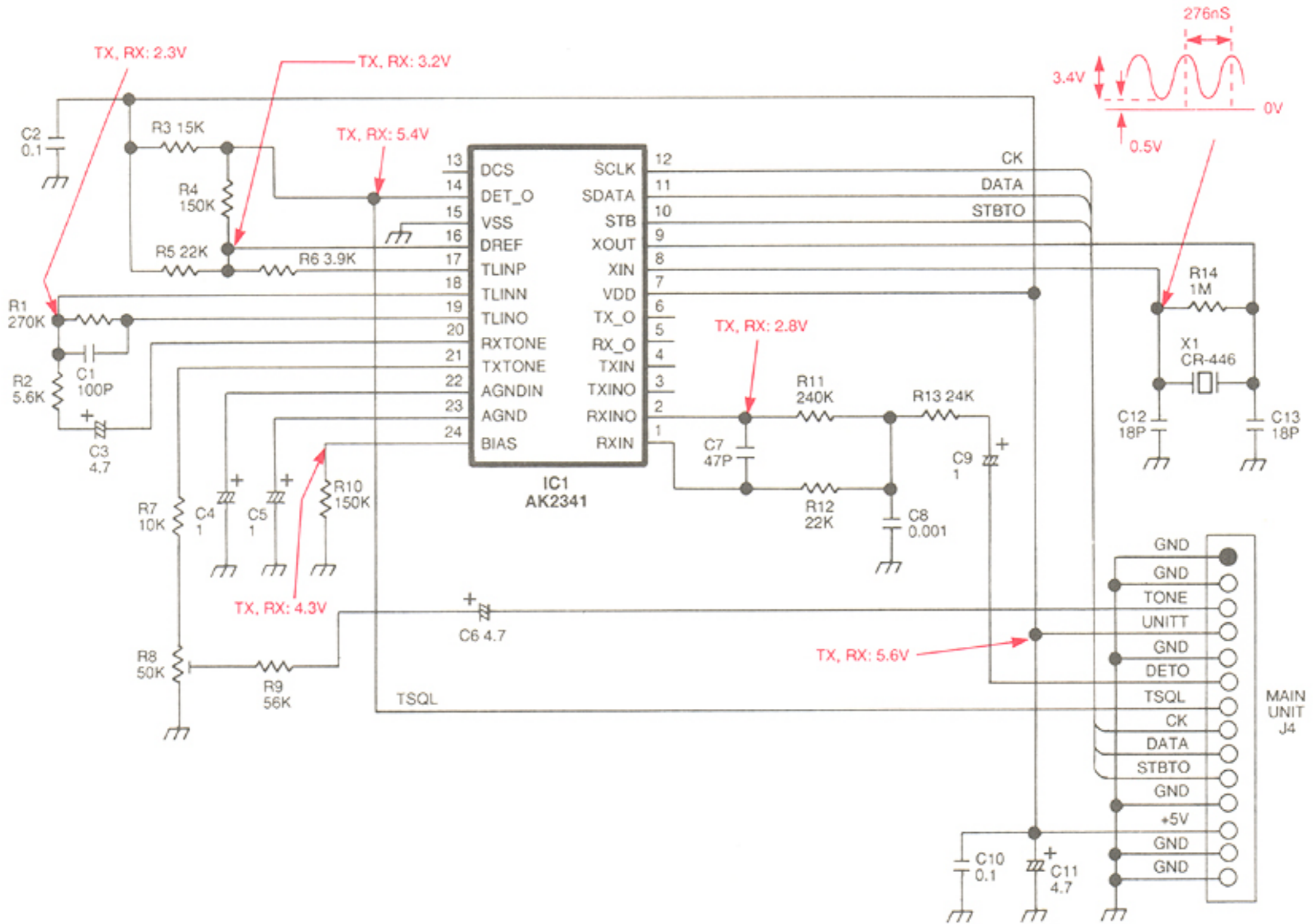
• BOARD LAYOUT (TOP VIEW)



• BOARD LAYOUT (BOTTOM VIEW)

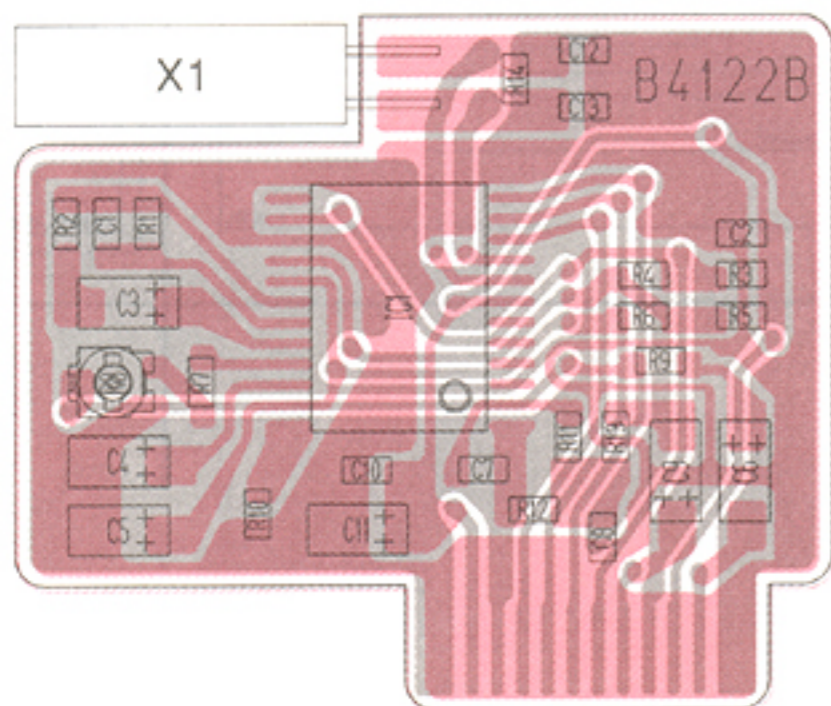


## 8-2 UT-85 TONE SQUELCH UNIT

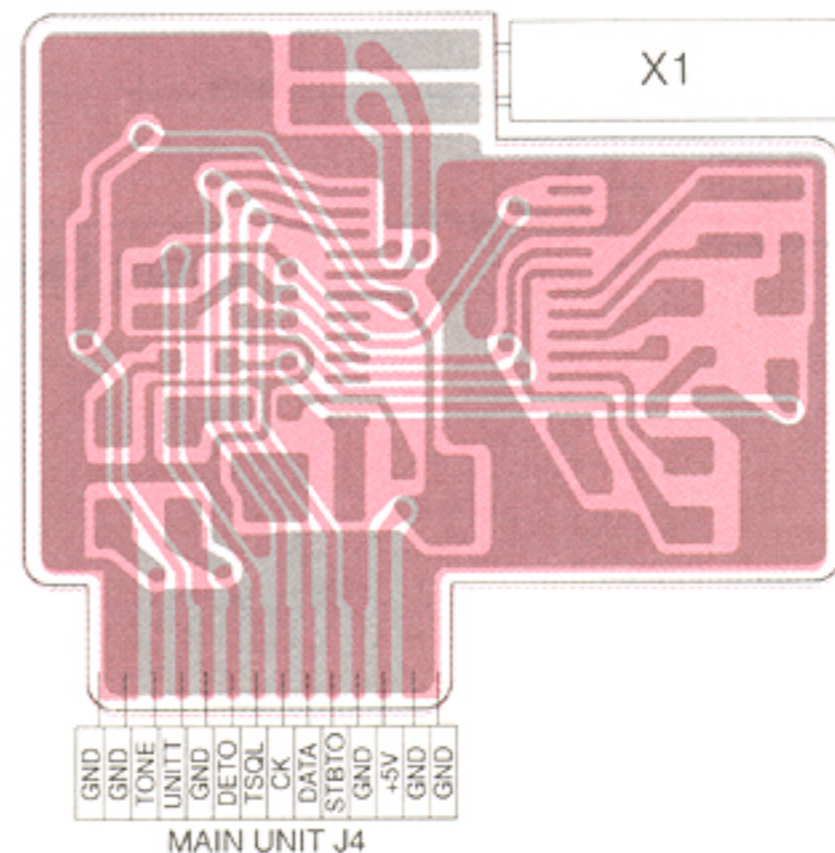


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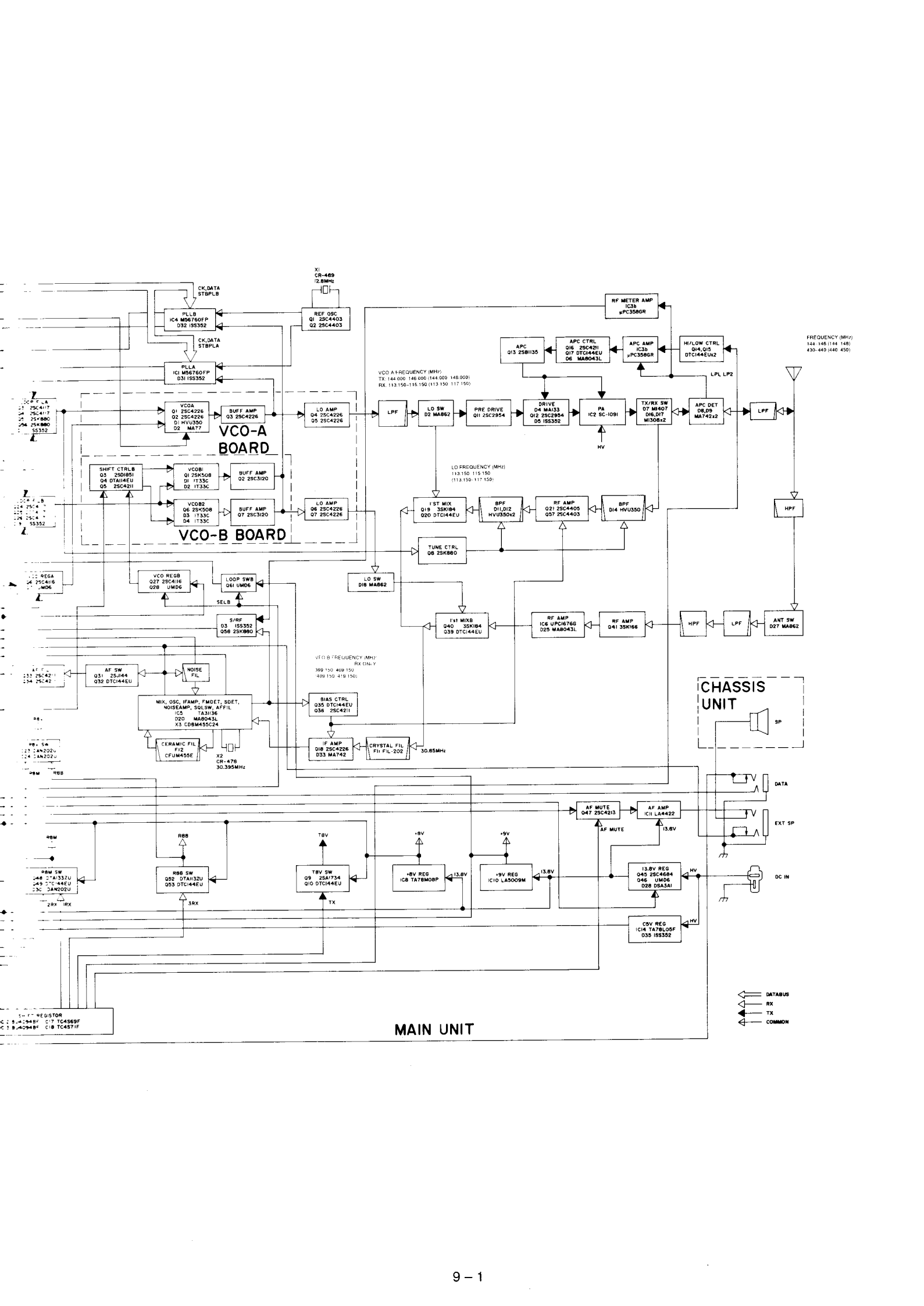
• BOARD LAYOUT (TOP VIEW)



• BOARD LAYOUT (BOTTOM VIEW)



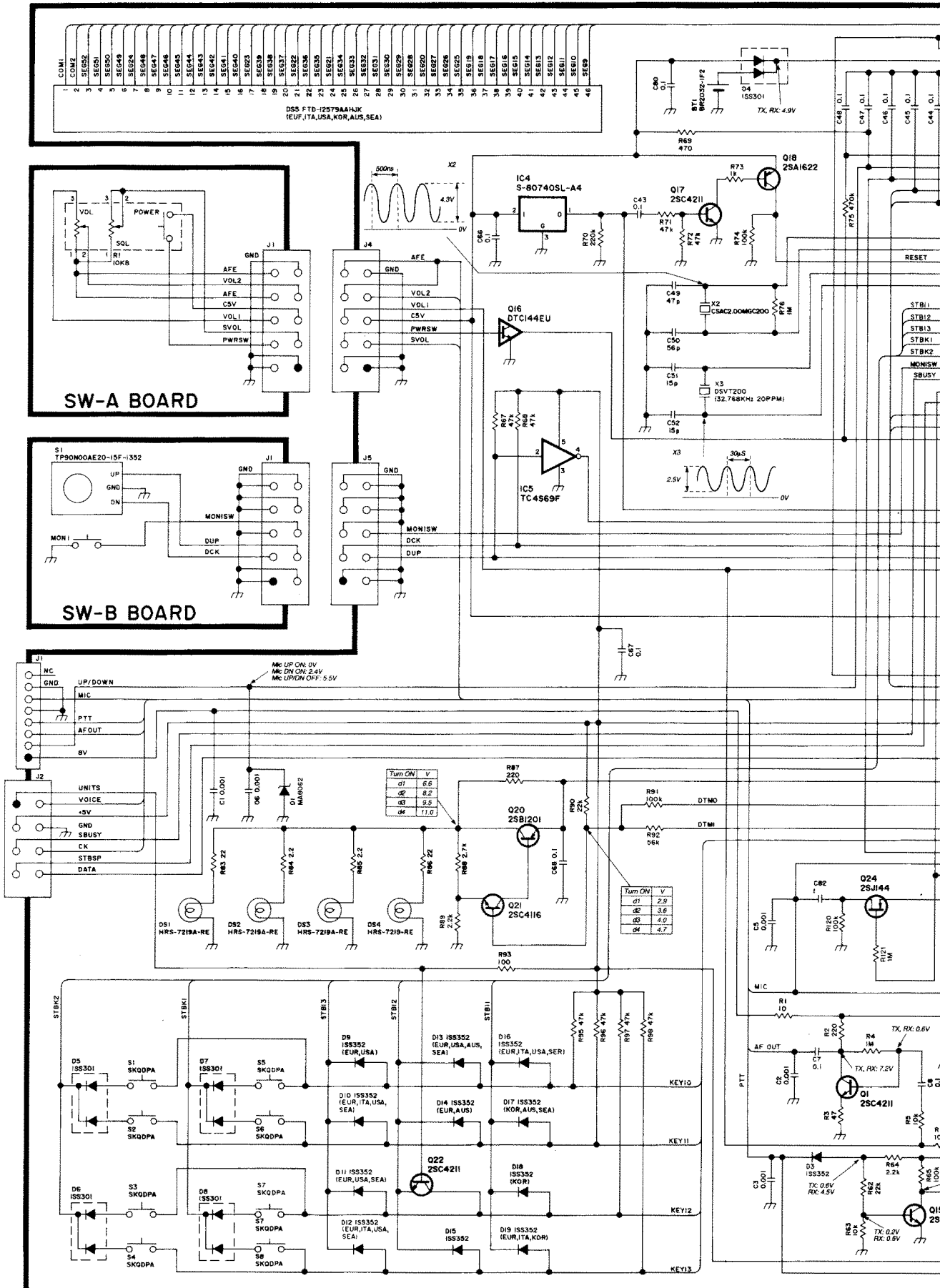


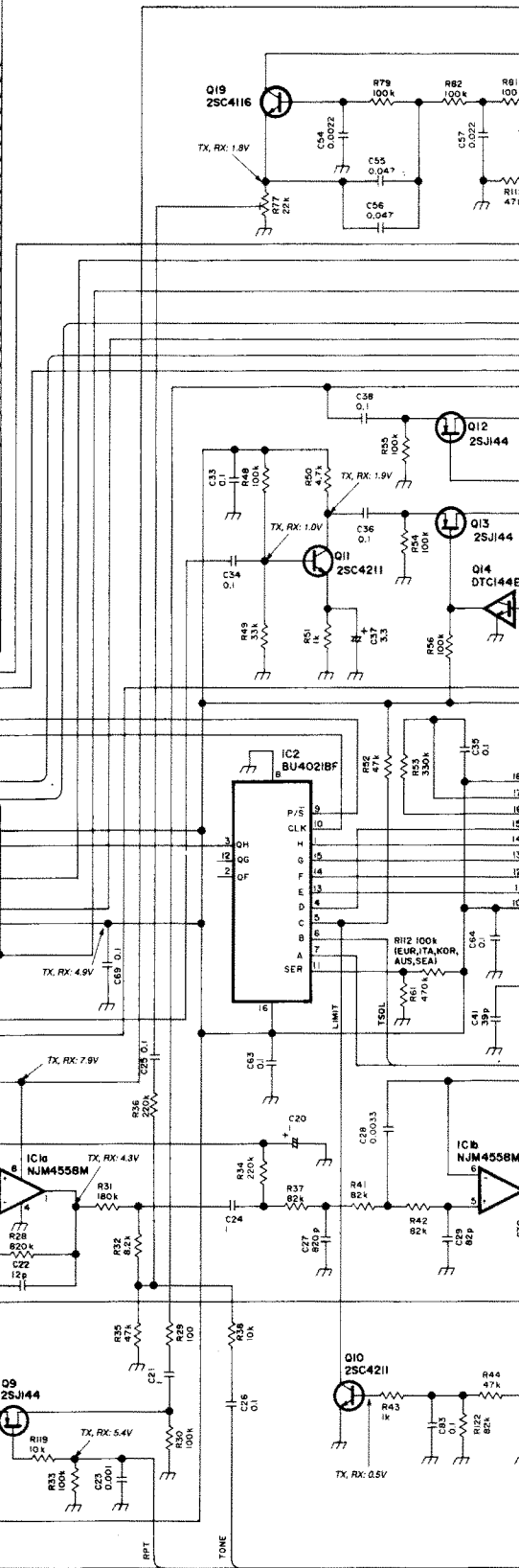
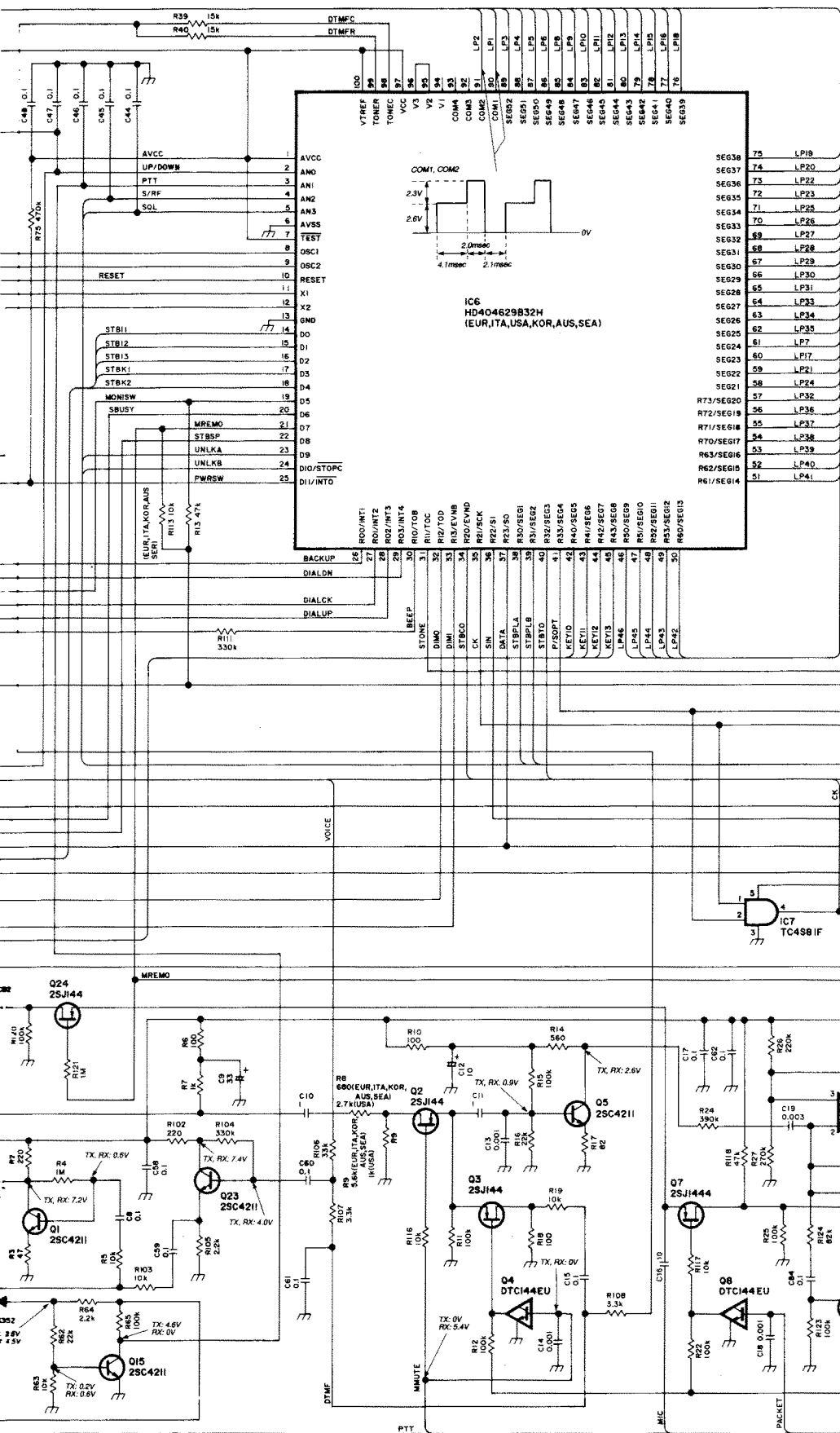


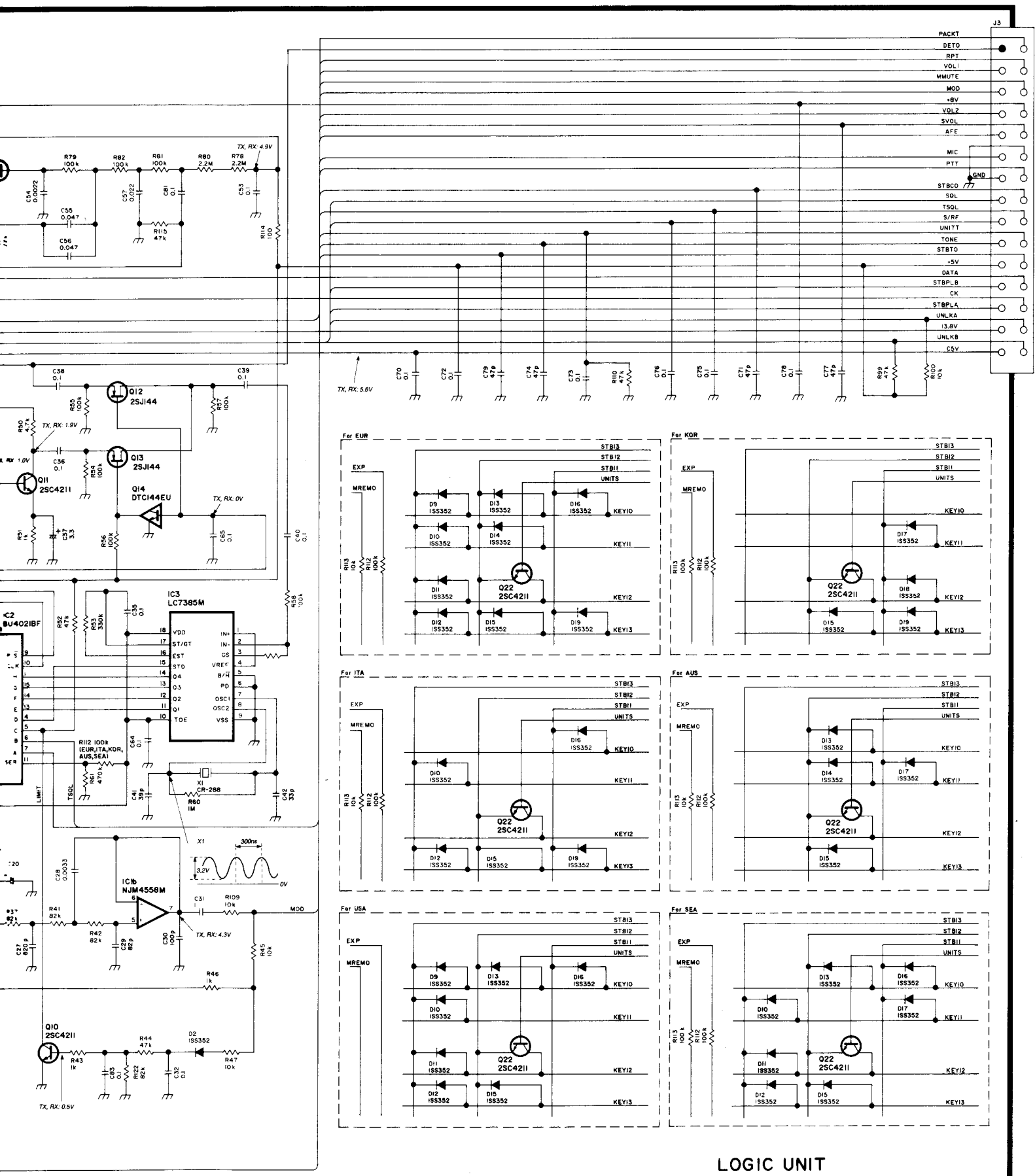


# SECTION 10 VOLTAGE DIAGRAMS

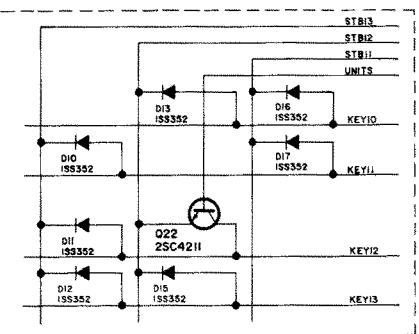
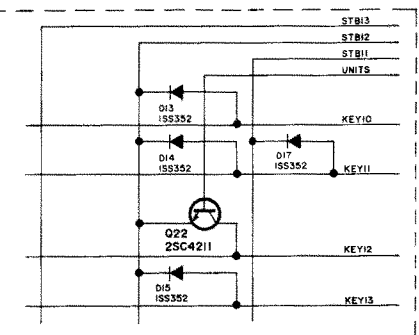
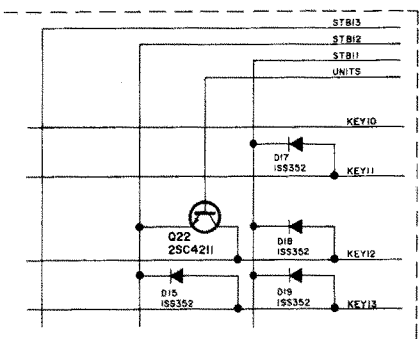
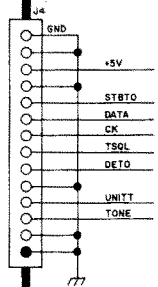
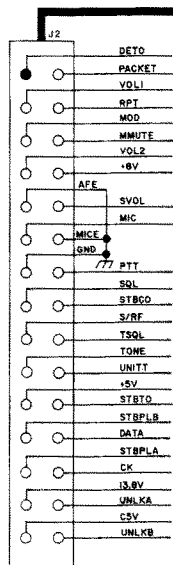
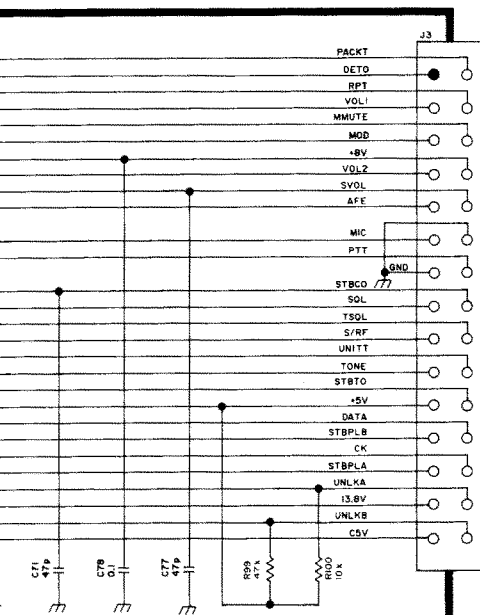
## 10-1 LOGIC UNIT







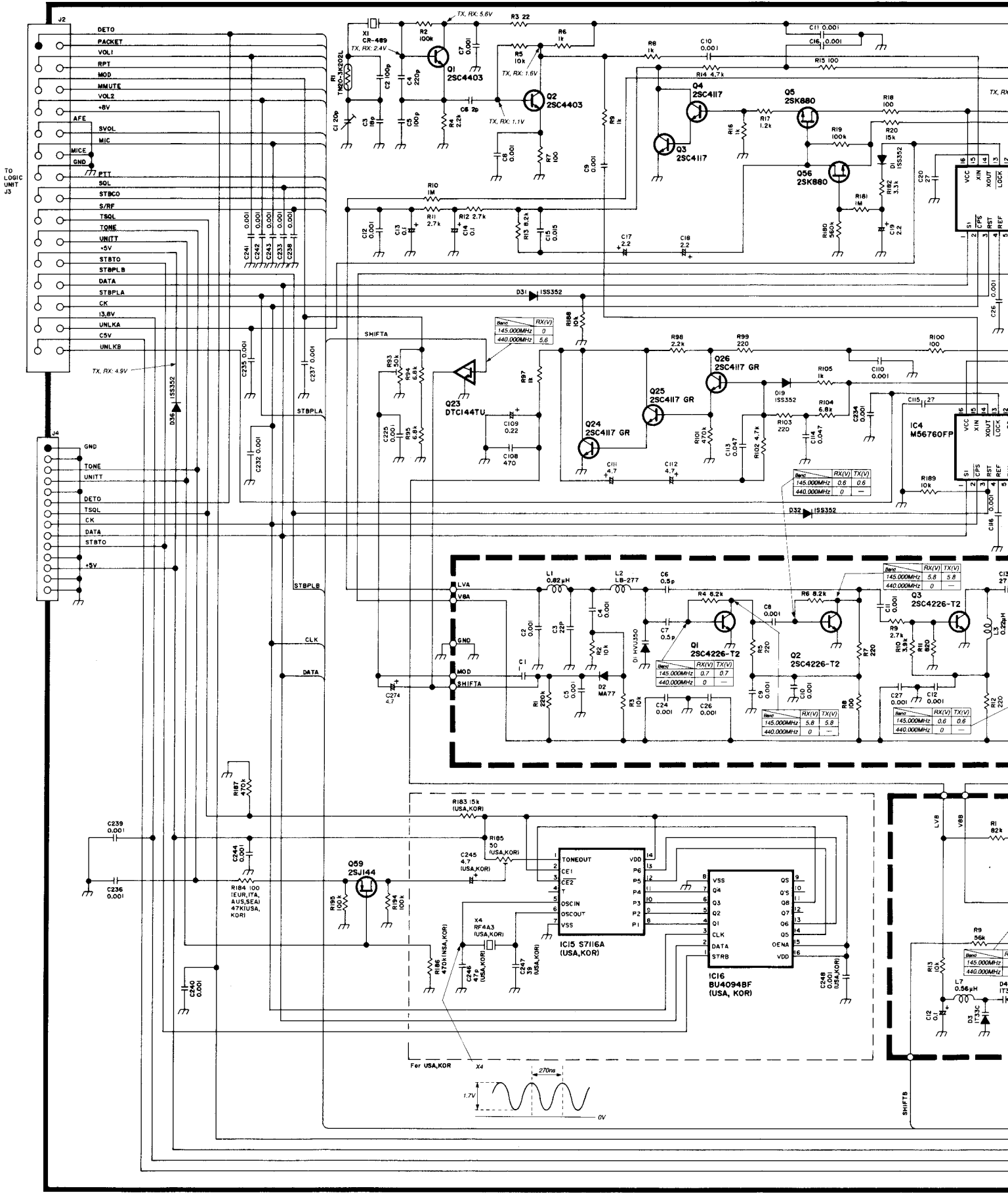
LOGIC UNIT

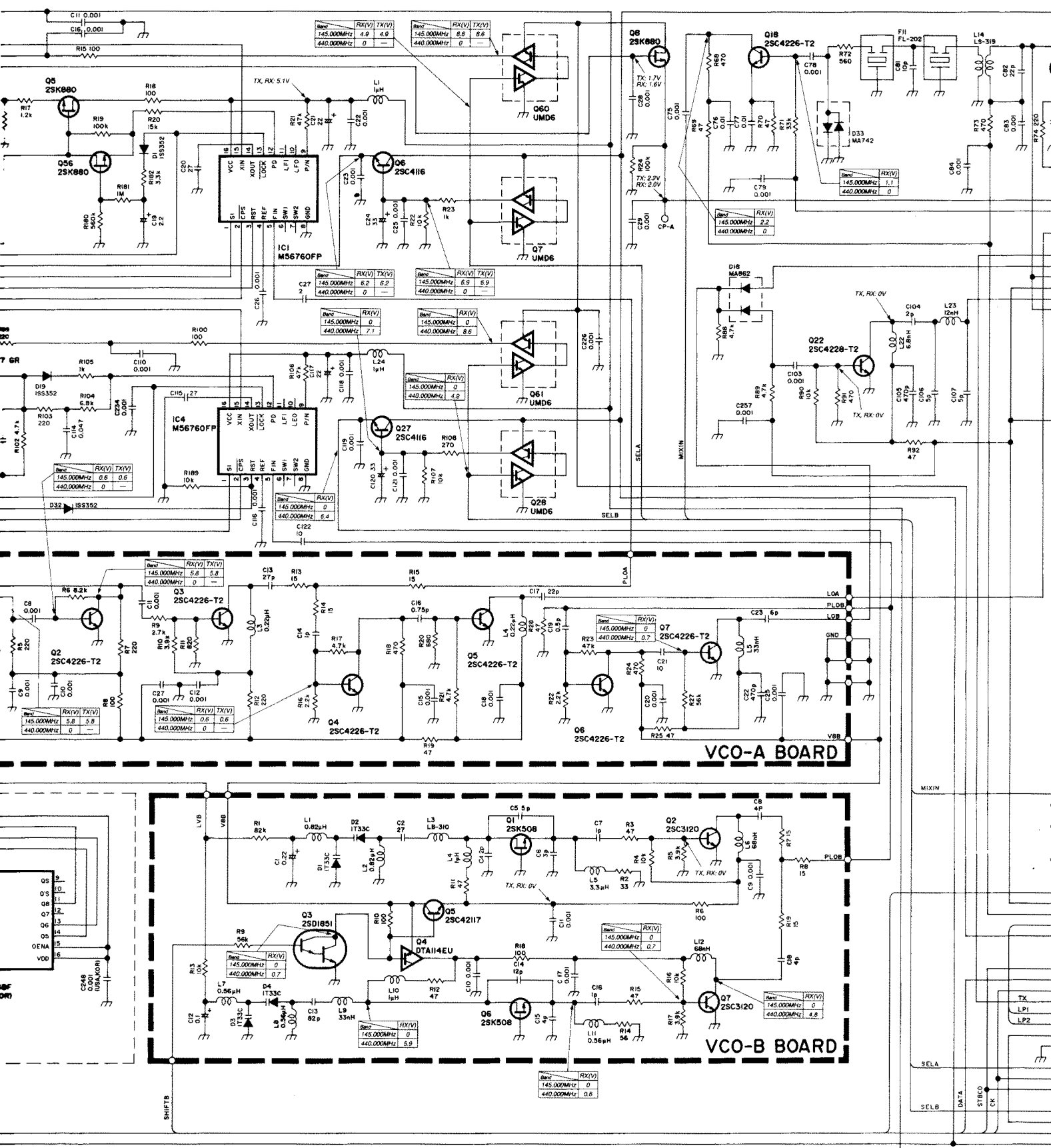


LOGIC UNIT

MAIN UNIT

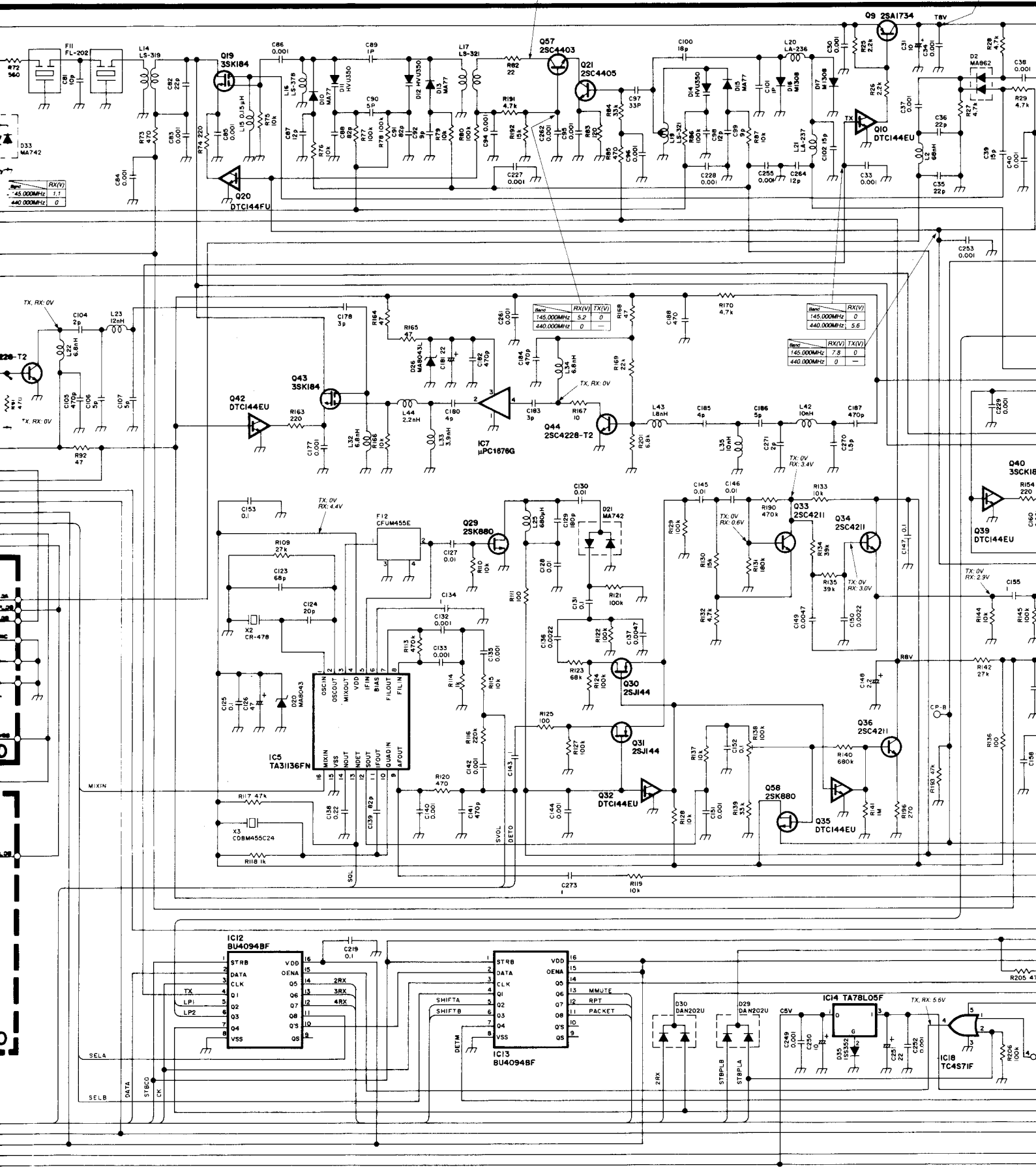
# 10-2 MAIN UNIT





Band	RX(V)	TX(V)
145.000MHz	7.1	0
440.000MHz	0	-

Band	RX(V)
145.000MHz	0
440.000MHz	7.8



Band	RX(V)
145.000MHz	1.1
440.000MHz	0

Band	RX(V)	TX(V)
145.000MHz	5.2	0
440.000MHz	0	-

Band	RX(V)	TX(V)
145.000MHz	7.8	0
440.000MHz	0	-

Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0

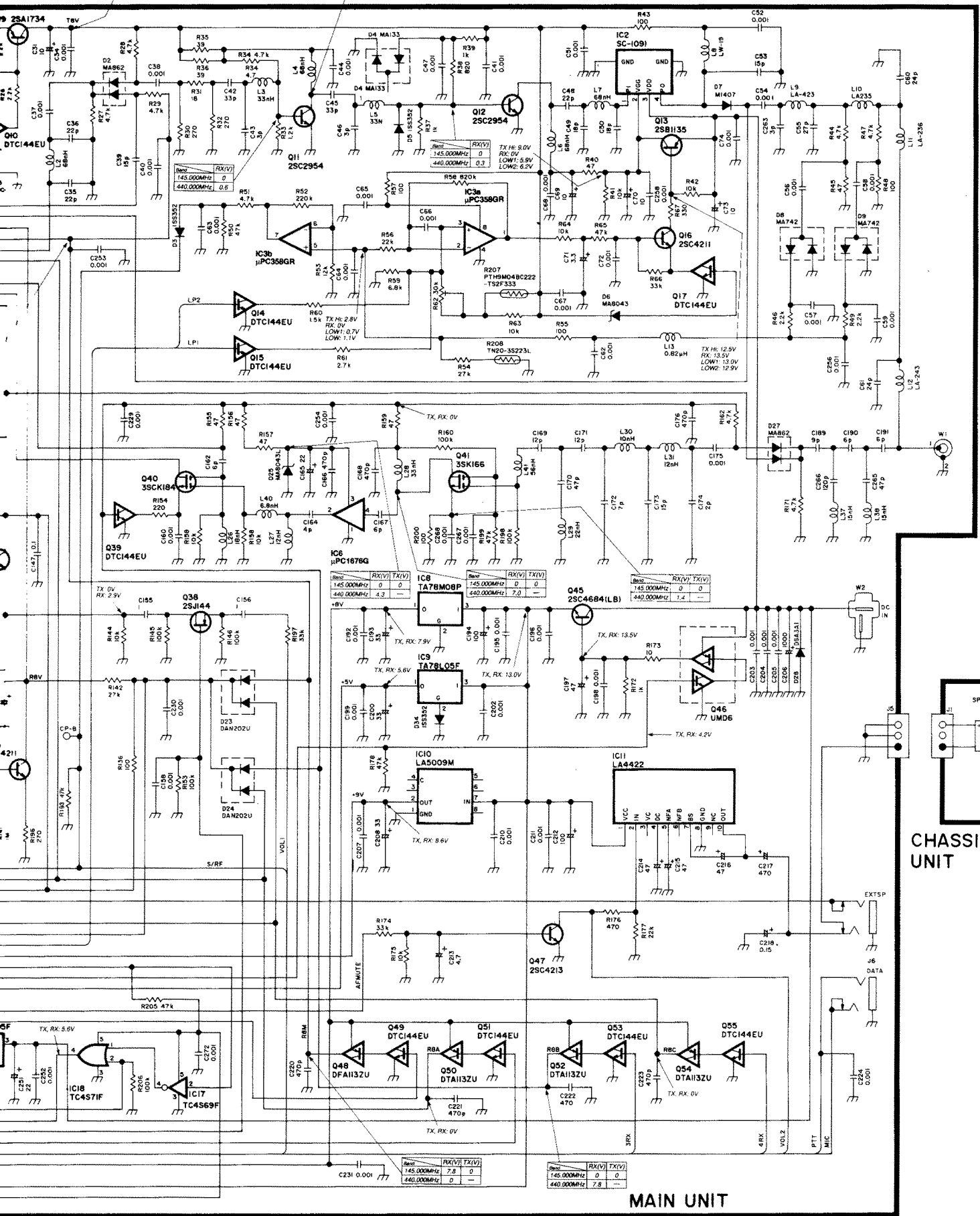
Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0

Band	RX(V)
145.000MHz	0
440.000MHz	0



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