



# SERVICE MANUAL

DUAL BAND FM TRANSCEIVER

**IC-W31A**

**IC-W31E**

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## INTRODUCTION

This service manual describes the latest service information for the IC-W31A/E DUAL BAND FM TRANSCEIVER at the time of publication.

| MODEL   | VERSION No. | VERSION   | SYMBOL |
|---------|-------------|-----------|--------|
| IC-W31E | #02         | Europe    | EUR    |
|         | #04         | Italy     | ITA    |
| IC-W31A | #05         | U.S.A.    | USA    |
|         | #07         | Australia | AUS    |
|         | #09         | 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>

|            |       |                  |         |             |           |
|------------|-------|------------------|---------|-------------|-----------|
| 1140004600 | IC    | HD404639A84FS    | IC-W31A | LOGIC UNIT  | 5 pieces  |
| 8810004370 | Screw | PH B0 M2 x 10 ZK | IC-W31A | Front panel | 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

| Version | 144 MHz band                                           | 440 MHz band                                           |
|---------|--------------------------------------------------------|--------------------------------------------------------|
| U.S.A.  | Rx:136.0–174.0 MHz* <sup>1</sup><br>Tx:144.0–148.0 MHz | Rx:400.0–470.0 MHz* <sup>2</sup><br>Tx:440.0–450.0 MHz |
| Italy   | Rx:136.0–174.0 MHz* <sup>1</sup><br>Tx:144.0–148.0 MHz | Rx:400.0–470.0 MHz* <sup>3</sup><br>Tx:430.0–440.0 MHz |
| EUR     | 144.0–146.0 MHz                                        | 430.0–440.0 MHz                                        |
| Asia    | Rx:140.0–150.0 MHz* <sup>1</sup><br>Tx:144.0–148.0 MHz | 430.0–440.0 MHz                                        |

Guaranteed ranges are: \*<sup>1</sup> 144.0–148.0 MHz

\*<sup>2</sup> 440.0–450.0 MHz

\*<sup>3</sup> 430.0–440.0 MHz

- Mode : FM (F3E)
- Number of memory channels : 98 (VHF 49 ch, UHF 49 ch)
- Frequency stability :  $\pm 5$  ppm (0 °C to +50 °C, +32 °F to +122 °F)
- Tuning steps : 5, 10, 12.5, 15, 20, 25, 30 or 50 kHz
- Antenna impedance: 50  $\Omega$  (unbalanced)
- External DC power : 4.5 to 16 V DC (negative ground)
- Current drain : at 13.5 V, typical

| CONDITION |                    | VHF                 | UHF                 |
|-----------|--------------------|---------------------|---------------------|
| Tx        | High               | 1.3 A               | 1.5 A               |
|           | Low                | 500 mA              | 600 mA              |
| 1 band Rx | Power saved        | 15 mA* <sup>4</sup> | 19 mA* <sup>4</sup> |
|           | Rated audio output | 160 mA              | 170 mA              |
| 2 band Rx | Power saved        | 28 mA* <sup>4</sup> |                     |
|           | Rated audio output | 210 mA              |                     |

\*<sup>4</sup> average value

- Usable temperature range:  
–10 °C to +60 °C (+14 °F to +140 °F)

- Dimensions (projections not included)

U.S.A. version : 57 (W) x 137 (H) x 31 (D) mm  
(with BP-180) 2.2 (W) x 5.3 (H) x 1.2 (D) in

Other versions : 57 (W) x 125 (H) x 31 (D) mm  
[with BP-170] 2.2 (W) x 4.9 (H) x 1.2 (D) in  
[or BP-171]

- Weight

U.S.A. version (with BP-180) : 365 g ; 12.9 oz

EUR, Italy, Australia versions : 340 g ; 12.0 oz  
(with BP-171)

Asia versions (with BP-170) : 330 g ; 11.7 oz

## ■ TRANSMITTER

- Output power : 5 W, 0.5 W, 15 mW (selectable)
- Modulation system : Variable reactance frequency modulation
- Max. freq. deviation\*<sup>5</sup> :  $\pm 5.0$  kHz
- Spurious emissions : Less than –60 dB
- Microphone impedance : 2 k $\Omega$

## ■ RECEIVER

- Receiver system : Double conversion superheterodyne
- Intermediate frequency : VHF 1st 43.100 MHz  
2nd 455 kHz  
: UHF 1st 35.800 MHz  
2nd 455 kHz
- Sensitivity\* : Less than 0.16  $\mu$ V  
(12 dB SINAD) Less than 0.32  $\mu$ V for V/V and U/U
- Squelch sensitivity : Less than 0.16  $\mu$ V (at threshold)
- Selectivity : More than 15 kHz/–6 dB  
Less than 30 kHz/–60 dB
- Spurious and image rejection ratio\*<sup>5</sup> : More than 50 dB  
(more than 40 dB at IF/2)
- Audio output power\*<sup>5</sup> : More than 180 mW  
(at 13.5 V) (at 10 % distortion with an 8  $\Omega$  load)
- Audio output impedance : 8  $\Omega$

\*<sup>5</sup> Specifications guaranteed at a transceiver temperature of +25 °C (+77 °F).

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



## SECTION 2 DISASSEMBLY INSTRUCTIONS

### ● Removing the rear panel

- ① Remove the 4 screws, (A) (black, 2 mm), and 2 screws, (B) (silver, 2 mm), to separate front and rear panel as shown below.

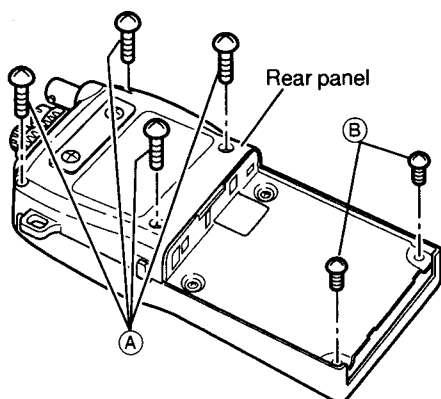


Fig. 1 Removing the rear panel

### ● Removing the 2F unit

- ③ Unsolder the point (E), and remove 2 nuts (F) (black).
- ④ Remove 4 screws, (D) (silver, 2 mm), to separate the rear plate as shown Fig. 3.
- ⑤ Remove 3 screws, (G) (silver, 1.4 mm), to separate the contact base and rear panel. Take off the contact base in the direction of the arrow.
- ⑥ Remove 2 screws, (H) (silver, 2 mm), and unplug J4 – J7 on the bottom side, to separate 2F and 1F units.

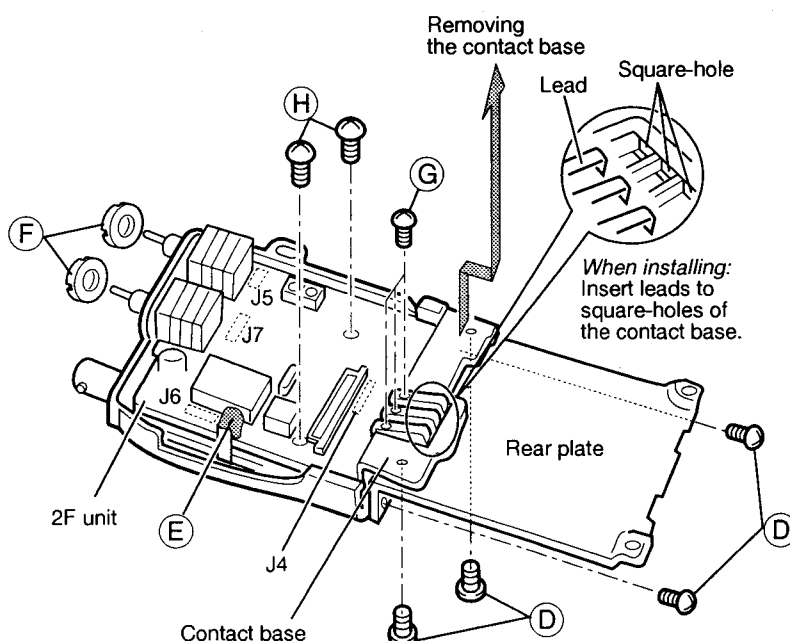


Fig. 3 Removing the 2F unit

### ● Removing the LOGIC unit

- ② Unplug J4 to separate front and rear panel then remove 3 screws, (C) (silver, 2 mm), and unsolder speaker leads.

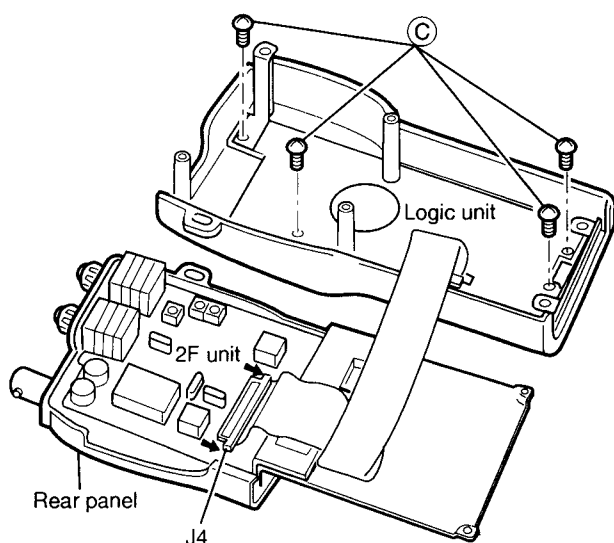


Fig. 2 Removing the LOGIC unit

### ● Removing the 1F unit

- ⑦ Remove 3 screws, (I) (nickel, 2 mm), and 1 screw, (J) (black, 2 mm), 1 nut (K) (incl. antenna connector unit), to separate the 1F unit.

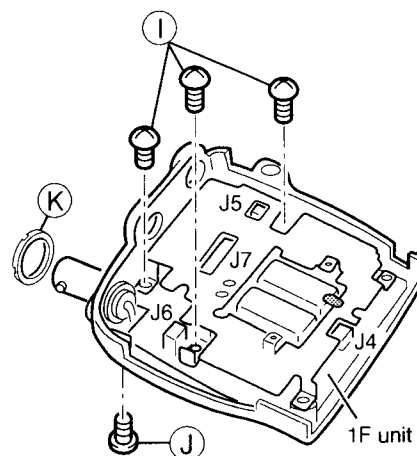
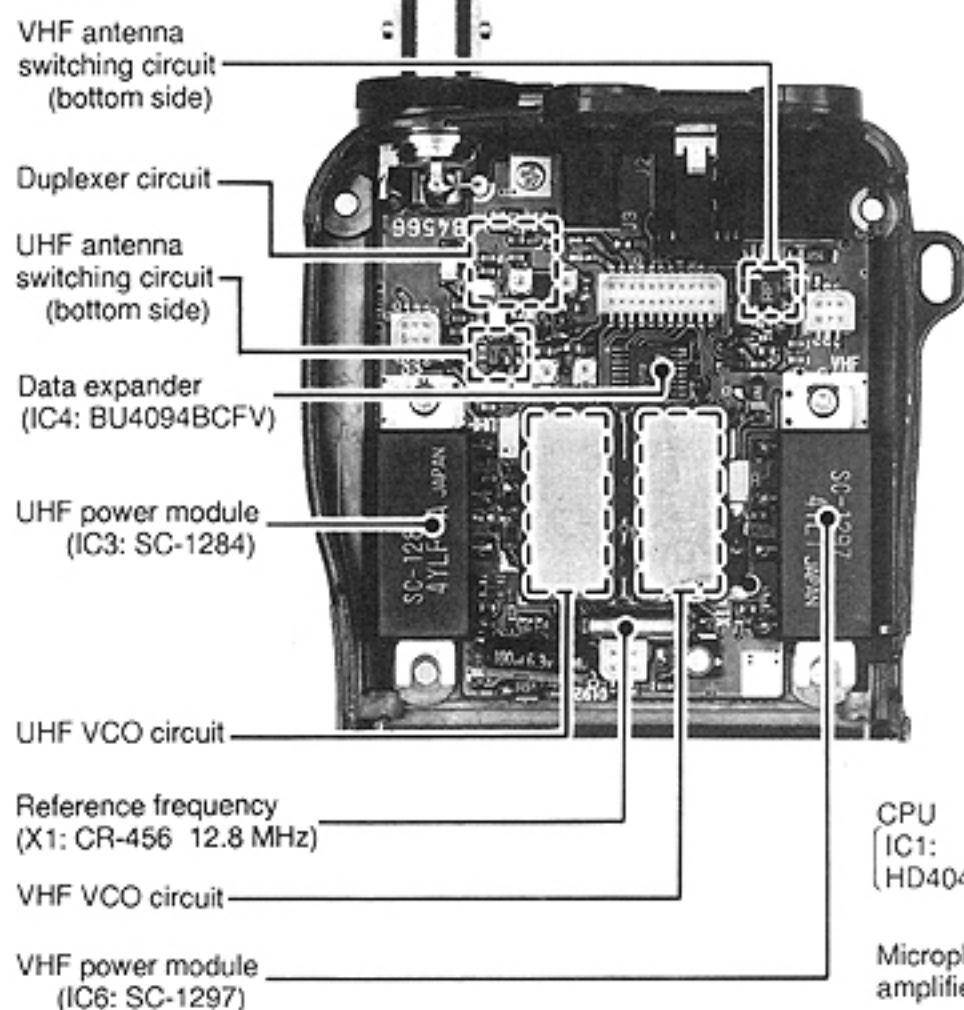


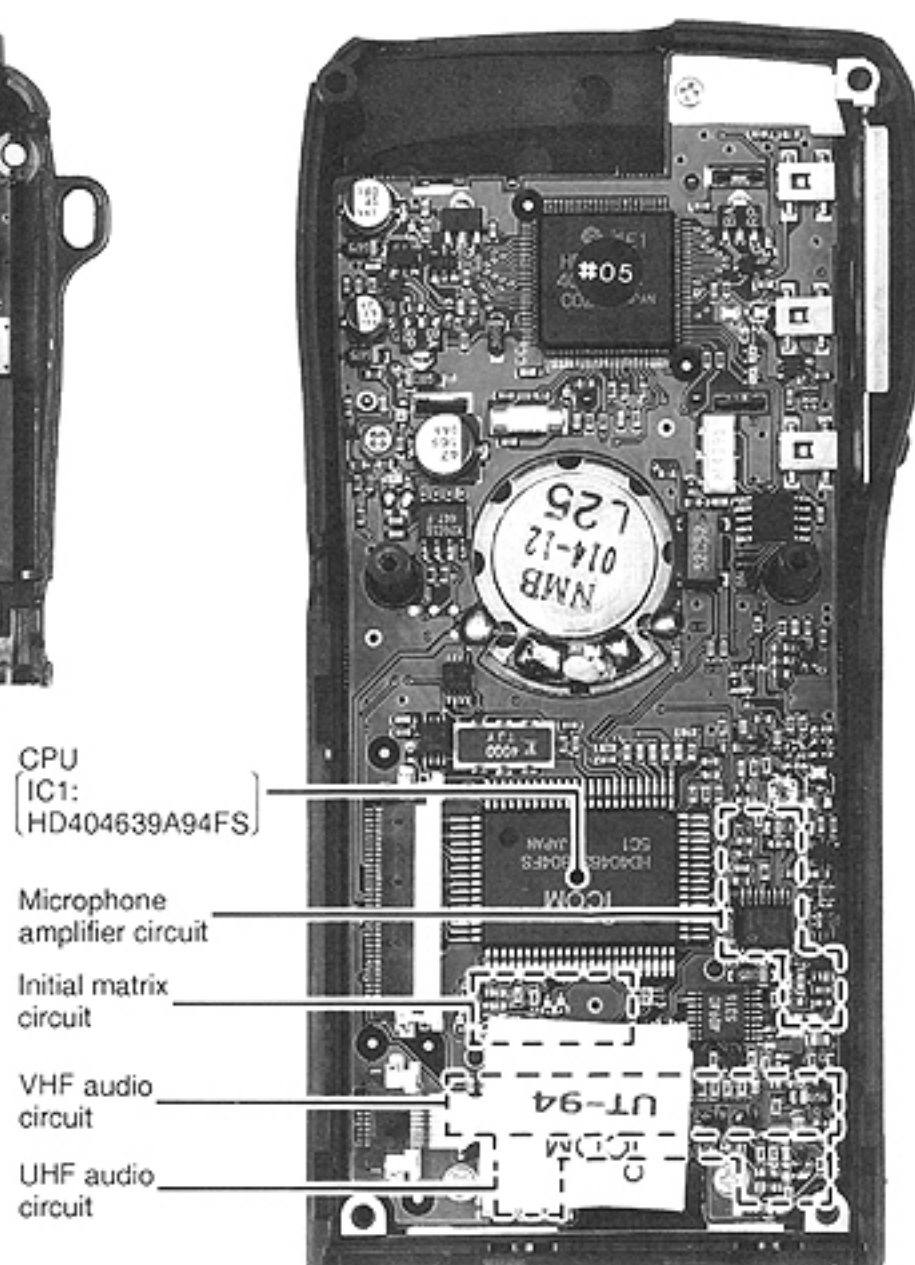
Fig. 4 Removing the 1F unit

## SECTION 3 INSIDE VIEWS

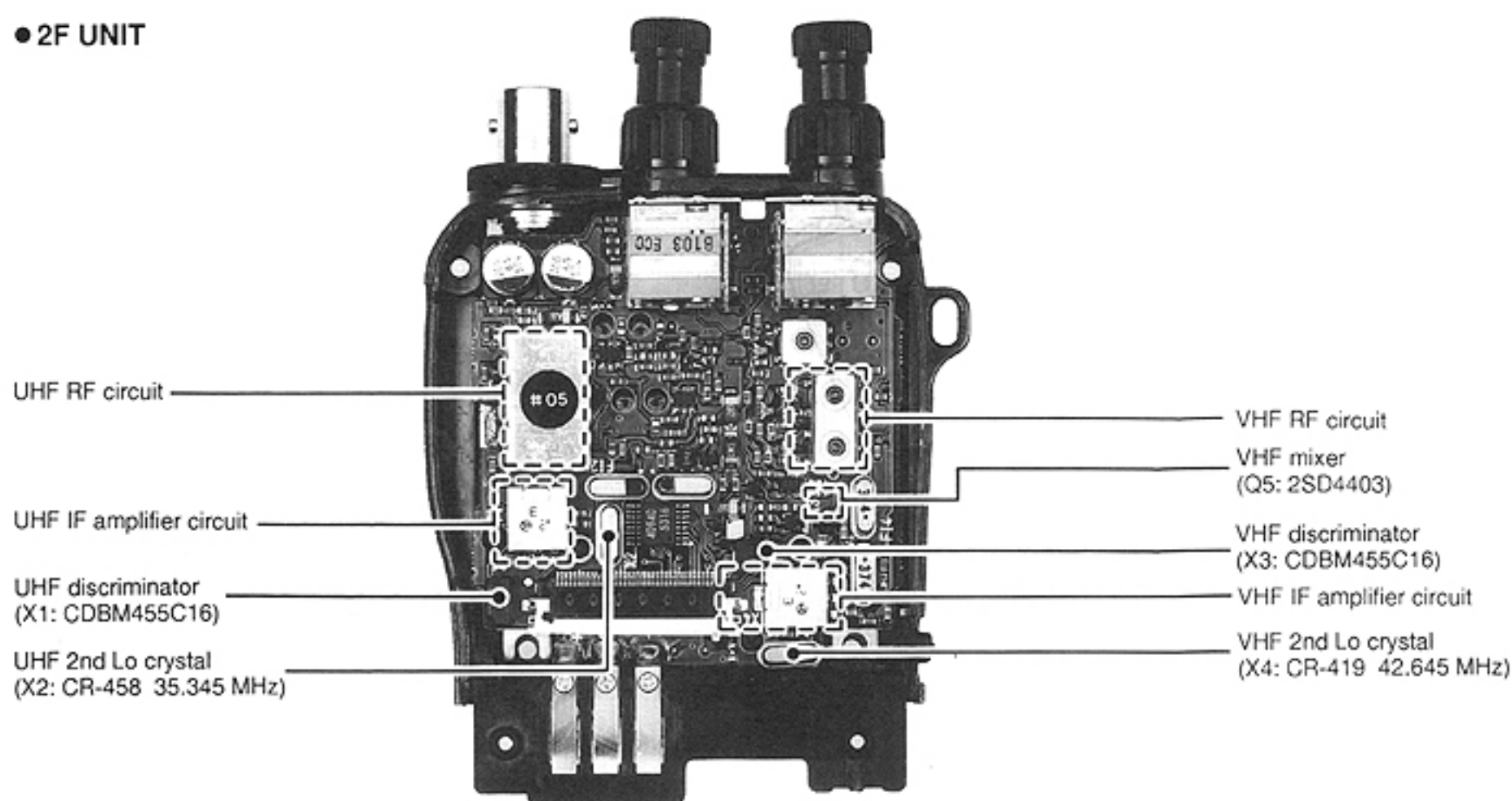
### • 1F UNIT



### • LOGIC UNIT



### • 2F UNIT



## SECTION 4 CIRCUIT DESCRIPTION

### 4-1 RECEIVER CIRCUITS

#### 4-1-1 DUPLEXER CIRCUIT (1F UNIT)

The transceiver has a duplexer (low-pass and high-pass filters) on the first stage from the antenna connector to separate the signals into VHF and UHF signals. The low-pass filter (L14–L16, C53–C58) for VHF signals and the high-pass filter (C48, C49, C147, C148, L11, L12) for UHF signals. The separated signals are applied to each RF circuit.

#### 4-1-2 VHF ANTENNA SWITCHING CIRCUIT (1F UNIT)

The antenna switching circuit functions as a low-pass filter while receiving. However, its impedance becomes very high while transmitting by grounding cathode of D37 and D38. Thus, transmit signals are blocked from entering the receiver circuits. The antenna switching circuit employs a  $1/4\lambda$  type diode switching system. The passed signals are then applied to the RF amplifier circuit on the 2F unit.

#### 4-1-3 VHF RF CIRCUIT (2F UNIT)

The RF circuit amplifies signals within the range of frequency coverage and filters out-of-band signals.

The signals from the antenna switching circuit pass through a band-pass filter (L10, D15), and are applied to the RF amplifier (Q18, Q19). The RF amplifier consists of a cascade circuit. The amplified signals are passed through the next stage band-pass filter (L8, L9, D12, D13) to suppress unwanted signals. The filtered signals are then applied to the mixer circuit (Q13).

D12 and D13 track the band-pass filters and are controlled by the PLL lock voltage. These diodes tune the center frequency of an RF passband for wide bandwidth receiving and good image response rejection.

#### 4-1-4 VHF 1ST MIXER AND 1ST IF CIRCUITS (2F UNIT)

The 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 mixer.

The signals from the VHF RF circuit are mixed with the VLO signal at the 1st mixer (Q13) to produce a 43.10 MHz 1st IF signal.

The 1st IF signal is applied to a pair of crystal filters (FI4) to suppress out-of-band signals. The 1st IF signal is amplified at the IF amplifier (Q10) and applied to the 2nd mixer circuit (IC2).

#### 4-1-5 V/V FUNCTION CIRCUIT

During the V/V function, VHF RF signals are applied to the UHF mixer (Q5) as well as the VHF mixer.

When the V/V function is activated, Q4 is turned ON, thus the VHF RF signals are entered to the UHF mixer via D10.

Q5 mixes doubled VCO output and RF signals for UHF receiving, however, direct VCO components are used for VHF receiving.

#### 4-1-6 VHF 2ND IF AND DEMODULATOR CIRCUITS (2F 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 the FI4 is amplified at Q10 and is applied to the 2nd mixer section of IC2 (pin 16), and is mixed with the 2nd LO signal to be converted to a 455 kHz 2nd IF signal.

IC2 contains the 2nd mixer, 2nd local oscillator, limiter amplifier, S-meter detector and quadrature detector circuits. The 2nd local oscillator section and X4 generate 42.645 MHz for the 2nd LO signal.

The 2nd IF signal (455 kHz) from the 2nd mixer (IC2 pin 3) passes through the ceramic filter (FI3) where unwanted signals are suppressed. It is then amplified at the limiter amplifier section (IC2 pin 5) and applied to the quadrature detector section (IC2 pin 8 and ceramic discriminator X3) to demodulate the 2nd IF signal into AF signals.

AF signals output from IC2 (pin 9) are applied to the AF amplifier (2F unit IC6), through the LOGIC unit. The S-meter output "L SD" signal from IC2 (pin 13) is applied to the CPU (IC1 pin 4). See Figure 1.

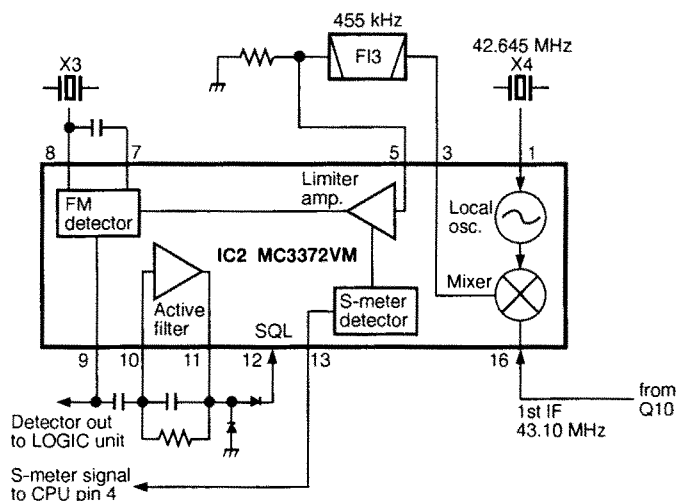


Fig. 1 VHF 2ND IF AMPLIFIER

#### 4-1-7 VHF AF AMPLIFIER CIRCUIT (LOGIC AND 2F UNITS)

The AF amplifier circuit, including an AF mute switch, amplifies the demodulated signal to drive a speaker.

AF signals are applied to Q19 on the LOGIC unit. Q19 (pins 2 – 4) is an active filter that functions as a high-pass filter to suppress subaudible tone signals for tone squelch operation. Q19 (pins 1, 5, 6) is also an active filter that functions as a low-pass filter to suppress higher noise signals.

The filtered signals are amplified at Q21 after passing through the AF mute switch (Q18) and the volume control circuit (Q12, Q13).

IC9 converts from the serial data of the CPU (IC1) to the parallel data. Those parallel data controls the attenuation level of Q10–Q13 for the volume control.

#### 4-1-8 VHF NOISE SQUELCH (2F UNIT)

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

Some of the noise components in the AF signal from IC2 (2F unit pin 9) are applied to the active filter section (IC2 pin 10, pin 11). The [VHF SQL] control on the V VR board adjusts the IC2 input level.

The active filter section amplifies noise components of frequencies of 20 kHz and above. Output signals are rectified by D25 for conversion to DC voltage.

The rectified voltage triggers the squelch switch section (IC2 pin 12). The squelch switch section sets the "LBUSY" line "HIGH/LOW" to apply the signal to the CPU (IC1 pin 49) on the LOGIC unit. Then the CPU outputs the L RMUTE.

The LRMUTE signal, activates the AF mute circuit (Q18) on the LOGIC unit to cut the VHF AF signals.

#### 4-1-9 AF POWER AMPLIFIER CIRCUIT (2F UNIT)

Audio signals for the VHF band are combined with audio signals for the UHF band and are then applied to IC6 pin 6 on the 2F unit. When no plug is connected to the [EXT SP] jack, the amplified audio signals are fed back to the AF power amplifier (IC6, pin 7) and are then applied to the internal speaker.

The voltage regulator (Q30, Q31) supplies power to the AF power amplifier. The AF ON signal from the CPU (LOGIC unit IC1) controls Q30 (2F unit) to reduce the current drain while the squelch is closed.

#### 4-1-10 UHF RF CIRCUIT (1F AND 2F UNITS)

UHF band signals from the antenna connector pass through the high-pass filter (L11 – L13, C48 – C50), low-pass filter (L9, L10, L36, C43 – C447, C197) and the antenna switching circuit (D18, D19, L5).

The UHF RF signals are applied to the 2F unit and are then amplified at the RF amplifiers (Q1, IC1). Saw filters (F11, F12) are used at the last stage of these amplifiers.

#### 4-1-11 UHF 1ST MIXER AND 1ST IF CIRCUITS (2F UNIT)

The filtered signals are mixed at Q5 with a ULO signal to produce a 35.8 MHz 1st IF signal.

The 1st IF signal passes through the pair of crystal filters (F12) and is then amplified at Q1 and applied to the FM IF IC (IC1 pin 16).

#### 4-1-12 U/U FUNCTION CIRCUIT

During the U/U function, UHF RF signals are applied to the VHF mixer (Q13) parallel with the UHF mixer.

When the U/U function is activated, Q25 is turned ON, thus the UHF RF signals are amplified at IC7, and then applied to the VHF mixer.

Q13 mixes the UHF RF signals and doubled components of VHF PLL output to produce a 43.10 MHz IF signal.

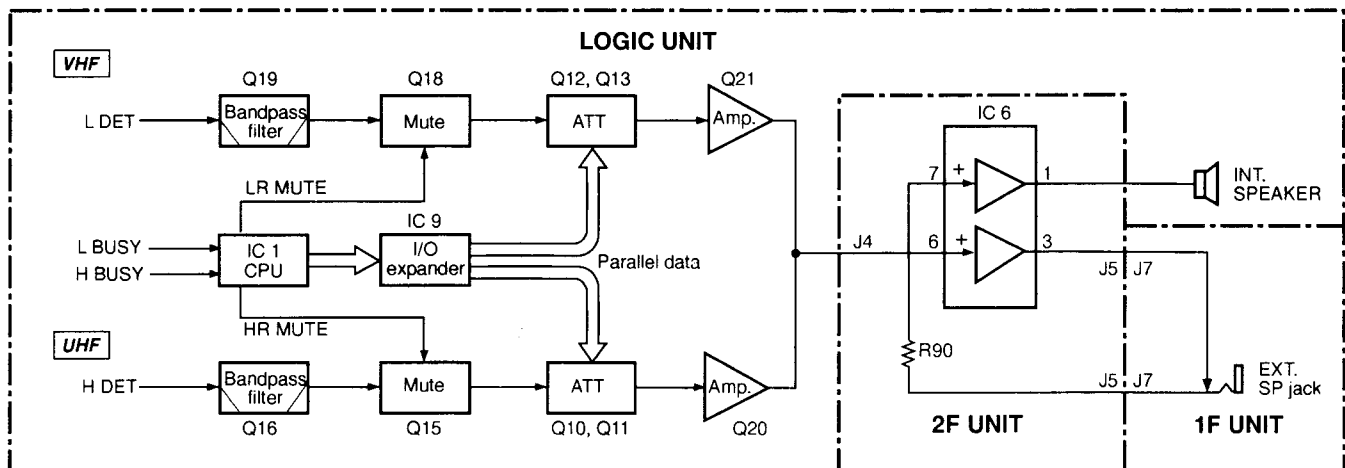


Fig. 2 AF SIGNAL LINE

#### 4-1-13 UHF 2ND IF AND DEMODULATOR CIRCUITS (2F UNIT)

A 2nd mixer, 2nd IF, 2nd local oscillator, limiter amplifier, quadrature detector circuit and S-meter detector circuit are incorporated in IC1. The 2nd local oscillator section and X2 generate a 35.345 MHz for the 2nd LO signal.

A 35.8 MHz IF signal is mixed with the 2nd Lo signal to produce the 2nd IF signal (455 kHz) at IC1. The 2nd IF signal from pin 3 is applied to pin 5 through the ceramic filter (F11) and is amplified at the limiter amplifier section in IC1. It is then applied to the quadrature detector section (IC1 pin 8 and ceramic discriminator X1) to demodulate the 2nd IF signal into AF signals.

The signals are output from IC1 (pin 9) as an "HDET" signal and then applied to the AF circuit (LOGIC unit).

The S-meter output "H SD" signal is applied to the CPU (IC1 pin 3) on the LOGIC unit from the FM IF IC (IC1 pin 13).

#### 4-1-14 UHF AF CIRCUIT (LOGIC UNIT)

The "HDET" signals (AF signals) from the FM IF IC (IC1 pin 9) are applied to the active filter (Q16) on the LOGIC unit. The filtered signals pass through the AF mute switch (Q15) and the volume control (Q10, Q11). The signals are amplified at Q20 and are then combined with audio signals with the VHF band audio.

#### 4-1-15 UHF SQUELCH CIRCUIT (2F UNIT)

Some of the noise components in the AF signal from IC1 (pin 9) are applied to the active filter section (IC1 pins 10 and 11). The [UHF SQL] control on the U VR board adjusts the IC1 input level. IC1 amplifies noise components and D1 rectifies them for conversion to DC voltage.

The rectified voltage triggers the squelch switch section (IC1 pin 12). The squelch switch controls the "HBUSY" signal to inform the CPU (IC1 pin 47) on the LOGIC unit.

### 4-2 TRANSMITTER CIRCUITS

#### 4-2-1 MICROPHONE AMPLIFIER CIRCUIT (LOGIC UNIT)

The microphone amplifier circuit amplifies audio signals with +6 dB/octave pre-emphasis from the microphone to a level needed for the modulation circuit. The microphone amplifier circuit is used for both the VHF and UHF bands.

The AF signals from the built-in condenser microphone, or from the [MIC] jack are applied to the microphone amplifier (IC10 pin 16).

The output signals from IC10 (pin 8) pass through the low-pass filter (C76, C78, R111, R112) where signal components greater than 3 kHz are attenuated. The signals are applied to the VHF VCO or UHF VCO circuit in the 1F unit.

#### 4-2-2 VHF MODULATION CIRCUIT (V VCO BOARD)

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

The "V MOD" signal changes the reactance of a diode (D1) to modulate the oscillated signal at the VHF VCO circuit (Q1, Q2, D1). The VCO output is buffer-amplified at Q3 and Q28 on the 1F unit and is then applied to the transmit/receive switching circuit (D24, D25) on the 1F unit.

#### 4-2-3 VHF POWER AMPLIFIER CIRCUIT (1F UNIT)

IC6 is a power module which provides more than 5 W of output power with a 13.5 V DC power source.

An RF signal from the transmit/receive switching circuit (D25) is amplified at the drive amplifiers (Q29, Q31) and then applied to IC6. The amplified signal is then applied to the antenna connector via the transmit/receive switching circuit (D39) and duplexer.

When E LOW power is selected, the output of the drive amplifier (Q31) bypasses the power module (IC6) through D30 and D32.

#### 4-2-4 VHF APC CIRCUIT (1F UNIT)

The APC circuit protects the power module (IC6) from a mismatched output load and selects HIGH, LOW1 or LOW2 output power.

The APC detector circuit (L21, D34 – D36) detects forward signals and rectified signals at D35 and D36 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 one of the differential amplifier inputs (Q25). When the antenna impedance is mismatched, the detected voltage exceeds the reference voltage. Thus the bias voltage of IC6 is decreased via Q13.

Low output power is obtained by changing the reference voltage (Q25 base) coming from IC4 pin 7. A thermistor (R93) controls APC reference voltage to reduce the output power when the temperature is increased.

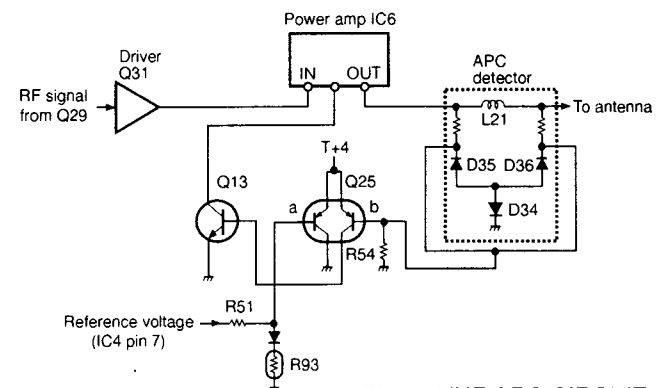


Fig. 3 VHF APC CIRCUIT

#### 4-2-7 UHF MODULATION CIRCUIT (UHF VCO BOARD)

The audio signals from the microphone amplifier circuit (described in Section 4-2-1) are applied to D3 on the UHF VCO board.

The audio signals change the reactance of D3 to modulate the oscillated signal (200 MHz band) at the UHF VCO circuit (Q1, Q2). The oscillated signal is amplified at Q3 and doubled at Q1 (UHF VCO2F board). The signal (400 MHz band) is amplified at the buffer amplifier (1F unit Q4) and then applied to the drive amplifiers (Q8, Q9).

#### 4-2-8 UHF POWER AMPLIFIER CIRCUIT (1F UNIT)

IC3 is a power module which provides a stable 5 W (DC 13.5 V) of output power.

The drive amplifier (Q8, Q9) and power amplifier (IC3) amplify the VCO oscillating signal to an output level. The output signal passes through the APC detector circuit (L20, D20, D21) and duplexer, and is applied to the antenna connector.

#### 4-2-9 UHF APC CIRCUIT (1F UNIT)

The APC circuit detects the output signal from the UHF power module on the 1F unit. Q25 compares the voltages detected by the APC detector and the reference voltages. When a voltage detected by APC exceeds a reference voltage, Q25 controls bias voltage of IC3 via Q13 to reduce the RF output power.

### 4-3 PLL CIRCUITS

#### 4-3-1 VHF PLL CIRCUIT (1F UNIT)

The oscillated signal at the VHF VCO circuit (VHF VCO board Q1, Q2) is amplified at Q27 and then applied to the PLL IC (IC5 pin 19). IC5 divides this input with the serial data from the CPU and phase-detects it with the divided reference frequency and then outputs the phase difference as pulses.

The output signals from IC5 (pin 13) are converted to DC voltages (lock voltage) by the loop filter (R58, C104) and are then fed back to the VCO circuit to stabilize the VCO frequency.

The DC voltage is also applied to the receiver turned bandpass filters as a "VTUNE" signal.

#### 4-3-2 UHF PLL CIRCUITS (1F UNIT)

The oscillated signal at the UHF VCO circuit (UHF VCO board Q1, Q2, D2) is amplified at Q3 and then applied to the UHF VCO 2F board.

The signal is doubled on the board to obtain 370 – 380 MHz frequency. The doubled signal is applied to the PLL IC (IC1 pin 19).

IC1 divides this input with the serial data from the CPU and phase-detects it with the reference frequency from IC5 and then outputs the phase difference as pulses.

The output signals from IC1 (pin 13) are converted to DC voltage (lock voltage) by the loop filter (R1 – R3, C1 – C3) and are then fed back to the VCO circuit to stabilize the VCO frequency.

The oscillated signal is doubled for UHF transmit and receiver circuits or bypassed the doubler circuit for V/V function.

### 4-4 OTHER CIRCUITS

#### 4-4-1 TONE SQUELCH UNIT (U.S.A. version only: TSQL UNIT)

The TSQL UNIT provides pocket beep, tone squelch and programmable tone encoder functions.

##### ENCODER FUNCTION

The serial data from the CPU (LOGIC unit IC1) is applied to IC1. The tone signal reply to the data signal is output from IC1 (pin 21) and is applied to R9. R9 adjusts the deviation level.

##### DECODER FUNCTION

The DET signal line is applied to the active low-pass filter between pin 1 and pin 2 within IC1. The filtered signal is compared with the programmed tone signal. Pin 14 of IC1 becomes "LOW" when the received signal matches to the programmed tone frequency. One of AF decoder signals (LED and HDET) are switched at IC12 (LOGIC unit), then applied to the TONE SQUELCH unit as a "DET" signal.

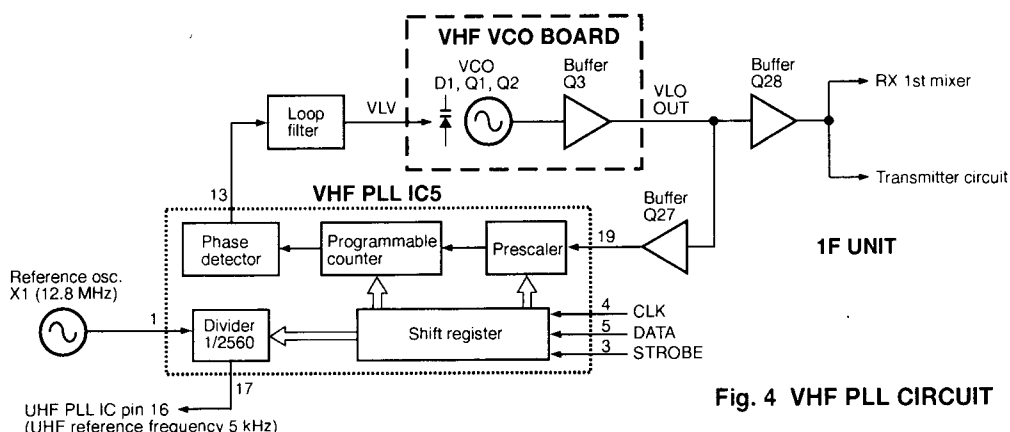


Fig. 4 VHF PLL CIRCUIT

## 4-5 PORT ALLOCATIONS

### 4-5-1 CPU (LOGIC UNIT)

| Pin number | Port name | Description                                                                                              |
|------------|-----------|----------------------------------------------------------------------------------------------------------|
| 1          | BATT      | Input port for the CPU power source.                                                                     |
| 2          | REMOTE    | Input port for optional speaker-microphones remote control signal.                                       |
| 3          | HSD       | Input port for a UHF S-meter detection signal.                                                           |
| 4          | LSD       | Input port for a VHF S-meter detection signal.                                                           |
| 7, 8       | OSC1, 2   | Clock oscillator terminals for a CPU clock.                                                              |
| 9          | RESET     | CPU is initialized when this port receives "HIGH."                                                       |
| 10, 11     | X1, X2    | Clock oscillator terminals for clock/timer function.                                                     |
| 13         | AFON      | Outputs an AF power amplifier control signal.<br>"HIGH": AF amp activates.<br>"LOW": AF amp deactivates. |
| 14         | HPLST     | Outputs a strobe signal to the UHF PLL IC (1F unit, IC1).                                                |
| 15         | HDATA     | Outputs a serial data for the UHF PLL IC (1F unit, IC1).                                                 |
| 16         | HCK       | Outputs a serial clock signal to the UHF PLL IC (1F unit, IC1).                                          |
| 17         | LIOST     | Outputs a strobe signal to the VHF band's data expander (1F unit, IC4).                                  |
| 18         | LDATA     | Outputs serial data for the VHF band.                                                                    |
| 19         | LCK       | Outputs a serial clock signal for the VHF band's data, expander (1F unit, IC4) and the VHF PLL IC.       |
| 20         | BUSY LED  | Outputs the receive LED signal (VHF band).                                                               |
| 21         | PTT       | Input port for the [PTT] switch.<br>"HIGH": [PTT] is pushed.                                             |
| 22         | EDATA     | Outputs a serial data for the EEPROM (IC3).                                                              |
| 23         | ECK       | Outputs a serial clock signal for the EEPROM (IC3).                                                      |
| 24         | LPLST     | Outputs a strobe signal to the VHF PLL IC (1F unit, IC5).                                                |
| 25         | STOPC     | Input port for the [POWER] switch.                                                                       |
| 26         | STD       | Input port for detection of a DTMF decoder.                                                              |
| 27         | INT       | CPU enters back up mode when this port receives "LOW."                                                   |
| 28         | MSTI      | Data bus for the SUB CPU.                                                                                |
| 29         | LDCK      | Input port for the VHF dial clock signal.                                                                |
| 30         | HDCK      | Input port for the UHF dial clock signal.                                                                |
| 31         | LDDN      | Input port for the VHF dial down signal.                                                                 |
| 32         | HDUP      | Input port for the UHF dial up signal.                                                                   |
| 33         | HDDN      | Input port for the UHF dial down signal.                                                                 |
| 34         | LDUP      | Input port for the VHF dial up signal.                                                                   |

| Pin number | Port name        | Description                                                                                       |
|------------|------------------|---------------------------------------------------------------------------------------------------|
| 35         | KEY              | Inputport for [FUNC], [BAND], [LIGHT] and [VOL] switch with different voltage.                    |
| 36         | DPD              | Outputs a DTMF decoder power control signal.                                                      |
| 37         | DCK              | Outputs a serial clock signal for the DTMF decoder (IC4).                                         |
| 38         | DDATA            | Input port for DTMF decoder data from IC4.                                                        |
| 39         | HUL              | Input port for the UHF PLL unlock signal<br>"HIGH": When PLL is unlocked.                         |
| 40         | LUL              | Input port for the VHF PLL unlock signal<br>"HIGH": When PLL is unlocked.                         |
| 41         | LTXC             | Outputs VHF transmit control signal.                                                              |
| 42         | HTXC             | Outputs UHF transmit control signal.                                                              |
| 43-45      | K1, RTSST, RIOST | Output strobe signals to the initial matrix.                                                      |
| 46         | MSTO             | Data bus line for the SUB CPU.                                                                    |
| 47         | H BUSY           | Input port for the UHF noise squelch condition.<br>"HIGH": Squelch close.<br>"LOW": Squelch open. |
| 48         | RCK              | Outputs a serial clock signal to I/O expanders (LOGIC unit IC9, 2F unit IC5).                     |
| 49         | L BUSY           | Input port for the VHF noise squelch condition.<br>"HIGH": Squelch close.<br>"LOW": Squelch open. |
| 50         | RDATA            | Outputs a serial data to I/O expanders (LOGIC unit IC9, 2F unit IC5).                             |
| 51-54      | KR0-KR3          | Input port for the key matrix.                                                                    |
| 55-59      | KS0-KS4          | Outputs strobe signals to the key matrix.                                                         |
| 60         | PCON             | Outputs the power save control signal.<br>"LOW": When the circuits are idled.                     |
| 61         | TCALL            | Outputs a 1750 Hz tone burst signal.                                                              |
| 62         | TBSEL            | Outputs a tone squelch unit audio input selector signal.                                          |
| 63         | MICM             | Outputs a microphone mute signal.<br>"HIGH": Mic mute                                             |
| 64         | MICC             | Outputs a microphone amplifier control signal.                                                    |
| 65         | LRMUT            | Outputs a VHF band audio mute signal.                                                             |
| 66         | HRMUT            | Outputs a UHF band audio mute signal.                                                             |
| 70         | TSQL             | Input port for tone squelch decoder signal. "LOW" when matched tone is received.                  |
| 71-75      | DA0-DA4          | Output reference voltage control signal for a meter.                                              |
| 77, 78     | TONE C, TONE R   | Output DTMF row and column signals.                                                               |

## 4-5-2 I/O EXPANDERS

### ● 1F UNIT IC4

| Pin number | Port name | Description                                                                                           |
|------------|-----------|-------------------------------------------------------------------------------------------------------|
| 4          | U3SC      | Outputs a power save control signal for the UHF band.<br>"HIGH" : When the circuits are idled.        |
| 5          | UELOW     | Outputs an E LOW power control signal for the UHF band.<br>"LOW" : When E LOW is selected.            |
| 6          | U SHIFT   | Outputs a UHF VCO switching signal.<br>"LOW" : During transmission.                                   |
| 7          | H/L       | Outputs a RF power selection signal.<br>"HIGH" : When high power is selected.                         |
| 11         | VV3SC     | Outputs a power save control signal during the V/V function.<br>"HIGH" : When the circuits are idled. |
| 12         | VELO      | Outputs an E LOW power control signal for the VHF band.<br>"LOW" : When E LOW is selected.            |
| 13         | V SHIFT   | Outputs a VHF VCO switching signal.<br>"HIGH" : During transmission.                                  |
| 14         | V3SC      | Outputs a power save control signal for the VHF band.<br>"HIGH" : When the circuits are idled.        |



## SECTION 5 ADJUSTMENT PROCEDURES

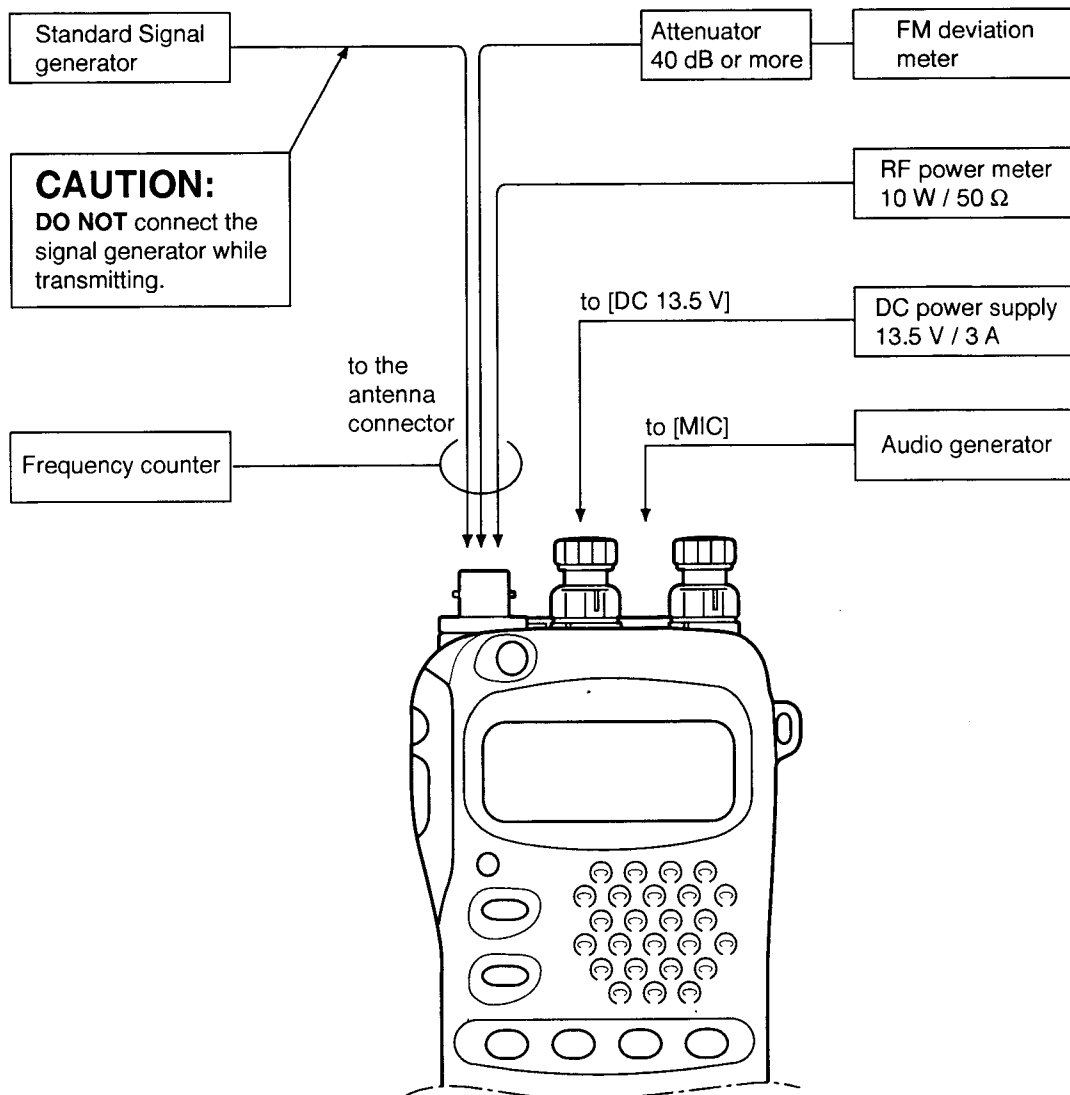
### 5-1 PREPARATION BEFORE SERVICING

#### ■ REQUIRED TEST EQUIPMENT

| EQUIPMENT                        | GRADE AND RANGE                                                                                                       | EQUIPMENT                       | GRADE AND RANGE                                                                           |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------|
| DC power supply                  | Output voltage : 13.5 V DC<br>Current capacity : 3 A or more                                                          | Standard signal generator (SSG) | Frequency range : 100–470 MHz<br>Output level : –127 to –17 dBm<br>(0.1 $\mu$ V to 32 mV) |
| RF power meter (terminated type) | Measuring range : 1–10 W<br>Frequency range : 100–500 MHz<br>Input impedance : 50 $\Omega$<br>SWR : 1.2 : 1 or better | DC voltmeter                    | Input impedance : 50 k $\Omega$ /V DC or better                                           |
| Frequency counter                | Frequency range : 100–470 MHz<br>Frequency accuracy : $\pm$ 1 ppm or better<br>Sensitivity : 100 mV or better         | Audio generator (AG)            | Frequency range : 300–3000 Hz<br>Measuring range : 1–500 mV                               |
| Oscilloscope                     | Frequency range : DC–20 MHz<br>Output range : 0.01–10 V                                                               | Attenuator                      | Attenuation : 40 dB or more<br>Capacity : 10 W or more                                    |
|                                  |                                                                                                                       | FM deviation meter              | Frequency minimum : 470 MHz<br>Measuring range : 0 to $\pm$ 10 kHz                        |

CW: Clockwise  
CCW: Counterclockwise

#### ■ CONNECTIONS



## 5-2 PLL ADJUSTMENT

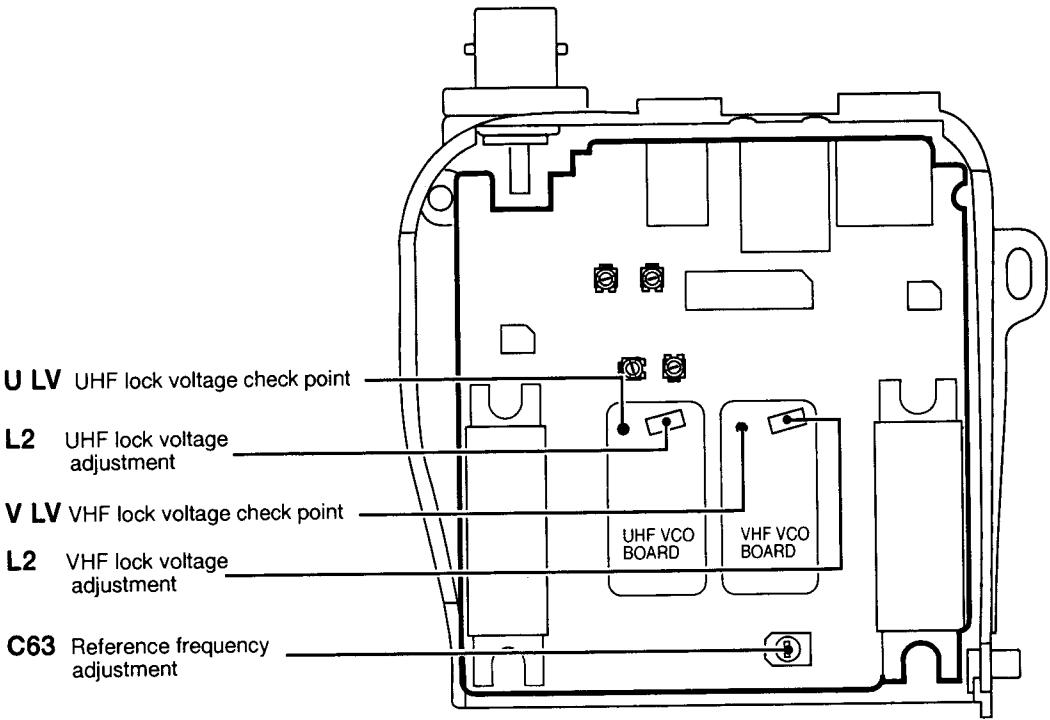
| ADJUSTMENT          |   | ADJUSTMENT CONDITIONS                                                                                                                                                                                                         | MEASUREMENT |                                                                | VALUE                                                             | ADJUSTMENT POINT |        |
|---------------------|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------|-------------------------------------------------------------------|------------------|--------|
|                     |   |                                                                                                                                                                                                                               | UNIT        | LOCATION                                                       |                                                                   | UNIT             | ADJUST |
| VHF LOCK VOLTAGE    | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 145.000 MHz</li> <li>Adjust either the transmit lock voltage or receive lock voltage.</li> </ul>                                                                  | VHF VCO     | Connect the DC voltmeter to the point, "V LV."                 | 1.4 V $\pm$ 0.3 V (Transmitting)<br>1.3 V $\pm$ 0.3 V (Receiving) | VHF VCO          | L2     |
| UHF LOCK VOLTAGE    | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 440.000 MHz (USA)<br/>430.000 MHz (All other versions)</li> <li>Adjust either the transmit lock voltage or receive lock voltage (whichever is higher).</li> </ul> | UHF VCO     | Connect the DC voltmeter to the point, "U LV."                 | 1.9 V $\pm$ 0.3 V (USA)<br>1.5 V $\pm$ 0.3 V (All other versions) | UHF VCO          | L2     |
| REFERENCE FREQUENCY | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 440.000 MHz</li> <li>Transmitting</li> </ul>                                                                                                                      | Top panel   | Loosely couple the frequency counter to the antenna connector. | 440.000 MHz                                                       | 1F               | C63    |

## 5-3 RECEIVER ADJUSTMENT

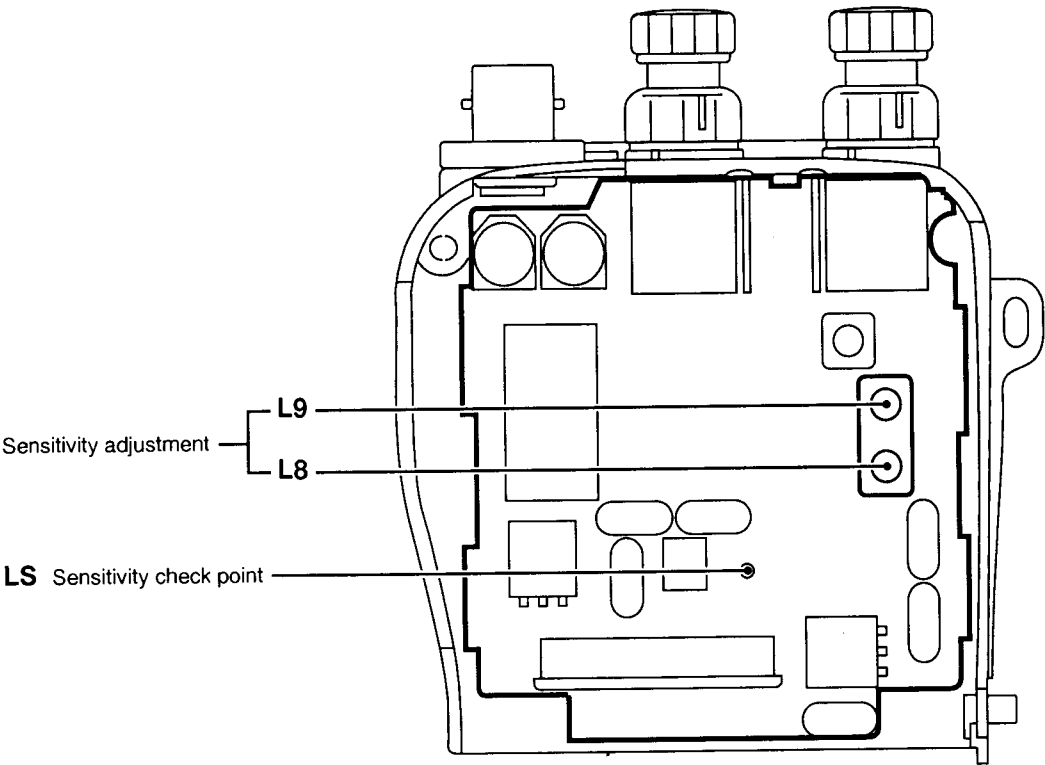
| ADJUSTMENT  |   | ADJUSTMENT CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MEASUREMENT |                                               | VALUE                                              | ADJUSTMENT POINT                                                                                                                          |                           |
|-------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|             |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | UNIT        | LOCATION                                      |                                                    | UNIT                                                                                                                                      | ADJUST                    |
| SENSITIVITY | 1 | <ul style="list-style-type: none"> <li>Displayed frequency : 145.000 MHz</li> <li>Connect the SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Level : 1.0 <math>\mu</math>V* (–107 dBm)</li> <li>Modulation : 1 kHz</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> </ul> </li> <li>[VHF SQL] control : CCW</li> <li>Receiving</li> </ul>                                                                                                                                  | 2F          | Connect the oscilloscope to the point, "LSD." | Maximum DC voltage                                 | 2F                                                                                                                                        | Adjust in sequence L9, L8 |
|             |   | NOTE : The transceiver has no adjustment points for the UHF sensitivity.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |                                               |                                                    |                                                                                                                                           |                           |
| S-METER     | 1 | <ul style="list-style-type: none"> <li>VHF displayed frequency: 145.000 MHz</li> <li>UHF displayed frequency: 443.000 MHz (USA)<br/>433.000 MHz (All other versions)</li> <li>Connect the SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Level : 0.5 <math>\mu</math>V (–113 dBm)</li> <li>Modulation : 1 kHz</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> </ul> </li> <li>Receiving</li> <li>Connect the terminator to the [MIC] jack as shown Page 5 – 3.</li> </ul> |             |                                               |                                                    | For VHF adjustment:<br>While pushing the [VOL] key, push [MONI].<br><br>For UHF adjustment:<br>While pushing the [VOL] key, push [RPT·M]. |                           |
|             | 2 | <ul style="list-style-type: none"> <li>Set the SSG output for the S-meter becoming to S3.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                       |             | The SSG output level.                         | 0.32 $\mu$ V to 0.79 $\mu$ V (–117 dBm to –109dBm) |                                                                                                                                           | Verify                    |

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

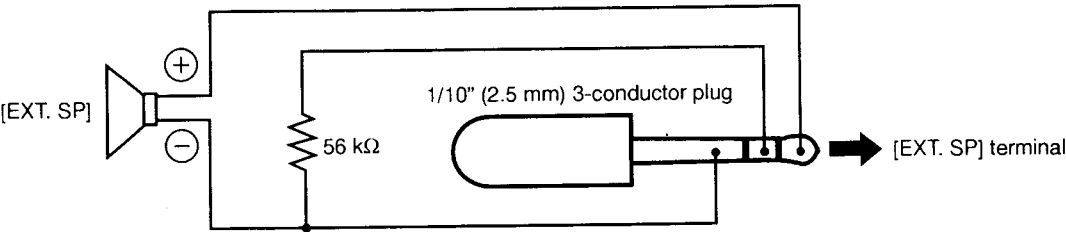
• 1F UNIT



• 2F UNIT



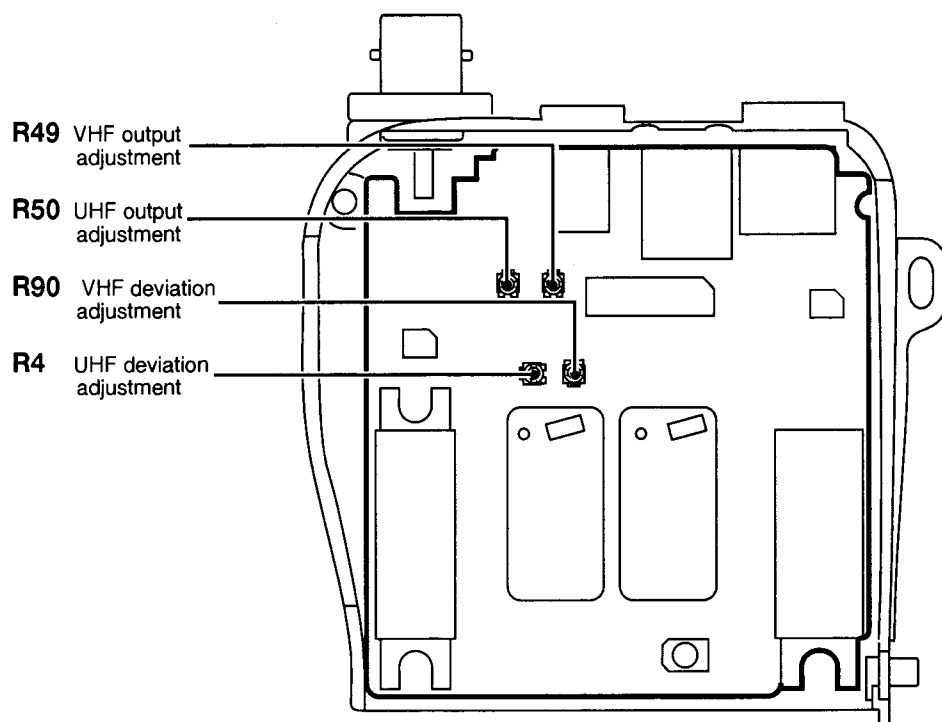
• Terminator for the S-meter adjustment



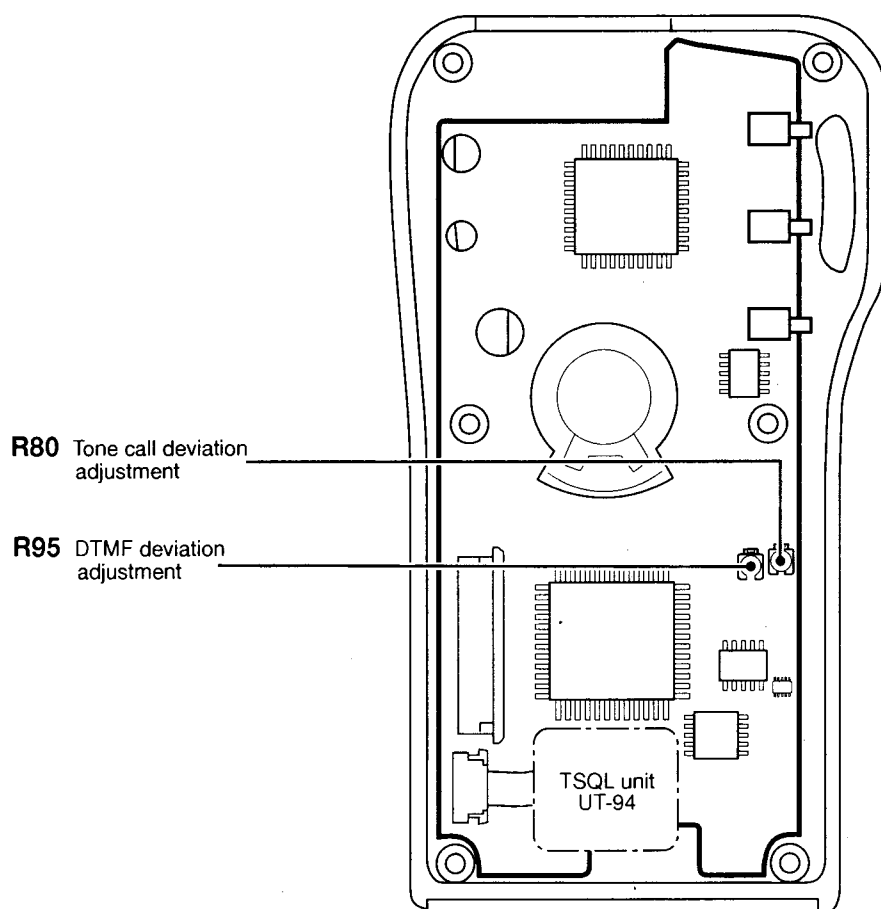
## 5-4 TRANSMITTER ADJUSTMENT

| ADJUSTMENT                                |   | ADJUSTMENT CONDITIONS                                                                                                                                                                                                                                                                                                                                                                                                          | MEASUREMENT |                                                                                 | VALUE        | ADJUSTMENT POINT |        |
|-------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------|--------------|------------------|--------|
|                                           |   |                                                                                                                                                                                                                                                                                                                                                                                                                                | UNIT        | LOCATION                                                                        |              | UNIT             | ADJUST |
| VHF<br>OUTPUT<br>POWER                    | 1 | <ul style="list-style-type: none"> <li>Displayed frequency 145.00 MHz</li> <li>Output power : High</li> <li>Transmitting</li> <li>Be sure the power supply voltage is 13.5 V.</li> </ul>                                                                                                                                                                                                                                       | Top panel   | Connect the RF power meter to the antenna connector.                            | 5.0 W        | 1F               | R49    |
|                                           | 2 | <ul style="list-style-type: none"> <li>Output power : Low (RF-meter 1 dot)</li> </ul>                                                                                                                                                                                                                                                                                                                                          |             |                                                                                 | 0.25 W–1.0 W |                  | Verify |
| UHF<br>OUTPUT                             | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 445.000 MHz (USA)<br/>435.000 MHz (All other versions)</li> <li>Output power : High</li> <li>Transmitting</li> <li>Be sure the power supply voltage is 13.5 V.</li> </ul>                                                                                                                                                                                          | Top panel   | Connect the RF power meter to the antenna connector.                            | 5.0 W        | 1F               | R50    |
|                                           | 2 | <ul style="list-style-type: none"> <li>Output power : Low (RF-meter 1 dot)</li> </ul>                                                                                                                                                                                                                                                                                                                                          |             |                                                                                 | 0.25 W–1.0 W |                  | Verify |
| VHF<br>DEVIATION                          | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 145.00 MHz</li> <li>Connect the audio generator to the [MIC] connector and set as: 95 mV/1.0 kHz</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>                                              | Top panel   | Connect the FM deviation meter to the antenna connector through the attenuator. | ±4.6 kHz     | 1F               | R90    |
|                                           | 2 | <ul style="list-style-type: none"> <li>Set the audio generator for the deviation becoming to ±3.5 kHz.</li> </ul>                                                                                                                                                                                                                                                                                                              |             |                                                                                 | 5.6 – 18 mV  |                  | Verify |
| UHF<br>DEVIATION                          | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 445.000 MHz (USA)<br/>435.000 MHz (All other versions)</li> <li>Connect the audio generator to the [MIC] connector and set as : 95 mV/1.0 kHz</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> | Top panel   | Connect the FM deviation meter to the antenna connector through the attenuator. | ±4.6 kHz     | 1F               | R4     |
|                                           | 2 | <ul style="list-style-type: none"> <li>Set the audio generator for the deviation becoming to ±3.5 kHz.</li> </ul>                                                                                                                                                                                                                                                                                                              |             |                                                                                 | 5.6 – 18 mV  |                  | Verify |
| TONE CALL<br>DEVIATION<br>(EUR, ITA only) | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 435.000 MHz</li> <li>HPF : 50 Hz</li> <li>LPF : 20 kHz</li> <li>De-emphasis : OFF</li> <li>Detector : (P-P)/2</li> <li>Push and hold [RPT•M] key while transmitting.</li> </ul>                                                                                                                                                                                    | Top panel   | Connect the FM deviation meter to the antenna connector through the attenuator. | ±3.5 kHz     | LOGIC            | R80    |
| DTMF<br>DEVIATION                         | 1 | <ul style="list-style-type: none"> <li>Displayed frequency: 445.00 MHz (USA)<br/>435.00 MHz (All other versions)</li> <li>Push [D] key while transmitting.</li> </ul>                                                                                                                                                                                                                                                          | Top panel   | Connect the FM deviation meter to the antenna connector through the attenuator. | ±3.5 kHz     | LOGIC            | R95    |

• 1F UNIT



• LOGIC UNIT



# SECTION 6 PARTS LIST

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                    |
|----------|------------|--------------|--------------------|
| IC1      | 1130007610 | S.IC         | μPD3140GS-E1 (DS8) |
| IC2      | 1130007280 | S.IC         | TC7S32FU(TE85R)    |
| IC3      | 1150001530 | IC           | SC1284             |
| IC4      | 1130007570 | S.IC         | BU4094BCFV-EZ      |
| IC5      | 1130007610 | S.IC         | μPD3140GS-E1 (DS8) |
| IC6      | 1140004380 | IC           | SC1297             |
| IC7      | 1130004500 | S.IC         | TC4S11F (TE85R)    |
| Q1       | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q3       | 1530002560 | S.TRANSISTOR | 2SC4403-3-TR       |
| Q4       | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25     |
| Q5       | 1590001690 | S.TRANSISTOR | UN9115(TX)         |
| Q6       | 1590001690 | S.TRANSISTOR | UN9115(TX)         |
| Q7       | 1590002080 | S.TRANSISTOR | UN9117(TX)         |
| Q8       | 1530002900 | S.TRANSISTOR | 2SC4226-T2         |
| Q9       | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25     |
| Q10      | 1590001140 | S.TRANSISTOR | UN9210(TX)         |
| Q11      | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q12      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q13      | 1530003280 | S.TRANSISTOR | 2SC4211-6-TR       |
| Q14      | 1530003190 | S.TRANSISTOR | 2SC4617 TLQ        |
| Q15      | 1530003190 | S.TRANSISTOR | 2SC4617 TLQ        |
| Q16      | 1530003190 | S.TRANSISTOR | 2SC4617 TLQ        |
| Q17      | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R     |
| Q18      | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q20      | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q21      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q22      | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q23      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q24      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q25      | 1590001160 | S.TRANSISTOR | XP1401-(TX).AB     |
| Q26      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q27      | 1530002560 | S.TRANSISTOR | 2SC4403-3-TR       |
| Q28      | 1530002570 | S.TRANSISTOR | 2SC4405-3-TR       |
| Q29      | 1530002560 | S.TRANSISTOR | 2SC4403-3-TR       |
| Q30      | 1590002080 | S.TRANSISTOR | UN9117(TX)         |
| Q31      | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25     |
| Q32      | 1590001140 | S.TRANSISTOR | UN9210(TX)         |
| Q33      | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q34      | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R     |
| Q35      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q36      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| Q37      | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R     |
| Q38      | 1590001970 | S.TRANSISTOR | UN921E(TX)         |
| Q39      | 1590001140 | S.TRANSISTOR | UN9210(TX)         |
| Q40      | 1590001130 | S.TRANSISTOR | UN9110(TX)         |
| Q41      | 1540000410 | S.TRANSISTOR | 2SD2345(TX)S       |
| Q42      | 1550000010 | S.FET        | 2SJ364-Q (TX)      |
| Q43      | 1590001150 | S.TRANSISTOR | UN9211(TX)         |
| D1       | 1790000860 | S.DIODE      | MA133(TX)          |
| D2       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D3       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D4       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D5       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D6       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D7       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D8       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D9       | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D10      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D11      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D12      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D14      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D15      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D16      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D17      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D18      | 1790001260 | S.DIODE      | MA2S077-(TX)       |
| D19      | 1790001260 | S.DIODE      | MA2S077-(TX)       |

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION |                         |
|----------|------------|-------------|-------------------------|
| D20      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D21      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D22      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D24      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D25      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D26      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D27      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D28      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D29      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D30      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D31      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D32      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D34      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D35      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D36      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D37      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D38      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D39      | 1790001260 | S.DIODE     | MA2S077-(TX)            |
| D42      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D43      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D44      | 1790001030 | S.DIODE     | SB30-03P-TD             |
| D46      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D47      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D48      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| D49      | 1790001250 | S.DIODE     | MA2S111-(TX)            |
| D50      | 1790001240 | S.DIODE     | MA2S728-(TX)            |
| X1       | 6050008730 | XTAL        | CR-456 (12.8 MHz)       |
| L1       | 6200004380 | S.COIL      | LL1608-F18NK            |
| L3       | 6200004380 | S.COIL      | LL1608-F18NK            |
| L4       | 6200004380 | S.COIL      | LL1608-F18NK            |
| L5       | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L6       | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L7       | 6200004680 | S.COIL      | LL1608-F8N2K            |
| L8       | 6200004410 | S.COIL      | LL1608-F27NK            |
| L9       | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L10      | 6200002340 | S.COIL      | LQN 1A 23NJ04           |
| L11      | 6200002340 | S.COIL      | LQN 1A 23NJ04           |
| L12      | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L13      | 6200002830 | S.COIL      | LQN 1A 84NJ04           |
| L14      | 6200002820 | S.COIL      | LQN 1A 47NJ04           |
| L15      | 6200002390 | S.COIL      | LQN 1A 64NJ04           |
| L16      | 6200002820 | S.COIL      | LQN 1A 47NJ04           |
| L17      | 6200004460 | S.COIL      | MLF1608D 82NM-T         |
| L18      | 6200004460 | S.COIL      | MLF1608D 82NM-T         |
| L19      | 6200004430 | S.COIL      | LL1608-F56NK            |
| L20      | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L21      | 6200002820 | S.COIL      | LQN 1A 47NJ04           |
| L22      | 6200002820 | S.COIL      | LQN 1A 47NJ04           |
| L23      | 6200002820 | S.COIL      | LQN 1A 47NJ04           |
| L24      | 6200004480 | S.COIL      | MLF1608D R82K-T         |
| L25      | 6200004480 | S.COIL      | MLF1608D R82K-T         |
| L26      | 6200004380 | S.COIL      | LL1608-F18NK            |
| L27      | 6200004490 | S.COIL      | LL1608-F39NK            |
| L30      | 6200004480 | S.COIL      | MLF1608D R82K-T         |
| L31      | 6200004460 | S.COIL      | MLF1608D 82NM-T         |
| L32      | 6200004470 | S.COIL      | MLF1608D R12K-T         |
| L34      | 6200004600 | S.COIL      | MLF1608D R15K-T         |
| L35      | 6200004370 | S.COIL      | LL1608-F15NK            |
| L36      | 6200002100 | S.COIL      | LQN 1A 17NJ04           |
| L37      | 6200003550 | S.COIL      | MLF1608A 4R7K-T         |
| R1       | 7030003360 | S.RESISTOR  | ERJ3GEYJ 221 V (220 Ω)  |
| R2       | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R3       | 7030003490 | S.RESISTOR  | ERJ3GEYJ 272 V (2.7 kΩ) |
| R4       | 7310003600 | S.TRIMMER   | EVM-1XSX50 B54 (503)    |

S.=Surface mount

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                        |
|----------|------------|------------------------------------|
| R5       | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)  |
| R6       | 7030003300 | S.RESISTOR ERJ3GEYJ 680 V (68 Ω)   |
| R10      | 7030003610 | S.RESISTOR ERJ3GEYJ 273 V (27 kΩ)  |
| R11      | 7030003300 | S.RESISTOR ERJ3GEYJ 680 V (68 Ω)   |
| R12      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R13      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R14      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R15      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R16      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R17      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)  |
| R18      | 7030003280 | S.RESISTOR ERJ3GEYJ 470 V (47 Ω)   |
| R19      | 7030003570 | S.RESISTOR ERJ3GEYJ 123 V (12 kΩ)  |
| R20      | 7030003510 | S.RESISTOR ERJ3GEYJ 392 V (3.9 kΩ) |
| R21      | 7030003480 | S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ) |
| R22      | 7030003230 | S.RESISTOR ERJ3GEYJ 180 V (18 Ω)   |
| R23      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R24      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R25      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R29      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R31      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R32      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R33      | 7030003720 | S.RESISTOR ERJ3GEYJ 224 V (220 kΩ) |
| R34      | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ) |
| R35      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)   |
| R36      | 7030003720 | S.RESISTOR ERJ3GEYJ 224 V (220 kΩ) |
| R37      | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)  |
| R38      | 7030003680 | S.RESISTOR ERJ3GEYJ 104 V (100 kΩ) |
| R39      | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)  |
| R40      | 7030003500 | S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ) |
| R41      | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R42      | 7030003500 | S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ) |
| R43      | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R44      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ) |
| R45      | 7030003320 | S.RESISTOR ERJ3GEYJ 101 V (100 Ω)  |
| R47      | 7030003670 | S.RESISTOR ERJ3GEYJ 823 V (82 kΩ)  |
| R49      | 7310003580 | S.TRIMMER EVM-1XSX50 B15 (104)     |
| R50      | 7310003580 | S.TRIMMER EVM-1XSX50 B15 (104)     |
| R51      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)   |
| R52      | 7030003570 | S.RESISTOR ERJ3GEYJ 123 V (12 kΩ)  |
| R53      | 7030003670 | S.RESISTOR ERJ3GEYJ 823 V (82 kΩ)  |
| R54      | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)  |
| R55      | 7030005670 | S.RESISTOR RR0816R-393-D (39 kΩ)   |
| R56      | 7030000330 | S.RESISTOR MCR10EZJH 390 Ω (391)   |
| R58      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R59      | 7030003460 | S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ) |
| R60      | 7030003310 | S.RESISTOR ERJ3GEYJ 820 V (82 Ω)   |
| R62      | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)  |
| R64      | 7030003310 | S.RESISTOR ERJ3GEYJ 820 V (82 Ω)   |
| R66      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R67      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R68      | 7030003530 | S.RESISTOR ERJ3GEYJ 562 V (5.6 kΩ) |
| R69      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R70      | 7030003290 | S.RESISTOR ERJ3GEYJ 560 V (56 Ω)   |
| R71      | 7030003470 | S.RESISTOR ERJ3GEYJ 182 V (1.8 kΩ) |
| R72      | 7030003510 | S.RESISTOR ERJ3GEYJ 392 V (3.9 kΩ) |
| R73      | 7030003230 | S.RESISTOR ERJ3GEYJ 180 V (18 Ω)   |
| R74      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R75      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R76      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R77      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R78      | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)  |
| R79      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)   |
| R80      | 7030003720 | S.RESISTOR ERJ3GEYJ 224 V (220 kΩ) |
| R83      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R84      | 7030003420 | S.RESISTOR ERJ3GEYJ 681 V (680 Ω)  |
| R85      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R86      | 7030003420 | S.RESISTOR ERJ3GEYJ 681 V (680 Ω)  |
| R87      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ) |
| R88      | 7030003320 | S.RESISTOR ERJ3GEYJ 101 V (100 Ω)  |
| R90      | 7310003600 | S.TRIMMER EVM-1XSX50 B54 (503)     |
| R91      | 7030003490 | S.RESISTOR ERJ3GEYJ 272 V (2.7 kΩ) |
| R93      | 7510000940 | S.THERMISTOR TBPS1R473K475H5Q      |
| R94      | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)  |
| R95      | 7030003420 | S.RESISTOR ERJ3GEYJ 681 V (680 Ω)  |
| R96      | 7030003340 | S.RESISTOR ERJ3GEYJ 151 V (150 Ω)  |
| R101     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                        |
|----------|------------|------------------------------------|
| R102     | 7030003680 | S.RESISTOR ERJ3GEYJ 104 V (100 kΩ) |
| R103     | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R104     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R105     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R106     | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)  |
| R108     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R109     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R110     | 7030003200 | S.RESISTOR ERJ3GEYJ 100 V (10 Ω)   |
| R111     | 7030003200 | S.RESISTOR ERJ3GEYJ 100 V (10 Ω)   |
| R112     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R113     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R114     | 7030003280 | S.RESISTOR ERJ3GEYJ 470 V (47 Ω)   |
| R115     | 7030003340 | S.RESISTOR ERJ3GEYJ 151 V (150 Ω)  |
| R116     | 7030003380 | S.RESISTOR ERJ3GEYJ 331 V (330 Ω)  |
| R118     | 7030003380 | S.RESISTOR ERJ3GEYJ 331 V (330 Ω)  |
| R119     | 7030003320 | S.RESISTOR ERJ3GEYJ 101 V (100 Ω)  |
| R120     | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ) |
| R121     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R122     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)  |
| R123     | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)  |
| R125     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ) |
| R126     | 7030003540 | S.RESISTOR ERJ3GEYJ 682 V (6.8 kΩ) |
| C1       | 4550008160 | S.TANTALUM ECST1CY155R             |
| C2       | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C3       | 4550008360 | S.TANTALUM ECST1VY104R             |
| C4       | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C5       | 4030007010 | S.CERAMIC C1608 CH 1H 100D-T-A     |
| C6       | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C7       | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C8       | 4030008970 | S.CERAMIC C1608 CH 1H 080D-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     |
| C13      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C14      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C15      | 4030008980 | S.CERAMIC C1608 CH 1H 070D-T-A     |
| C17      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C18      | 4030008970 | S.CERAMIC C1608 CH 1H 080D-T-A     |
| C19      | 4030008970 | S.CERAMIC C1608 CH 1H 080D-T-A     |
| C20      | 4030008970 | S.CERAMIC C1608 CH 1H 080D-T-A     |
| C21      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C22      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C23      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C24      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C25      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C26      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C27      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A     |
| C28      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A     |
| C29      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C30      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C31      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C32      | 4550008140 | S.TANTALUM ECST1EY474R             |
| C33      | 4550008080 | S.TANTALUM TEMSVB2 1C 108M-8L      |
| C34      | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A     |
| C35      | 4030009920 | S.CERAMIC C1608 CH 1H 050B-T-A     |
| C36      | 4030009520 | S.CERAMIC C1608 CH 1H 020B-T-A     |
| C39      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C40      | 4030008980 | S.CERAMIC C1608 CH 1H 070D-T-A     |
| C41      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A     |
| C43      | 4030009520 | S.CERAMIC C1608 CH 1H 020B-T-A     |
| C44      | 4030008500 | S.CERAMIC C1608 CH 1H 0R5B-T-A     |
| C45      | 4030009920 | S.CERAMIC C1608 CH 1H 050B-T-A     |
| C46      | 4030009510 | S.CERAMIC C1608 CH 1H 010B-T-A     |
| C47      | 4030009920 | S.CERAMIC C1608 CH 1H 050B-T-A     |
| C48      | 4030007070 | S.CERAMIC C1608 CH 1H 330J-T-A     |
| C49      | 4030007150 | S.CERAMIC C1608 CH 1H 151J-T-A     |
| C50      | 4030008990 | S.CERAMIC C1608 CH 1H 080D-T-A     |
| C51      | 4030008860 | S.CERAMIC C1608 JB 1H 102K-T-A     |
| C53      | 4030009510 | S.CERAMIC C1608 CH 1H 010B-T-A     |
| C54      | 4030007020 | S.CERAMIC C1608 CH 1H 120J-T-A     |
| C55      | 4030009520 | S.CERAMIC C1608 CH 1H 020B-T-A     |
| C56      | 4030007060 | S.CERAMIC C1608 CH 1H 270J-T-A     |
| C57      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A     |
| C58      | 4030008650 | S.CERAMIC C1608 CH 1H 240J-T-A     |

S.=Surface mount

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION |                       |
|----------|------------|-------------|-----------------------|
| C59      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C60      | 4030007070 | S.CERAMIC   | C1608 CH 1H 330J-T-A  |
| C61      | 4030007010 | S.CERAMIC   | C1608 CH 1H 100D-T-A  |
| C62      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C63      | 4610001910 | S.TRIMMER   | CTZ3E-10A-W1          |
| C64      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C65      | 4550006190 | S.TANTALUM  | ECST0GY106R           |
| C66      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C69      | 4550006190 | S.TANTALUM  | ECST0GY106R           |
| C70      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C72      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C73      | 4550006220 | S.TANTALUM  | TEMSVA 0J 156M-8L     |
| C74      | 4550006220 | S.TANTALUM  | TEMSVA 0J 156M-8L     |
| C75      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C76      | 4550006220 | S.TANTALUM  | TEMSVA 0J 156M-8L     |
| C77      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C79      | 4550006121 | S.TANTALUM  | TEMSVA 0G 226M-8R     |
| C80      | 4550006121 | S.TANTALUM  | TEMSVA 0G 226M-8R     |
| C81      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C82      | 4550006190 | S.TANTALUM  | ECST0GY106R           |
| C85      | 4030007050 | S.CERAMIC   | C1608 CH 1H 220J-T-A  |
| C86      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C87      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C90      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C92      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C93      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C94      | 4550006150 | S.TANTALUM  | ECST1CY105R           |
| 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 JB 1H 102K-T-A  |
| C98      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C99      | 4550006080 | S.TANTALUM  | TEMSVB2 1C 106M-8L    |
| C100     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C101     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C102     | 4030010070 | S.CERAMIC   | C1608 X7S 1C 104K-T-A |
| C103     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C104     | 4550006360 | S.TANTALUM  | ECST1VY104R           |
| C105     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C106     | 4550006340 | S.TANTALUM  | ECST1AY335R           |
| C108     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C109     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C110     | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A  |
| C111     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C112     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C113     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C114     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C115     | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A  |
| C117     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C118     | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A  |
| C119     | 4030007020 | S.CERAMIC   | C1608 CH 1H 120J-T-A  |
| C120     | 4030007050 | S.CERAMIC   | C1608 CH 1H 220J-T-A  |
| C121     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C122     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C123     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C124     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C125     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C126     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C128     | 4550006080 | S.TANTALUM  | TEMSVB2 1C 106M-8L    |
| C129     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C130     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C132     | 4030007030 | S.CERAMIC   | C1608 CH 1H 150J-T-A  |
| C133     | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A  |
| C134     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C135     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C136     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C137     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C138     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C139     | 4030007030 | S.CERAMIC   | C1608 CH 1H 150J-T-A  |
| C140     | 4030007070 | S.CERAMIC   | C1608 CH 1H 330J-T-A  |
| C141     | 4030007030 | S.CERAMIC   | C1608 CH 1H 150J-T-A  |
| C142     | 4550006150 | S.TANTALUM  | ECST1CY105R           |
| C144     | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A  |
| C146     | 4030007020 | S.CERAMIC   | C1608 CH 1H 120J-T-A  |
| C147     | 4030007010 | S.CERAMIC   | C1608 CH 1H 100D-T-A  |
| C148     | 4030006970 | S.CERAMIC   | C1608 CH 1H 060D-T-A  |
| C149     | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A  |

[1F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                      |
|----------|------------|--------------|----------------------|
| C153     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C170     | 4030009560 | S.CERAMIC    | C1608 CH 1H R75B-T-A |
| C171     | 4030009000 | S.CERAMIC    | C2012 JB 1C 224K-T-A |
| C172     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C173     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C174     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C175     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C176     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C177     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C178     | 4030006850 | S.CERAMIC    | C1608 JB 1H 471K-T-A |
| C180     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C182     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C183     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C185     | 4030007050 | S.CERAMIC    | C1608 CH 1H 220J-T-A |
| C186     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C187     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C188     | 4030007070 | S.CERAMIC    | C1608 CH 1H 330J-T-A |
| C189     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C190     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C191     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C192     | 4510005610 | ELECTROLITIC | ECA 0JG 101X         |
| C193     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| C197     | 4030009500 | S.CERAMIC    | C1608 CH 1H 0R5B-T-A |
| C201     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A |
| J1       | 6450000130 | CONNECTOR    | HSJ1102-01-540       |
| J2       | 6450001060 | CONNECTOR    | HSJ1493-01-010       |
| J3       | 6450000870 | CONNECTOR    | HEC2711-01-020       |
| J4       | 6510017630 | S.CONNECTOR  | 53264-0690           |
| J5       | 6510017630 | S.CONNECTOR  | 53264-0690           |
| J6       | 6510017630 | S.CONNECTOR  | 53264-0690           |
| J7       | 6510017610 | S.CONNECTOR  | 53264-2290           |
| W2       | 7120000380 | JUMPER       | JPW 01 R-01          |
| 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       | 7030003860 | S.JUMPER     | ERJ3GE JPW V         |
| EP1      | 0910045080 | PCB          | B 4566               |

S.=Surface mount



## [V VCO BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                                 |
|----------|------------|--------------|---------------------------------|
| Q1       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| Q2       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| Q3       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| D1       | 1790001290 | S.VARICAP    | MA304(TX)                       |
| D2       | 1790001260 | S.DIODE      | MA2S077-(TX)                    |
| L1       | 6200004480 | S.COIL       | MLF1608D R82K-T                 |
| L2       | 6110003100 | COIL         | LA-499                          |
| L3       | 6200004460 | S.COIL       | MLF1608D 82NM-T                 |
| R1       | 7030006050 | S.RESISTOR   | RR0510P-181-D (180 $\Omega$ )   |
| R2       | 7030006030 | S.RESISTOR   | RR0510P-822-D (8.2 k $\Omega$ ) |
| R3       | 7030005700 | S.RESISTOR   | ERJ2GEJ 274 X (270 k $\Omega$ ) |
| R4       | 7030005810 | S.RESISTOR   | RR0510P-152-D (1.5 k $\Omega$ ) |
| R5       | 7030005780 | S.RESISTOR   | RR0510P-221-D (220 $\Omega$ )   |
| R6       | 7030005110 | S.RESISTOR   | ERJ2GEJ 224 X (220 k $\Omega$ ) |
| R7       | 7030005760 | S.RESISTOR   | RR0510R-680-D (68 $\Omega$ )    |
| R8       | 7030006030 | S.RESISTOR   | RR0510P-822-D (8.2 k $\Omega$ ) |
| R9       | 7030005880 | S.RESISTOR   | RR0510R-820-D (82 $\Omega$ )    |
| R10      | 7030005840 | S.RESISTOR   | RR0510R-473-D (47 k $\Omega$ )  |
| R11      | 7030005770 | S.RESISTOR   | RR0510P-101-D (100 $\Omega$ )   |
| R13      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R14      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R15      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R16      | 7030005760 | S.RESISTOR   | RR0510R-680-D (68 $\Omega$ )    |
| C1       | 4030008560 | S.CERAMIC    | C1608 CH 1H 300J-T-A            |
| C2       | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A            |
| C4       | 4030009550 | S.CERAMIC    | C1608 CH 1H 2R5B-T-A            |
| C5       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C6       | 4030009550 | S.CERAMIC    | C1608 CH 1H 2R5B-T-A            |
| C7       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C8       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C9       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C10      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C11      | 4030009670 | S.CERAMIC    | C1005 CH 1E 010C-T-A            |
| C12      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C13      | 4030009830 | S.CERAMIC    | C1005 CH 1E 180J-T-A            |
| C14      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C15      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| J1       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J2       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J3       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J4       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J5       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J6       | 6910008020 | CONNECTOR    | IPS-1323                        |
| EP1      | 0910045140 | PCB          | B 4571                          |

## [U VCO BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                                 |
|----------|------------|--------------|---------------------------------|
| Q1       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| Q2       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| Q3       | 1530003260 | S.TRANSISTOR | 2SC5008-T1                      |
| D2       | 1790001310 | S.VARICAP    | 1SV270(TPH3)                    |
| D3       | 1790001260 | S.DIODE      | MA2S077-(TX)                    |
| L1       | 6200001520 | S.COIL       | MLF2012D R82K-T                 |
| L2       | 6110003100 | COIL         | LA-499                          |
| L3       | 6200004400 | S.COIL       | LL1608-F47NK                    |
| R1       | 7030006020 | S.RESISTOR   | RR0510P-682-D (6.8 k $\Omega$ ) |
| R2       | 7030005880 | S.RESISTOR   | RR0510R-820-D (82 $\Omega$ )    |
| R4       | 7030005810 | S.RESISTOR   | RR0510P-152-D (1.5 k $\Omega$ ) |
| R5       | 7030005780 | S.RESISTOR   | RR0510P-221-D (220 $\Omega$ )   |
| R6       | 7030006030 | S.RESISTOR   | RR0510P-822-D (8.2 k $\Omega$ ) |
| R7       | 7030005880 | S.RESISTOR   | RR0510R-820-D (82 $\Omega$ )    |
| R8       | 7030005850 | S.RESISTOR   | RR0510R-563-D (56 k $\Omega$ )  |
| R9       | 7030005760 | S.RESISTOR   | RR0510R-680-D (68 $\Omega$ )    |
| R11      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R12      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R13      | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )    |
| R14      | 7030005760 | S.RESISTOR   | RR0510R-680-D (68 $\Omega$ )    |
| R15      | 7030005110 | S.RESISTOR   | ERJ2GEJ 224 X (220 k $\Omega$ ) |
| R16      | 7030005770 | S.RESISTOR   | RR0510P-101-D (100 $\Omega$ )   |
| C1       | 4030007090 | S.CERAMIC    | C1608 CH 1H 470J-T-A            |
| C2       | 4030007140 | S.CERAMIC    | C1608 CH 1H 121J-T-A            |
| C3       | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A            |
| C4       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C6       | 4030009510 | S.CERAMIC    | C1608 CH 1H 010B-T-A            |
| C7       | 4030009510 | S.CERAMIC    | C1608 CH 1H 010B-T-A            |
| C8       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C9       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C10      | 4030009890 | S.CERAMIC    | C1005 CH 1E 020C-T-A            |
| C11      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| C12      | 4030009730 | S.CERAMIC    | C1005 CH 1E 090D-T-A            |
| C13      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A            |
| J1       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J2       | 6910008020 | CONNECTOR    | IPS-1323                        |
| J3       | 6910008020 | CONNECTOR    | IPS-1323                        |
| EP1      | 0910045150 | PCB          | B 4572                          |

S.=Surface mount

## [V VCO 2F BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                                |
|----------|------------|--------------|--------------------------------|
| Q1       | 1530003280 | S.TRANSISTOR | 2SC5008-T1                     |
| Q2       | 1530003280 | S.TRANSISTOR | 2SC5008-T1                     |
| L2       | 6200004410 | S.COIL       | LL1808-F27NK                   |
| L3       | 6200004370 | S.COIL       | LL1808-F15NK                   |
| L4       | 6200004390 | S.COIL       | LL1808-F22NK                   |
| L6       | 6200004420 | S.COIL       | LL1808-F33NK                   |
| L7       | 6200004410 | S.COIL       | LL1808-F27NK                   |
| R1       | 7030006290 | S.RESISTOR   | RR0510R-333-D (33 k $\Omega$ ) |
| R2       | 7030005950 | S.RESISTOR   | RR0510R-123-D (12 k $\Omega$ ) |
| R3       | 7030006280 | S.RESISTOR   | RR0510R-330-D (33 $\Omega$ )   |
| R4       | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )   |
| R5       | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )   |
| R6       | 7030005740 | S.RESISTOR   | RR0510R-150-D (15 $\Omega$ )   |
| R8       | 7030005780 | S.RESISTOR   | RR0510P-221-D (220 $\Omega$ )  |
| R9       | 7030006290 | S.RESISTOR   | RR0510R-333-D (33 k $\Omega$ ) |
| R11      | 7030003320 | S.RESISTOR   | ERJ3GEYJ 101 V (100 $\Omega$ ) |
| C1       | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A           |
| C2       | 4030006880 | S.CERAMIC    | C1808 JB 1H 102K-T-A           |
| C3       | 4030009690 | S.CERAMIC    | C1005 CH 1E 030C-T-A           |
| C4       | 4030010380 | S.CERAMIC    | C1005 CH 1E 820J-T-A           |
| C5       | 4030009840 | S.CERAMIC    | C1005 CH 1E 060D-T-A           |
| C6       | 4030009740 | S.CERAMIC    | C1005 CH 1E 100D-T-A           |
| C7       | 4030009690 | S.CERAMIC    | C1005 CH 1E 030C-T-A           |
| C8       | 4030009760 | S.CERAMIC    | C1005 CH 1E 150J-T-A           |
| C9       | 4030009670 | S.CERAMIC    | C1005 CH 1E 010C-T-A           |
| C10      | 4030009720 | S.CERAMIC    | C1005 CH 1E 080D-T-A           |
| C11      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A           |
| C12      | 4030009810 | S.CERAMIC    | C1005 JB 1E 102K-T-A           |
| C13      | 4030009690 | S.CERAMIC    | C1005 CH 1E 030C-T-A           |
| C14      | 4030009840 | S.CERAMIC    | C1005 CH 1E 060D-T-A           |
| C15      | 4030009790 | S.CERAMIC    | C1005 CH 1E 330J-T-A           |
| J1       | 6910008020 | CONNECTOR    | IPS-1323                       |
| J2       | 6910008020 | CONNECTOR    | IPS-1323                       |
| J3       | 6910008020 | CONNECTOR    | IPS-1323                       |
| J4       | 6910008020 | CONNECTOR    | IPS-1323                       |
| EP1      | 0910045100 | PCB          | B 4568                         |

## [2F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION   |                    |
|----------|------------|---------------|--------------------|
| IC1      | 1110003570 | S.IC          | MC3372VMEL         |
| IC2      | 1110003570 | S.IC          | MC3372VMEL         |
| IC3      | 1110003370 | S.IC          | $\mu$ PC2748T-E3   |
| IC4      | 1110003370 | S.IC          | $\mu$ PC2748T-E3   |
| IC5      | 1130007570 | S.IC          | BU4094BCFV-EZ      |
| IC6      | 1110002420 | S.IC          | NJM2073M(T1)       |
| IC7      | 1110003370 | S.IC          | $\mu$ PC2748T-E3   |
| Q1       | 1530003220 | S.TRANSISTOR  | 2SC4406-4-TR       |
| Q2       | 1590001690 | S.TRANSISTOR  | UN9115(TX)         |
| Q4       | 1590002080 | S.TRANSISTOR  | UN9117(TX)         |
| Q5       | 1530002580 | S.TRANSISTOR  | 2SC4403-3-TR       |
| Q6       | 1530003280 | S.TRANSISTOR  | 2SC4211-6-TR       |
| Q7       | 1590001140 | S.TRANSISTOR  | UN9210(TX)         |
| Q8       | 1530003280 | S.TRANSISTOR  | 2SC4211-6-TR       |
| Q9       | 1590001140 | S.TRANSISTOR  | UN9210(TX)         |
| Q10      | 1530003220 | S.TRANSISTOR  | 2SC4406-4-TR       |
| Q12      | 1590001690 | S.TRANSISTOR  | UN9115(TX)         |
| Q13      | 1530002580 | S.TRANSISTOR  | 2SC4403-3-TR       |
| Q14      | 1590001690 | S.TRANSISTOR  | UN9115(TX)         |
| Q15      | 1590002080 | S.TRANSISTOR  | UN9117(TX)         |
| Q16      | 1590002080 | S.TRANSISTOR  | UN9117(TX)         |
| Q17      | 1590001690 | S.TRANSISTOR  | UN9115(TX)         |
| Q18      | 1530002570 | S.TRANSISTOR  | 2SC4405-3-TR       |
| Q19      | 1530002570 | S.TRANSISTOR  | 2SC4405-3-TR       |
| Q20      | 1530003280 | S.TRANSISTOR  | 2SC4211-6-TR       |
| Q21      | 1520000460 | S.TRANSISTOR  | 2SB1132 T100 R     |
| Q22      | 1510000670 | S.TRANSISTOR  | 2SA1588-GR (TE85R) |
| Q23      | 1510000670 | S.TRANSISTOR  | 2SA1588-GR (TE85R) |
| Q24      | 1580000540 | S.FET         | 2SK880-Y (TE85R)   |
| Q25      | 1590001860 | S.TRANSISTOR  | UN9215(TX)         |
| Q27      | 1520000460 | S.TRANSISTOR  | 2SB1132 T100 R     |
| Q30      | 1590001170 | S.TRANSISTOR  | XP1501-(TX).AB     |
| Q31      | 1520000650 | S.TRANSISTOR  | 2SB1201-S-TL       |
| Q32      | 1590001860 | S.TRANSISTOR  | UN9215(TX)         |
| D1       | 1790000490 | S.DIODE       | HSM88AS-TR         |
| D3       | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D4       | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D5       | 1790001250 | S.DIODE       | MA2S111-(TX)       |
| D6       | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D7       | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D8       | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D10      | 1750000350 | S.VARICAP     | 1SV252(TE85R)      |
| D11      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D12      | 1790001290 | S.VARICAP     | MA304(TX)          |
| D13      | 1790001290 | S.VARICAP     | MA304(TX)          |
| D14      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D15      | 1790001290 | S.VARICAP     | MA304(TX)          |
| D16      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D17      | 1790001250 | S.DIODE       | MA2S111-(TX)       |
| D18      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D19      | 1790001240 | S.DIODE       | MA2S728-(TX)       |
| D20      | 1790001030 | S.DIODE       | SB30-03P-TD        |
| D21      | 1750000130 | S.DIODE       | DA204U T107        |
| D22      | 1790000670 | S.DIODE       | SB07-03C-TA        |
| D25      | 1790000490 | S.DIODE       | HSM88AS-TR         |
| D27      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D28      | 1790001250 | S.DIODE       | MA2S111-(TX)       |
| D29      | 1790001250 | S.DIODE       | MA2S111-(TX)       |
| D30      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D31      | 1790000980 | S.DIODE       | MA742(TX)          |
| D32      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D33      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| D34      | 1790001260 | S.DIODE       | MA2S077-(TX)       |
| FI1      | 2020001050 | S.CERAMIC     | SFPC455E-TC01      |
| FI2      | 2010001640 | FILTER        | FL-203 (35.800MHz) |
| FI3      | 2020001050 | S.CERAMIC     | SFPC455E-TC01      |
| FI4      | 2010001780 | MONOLITHIC    | FL-219 (43.100MHz) |
| X1       | 6070000080 | DISCRIMINATOR | CDBM455C16         |

S.=Surface mount

[2F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION   |                         |
|----------|------------|---------------|-------------------------|
| X2       | 6050008880 | XTAL          | CR-458 (35.345106MHz)   |
| X3       | 6070000080 | DISCRIMINATOR | CDBM455C16              |
| X4       | 6050008400 | XTAL          | CR-419 (42.645MHz)      |
| L1       | 6200002710 | S.COIL        | ELJFC 1R8K-F            |
| L2       | 6200002240 | S.COIL        | ELJFC 2R2K-F            |
| L3       | 6200004350 | S.COIL        | LL1808-F10NK            |
| L4       | 6200004350 | S.COIL        | LL1808-F10NK            |
| L5       | 6200004390 | S.COIL        | LL1808-F22NK            |
| L6       | 6200004380 | S.COIL        | LL1808-F18NK            |
| L7       | 6200002710 | S.COIL        | ELJFC 1R8K-F            |
| L8       | 6130002800 | S.COIL        | LB-320                  |
| L9       | 6130002810 | S.COIL        | LB-321                  |
| L10      | 6150004340 | S.COIL        | LS-490                  |
| L13      | 6200004380 | S.COIL        | LL1808-F18NK            |
| L15      | 6200004370 | S.COIL        | LL1808-F15NK            |
| L16      | 6200004390 | S.COIL        | LL1808-F22NK            |
| L17      | 6200004380 | S.COIL        | LL1808-F18NK            |
| L18      | 6200004660 | S.COIL        | MLF1608A 1R8K-T         |
| L19      | 6200004940 | S.COIL        | MLF1608D R27K-T         |
| R1       | 7030003470 | S.RESISTOR    | ERJ3GEYJ 182 V (1.8 kΩ) |
| R2       | 7030003640 | S.RESISTOR    | ERJ3GEYJ 473 V (47 kΩ)  |
| R3       | 7030003510 | S.RESISTOR    | ERJ3GEYJ 392 V (3.9 kΩ) |
| R4       | 7030003480 | S.RESISTOR    | ERJ3GEYJ 222 V (2.2 kΩ) |
| R5       | 7030003560 | S.RESISTOR    | ERJ3GEYJ 103 V (10 kΩ)  |
| R7       | 7030003640 | S.RESISTOR    | ERJ3GEYJ 473 V (47 kΩ)  |
| R8       | 7030003500 | S.RESISTOR    | ERJ3GEYJ 332 V (3.3 kΩ) |
| R9       | 7030003680 | S.RESISTOR    | ERJ3GEYJ 104 V (100 kΩ) |
| R10      | 7030003300 | S.RESISTOR    | ERJ3GEYJ 680 V (68 Ω)   |
| R11      | 7030003670 | S.RESISTOR    | ERJ3GEYJ 823 V (82 kΩ)  |
| R12      | 7030003400 | S.RESISTOR    | ERJ3GEYJ 471 V (470 Ω)  |
| R13      | 7030003460 | S.RESISTOR    | ERJ3GEYJ 152 V (1.5 kΩ) |
| R14      | 7030003440 | S.RESISTOR    | ERJ3GEYJ 102 V (1 kΩ)   |
| R15      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R16      | 7030003690 | S.RESISTOR    | ERJ3GEYJ 124 V (120 kΩ) |
| R17      | 7030003660 | S.RESISTOR    | ERJ3GEYJ 683 V (68 kΩ)  |
| R18      | 7030003220 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R19      | 7030003220 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R20      | 7030003220 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R22      | 7030003480 | S.RESISTOR    | ERJ3GEYJ 222 V (2.2 kΩ) |
| R23      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R24      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R25      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R26      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R27      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R28      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R30      | 7030003470 | S.RESISTOR    | ERJ3GEYJ 182 V (1.8 kΩ) |
| R31      | 7030003740 | S.RESISTOR    | ERJ3GEYJ 334 V (330 kΩ) |
| R32      | 7030003500 | S.RESISTOR    | ERJ3GEYJ 332 V (3.3 kΩ) |
| R33      | 7030003560 | S.RESISTOR    | ERJ3GEYJ 103 V (10 kΩ)  |
| R35      | 7030003650 | S.RESISTOR    | ERJ3GEYJ 563 V (56 kΩ)  |
| R36      | 7030003740 | S.RESISTOR    | ERJ3GEYJ 334 V (330 kΩ) |
| R38      | 7030003840 | S.RESISTOR    | ERJ3GEYJ 225 V (2.2 MΩ) |
| R39      | 7030003540 | S.RESISTOR    | ERJ3GEYJ 682 V (6.8 kΩ) |
| R40      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R41      | 7030003740 | S.RESISTOR    | ERJ3GEYJ 334 V (330 kΩ) |
| R42      | 7030003700 | S.RESISTOR    | ERJ3GEYJ 154 V (150 kΩ) |
| R43      | 7030003680 | S.RESISTOR    | ERJ3GEYJ 104 V (100 kΩ) |
| R45      | 7030003300 | S.RESISTOR    | ERJ3GEYJ 680 V (68 Ω)   |
| R46      | 7030003400 | S.RESISTOR    | ERJ3GEYJ 471 V (470 Ω)  |
| R47      | 7030003460 | S.RESISTOR    | ERJ3GEYJ 152 V (1.5 kΩ) |
| R48      | 7030003440 | S.RESISTOR    | ERJ3GEYJ 102 V (1 kΩ)   |
| R49      | 7030003680 | S.RESISTOR    | ERJ3GEYJ 104 V (100 kΩ) |
| R50      | 7030003660 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R51      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R52      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R53      | 7030003220 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R54      | 7030003220 | S.RESISTOR    | ERJ3GEYJ 150 V (15 Ω)   |
| R55      | 7030003480 | S.RESISTOR    | ERJ3GEYJ 222 V (2.2 kΩ) |
| R56      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R57      | 7030003520 | S.RESISTOR    | ERJ3GEYJ 472 V (4.7 kΩ) |
| R58      | 7030003680 | S.RESISTOR    | ERJ3GEYJ 104 V (100 kΩ) |
| R59      | 7030003680 | S.RESISTOR    | ERJ3GEYJ 104 V (100 kΩ) |

[2F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION |                         |
|----------|------------|-------------|-------------------------|
| R60      | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R61      | 7030003400 | S.RESISTOR  | ERJ3GEYJ 471 V (470 Ω)  |
| R62      | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R63      | 7030003280 | S.RESISTOR  | ERJ3GEYJ 470 V (47 Ω)   |
| R64      | 7030003280 | S.RESISTOR  | ERJ3GEYJ 470 V (47 Ω)   |
| R65      | 7030003460 | S.RESISTOR  | ERJ3GEYJ 152 V (1.5 kΩ) |
| R66      | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R67      | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R68      | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R69      | 7030003280 | S.RESISTOR  | ERJ3GEYJ 330 V (33 Ω)   |
| R70      | 7030003610 | S.RESISTOR  | ERJ3GEYJ 273 V (27 kΩ)  |
| R71      | 7030003220 | S.RESISTOR  | ERJ3GEYJ 150 V (15 Ω)   |
| R73      | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R74      | 7030003300 | S.RESISTOR  | ERJ3GEYJ 680 V (68 Ω)   |
| R75      | 7030003680 | S.RESISTOR  | ERJ3GEYJ 104 V (100 kΩ) |
| R76      | 7030003640 | S.RESISTOR  | ERJ3GEYJ 473 V (47 kΩ)  |
| R77      | 7030003510 | S.RESISTOR  | ERJ3GEYJ 392 V (3.9 kΩ) |
| R78      | 7030003580 | S.RESISTOR  | ERJ3GEYJ 153 V (15 kΩ)  |
| R79      | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R80      | 7030003680 | S.RESISTOR  | ERJ3GEYJ 104 V (100 kΩ) |
| R81      | 7030003580 | S.RESISTOR  | ERJ3GEYJ 153 V (15 kΩ)  |
| R83      | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R84      | 7030000180 | S.RESISTOR  | MCR10EZJH 22 Ω (220)    |
| R85      | 7030003200 | S.RESISTOR  | ERJ3GEYJ 100 V (10 Ω)   |
| R86      | 7030003200 | S.RESISTOR  | ERJ3GEYJ 100 V (10 Ω)   |
| R87      | 7030003200 | S.RESISTOR  | ERJ3GEYJ 100 V (10 Ω)   |
| R88      | 7030003200 | S.RESISTOR  | ERJ3GEYJ 100 V (10 Ω)   |
| R89      | 7030003570 | S.RESISTOR  | ERJ3GEYJ 123 V (12 kΩ)  |
| R90      | 7030003830 | S.RESISTOR  | ERJ3GEYJ 185 V (1.8 MΩ) |
| R91      | 7030003480 | S.RESISTOR  | ERJ3GEYJ 222 V (2.2 kΩ) |
| R92      | 7030003570 | S.RESISTOR  | ERJ3GEYJ 123 V (12 kΩ)  |
| R94      | 7030005330 | S.RESISTOR  | RR0816P-562-D (5.6 kΩ)  |
| R95      | 7030005320 | S.RESISTOR  | RR0816P-103-D (10 kΩ)   |
| R96      | 7030003450 | S.RESISTOR  | ERJ3GEYJ 122 V (1.2 kΩ) |
| R97      | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R98      | 7030000200 | S.RESISTOR  | MCR10EZJH 33 Ω (330)    |
| R104     | 7030003720 | S.RESISTOR  | ERJ3GEYJ 224 V (220 kΩ) |
| R105     | 7030000180 | S.RESISTOR  | MCR10EZJH 22 Ω (220)    |
| R109     | 7030003730 | S.RESISTOR  | ERJ3GEYJ 274 V (270 kΩ) |
| R110     | 7030003730 | S.RESISTOR  | ERJ3GEYJ 274 V (270 kΩ) |
| R111     | 7030003850 | S.RESISTOR  | ERJ3GEYJ 563 V (56 kΩ)  |
| R112     | 7030003850 | S.RESISTOR  | ERJ3GEYJ 563 V (56 kΩ)  |
| R113     | 7030005330 | S.RESISTOR  | RR0816P-562-D (5.6 kΩ)  |
| R114     | 7030005330 | S.RESISTOR  | RR0816P-562-D (5.6 kΩ)  |
| R115     | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R117     | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R118     | 7030003560 | S.RESISTOR  | ERJ3GEYJ 103 V (10 kΩ)  |
| R119     | 7030003520 | S.RESISTOR  | ERJ3GEYJ 472 V (4.7 kΩ) |
| R120     | 7030000200 | S.RESISTOR  | MCR10EZJH 33 Ω (330)    |
| R121     | 7030003450 | S.RESISTOR  | ERJ3GEYJ 122 V (1.2 kΩ) |
| R122     | 7030003440 | S.RESISTOR  | ERJ3GEYJ 102 V (1 kΩ)   |
| R123     | 7030003450 | S.RESISTOR  | ERJ3GEYJ 122 V (1.2 kΩ) |
| R124     | 7030000200 | S.RESISTOR  | MCR10EZJH 33 Ω (330)    |
| R125     | 7030003640 | S.RESISTOR  | ERJ3GEYJ 473 V (47 kΩ)  |
| C1       | 4030010740 | S.CERAMIC   | C1608 JB 1A 104K-T-A    |
| C2       | 4030010740 | S.CERAMIC   | C1608 JB 1A 104K-T-A    |
| C3       | 4030007060 | S.CERAMIC   | C1608 CH 1H 270J-T-A    |
| C4       | 4030010740 | S.CERAMIC   | C1608 JB 1A 104K-T-A    |
| C5       | 4030006850 | S.CERAMIC   | C1608 JB 1H 471K-T-A    |
| C6       | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C7       | 4030007070 | S.CERAMIC   | C1608 CH 1H 330J-T-A    |
| C8       | 4030010740 | S.CERAMIC   | C1608 JB 1A 104K-T-A    |
| C9       | 4030008920 | S.CERAMIC   | C1608 JB 1C 473K-T-A    |
| C10      | 4030006990 | S.CERAMIC   | C1608 CH 1H 080D-T-A    |
| C11      | 4030007040 | S.CERAMIC   | C1608 CH 1H 180J-T-A    |
| C12      | 4030007030 | S.CERAMIC   | C1608 CH 1H 150J-T-A    |
| C13      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C14      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C15      | 4030007020 | S.CERAMIC   | C1608 CH 1H 102J-T-A    |
| C17      | 4030006990 | S.CERAMIC   | C1608 CH 1H 080D-T-A    |
| C18      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C19      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C20      | 4030006860 | S.CERAMIC   | C1608 JB 1H 102K-T-A    |
| C21      | 4030009520 | S.CERAMIC   | C1608 CH 1H 020B-T-A    |

S.=Surface mount

## [2F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                    |
|----------|------------|--------------------------------|
| C22      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C23      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C25      | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A |
| C26      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C27      | 4030007060 | S.CERAMIC C1608 CH 1H 270J-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      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C32      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A |
| C33      | 4030009520 | S.CERAMIC C1608 CH 1H 020B-T-A |
| C34      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A |
| C35      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C36      | 4030006860 | S.CERAMIC C1608 CH 1H 080D-T-A |
| C37      | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A |
| C38      | 4030007020 | S.CERAMIC C1608 CH 1H 120J-T-A |
| C39      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C40      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C41      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C42      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C43      | 4030006860 | S.CERAMIC C1608 CH 1H 080D-T-A |
| C44      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C45      | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A |
| C46      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C47      | 4030007070 | S.CERAMIC C1608 CH 1H 330J-T-A |
| C48      | 4030006900 | S.CERAMIC C1608 JB 1E 103K-T-A |
| C49      | 4030007010 | S.CERAMIC C1608 CH 1H 100D-T-A |
| C50      | 4030007030 | S.CERAMIC C1608 CH 1H 150J-T-A |
| C52      | 4030007060 | S.CERAMIC C1608 CH 1H 270J-T-A |
| C53      | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A |
| C54      | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A |
| 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 |
| C61      | 4030007010 | S.CERAMIC C1608 CH 1H 100D-T-A |
| C62      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C63      | 4030006860 | S.CERAMIC C1608 CH 1H 070D-T-A |
| C64      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C65      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C66      | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A |
| C67      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C68      | 4030007010 | S.CERAMIC C1608 CH 1H 100D-T-A |
| C69      | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A |
| C70      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C71      | 4030007030 | S.CERAMIC C1608 CH 1H 150J-T-A |
| C72      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C73      | 4030009920 | S.CERAMIC C1608 CH 1H 050B-T-A |
| C74      | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A |
| C75      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C76      | 4030009540 | S.CERAMIC C1608 CH 1H 1R5B-T-A |
| C77      | 4030007020 | S.CERAMIC C1608 CH 1H 120J-T-A |
| C78      | 4030006860 | S.CERAMIC C1608 CH 1H 070D-T-A |
| C79      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C80      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C81      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C82      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C83      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C84      | 4030007120 | S.CERAMIC C1608 CH 1H 820J-T-A |
| C85      | 4030007020 | S.CERAMIC C1608 CH 1H 120J-T-A |
| C86      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C87      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C88      | 4030006900 | S.CERAMIC C1608 JB 1E 103K-T-A |
| C89      | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A |
| C91      | 4550006190 | S.TANTALUM ECST0GY106R         |
| C92      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C93      | 4550006190 | S.TANTALUM ECST0GY106R         |
| C94      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C95      | 4550006121 | S.TANTALUM TEMSVA 0G 226M-8R   |
| C96      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C97      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C98      | 4550006320 | S.TANTALUM ECST0JY475R         |
| C99      | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |
| C100     | 4550006320 | S.TANTALUM ECST0JY475R         |
| C101     | 4550008590 | S.TANTALUM ECST1CY684R         |
| C102     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A |

## [2F UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                      |
|----------|------------|----------------------------------|
| C103     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C104     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C105     | 4030006900 | S.CERAMIC C1608 JB 1E 103K-T-A   |
| C106     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C107     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C108     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C109     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C110     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C111     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C112     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C113     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C114     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C115     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C116     | 4550006121 | S.TANTALUM TEMSVA 0G 226M-8R     |
| C117     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C118     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C122     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C123     | 4510005320 | S.ELECTROLITIC ECEV0JA101SP      |
| C124     | 4510005320 | S.ELECTROLITIC ECEV0JA101SP      |
| C125     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C126     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C127     | 4550006170 | S.TANTALUM ECST1AY225R           |
| C128     | 4550006170 | S.TANTALUM ECST1AY225R           |
| C129     | 4030006860 | S.CERAMIC C1608 JB 1H 472K-T-A   |
| C130     | 4030006860 | S.CERAMIC C1608 JB 1H 472K-T-A   |
| C131     | 4510005320 | S.ELECTROLITIC ECEV0JA101SP      |
| C132     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C133     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C134     | 4550006860 | S.TANTALUM ECST0JY335R           |
| C135     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C142     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C144     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C145     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C146     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C148     | 4030009530 | S.CERAMIC C1608 CH 1H 030B-T-A   |
| C149     | 4030007040 | S.CERAMIC C1608 CH 1H 180J-T-A   |
| C150     | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A   |
| C151     | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A   |
| C152     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C153     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C154     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C155     | 4030008960 | S.CERAMIC C2012 JB 1C 104K-T-A   |
| C156     | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A   |
| C157     | 4030008920 | S.CERAMIC C1608 JB 1C 473K-T-A   |
| C158     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C159     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C160     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C161     | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A   |
| C162     | 4030009520 | S.CERAMIC C1608 CH 1H 020B-T-A   |
| C163     | 4030009910 | S.CERAMIC C1608 CH 1H 040B-T-A   |
| C164     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C165     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C166     | 4030007040 | S.CERAMIC C1608 CH 1H 180J-T-A   |
| C167     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C168     | 4510005310 | S.ELECTROLITIC ECEV1CA220SR      |
| C169     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C170     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C171     | 4030010740 | S.CERAMIC C1608 JB 1A 104K-T-A   |
| C172     | 4030007170 | S.CERAMIC C1608 CH 1H 221J-T-A   |
| C173     | 4030007170 | S.CERAMIC C1608 CH 1H 221J-T-A   |
| C174     | 4030006900 | S.CERAMIC C1608 JB 1E 103K-T-A   |
| C175     | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A   |
| C176     | 4030008770 | S.CERAMIC C1608 JB 1H 582K-T-A   |
| J1       | 6510018180 | S.CONNECTOR 52365-0690           |
| J2       | 6510018180 | S.CONNECTOR 52365-0690           |
| J3       | 6510018180 | S.CONNECTOR 52365-0690           |
| J4       | 6510017940 | S.CONNECTOR IL-FPR-U38S-HF-E3000 |
| J5       | 6510017620 | S.CONNECTOR 52357-2290           |
| W1       | 7030003860 | S.JUMPER ERJ3GE JPW V            |
| W2       | 7030003860 | S.JUMPER ERJ3GE JPW V            |
| EP1      | 0910045092 | PCB B 4567B                      |

S.=Surface mount

## [V VR BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION |                             |
|----------|------------|-------------|-----------------------------|
| C1       | 4030007090 | S.CERAMIC   | C1608 CH 1H 470J-T-A        |
| S1       | 7600000170 | ENCODER     | TP96D96E<br>20-15FB10K-1480 |
| EP1      | 0910045111 | PCB         | B 4569A                     |

## [U VR BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION |                             |
|----------|------------|-------------|-----------------------------|
| S1       | 7600000170 | ENCODER     | TP96D96E<br>20-15FB10K-1480 |
| EP1      | 0910045131 | PCB         | B 4570A                     |

## [UHF RF-A BOARD]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                                  |
|----------|------------|--------------|----------------------------------|
| IC7      | 1110003370 | S.IC         | $\mu$ PC2748T-E3                 |
| Q32      | 1530002900 | S.TRANSISTOR | 2SC4228-T2                       |
| D1       | 1790001260 | S.DIODE      | MA2S077-(TX)                     |
| F15      | 2040000750 | S.FILTER     | HWCK002 (435MHz)<br>[except USA] |
|          | 2040000750 | S.FILTER     | HWCK001 (445MHz)<br>[USA]        |
| F16      | 2040000750 | S.FILTER     | HWCK002 (435MHz)<br>[except USA] |
|          | 2040000750 | S.FILTER     | HWCK001 (445MHz)<br>[USA]        |
| L11      | 6200002340 | S.COIL       | LQN 1A 23NJ04                    |
| L12      | 6200002350 | S.COIL       | LQN 1A 27NJ04                    |
| R99      | 7030003370 | S.RESISTOR   | ERJ3GEYJ 271 V (270 $\Omega$ )   |
| R100     | 7030003230 | S.RESISTOR   | ERJ3GEYJ 180 V (18 $\Omega$ )    |
| R101     | 7030003370 | S.RESISTOR   | ERJ3GEYJ 271 V (270 $\Omega$ )   |
| R102     | 7030003360 | S.RESISTOR   | ERJ3GEYJ 221 V (220 $\Omega$ )   |
| R103     | 7030003640 | S.RESISTOR   | ERJ3GEYJ 473 V (47 k $\Omega$ )  |
| R116     | 7030003380 | S.RESISTOR   | ERJ3GEYJ 331 V (330 $\Omega$ )   |
| C1       | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A             |
| C136     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A             |
| C137     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A             |
| C138     | 4030006860 | S.CERAMIC    | C1608 JB 1H 102K-T-A             |
| C139     | 4030006990 | S.CERAMIC    | C1608 CH 1H 080D-T-A             |
| C140     | 4030006850 | S.CERAMIC    | C1608 JB 1H 471K-T-A             |
| C154     | 4030006850 | S.CERAMIC    | C1608 JB 1H 471K-T-A             |
| J1       | 6910008020 | CONNECTOR    | IPS-1323                         |
| J2       | 6910008020 | CONNECTOR    | IPS-1323                         |
| J3       | 6910008020 | CONNECTOR    | IPS-1323                         |
| J4       | 6910008020 | CONNECTOR    | IPS-1323                         |
| EP1      | 0910046160 | PCB          | B 4655                           |

## [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION  |                                    |
|----------|------------|--------------|------------------------------------|
| IC1      | 1140005380 | S.IC         | HD404639B04FS                      |
| IC2      | 1130007110 | S.IC         | TC7W04FU(Te12L)                    |
| IC3      | 1140004620 | S.IC         | X24C16S8-2.7                       |
| IC4      | 1130007560 | S.IC         | LC73881M-TLM                       |
| IC5      | 1130006220 | S.IC         | TC4W53FU (Te12L)                   |
| IC6      | 1180001240 | S.IC         | S-81335HG-KI-T1                    |
| IC7      | 1110003380 | S.IC         | S-80730SL-AT-T1                    |
| IC8      | 1130003760 | S.IC         | TC4S81F (Te85R)                    |
| IC9      | 1130007570 | S.IC         | BU4094BCFV-EZ                      |
| IC10     | 1110003410 | S.IC         | $\mu$ PC5023GR-043-GJG-T2          |
| IC11     | 1130006220 | S.IC         | TC4W53FU (Te12L)                   |
| IC12     | 1130006220 | S.IC         | TC4W53FU (Te12L)                   |
| IC13     | 1140004440 | S.IC         | HD404829C02H                       |
| Q1       | 1590001470 | S.TRANSISTOR | UN9213(TX)                         |
| Q4       | 1590001190 | S.TRANSISTOR | XP6501-(TX).AB                     |
| Q6       | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R                     |
| Q7       | 1530003280 | S.TRANSISTOR | 2SC4211-6-TR                       |
| Q8       | 1590001170 | S.TRANSISTOR | XP1501-(TX).AB                     |
| Q9       | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R                     |
| Q10      | 1590001180 | S.TRANSISTOR | XP1210(TX)                         |
| Q11      | 1590001180 | S.TRANSISTOR | XP1210(TX)                         |
| Q12      | 1590001180 | S.TRANSISTOR | XP1210(TX)                         |
| Q13      | 1590001180 | S.TRANSISTOR | XP1210(TX)                         |
| Q14      | 1590001860 | S.TRANSISTOR | UN9215(TX)                         |
| Q15      | 1550000010 | S.FET        | 2SJ364-Q (TX)                      |
| Q16      | 1590001190 | S.TRANSISTOR | XP6501-(TX).AB                     |
| Q17      | 1590001860 | S.TRANSISTOR | UN9215(TX)                         |
| Q18      | 1550000010 | S.FET        | 2SJ364-Q (TX)                      |
| Q19      | 1590001190 | S.TRANSISTOR | XP6501-(TX).AB                     |
| Q20      | 1540000350 | S.TRANSISTOR | 2SD2216-S(TX)                      |
| Q21      | 1540000350 | S.TRANSISTOR | 2SD2216-S(TX)                      |
| Q22      | 1540000350 | S.TRANSISTOR | 2SD2216-S(TX)                      |
| Q23      | 1540000350 | S.TRANSISTOR | 2SD2216-S(TX)<br>[IC-W31E only]    |
| Q25      | 1590001150 | S.TRANSISTOR | UN9211(TX)                         |
| Q26      | 1520000430 | S.TRANSISTOR | 2SB1462-R(TX)                      |
| Q27      | 1590001130 | S.TRANSISTOR | UN9110(TX)                         |
| Q28      | 1590001190 | S.TRANSISTOR | XP6501-(TX).AB                     |
| Q29      | 1590002210 | S.TRANSISTOR | RN4904(Te85L)                      |
| D4       | 1790001250 | S.DIODE      | MA2S111-(TX)                       |
| D6       | 1790001250 | S.DIODE      | MA2S111-(TX)                       |
| D7       | 1790001250 | S.DIODE      | MA2S111-(TX)                       |
| D8       | 1790001200 | S.DIODE      | MA6S121(TX)                        |
| D11      | 1750000220 | S.DIODE      | DA113W T107 [USA, EUR]             |
|          | 1750000240 | S.DIODE      | DA112 T107 [UK, AUS]               |
|          | 1160000050 | S.DIODE      | DAP202U T107 [SEA]                 |
| D12      | 1750000240 | S.DIODE      | DA112 T107<br>[USA, SEA, AUS, ITA] |
|          | 1790001250 | S.DIODE      | MA2S111-(TX)<br>[except ITA]       |
| D15      | 1160000050 | S.DIODE      | DAP202U T107<br>[except ITA]       |
| D17      | 1790001250 | S.DIODE      | MA2S111-(TX) [USA]                 |
| D19      | 1790000990 | S.ZENER      | MA8051-H(TX)                       |
| D20      | 1790001250 | S.DIODE      | MA2S111-(TX)                       |
| D21      | 1790000840 | S.DIODE      | MA132WA(TX)                        |
| D22      | 1790000840 | S.DIODE      | MA132WA(TX)                        |
| D23      | 1790000970 | S.DIODE      | MA729(TX)                          |
| D25      | 1790001250 | S.DIODE      | MA2S111-(TX)                       |
| X1       | 6060000570 | S.CERAMIC    | FAR-C3CA-04000-J00-R               |
| X2       | 6050009460 | S.XTAL       | CM200S SMD(32.768KHz)              |
| X3       | 6050009020 | S.CERAMIC    | EFOS4194E3                         |
| X4       | 6060000520 | S.CERAMIC    | CSAC2.00MGC200-TC                  |
| R1       | 7030005470 | S.RESISTOR   | RR0816R-244-D (240 k $\Omega$ )    |
| R2       | 7030005490 | S.RESISTOR   | RR0816R-363-D (36 k $\Omega$ )     |
| R3       | 7030005330 | S.RESISTOR   | RR0816P-562-D (5.6 k $\Omega$ )    |
| R4       | 7030003760 | S.RESISTOR   | ERJ3GEYJ 474 V (470 k $\Omega$ )   |
| R5       | 7030003600 | S.RESISTOR   | ERJ3GEYJ 223 V (22 k $\Omega$ )    |

S.=Surface mount

## [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                                      |
|----------|------------|--------------------------------------------------|
| R6       | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)                |
| R7       | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)                |
| R8       | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                 |
| R10      | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                 |
| R12      | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                 |
| R13      | 7030003760 | S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)               |
| R18      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R19      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)               |
| R20      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R21      | 7030003470 | S.RESISTOR ERJ3GEYJ 182 V (1.8 kΩ)               |
| R22      | 7030003650 | S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)                |
| R23      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)               |
| R24      | 7030003620 | S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)                |
| R25      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)                |
| R26      | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)                |
| R27      | 7030003570 | S.RESISTOR ERJ3GEYJ 123 V (12 kΩ)                |
| R28      | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)               |
| R29      | 7030003470 | S.RESISTOR ERJ3GEYJ 182 V (1.8 kΩ)               |
| R30      | 7030003650 | S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)                |
| R31      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)               |
| R32      | 7030003620 | S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)                |
| R33      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)                |
| R34      | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)                |
| R35      | 7030003570 | S.RESISTOR ERJ3GEYJ 123 V (12 kΩ)                |
| R36      | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)               |
| R37      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)               |
| R38      | 7030003760 | S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)               |
| R39      | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                 |
| R40      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)               |
| R41      | 7030003630 | S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)                |
| R42      | 7030003630 | S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)                |
| R43      | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)               |
| R44      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)                |
| R45      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)               |
| R46      | 7030003750 | S.RESISTOR ERJ3GEYJ 394 V (390 kΩ)               |
| R47      | 7030003700 | S.RESISTOR ERJ3GEYJ 154 V (150 kΩ)               |
| R49      | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)               |
| R50      | 7030003760 | S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)               |
| R51      | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                 |
| R52      | 7030003520 | S.RESISTOR ERJ3GEYJ 154 V (150 kΩ)               |
| R53      | 7030003630 | S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)                |
| R54      | 7030003630 | S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)                |
| R55      | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)               |
| R56      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)                |
| R57      | 7030003550 | S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)               |
| R58      | 7030003750 | S.RESISTOR ERJ3GEYJ 394 V (390 kΩ)               |
| R59      | 7030003700 | S.RESISTOR ERJ3GEYJ 154 V (150 kΩ)               |
| R61      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)                 |
| R62      | 7030003740 | S.RESISTOR ERJ3GEYJ 334 V (330 kΩ)               |
| R63      | 7030003730 | S.RESISTOR ERJ3GEYJ 274 V (270 kΩ)               |
| R64      | 7030003500 | S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)               |
| R65      | 7030003580 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R66      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)                 |
| R67      | 7030003740 | S.RESISTOR ERJ3GEYJ 334 V (330 kΩ)               |
| R68      | 7030003730 | S.RESISTOR ERJ3GEYJ 274 V (270 kΩ)               |
| R69      | 7030003500 | S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)               |
| R70      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R71      | 7410000750 | S.ARRAY EXB-V4V 104JV (100 kΩ)                   |
| R72      | 7410000580 | S.ARRAY EXB-V4V 224JV (220 kΩ)<br>[IC-W31E only] |
| R73      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R74      | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)                |
| R75      | 7030003650 | S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)                |
| R76      | 7030003670 | S.RESISTOR ERJ3GEYJ 823 V (82 kΩ)                |
| R77      | 7030003560 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                |
| R78      | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)                |
| R79      | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)                |
| R80      | 7310003910 | S.TRIMMER MVR32HXB N502 (5K)<br>[IC-W31E only]   |
| R81      | 7030003500 | S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)               |
| R82      | 7030003420 | S.RESISTOR ERJ3GEYJ 681 V (680 Ω)                |
| R84      | 7030005470 | S.RESISTOR RR0816R-244-D (240 kΩ)                |
| R85      | 7030005500 | S.RESISTOR RR0816R-124-D (120 kΩ)                |
| R86      | 7030005960 | S.RESISTOR RR0816R-623-D (62 kΩ)                 |
| R87      | 7030005510 | S.RESISTOR RR0816P-303-D (30 kΩ)                 |
| R88      | 7030005450 | S.RESISTOR RR0816P-153-D (15 kΩ)                 |

## [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                                         |
|----------|------------|-----------------------------------------------------|
| R89      | 7030005450 | S.RESISTOR RR0816P-153-D (15 kΩ)                    |
| R90      | 7030005630 | S.RESISTOR RR0816R-154-D (150 kΩ)                   |
| R91      | 7030005630 | S.RESISTOR RR0816R-154-D (150 kΩ)                   |
| R92      | 7030005630 | S.RESISTOR RR0816R-154-D (150 kΩ)                   |
| R93      | 7410000830 | S.ARRAY EXB-V4V 103JV (10 kΩ)                       |
| R94      | 7030003580 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                   |
| R95      | 7310003550 | S.TRIMMER MVR32HXB N473                             |
| R96      | 7030003580 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                   |
| R97      | 7030003580 | S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)<br>[IC-W31E only] |
| R98      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)                    |
| R99      | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)                    |
| R100     | 7030003450 | S.RESISTOR ERJ3GEYJ 122 V (1.2 kΩ)                  |
| R101     | 7030003580 | S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)                   |
| R102     | 7030003400 | S.RESISTOR ERJ3GEYJ 471 V (470 Ω)                   |
| R103     | 7030003720 | S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)                  |
| R104     | 7030003410 | S.RESISTOR ERJ3GEYJ 561 V (560 Ω)                   |
| R105     | 7030003650 | S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)                   |
| R106     | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)                   |
| R107     | 7030003690 | S.RESISTOR ERJ3GEYJ 124 V (120 kΩ)                  |
| R108     | 7030003710 | S.RESISTOR ERJ3GEYJ 184 V (180 kΩ)                  |
| R109     | 7030003720 | S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)                  |
| R110     | 7030003590 | S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)                   |
| R111     | 7030003650 | S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)                   |
| R112     | 7030003640 | S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)                   |
| R114     | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)                  |
| R115     | 7030003480 | S.RESISTOR ERJ3GEYJ 222 V (2.2 kΩ)                  |
| R117     | 7030003620 | S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)                   |
| R118     | 7410000830 | S.ARRAY EXB-V4V 103JV (10 kΩ)                       |
| R120     | 7410000820 | S.ARRAY EXB-V4V 223JV (22 kΩ)                       |
| R122     | 7030003840 | S.RESISTOR ERJ3GEYJ 225 V (2.2 MΩ)                  |
| R123     | 7030003840 | S.RESISTOR ERJ3GEYJ 225 V (2.2 MΩ)                  |
| R124     | 7410001020 | S.ARRAY EXB-V4V i52JV (1.5 kΩ)                      |
| R126     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)                  |
| R127     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)                  |
| R128     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)                  |
| R129     | 7030003520 | S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)                  |
| R130     | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                    |
| R131     | 7030003800 | S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)                    |
| R132     | 7030003690 | S.RESISTOR ERJ3GEYJ 124 V (120 kΩ)                  |
| R133     | 7030003620 | S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)                   |
| R134     | 7030003660 | S.RESISTOR ERJ3GEYJ 683 V (68 kΩ)                   |
| R135     | 7030003540 | S.RESISTOR ERJ3GEYJ 682 V (6.8 kΩ)                  |
| R136     | 7410000930 | S.ARRAY EXB-V4V 121JV (120 Ω)                       |
| R137     | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)<br>[IC-W31E only] |
| R138     | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)<br>[IC-W31E only] |
| R139     | 7030003600 | S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)<br>[IC-W31E only] |
| R140     | 7030003760 | S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)                  |
| R142     | 7030003510 | S.RESISTOR ERJ3GEYJ 392 V (3.9 kΩ)                  |
| R143     | 7410001060 | S.ARRAY EXB-V4V 221JV (220 Ω)                       |
| R144     | 7030003670 | S.RESISTOR ERJ3GEYJ 823 V (82 kΩ)<br>[IC-W31E only] |
| R145     | 7030003380 | S.RESISTOR ERJ3GEYJ 221 V (220 Ω)                   |
| R146     | 7030003360 | S.RESISTOR ERJ3GEYJ 221 V (220 Ω)                   |
| R147     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R148     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R149     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R150     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R151     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R152     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R153     | 7030003390 | S.RESISTOR ERJ3GEYJ 391 V (390 Ω)                   |
| R154     | 7030003440 | S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)                    |
| C1       | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A                      |
| C2       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |
| C3       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |
| C4       | 4030006850 | S.CERAMIC C1608 JB 1H 471K-T-A                      |
| C5       | 4030006860 | S.CERAMIC C1608 JB 1H 102K-T-A                      |
| C6       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |
| C7       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |
| C8       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |
| C9       | 4030010070 | S.CERAMIC C1608 X7S 1C 104K-T-A                     |

S.=Surface mount

## [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                                      |
|----------|------------|--------------------------------------------------|
| C11      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C12      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C15      | 4030006870 | S.CERAMIC C1808 JB 1H 222K-T-A                   |
| C16      | 4030007010 | S.CERAMIC C1808 CH 1H 100D-T-A                   |
| C17      | 4030007010 | S.CERAMIC C1808 CH 1H 100D-T-A                   |
| C18      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C19      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C21      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C22      | 4510004640 | S.ELECTROLITIC ECEV1CA470SP                      |
| C23      | 4510005900 | S.ELECTROLITIC ECEV0GA101SR                      |
| C24      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C25      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C26      | 4550003290 | S.TANTALUM TESVA 0G 475M1-8L                     |
| C27      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C28      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C29      | 4510006090 | S.ELECTROLITIC ECEV0GA470SR                      |
| C30      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C31      | 4030008900 | S.CERAMIC C1808 JB 1C 333K-T-A                   |
| C32      | 4030009000 | S.CERAMIC C2012 JB 1C 224K-T-A                   |
| C33      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C34      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C35      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C36      | 4030006870 | S.CERAMIC C1808 JB 1H 222K-T-A                   |
| C37      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C38      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C39      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C41      | 4030008900 | S.CERAMIC C1808 JB 1C 333K-T-A                   |
| C42      | 4030009000 | S.CERAMIC C2012 JB 1C 224K-T-A                   |
| C43      | 4030006870 | S.CERAMIC C1808 JB 1H 222K-T-A                   |
| C44      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C45      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C46      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C48      | 4550008030 | S.TANTALUM TEMSVA 0G 156M1-8L                    |
| C49      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C50      | 4030009000 | S.CERAMIC C2012 JB 1C 224K-T-A                   |
| C51      | 4550008030 | S.TANTALUM TEMSVA 0G 156M1-8L                    |
| C52      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C53      | 4030009000 | S.CERAMIC C2012 JB 1C 224K-T-A                   |
| C54      | 4030008920 | S.CERAMIC C1808 JB 1C 473K-T-A                   |
| C55      | 4030008850 | S.CERAMIC C1808 JB 1C 123K-T-A                   |
| C56      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C57      | 4550000460 | S.TANTALUM TESVA 1C 105M1-8L                     |
| C58      | 4030006880 | S.CERAMIC C1808 JB 1H 472K-T-A<br>[IC-W31E only] |
| C59      | 4030006870 | S.CERAMIC C1808 JB 1H 222K-T-A<br>[IC-W31E only] |
| C61      | 4030008880 | S.CERAMIC C1808 JB 1C 223K-T-A                   |
| C63      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C66      | 4030008880 | S.CERAMIC C1808 JB 1C 223K-T-A                   |
| C67      | 4030008920 | S.CERAMIC C1808 JB 1C 473K-T-A                   |
| C68      | 4550003290 | S.TANTALUM TESVA 0G 475M1-8L                     |
| C69      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C70      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C71      | 4030008920 | S.CERAMIC C1808 JB 1C 473K-T-A                   |
| C72      | 4030008770 | S.CERAMIC C1808 SL 1H 151J-T-A                   |
| C73      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C74      | 4550000270 | S.TANTALUM TESVA 1E 474M1-8L                     |
| C75      | 4550000460 | S.TANTALUM TESVA 1C 105M1-8L                     |
| C76      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C77      | 4030009970 | S.CERAMIC C1808 JB 1H 182K-T-A                   |
| C78      | 4030006880 | S.CERAMIC C1808 JB 1H 472K-T-A                   |
| C79      | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A                  |
| C80      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C81      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C83      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C84      | 4030010740 | S.CERAMIC C1808 JB 1A 104K-T-A                   |
| C85      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C86      | 4030006900 | S.CERAMIC C1808 JB 1E 103K-T-A                   |
| C87      | 4030010740 | S.CERAMIC C1808 JB 1A 104K-T-A                   |
| C88      | 4030007040 | S.CERAMIC C1808 CH 1H 180J-T-A                   |
| C89      | 4030007030 | S.CERAMIC C1808 CH 1H 150J-T-A                   |
| C92      | 4550000460 | S.TANTALUM TESVA 1C 105M1-8L                     |
| C93      | 4030006860 | S.CERAMIC C1808 JB 1H 102K-T-A                   |
| C95      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C96      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |
| C97      | 4030006850 | S.CERAMIC C1808 JB 1H 471K-T-A                   |

## [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                      |
|----------|------------|----------------------------------|
| C100     | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A  |
| C101     | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A  |
| C102     | 4550008010 | S.TANTALUM TEMSVA 0G 106M8L      |
| C103     | 4030010070 | S.CERAMIC C1808 X7S 1C 104K-T-A  |
| C104     | 4030007080 | S.CERAMIC C1808 CH 1H 390J-T-A   |
| C105     | 4030007090 | S.CERAMIC C1808 CH 1H 470J-T-A   |
| DS1      | 5030001140 | LCD T-535001A                    |
| DS2      | 5040001110 | S.LED SLM-23VMWS T97B            |
| DS3      | 5040001920 | S.LED SML-110MT T86              |
| DS4      | 5040001920 | S.LED SML-110MT T86              |
| DS5      | 5040001920 | S.LED SML-110MT T86              |
| DS6      | 5040001920 | S.LED SML-110MT T86              |
| DS7      | 5010000120 | S.LED LN1371G-(TR)               |
| DS8      | 5010000120 | S.LED LN1371G-(TR)               |
| DS9      | 5010000120 | S.LED LN1371G-(TR)               |
| DS10     | 5010000120 | S.LED LN1371G-(TR)               |
| DS11     | 5010000120 | S.LED LN1371G-(TR)               |
| DS12     | 5010000120 | S.LED LN1371G-(TR)               |
| DS13     | 5010000120 | S.LED LN1371G-(TR)               |
| S1       | 2260001880 | S.SWITCH SKQDPB                  |
| S2       | 2260002140 | S.SWITCH SKQLLC                  |
| S3       | 2260002140 | S.SWITCH SKQLLC                  |
| S4       | 2260002140 | S.SWITCH SKQLLC                  |
| J1       | 6510017680 | S.CONNECTOR IL-FPR-38S-HF-E3000  |
| J2       | 6510018600 | S.CONNECTOR IL-FPR-U10S-HF-E3000 |
| W1       | 7030003860 | S.JUMPER ERJ3GE JPW V            |
| W2       | 7030003860 | S.JUMPER ERJ3GE JPW V            |
| W3       | 9045995030 | WIRE 71/98/020/X98/X98           |
| W4       | 8900005810 | CABLE OPC-545 (N:38 L:105)       |
| MC1      | 7700001750 | MICROPHONE EM-123TH              |
| EP1      | 8930037540 | LCD CONTACT SRCN-1459 ZCC        |
| EP2      | 0910045174 | PCB B 4466D                      |

S.=Surface mount

## SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

### 7-1 CABINET PARTS

#### [CHASSIS PARTS]

| REF. NO. | ORDER NO.  | DESCRIPTION                     | QTY. |
|----------|------------|---------------------------------|------|
| J 1      | 6510015550 | Connector BNC-R117              | 1    |
| MP 1     | 8210011591 | 1460 Rear panel                 | 1    |
| MP 2     | 8930035520 | 1459 Rear plate                 | 1    |
| MP 3     | 8930033760 | 1460 Release plate              | 1    |
| MP 4     | 8930033770 | 1460 Release button             | 1    |
| MP 5     | 8930035131 | Spring (V)-1                    | 1    |
| MP 6     | 8510009310 | 1460 Shield plate               | 1    |
| MP 7     | 8610009330 | Knob N225                       | 2    |
| MP 8     | 8610009341 | Knob N226-1                     | 2    |
| MP 10    | 8310034261 | 1460 Contact base-1             | 1    |
| MP 11    | 8930033820 | 1460 Contact spring             | 3    |
| MP 12    | 8930035410 | 1460 Contact rubber             | 3    |
| MP 13    | 8930033811 | 1460 Connector seal-1           | 1    |
| MP 14    | 8930035030 | 1460 VR spacer                  | 1    |
| MP 15    | 8810004370 | Screw PH B0 M2 x 10 ZK          | 4    |
| MP 16    | 8810006760 | Screw PH B0 No.0 M2 x 3 NI      | 2    |
| MP 17    | 8810006760 | Screw PH B0 No.0 M2 x 3 NI      | 2    |
| MP 18    | 8810003850 | Screw PH B0 No.0-3 M1.4x 2.5 NI | 3    |
| MP 19    | 8810005860 | Screw PH No.0 M2 x 3 NI         | 1    |
| MP 20    | 8810005860 | Screw PH No.0 M2 x 3 NI         | 2    |
| MP 21    | 8810005860 | Screw PH No.0 M2 x 3 NI         | 2    |
| MP 22    | 8810005360 | Screw PH No.0 M2 x 3 ZK         | 1    |
| MP 23    | 8810005320 | Screw PH M2 X 4 NI FE           | 2    |
| MP 24    | 8830000570 | Nut (A)                         | 2    |
| MP 25    | 8010014982 | Hole bush (B)-2                 | 2    |

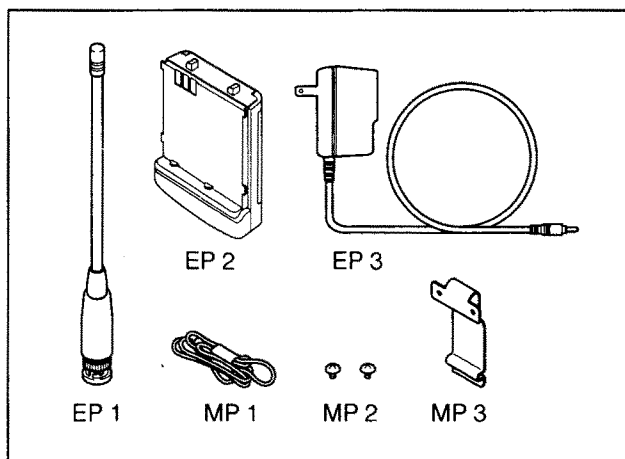
#### [LOGIC UNIT]

| REF. NO. | ORDER NO.  | DESCRIPTION                             | QTY. |
|----------|------------|-----------------------------------------|------|
| EP 1     | 8930037540 | LCD contact screen SRCN-1459 ZOC        | 2    |
| DS 1     | 5030001140 | LCD T-535001A                           | 1    |
| MP 1     | 8210012891 | 1459 Front panel-1 W-31A (incl. MP2, 3) | 1    |
|          | 8210012901 | 1459 Front panel-1 W-31E (incl. MP2, 3) | 1    |
| MP 6     | 8930035431 | Rubber button 1459 10 key-1             | 1    |
| MP 7     | 8930035440 | 1459 Power button                       | 1    |
| MP 8     | 8210012180 | 1459 Reflector                          | 1    |
| MP 9     | 8930035530 | 1459 LCD holder                         | 1    |
| MP 12    | 8930024231 | 1121 Microphone seal-1                  | 1    |
| MP 13    | 8810006760 | Screw No.0 B0 PH No.1 M2 x 3 NI         | 4    |
| MP 14    | 8930036230 | 1459 Grounding plate                    | 1    |
| MP 17    | 8930037480 | 1459 L-grounding plate                  | 1    |
| W 4      | 8900005810 | Cable OPC-545 (N:38 L:105)              | 1    |
| *        | 2510000340 | SPEAKER CS J28 014-12                   | 1    |

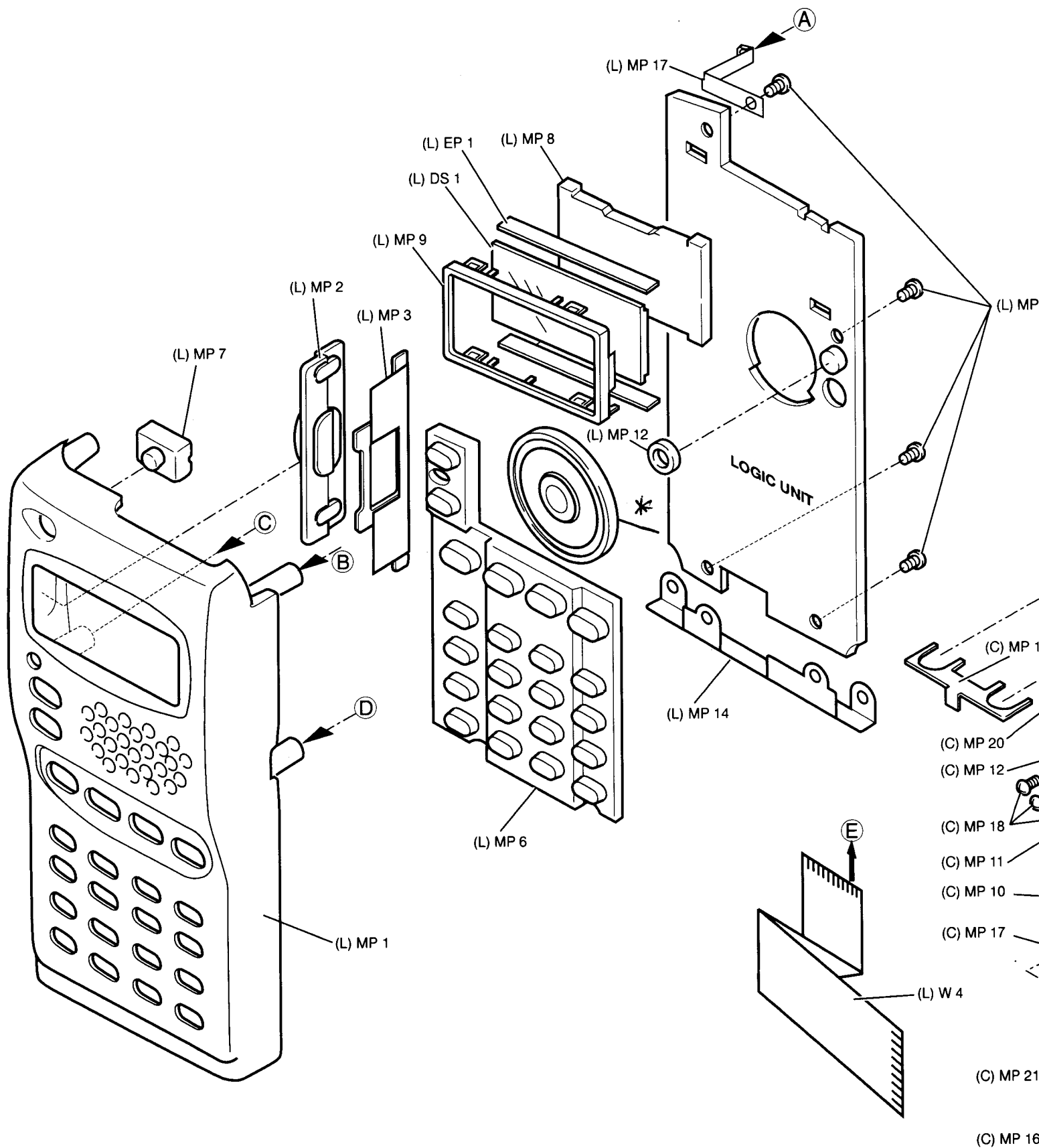
Screw abbreviations: PH: Pan head B0: Self-tapping NI: Nickel ZK: Black

### 7-2 ACCESSORIES

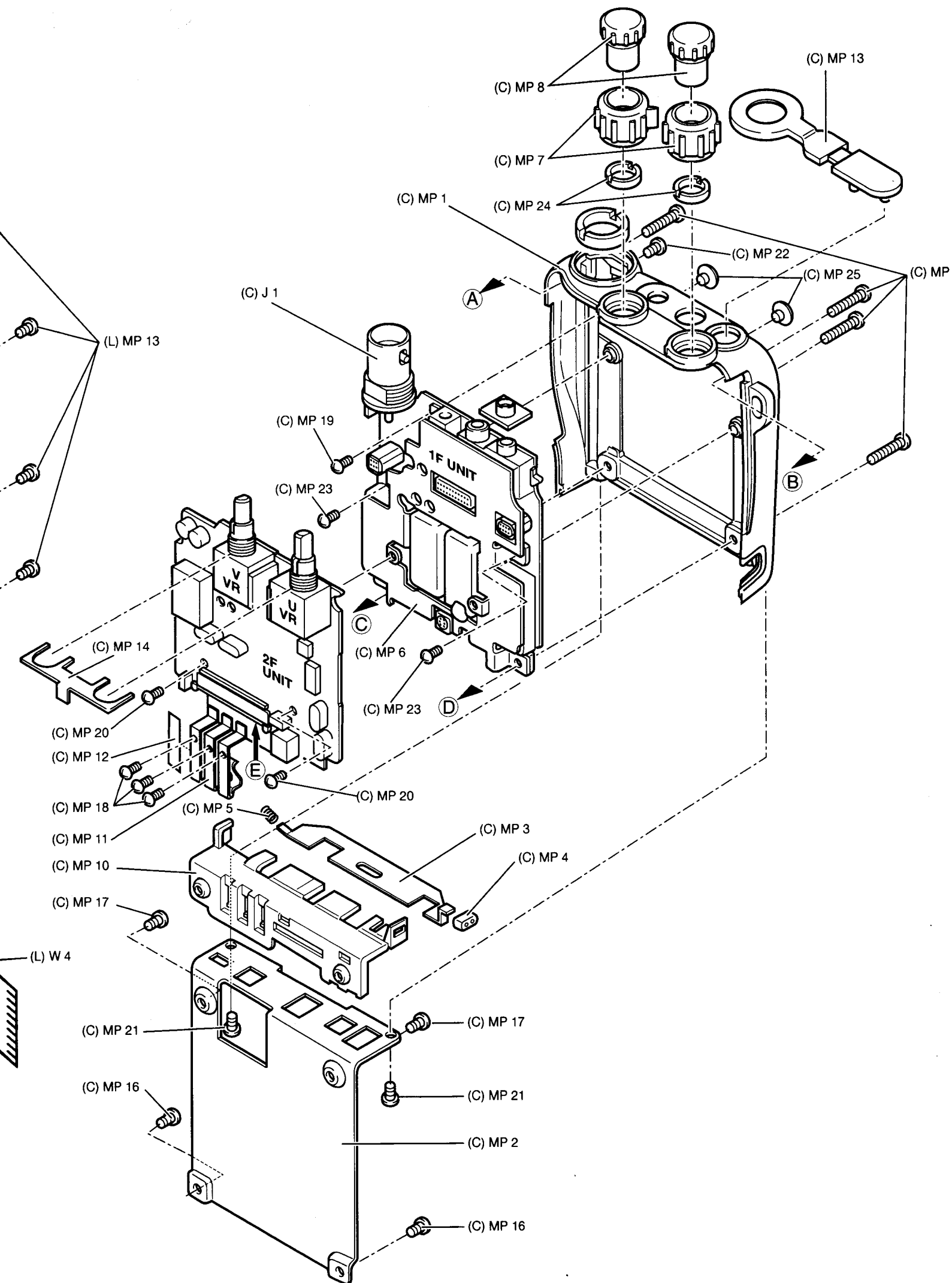
| REF. NO. | ORDER NO.         | DESCRIPTION                           | QTY. |
|----------|-------------------|---------------------------------------|------|
| EP 1     | Optional products | Antenna FA-B270C (EUR, ITA, AUS, SEA) | 1    |
|          |                   | Antenna FA-1443B (USA)                | 1    |
| EP 2     | Optional products | Battery pack BP-171 (EUR, ITA, AUS)   | 1    |
| 2        | Optional products | Battery case BP-170 (SEA) 1           |      |
| EP 3     | Optional products | Wall charger BC-74D (EUR, ITA)        | 1    |
|          | Optional products | Wall charger BC-74A (USA)             | 1    |
|          | Optional products | Wall charger BC-110V (AUS)            | 1    |
| MP 1     | 8010011960        | Strap belt HK-005                     | 1    |
| MP 2     | 8810005730        | Screw PH M3 x 3 BS ZK                 | 2    |
| MP 3     | 8930035330        | 752 Belt clip (A)                     | 1    |





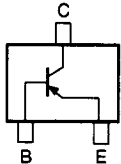
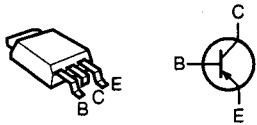
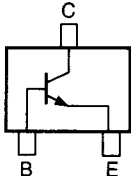
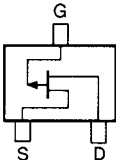
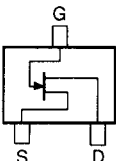
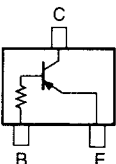
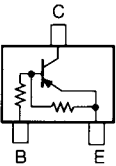
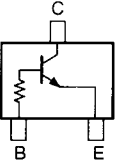


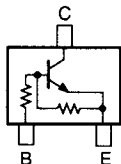
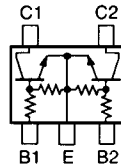
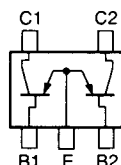
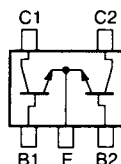
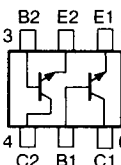
Unit abbreviations (C): CHASSIS PARTS (L): LOGIC UNIT



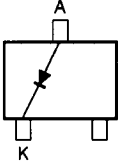
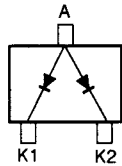
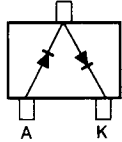
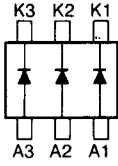
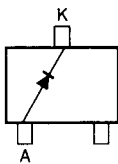
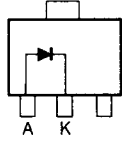
# SECTION 8 SEMI-CONDUCTOR INFORMATION

## 8-1 TRANSISTORS

| NAME                                                                                                                                      | SYMBOL                                                        | INSIDE VIEW                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2SA1588-GR<br>2SB1132-R<br>2SB1462-R                                                                                                      | ZG<br>BAR<br>AR                                               |    |
| 2SB1201                                                                                                                                   | —                                                             |    |
| 2SC4211-TR<br>2SC4226-T2<br>2SC4228-T2<br>2SC4403-TR<br>2SC4406-4-TR<br>2SC4405-3-TR<br>2SC4617-TLQ<br>2SC5006-T1<br>2SD2216-S<br>2SD2345 | L7<br>R25<br>R44<br>LY3<br>JT4<br>OY3<br>BQ<br>24<br>YS<br>1Z |   |
| 2SJ364Q                                                                                                                                   | 4M                                                            |  |
| 2SK880-Y                                                                                                                                  | XY                                                            |  |
| UN9110                                                                                                                                    | 6L                                                            |  |
| UN9115<br>UN9117                                                                                                                          | 6E<br>6H                                                      |  |
| DTC144TU<br>UN9210<br>UN9215                                                                                                              | 06<br>8L<br>8E                                                |  |

| NAME                                   | SYMBOL               | INSIDE VIEW                                                                           |
|----------------------------------------|----------------------|---------------------------------------------------------------------------------------|
| DTC144EU<br>UN921E<br>UN9211<br>UN9213 | 26<br>8N<br>8A<br>8C |    |
| XP1210                                 | AC                   |    |
| XP1401                                 | 5V                   |    |
| XP1501                                 | 5R                   |   |
| XP6501 AB                              | 5N                   |  |

## 8-2 DIODES

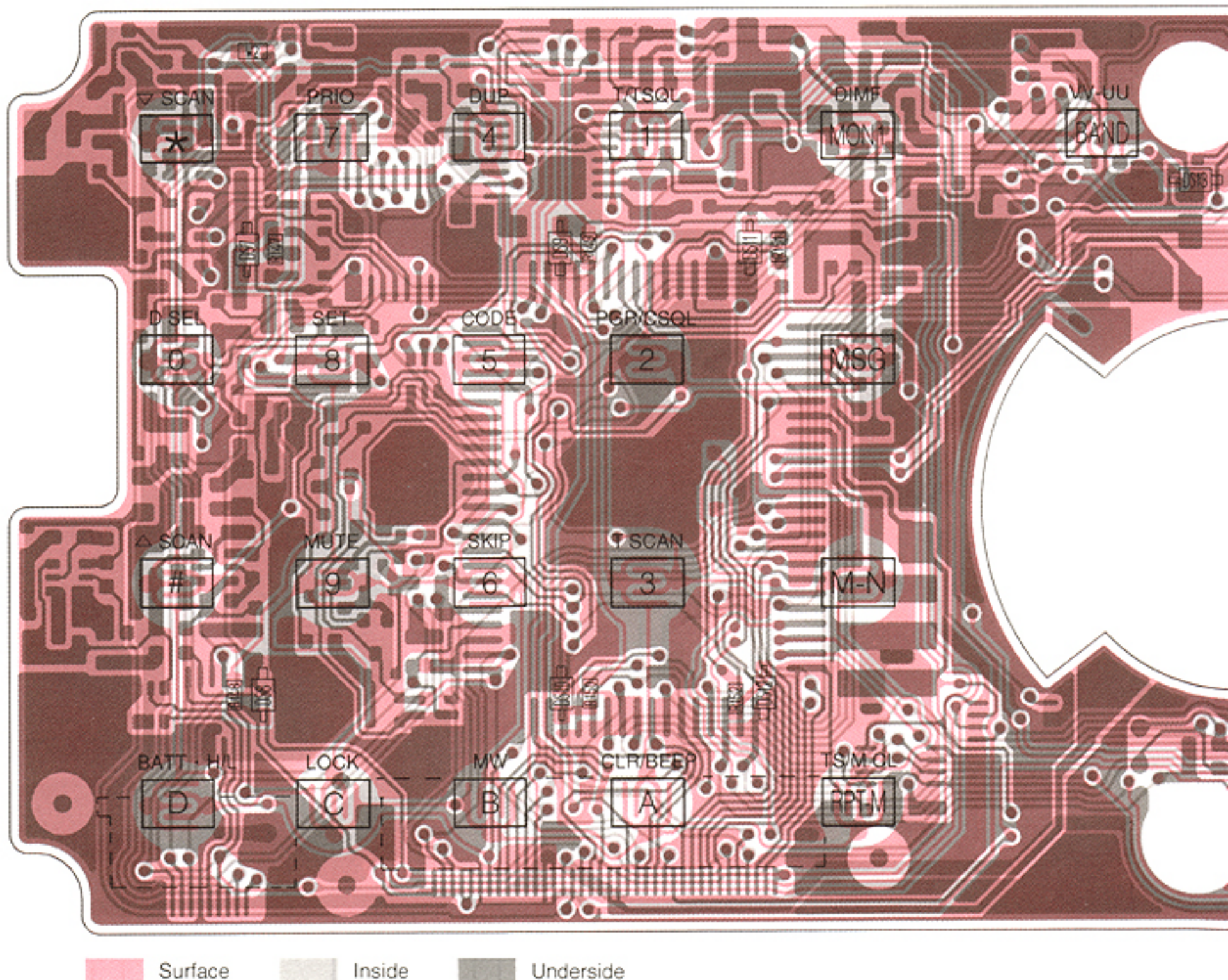
| NAME                                          | SYMBOL                     | INSIDE VIEW                                                                         |
|-----------------------------------------------|----------------------------|-------------------------------------------------------------------------------------|
| DA113W                                        | AY                         |    |
| DAP202U                                       | P                          |    |
| 1SV252<br>DA204U<br>MA133<br>MA742<br>HSM88AS | 3E<br>K<br>MP<br>N1V<br>C1 |    |
| MA6S121                                       | M2D                        |  |
| SB07-03C-TA                                   | J                          |  |
| SB30-03P                                      | SG                         |  |
| 1SV270<br>MA304                               | TF<br>7R                   |  |
| MA729<br>MA2S111<br>MA2S077<br>MA2S728        | 2B<br>A<br>S<br>B          |  |



## SECTION 9 BOARD LAYOUTS

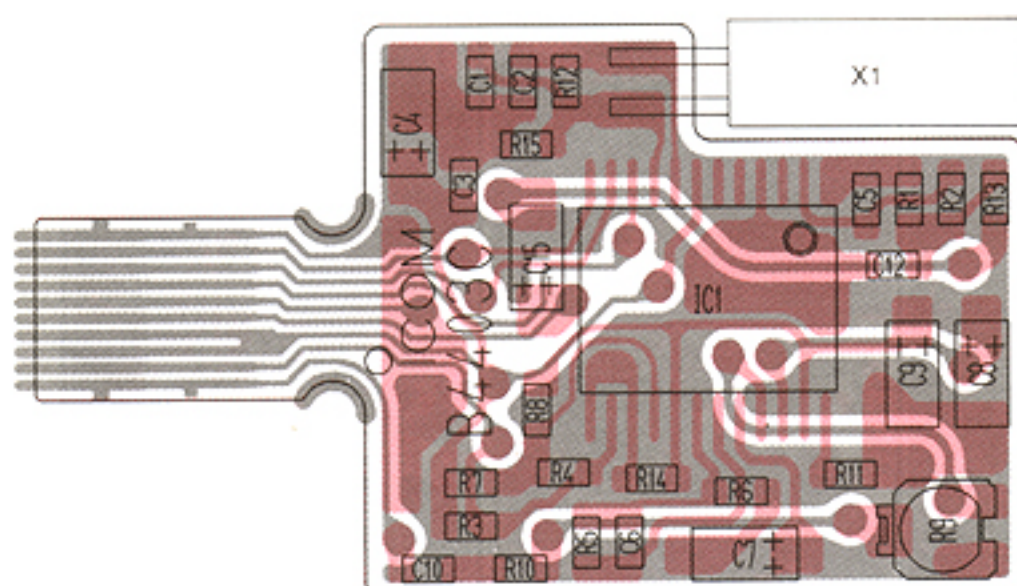
### 9-1 LOGIC UNIT

#### • LOGIC UNIT (TOP VIEW)



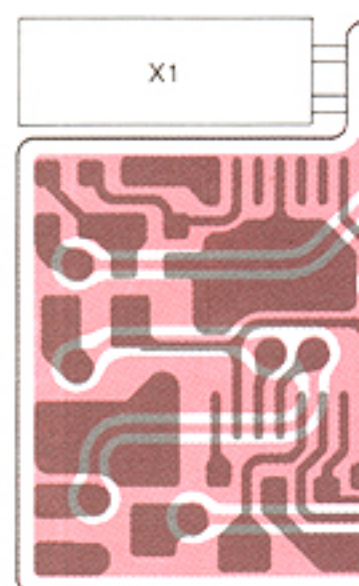
#### • TSQL UNIT (TOP VIEW)

(Built-in for USA, optional for other versions.)

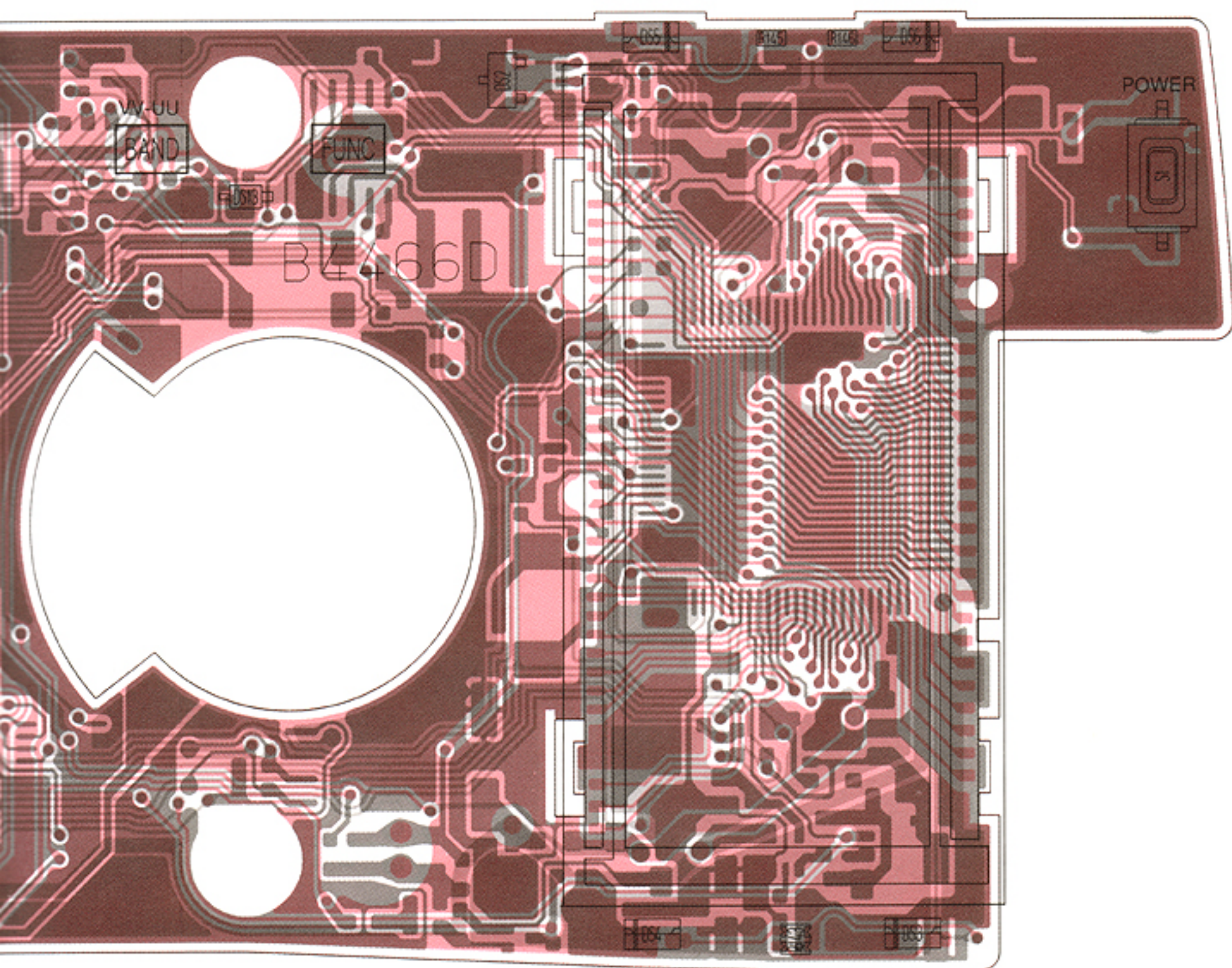


#### • TSQL UNIT (BOTTOM VIEW)

(Built-in for USA, optional for other versions.)

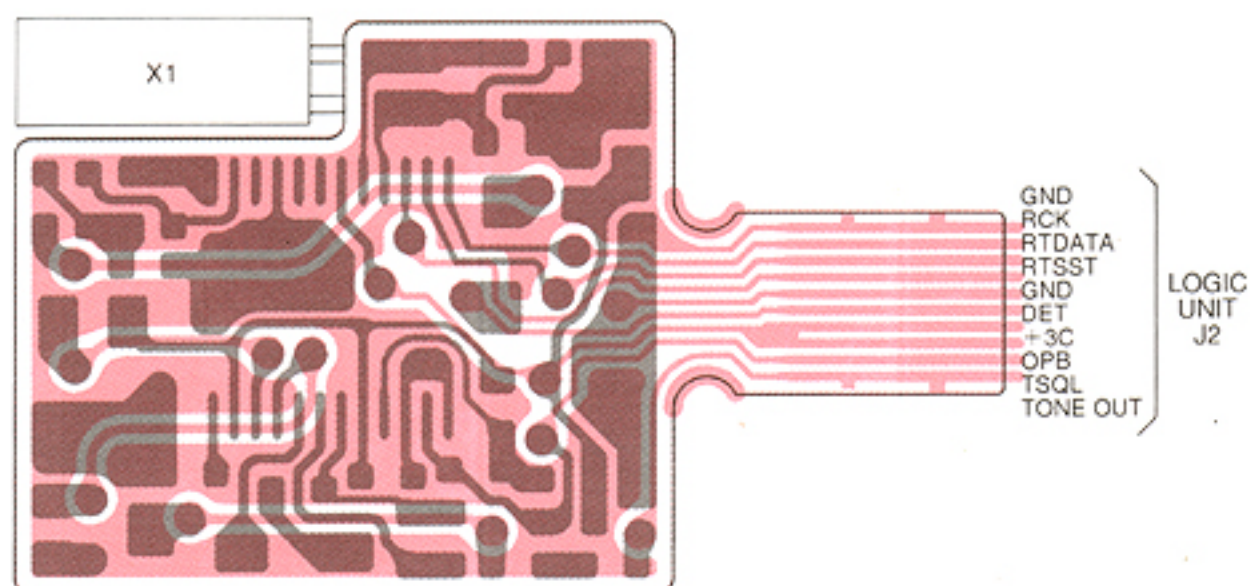






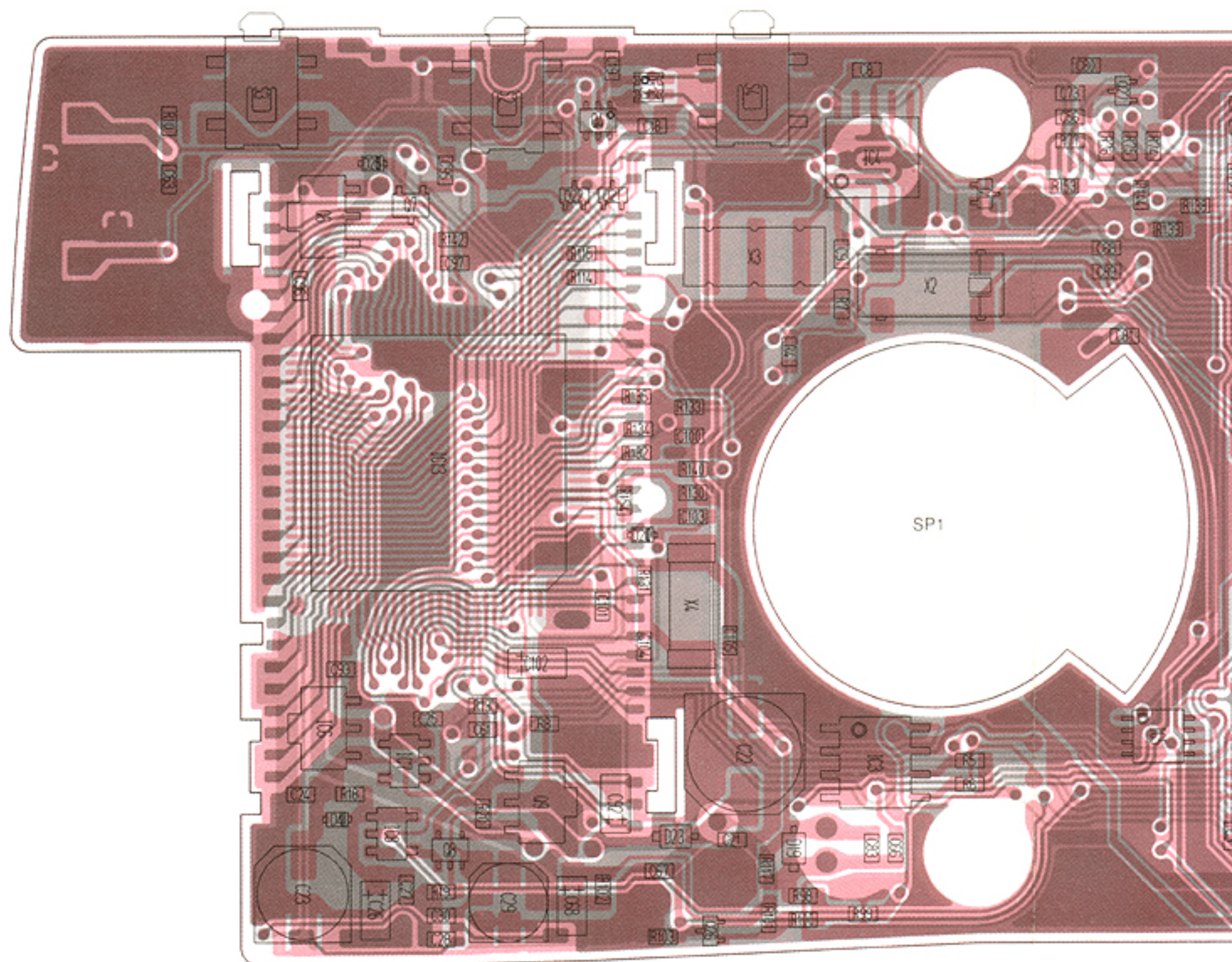
• TSQ1 UNIT (BOTTOM VIEW)

(Built-in for USA, optional for other versions.)



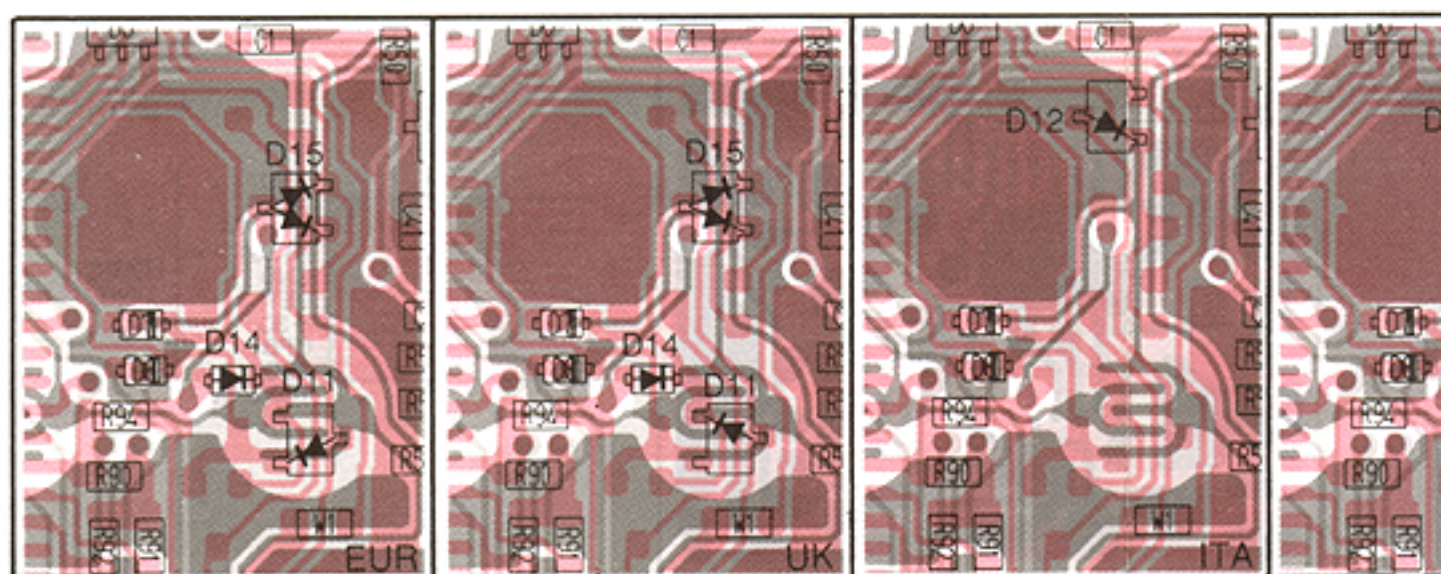


• LOGIC UNIT (BOTTOM VIEW)

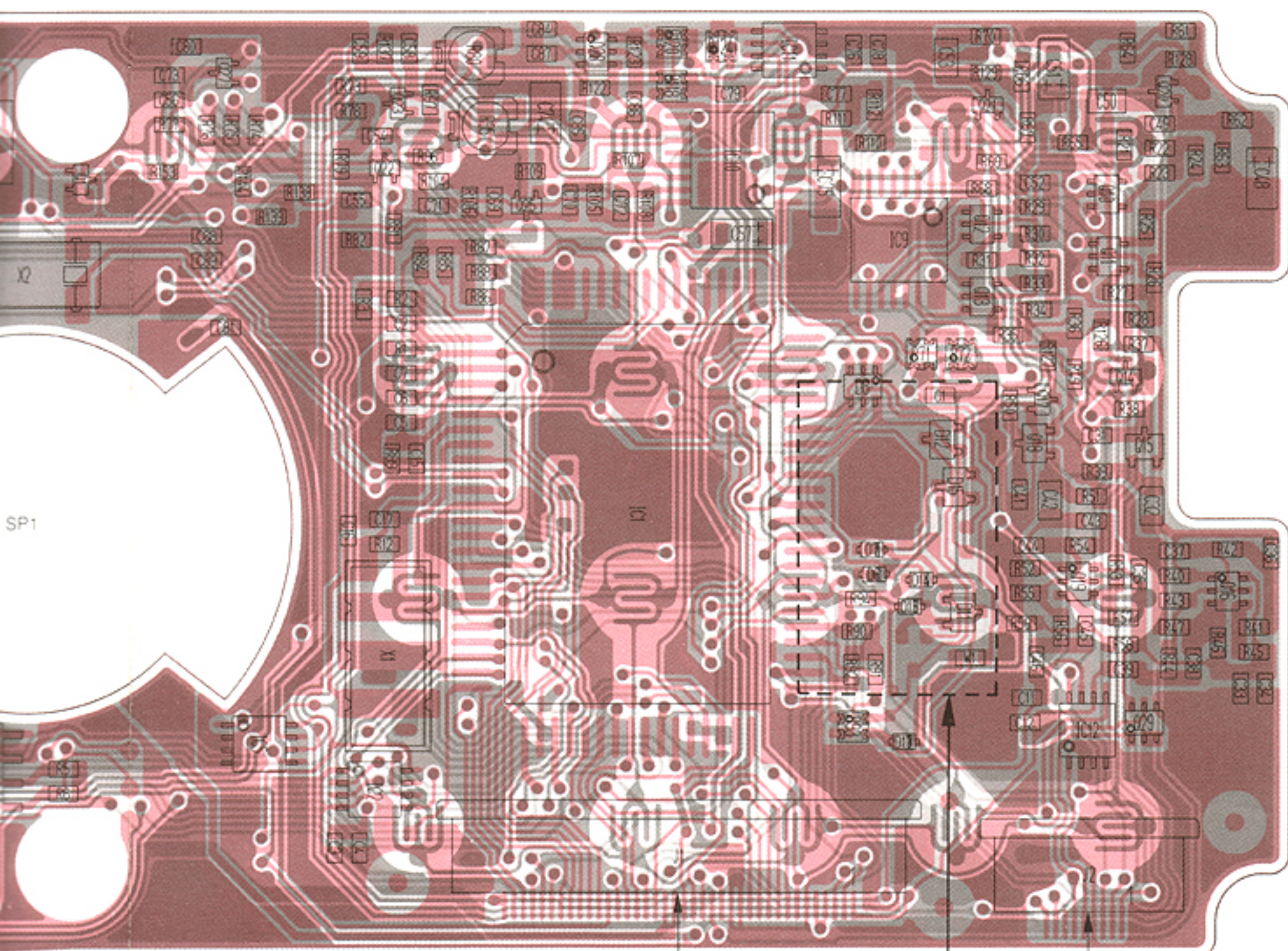


Surface Inside Underside

|        |
|--------|
| LDET   |
| LSO    |
| LBUSY  |
| RCK    |
| RODATA |
| RIOST  |
| LPLST  |
| LCK    |
| LDATA  |
| LIOST  |
| REMOTE |
| EXTMIC |
| LTXC   |
| HDCK   |





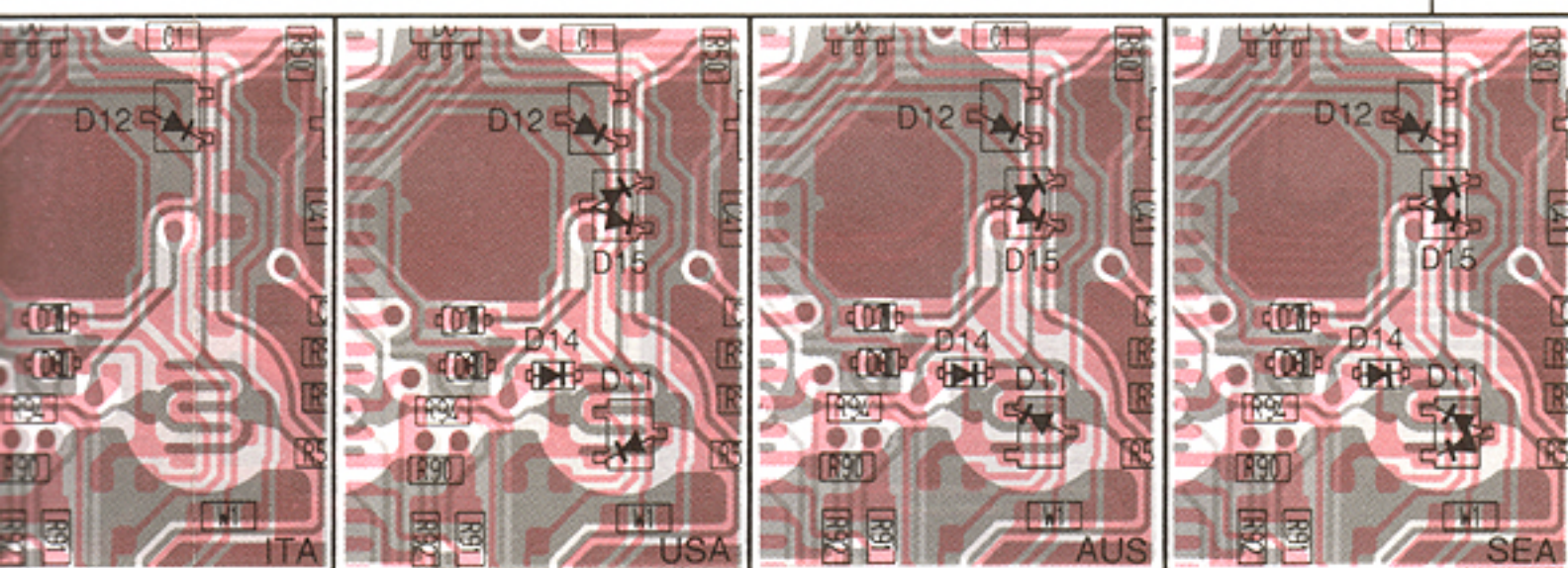


|        |
|--------|
| LSD    |
| LBUSY  |
| RCK    |
| RDATA  |
| RIOST  |
| LPLST  |
| LCK    |
| LDATA  |
| LIOST  |
| REMOTE |
| EXTMIC |
| LTXC   |
| HDCK   |
| HDUP   |
| HTXC   |
| MOD    |
| SPG    |
| SPG    |
| LUL    |
| HUL    |
| +3C    |
| OUTAF  |
| VCC    |
| GND    |
| GND    |
| HPLST  |
| HCK    |
| HDATA  |
| LDUP   |
| LDCK   |
| AFON   |
| GND    |
| INSP   |
| INSP   |
| HBUSY  |
| HSD    |
| HDET   |

2F UNIT J4

|          |
|----------|
| TONE OUT |
| TSOL     |
| OPB      |
| +3C      |
| DET      |
| GND      |
| RTSST    |
| RTDATA   |
| RCK      |
| GND      |

TSOL UNIT (OPTIONAL)

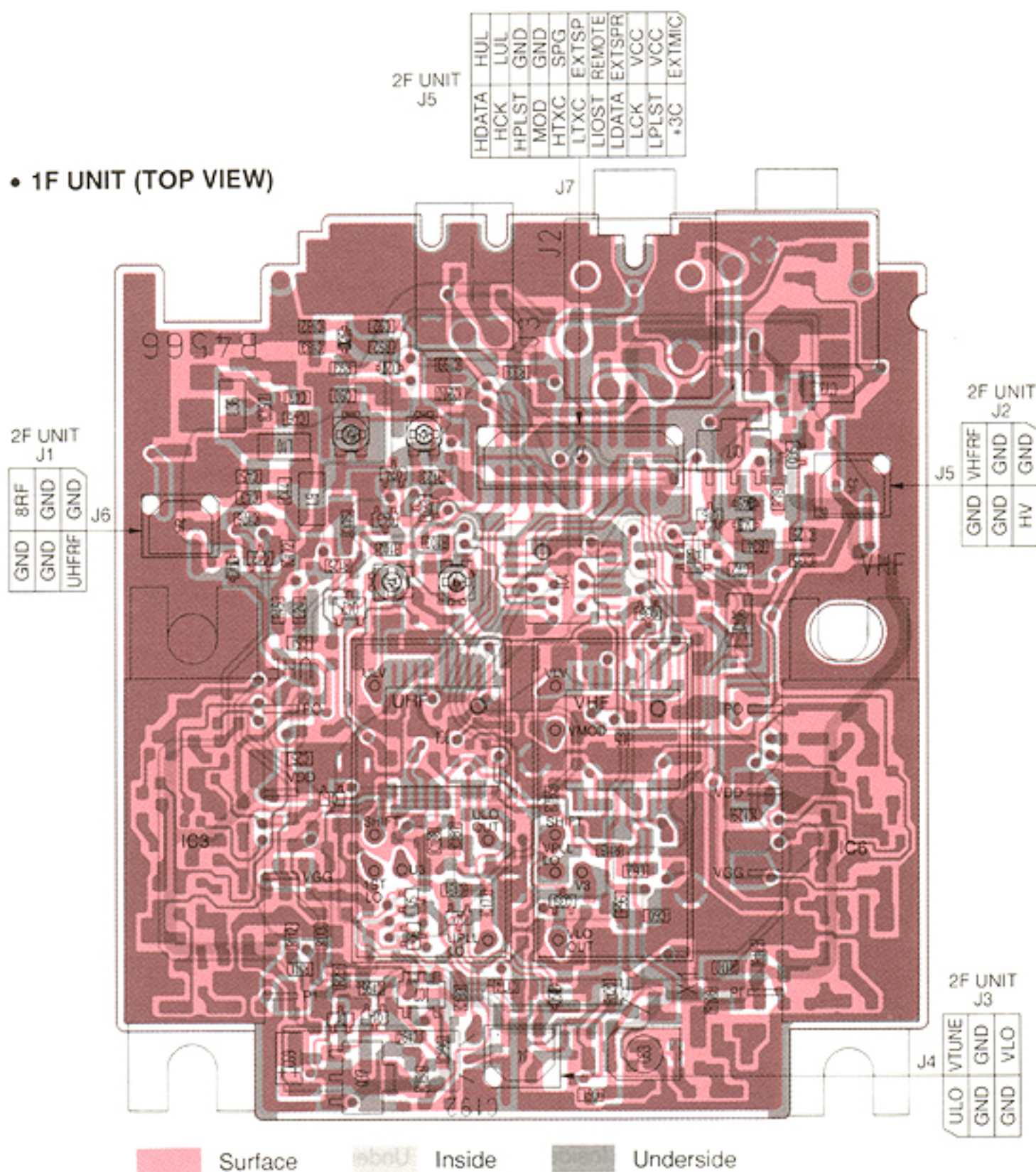




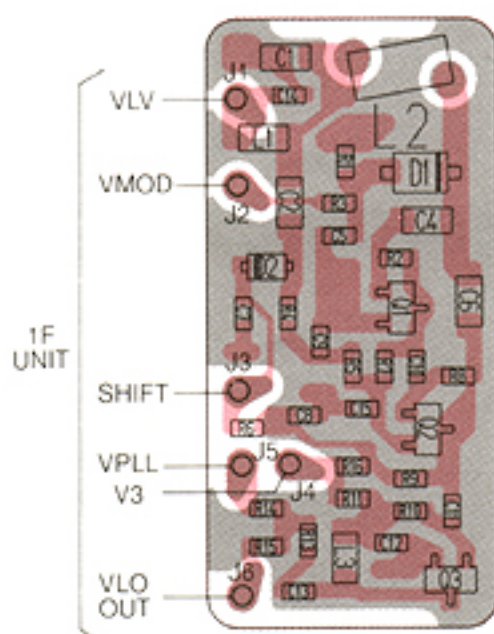
## 9-2 1F UNIT

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

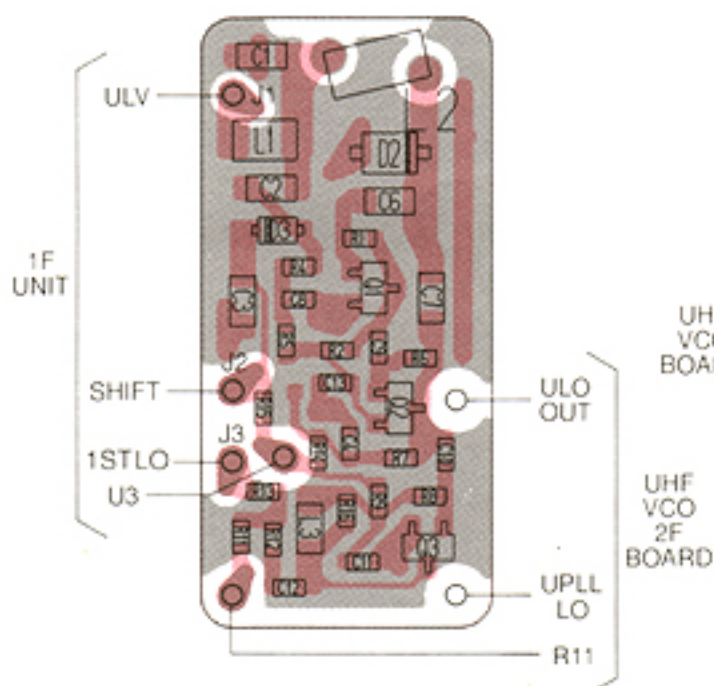
### • 1F UNIT (TOP VIEW)



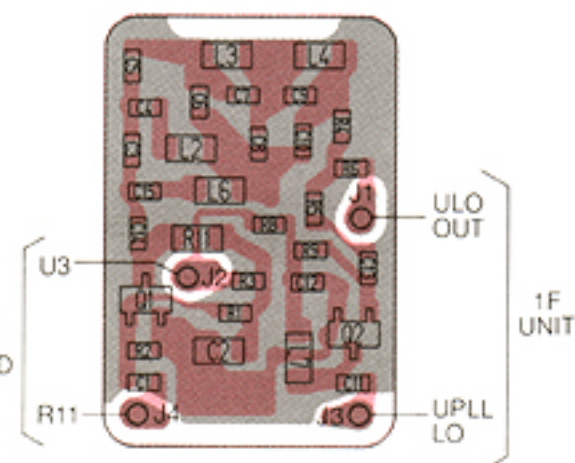
### • VHF VCO BOARD (TOP VIEW)



### • UHF VCO BOARD (TOP VIEW)

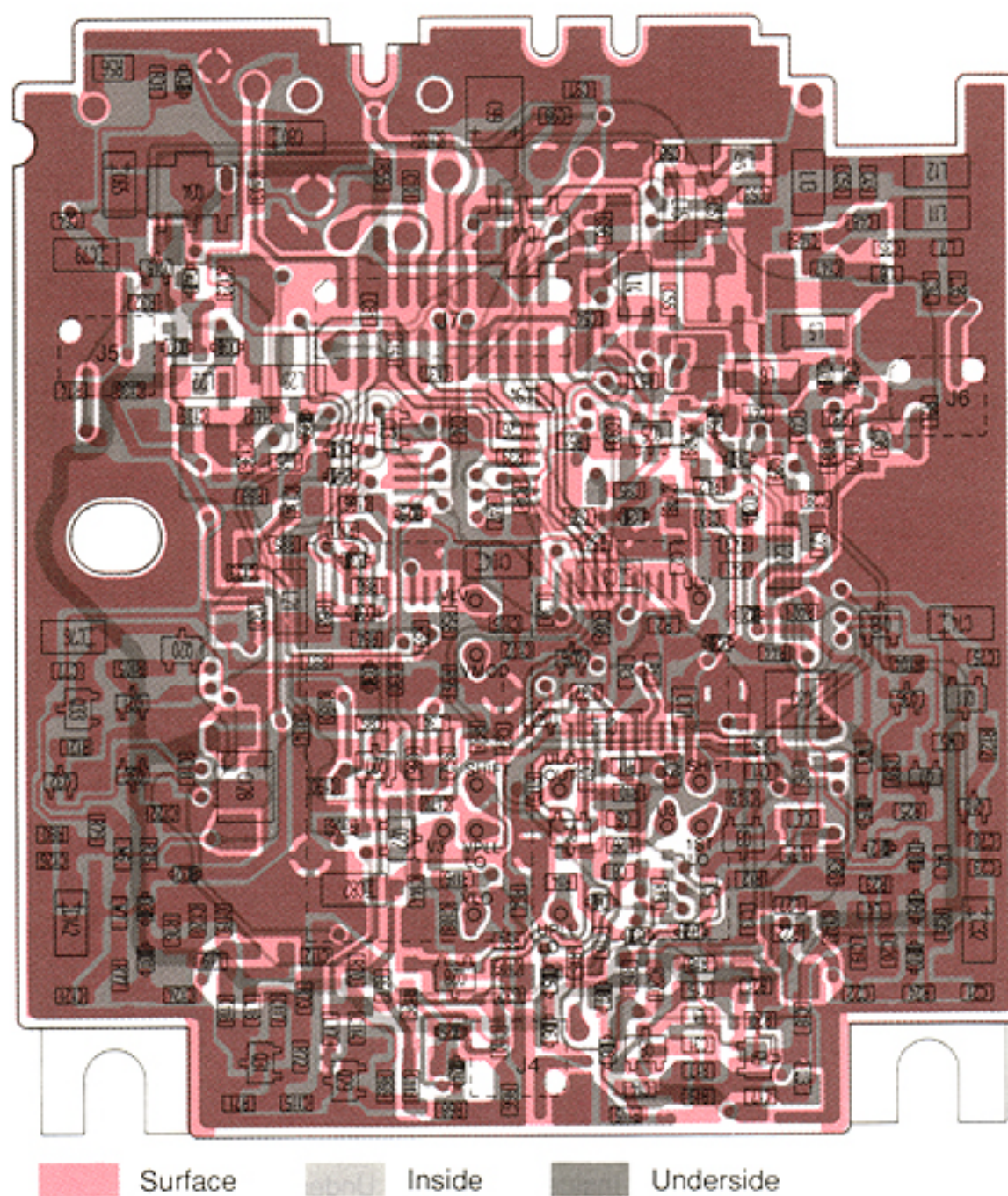


### • UHF VCO 2F BOARD (TOP VIEW)





• 1F UNIT (BOTTOM VIEW)

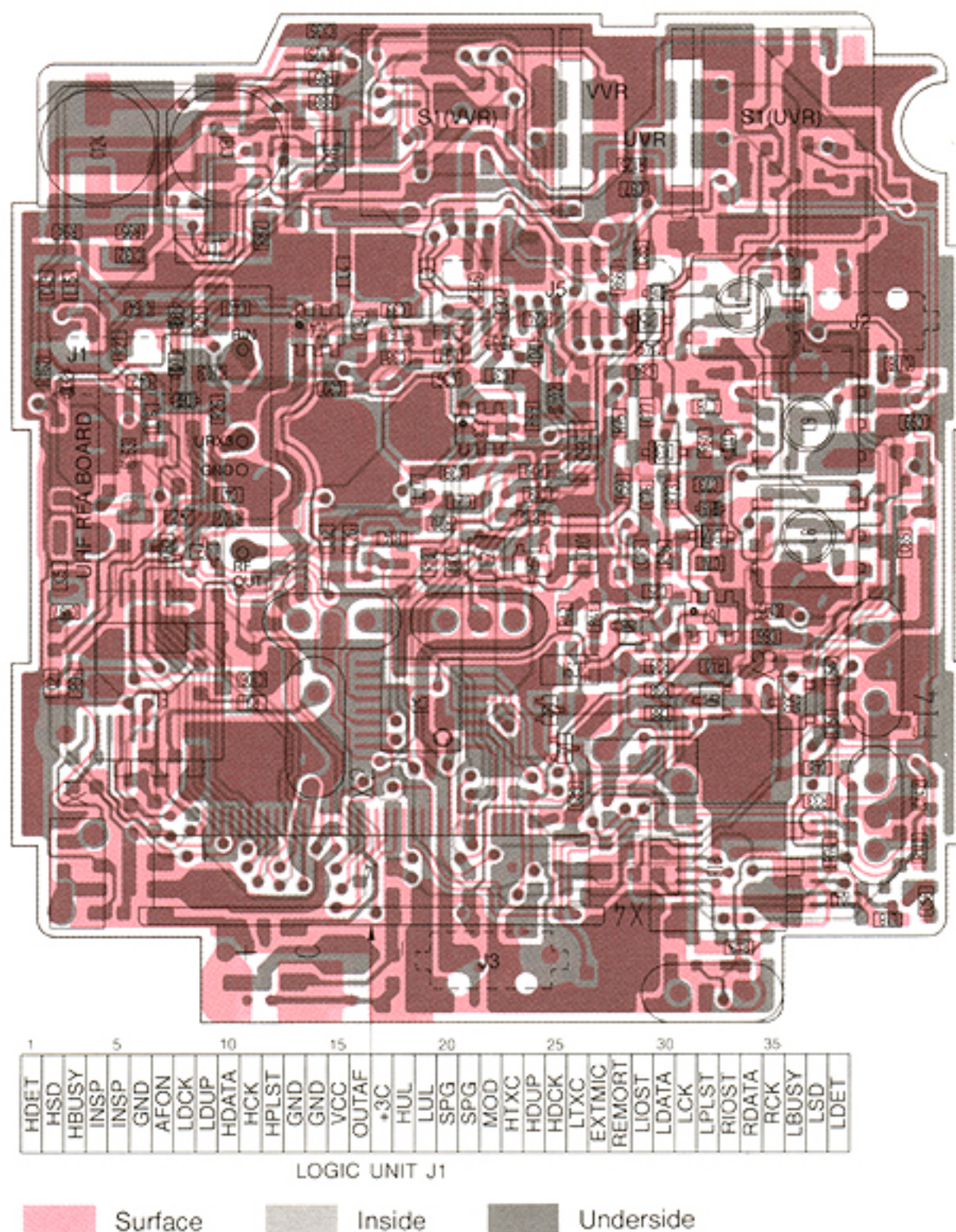




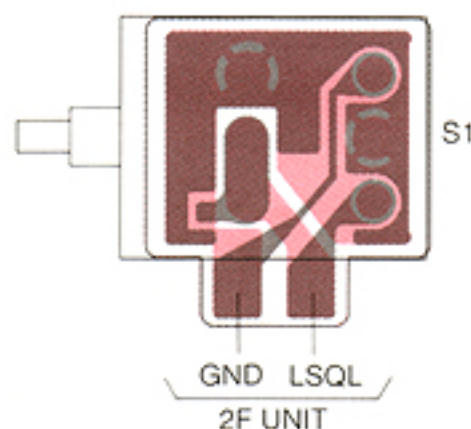
## 9-3 2F UNIT

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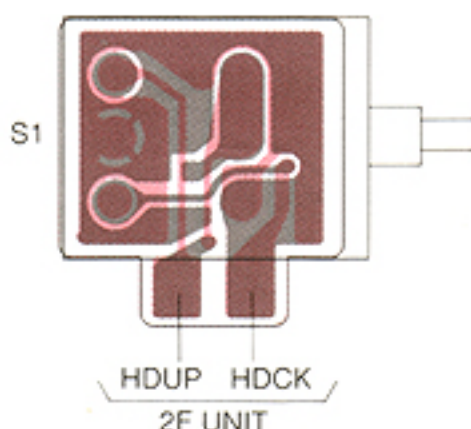
### • 2F UNIT (TOP VIEW)



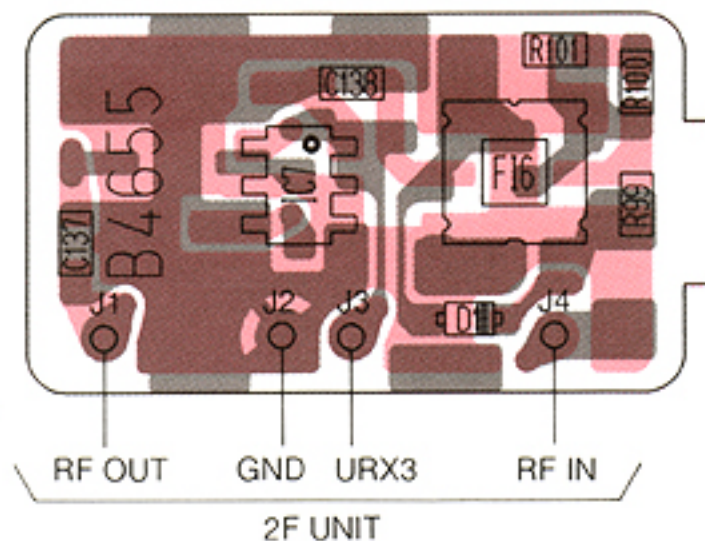
### • V VR BOARD (TOP VIEW)



### • U VR BOARD (TOP VIEW)

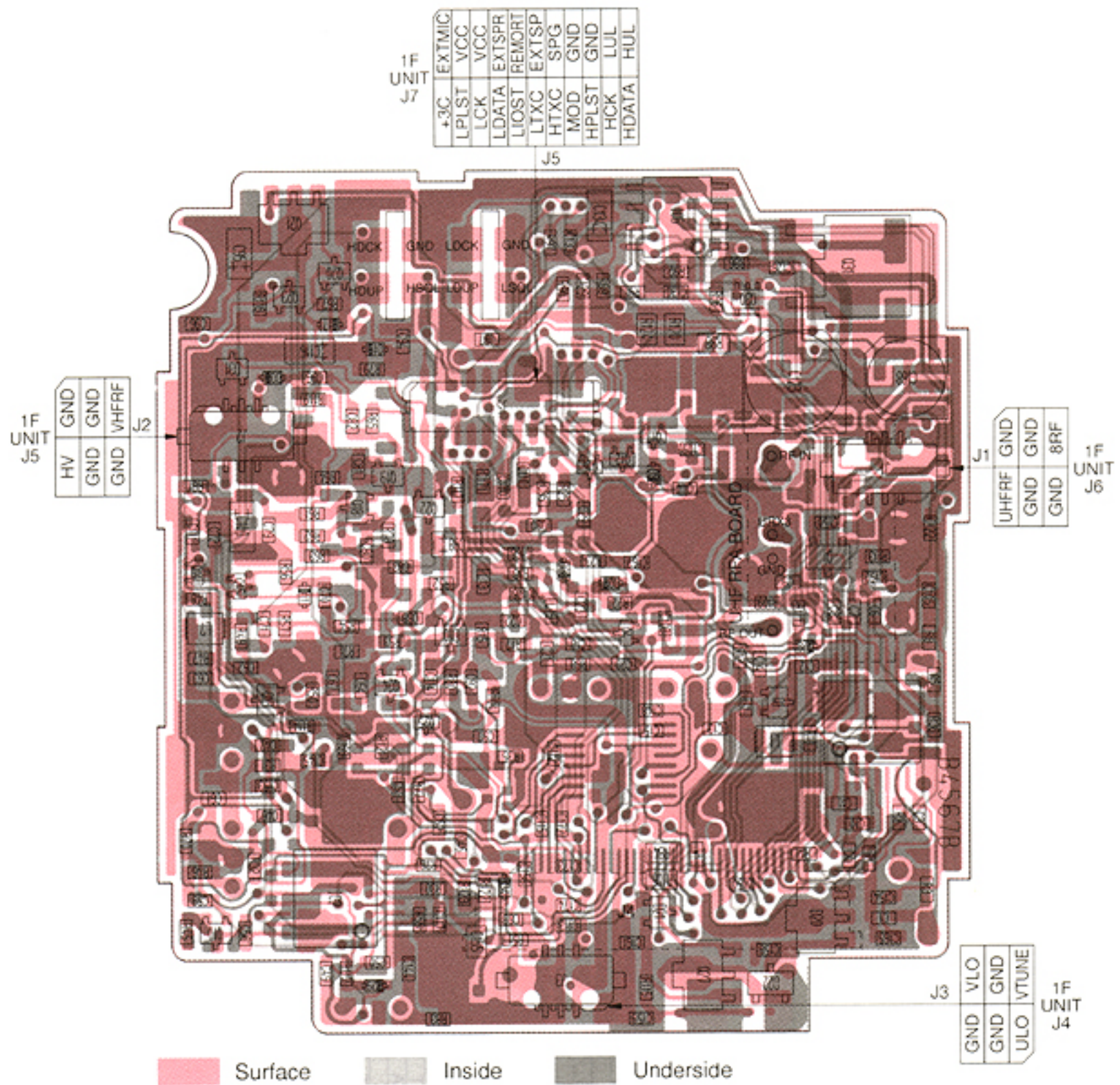


### • UHF RF-A BOARD (TOP VIEW)

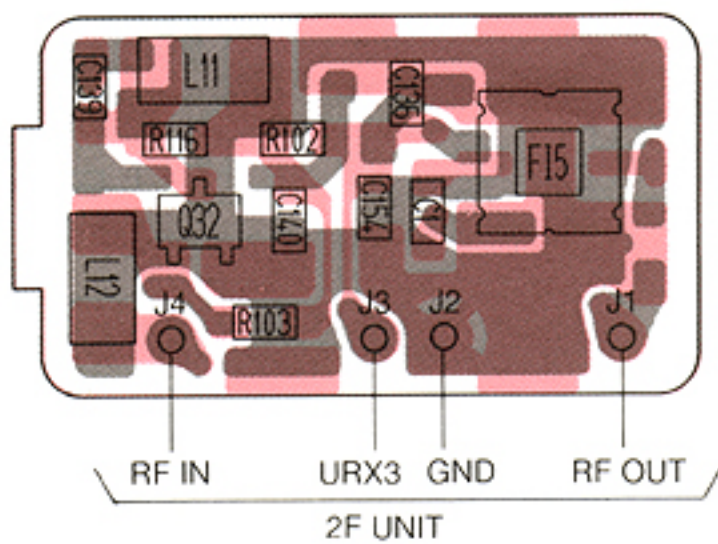




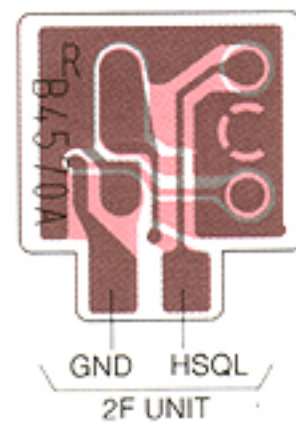
• 2F UNIT (BOTTOM VIEW)



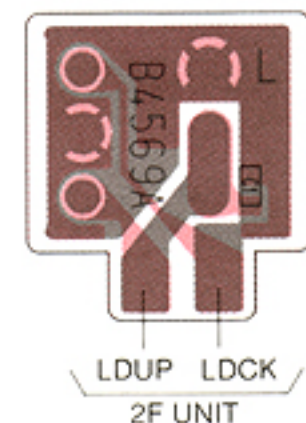
• UHF RF-A BOARD (BOTTOM VIEW)



• U VR BOARD (BOTTOM VIEW)

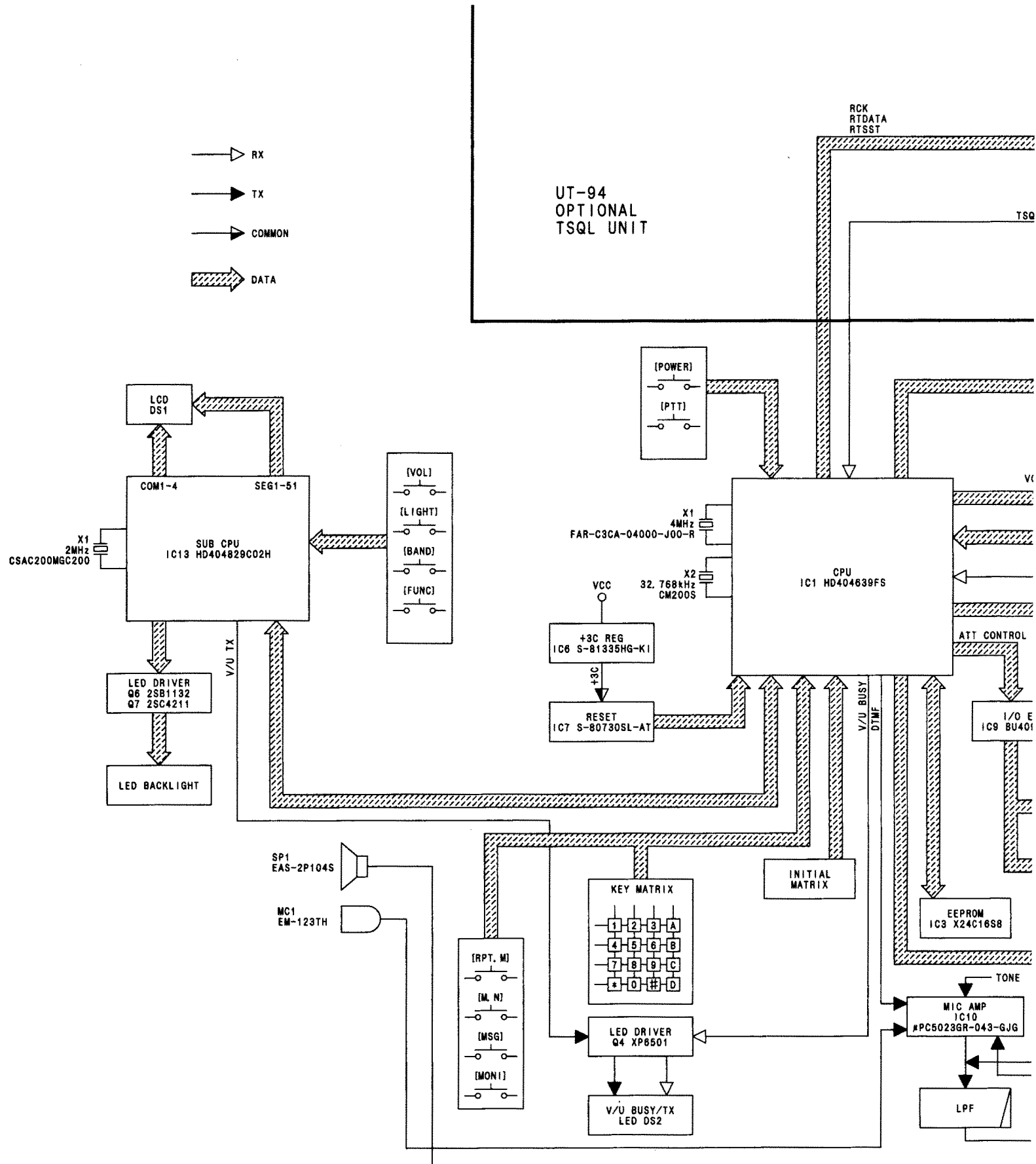
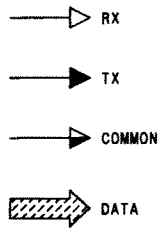


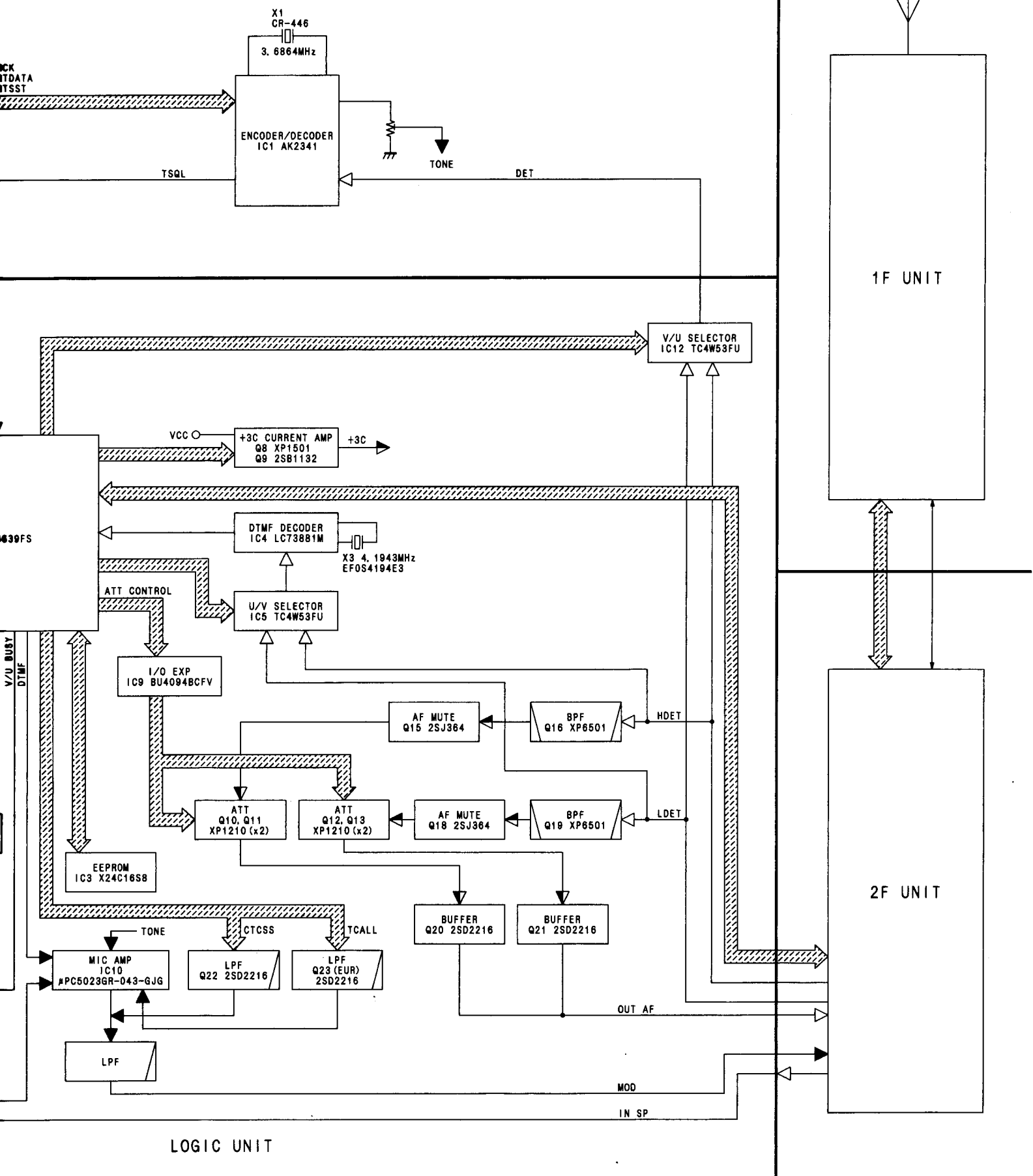
• V VR BOARD (BOTTOM VIEW)

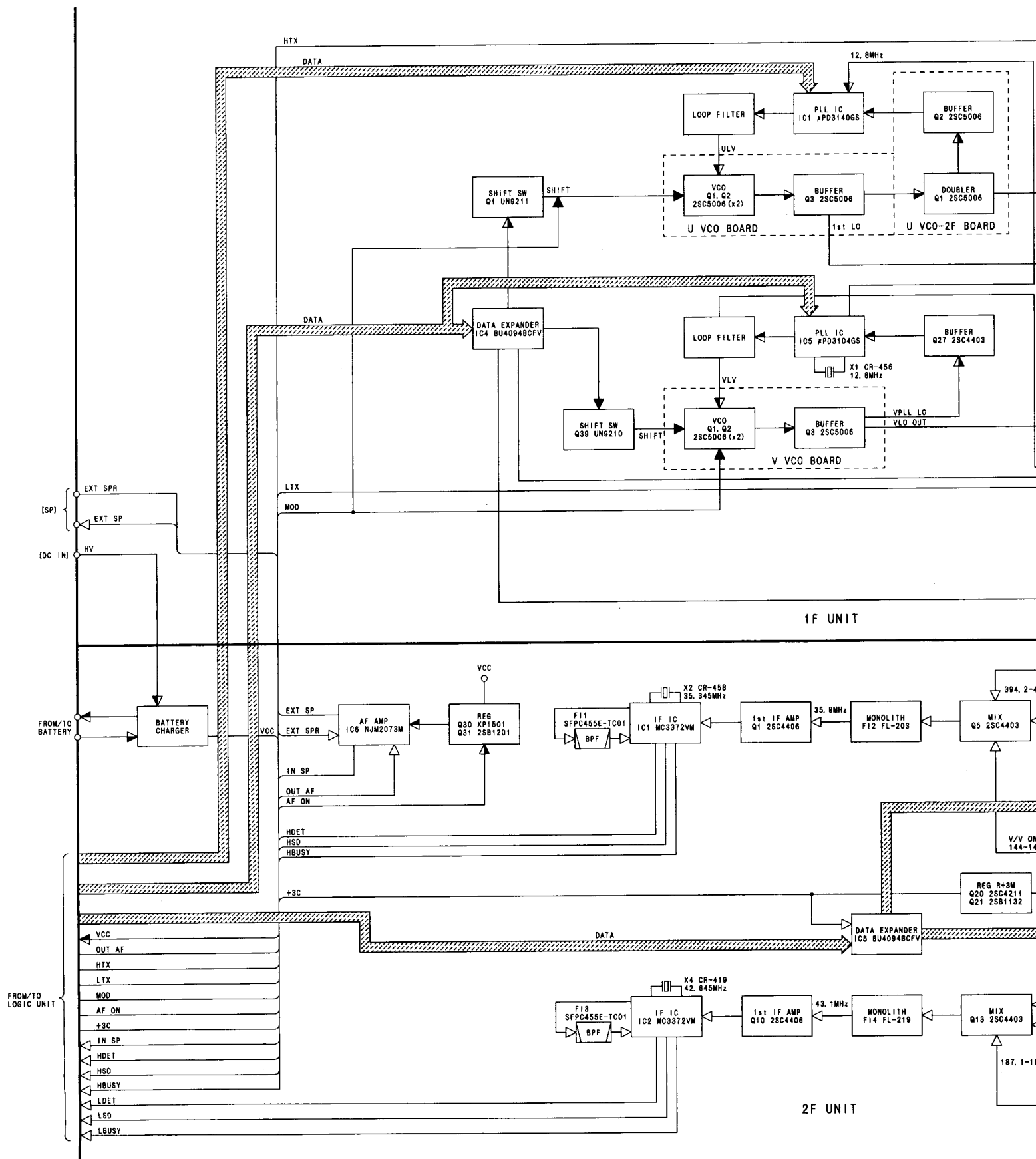




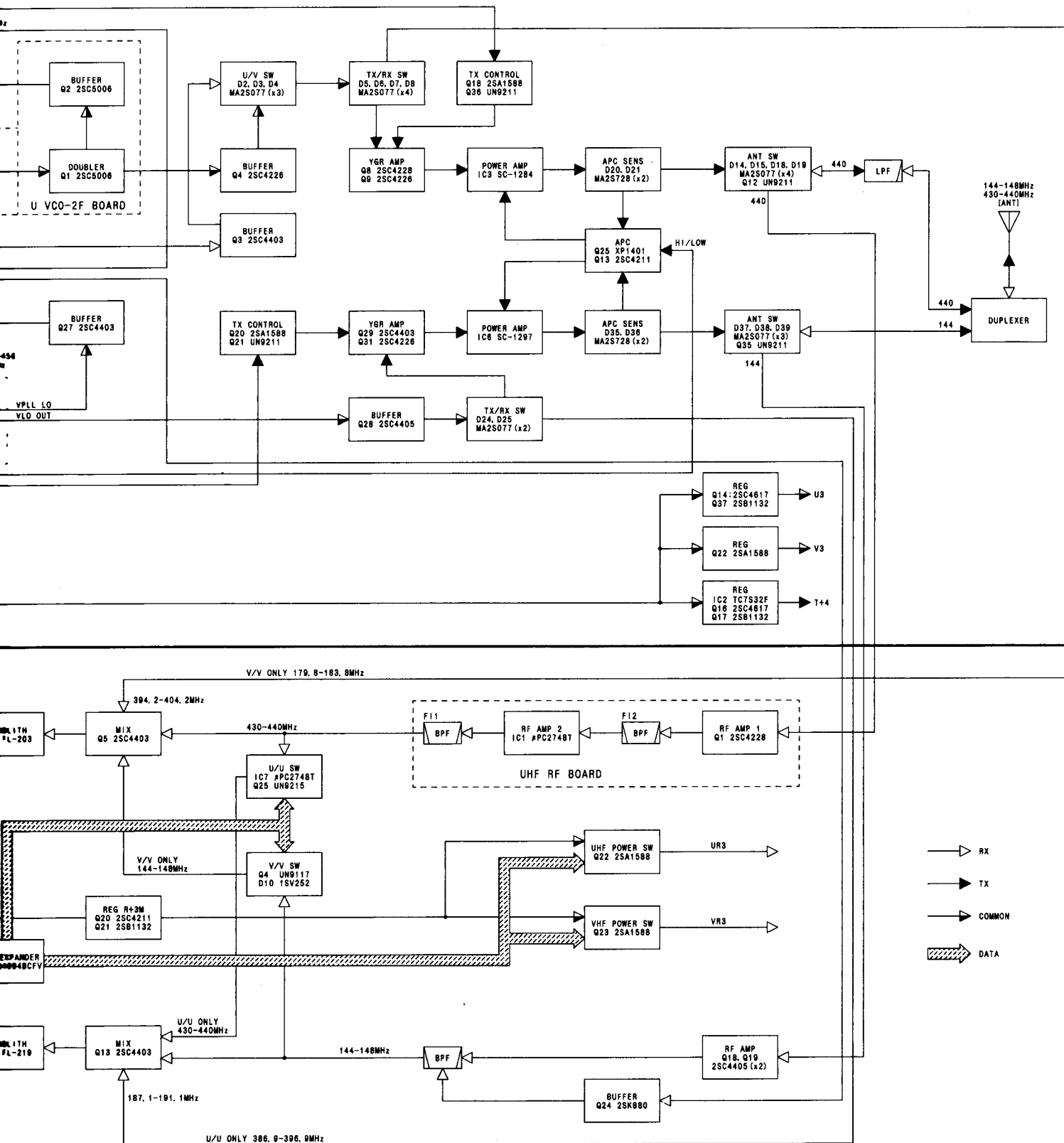
# SECTION 10 BLOCK DIAGRAM



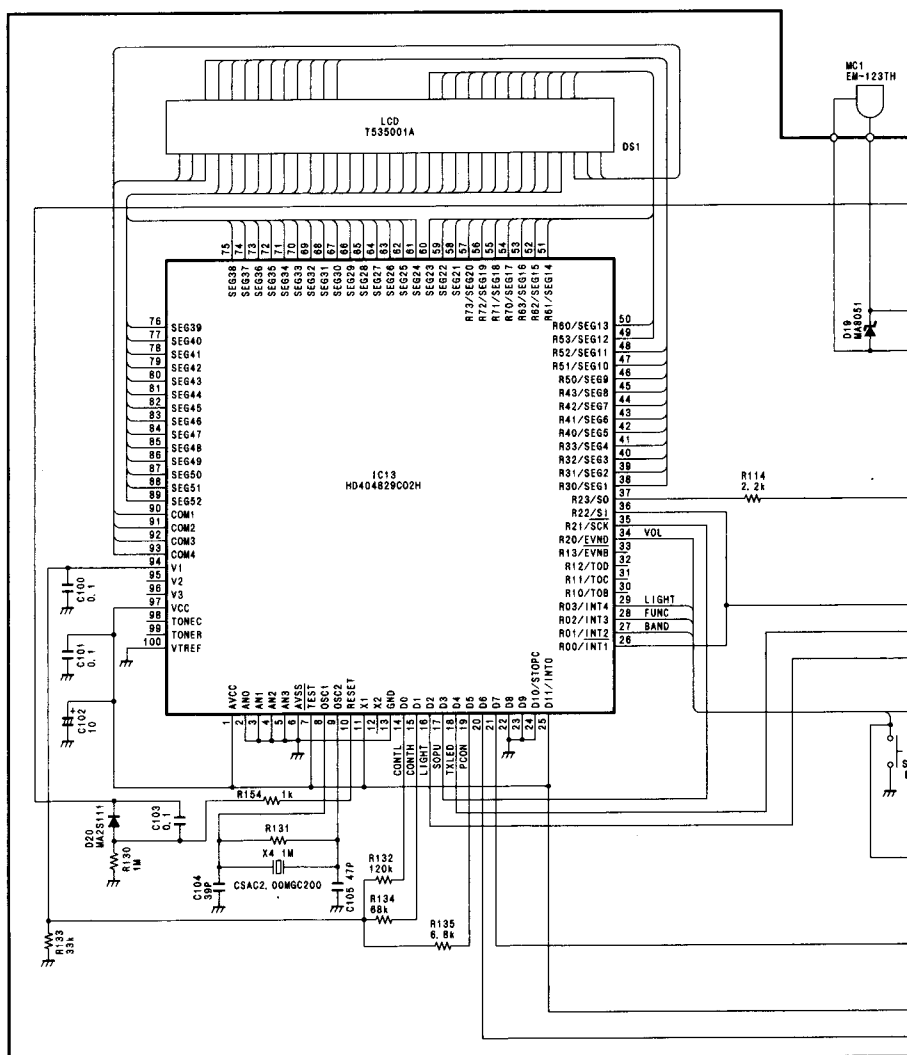
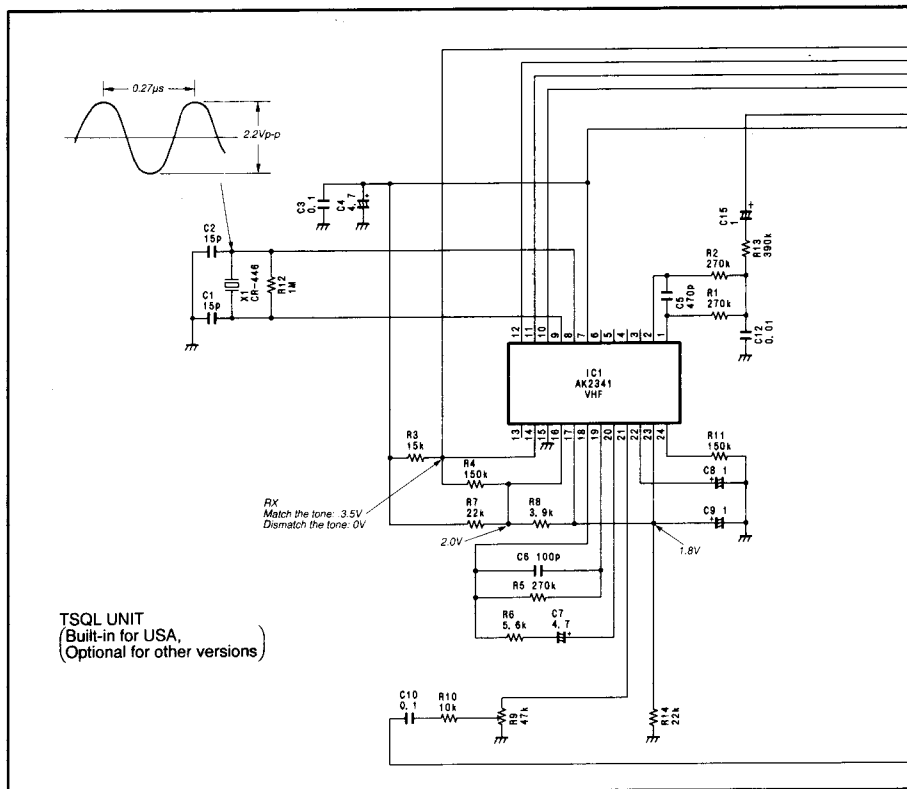


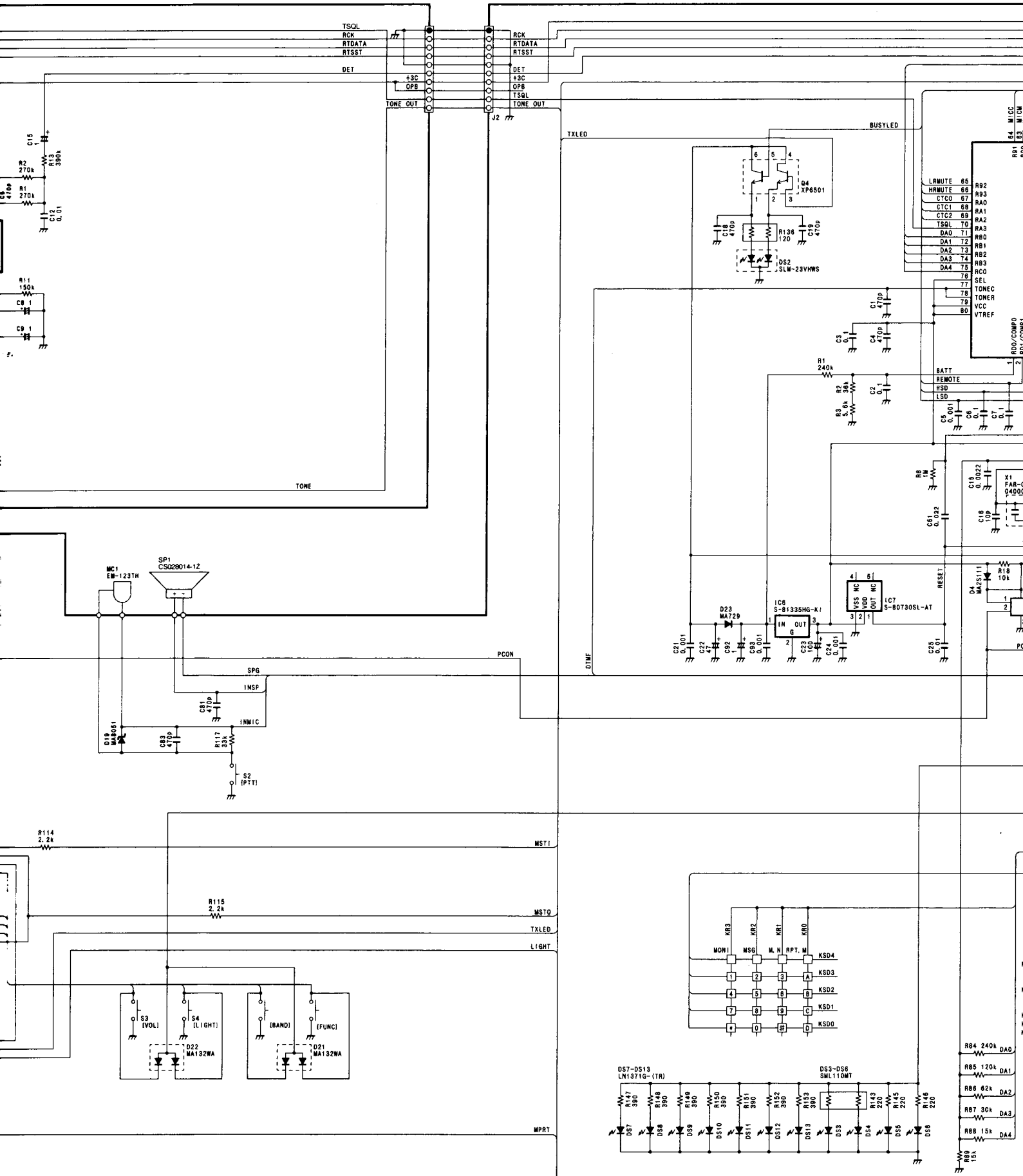




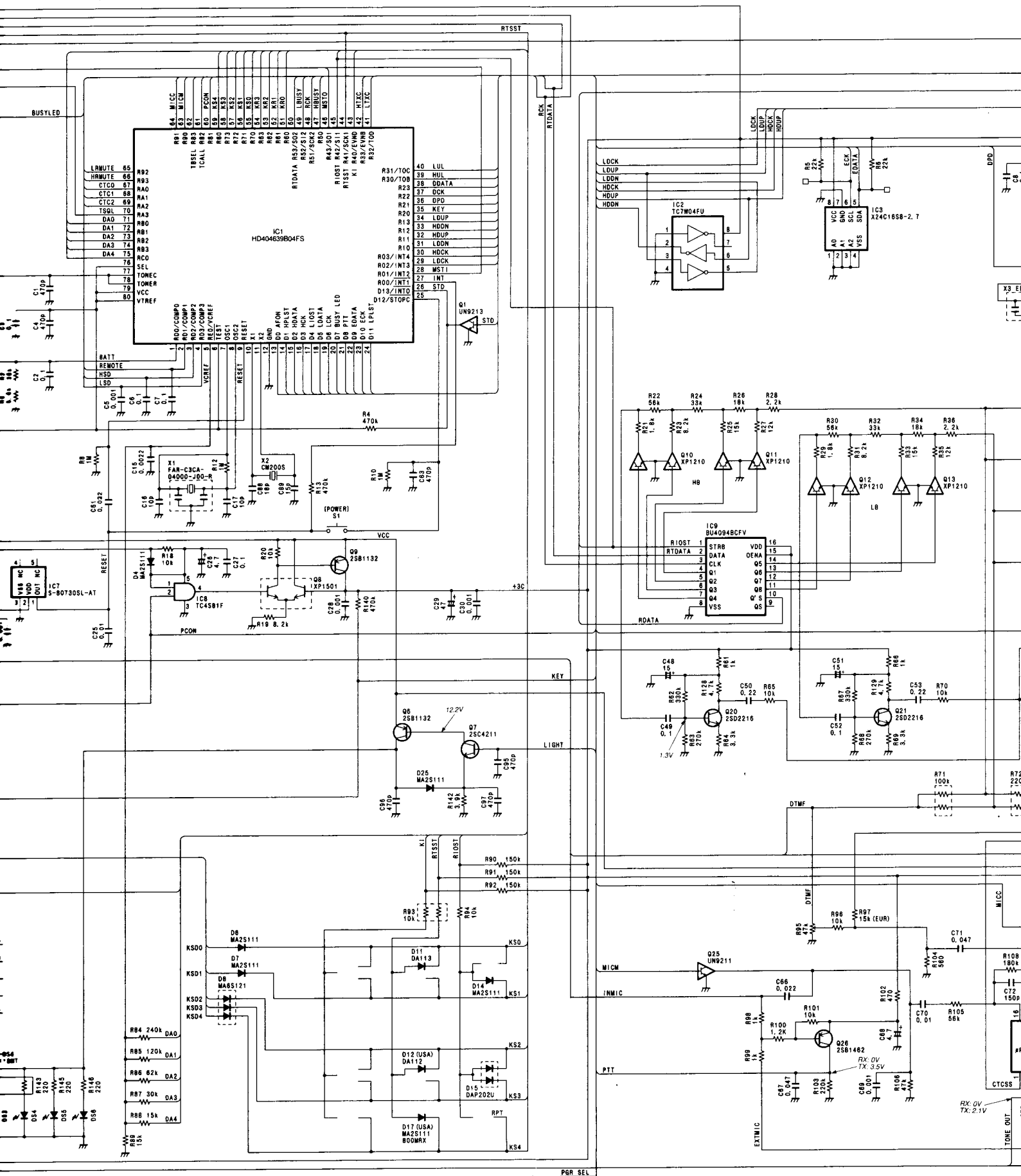


## SECTION 11 VOLTAGE DIAGRAM



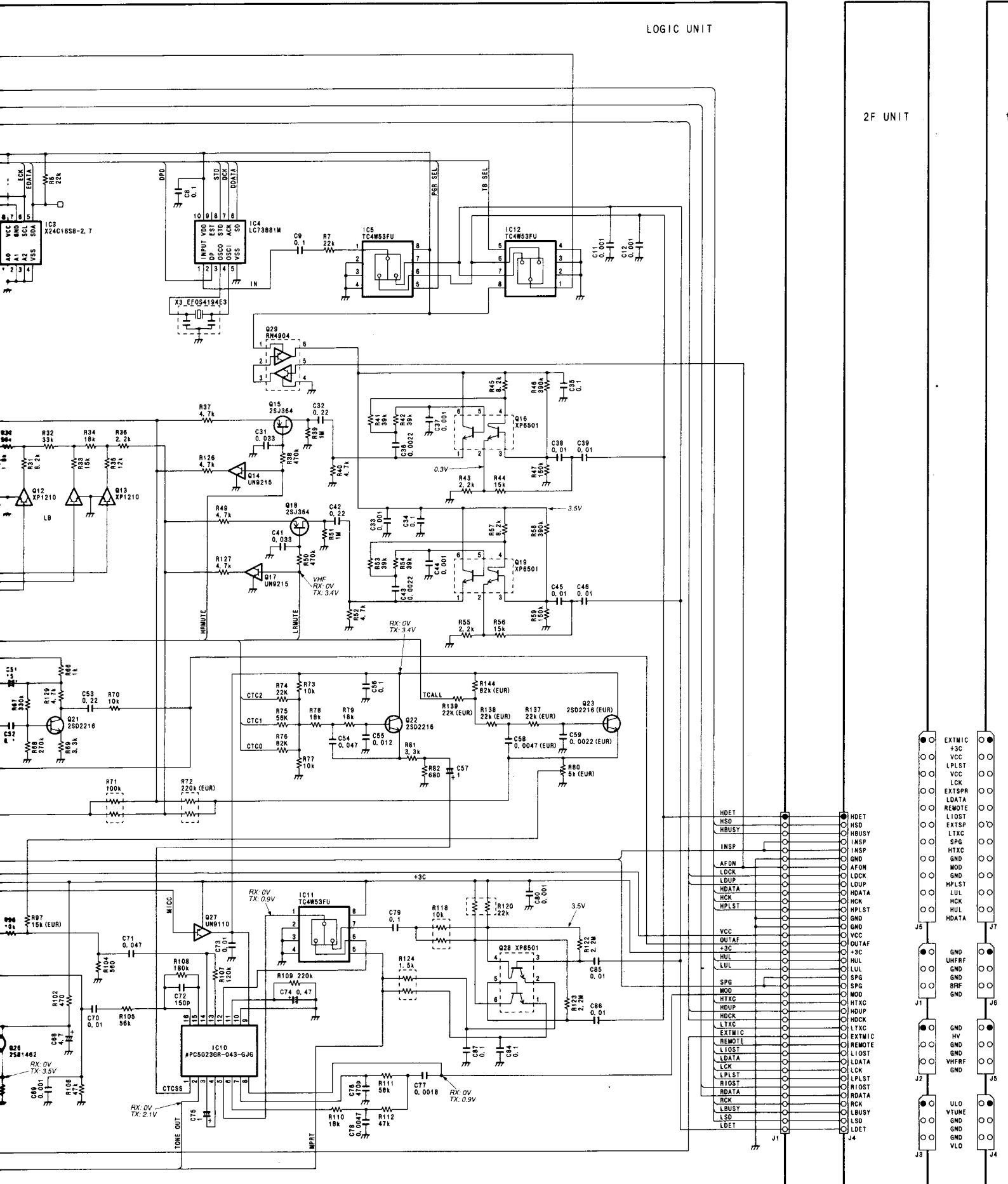


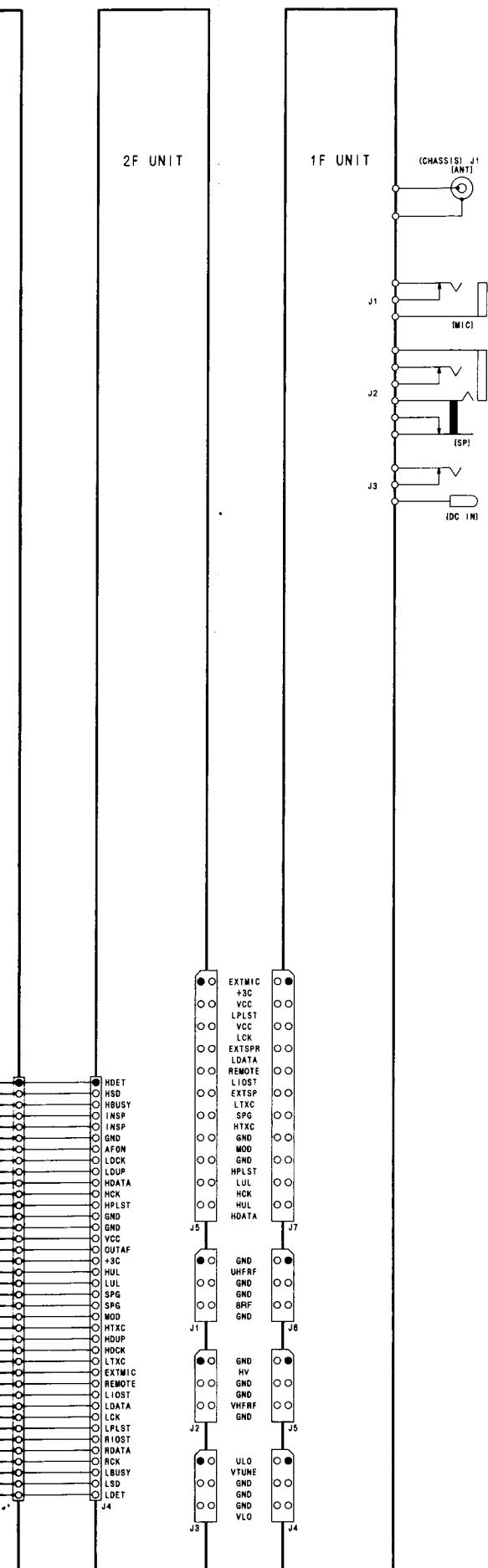


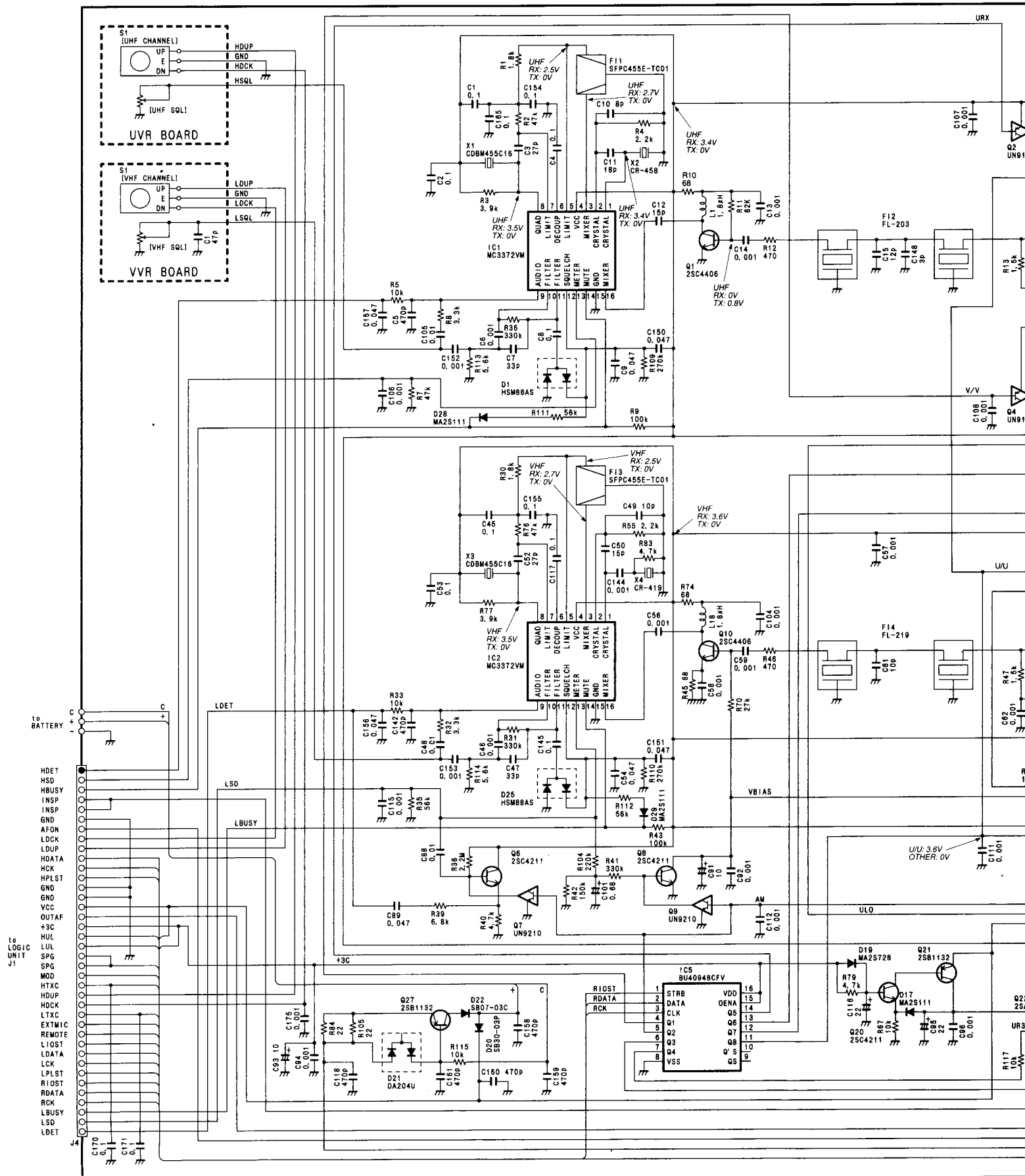


# LOGIC UNIT

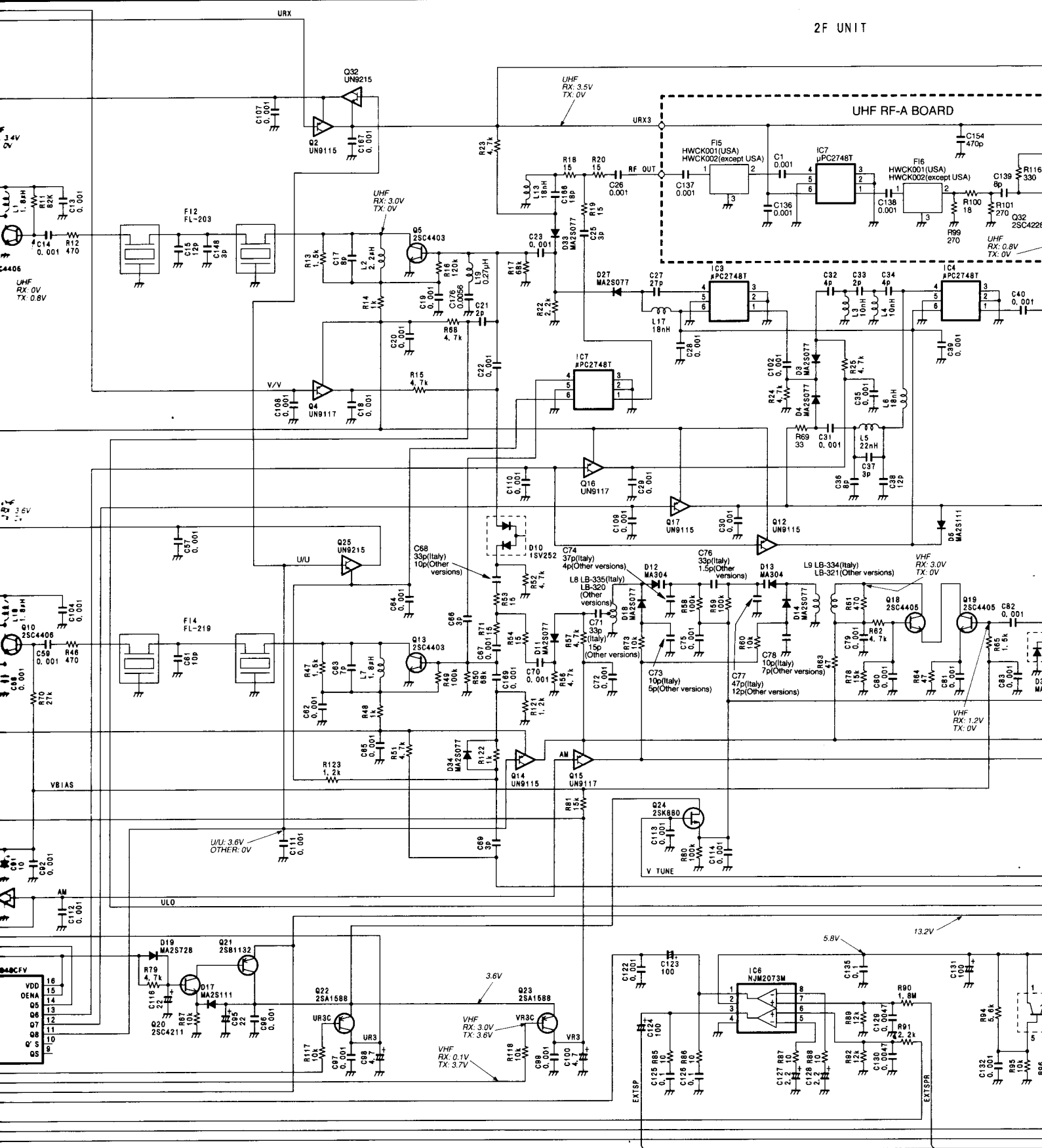
# 2F UNIT



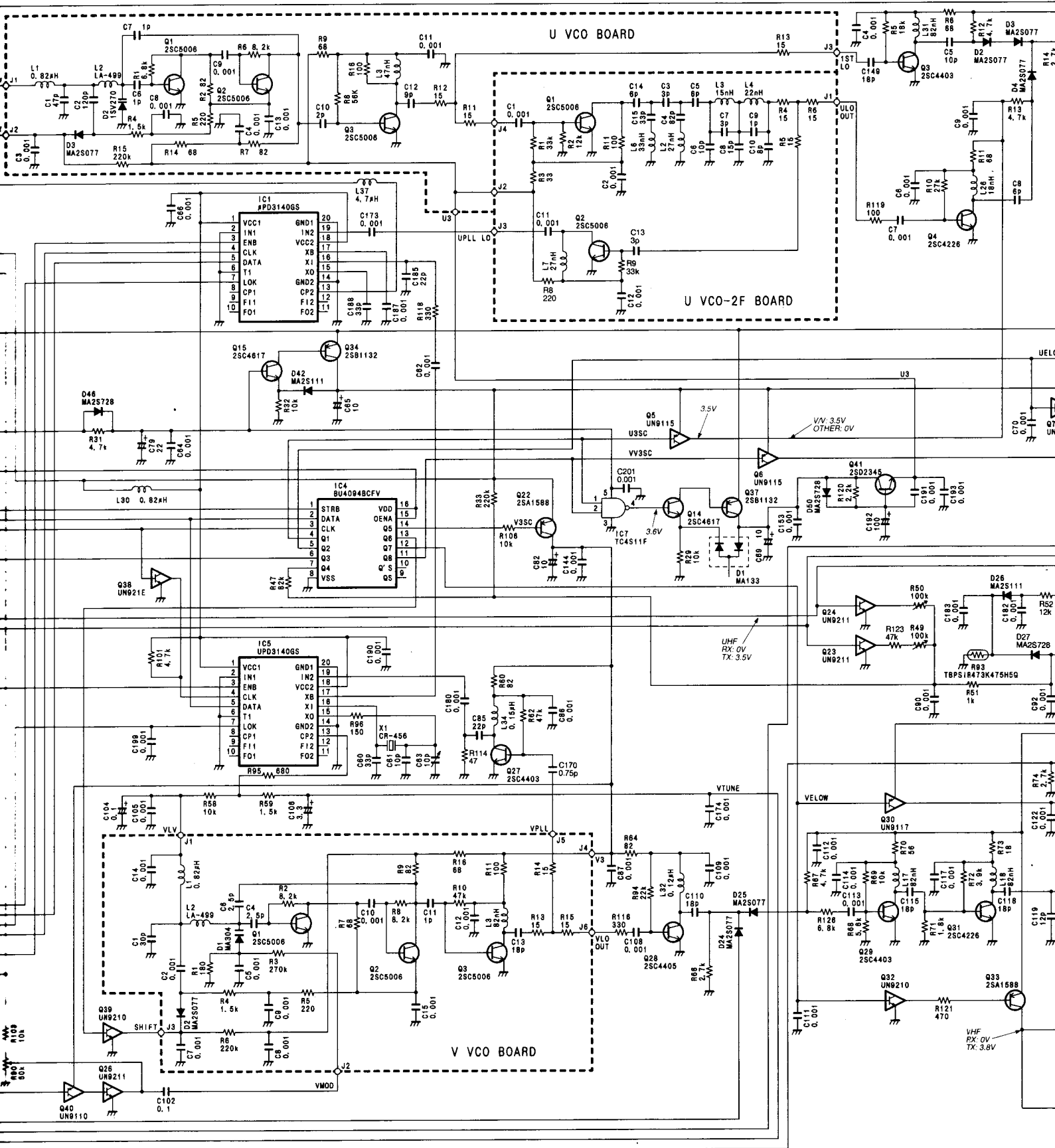


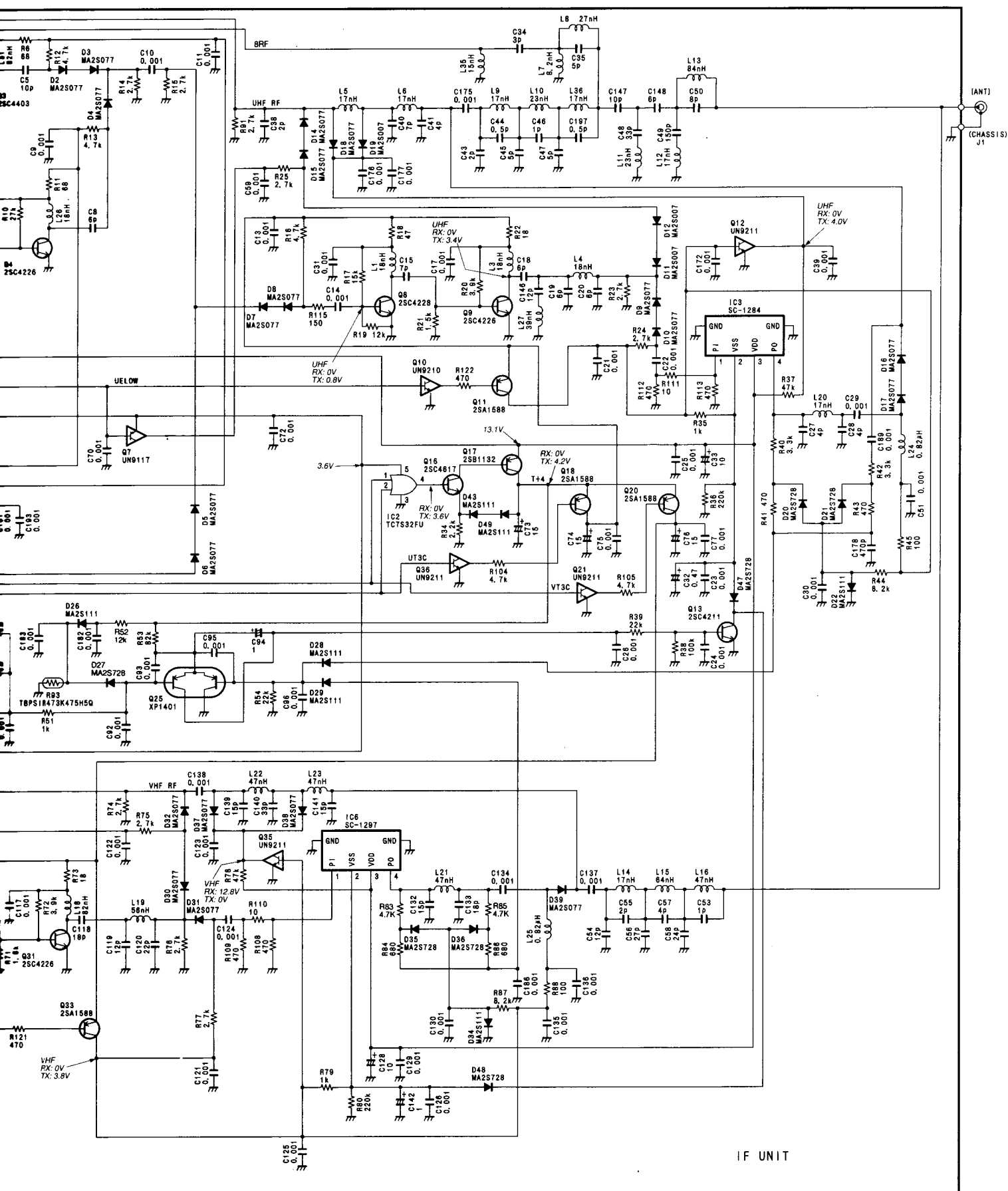














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