ICOM

SERVICE MANUAL

DUAL BAND FM TRANSCEIVER

IC-W32A
IC-W32E

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the IC-W32A/E DUAL BAND FM TRANSCEIVER at the time of publication.

MODEL	VERSION No.	VERSION	SYMBOL
IC-W32E	#02	Europe	EUR
	#03	England	UK
IC-W32A	#04	Italy	ITA
	#05	U.S.A.	USA
	#07	Australia	AUS
	#09	Asia	SEA

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

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. This will ruin the transceiver.
DO NOT expose the transceiver to rain, snow or any liquids.
DO NOT reverse the polarities of the power supply when connecting the transceiver.
DO NOT apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front end.

ORDERING PARTS

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

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

<SAMPLE ORDER>

1130007610	IC	μPD3140GS	IC-W32A	LOGIC UNIT	5 pieces
8810004370	Screw	PH B0 M2 x 10 ZK	IC-W32A	Rear 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.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

				144 MHz band	430 (440) MHz band
GENERAL	Frequency coverage	U.S.A		Tx: 144 MHz–148 MHz Rx: 118 MHz–174 MHz*1	Tx: 440 MHz–450 MHz Rx: 400 MHz–470 MHz*2
		Europe		144 MHz–146 MHz	430 MHz–440 MHz
		Asia		Tx: 144 MHz–148 MHz Rx: 118 MHz–174 MHz*1	430 MHz–440 MHz
		Australia		144 MHz–148 MHz	430 MHz–440 MHz
		Italy		Tx: 144 MHz–148 MHz Rx: 136 MHz–174 MHz*1	Tx: 430 MHz–440 MHz Rx: 400 MHz–470 MHz*3
		Guaranteed frequency range: *1144 MHz–148 MHz, *2440 MHz–450 MHz, *3430 MHz–440 MHz NOTE (USA, Asia only): The avionics band (118–136 MHz) **doesn't** act via the UHF display.			
	Mode			FM (F3E), AM (U.S.A and Asia Rx only, 118–136 MHz)	
	Frequency stability			± 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 connector			BNC (50 Ω)	
	External DC power			4.5 to 16 V DC	
	Current drain (at 13.5 V DC)	Tx	High power (typ.)	1.6 A	1.5 A
			Low power (typ.)	0.5 A	0.6 A
		Rx	Rated audio (typ.)	210 mA (Both bands at rated audio)	
			Power saved (typ.)	40 mA	
	Usable temperature range			−10 °C to +60 °C (+14 °F to +140 °F)	
	Dimensions (Projections not included)			57 (W) × 125 (H) × 31 (D) mm; 2 1/4 (W) × 4 15/16 (H) × 1 7/32 (D) in (with BP-170/171) 57 (W) × 137 (H) × 33 (D) mm; 2 1/4 (W) × 5 13/32 (H) × 1 5/16 (D) in (with BP-173/180)	
	Weight			320 g; 11.3 oz (with BP-170 and dry cell batteries) 340 g; 12.0 oz (with BP-171) 360 g; 12.7 oz (with BP-180) 450 g; 1.0 lb (with BP-173)	
TRANSMITTER	RF output power (at 13.5 V DC)			High: 5.0 W Low: 0.5 W	High: 5.0 W Low: 0.5 W
	Modulation system			Variable reactance frequency modulation	
	Max. frequency deviation			±5.0 kHz	
	Spurious emissions			Less than −60 dB	
	External mic. connector			3-conductor 2.5 (d) mm (1/10") (2 kΩ)	
RECEIVER	Receive system			Double-conversion superheterodyne	
	Intermediate frequencies			1st: 30.850 MHz (for VHF display), 46.050 MHz (for UHF display) 2nd: 450 kHz (The same for both displays)	
	Sensitivity			Original band : Less than 0.16 µV for 12 dB SINAD Opposite band : Less than 0.32 µV for 12 dB SINAD	
	Squelch sensitivity			Less than 0.16 µV	
	Selectivity			More than 30 kHz/ −60 dB, Less than 15 kHz/ −6 dB	
	Spurious and image rejection ratio			More than 60 dB (Except 1/2 IF and 2nd image)	More than 50 dB (Except 1/2 IF and 2nd image)
	Audio output power (at 13.5 V)			More than 180 mW at 10 % distortion with an 8 Ω load	
	External speaker connector			3-conductor 3.5 (d) mm (1/8") (8 Ω)	

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

SECTION 2 DISASSEMBLY INSTRUCTIONS

• Removing the rear panel

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

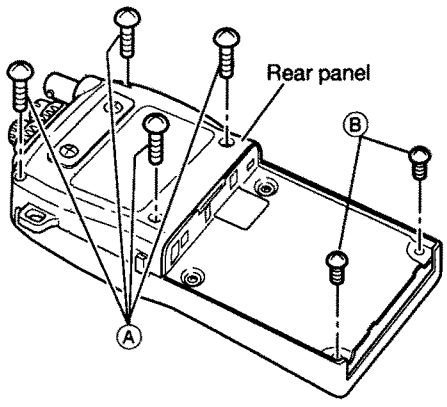


Fig. 1 Removing the rear panel

• Removing the LOGIC unit

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

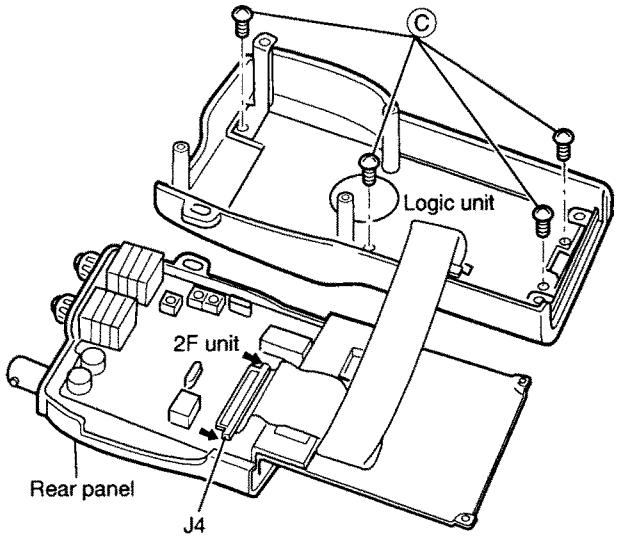


Fig. 2 Removing the LOGIC unit

• Removing the 2F unit

③ Unsolder the point Ⓔ, and remove 2 nuts Ⓕ (black).

④ Unscrew 4 screws, Ⓓ (silver, 2 mm), to separate the rear plate as shown Fig. 3.

⑤ Unscrew 3 screws, Ⓖ (silver, 1.4 mm), to separate the contact base and rear panel. Take off the contact base in the direction of the arrow.

⑥ Unscrew 2 screws, Ⓗ (silver, 2 mm), and unplug J4 – J7 on the bottom side, to separate 2F and 1F units.

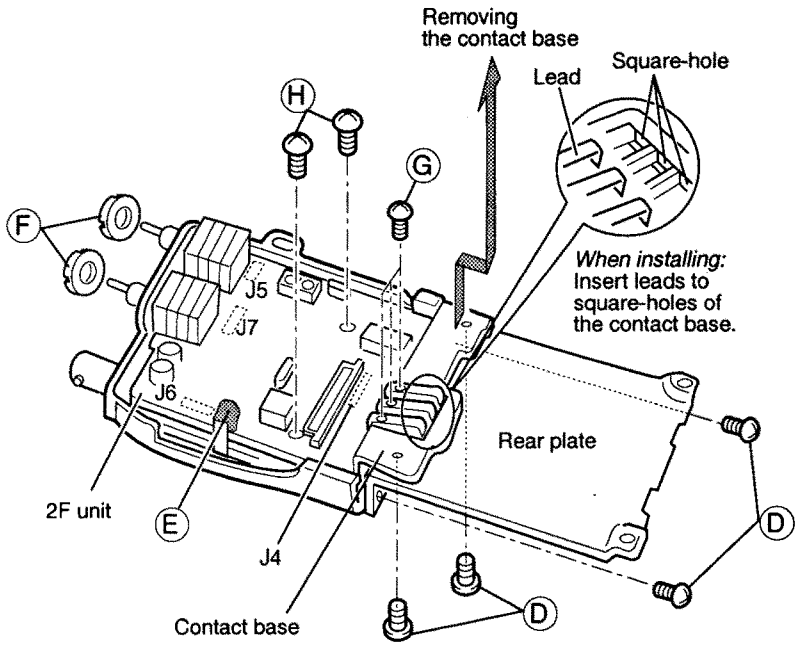


Fig. 3 Removing the 2F unit

• Removing the 1F unit

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

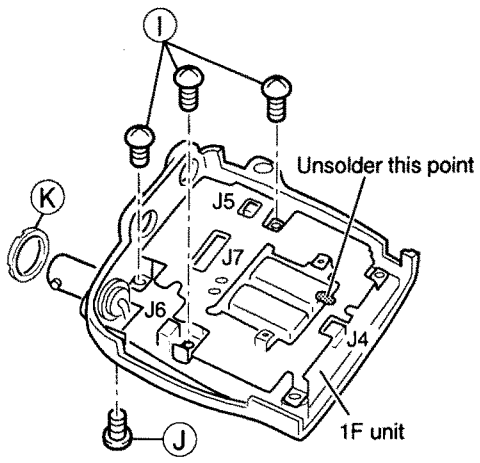
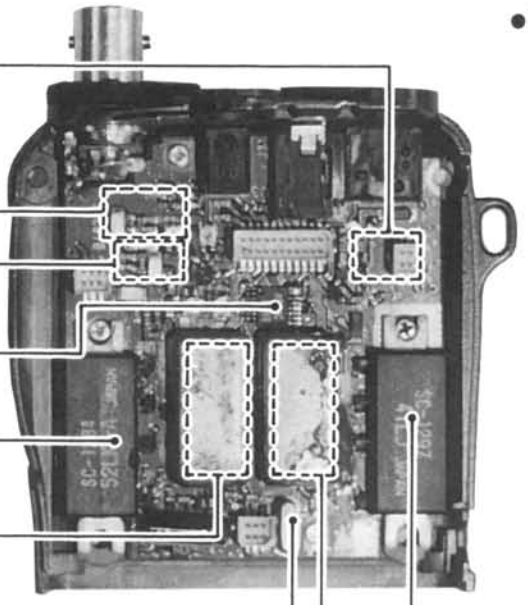


Fig. 4 Removing the 1F unit

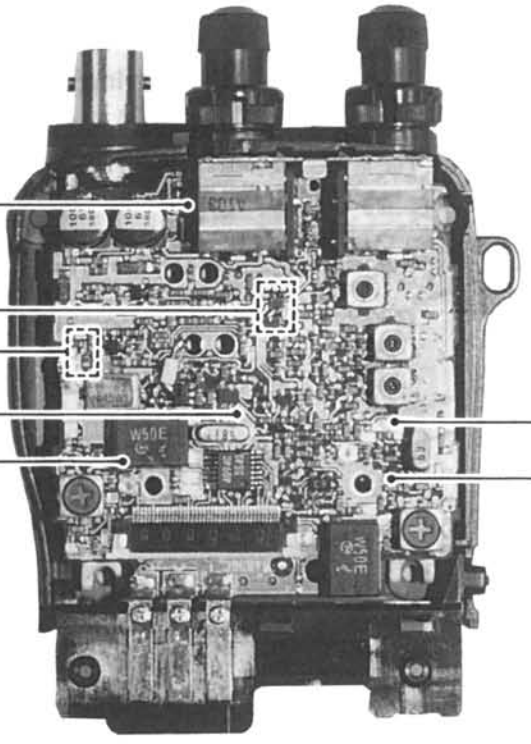
SECTION 3 INSIDE VIEWS

● 1F UNIT



● LOGIC UNIT

● 2F UNIT



Note: *Located under side of this point.

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) is for VHF signals and the high-pass filter (L11–L13, C48–C50, C147, C148) is 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 applying a current to D37 and D38. Thus, transmit signals are blocked from entering the receiver circuits. The antenna switching circuit employs a 1/4 λ 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 are applied to the RF amplifiers (Q220, Q221, Q19) and then passed through the tunable bandpass filter (D32, D42, D43, L7–L9) to suppress unwanted signals. The filtered signals are applied to the 1st mixer circuit.

Varactor diodes (D32, D42, D43 track the bandpass filters and are controlled by the PLL lock voltage. These diodes tune the center frequency to obtain 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 1st LO (VCO output) frequency. By changing the PLL frequency, only the desired frequency will be passed through a crystal filter at the next stage of the mixer.

The receive signals from the VHF RF circuit are mixed with the 1st LO signal (VCO output signal) at the 1st mixer (Q106) to produce a 30.85 MHz 1st IF signal.

The 1st IF signal is applied to a crystal filter (FI101) to suppress out-of-band signals. This filtered signal is amplified at the IF amplifier (Q108) and is then applied to the 2nd mixer circuit (IC101).

4-1-5 VHF RECEIVING VIA UHF DISPLAY

During V/V para-watch operation, a portion of the VHF RF signals from the RF amplifier (Q221) are applied to the UHF mixer circuit (Q7) via the bandpass filter (L221–L225, C222–C226) and RF amplifier (IC230).

When the V/V para-watch operation is activated, the V/V switch controller (Q222) is turned ON; thus the VHF RF signals are applied to the UHF mixer via the V/V switching diode (D221).

4-1-6 VHF 2ND IF AND DEMODULATOR CIRCUITS (2F UNIT)

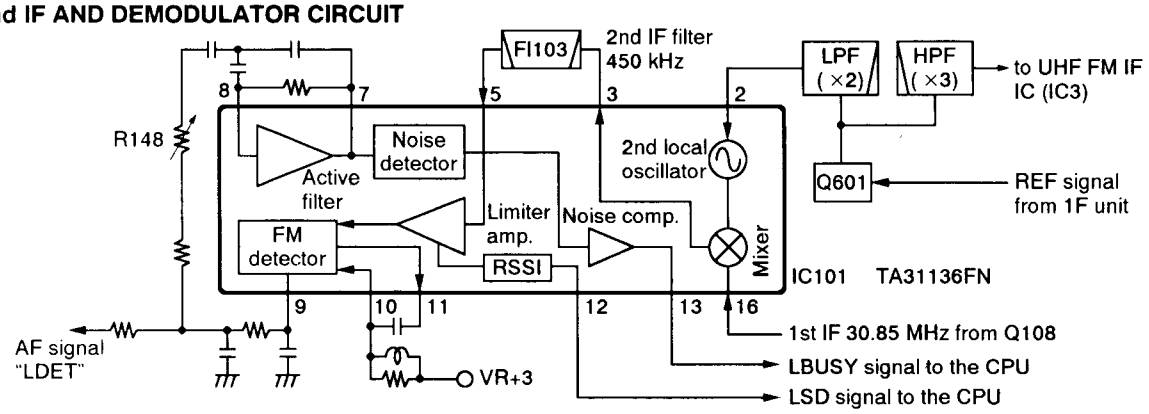
The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal. A double superheterodyne system (which converts receive signals twice) improves the image rejection ratio and obtains stable receiver gain.

The FM IF IC (IC101) contains the 2nd mixer, 2nd local oscillator, limiter amplifier, S-meter detector and quadrature detector circuits.

The 1st IF signal (30.85 MHz) from the IF amplifier (Q108) is applied to the 2nd mixer section of IC101 (pin 16), and is mixed with the 2nd LO signal (30.4 MHz) for conversion to a 450 kHz 2nd IF signal at the 2nd mixer section.

The 2nd IF signal (450 kHz) from the 2nd mixer section (IC101, pin 3) passes though the ceramic filter (FI103) where unwanted signals are suppressed. It is then amplified at the limiter amplifier section (IC101, pin 5) and applied to the quadrature detector section to demodulate the 2nd IF signal into AF signals.

• VHF 2nd IF AND DEMODULATOR CIRCUIT



AF signals output from IC101 (pin 9) are applied to the AF amplifier (IC6) via the squelch mute switch (LOGIC unit, Q102) and [L-VOL] control (V-VR board, S1). The S-meter "LSD" signal output from IC101 (pin 12) is applied to the CPU (LOGIC unit, IC1).

4-1-7 UHF RF CIRCUIT (2F UNIT)

The signals from the antenna switching circuit (1F unit D16–D19) are amplified at the the RF amplifiers (Q4, Q1) and are then passed though the bandpass filter (FI1) to suppress out-of-band signals. The filtered signals are amplified at another RF amplifier (IC1) and are then applied to the 1st mixer circuit (Q7).

4-1-8 UHF 1ST MIXER AND 1ST IF CIRCUITS (2F UNIT)

The amplified UHF RF signals are mixed at the 1st mixer circuit (Q7) with a ULO signal to produce a 46.05 MHz 1st IF signal.

The 1st IF signal is passed through the crystal filter (FI2) and is then amplified at the IF amplifier (Q8). The amplified IF signal is then applied to the FM IF IC (IC3, pin 16).

4-1-9 UHF RECEIVING VIA VHF DISPLAY

During U/U para-watch operation, a portion of the UHF RF signals from the RF amplifier (IC1) are applied to the VHF mixer (Q106) parallel to the UHF mixer.

When the U/U function is activated, U/U switch control (Q513) is turned ON; thus the UHF RF signals from IC1 (pin 4) are amplified at IC240 via D5 and then are applied to the VHF mixer circuit.

4-1-10 UHF 2ND IF AND DEMODULATOR CIRCUITS (2F UNIT)

The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal. The FM IF IC (IC3) contains the 2nd mixer, 2nd local oscillator, limiter amplifier, S-meter detector and quadrature detector circuits.

The 1st IF signal (46.05 MHz) from the IF amplifier (Q8) is applied to the 2nd mixer section of IC3 (pin 16), and is mixed with the 2nd LO signal (45.6 MHz) for conversion to a 450 kHz 2nd IF signal at the 2nd mixer section.

The 2nd IF signal (450 kHz) from the 2nd mixer section (IC3, pin 3) passes though the ceramic filter (FI3) and is then amplified at the limiter amplifier section (IC3, pin 5). The amplified signal is applied to the quadrature detector section to demodulate the 2nd IF signal into AF signals.

AF signals output from IC3 (pin 9) are applied to the AF amplifier (IC6) via the squelch mute switch (LOGIC unit, Q142) and [R-VOL] control (U-VR board, S1). The S-meter "HSD" signal output from IC3 (pin 12) is applied to the CPU (LOGIC unit, IC1).

4-1-11 NOISE SQUELCH CIRCUIT (MAIN AND LOGIC UNITS)

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

Some of the noise components in the AF signals from the FM IF ICs (IC101 for VHF, IC3 for UHF, pin 9) are applied to the active filter section (IC101 pins 7, 8). A variable resistor (R148 for VHF, R35 for UHF) adjusts the active filter input level.

The active filter section amplifies noise components. The filtered signals are rectified at the noise detector section and converted into "LBUSY(VHF)" or "HBUSY(UHF)" (pulse type) signals. Both the "LBUSY" and "HBUSY" signals are applied to the CPU (LOGIC unit, IC1).

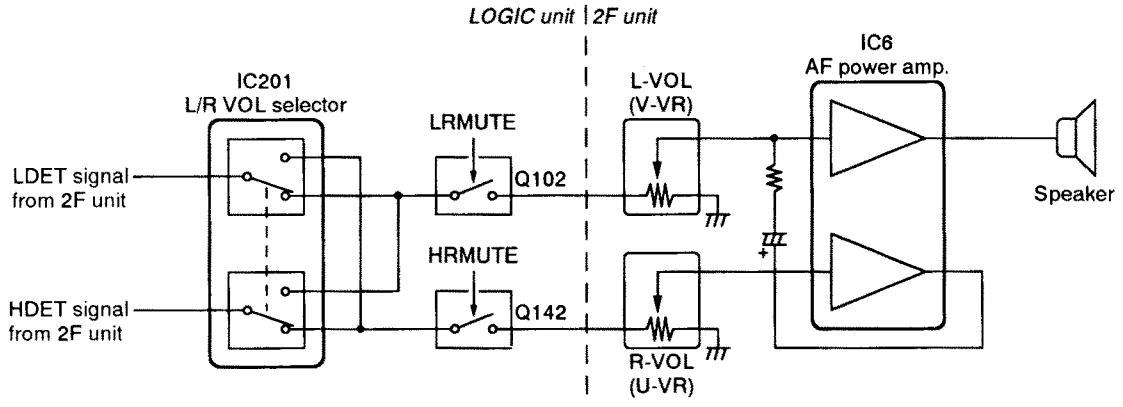
The CPU detects the signal level by the number of pulses, and outputs an "LRMUTE (VHF)" and "HRMUTE (UHF)" signal. These signals control the AF mute switches (Q102 for VHF, Q142 for UHF) to cut the AF signal line.

4-1-12 AF POWER AMPLIFIER CIRCUIT (2F UNIT)

From the RF to IF stages, the circuit used is determined by the operating frequency band, however, in the AF stage the circuit used depends on the band exchange function's selection.

The AF amplifier circuit amplifies the demodulated signals to drive a speaker. It also contains an L/R VOL selector which assigns each AF volume control to correspond to the display condition.

• AF CIRCUIT



The demodulated AF signals ("LDET" and "HDET") from the FM IF ICs (IC101 for VHF, IC3 for UHF) are applied to the L/R VOL selector (LOGIC unit, IC201) to select the matched volume control which is assigned by the band exchange function via the bandpass filter (LOGIC unit, Q101 for VHF, Q141 for UHF). The passed signals are then applied to the AF power amplifier (IC6) via the AF mute switch (LOGIC unit, Q102 for L displayed band, Q142 for R displayed band) and AF volume control (L-VOL; V-VR board, S1 or R-VOL; U-VR board, S1). The bandpass filter suppresses subaudible tones and higher noise signal components.

When the VHF band is assigned to the left displayed band, the demodulated audio signals (LDET) from the FM IF IC (IC101) are guided into the R displayed band AF mute switch (LOGIC unit, Q142). The passed signals (HAFO) are applied to the R-VOL (U-VR board, S1) and then applied to the AF power amplifier (IC6, pin 6). The amplified AF signals are attenuated by R715 and then fed back to the AF power amplifier (IC6. pin 7). The amplified AF signals are output from pin 1 and then applied to the internal speaker (LOGIC unit, SP1) via the [SP] jack (1F unit, J2) when no plug is connected to the jack.

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 AF signals from the built-in condenser microphone (LOGIC unit, MC1), or from the [MIC] jack (1F unit, J1) via the "EXT MIC" line, are applied to the limiter amplifier (LOGIC unit, IC341) which has +6 dB/octave pre-emphasis characteristics. The amplified AF signals are applied to frequency deviation adjustment pots (1F unit, R90 for VHF, R4 for UHF) and are then applied to the modulation circuit on the V-VCO or U-VCO board.

Q321 on the LOGIC unit is the PTT control circuit and outputs a "High" signal to the CPU when transmitting.

4-2-2 MODULATION CIRCUIT (V-VCO AND U-VCO BOARDS)

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

• VHF modulation circuit

The "VMOD" signals change the reactance of a varactor diode (D702) to modulate the oscillated signal at the V-VCO circuit (Q701, Q702).

The oscillated signal is buffer-amplified at the buffer-amplifier (Q703) and then applied to the T/R switch (1F unit, D24, D25) via the LO amplifier (1F unit, Q28).

• UHF modulation circuit

The "UMOD" signals are applied to the U-VCO circuit via the "USHIFT" line. The applied signals change the reactance of a diode (D801) to modulate the oscillated signal at the U-VCO circuit (Q801, Q802).

The oscillated signal is buffer-amplified at Q803 and then applied to a multiplier circuit (Q804). The multiplied signal is buffer-amplified at 1F unit, Q4 and then applied to the T/R switching circuit (D5–D8).

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

The VHF power amplifier circuit provides more than 5 W with a 13.5 V DC power source.

An RF signal from the T/R switch (D24) is amplified at the drive amplifier (Q29, Q31) and then applied to the power amplifier (IC6).

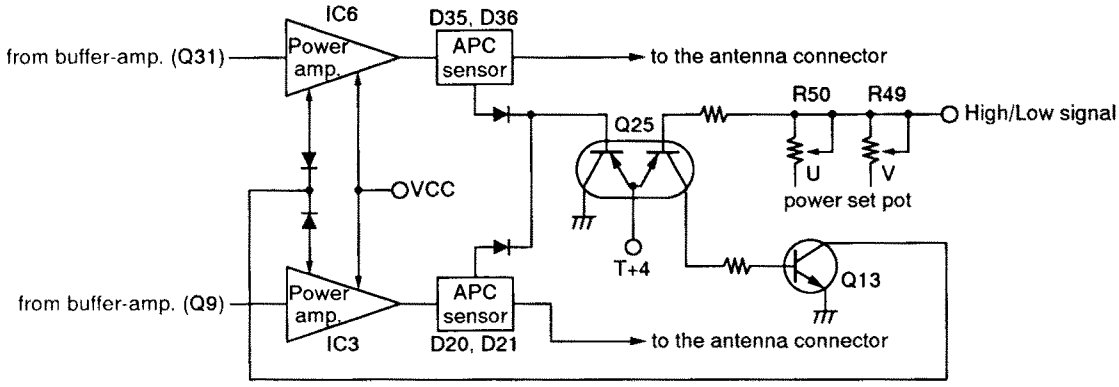
The amplified RF signal is applied to the antenna connector via the APC sensor and antenna switching circuits.

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

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

The RF signal from the T/R switch (D7, D8) is amplified at the drive amplifiers (Q8, Q9) and then applied to the power amplifier (IC3) to provide the specified output power. The amplified RF signal is applied to the antenna connector via the APC sensor and antenna switching circuits.

• APC CIRCUIT



4-2-5 APC CIRCUIT (1F UNIT)

The APC circuit protects the power modules (IC6 for VHF, IC3 for UHF) from a mismatched output load and selects HIGH and LOW output power. The APC circuit consists of an APC sensor and APC control circuits.

The APC sensor circuit (D35, D36 for VHF, D20, D21 for UHF) detects forward signals and rectified signals respectively. The combined voltage is at a minimum level when the antenna is matched at 50 Ω and increases 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 the power amplifiers (IC3, IC6) is decreased via APC control (Q13).

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

4-3 PLL CIRCUITS

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

The oscillated signal at the V-VCO circuit (V-VCO board, Q701, Q702, D702) is amplified at a buffer-amplifier (Q703) and is amplified again at another buffer-amplifier (Q27). The amplified signal is applied to the PLL IC (IC5, pin 19), and then divided by serial data from the CPU and phase-detected with the divided reference frequency. The phase difference is output as pulses.

The output signals from IC5 (pin 13) are converted to DC voltages (lock voltage) by the loop filter (R59, C104) and are then fed back to the V-VCO circuit to stabilize the VCO frequency.

The DC voltage is also applied to the receiver tuned band-pass filters as a "VTUNE" signal.

During U/U para-watch operation, the VHF PLL circuit activates as usual. However, the tripled 1st LO components generated at the LO amplifier (Q28) are used for the 1st mixer circuit (2F unit, Q106).

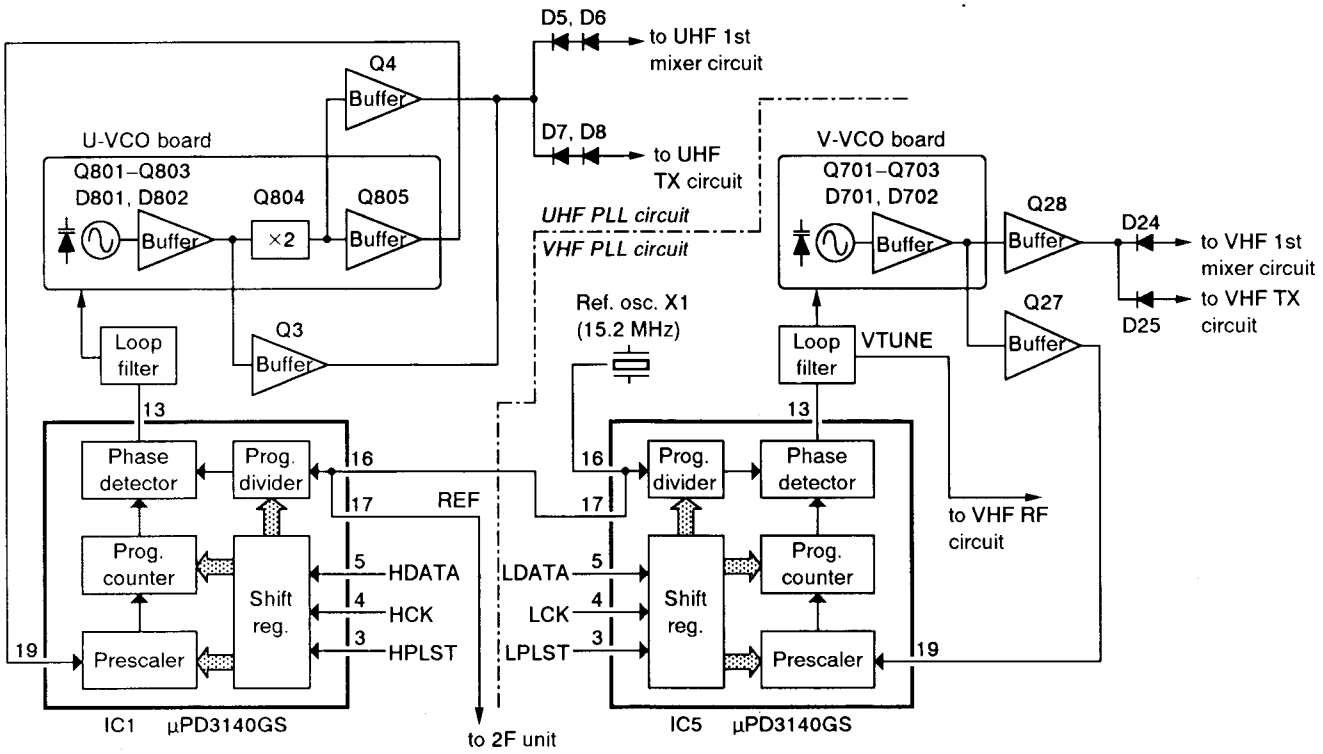
4-3-2 UHF PLL CIRCUIT (1F UNIT)

The oscillated signal at the U-VCO circuit (U-VCO board, Q801, Q802, D802) is amplified at the buffer-amplifier (Q803) and multiplied by 2 at the doubler (Q804). The multiplied signal is applied to the PLL IC (IC1, pin 19) via the buffer-amplifier (U-VCO board, Q805). The applied signal is divided by serial data from the CPU. It is then phase-detected with the divided reference frequency and the phase difference is output as pulses.

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

During V/V para-watch operation, the LO signal is multiplied at the doubler circuit (Q804) beforehand, therefore, the buffer-amplified signal from Q803 is used for the 1st LO signal through the 1STLO line.

• PLL CIRCUITS



4-4 POWER SUPPLY CIRCUITS

VOLTAGE LINE

Line	Description
HV	The voltage from the external power supply or attached battery pack.
VCC	The same voltage as the HV line (external power supply or battery pack) passed through a diode (1F unit, D44).
+3CPU	Common 3 V converted from the VCC line by the +3CPU regulator IC (LOGIC unit, IC2). The output voltage is supplied to the +3C, R3 and T4 regulator circuits, etc.
+3C	Common 3 V converted from the VCC line by the +3C regulator circuit (LOGIC unit, Q4, Q5) using the +3CPU regulator (LOGIC unit, IC2).
R3	3 V for receiver circuit converted from the VCC line by the R3 regulator circuit (2F unit, Q4, Q5).
T4	4 V for transmitter circuit converted from the VCC line by the T4 regulator circuit (1F unit, Q702, Q703). The T4 regulator circuit is controlled by the CPU (LOGIC unit, IC1 pin 45) via the T4 control regulator circuit (1F unit, Q704).
T8	8 V for drive amplifier circuit converted from the VCC line by the T8 regulator circuit (1F unit, Q100, Q101, D100).

4-5 PORT ALLOCATIONS

4-5-1 CPU (LOGIC UNIT)

Pin number	Port name	Description
3	CTCIN	Input port for CTCSS decoded signals.
4	HSD	Input port for UHF S-meter signal.
5	LSD	Input port fot VHF S-meter signal.
6	MGKEY	Input port for both [SQL] and [L/G] keys.
7	REMOTE	Input port for remote control signals from an optional HM-75A microphone via the [MIC] jack.
8	VIN	Input port for the voltage from a connected battery pack or external power supply.
9	CTCOUT	Outputs CTCSS tone signals.
10	DTMF	Output port for: • Beep audio signals while receiving. • DTMF signals or 1750 Hz tone signal while transmitting. (according to versions)

CPU (CONTINUED)

Pin number	Port name	Description
11	HDATA	DATA bus line for UHF PLL. • Outputs UHF PLL data when UHF PLL is locked. • When UHF PLL is unlocked, UHF PLL IC releases the port being pulled down, therefore, the CPU receives a "LOW" level signal.
12	LDATA	DATA bus line for VHF PLL. • Outputs VHF PLL data when the VHF PLL is locked and TX data when transmitting. • When the VHF PLL is unlocked, VHF PLL IC releases the port being pulled down, therefore, the CPU receives a "LOW" level signal.
17	LIGHT	Outputs LCD and key backlight control signal. "High": During backlight ON.
18	AFON	Outputs control signal for the AF regulator circuit (2F unit, Q30, Q31). "High": Activates the AF amplifier.
19	CLOUT	Outputs cloning signal.
20	CLIN	Input port for cloning signal.
21	PCON	Outputs +3 V regulator control signal. "High": Power ON.
22	HBUSY	Input port for UHF noise signals.
23	LBUSY	Input port for VHF noise signals.
25	MICC	Outputs mic. amplifier control signal. "Low" : Activates the mic. amp.
26	MICM	Outputs mic. audio mute signal. "High": Mic. audio is muted.
27	AFCHG	Outputs M/S selector control signal. "High": UHF band on left and VHF band on right display.
28	HRMUTE	Outputs right displayed band squelch switch (LOGIC unit, Q142) control signal. "High": Right displayed band audio is muted.
29	HTX	Outputs UHF transmit control signal. "High": While transmitting on UHF.
30	LRMUTE	Outputs left displayed band squelch switch (LOGIC unit, Q102) control signal. "High": Left displayed band audio is muted.
31	LTX	Outputs VHF transmit control signal. "High": While transmitting on VHF.
32	POWER	Input port for [POWER] switch.

CPU (continued)

Pin number	Port name	Description
39	HDUP	Input port for the right [DIAL] up/down signals.
40	HDCK	Input port for the right [DIAL] clock signals.
41	LDUP	Input port for the left [DIAL] up/down signals.
42	LDCK	Input port for the left [DIAL] clock signals.
43–46	KR3–KR0	Input ports for key matrix.
47	PTT	Input port for [PTT] switch.
48	ESIO	DATA bus line for the EEPROM (LOGIC unit, IC601).
49	LIODATA	Outputs data signal for I/O expander IC (LOGIC unit, IC5).
50	LIOCK	Outputs clock signals for I/O expander IC (LOGIC unit, IC5).
51	RCK	Outputs clock signals for RX expander IC (2F unit, IC801).
52	RDATA	Outputs data signal for RX expander IC (2F unit, IC801).
53	RIOST	Outputs strobe signals for RX expander IC (2F unit, IC801).
54	LIOST	Outputs strobe signals for TX expander IC (1F unit, IC4).
55	LOGST	Outputs strobe signals for I/O expander IC (LOGIC unit, IC5).
57	LPLST	Outputs strobe signals for VHF PLL.
58	CTC	Outputs control signal for CTCSS filter control signal. "Low" : While tone squelch is ON.
59	LCK	Outputs clock signal for both VHF PLL and the TX expander IC (1F unit, IC4).
60	HPLST	Outputs strobe signals for UHF PLL.
61	TBSEL	Outputs frequency band select signal for CTCSS function. "High": While CTCSS is activated on UHF band. "Low" : While CTCSS is activated on VHF band.
62	HCK	Outputs clock signals for UHF PLL.
63	TXLED	Outputs TX LED control signal. "High": TX LED lights.
64	BLED	Outputs BUSY LED control signal.

4-5-2 TX EXPANDER IC (1F UNIT, IC4)

Pin number	Port name	Description
4	U3SC	Outputs UHF band's power save control signal.
5	UMODM	Outputs modulation mute signal for UHF band. "High": Muted
6	USHIFT	Outputs VCO shift signal for U-VCO. "High": While transmitting on UHF.
7	H/L	Outputs TX output power control signal. "High": High power is selected.
11	VV3SC	Outputs power save control signal for V/V para-watch operation.
12	VMODM	Outputs modulation mute signal for VHF band. "High": Muted
13	VSHIFT	Outputs VCO shift signal for V-VCO. "High": While transmitting on VHF.
14	V3SC	Outputs VHF band's power save control signal.

4-5-3 RX EXPANDER IC (2F UNIT, IC801)

Pin number	Port name	Description
4	SUBV	Outputs receiving mode select signal. "Low" : V/V mode is selected.
6	VR3C	Outputs VR3C regulator circuit (2F unit, Q804) control signal. "Low" : While VHF signals are received.
7	UR3C	Outputs UR3C regulator circuit (2F unit, Q803) control signal. "Low" : While UHF signals are received.

4-5-4 I/O EXPANDER IC (LOGIC UNIT, IC5)

Pin number	Port name	Description
4–7	KS0–KS3	Output ports for key strobe signals.
12	TCAL	Outputs DTMF audio level control signal. "High": When 1750 Hz tone signals are output.
13, 14	KS5, KS4	Output ports for key strobe signals.

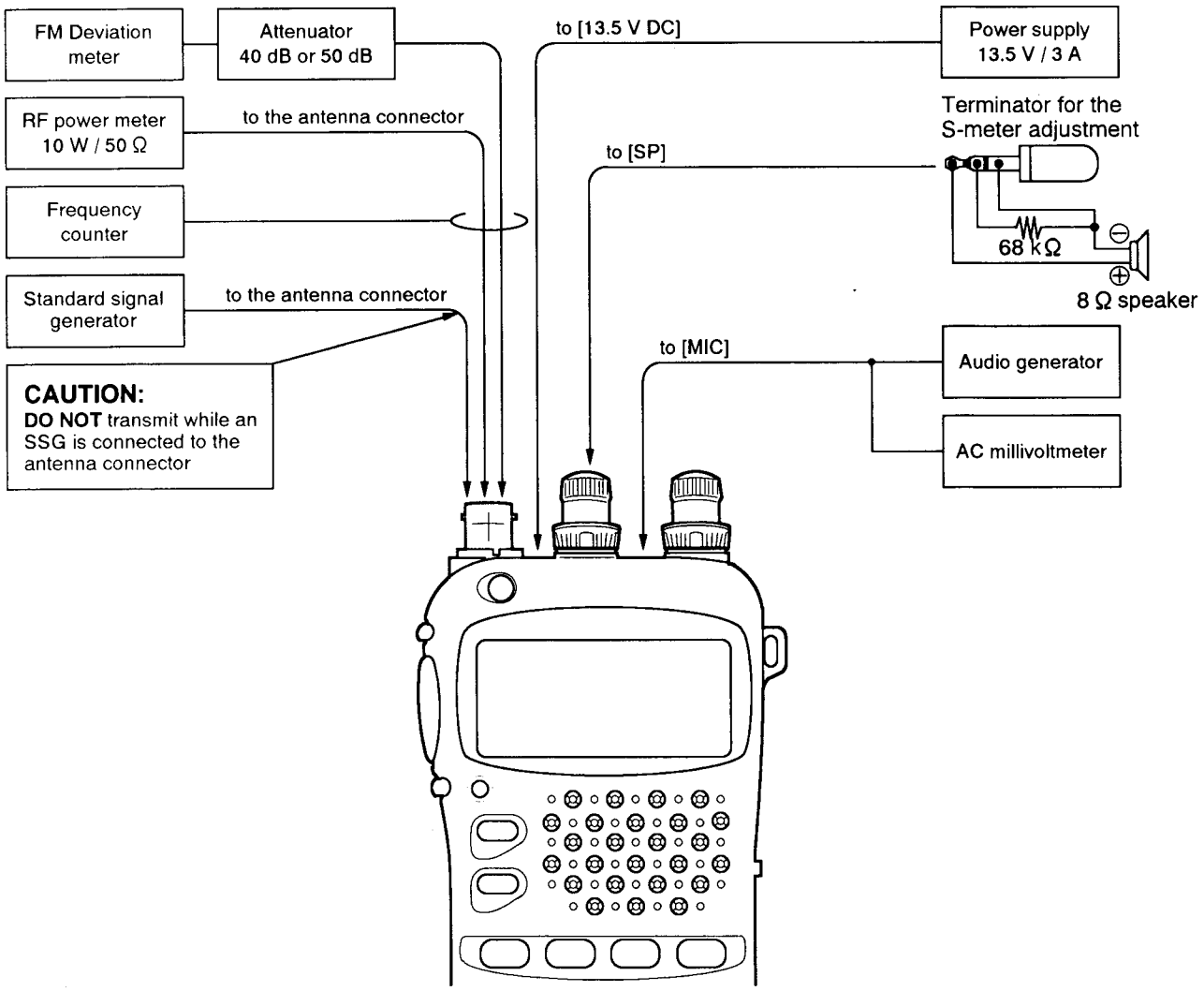
SECTION 5 ADJUSTMENT PROCEDURES

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 Current capacity : 3 A or more	Standard signal generator	Frequency range : 100–470 MHz Output level : −128 to −17 dBm (0.089 µV to 32 mV)
RF power meter	Measuring range : 1–10 W Frequency range : 100–500 MHz Input impedance : 50 Ω SWR : 1.2 : 1 or better	DC voltmeter	Input impedance : 50 kΩ/V DC or better
		Audio generator	Frequency range : 300–3000 MHz Output level : 1–500 mV
Frequency counter	Frequency range : 100–470 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Attenuator	Attenuation : 40 dB or more Capacity : 10 W or more
Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–10 V	FM deviation meter	Frequency range : 100–470 MHz Measuring range : 0 to ±10 kHz

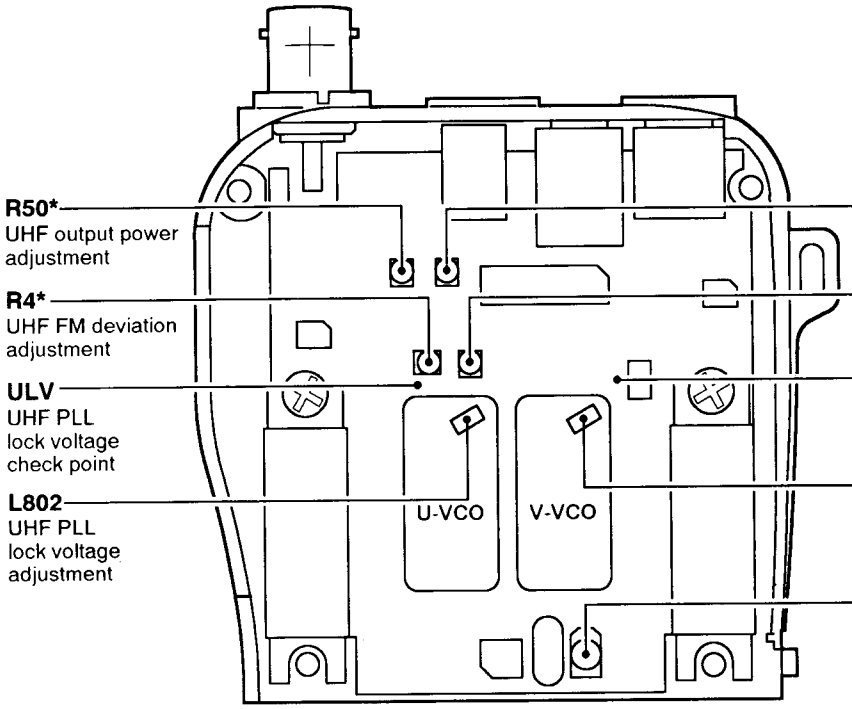
■ CONNECTIONS



5-2 PLL AND TRANSMITTER ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT	
			UNIT	LOCATION		UNIT	ADJUST
PLL LOCK VOLTAGE	1	• Displayed frequency : 146.000 MHz • Receiving	1F	Connect a digital multimeter or an oscilloscope to VLV.	1.05 V	V-VCO	L702
	2	• Transmitting			1.4 V ±0.25 V		Verify
	3	• Displayed frequency : 440.000 MHz • Receiving		Connect a digital multimeter or an oscilloscope to ULV.	1.35 V	U-VCO	L802
PLL REFERENCE FREQUENCY	1	• Displayed frequency : 440.000 MHz • Transmitting	Top panel	Loosely couple a frequency counter to the antenna connector.	440.00000 MHz	1F	C63
OUTPUT POWER	1	• Displayed frequency : 145.000 MHz • Output power : High • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	5.0 W	1F	R49
	2	• Output power : Low • Transmitting			0.25–1.0 W		Verify
	3	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Output power : High • Transmitting			5.0 W		R50
	4	• Output power : Low • Transmitting			0.25–1.0 W		Verify
FM DEVIATION	1	• Displayed frequency : 145.000 MHz • Connect an audio generator to the [MIC] connector and set as : 1 kHz/95 mV • Set an FM deviation meter as: HPF : 50 Hz LPF : 20 kHz De-emphasis : OFF Detector : (P – P)/2 • Output power : High • Transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.6 kHz	1F	R90
	2	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Output power : High • Transmitting			±4.6 kHz		R4
DTMF DEVIATION (IC-W32A only)	1	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Push [D] key while transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±3.5 kHz	LOGIC	R904
TONE CALL DEVIATION (IC-W32E only)	1	• Displayed frequency : 435.000 MHz • Set an FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P – P)/2 • Push [CALL] key while transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±3.5 kHz	LOGIC	R904

• **1F UNIT**



R50*
UHF output power adjustment

R4*
UHF FM deviation adjustment

ULV
UHF PLL lock voltage check point

L802
UHF PLL lock voltage adjustment

R49*
VHF output power adjustment

R90*
VHF FM deviation adjustment

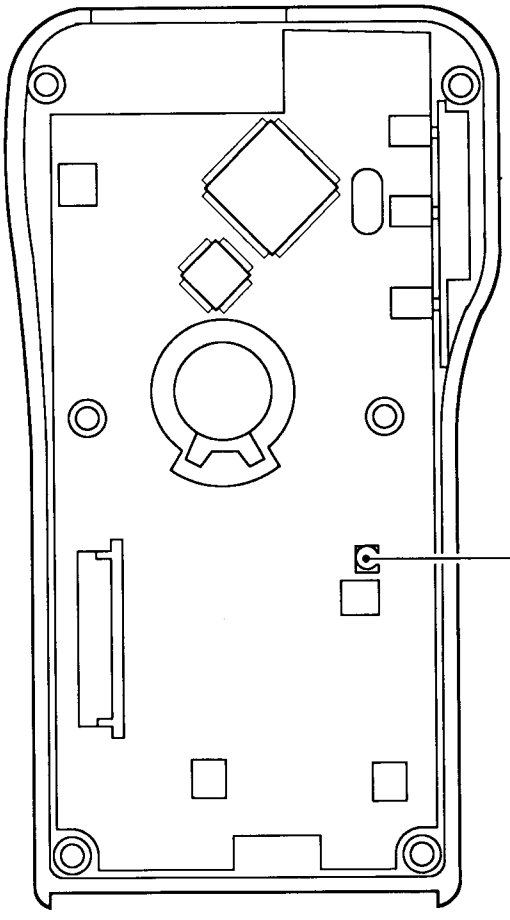
VLV
VHF PLL lock voltage check point

L702
VHF PLL lock voltage adjustment

C63*
Reference frequency adjustment

*1F unit adjustment can be performed through openings on the 2F unit side "▶". (See page 5-5)

• **LOGIC UNIT**



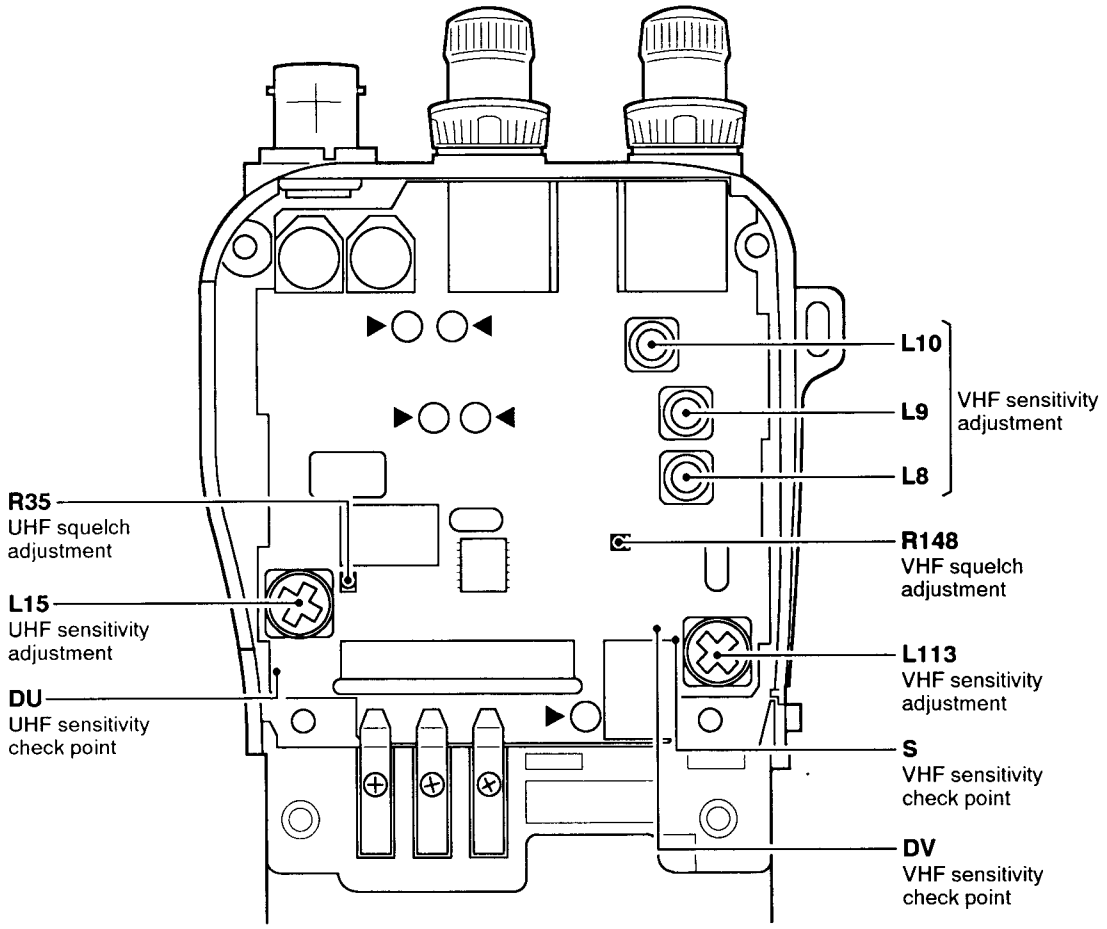
R904
DTMF (IC-W32A) or Tone call (IC-W32E) deviation adjustment

5-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT	
			UNIT	LOCATION		UNIT	ADJUST
VHF SENSITIVITY	1	• Displayed frequency : 145.000 MHz • Connect a SSG to the antenna connector and set as: Level : 1.0 mV* (−47 dBm) Modulation : OFF • Receiving	2F	Connect a digital multimeter or oscilloscope to DV.	1.0 V	2F	L113
	2			Connect a digital multimeter or oscilloscope to the check point "S".	Maximum level		Adjust in sequence L10, L9 L8
UHF SENSITIVITY	1	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Connect a SSG to the antenna connector and set as: Level : 1.0 mV* (−47 dBm) Modulation : OFF • Receiving	2F	Connect a digital multimeter or oscilloscope to DU.	1.0 V	2F	L15
VHF SQUELCH LEVEL	1	• Displayed frequency : 145.000 MHz • Connect an SSG to the antenna connector and set as: Level : 0.089 µV* (−128 dBm) Modulation : 1 kHz (±3.5 kHz Dev.) • Squelch setting : AT • Pre-set the R148 to maximum CCW. • Receiving	Speaker		At the point where the AF signal just disappears.	2F	R148
UHF SQUELCH LEVEL	1	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Connect an SSG to the antenna connector and set as: Level : 0.089 µV* (−128 dBm) Modulation : 1 kHz (±3.5 kHz Dev.) • Squelch setting : AT • Pre-set the R35 to maximum CCW. • Receiving	Speaker		At the point where the AF signal just disappears.	2F	R35
S-METER	1	• Displayed frequency : 145.000 MHz • Connect an SSG to the antenna connector and set as: Level : 0.5 µV* (−113 dBm) Mod. : 1 kHz (±3.5 kHz Dev.) • Connect a terminator to the [SP] jack. • Receiving	Front panel			Push and hold the [1] key.	
	2	• Set an SSG output level for the S-meter to S3 (4 dots).	SSG	Output level	0.32 to 0.79 µV (−117 to −109 dBm)	Verify	
	3	• Displayed frequency : 445.000 MHz (USA version) 435.000 MHz (Other versions) • Connect an SSG to the antenna connector and set as: Level : 0.5 µV* (−113 dBm) Mod. : 1 kHz (±3.5 kHz Dev.) • Connect a terminator to the [SP] jack. • Receiving	Front panel			Push and hold the [3] key.	
	4	• Set an SSG output level for the S-meter to S3 (4 dots).	SSG	Output level	0.32 to 0.79 µV (−117 to −109 dBm)	Verify	

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

• **2F UNIT**



NOTE: 1F unit adjustment can be performed through openings on the 2F unit side "▶".

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	SC-1284
IC4	1130007510	S.IC	BU4094BCFV-E1
IC5	1130007610	S.IC	μPD3140GS-E1 (DS8)
IC6	1140004380	IC	SC-1297
IC7	1130004500	S.IC	TC4S11F (TE85R)
Q1	1590001150	S.TRANSISTOR	UN9211(TX)
Q3	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q4	1530003500	S.TRANSISTOR	2SC5085-O (TE85R)
Q5	1590001690	S.TRANSISTOR	UN9115(TX)
Q6	1590001690	S.TRANSISTOR	UN9115(TX)
Q8	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q9	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q13	1530003280	S.TRANSISTOR	2SC4211-6-TL
Q14	1530003190	S.TRANSISTOR	2SC4617 TLQ
Q15	1590001170	S.TRANSISTOR	XP1501-(TX).AB
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-TL
Q28	1530003500	S.TRANSISTOR	2SC5085-O (TE85R)
Q29	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q31	1530002570	S.TRANSISTOR	2SC4405-3-TL
Q34	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q36	1590001150	S.TRANSISTOR	UN9211(TX)
Q37	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q39	1590001150	S.TRANSISTOR	UN9211(TX)
Q41	1540000410	S.TRANSISTOR	2SD2345(TX)S
Q43	1590001150	S.TRANSISTOR	UN9211(TX)
D1	1750000370	S.DIODE	DA221 TL
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)
D16	1790001260	S.DIODE	MA2S077-(TX)
D17	1790001260	S.DIODE	MA2S077-(TX)
D18	1790001260	S.DIODE	MA2S077-(TX)
D19	1790001260	S.DIODE	MA2S077-(TX)
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	1790001250	S.DIODE	MA2S111-(TX)
D28	1790001250	S.DIODE	MA2S111-(TX)
D29	1790001250	S.DIODE	MA2S111-(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)
D43	1750000370	S.DIODE	DA221 TL
D44	1750000560	S.DIODE	RB050L-40 TE-25
D47	1790001240	S.DIODE	MA2S728-(TX)

[1F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D48	1790001240	S.DIODE	MA2S728-(TX)
D50	1790001240	S.DIODE	MA2S728-(TX)
X1	6050009430	XTAL	CR-515 (15.200000 MHz)
L1	6200004370	S.COIL	LL1608-F15NK
L3	6200004370	S.COIL	LL1608-F15NK
L5	6200002100	S.COIL	LQN 1A 17NJ04
L6	6200002100	S.COIL	LQN 1A 17NJ04
L7	6200004340	S.COIL	LL1608-F6N8K
L8	6200004400	S.COIL	LL1608-F47NK
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	6200003290	S.COIL	ELJNC R12K-F
L14	6200005900	S.COIL	NLH252018T-047J 47N
L15	6200005900	S.COIL	NLH252018T-047J 47N
L16	6200005890	S.COIL	NLH252018T-039J 39N
L17	6200004430	S.COIL	LL1608-F56NK
L18	6200005270	S.COIL	LL1608-F82NK
L20	6200002330	S.COIL	LQN 1A 15NJ04
L21	6200005900	S.COIL	NLH252018T-047J 47N
L22	6200005900	S.COIL	NLH252018T-047J 47N
L23	6200005900	S.COIL	NLH252018T-047J 47N
L24	6200004480	S.COIL	MLF1608D R82K-T
L25	6200004480	S.COIL	MLF1608D R82K-T
L26	6200004380	S.COIL	LL1608-F18NK
L27	6200004360	S.COIL	LL1608-F12NK
L30	6200004480	S.COIL	MLF1608D R82K-T
L31	6200005270	S.COIL	LL1608-F82NK
L32	6200004390	S.COIL	LL1608-F22NK
L34	6200004600	S.COIL	MLF1608D R15K-T
L35	6200004340	S.COIL	LL1608-F6N8K
L36	6200002330	S.COIL	LQN 1A 15NJ04
L37	6200003550	S.COIL	MLF1608A 4R7K-T
L38	6200002830	S.COIL	LQN 1A 84NJ04
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)
R5	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R6	7030003300	S.RESISTOR	ERJ3GEYJ 680 V (68 Ω)
R10	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R11	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R12	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
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	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R20	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R21	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R22	7030003230	S.RESISTOR	ERJ3GEYJ 180 V (18 Ω)
R29	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R31	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
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)
R38	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R39	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R40	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R41	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)

S.=Surface mount

[1F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R42	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R43	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R44	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R45	7030003300	S.RESISTOR	ERJ3GEYJ 680 V (68 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	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R53	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R54	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R56	7030000330	S.RESISTOR	MCR10EZHJ 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)
R61	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R62	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R64	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R66	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R67	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
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	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R79	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R80	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R83	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R84	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R85	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 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)
R93	7510000940	S.THERMISTOR	TBPS1R473K475H5Q
R94	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R95	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R96	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R101	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R102	7030003770	S.RESISTOR	ERJ3GEYJ 564 V (560 kΩ)
R103	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 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)
R107	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
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	7030003310	S.RESISTOR	ERJ3GEYJ 820 V (82 Ω)
R115	7030003250	S.RESISTOR	ERJ3GEYJ 270 V (27 Ω)
R118	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R120	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R123	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R125	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
C1	4550002960	S.TANTALUM	TESVA 1C 155M1-8L
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C4	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C5	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C6	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C7	4030009910	S.CERAMIC	C1608 CH 1H 040B-T-A
C8	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C13	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C14	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C15	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C17	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

[1F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C18	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C23	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C24	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C25	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C26	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C27	4030006970	S.CERAMIC	C1608 CH 1H 060D-T-A
C28	4030009530	S.CERAMIC	C1608 CH 1H 030B-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	4550000270	S.TANTALUM	TESVA 1E 474M1-8L
C33	4550006080	S.TANTALUM	TEMSVB2 1C 106M-8L
C34	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C35	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C38	4030006970	S.CERAMIC	C1608 CH 1H 060D-T-A
C39	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C40	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C41	4030009910	S.CERAMIC	C1608 CH 1H 040B-T-A
C43	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C44	4030009570	S.CERAMIC	C1608 CH 1H 0R3B-T-A
C45	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C46	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C47	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C48	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C49	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C50	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C51	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C53	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C54	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C55	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C56	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C57	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C58	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C60	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C61	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C62	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C63	4610002090	S.TRIMMER	CTZ3S-20C-W1-P
C64	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C65	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C66	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C69	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C72	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C73	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C74	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C75	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C76	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C77	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C81	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C82	4550006030	S.TANTALUM	TEMSVA 0G 156M1-8L
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	4550000460	S.TANTALUM	TESVA 1C 105M1-8L
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
C100	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C101	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C102	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C103	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C104	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C105	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C106	4550003080	S.TANTALUM	TEMSVA 1A 335M-8L
C107	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C109	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C110	4030007040	S.CERAMIC	C1608 CH 1H 180J-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

S.=Surface mount

[1F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
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	4030007030	S.CERAMIC	C1608 CH 1H 150J-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	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A
C141	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C142	4550000270	S.TANTALUM	TESVA 1E 474M1-8L
C144	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C146	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C147	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C148	4030006970	S.CERAMIC	C1608 CH 1H 060D-T-A
C149	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C153	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C170	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C171	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C173	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C174	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C175	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C178	4030006860	S.CERAMIC	C1608 JB 1H 102K-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	4030009510	S.CERAMIC	C1608 CH 1H 010B-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
C194	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C195	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C196	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C199	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C200	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-
C201	4030006970	S.CERAMIC	C1608 CH 1H 060D-T-A
C905	4550006030	S.TANTALUM	TEMSVA 0G 156M1-8L
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
W1	7120000380	JUMPER	JPW 01 R-01
W2	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910047833	PCB	B 4833C

[V-VCO BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
Q701	1530003260	S.TRANSISTOR	2SC5006-T1
Q702	1530003260	S.TRANSISTOR	2SC5006-T1
Q703	1530003260	S.TRANSISTOR	2SC5006-T1
D701	1790001260	S.DIODE	MA2S077-(TX)
D702	1790001290	S.VARICAP	MA304(TX)
L701	6200004480	S.COIL	MLF1608D R82K-T
L702	6110003080	COIL	LA-496
L703	6200004490	S.COIL	LL1608-F39NK
R701	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R702	7030005700	S.RESISTOR	ERJ2GEJ 274 X (270 kΩ)
R703	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R704	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R705	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R706	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R707	7030005210	S.RESISTOR	ERJ2GEJ 822 X (8.2 kΩ)
R708	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R709	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R710	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R711	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R712	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R713	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R714	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R715	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
C701	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C702	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C703	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C704	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C705	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C706	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C707	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C708	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C709	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C710	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C711	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C712	4030011630	S.CERAMIC	C1005 CH 1E 0R5B-T-A
C713	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C714	4030009830	S.CERAMIC	C1005 CH 1E 180J-T-A
J701	6910008020	CONNECTOR	IPS-1323
J702	6910008020	CONNECTOR	IPS-1323
J703	6910008020	CONNECTOR	IPS-1323
J704	6910008020	CONNECTOR	IPS-1323
J705	6910008020	CONNECTOR	IPS-1323
J706	6910008020	CONNECTOR	IPS-1323
EP1	0910047841	PCB	B 4840A

S.=Surface mount

[U-VCO BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
Q801	1530003260	S.TRANSISTOR	2SC5006-T1
Q802	1530003260	S.TRANSISTOR	2SC5006-T1
Q803	1530003260	S.TRANSISTOR	2SC5006-T1
Q804	1530003260	S.TRANSISTOR	2SC5006-T1
Q805	1530003260	S.TRANSISTOR	2SC5006-T1
D801	1790001260	S.DIODE	MA2S077-(TX)
D802	1790001310	S.VARICAP	1SV270(TPH3)
L801	6200004480	S.COIL	MLF1608D R82K-T
L802	6110003100	COIL	LA-499
L803	6200004400	S.COIL	LL1608-F47NK
L804	6200004390	S.COIL	LL1608-F22NK
L805	6200004380	S.COIL	LL1608-F18NK
L806	6200004370	S.COIL	LL1608-F15NK
L807	6200004380	S.COIL	LL1608-F18NK
L831	6200004420	S.COIL	LL1608-F33NK
R801	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R802	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R803	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R804	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R805	7030005210	S.RESISTOR	ERJ2GEJ 822 X (8.2 kΩ)
R806	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R807	7030005720	S.RESISTOR	ERJ2GEJ 563 X (56 kΩ)
R808	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R809	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R810	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R811	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R812	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R813	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R814	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R815	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R816	7030007260	S.RESISTOR	ERJ2GEJ 330 X (33 Ω)
R817	7030008010	S.RESISTOR	ERJ2GEJ 123X
R818	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R831	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R832	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R833	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R834	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R835	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
C801	4030011320	S.CERAMIC	C1005 CH 1E 470J-T-A
C802	4030011610	S.CERAMIC	C1005 CH 1E 680J-T-A
C803	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C804	4030011640	S.CERAMIC	C1005 CH 1E 010B-T-A
C805	4030011640	S.CERAMIC	C1005 CH 1E 010B-T-A
C806	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C807	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C808	4030011660	S.CERAMIC	C1005 CH 1E 020B-T-A
C809	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C810	4030009740	S.CERAMIC	C1005 CH 1E 100D-T-A
C811	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C812	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C813	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C814	4030009740	S.CERAMIC	C1005 CH 1E 100D-T-A
C815	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C816	4030010280	S.CERAMIC	C1005 CH 1E 390J-T-A
C817	4030009700	S.CERAMIC	C1005 CH 1E 050C-T-A
C818	4030010250	S.CERAMIC	C1005 CH 1H 101J-T-A
C819	4030009720	S.CERAMIC	C1005 CH 1E 080D-T-A
C820	4030009730	S.CERAMIC	C1005 CH 1E 090D-T-A
C821	4030011650	S.CERAMIC	C1005 CH 1E 1R5B-T-A
C822	4030009760	S.CERAMIC	C1005 CH 1E 150J-T-A
C823	4030011630	S.CERAMIC	C1005 CH 1E 0R5B-T-A
C824	4030009740	S.CERAMIC	C1005 CH 1E 100D-T-A
C831	4030009740	S.CERAMIC	C1005 CH 1E 100D-T-A
C832	4030010090	S.CERAMIC	C1005 CH 1E 560J-T-A
C833	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
J801	6910008020	CONNECTOR	IPS-1323

[U-VCO BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
J802	6910008020	CONNECTOR	IPS-1323
J803	6910008020	CONNECTOR	IPS-1323
J804	6910008020	CONNECTOR	IPS-1323
J805	6910008020	CONNECTOR	IPS-1323
J806	6910008020	CONNECTOR	IPS-1323
EP1	0910047812	PCB	B 4841B

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110003370	S.IC	μPC2748T-E3
IC3	1110003490	S.IC	TA31136FN(D,EL)
IC6	1110002420	S.IC	NJM2073M(T1)
IC101	1110003490	S.IC	TA31136FN(D,EL)
IC102	1130004200	S.IC	TC4S66F (TE85R)
IC230	1110003370	S.IC	μPC2748T-E3
IC240	1110003370	S.IC	μPC2748T-E3
IC801	1130007510	S.IC	BU4094BCFV-E1
Q1	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q3	1590001690	S.TRANSISTOR	UN9115(TX)
Q4	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q7	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q8	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q19	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q24	1560000540	S.FET	2SK880-Y (TE85R)
Q27	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q30	1590001170	S.TRANSISTOR	XP1501-(TX).AB
Q31	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q103	1590001690	S.TRANSISTOR	UN9115(TX)
Q104	1590001690	S.TRANSISTOR	UN9115(TX)
Q106	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q108	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q200	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q201	1590001690	S.TRANSISTOR	UN9115(TX)
Q210	1530002900	S.TRANSISTOR	2SC4228-T2 R45
Q211	1590001690	S.TRANSISTOR	UN9115(TX)
Q220	1530002570	S.TRANSISTOR	2SC4405-3-TL
Q221	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q222	1590001690	S.TRANSISTOR	UN9115(TX)
Q240	1590001150	S.TRANSISTOR	UN9211(TX)
Q409	1590001170	S.TRANSISTOR	XP1501-(TX).AB
Q410	1590001690	S.TRANSISTOR	UN9115(TX)
Q411	1540000350	S.TRANSISTOR	2SD2216-S(TX)
Q412	1540000350	S.TRANSISTOR	2SD2216-S(TX)
Q513	1590001860	S.TRANSISTOR	UN9215(TX)
Q601	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q801	1590001170	S.TRANSISTOR	XP1501-(TX).AB
Q802	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q803	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q804	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
D3	1750000530	S.DIODE	1SV271 (TPH3)
D4	1790001260	S.DIODE	MA2S077-(TX)
D5	1790001260	S.DIODE	MA2S077-(TX)
D6	1790001260	S.DIODE	MA2S077-(TX)
D10	1790001250	S.DIODE	MA2S111-(TX)
D11	1790001250	S.DIODE	MA2S111-(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)
D18	1790001260	S.DIODE	MA2S077-(TX)
D20	1790001030	S.DIODE	SB30-03P-TD
D21	1750000370	S.DIODE	DA221 TL
D22	1790000670	S.DIODE	SB07-03C-TB

S.=Surface mount

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D32	1790001290	S.VARICAP	MA304(TX)
D109	1790001260	S.DIODE	MA2S077-(TX)
D201	1790001260	S.DIODE	MA2S077-(TX)
D203	1790000850	S.DIODE	MA132WK(TX)
D221	1790001260	S.DIODE	MA2S077-(TX)
D223	1790001240	S.DIODE	MA2S728-(TX)
D224	1790001240	S.DIODE	MA2S728-(TX)
D230	1790001260	S.DIODE	MA2S077-(TX)
D240	1790001260	S.DIODE	MA2S077-(TX)
D515	1790001260	S.DIODE	MA2S077-(TX)
FI1	2040001000	S.SAW	EFCH435MWNP1 except [USA]
FI1	2040001020	S.SAW	EFCH445MWNP1 [USA] only
FI2	2020001310	XTAL	46M15A (46.050 MHz)
FI3	2020001270	CERAMIC	CFWM450E
FI101	2020001300	XTAL	30M15A2 (30.850 MHz)
FI103	2020001270	CERAMIC	CFWM450E
L2	6200004370	S.COIL	LL1608-F15NK
L3	6200004360	S.COIL	LL1608-F12NK
L6	6200004370	S.COIL	LL1608-F15NK
L7	6200006630	S.COIL	TFL0816 39N
L8	6150004920	S.COIL	LS-518
L9	6150004920	S.COIL	LS-518
L10	6150004920	S.COIL	LS-518
L13	6200004920	S.COIL	MLF1608A 2R2K-T
L14	6200004660	S.COIL	MLF1608A 1R8K-T
L15	6150004840	S.COIL	LS-510
L16	6200004400	S.COIL	LL1608-F47NK
L20	6200004410	S.COIL	LL1608-F27NK
L108	6200003640	S.COIL	MLF1608K 100K-T
L112	6200004660	S.COIL	MLF1608A 1R8K-T
L113	6150004840	S.COIL	LS-510
L200	6200004360	S.COIL	LL1608-F12NK
L201	6200004360	S.COIL	LL1608-F12NK
L202	6200004360	S.COIL	LL1608-F12NK
L210	6200004370	S.COIL	LL1608-F15NK
L211	6200005250	S.COIL	LL1608-F5N6K
L212	6200004340	S.COIL	LL1608-F6N8K
L213	6200004340	S.COIL	LL1608-F6N8K
L220	6200004590	S.COIL	MLF1608D R18K-T
L221	6200004720	S.COIL	MLF1608D R10K-T
L222	6200004490	S.COIL	LL1608-F39NK
L223	6200004720	S.COIL	MLF1608D R10K-T
L224	6200004720	S.COIL	MLF1608D R10K-T
L225	6200004370	S.COIL	LL1608-F15NK
L226	6200004490	S.COIL	LL1608-F39NK
L600	6200003550	S.COIL	MLF1608A 4R7K-T
L601	6200003540	S.COIL	MLF1608D R22K-T
L602	6200004600	S.COIL	MLF1608D R15K-T
L603	6200004790	S.COIL	MLF1608D R47K-T
L604	6200005140	S.COIL	MLF1608D R33K-T
L605	6200005140	S.COIL	MLF1608D R33K-T
R3	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R4	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R5	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R8	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R9	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R10	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R11	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R12	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R13	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R14	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R15	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R17	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R18	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R19	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R20	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R21	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R22	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R23	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R24	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R25	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R26	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R27	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R28	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R29	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R30	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R31	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R32	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R33	7510001040	S.THERMISTOR	TBPS1R153K460H5Q
R34	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R35	7310003590	S.TRIMMER	EVM-1XSX50 B24 (203)
R36	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R37	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R38	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R39	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R41	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R58	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R59	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R60	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R61	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
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)
R73	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R75	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R80	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R81	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R84	7030000180	S.RESISTOR	MCR10EZHJ 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	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R90	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R91	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R92	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R94	7030005330	S.RESISTOR	RR0816P-562-D (5.6 kΩ)
R95	7030005320	S.RESISTOR	RR0816P-103-D (10 kΩ)
R96	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R97	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R98	7030000200	S.RESISTOR	MCR10EZHJ 33 Ω (330)
R105	7030000180	S.RESISTOR	MCR10EZHJ 22 Ω (220)
R115	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R116	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R117	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R120	7030000200	S.RESISTOR	MCR10EZHJ 33 Ω (330)
R124	7030000200	S.RESISTOR	MCR10EZHJ 33 Ω (330)
R125	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R126	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R127	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R128	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R129	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R130	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R137	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R138	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R139	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R140	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R141	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R142	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R143	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R144	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R145	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R146	7510001040	S.THERMISTOR	TBPS1R153K460H5Q
R147	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R148	7310003590	S.TRIMMER	EVM-1XSX50 B24 (203)
R149	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R150	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R151	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R152	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R153	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R201	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R202	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R203	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)

S.=Surface mount

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R204	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R205	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R206	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R210	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R211	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R212	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R220	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R221	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R222	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R223	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R224	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R225	7030003240	S.RESISTOR	ERJ3GEYJ 220 V (22 Ω)
R226	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R227	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R228	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R231	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R232	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R240	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R241	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R260	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R453	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R454	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R455	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R456	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R457	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R458	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R459	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R460	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R461	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R462	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R563	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R564	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R565	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R566	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R601	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R603	7030003300	S.RESISTOR	ERJ3GEYJ 680 V (68 Ω)
R651	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R652	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R715	7030003770	S.RESISTOR	ERJ3GEYJ 564 V (560 k Ω)
R802	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R803	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R804	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R899	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ) except [USA]
C4	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C5	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C7	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C12	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C13	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C14	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C15	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C35	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C36	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A
C37	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C38	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C39	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 JB 1H 102K-T-A
C44	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C45	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C46	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C47	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C48	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C49	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C50	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C51	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C52	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C53	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C54	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C60	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C61	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C70	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C71	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C73	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C74	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C75	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C76	4030009540	S.CERAMIC	C1608 CH 1H 1R5B-T-A
C77	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C78	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C79	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C81	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C83	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C84	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C85	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C86	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C87	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C90	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C106	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C113	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C118	4030006860	S.CERAMIC	C1608 JB 1H 102K-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	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C128	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C129	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C130	4030006860	S.CERAMIC	C1608 JB 1H 102K-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	4550004040	S.TANTALUM	TEMSVA 0J 685M-8L
C135	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C136	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C138	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C140	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C148	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C150	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C151	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C152	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C153	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C154	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C155	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C156	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C157	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C158	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C159	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C160	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C161	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C162	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C163	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C164	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C165	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C168	4510005310	S.ELECTROLITIC	ECEV1CA220SR
C201	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C202	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C203	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C204	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A
C205	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C206	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C207	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C210	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C211	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C212	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C213	4030009550	S.CERAMIC	C1608 CH 1H 2R5B-T-A
C214	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C215	4030009550	S.CERAMIC	C1608 CH 1H 2R5B-T-A
C216	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C220	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C221	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C222	4030007000	S.CERAMIC	C1608 CH 1H 090D-T-A
C223	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A
C224	4030007000	S.CERAMIC	C1608 CH 1H 090D-T-A
C225	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A

S.=Surface mount

[2F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C226	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C227	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C235	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C236	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C237	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C240	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C241	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C242	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A
C260	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C261	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C262	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C263	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C264	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C461	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C462	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C463	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C464	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C465	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C466	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C467	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C468	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C469	4550003290	S.TANTALUM	TESVA 0G 475M1-8L
C570	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C572	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C573	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C574	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C577	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C578	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C601	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C602	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C603	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C604	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C605	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C606	4030007160	S.CERAMIC	C1608 CH 1H 181J-T-A
C607	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A
C608	4030007160	S.CERAMIC	C1608 CH 1H 181J-T-A
C609	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A
C610	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A
C802	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C804	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C805	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C806	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C807	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C808	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C809	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C815	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C816	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C817	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C818	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C819	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C820	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C821	4030006860	S.CERAMIC	C1608 JB 1H 102K-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
W4	7030003860	S.JUMPER	ERJ3GE JPW V
W50	7030003860	S.JUMPER	ERJ3GE JPW V
W101	7030003860	S.JUMPER	ERJ3GE JPW V
W102	7030003860	S.JUMPER	ERJ3GE JPW V
W210	7030003860	S.JUMPER	ERJ3GE JPW V
W211	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910047823	PCB	B 4836C

[V-VR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	7600000200	ENCORDER	TP96D96E20-15F10KA-1882
EP1	0910047780	PCB	B 4844

[U-VR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	7600000200	ENCORDER	TP96D96E20-15F10KA-1882
EP1	0910047790	PCB	B 4845

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140006350	S.IC	M38267M8L-166-GP
IC2	1130008220	S.IC	SED1510F0C
IC5	1130007510	S.IC	BU4094BCFV-E1
IC201	1130008230	S.IC	BU4053BCFV-E2
IC202	1110002700	S.IC	NJM2904M-T1
IC341	1110004110	S.IC	BA4510F-T1
IC601	1140005880	S.IC	X25320S8I-2.7T6
IC701	1180001240	S.IC	S-81335HG-KI-T1
IC721	1110003380	S.IC	S-80730SL-AT-T1
Q1	1590001140	S.TRANSISTOR	UN9210(TX)
Q2	1590001140	S.TRANSISTOR	UN9210(TX)
Q3	1590002070	S.TRANSISTOR	UN9112(TX)
Q4	1590002070	S.TRANSISTOR	UN9112(TX)
Q101	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q102	1550000010	S.FET	2SJ364-Q (TX)
Q141	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q142	1550000010	S.FET	2SJ364-Q (TX)
Q201	1590001690	S.TRANSISTOR	UN9115(TX)
Q241	1540000350	S.TRANSISTOR	2SD2216-S(TX)
Q321	1520000430	S.TRANSISTOR	2SB1462-R(TX)
Q341	1590001150	S.TRANSISTOR	UN9211(TX)
Q342	1590002070	S.TRANSISTOR	UN9112(TX)
Q343	1590001150	S.TRANSISTOR	UN9211(TX)
Q401	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q402	1590001170	S.TRANSISTOR	XP1501-(TX).AB
Q421	1590001860	S.TRANSISTOR	UN9215(TX)
Q422	1590001860	S.TRANSISTOR	UN9215(TX)
Q621	1590001140	S.TRANSISTOR	UN9210(TX)
Q701	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q702	1590001170	S.TRANSISTOR	XP1501-(TX).AB
Q703	1590001470	S.TRANSISTOR	UN9213(TX)
Q721	1590001150	S.TRANSISTOR	UN9211(TX)
D301	1790000990	S.ZENER	MA8051-H(TX)
D501	1790001200	S.DIODE	MA6S121(TX)
D502	1790001200	S.DIODE	MA6S121(TX)
D522	1790001250	S.DIODE	MA2S111-(TX) except [ITA]
D523	1160000050	S.DIODE	DAP202U T107 except [ITA]
D523	1750000240	S.DIODE	DA112 T107 [ITA] only
D524	1160000050	S.DIODE	DAP202U T107 [ITA], [SWE]
D524	1750000220	S.DIODE	DA113W T107 [UK], [AUS]
D524	1750000240	S.DIODE	DA112 T107 [USA], [EUR]
D525	1750000220	S.DIODE	DA113W T107 [ITA] only
D525	1750000240	S.DIODE	DA112 T107 [USA], [SEA], [AUS]

S.=Surface mount

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D526	1790001250	S.DIODE	MA2S111-(TX) [USA] only
D621	1790001250	S.DIODE	MA2S111-(TX)
D701	1790000970	S.DIODE	MA729(TX)
D721	1790001250	S.DIODE	MA2S111-(TX)
X1	6050009810	S.XTAL	CR-550 (5.843 MHz)
R1	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) except [USA]
R2	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R3	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R6	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R7	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R8	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R10	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ)
R11	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R12	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R13	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R15	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R16	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R23	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R24	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R25	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R26	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R27	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R28	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R29	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R31	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R32	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R33	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R34	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R101	7030003750	S.RESISTOR	ERJ3GEYJ 394 V (390 kΩ)
R102	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R103	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R104	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R105	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R106	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R107	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R108	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R109	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R110	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R126	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R128	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R129	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R130	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R141	7030003750	S.RESISTOR	ERJ3GEYJ 394 V (390 kΩ)
R142	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R143	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R144	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R145	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R146	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R147	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R148	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R149	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R150	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R201	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R202	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R203	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R204	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R205	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R206	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R207	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R208	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R209	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R210	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R241	7030003840	S.RESISTOR	ERJ3GEYJ 225 V (2.2 MΩ)
R242	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R243	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R301	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R321	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R322	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R323	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R324	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R325	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R326	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R341	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R342	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R343	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R344	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R345	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R346	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R347	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R348	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R349	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R350	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R351	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R352	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R381	7410000580	S.ARRAY	EXB-V4V 224JV (220 kΩ)
R391	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R392	7030003830	S.RESISTOR	ERJ3GEYJ 185 V (1.8 MΩ)
R401	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R411	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R412	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R413	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R414	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R415	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R416	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R417	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R418	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R419	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R421	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R422	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R423	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R424	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R425	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R426	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)
R502	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R503	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R504	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R505	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R506	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R507	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R601	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R621	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R641	7030005520	S.RESISTOR	RR0816R-334-D (330 kΩ)
R642	7030005640	S.RESISTOR	RR0816R-753-D (75 kΩ)
R701	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R702	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R703	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R721	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R722	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R901	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R902	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R904	7310002600	S.TRIMMER	RV-110 (RH03A3AS4X0AA) 473
R905	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R906	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
C1	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C2	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C4	4030009650	S.CERAMIC	C1608 CH 1H 240J-T-A
C5	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A
C6	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C7	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C8	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C9	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C41	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C42	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C101	4030008850	S.CERAMIC	C1608 JB 1C 123K-T-A
C102	4030008850	S.CERAMIC	C1608 JB 1C 123K-T-A
C103	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C104	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C105	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C106	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C107	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C108	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

S.=Surface mount

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C121	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C141	4030008850	S.CERAMIC	C1608 JB 1C 123K-T-A
C142	4030008850	S.CERAMIC	C1608 JB 1C 123K-T-A
C143	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C144	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C145	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C146	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C147	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C148	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C161	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C201	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C202	4030008910	S.CERAMIC	C1608 JB 1C 393K-T-A
C203	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C204	4030009980	S.CERAMIC	C1608 JB 1H 152K-T-A
C205	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C206	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C207	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C208	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C209	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C210	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C211	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C241	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C242	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C243	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C301	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C321	4550003290	S.TANTALUM	TESVA 0G 475M1-8L
C322	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C341	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C342	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C343	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C344	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C345	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C346	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C348	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C349	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C350	4030010040	S.CERAMIC	C1608 JB 1H 561K-T-A
C351	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C352	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C353	4550006780	S.TANTALUM	TEMSVB2 0J 476M-8R
C354	4550003290	S.TANTALUM	TESVA 0G 475M1-8L
C355	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C391	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C401	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C402	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C403	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C421	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C501	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C502	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C503	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C504	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C521	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C522	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C523	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C524	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C525	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C526	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C601	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C641	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C701	4550006080	S.TANTALUM	TEMSVB2 1C 106M-8L
C702	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C703	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C704	4550006780	S.TANTALUM	TEMSVB2 0J 476M-8R
C705	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C706	4550006120	S.TANTALUM	TEMSVA 0G 226M-8L
C707	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C708	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C709	4550006780	S.TANTALUM	TEMSVB2 0J 476M-8R
C721	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C722	4030010740	S.CERAMIC	C1608 JB 1A 104K-T-A
C952	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
DS1	5030001440	LCD	T535005
DS2	5040001920	S.LED	SML-110MT T86
DS3	5040001920	S.LED	SML-110MT T86
DS4	5040001920	S.LED	SML-110MT T86

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
DS5	5040001920	S.LED	SML-110MT T86
DS6	5010000120	S.LED	LN1371G-(TR)
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)
DS21	5040002070	S.LED	LNJ107W5PRW
S301	2230000900	S.SWITCH	JPM1990-2013R
S302	2230000900	S.SWITCH	JPM1990-2013R
S303	2260002140	S.SWITCH	SKQLLC
S553	2260001680	S.SWITCH	SKQDPB
J1	6510017680	S.CONNECTOR	IL-FPR-38S-HF-E3000
W2	8900005810	CABLE	OPC-545
W701	7030003860	S.JUMPER	ERJ3GE JPW V
MC1	7700001750	MICROPHONE	EM-123TH
EP1	8930041130	LCD CONTACT	SRCN-1882 ZCC-505
EP2	0910047802	PCB	B 4837B

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 (incl. nut)	1
MP 1	8210013831	1460 Rear panel (A)-1	1
MP 2	8930035520	1459 Rear plate	1
MP 3	8930033760	1460 Release plate	1
MP 4	8930033771	1460 Release button (SI)	1
MP 5	8930035131	Spring (V)-1	1
MP 6	8510010800	1882 A-Shield plate	1
MP 7	8610010170	Knob N248	2
MP 8	8610010180	Knob N249	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	8810008640	Screw FH B0 No.0-1 M2 x 4 NI-ZU (BT)	2
MP 17	8810006760	Screw PH B0 No.0-1 M2 x 3 NI	2
MP 18	8810003850	Screw PH B0 No.0-3 M1.4 x 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.0-1 M2 x 3 ZK	1
MP 23	8810005320	Screw PH M2 x 4 NI FE	2
MP 24	8830000570	Nut (A)	2
MP 25	8930040350	1810 EMC plate	1
MP 26	8010005730	Screw PH M3 x 3 BS ZK	2

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
EP 1	8930041130	LCD contact SRCN-1882	2
DS 1	5030001440	LCD T-535005	1
SP 1*	2510000840	Speaker CS028014-12	1
MP 1*	8210013821	1459 Front panel (A)-1	1
MP 2*	8930040640	1459 PTT button (B)	1
MP 3*	8930036360	1459 PTT angle	1
MP 4*	8310038860	1459 Window plate (C) IC-W32A	1
	8310038870	1459 Window plate (D) IC-W32E	1
MP 5*	8930035540	1459 Window sheet	1
MP 6	8930040781	1459 10 key (A)-1	1
MP 7	8930035440	1459 Power button	1
MP 8	8210012181	1459 Reflector-1	1
MP 9	8930035530	1459 LCD holder	1
MP 10*	8930018220	870 Net	1
MP 11*	8930022560	1144 Lens	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 Grouunding plate	1
MP 17	8930037480	1459 L-grounding plate	1
MP 18*	8930041370	1882 SW sheet	1
W 2	8900005810	Cable OPC-545	1
*	8210013920	1459 Front panel-1 assembly IC-W32A	1
*	8210013930	1459 Front panel-1 assembly IC-W32E (incl. MP1, MP2, MP3, MP4, MP5, MP10, MP11, MP18)	1

[1F UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP 1	8930034520	1460 Mic jack seal	1

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

[V-VCO BOARD]

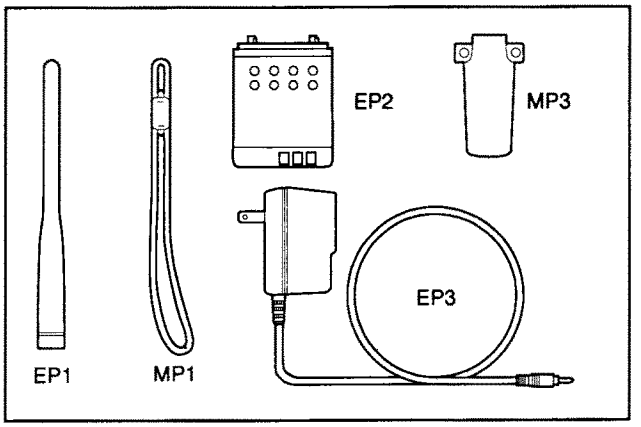
REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP 1	8510009580	1460 S-VCO case	1

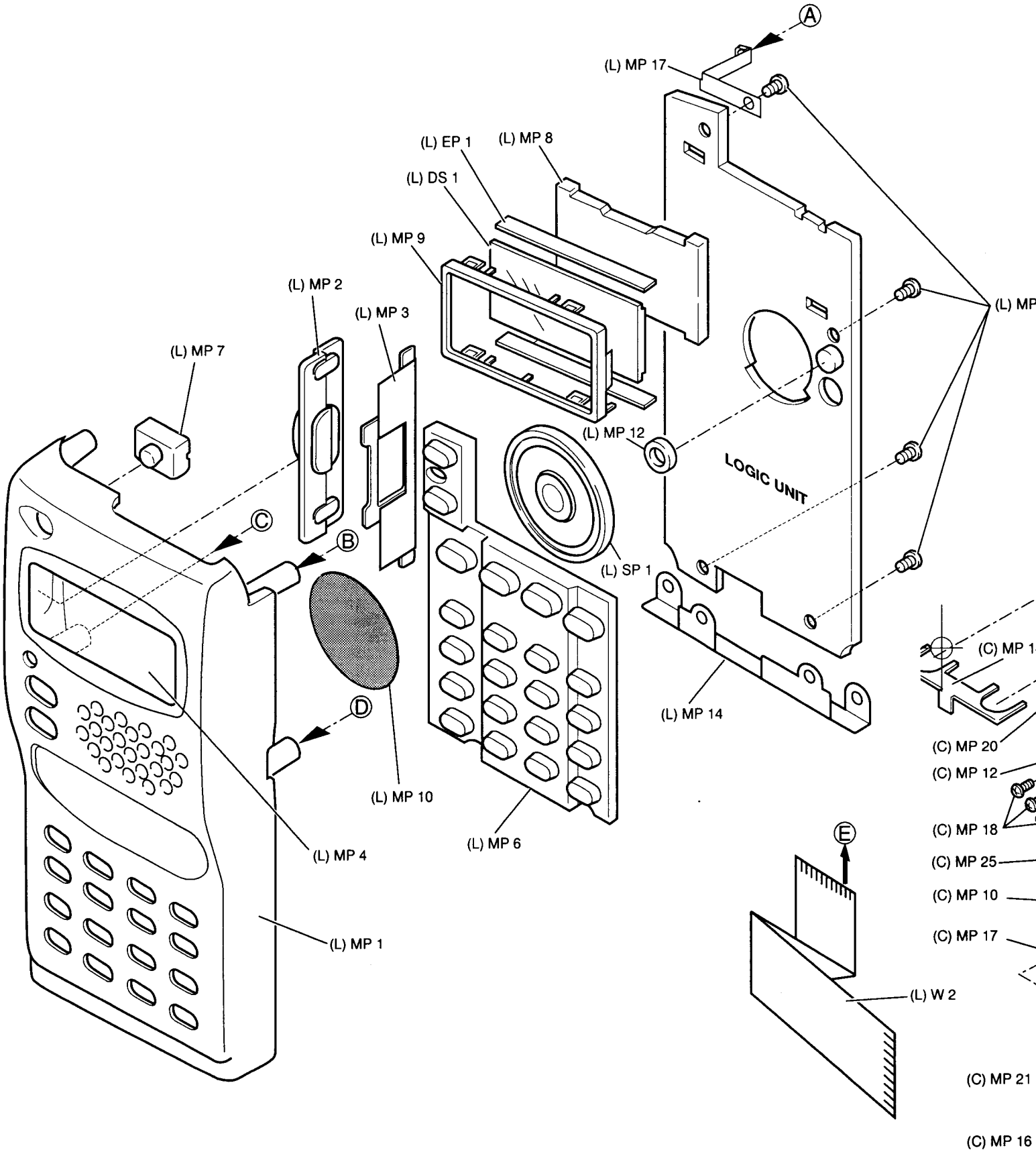
[U-VCO BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP 1	8510009580	1460 S-VCO case	1

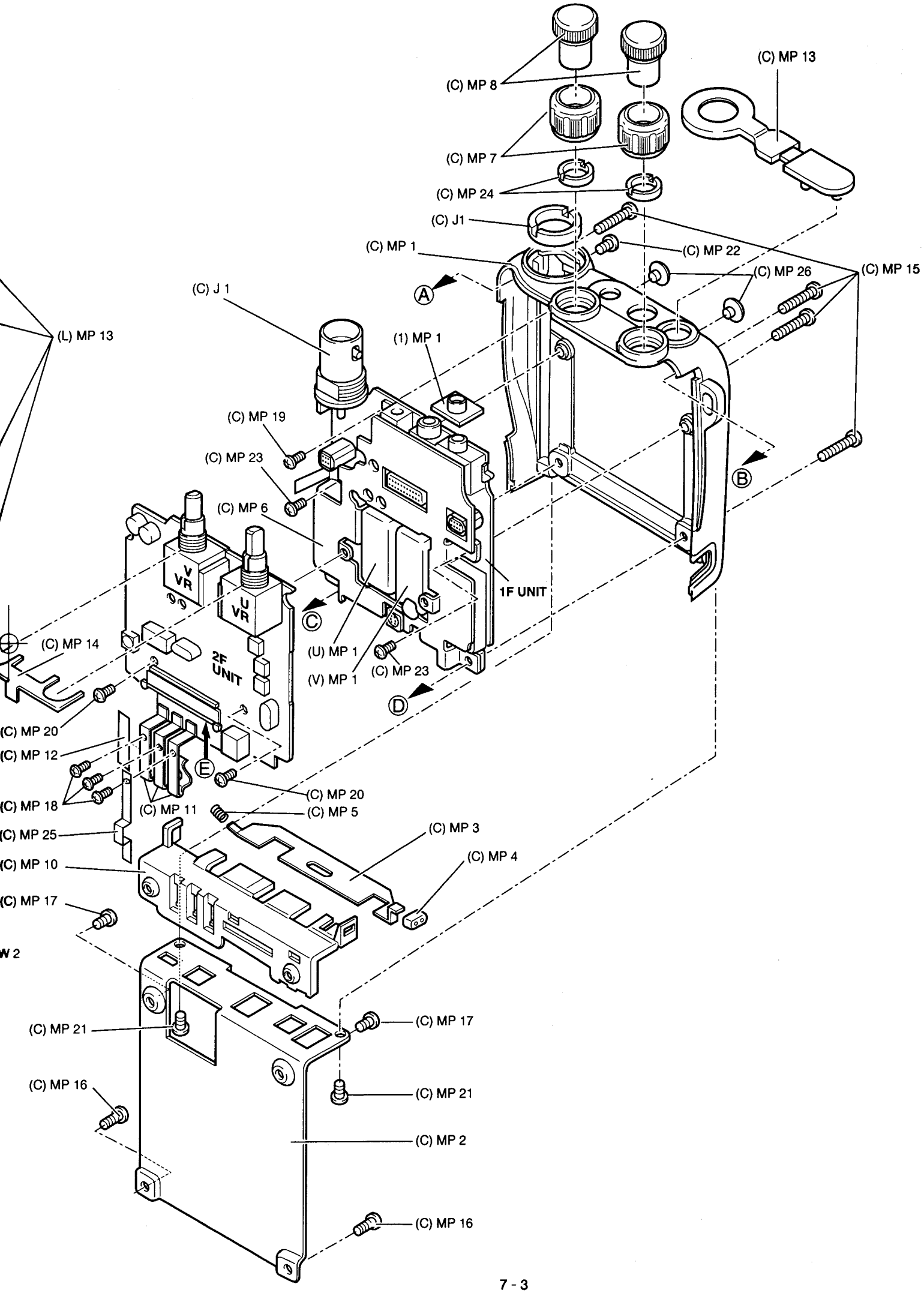
7-2 ACCESSORIES

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
EP 1	Optional product	Antenna FA-B270C (EUR, ITA, AUS, SEA)	1
		Antenna FA-B270D (USA)	1
EP 2	Optional product	Battery pack BP-170 (SEA)	1
	Optional product	Battery case BP-171 (AUS)	1
	Optional product	Battery case BP-173 (USA)	1
	Optional product	Battery case BP-180 (UK, EUR, ITA)	1
EP 3	Optional product	Wall charger BC-110D (EUR, ITA)	1
	Optional product	Wall charger BC-110A (USA)	1
	Optional product	Wall charger BC-110V (AUS)	1
MP 1	8010011960	Strap belt HK-005	1
MP 3	8010008620	752 Belt clip (A)	1



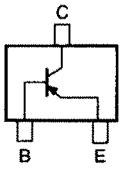
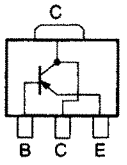
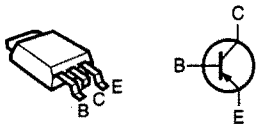
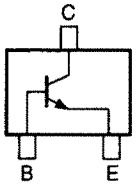
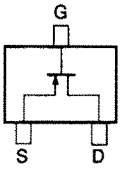
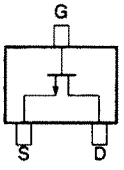
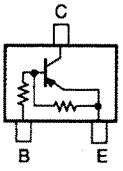


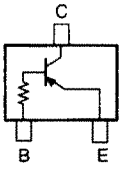
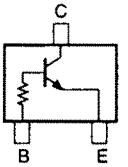
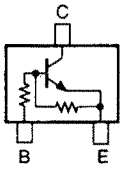
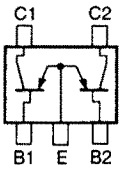
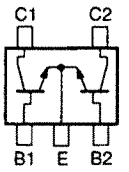
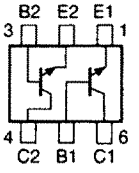
Unit abbreviations (C): CHASSIS PARTS (L): LOGIC UNIT (V): V-VCO BOARD (U): U-VCO BOARD (1): 1F UNIT


(C) MP 8
(C) MP 13
(C) MP 7
(C) MP 24
(C) J1
(C) MP 1
(C) MP 22
(C) MP 26
(C) MP 15
(C) J 1
(L) MP 13
(1) MP 1
(C) MP 19
(C) MP 23
(C) MP 6
1F UNIT
V VR
U VR
2F UNIT
(C) MP 14
(U) MP 1
(V) MP 1
(C) MP 23
(C) MP 20
(C) MP 12
(C) MP 18
(C) MP 11
(C) MP 20
(C) MP 5
(C) MP 25
(C) MP 3
(C) MP 10
(C) MP 4
(C) MP 17
W 2
(C) MP 21
(C) MP 17
(C) MP 16
(C) MP 21
(C) MP 2
(C) MP 16

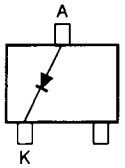
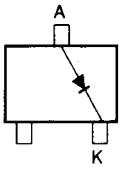
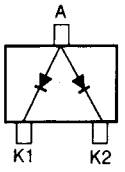
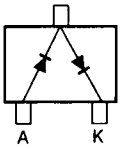
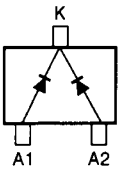
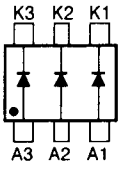
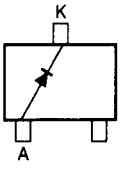
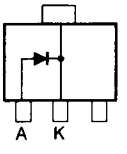
SECTION 8 SEMI-CONDUCTOR INFORMATION

8-1 TRANSISTORS

NAME	SYMBOL	INSIDE VIEW
2SA1588-GR 2SB1462-R	ZG AR	
2SB1132-R	BAR	
2SB1201	B1201	
2SC4211-6 2SC4215-O 2SC4226-R25 2SC4228-R45 2SC4403-3 2SC4405-3 2SC4617-TLQ 2SC5006-T1 2SC5065-O 2SD2216-S 2SD2345	L6 QO R25 R45 LY3 OY3 BQ 24 MAO YS 1Z	
2SJ364Q	4M	
2SK880-Y	XY	
UN9112	6B	

NAME	SYMBOL	INSIDE VIEW
UN9115	6E	
UN9210 UN9215	8L 8E	
UN9211 UN9213	8A 8C	
XP1401	5V	
XP1501	5R	
XP6501 AB	5N	

8-2 DIODES

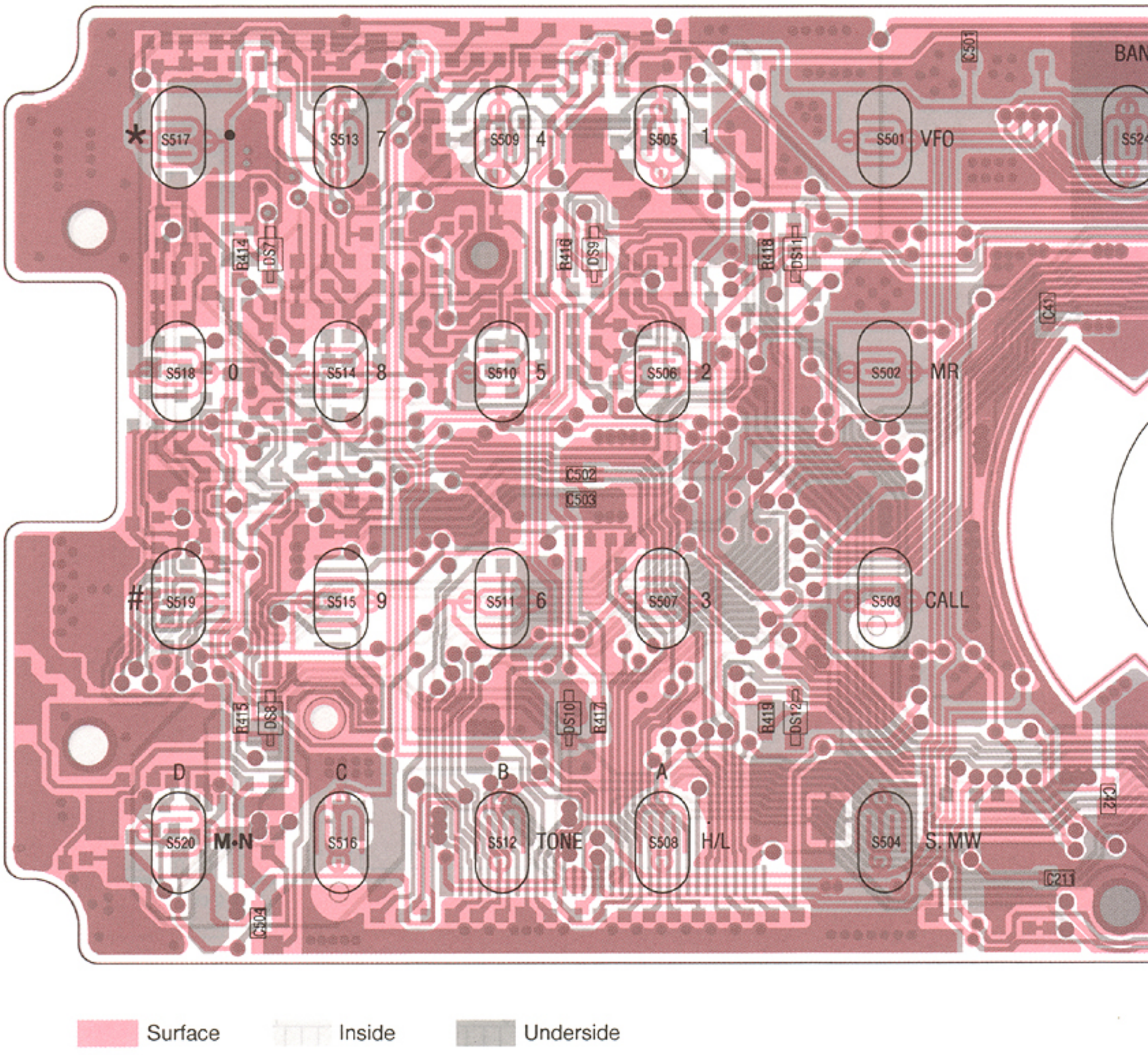
NAME	SYMBOL	INSIDE VIEW
DA112	AZ	
DA113W	AY	
DAP202U	P	
DA221	K	
MA132WK	MU	
MA6S121	M2D	
SB07-03C	J	
SB30-03P	SG	

NAME	SYMBOL	INSIDE VIEW
1SV270	TF	
MA8051-H	5-1	
1SV271 MA729 MA2S111 MA2S077 MA2S728	TG 2B A S B	
MA304	7R	
RB050L-40	35	

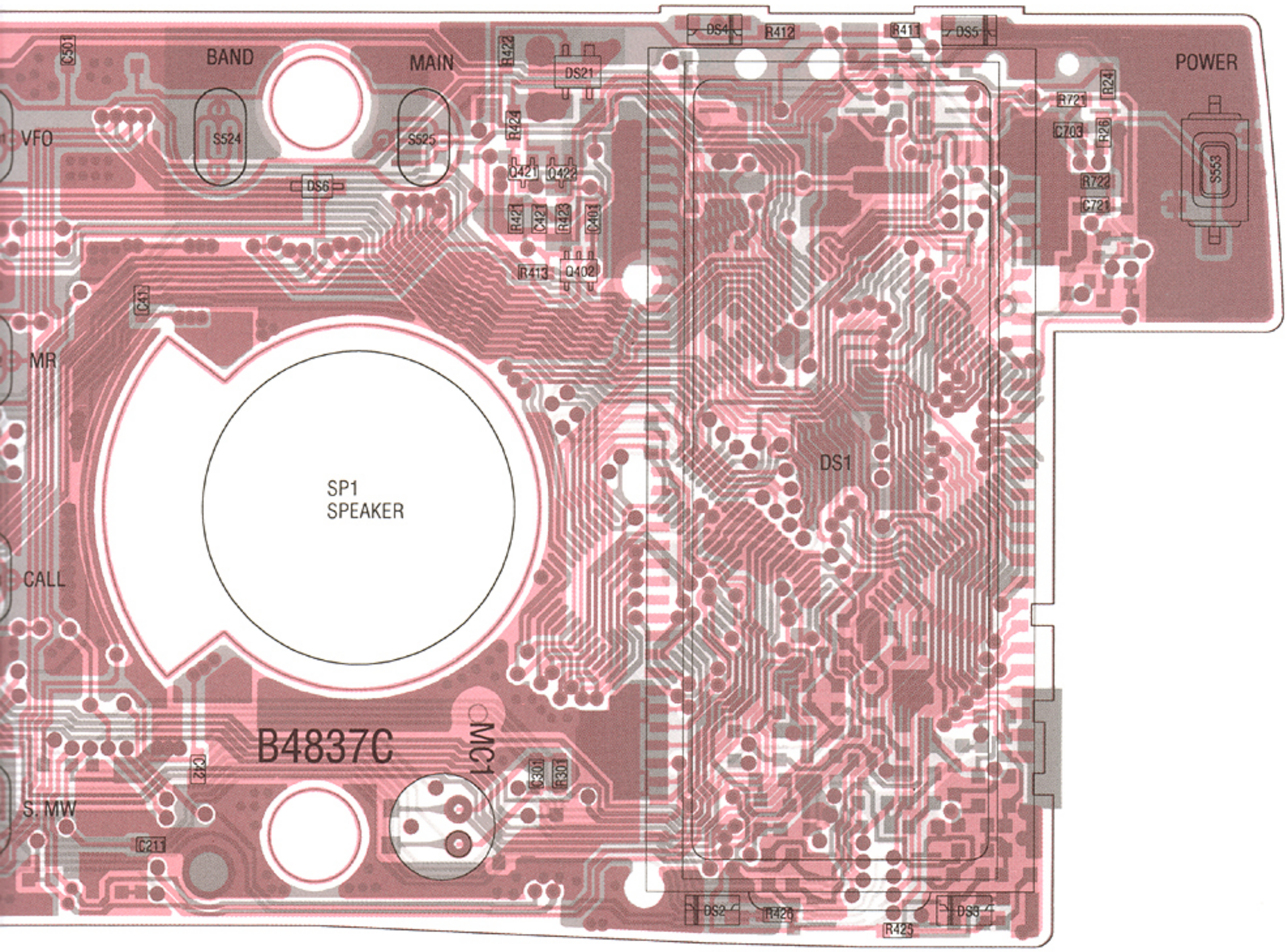
SECTION 9 BOARD LAYOUTS

9-1 LOGIC UNIT

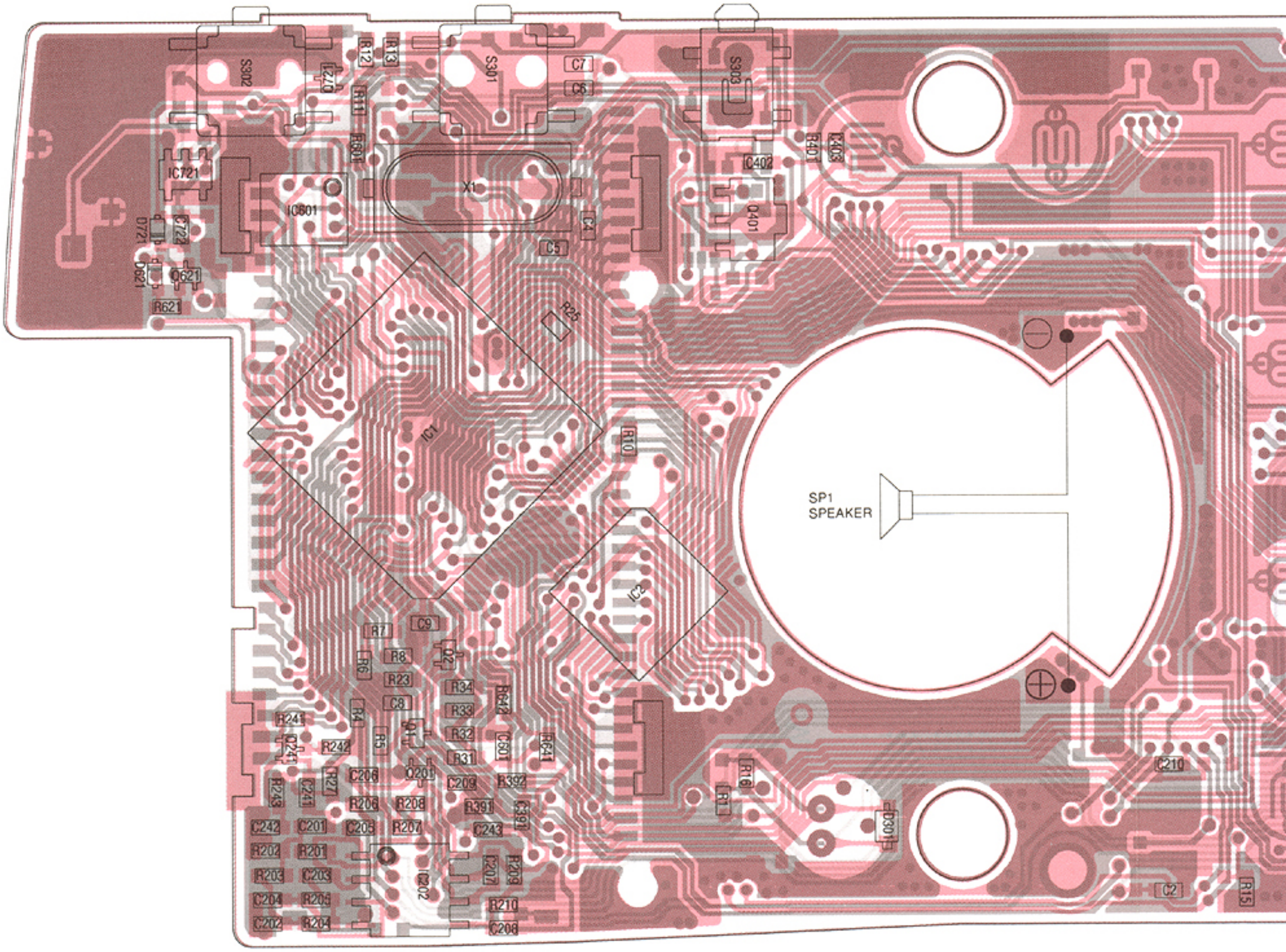
● CONTROL UNIT (TOP VIEW)



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

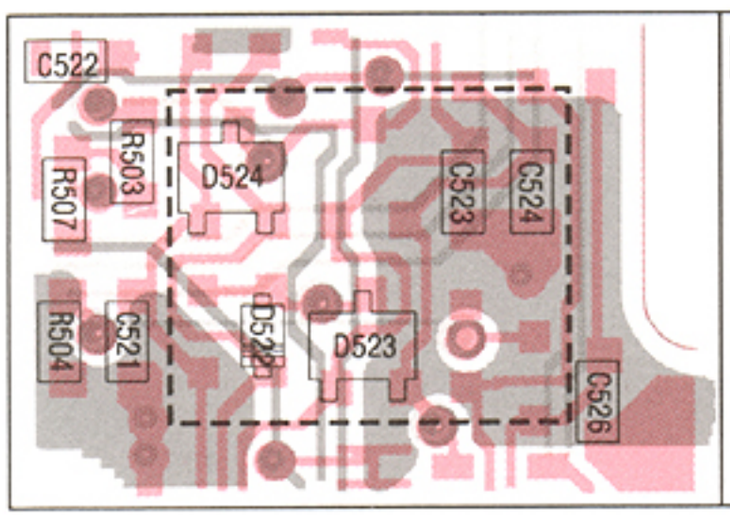


• CONTROL UNIT (BOTTOM VIEW)

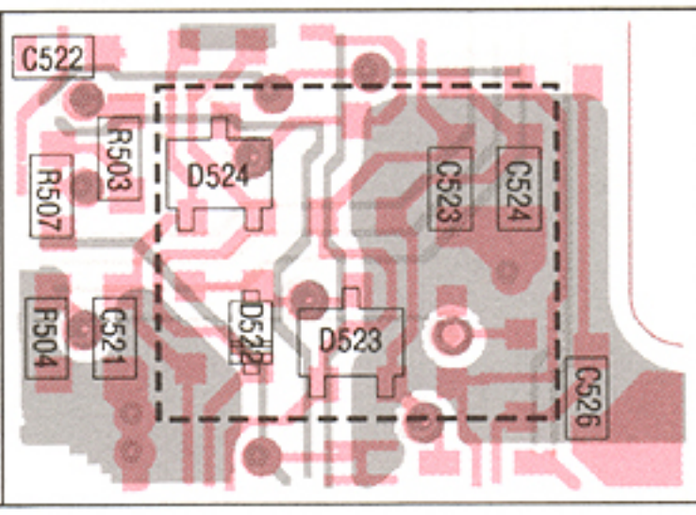


Surface Inside Underside

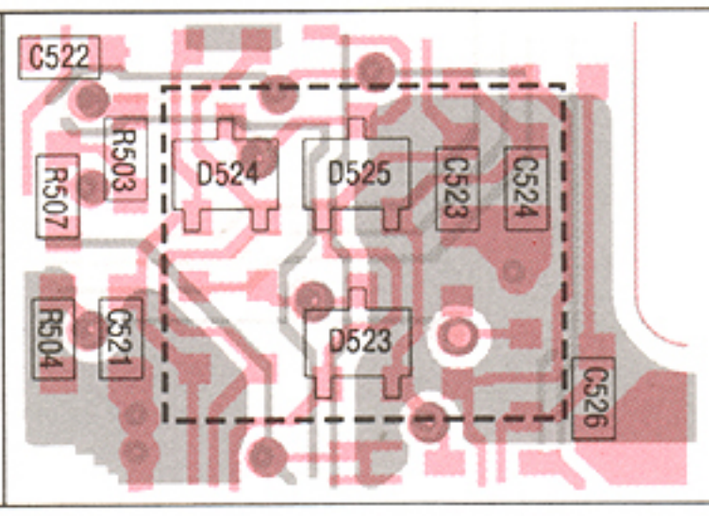
EUR

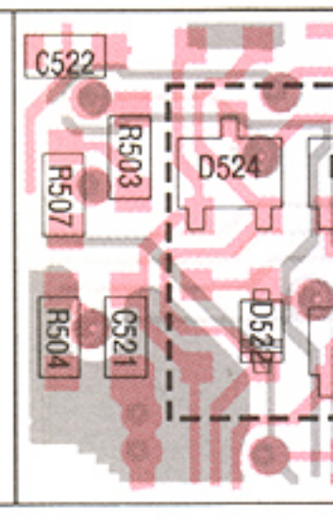


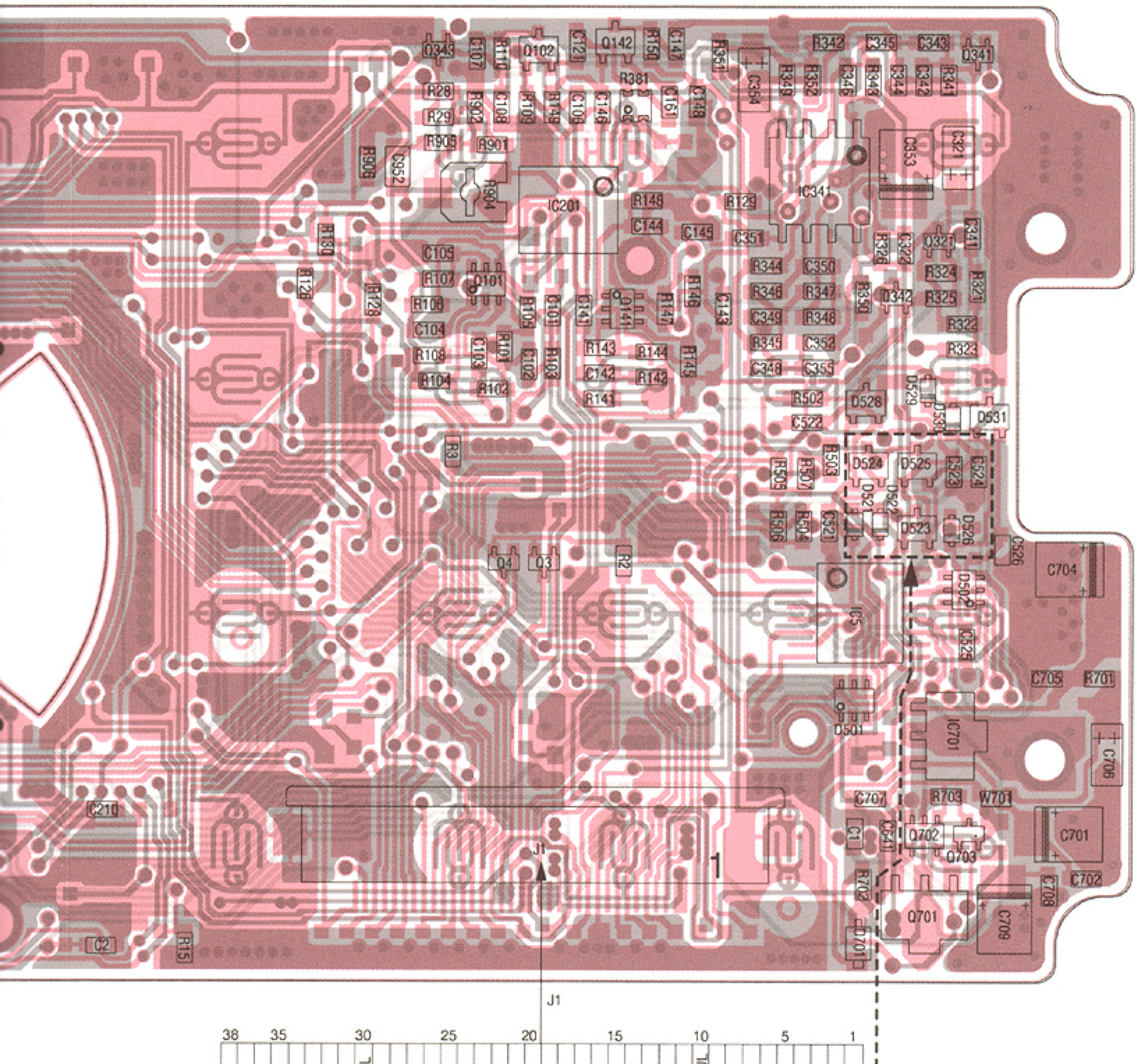
UK

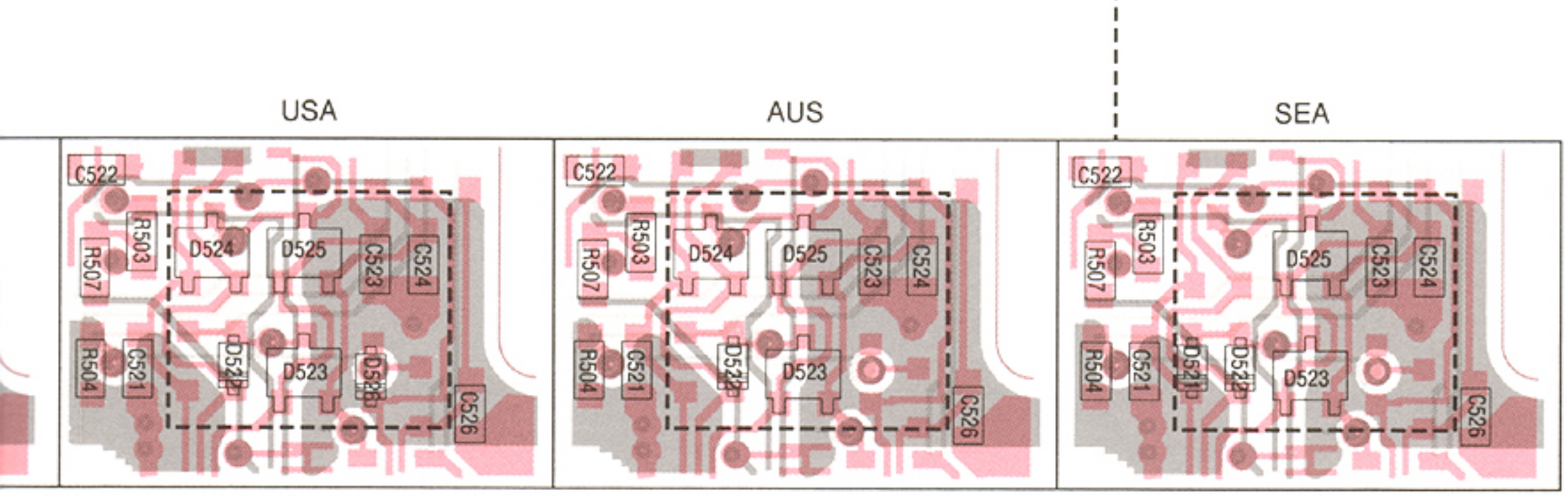


ITA





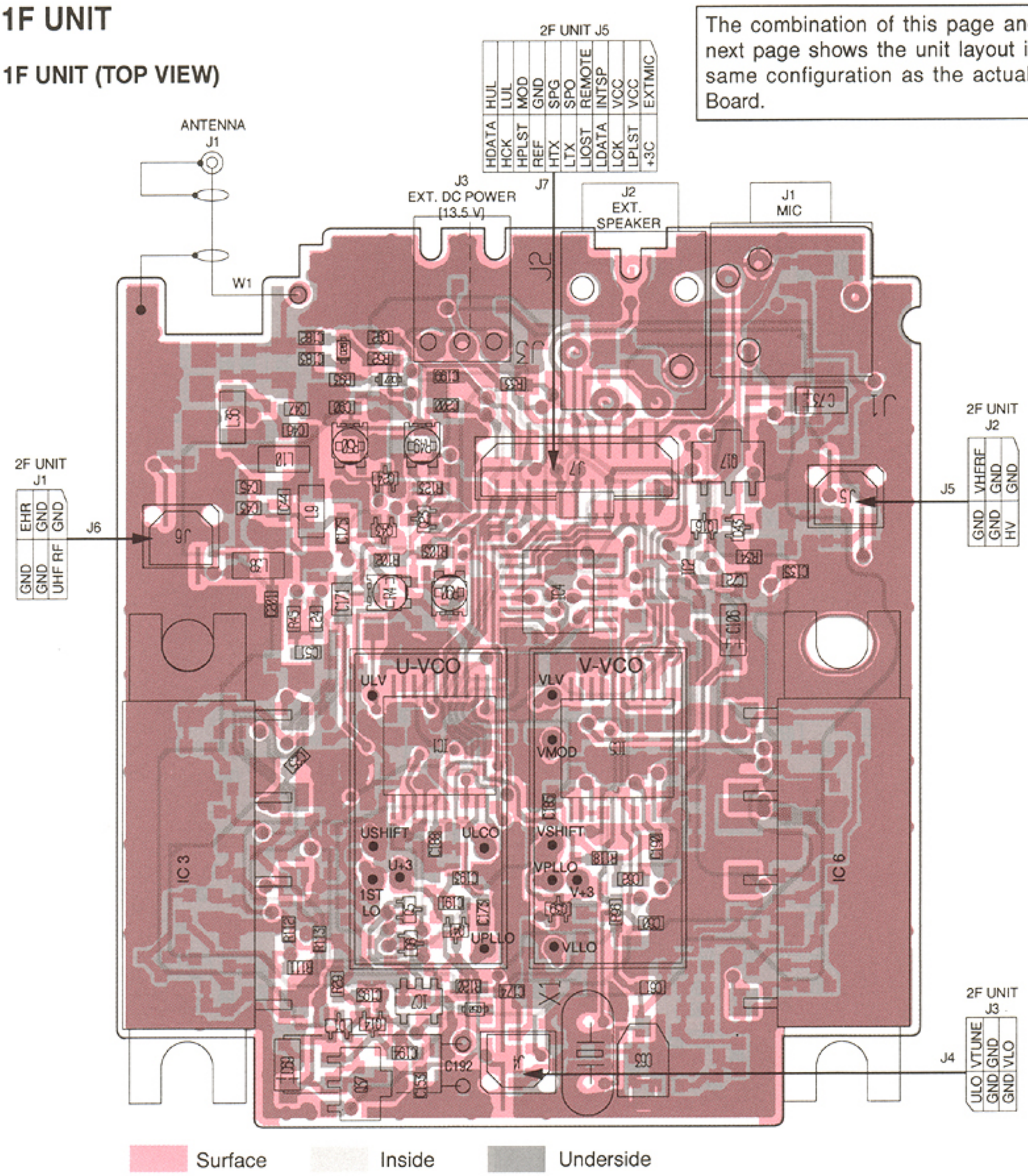

J1
38 35 30 25 20 15 10 5 1
LDET LSD LBUSY RCK RDATA RIOST LPLST LCK LDATA/LUL LIOST REMOTE EXTMIC LTX HDCK HDUP HTX MOD SPG SPG NC01 NC +3C LVOL VCC HVOL GND HPLST HCK HDATA/HUL LDUP LDCK AFON GND INTSP INTSP HBUSY HSD HDET
2F UNIT J4


USA
AUS
SEA
C522
R503
R507
R504
C521
D524
D525
D523
C523
C524
C526

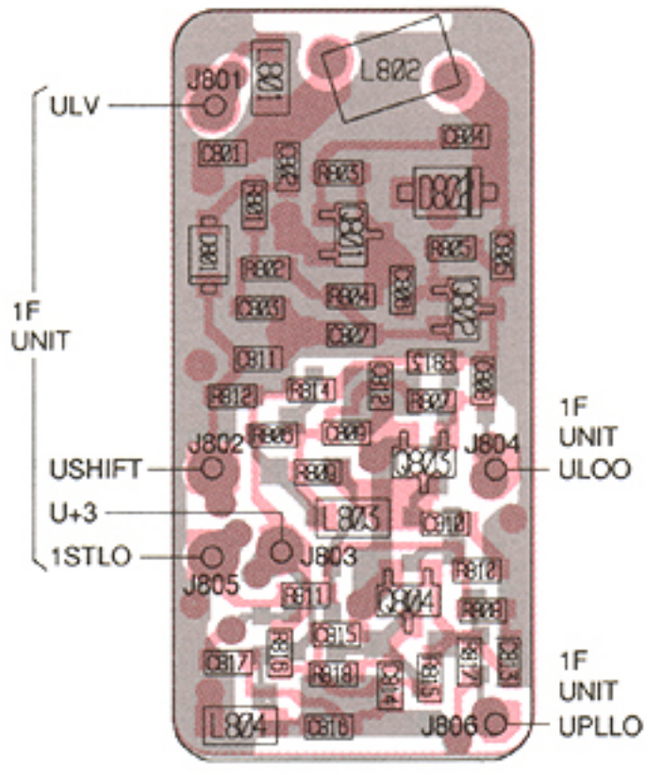
9-2 1F UNIT

● 1F UNIT (TOP VIEW)

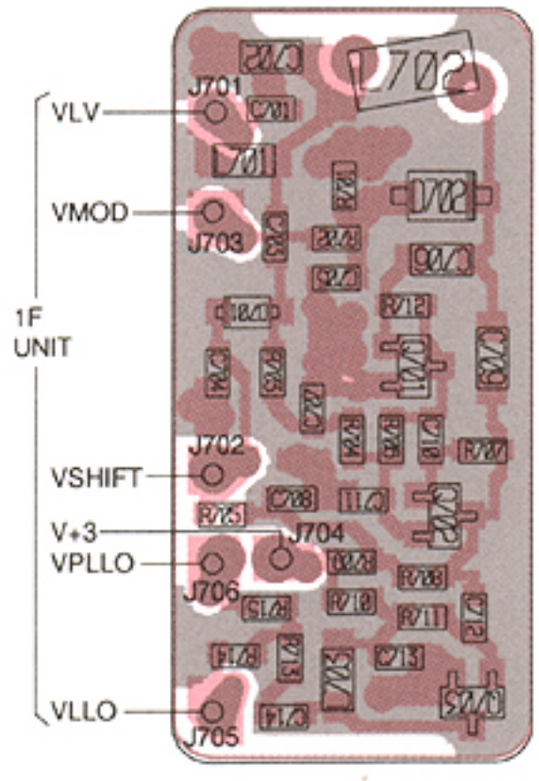
The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



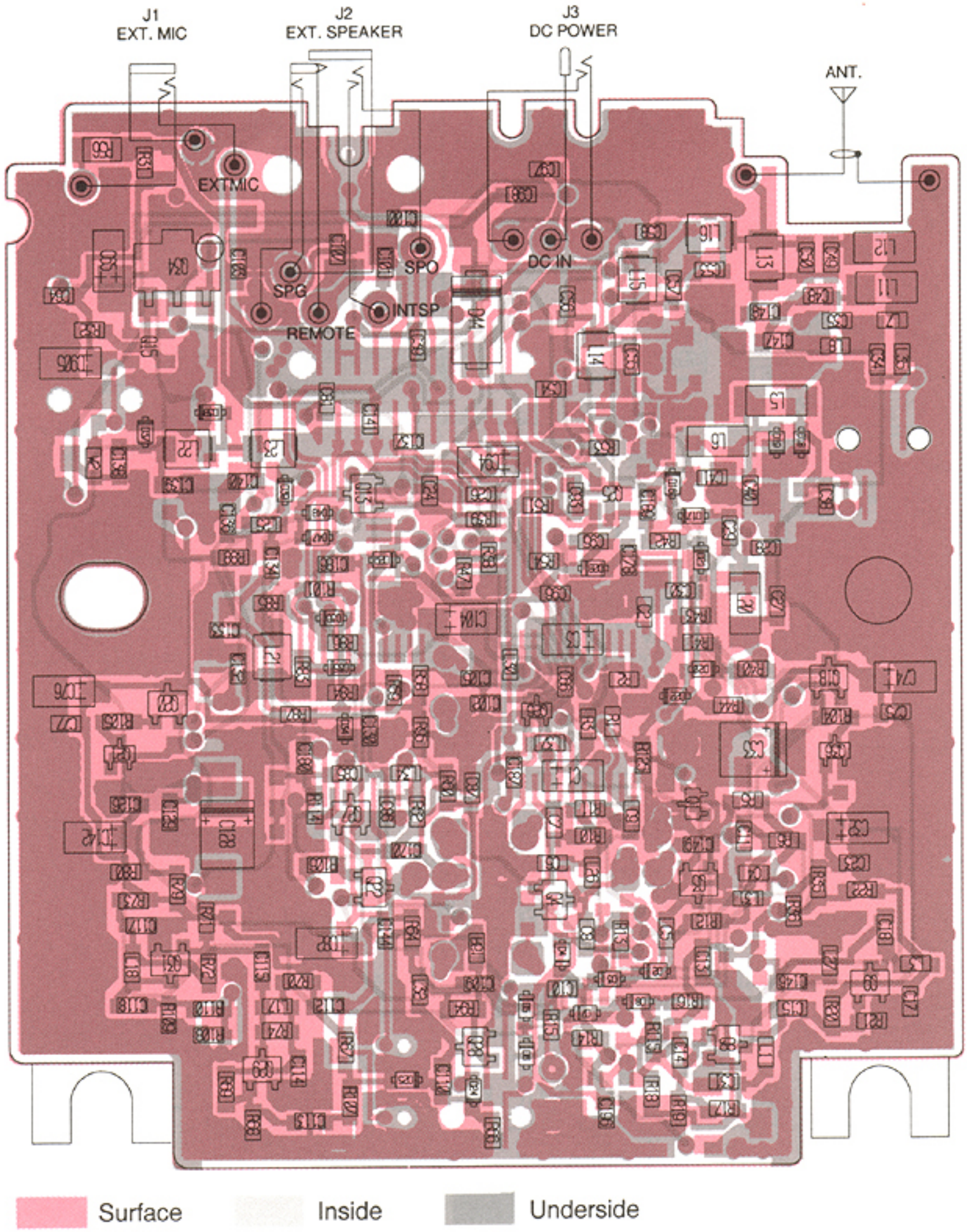
● UHF VCO BOARD (TOP VIEW)



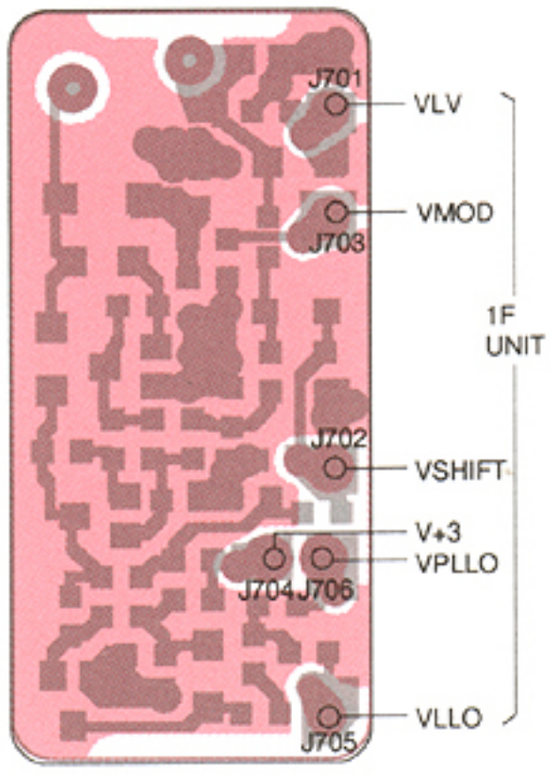
● VHF VCO BOARD (TOP VIEW)



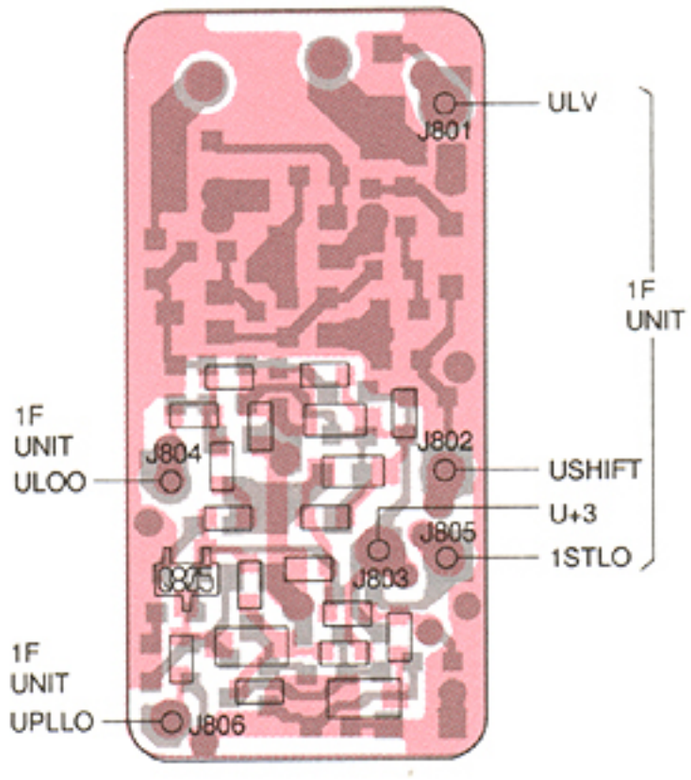
● 1F UNIT (BOTTOM VIEW)



● VHF VCO BOARD (BOTTOM VIEW)



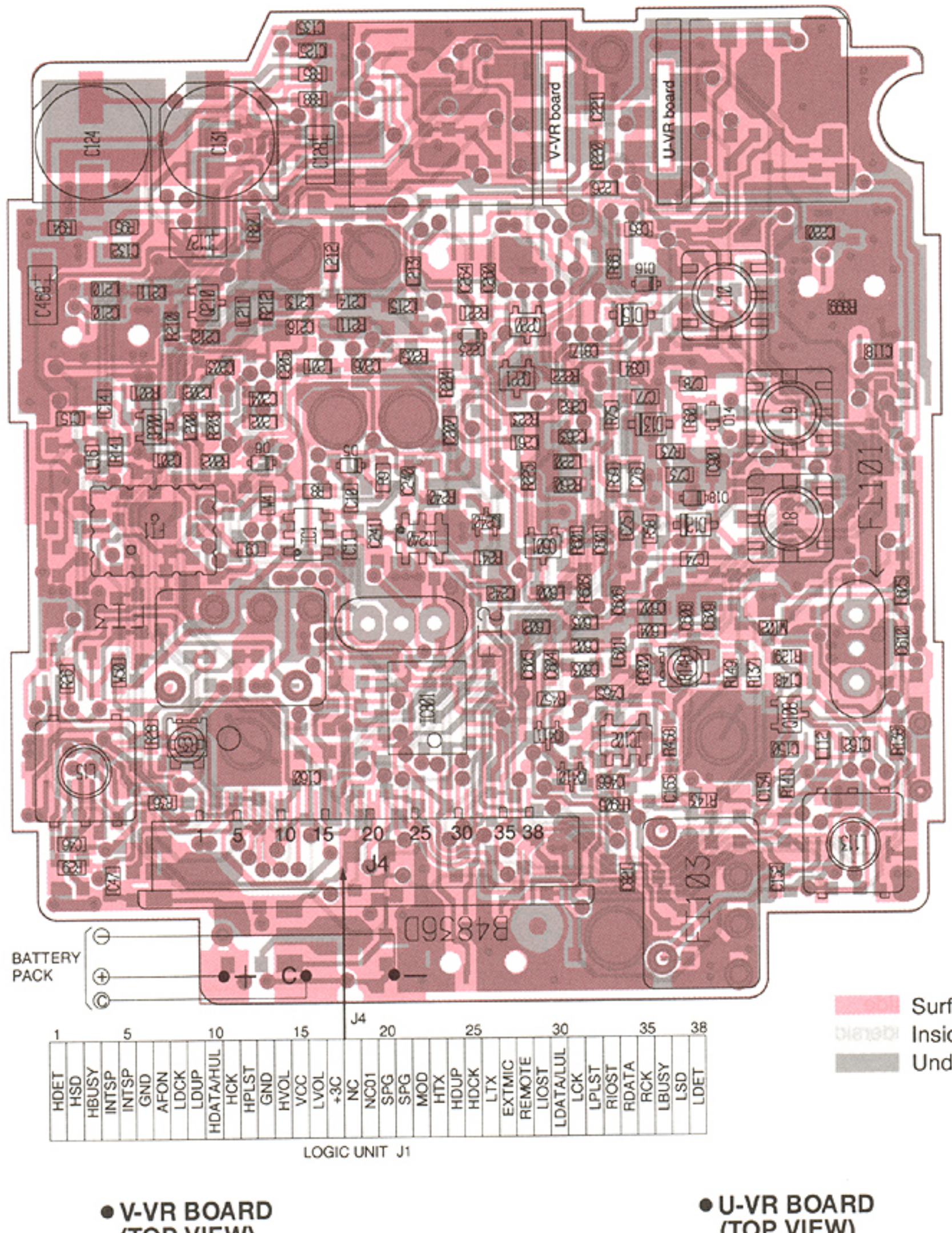
● UHF VCO BOARD (BOTTOM VIEW)



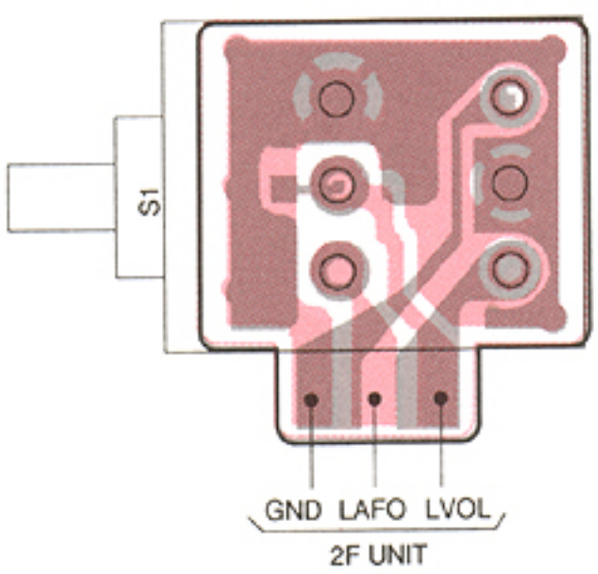
9-2 2F UNIT

● 2F UNIT (TOP VIEW)

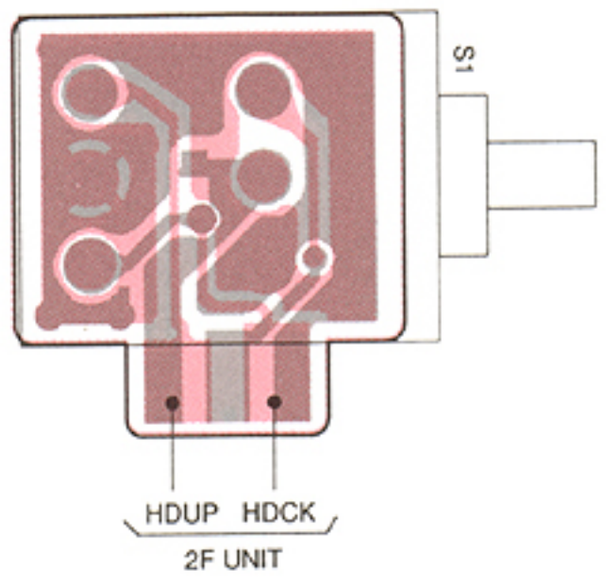
The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



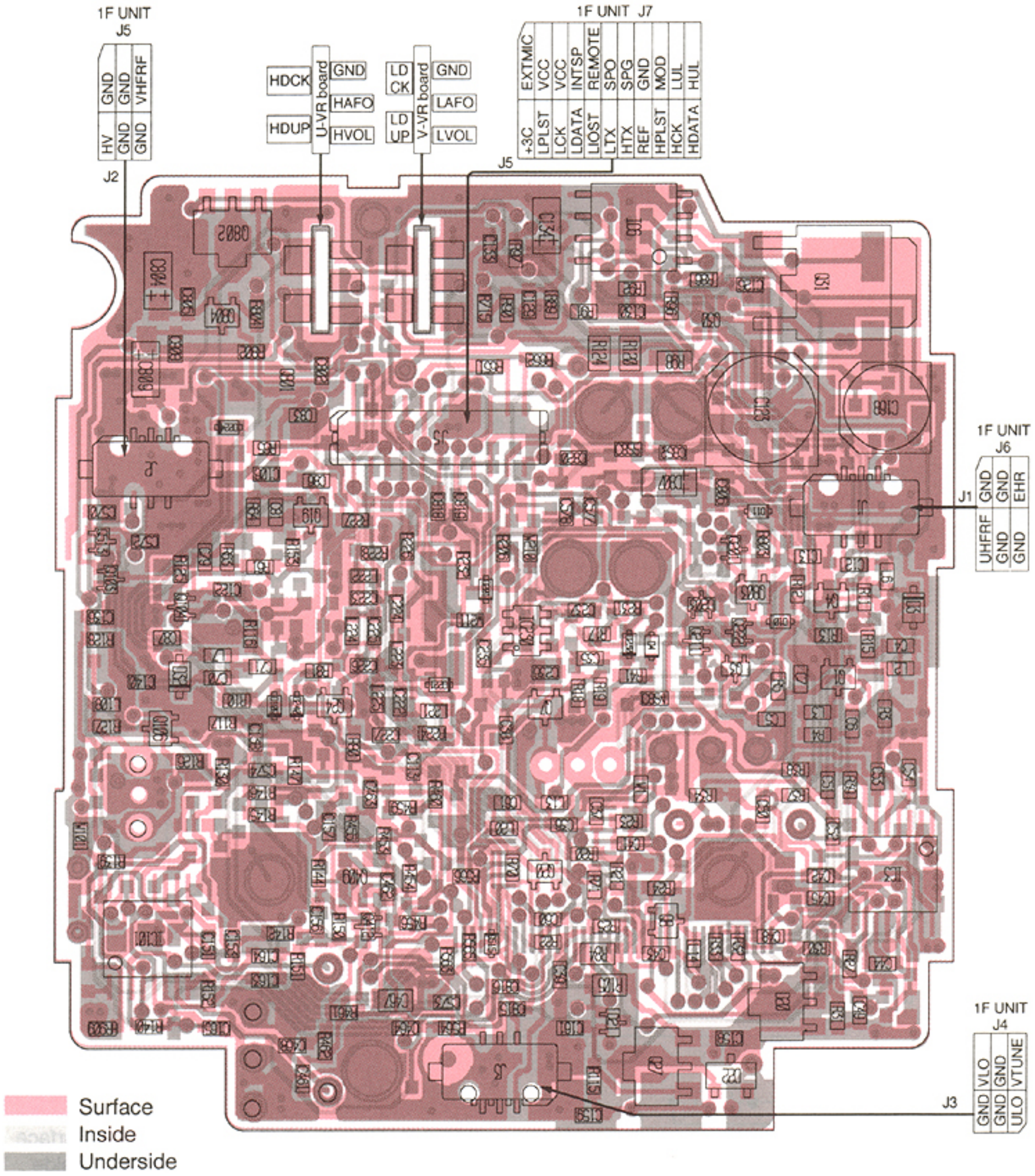
● V-VR BOARD (TOP VIEW)



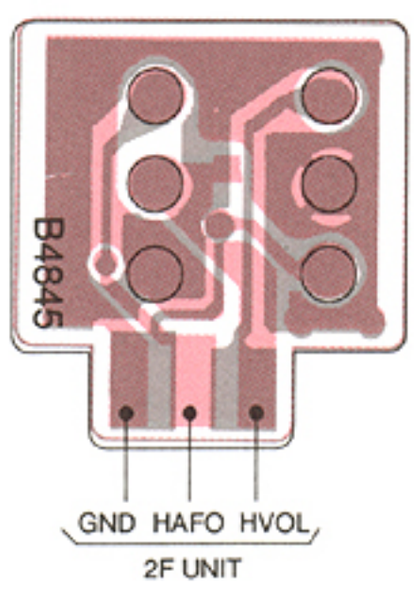
● U-VR BOARD (TOP VIEW)



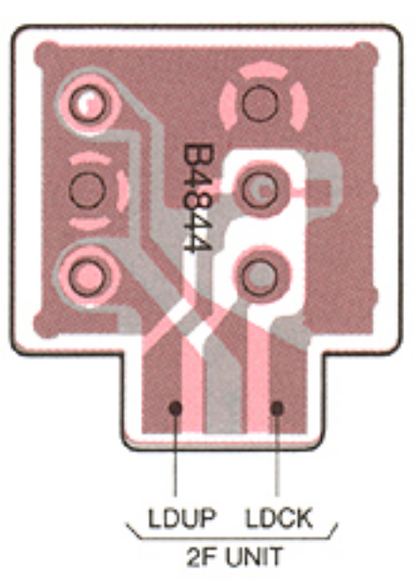
● 2F UNIT (BOTTOM VIEW)



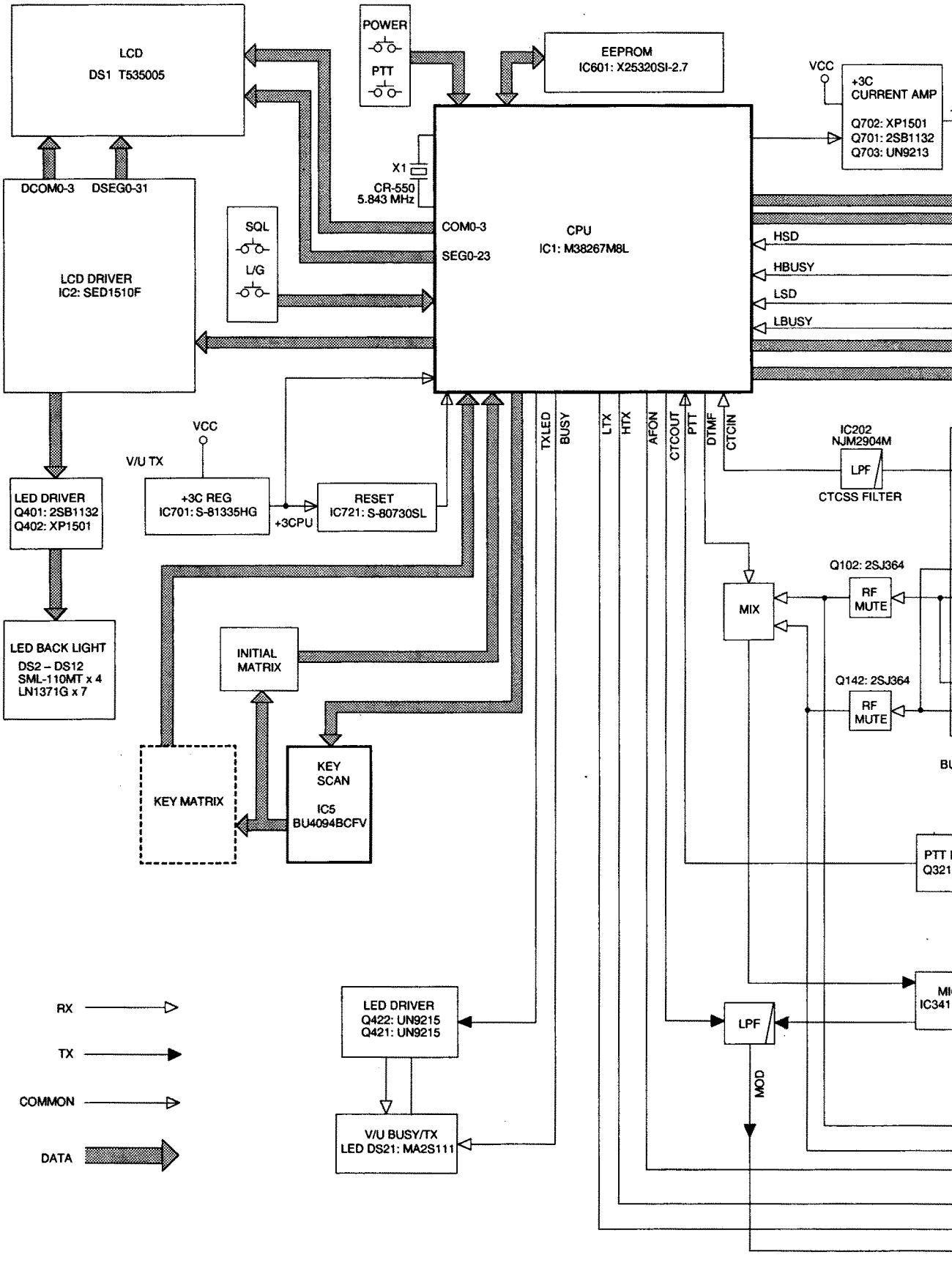
● U-VR BOARD (BOTTOM VIEW)



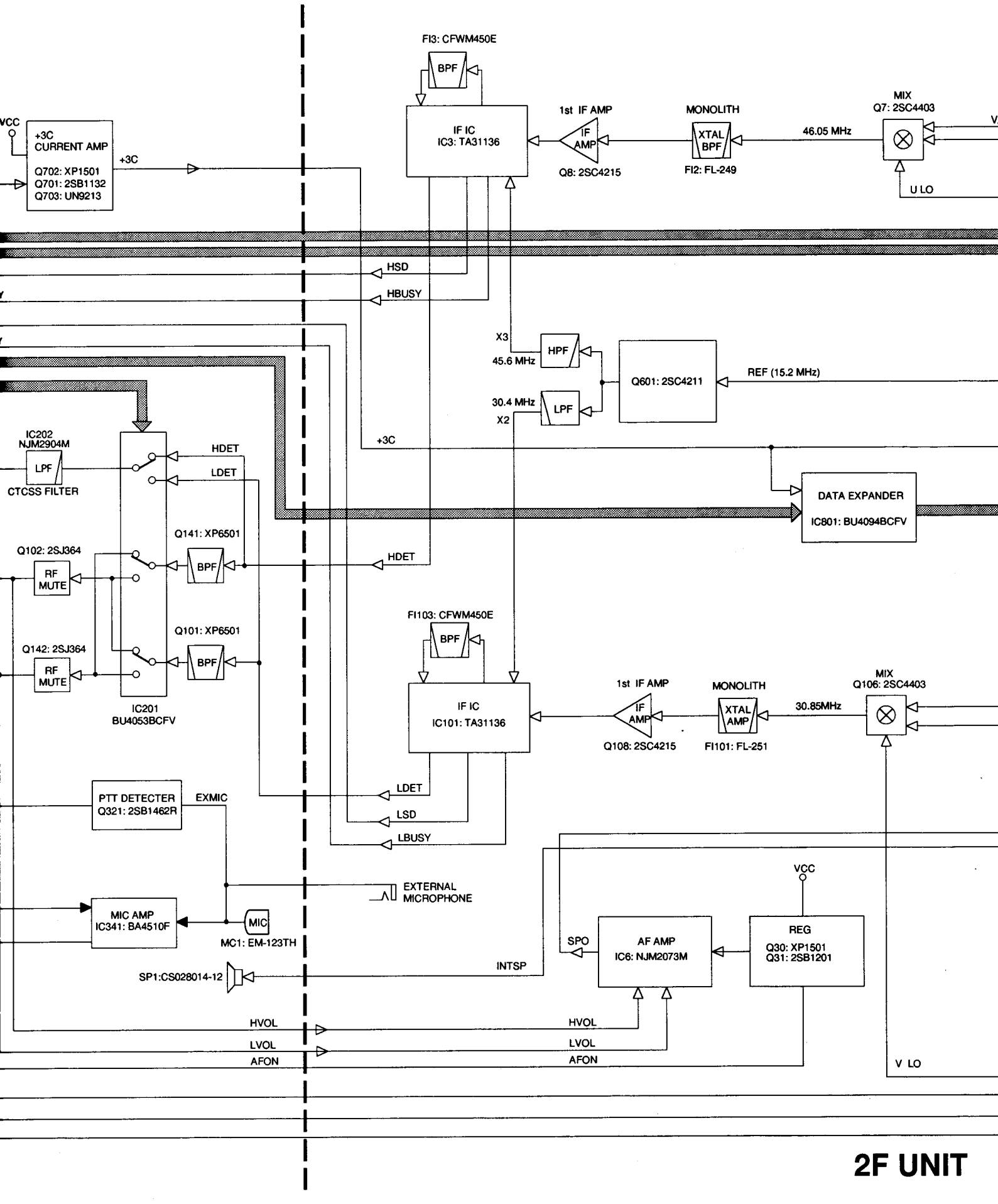
● V-VR BOARD (BOTTOM VIEW)



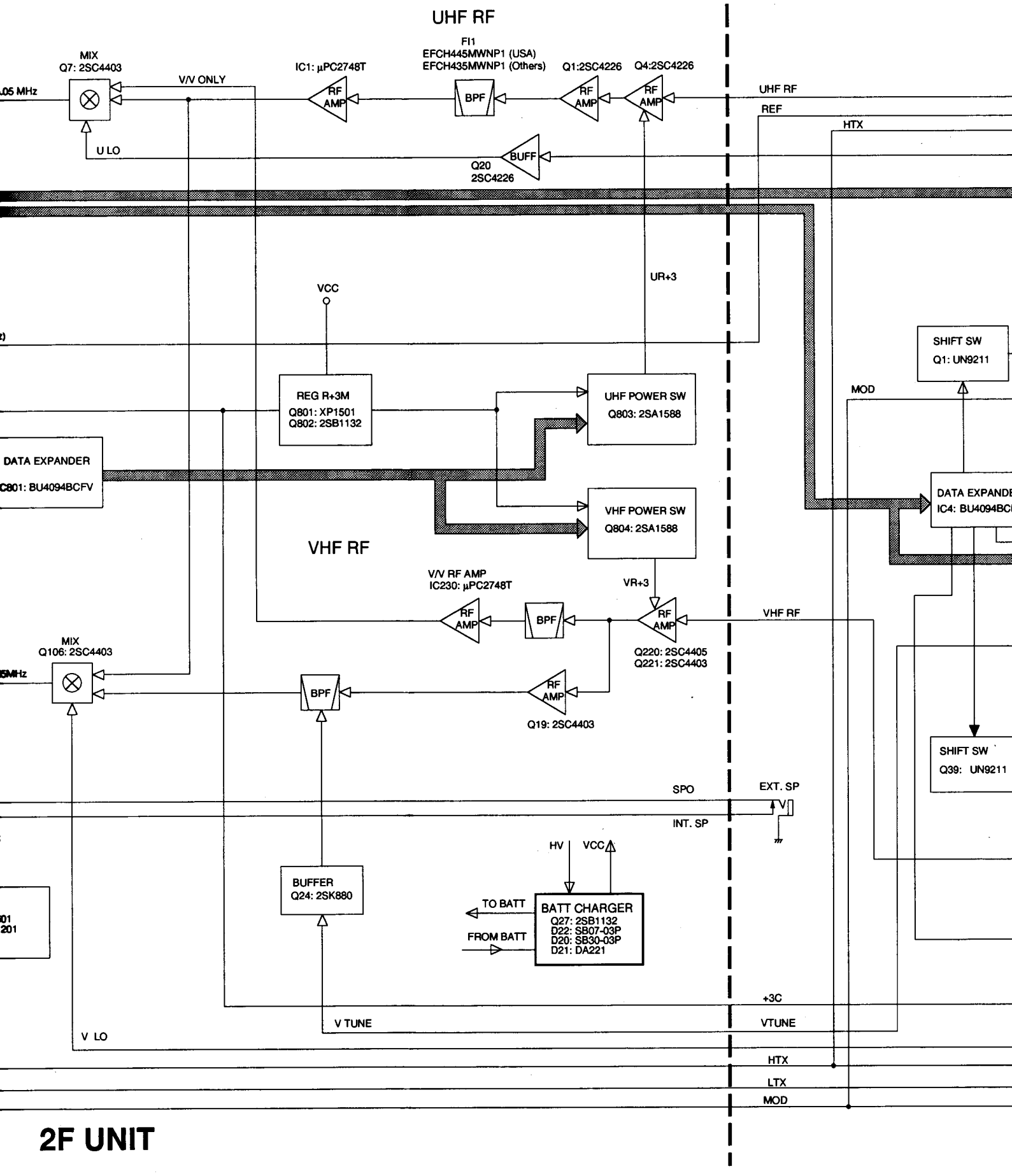
SECTION 10 BLOCK DIAGRAM



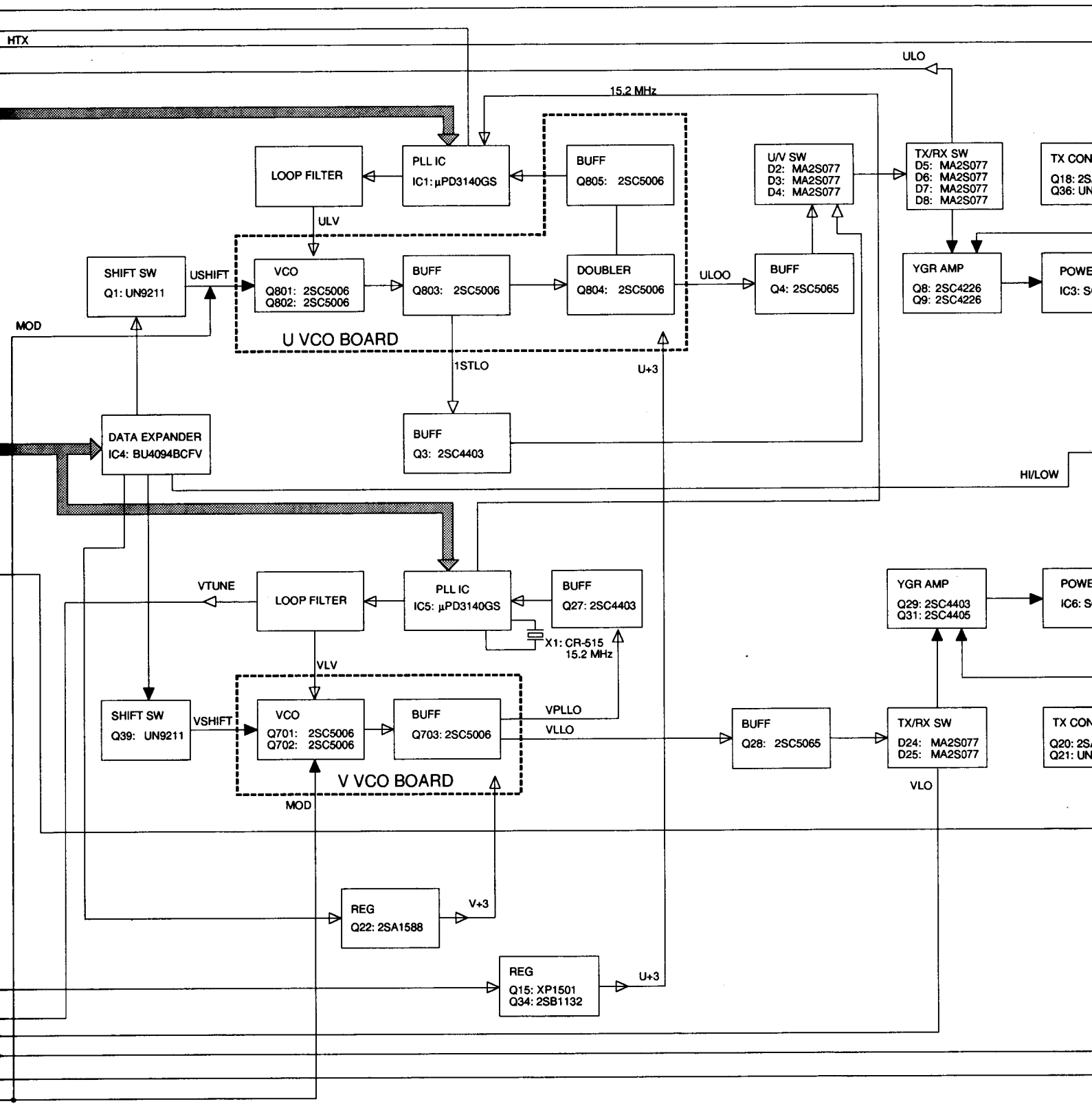
LOGIC UNIT


FI3: CFWM450E
BPF
IF IC
IC3: TA31136
1st IF AMP
IF AMP
Q8: 2SC4215
MONOLITH
XTAL BPF
FI2: FL-249
46.05 MHz
MIX
Q7: 2SC4403
U LO
VCC
+3C
CURRENT AMP
Q702: XP1501
Q701: 2SB1132
Q703: UN9213
+3C
HSD
HBUSY
X3
45.6 MHz
HPF
30.4 MHz
LPF
X2
Q601: 2SC4211
REF (15.2 MHz)
IC202
NJM2904M
LPF
CTCSS FILTER
HDET
LDET
+3C
DATA EXPANDER
IC801: BU4094BCFV
Q141: XP6501
Q102: 2SJ364
RF MUTE
BPF
HDET
FI103: CFWM450E
BPF
Q101: XP6501
Q142: 2SJ364
RF MUTE
BPF
IC201
BU4053BCFV
IF IC
IC101: TA31136
1st IF AMP
IF AMP
Q108: 2SC4215
MONOLITH
XTAL AMP
FI101: FL-251
30.85MHz
MIX
Q106: 2SC4403
PTT DETECTER
Q321: 2SB1462R
EXMIC
LDET
LSD
LBUSY
EXTERNAL MICROPHONE
MIC AMP
IC341: BA4510F
MIC
MC1: EM-123TH
SP1:CS028014-12
INTSP
VCC
SPO
AF AMP
IC6: NJM2073M
REG
Q30: XP1501
Q31: 2SB1201
HVOL
LVOL
AFON
HVOL
LVOL
AFON
V LO

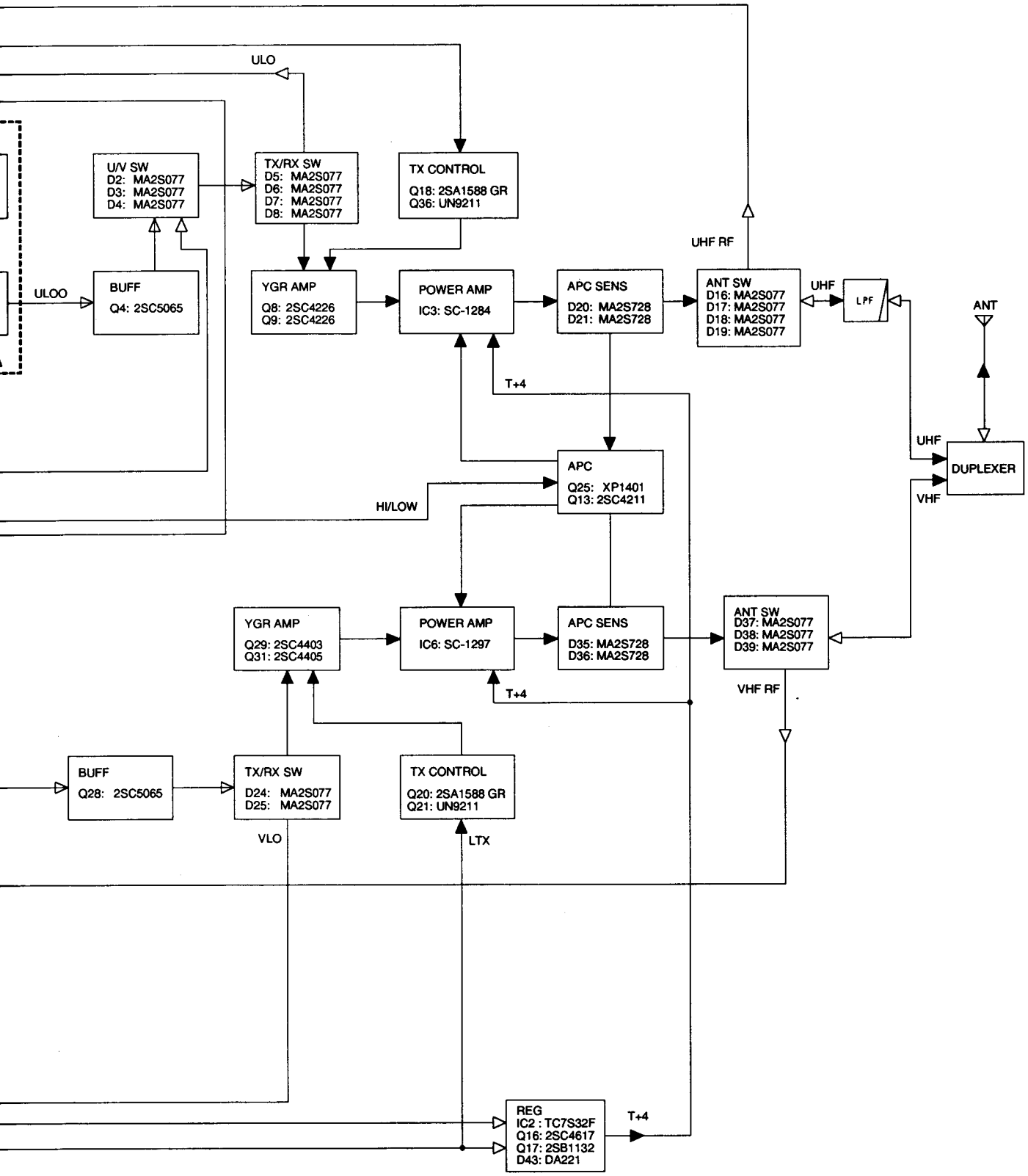
2F UNIT


UHF RF
MIX
Q7: 2SC4403
V/V ONLY
IC1: µPC2748T
FI1
EFCH445MWNP1 (USA)
EFCH435MWNP1 (Others)
Q1:2SC4226
Q4:2SC4226
RF AMP
BPF
UHF RF
REF
HTX
U LO
BUFF
Q20
2SC4226
UR+3
VCC
SHIFT SW
Q1: UN9211
MOD
REG R+3M
Q801: XP1501
Q802: 2SB1132
UHF POWER SW
Q803: 2SA1588
DATA EXPANDER
C801: BU4094BCFV
VHF POWER SW
Q804: 2SA1588
VHF RF
V/V RF AMP
IC230: µPC2748T
VR+3
VHF RF
MIX
Q106: 2SC4403
Q220: 2SC4405
Q221: 2SC4403
Q19: 2SC4403
SHIFT SW
Q39: UN9211
SPO
EXT. SP
INT. SP
HV
VCC
BUFFER
Q24: 2SK880
TO BATT
FROM BATT
BATT CHARGER
Q27: 2SB1132
D22: SB07-03P
D20: SB30-03P
D21: DA221
+3C
V TUNE
VTUNE
V LO
HTX
LTX
MOD

2F UNIT

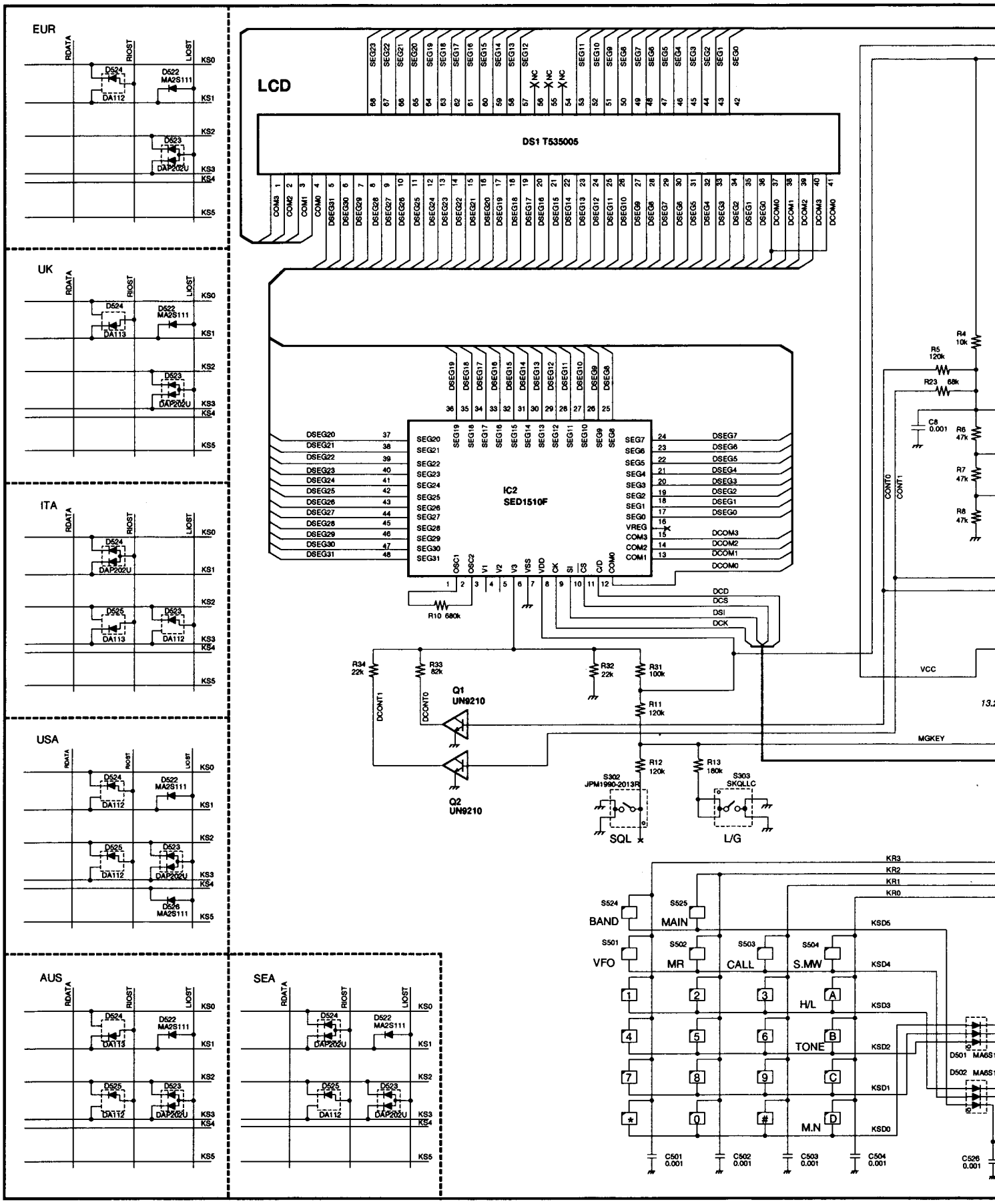

HTX
ULO
15.2 MHz
LOOP FILTER
PLL IC
IC1: µPD3140GS
BUFF
Q805: 2SC5006
U/V SW
D2: MA2S077
D3: MA2S077
D4: MA2S077
TX/RX SW
D5: MA2S077
D6: MA2S077
D7: MA2S077
D8: MA2S077
TX CON
Q18: 2S
Q36: UN
ULV
SHIFT SW
Q1: UN9211
USHIFT
VCO
Q801: 2SC5006
Q802: 2SC5006
BUFF
Q803: 2SC5006
DOUBLER
Q804: 2SC5006
ULOO
BUFF
Q4: 2SC5065
YGR AMP
Q8: 2SC4226
Q9: 2SC4226
POWE
IC3: S
MOD
U VCO BOARD
1STLO
U+3
DATA EXPANDER
IC4: BU4094BCFV
BUFF
Q3: 2SC4403
HI/LOW
VTUNE
LOOP FILTER
PLL IC
IC5: µPD3140GS
BUFF
Q27: 2SC4403
YGR AMP
Q29: 2SC4403
Q31: 2SC4405
POWE
IC6: S
X1: CR-515
15.2 MHz
VLV
SHIFT SW
Q39: UN9211
VSHIFT
VCO
Q701: 2SC5006
Q702: 2SC5006
BUFF
Q703: 2SC5006
VPLLO
VLLO
BUFF
Q28: 2SC5065
TX/RX SW
D24: MA2S077
D25: MA2S077
TX CON
Q20: 2S
Q21: UN
VLO
V VCO BOARD
MOD
REG
Q22: 2SA1588
V+3
REG
Q15: XP1501
Q34: 2SB1132
U+3

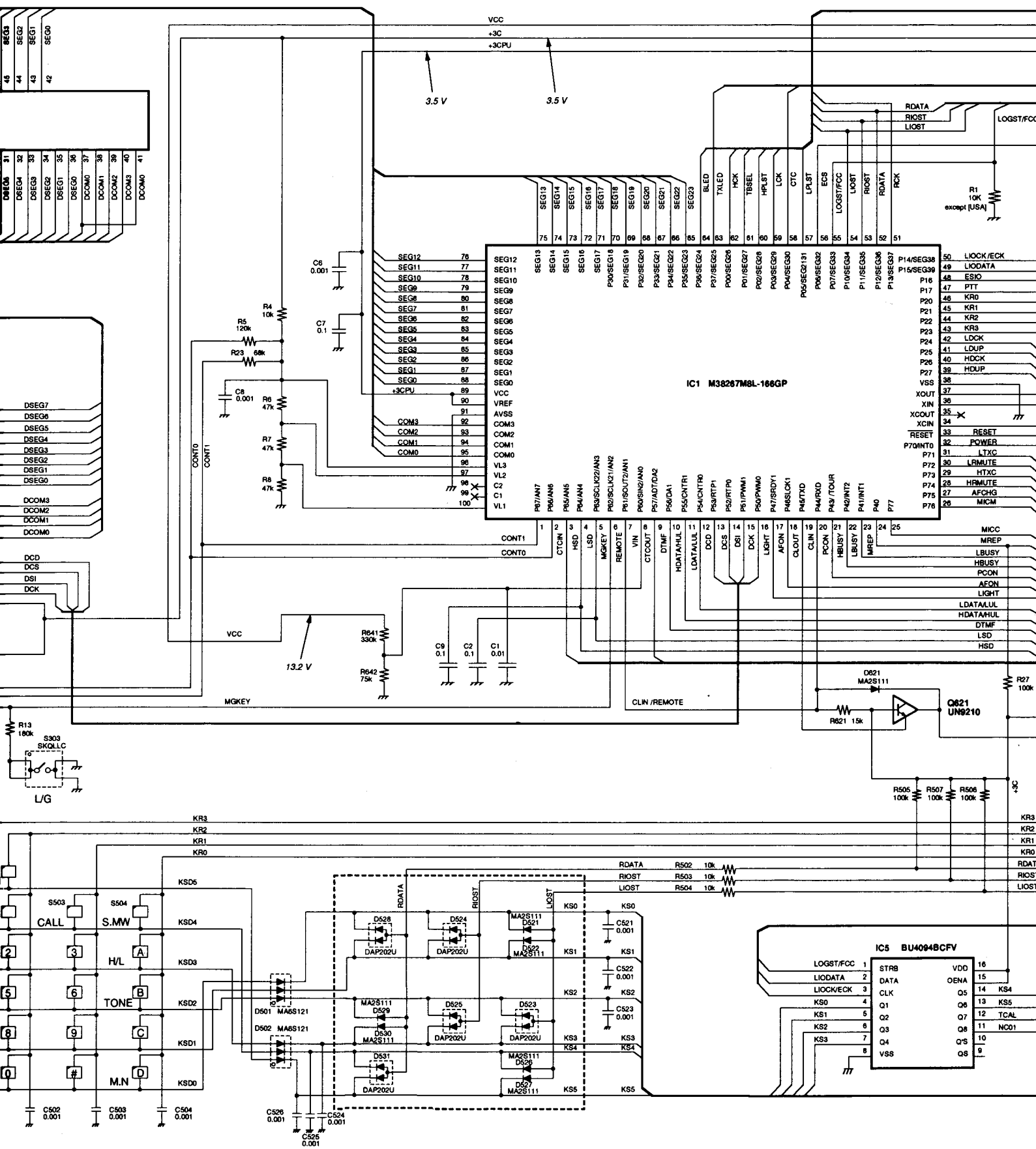
1F UNIT

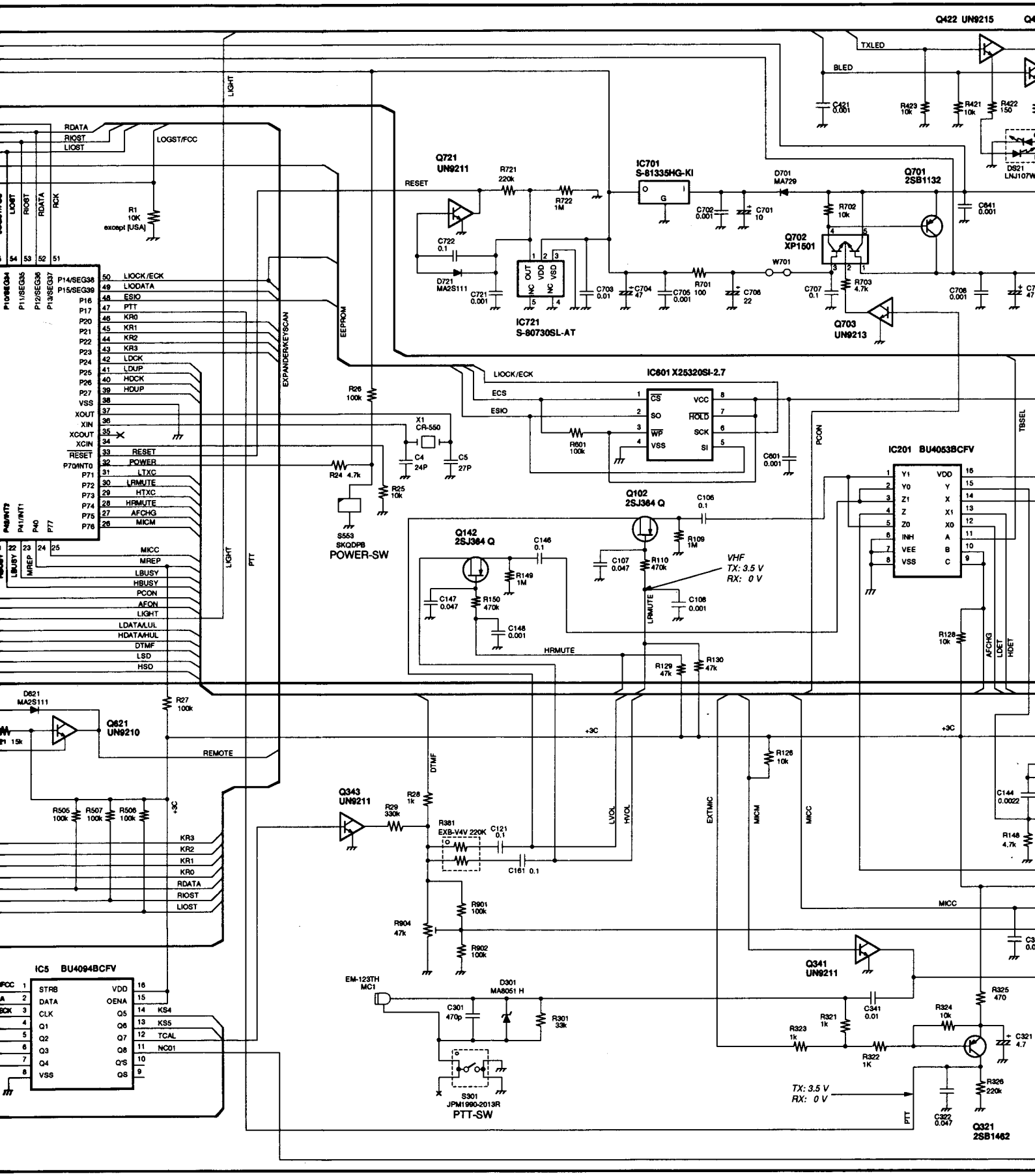

ULO
U/V SW
D2: MA2S077
D3: MA2S077
D4: MA2S077
TX/RX SW
D5: MA2S077
D6: MA2S077
D7: MA2S077
D8: MA2S077
TX CONTROL
Q18: 2SA1588 GR
Q36: UN9211
UHF RF
ULOO
BUFF
Q4: 2SC5065
YGR AMP
Q8: 2SC4226
Q9: 2SC4226
POWER AMP
IC3: SC-1284
APC SENS
D20: MA2S728
D21: MA2S728
ANT SW
D16: MA2S077
D17: MA2S077
D18: MA2S077
D19: MA2S077
UHF
LPF
ANT
T+4
UHF
DUPLEXER
APC
Q25: XP1401
Q13: 2SC4211
HI/LOW
VHF
YGR AMP
Q29: 2SC4403
Q31: 2SC4405
POWER AMP
IC6: SC-1297
APC SENS
D35: MA2S728
D36: MA2S728
ANT SW
D37: MA2S077
D38: MA2S077
D39: MA2S077
T+4
VHF RF
BUFF
Q28: 2SC5065
TX/RX SW
D24: MA2S077
D25: MA2S077
TX CONTROL
Q20: 2SA1588 GR
Q21: UN9211
VLO
LTX
REG
IC2 : TC7S32F
Q16: 2SC4617
Q17: 2SB1132
D43: DA221
T+4

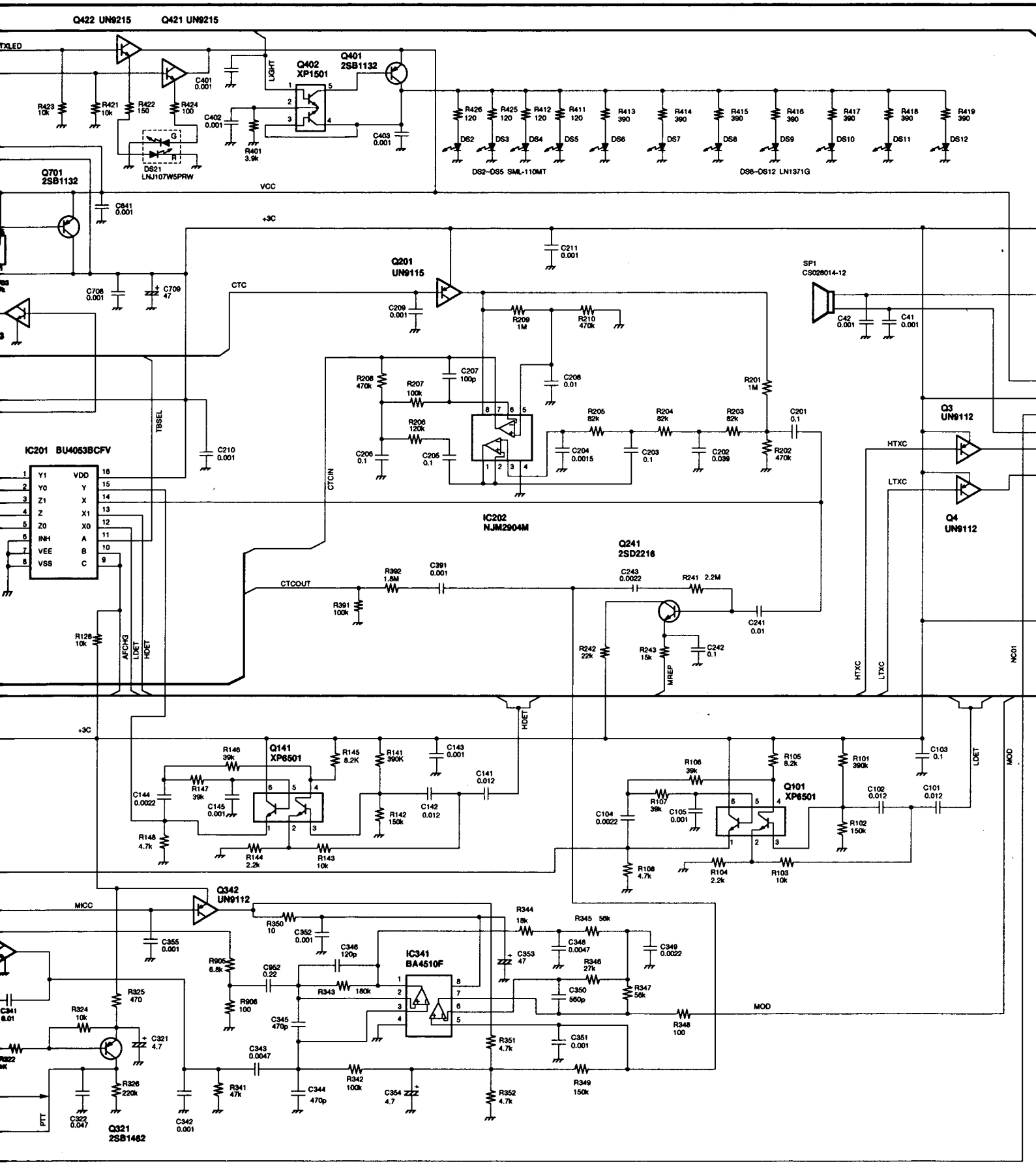
1F UNIT

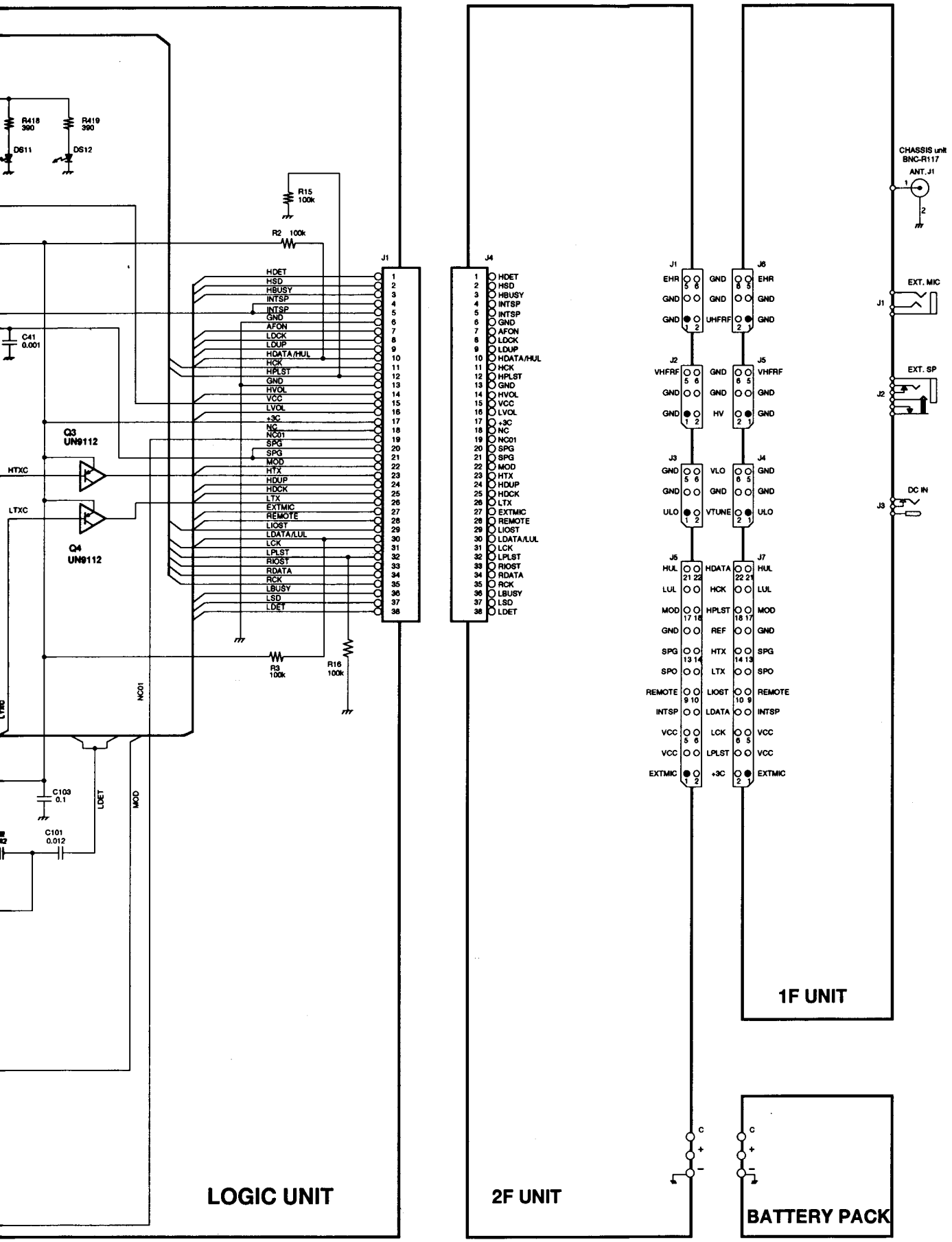
SECTION 11 VOLTAGE DIAGRAM

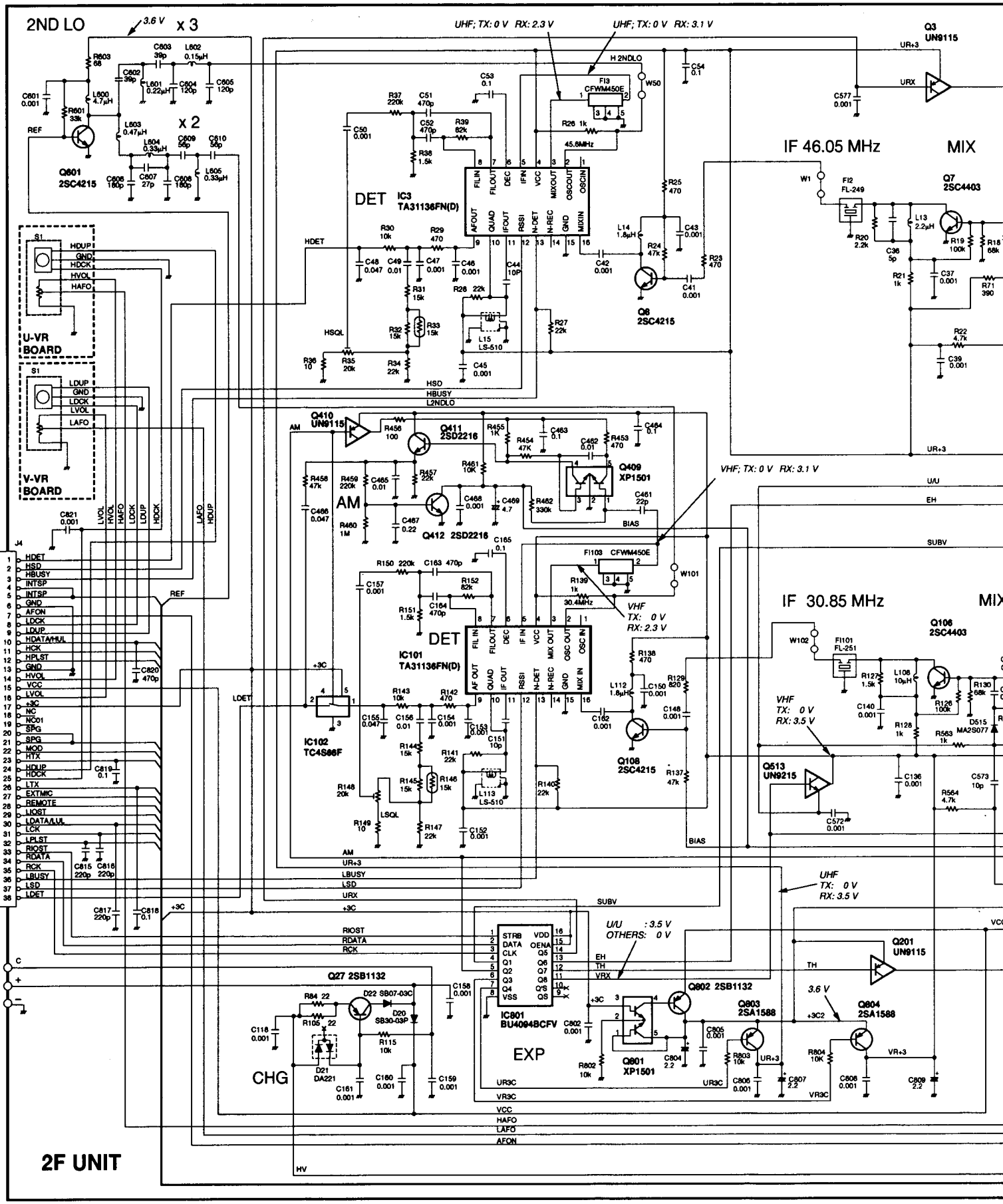


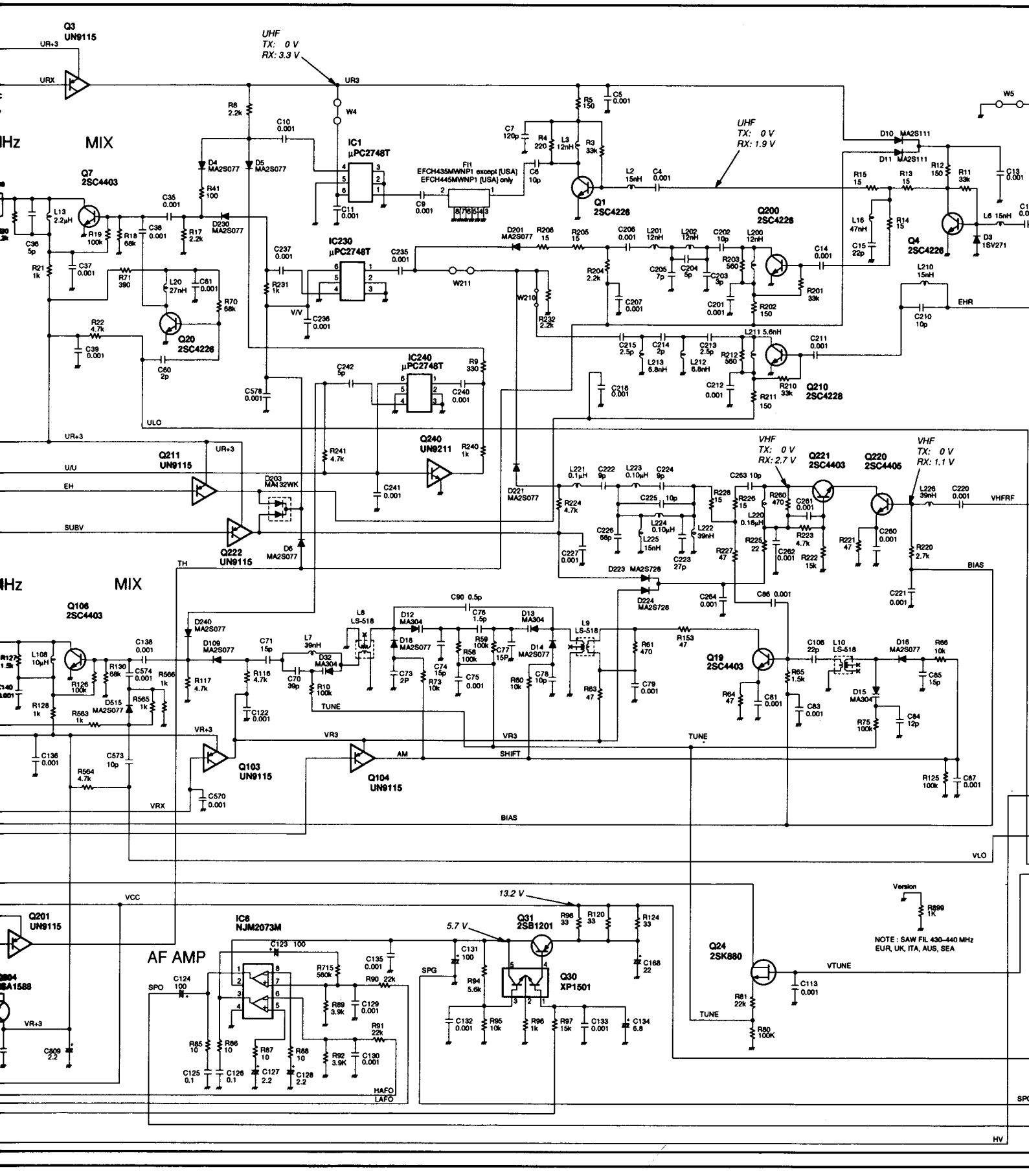

IC1 M38267M8L-166GP
IC5 BU4094BCFV
Q621 UN9210
D621 MA2S111
VCC
+3C
+3CPU
3.5 V
13.2 V
RDATA
RIOST
LIOST
LOGST/FCC
CONT0
CONT1
MGKEY
CLIN /REMOTE
L/G
S303 SKQLLC
CALL
S.MW
H/L
TONE
M.N
KR0
KR1
KR2
KR3
KSD0
KSD1
KSD2
KSD3
KSD4
KSD5
KS0
KS1
KS2
KS3
KS4
KS5
D501 MA6S121
D502 MA6S121
DAP202U
MA2S111

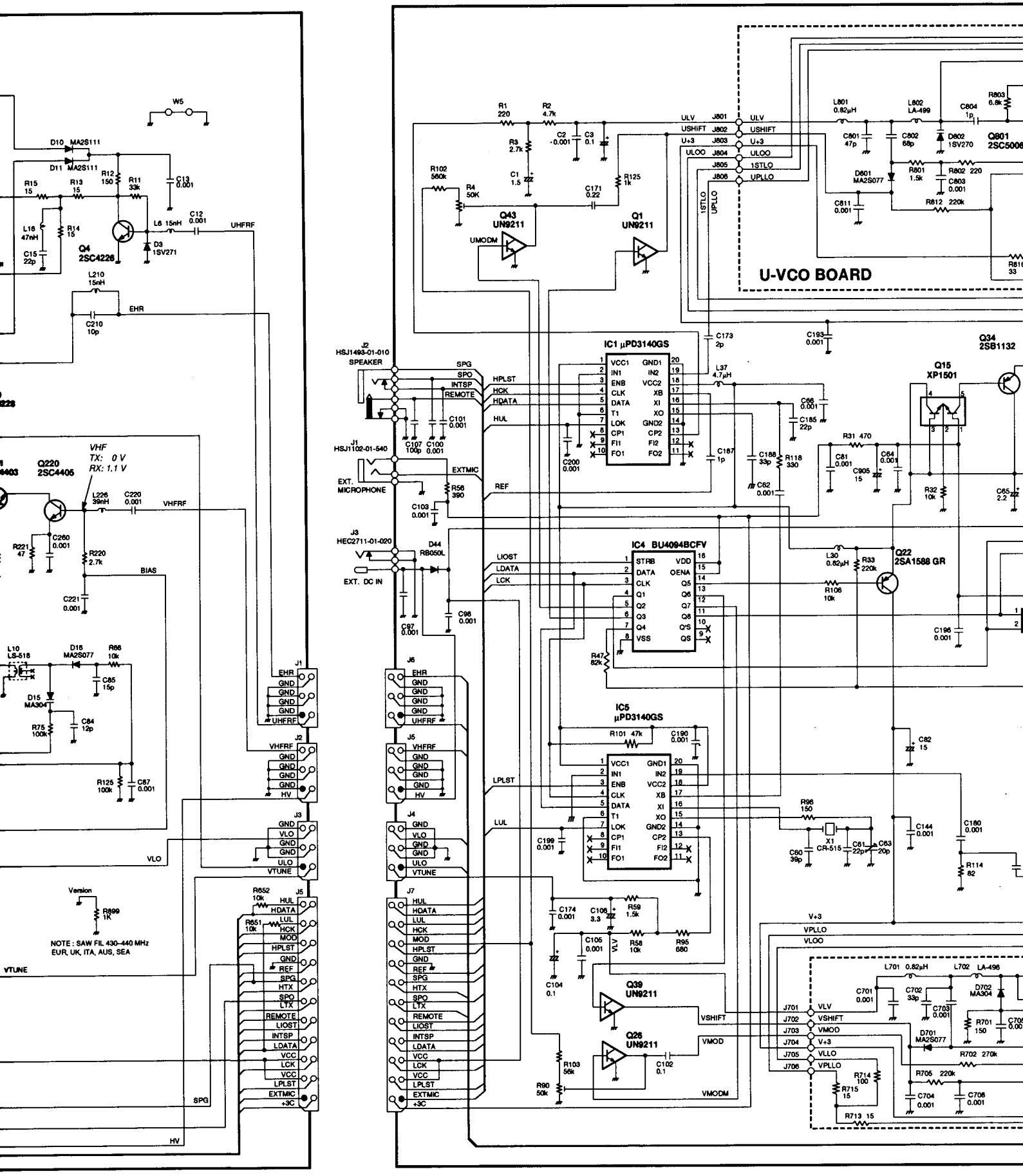

Q422 UN9215
TXLED
BLED
C421 0.001
R423 10k
R421 10k
R422 150
D521 LNJ107W
Q721 UN9211
R721 220k
R722 1M
RESET
IC701 S-81335HG-KI
D701 MA729
Q701 2SB1132
C702 0.001
C701 10
R702 10k
C841 0.001
Q702 XP1501
W701
C722 0.1
D721 MA2S111
C721 0.001
C703 0.01
C704 47
C705 0.001
R701 100
C706 22
C707 0.1
R703 4.7k
C708 0.001
IC721 S-80730SL-AT
Q703 UN9213
RDATA
RIOST
LIOST
LOGST/FCC
R1 10K except [USA]
LIGHT
EEPROM
EXPANDERKEYSCAN
P14/SEG38 LIOCK/ECK
P15/SEG39 LIODATA
P16 ESIO
P17 PTT
P20 KR0
P21 KR1
P22 KR2
P23 KR3
P24 LDCK
P25 LDUP
P26 HDCK
P27 HDUP
VSS
XOUT
XIN
XCOUT
XCIN
RESET
P70/INT0 POWER
P71 LTXC
P72 LRMUTE
P73 HTXC
P74 HRMUTE
P75 AFCHG
P76 MICM
MICC
MREP
LBUSY
HBUSY
PCON
AFON
LIGHT
LDATA/LUL
HDATA/HUL
DTMF
LSD
HSD
LIOCK/ECK
ECS
ESIO
IC601 X25320SI-2.7
R26 100k
X1 CR-550
C4 24P
C5 27P
R24 4.7k
R25 10k
S553 SKQDPB POWER-SW
R601 100k
C601 0.001
PCON
TBSEL
IC201 BU4053BCFV
Q102 2SJ364 Q
C106 0.1
R109 1M
Q142 2SJ364 Q
C146 0.1
R149 1M
C107 0.047
R110 470k
VHF TX: 3.5 V RX: 0 V
C147 0.047
R150 470k
C148 0.001
LRMUTE
C108 0.001
HRMUTE
R129 47k
R130 47k
R128 10k
AFCHG
LDET
HDET
D621 MA2S111
Q621 UN9210
R27 100k
REMOTE
+3C
R505 100k
R507 100k
R506 100k
KR3
KR2
KR1
KR0
RDATA
RIOST
LIOST
DTMF
Q343 UN9211
R28 1k
R29 330k
R381 EXB-V4V 220K
C121 0.1
C161 0.1
LVOL
HVOL
EXTMIC
MICM
MICC
R126 10k
C144 0.0022
R148 4.7k
R901 100k
R904 47k
R902 100k
IC5 BU4094BCFV
STRB
DATA
CLK
Q1
Q2
Q3
Q4
VSS
VDD
OENA
Q5
Q6
Q7
Q8
Q'S
QS
KS4
KS5
TCAL
NC01
EM-123TH MC1
D301 MA8051 H
C301 470p
R301 33k
S301 JPM1990-2013R PTT-SW
Q341 UN9211
C341 0.01
R321 1k
R323 1k
R322 1K
R324 10k
R325 470
C321 4.7
R326 220k
C322 0.047
TX: 3.5 V
RX: 0 V
PTT
Q321 2SB1462

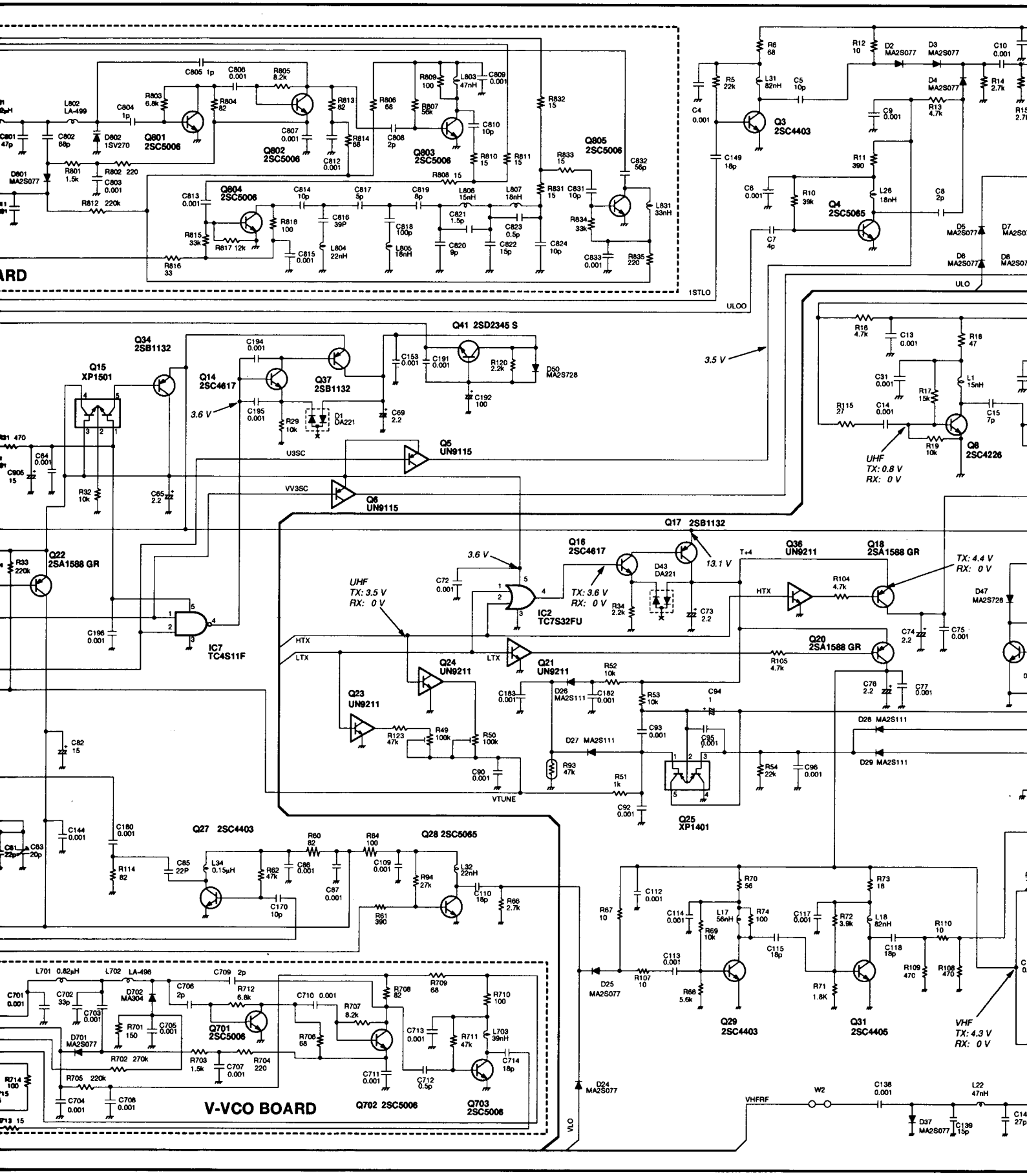

Q422 UN9215
Q421 UN9215
TXLED
LIGHT
Q402
XP1501
Q401
2SB1132
C401 0.001
C402 0.001
C403 0.001
R401 3.9k
R423 10k
R421 10k
R422 150
R424 100
DS21
LNJ107W5PRW
R426 120
R425 120
R412 120
R411 120
R413 390
R414 390
R415 390
R416 390
R417 390
R418 390
R419 390
DS2
DS3
DS4
DS5
DS6
DS7
DS8
DS9
DS10
DS11
DS12
DS2-DS5 SML-110MT
DS6-DS12 LN1371G
Q701
2SB1132
C641 0.001
VCC
+3C
C706 0.001
C709 47
C211 0.001
Q201
UN9115
CTC
C209 0.001
R209 1M
R210 470k
SP1
CS028014-12
C42 0.001
C41 0.001
R208 470k
R207 100k
C207 100p
C208 0.01
R206 120k
C206 0.1
C205 0.1
R205 82k
R204 82k
R203 82k
C201 0.1
C204 0.0015
C203 0.1
C202 0.039
R202 470k
R201 1M
Q3
UN9112
HTXC
LTXC
Q4
UN9112
TBSEL
CTCIN
IC201 BU4053BCFV
Y1
Y0
Z1
Z
Z0
INH
VEE
VSS
VDD
Y
X
X1
X0
A
B
C
C210 0.001
IC202
NJM2904M
Q241
2SD2216
CTCOUT
R392 1.8M
C391 0.001
R391 100k
C243 0.0022
R241 2.2M
C241 0.01
R242 22k
R243 15k
C242 0.1
MREP
R128 10k
AFCHG
LDET
HDET
NCO1
MOD
Q141
XP6501
R146 39k
R145 8.2K
R141 390K
C143 0.001
C141 0.012
C144 0.0022
R147 39k
C145 0.001
C142 0.012
R142 150k
R148 4.7k
R144 2.2k
R143 10k
Q101
XP6501
R106 39k
R105 8.2k
R101 390k
C103 0.1
R107 39k
C102 0.012
C101 0.012
C104 0.0022
C105 0.001
R102 150k
R108 4.7k
R104 2.2k
R103 10k
Q342
UN9112
MICC
R350 10
C352 0.001
C355 0.001
R905 6.8k
C952 0.22
C346 120p
IC341
BA4510F
R343 180k
R906 100
C345 470p
R325 470
R324 10k
C321 4.7
C343 0.0047
R326 220k
C322 0.047
PTT
C342 0.001
R341 47k
C344 470p
R342 100k
C354 4.7
R352 4.7k
R351 4.7k
C353 47
R344 18k
R345 56k
C348 0.0047
C349 0.0022
R346 27k
C350 560p
R347 56k
R348 100
C351 0.001
R349 150k
Q321
2SB1462

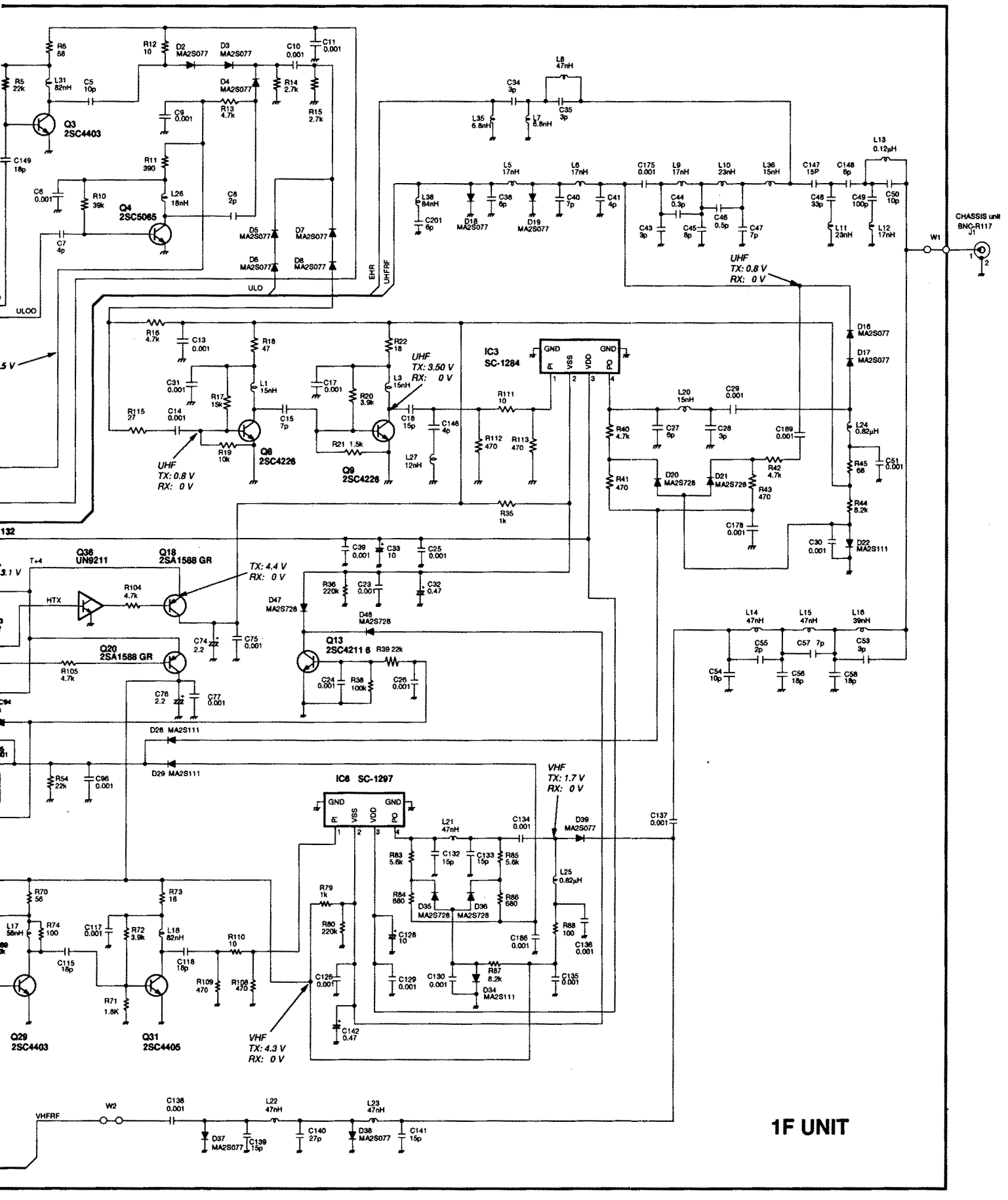

LOGIC UNIT
2F UNIT
1F UNIT
BATTERY PACK
R418 390
R419 390
DS11
DS12
R15 100k
R2 100k
C41 0.001
Q3 UN9112
Q4 UN9112
HTXC
LTXC
C103 0.1
C101 0.012
R3 100k
R16 100k
J1
HDET
HSD
HBUSY
INTSP
GND
AFON
LDCK
LDUP
HDATA/HUL
HCK
HPLST
VCC
LVOL
+3C
NC
NC01
SPG
MOD
HTX
HDUP
HDCK
LTX
EXTMIC
REMOTE
LIOST
LDATA/LUL
LCK
LPLST
RIOST
RDATA
RCK
LBUSY
LSD
LDET
J4
J1
J6
J2
J5
J3
J4
J5
J7
EHR
GND
UHFRF
VHFRF
HV
VLO
VTUNE
ULO
HUL
LUL
HDATA
HCK
HPLST
REF
HTX
LTX
LIOST
LDATA
LCK
LPLST
+3C
CHASSIS unit BNC-R117
ANT. J1
EXT. MIC
EXT. SP
DC IN
C
+
-


2ND LO
3.6 V
x 3
x 2
REF
Q601
2SC4215
DET
IC3
TA31136FN(D)
HDET
HSQL
HSO
HBUSY
L2NDLO
U-VR
BOARD
V-VR
BOARD
HDUP
GND
HDCK
HVOL
HAFO
LDUP
LDCK
LVOL
LAFO
J4
to LOGIC
UNIT
to BATTRY
AM
Q410
UN9115
Q411
2SD2216
Q412 2SD2216
Q409
XP1501
Q8
2SC4215
IC101
TA31136FN(D)
IC102
TC4S66F
LDET
LSQL
UHF; TX: 0 V RX: 2.3 V
UHF; TX: 0 V RX: 3.1 V
VHF; TX: 0 V RX: 3.1 V
VHF
TX: 0 V
RX: 2.3 V
VHF
TX: 0 V
RX: 3.5 V
UHF
TX: 0 V
RX: 3.5 V
U/U : 3.5 V
OTHERS: 0 V
IF 46.05 MHz
MIX
IF 30.85 MHz
MIX
Q3
UN9115
Q7
2SC4403
Q106
2SC4403
Q513
UN9215
Q201
UN9115
Q602 2SB1132
Q603
2SA1588
Q604
2SA1588
Q801
XP1501
Q27 2SB1132
IC801
BU4094BCFV
EXP
CHG
D21
DA221
D20
SB30-03P
D22 SB07-03C
UR+3
VR+3
UR3C
VR3C
VCC
HAFO
LAFO
AFON
HV
BIAS
SUBV
EH
TH
VRX
URX
RIOST
RDATA
RCK
LBUSY
LSD
LDET
+3C
+3C2
2F UNIT


Q3
UN9115
UR+3
URX
UHF
TX: 0 V
RX: 3.3 V
UR3
W4
W5
MIX
IC1
µPC2748T
FI1
EFCH435MWNP1 except [USA]
EFCH445MWNP1 [USA] only
Q7
2SC4403
D4 MA2S077
D5 MA2S077
D230 MA2S077
UHF
TX: 0 V
RX: 1.9 V
Q1
2SC4226
D10 MA2S111
D11 MA2S111
Q200
2SC4226
Q4
2SC4226
D3
1SV271
IC230
µPC2748T
W211
W210
V/V
EHR
Q20
2SC4226
IC240
µPC2748T
ULO
Q240
UN9211
Q211
UN9115
U/U
EH
SUBV
Q222
UN9115
D203
MA132WK
D6
MA2S077
D221
MA2S077
VHF
TX: 0 V
RX: 2.7 V
Q221
2SC4403
Q220
2SC4405
VHF
TX: 0 V
RX: 1.1 V
VHFRF
BIAS
TH
MIX
Q106
2SC4403
TUNE
Q19
2SC4403
VR+3
VR3
AM
SHIFT
Q103
UN9115
Q104
UN9115
VRX
VLO
VCC
13.2 V
Q201
UN9115
IC6
NJM2073M
AF AMP
5.7 V
Q31
2SB1201
Q30
XP1501
SPG
SPO
HAFO
LAFO
Q24
2SK880
VTUNE
Version
NOTE : SAW FIL 430-440 MHz
EUR, UK, ITA, AUS, SEA
HV


U-VCO BOARD
IC1 µPD3140GS
IC4 BU4094BCFV
IC5 µPD3140GS
Q43 UN9211
Q1 UN9211
Q39 UN9211
Q26 UN9211
Q4 2SC4226
Q220 2SC4405
Q15 XP1501
Q22 2SA1588 GR
Q34 2SB1132
Q801 2SC5006
D10 MA2S111
D11 MA2S111
D3 1SV271
D15 MA304
D18 MA2S077
D44 RB050L
D601 MA2S077
D701 MA2S077
D702 MA304
L10 LS-518
L210 15nH
L226 39nH
L801 0.82µH
L802 LA-499
L701 0.82µH
L702 LA-496
L37 4.7µH
L30 0.82µH
X1 CR-515
W5
VHF
TX: 0 V
RX: 1.1 V
BIAS
VTUNE
VLO
HV
SPG
EHR
VHFRF
UHFRF
UMODM
1STLO
UPLLO
VSHIFT
VMOD
VMODM
VPLLO
VLOO
V+3
SPEAKER
EXT. MICROPHONE
EXT. DC IN
NOTE : SAW FIL 430-440 MHz
EUR, UK, ITA, AUS, SEA
Version
J1
J2
J3
J4
J5
J6
J7
HSJ1493-01-010
HSJ1102-01-540
HEC2711-01-020
SPO
INTSP
REMOTE
HPLST
HCK
HDATA
HUL
EXTMIC
REF
LIOST
LDATA
LCK
LUL
LPLST
HTX
LTX
MOD
+3C
ULV
USHIFT
U+3
ULOO
1STLO
UPLLO
VLV
VSHIFT
VMOD
V+3
VLLO
VPLLO


Q801 2SC5006
Q802 2SC5006
Q803 2SC5006
Q804 2SC5006
Q805 2SC5006
Q3 2SC4403
Q4 2SC5065
1STLO
ULOO
ULO
Q41 2SD2345 S
Q34 2SB1132
Q15 XP1501
Q14 2SC4617
Q37 2SB1132
3.5 V
3.6 V
U3SC
VV3SC
Q5 UN9115
Q6 UN9115
Q8 2SC4226
UHF TX: 0.8 V RX: 0 V
Q17 2SB1132
Q16 2SC4617
Q36 UN9211
Q18 2SA1588 GR
Q22 2SA1588 GR
IC2 TC7S32FU
IC7 TC4S11F
UHF TX: 3.5 V RX: 0 V
TX: 3.6 V RX: 0 V
13.1 V
TX: 4.4 V RX: 0 V
HTX
LTX
Q24 UN9211
Q21 UN9211
Q23 UN9211
Q20 2SA1588 GR
VTUNE
Q25 XP1401
Q27 2SC4403
Q28 2SC5065
Q29 2SC4403
Q31 2SC4405
VHF TX: 4.3 V RX: 0 V
V-VCO BOARD
Q701 2SC5006
Q702 2SC5006
Q703 2SC5006
VLO
VHFRF


Q3 2SC4403
Q4 2SC5065
Q6 2SC4226
Q9 2SC4226
IC3 SC-1284
Q36 UN9211
Q18 2SA1588 GR
Q20 2SA1588 GR
Q13 2SC4211 6
IC6 SC-1297
Q29 2SC4403
Q31 2SC4405
CHASSIS unit
BNC-R117
J1
W1
W2
UHF TX: 0.8 V RX: 0 V
UHF TX: 3.50 V RX: 0 V
UHF TX: 0.8 V RX: 0 V
TX: 4.4 V RX: 0 V
VHF TX: 1.7 V RX: 0 V
VHF TX: 4.3 V RX: 0 V
ULO
ULOO
EHR
UHFRF
VHFRF
HTX
1F UNIT

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