ICOM

SERVICE MANUAL

VHF/UHF FM TRANSCEIVER

IC-Q7A
IC-Q7E

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-Q7A/IC-Q7E** at the time of publication.

MODEL	VERSION	SYMBOL
IC-Q7E	Europe	EUR
	Italy	ITA
IC-Q7A	U.S.A.	USA
	Asia	SEA
	Canada	USA-1
	Taiwan	TPE

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 3.5 V. Such a connection could cause a fire hazard and/or electric.

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 (100mW) 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>

8930046580	LCD Contact	IC-Q7	LOGIC UNIT	5 pieces
8810009560 Screw	PH BO M2x6 ZK	IC-Q7	Chassis	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 or electronic parts. An insulated turning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 30 dB to 40 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

• Frequency range :

Version	Transmit (MHz)	Receive (MHz)
U.S.A.	144 – 148 440 – 450	30.0 – 823.995 849.0 – 868.995 894.0 – 1309.995*2
Europe	144 – 146 430 – 440	30.0 – 1309.995*2
Italy, Asia	136 – 174*1 430 – 440	30.0 – 1309.995*2
TWN	144 – 148 430 – 440	30.0 – 1309.995*2
USA-1	144 – 148 430 – 450	30.0 – 1309.995*2

*1 Specifications guaranteed 144 – 148 MHz
*2 Specifications guaranteed 30 – 1300 MHz

• Mode : F3 (FM)

• No. of memory channels : 200 channels

• Frequency stability : ±6 ppm max. (–10°C to +60°C)

• Tuning steps : 5, 6.25, 10, 12.5, 15, 20, 25, 30, 50, and 100 kHz

• Anntena Impedance : 50 Ω

• Power supply requirement : 2 × AA(R6) Ni-Cd or alkaline cell

• Polarity : Negative ground

• Frequency resolution : 5 kHz, 6 kHz

• Current drain (at 3.0 V DC) :

Receive	Standby	95 mA (typical)
	Max audio	170 mA (typical)
	Power saved	38 mA (typical)
Transmit	VHF	440 mA (typical)
	UHF	380 mA (typical)

• Usable temperature range : –10°C to +60°C
–14°F to +140°F

• Dimensions (projections not included) : 58(W) × 86(H) × 27(D) mm
99/32(W) × 83/8(H) × 11/16(D) in

• Weight (with antenna and battely) : 170 (g); 6 oz

• MIC/SP connector : 4-conductor 3.5(d) mm (1/8"); 2 kΩ/8 Ω

■ TRANSMITTER

• Output power (at 3.0 V DC) : VHF 350 mW
UHF 300 mW

• Modulation system : Variable reactance modulation

• Max. freq. deviation : ±5 kHz

• Spurious Emissions : less than –40 dB

■ RECEIVER

• Receiver system : Tripple super heterodyne

• Intermediate frequency : 1st 266.7 MHz
2nd 19.65 MHz
3rd 450 kHz

• Sensitivity* :
(except spurious points; typical values)

Frequency (MHz)	FM	WFM	AM
30.0 – 76.0	0.32 µV	—	—
76.0 – 108.0		1.0 µV	
108.0 – 118.0		—	0.56 µV
118.0 – 136.0	0.16 µV		—
136.0 – 175.0			
175.0 – 222.0	0.22 µV	1.0 µV	0.79 µV
222.0 – 247.0		—	1.4 µV
247.0 – 330.0	0.4 µV		—
330.0 – 380.0	0.32 µV		
380.0 – 470.0	0.18 µV		
470.0 – 750.0	1.0 µV	0.16 µV	
750.0 – 770.0	0.32 µV		
770.0 – 1000.0		—	
1000.0 – 1200.0	0.79 µV		
1200.0 – 1300.0	0.5 µV		

*FM and WFM are measured at 12 dB SINAD; AM is measured at 10 dB S/N.

• Squelch sensitivity :
144 – 148 MHz less than 0.18 µV
430 – 450 MHz less than 0.22 µV

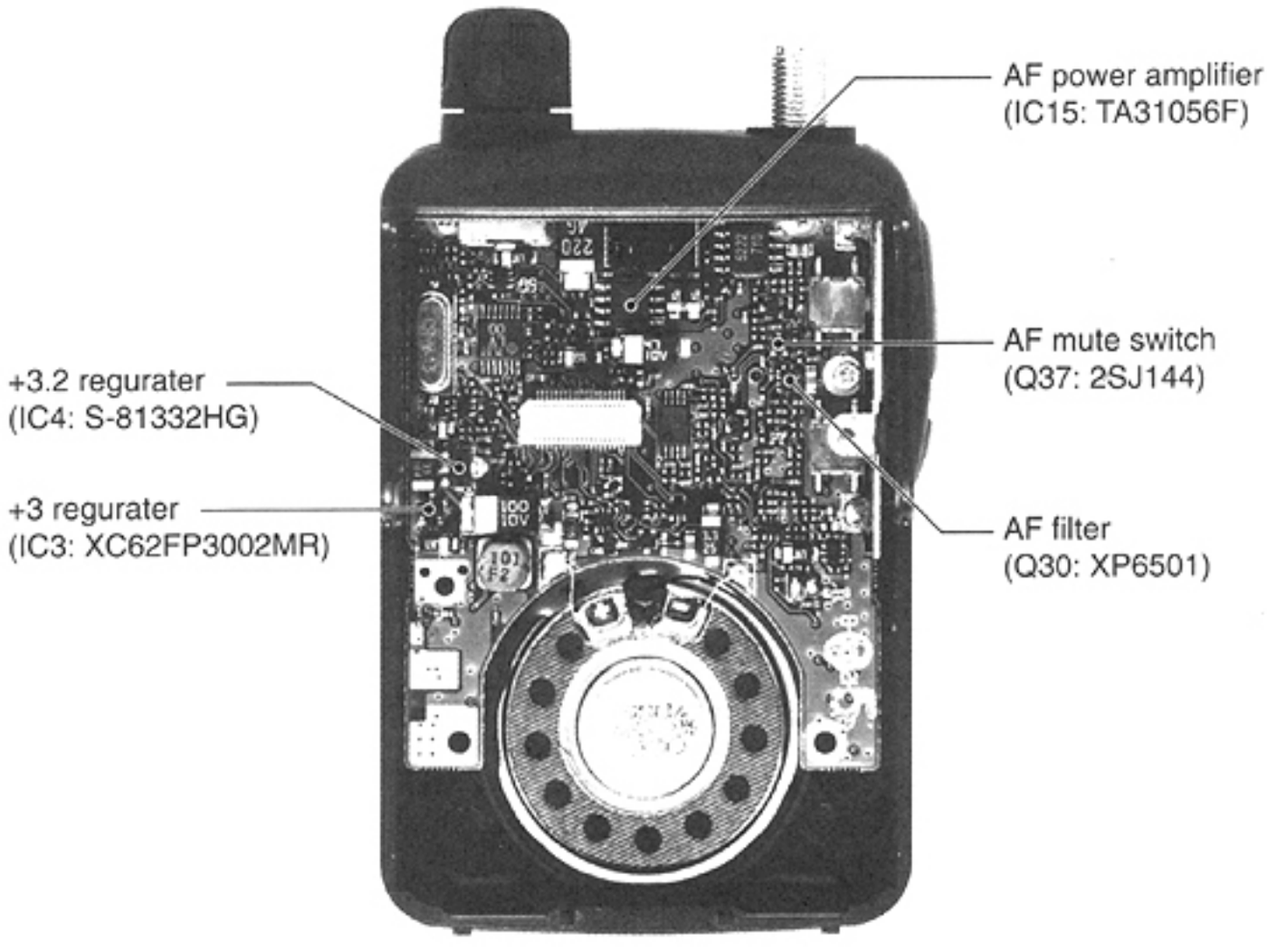
• Selectivity :
FM, AM more than 15 kHz/–6 dB
less than 30 kHz/–60 dB
WFM more than 150 kHz/–6 dB

• Audio output power : 100 mW typical at 10 % distortion with an 8 Ω load

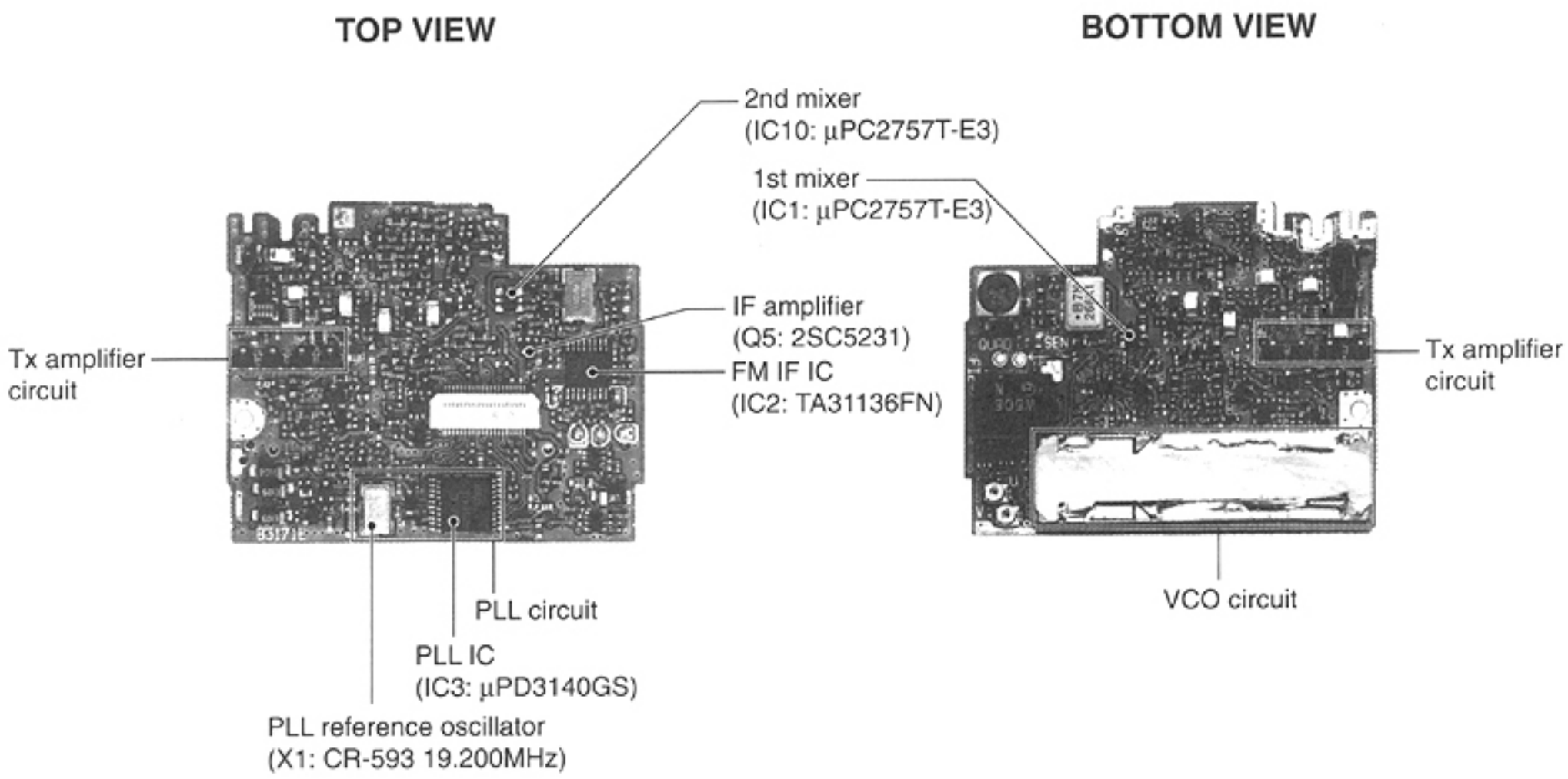
All stated specifications are subject to change without notice or obligation.

SECTION 2 INSIDE VIEWS

• LOGIC UNIT



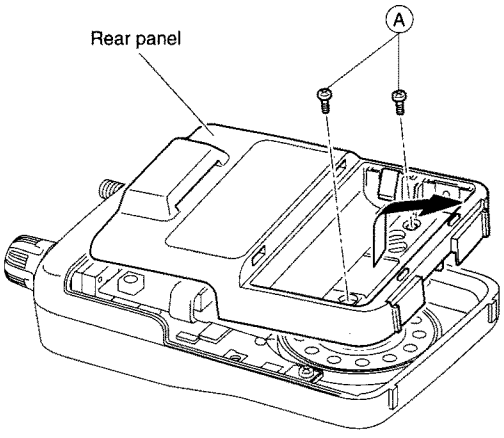
• RF UNIT



SECTION 3 DISASSEMBLY INSTRUCTIONS

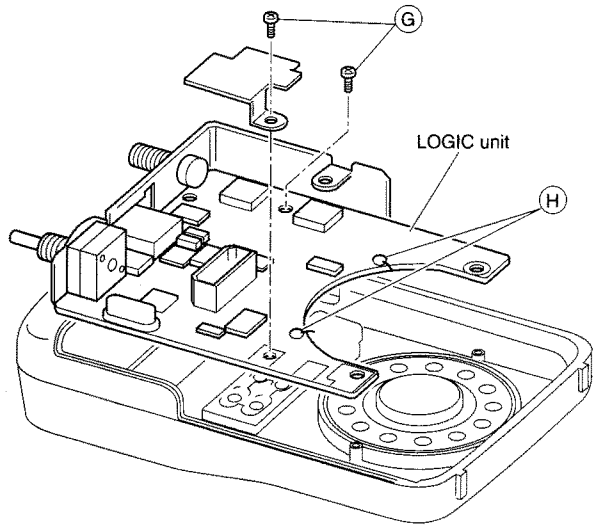
• REMOVING THE REAR PANEL

① Unscrew 2 screws, Ⓐ.
② Remove the rear panel in the direction of the arrow.



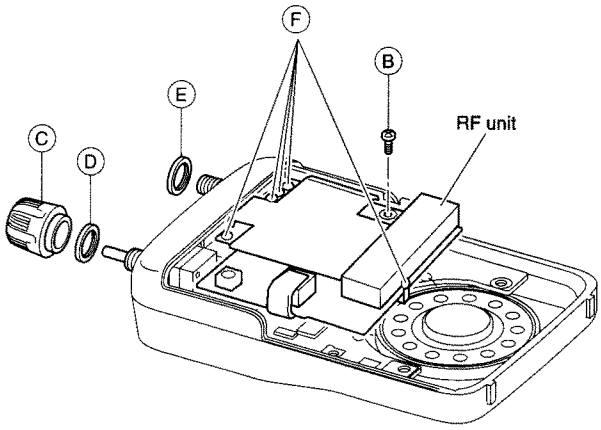
• REMOVING THE LOGIC UNIT

① Unscrew 2 screws, Ⓖ.
② Unsolder 2 points, Ⓗ, and then remove the LOGIC unit.



• REMOVING THE RF UNIT

① Unscrew 1 screw, Ⓑ.
② Remove 1 knob, Ⓒ.
Unscrew 2 nuts, Ⓓ and Ⓔ.
③ Unsolder 5 points, Ⓕ, and then remove the RF unit.



SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

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

The RF signals from the antenna connector pass through the antenna switching circuit (D3, D6, D9). The passed signals are then applied to either Duplexer or RX band switching circuit.

4-1-2 DUPLEXER CIRCUIT (RF UNIT)

The transceiver has a duplexer (low-pass and bandpass filters) on the frist stage from the antenna switcing diode to separate the signals into VHF and UHF signals.

• RF signals below 175.0 MHz

The RF signals below 175.0 MHz are passed through the low-pass filter (L57–L59, C8–C11, C67) and are applied to the VHF RF circuit.

• RF signals 330.0 MHz–469.995 MHz

The 330 MHz–469.995 MHz RF signals are passed through the bandpass filter (L3–L5, C21–C24, C218) and are applied to the UHF RF circuit.

4-1-3 VHF/UHF RF CIRCUIT (RF UNIT)

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

(1) VHF RF CIRCUIT

The filtered signals from the low-pass filter circuit are amplified at the VHF RF amplifier (Q14) through the Tx/Rx swiching diode (D15), and are then passed through the two stages of tunable bandpass filters (D1, D2, L28, L1). The filtered signals are applied to the 1st mixer circuit (IC1, pin 1) via the band switching diode (D25).

(2) UHF RF CIRCUIT

The filtered signals from the bandpass filter circuit are amplified at the UHF RF amplifier (Q35) via the Tx/Rx switching diode (D27) and are passed through the two stage of tunable bandpass filters (D4, D5, L61, L60). The filtered signals are applied to the 1st mixer circuit via the band switching diode (D29). The filtered signals are applied to the 1st mixer circuit (IC1, pin 1).

The tunable bandpass filters employ varactor diodes (D1, D2, D4, D5) to tune the center frequency of the RF passband for wide bandwidth receiving and good image response rejection. These diodes are controlled by the CPU (LOGIC unit; IC11, pin 9).

4-1-4 RX BAND SWITCHING CIRCUIT (RF UNIT)

The signals from the antenna connector pass through the antenna switching circuit (D6, D9). The signals are then applied to the RX RF circuit via RX the band switching circuit (D11, D13, D31) which suppress out-of-band signals.

4-1-5 RX RF CIRCUIT (RF UNIT)

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

(1) 470.0 MHz–1026.995 MHz signals

RF signals (470 MHz–1026.995 MHz) from a band switching circuit (D11) pass through a bandpass filter (L7, L8, L42, C32, C33, C35–C39, C145) and are amplified at an RF amplifier (Q24). The amplified signals are then applied to the 1st mixer circuit (IC1) through the band switching diode (D32).

(2) 30.0 MHz–117.995 MHz, 175 MHz–329.995 MHz

The 30.0 MHz – 117.995 MHz, 175 MHz – 329.995 MHz signals pass through a low-pass filter (L9, L10, C40–C43) via the band switching diode (D13), and are then amplified at the RF amplifier (Q36). The amplified signals are applied to the 1st mixer circuit (IC1) via the band switching diode (D34).

(3) 1027.0 MHz–1309.995 MHz

The 1027.0 MHz–1309.995 MHz signals pass through a bandpass filter (L11, L12, L43, C4, C5, C45 – C51) via the band switching diode (D13), and are then amplified at the RF amplifier (Q36). The amplified signals are applied to the 1st mixer circuit (IC1) via the band switching diode (D36).

4-1-6 1ST MIXER CIRCUIT (RF UNIT)

The 1st mixer circuit converts the received RF signals to a fixed frequency of the 1st IF signal with a PLL output frequency. By changing the PLL frequency, only the desired frequency will pass through the bandpass filter at the next stage of the 1st mixer.

The filtered RF signals are mixed with 1st LO signals at the 1st mixer (IC1) to produce a 266.7 MHz 1st IF signal. The 1st IF signal is output from pin 6, and passed through the bandpass filter (FI1) to suppress unwanted harmonic components. The filtered 1st IF signal is applied to the 2nd mixer circuit.

The 1st LO signals are generated at the V VCO (Q32, D45) or U VCO (Q28, Q30, D54) circuit (according to the receiving frequency), and are applied to the 1st mixer (IC1, pin 3) directly or passing through the doubler circuit (Q31) after being amplified at the buffer amplifier (IC4, Q40).

4-1-7 1ST IF AND 2ND MIXER CIRCUITS (RF UNIT)

The 2nd mixer circuit converts the 1st IF signal to a 2nd IF signal.

The filtered 266.7 MHz 1st IF signal from the bandpass filter (FI1) is mixed with the 2nd LO signal at the 2nd mixer (IC10) to produce a 19.65 MHz 2nd IF signal. The 2nd IF signal passes through (except WFM mode) or bypasses (WFM mode) the bandpass filter (FI3), and is then amplified at the buffer amplifier (Q5). The amplified signal is applied to the demodulator circuit.

4-1-8 DEMODULATOR CIRCUITS (RF UNIT)

The demodulator circuit converts the 2nd IF signal into AF signals.

The 19.65 MHz 2nd IF signal from the buffer amplifier (Q5) is applied to the 3rd mixer section of the FM IF IC (IC2, pin 16), and is then mixed with the 3rd LO signal for conversion into a 450 kHz 3rd IF signal.

IC2 contains the 3rd mixer, limiter amplifier, quadrature detector and S-meter detector, etc. A frequency from the PLL reference oscillator is used for the 3rd LO signal (19.20 MHz).

(1) FM mode

The 3rd IF signal is output from FM IF IC (IC2, pin 3) and passes through the ceramic bandpass filter (FI2). The filtered signal is fed back and amplified at the limiter amplifier section (pin 5), then demodulated into AF signals at the quadrature detector section (pins 10, 11) and detector coil (L21). The demodulated AF signals are output from pin 9 and are applied to the AF circuit (LOGIC unit).

(2) WFM mode

The 3rd IF signal from the 3rd mixer bypasses the ceramic filter (FI2) and fed back to the limiter amplifier section (pin 5). The amplified signal is demodulated at the quadrature detector section (pins 10, 11) and detector coil (L21). The AF signals are output from pin 9 and are applied to the AF circuit (LOGIC unit).

By connecting R55 to R54 in parallel, the output characteristics of pin 12, "RSSI", change gradually. Therefore, the FM IF IC can detect WFM components.

(3) AM mode

The filtered 3rd IF signal from the bandpass filter (FI2) is amplified at the 3rd IF amplifier (Q1). The amplified IF signal is applied to the AM detector circuit (Q4) to convert into AF signals, and the signals are applied to the AF circuit (LOGIC unit).

4-1-9 AF AMPLIFIER CIRCUIT (LOGIC UNIT)

The AF amplifier circuit amplifies the demodulated AF signals to drive a speaker.

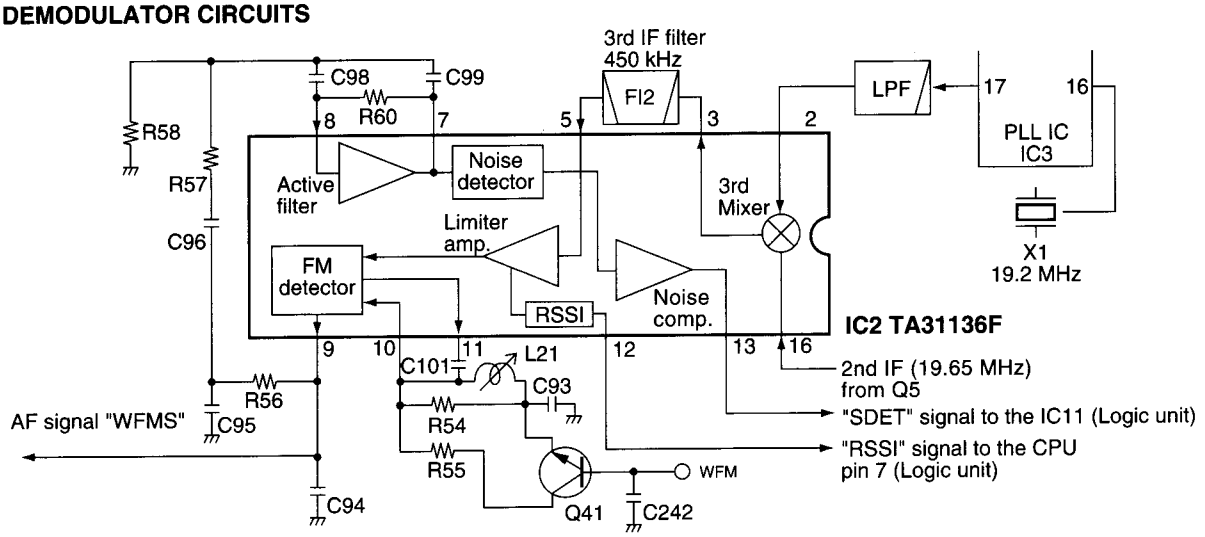
While in FM mode, AF signals from the demodulator circuit (RF unit) are passed through the de-emphasis (R118, C66, C68) and bandpass filter (Q30) and are then applied to the pre-amplifier (Q31).

While in AM mode, AF signals are pass through the bandpass filter (Q30) and are then applied to the pre-amplifier (Q31).

While in WFM mode, AF signals are applied to the pre-amplifier (Q31) directly.

The pre-amplified AF signals pass through the AF mute switch (Q37), and are then applied to the electronic volume control circuit (IC14, pin 6). The level controlled AF signals are output from pin 7 and are applied to the AF power amplifier (IC15, pin 1) via the buffer amplifier (Q36). The power amplified AF signals are applied to the internal speaker via the [EXT SP] jack.

• 2nd IF AND DEMODULATOR CIRCUITS



The electronic volume control circuit controls AF gain, therefore, the AF output level is according to the [VOL] setting and also the squelch conditions.

4-1-10 SQUELCH CIRCUIT(LOGIC AND RF UNITS)

• NOISE SQUELCH

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

A portion of the AF signals from the FM IF IC (IC2, pin 9) are applied to the active filter section (IC2, pin 8). The active filter section amplifies and filters noise components. The filtered signals are applied to the noise detector section and output from IC2 (pin 13) as the "SDET" signal.

The "SDET" signal from IC2 (pin 13) passes through the noise detector (LOGIC unit; IC1), and is then applied to the CPU (LOGIC unit; IC11, pin 12) via "SQL" line. The CPU analyzes the noise condition and outputs the "AMUTE" signal to AF mute switch (Q37).

Even when the squelch is closed, the AF mute switch (Q37) opens at the moment of emitting beep tones.

• TONE SQUELCH

The tone squelch circuit detects AF signals and opens the squelch only when receiving a signal containing a matching subaudible tone (CTCSS). When tone squelch is in use, and a signal with a mismatched or no subaudible tone is received, the tone squelch circuit mutes the AF signals even when noise squelch is open.

A portion of the AF signals from the FM IF IC (IC2, pin 9) passes through the low-pass filter (LOGIC unit; IC9) to remove AF (voice) signals and is applied to the CTCSS decoder inside the CPU (LOGIC unit; IC11, pin 8) via the "RTONE" line to control the AF mute switch.

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHON AMPLIFIER CIRCUIIT (LOGIC UNIT)

The microphone amplifier circuit amplifies the audio signals from the microphone, within +6 dB/octave pre-emphasis characteristics (300 Hz–3 kHz), to a level needed for the modulation circuit. The microphone amplifier circuit is used for both the VHF and UHF bands.

The AF signals from the microphone are amplified at the microphone amplifier (Q12) and the limiter amplifier (Q2) which has a negative feedback circuit for +6 dB/octave pre-emphasis.

The amplified signals are applied to the low-pass filter (Q7) to filter out RF components and are then applied to the RF unit as the "MOD" signal.

4-2-2 MODULATION CIRCUIT (RF UNIT)

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

• VVCO

The applied signals from the limiter amplifier changes the reactance of D45 to modulate the oscillated signal at the VVCO circuit (Q32). The modulated signal is amplified at the buffer amplifiers (IC4, Q40) and is then applied to the drive amplifier circuit for VHF band.

• UVCO

The applied signals from the limiter amplifier changes the reactance of D54 to modulate the oscillated signal at the UVCO circuit (Q28, Q30). The modulated signal is amplified at the buffer amplifiers (IC4, Q40) and is then applied to the drive amplifier circuit for UHF band.

4-2-3 DRIVE/POWER AMPLIFIER CIRCUITS (RF UNIT)

The amplifier circuit amplifies the VCO oscillating signal to the output power level.

• VHF PA

The signal from the buffer amplifiers (IC4, Q40) is passed through the Tx/Rx switch (D23), and is amplified at the driver amplifiers (Q23, Q13) and the power amplifiers (Q9–Q12) to obtain 350 mW of RF power.

The amplified signal is passed through the antenna switching circuit (D16) and low-pass filter, and is then applied to the antenna connector.

• UHF PA

The amplified signal from IC4, Q40 passes through the Tx/Rx switch (D28), and is amplified to 300 mW of RF power at the driver amplifiers (Q22, Q21) and the power amplifiers (Q17–Q20).

The signal is applied to the antenna connector via the antenna switching circuit (D40).

4-3 PLL CIRCUITS

4-3-1 PLL CIRCUIT (RF UNIT)

A PLL circuit provides stable oscillation of the transmit frequency and the receive 1st/2nd LO frequencies. The PLL circuit compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) of a programmable divider.

An oscillated signal from the 1st VCO via the buffer amplifiers (IC4, Q43) is applied to the PLL IC (IC3, pin 19) and is prescaled in the PLL IC based on the divided ratio (N-data). The reference signal is generated at the reference oscillator (X1) and is also applied to the PLL IC (pin 16). The PLL IC detects the out-of-step phase using the reference frequency and outputs it from pin 13. The output signal is passed through the loop filter (Q2, Q45) and is then applied to the VCO circuit as the lock voltage.

4-3-2 1ST VCO CIRCUIT (RF UNIT)

The 1st VCO circuit contains a separate V VCO (Q32, D45) and U VCO (Q28, Q30, D54). The oscillated signal is amplified at the buffer amplifiers (IC4, Q40), and is then applied to the Tx/Rx switching circuit (D23, D28, D42, D43, D44). Then the Tx and Rx signals are applied to the pre-driver (Q23: for VHF, Q22: for UHF) and 1st mixer (IC1) respectively.

A portion of the RF signal from buffer amplifier (IC4) is amplified at the buffer amplifier (Q43), and is then fed back to the PLL IC (IC3 pin 19) as the comparison signal.

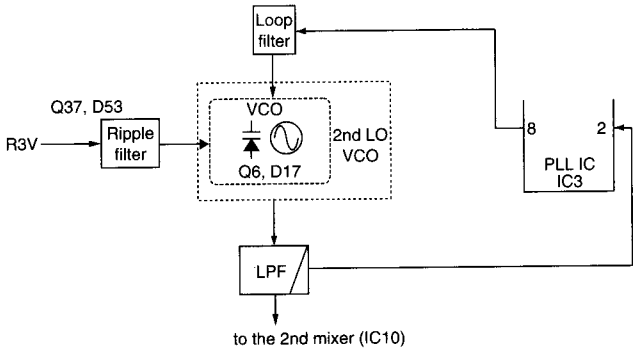
4-3-3 2ND LO VCO CIRCUIT (RF UNIT)

The 2nd LO VCO circuit generates the 2nd LO frequencies, and the signals are applied to the 2nd mixer circuit.

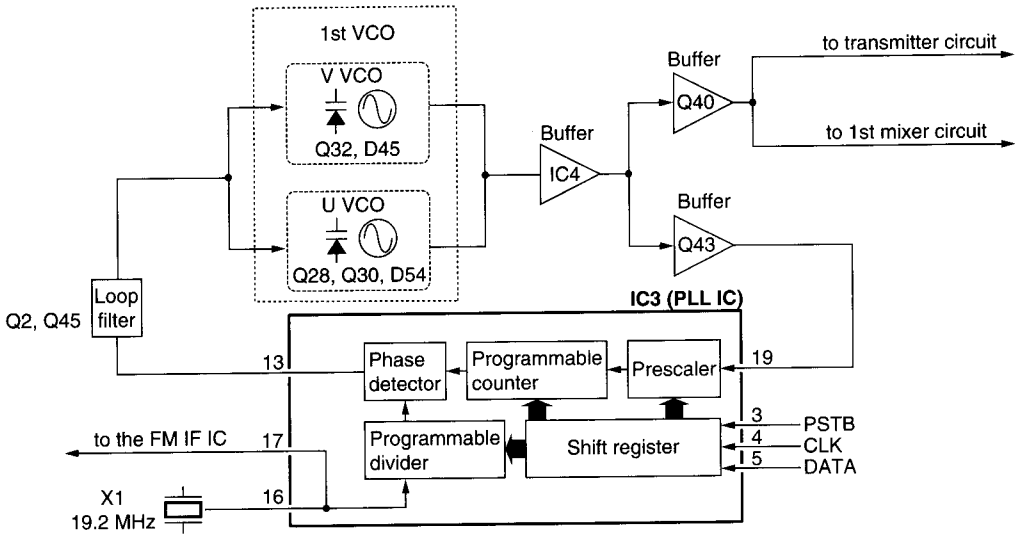
The generated signals from the 2nd VCO (Q6, D17) are applied to the 2nd mixer (IC10, pin 3), then mixed with the 1st IF signal.

An oscillated signal from the 2nd VCO passes through the low-pass filter (C154, C250 – C252, L69) and is applied to the PLL IC (IC3, pin 2), and is then output from pin 8.

• 2nd LO VCO circuit



• PLL circuit



4-4 POWER SUPPLY CIRCUITS

VOLTAGE LINE

LINE	DESCRIPTION
BATT	The voltage from the attached battery.
VP	Common 13 V converted from BATT line by the DC-DC convertors (IC10 and D3, D5, D15). The output voltage is applied to the PLL circuit (RF unit).
VHT2V	VHF transmit 2V controlled by the +2.0 switch (Q28) from the +2V regulator (Q21, Q32) using the "TXV" signal from CPU (IC11).
UHT2V	UHF transmit 2V controlled by the +2.0 switch (Q28) from the +2V regulator (Q21, Q32) using the "TXU" signal from CPU (IC11).
R3V	Receive 3V controlled by the R3S regulator circuit (Q4) using the "RX" signal from CPU (IC11).
+3S	Common 3V converted by the +3S regulator circuit (Q3, Q39) using the "+3SC" signal from CPU (IC11).
+3V	Common 3V controlled by the +3V regulator circuit (Q6) using the "POWERC" signal from CPU (IC11).
3V	Transmit 3V controlled from +3V line by the 3V regulator circuit (Q5).

4-5 PORT ALLOCATIONS

4-5-1 CPU (LOGIC UNIT IC11)

Pin number	Port name	Description
1	DBL1	Output control signal for the doubler circuit.
2	MMUTE	Outputs MIC mute control singal.
3	K2	Input port for [LOCK], [BAND], [VMC] switches.
4	K1	Input port for [FUNC] switch and [DIAL].
5	AMUTE	Output AF mute switch (LOGIC unit; Q37) control signal. Low : While squelched.
6	BATT	Input port for the low battery detection.
7	RSSI	Input port for the RSSI signal from the FM IF IC (RF unit; IC2, pin 12) to detect receiving signal strength.
8	RTONE	Input port for CTCSS decoded signal.
9	TSTCTU	Outputs CTCSS, and T-CALL signal while transmitting, and control signal for VHF/UHF tunable BPF while receiving.
10	FSET	Output signal to adjust the RIT.
11	TCON	Outputs control signal for the CTCSS regulator circuit.
12	SQL	Pulse signal input port for the squelch.
13	KFUNC	Input port for the [FUNC] switch. Low : While [FUNC] switch is pushed.
14	KSQL	Input port for the [SQL] switch. Low : While [SQL] switch is pushed.
15	VRC	Output signal to adjust the TX modulation level and RX volume level.
16	DCK	Input port for clock signal from the [DIAL].
17	AM	Outputs AM mode select signal. Low : When AM mode is selected.
18	WFM	Outputs WFM mode select signal. Low : When WFM mode is selected.
21	BEEP	Outputs beep audio signals.
22	DUD	Input port for the UP/DOWN signal from the [DIAL].
23	POWER	Input port for the [POWER] switch. Low : While [POWER] switch is pushed.
24	AFON	Outputs control signal for the AF amplifier requlator circuit. High : Activates the AF amplifier circuit.
25	RX	Outputs R3V regulator control signal while receiving.
26	TXV	Outputs T3V and VHT2V regulators control signal. Low : Transimit on VHF.
27	+3SC	Outputs +3S regulator control singal.
28	POWERC	Outputs +3V regulator control signal.
29	LIGHT	Outputs LCD backlight control signal. High : Lights ON.
30	TXU	Outputs T3V and UHT2V regulators control signal.
31	BUSY	Outputs BUSY LED control signal. High : The BUSY LED is ON.
32	PTT	Input port for the [PTT] switch. High : While [PTT] switch is pushed.
33	RESET	Input port for the RESET signal.
39	EDA	Outputs data signals to the EEPROM IC (LOGIC unit; IC2).
42	PCK/IS	Outputs clock signal to both PLL IC (RF unit; IC3) and EEPROM IC.
43	ECK/I3	Outputs clock signal to EEPROM IC.
44, 45	I2, I1	Input ports for Initial matrix.
46	PSTB/I0	Outputs strobe signals for the PLL IC.
47	PDA/UL	Outputs data signals to the PLL IC. Input port for PLL unlock signal from PLL IC (RF unit; IC3).
48	DBL2	Output control signal for the doubler circuit.
50	300MC	Outputs band pass filter select signal. Low : When frequencies 30.0 to 118.0 MHz or 175.0 to 330 MHz are displayed.
51	GC	Output band pass filter select signal. Low : When frequencies 1027 to 1300 MHz are displayed.
52	800MC	Output band pass filter select signal. Low : When frequencies 470 to 1027 MHz are displayed.
53	UHFC	Output band pass filter select signal. Low : When frequencies 330 to 470 MHz are displayed.
54	VHFC	Output band pass filter select signal. Low : When frequencies 118 to 175 MHz are displayed.
55	SHIFT	Outputs shift signal for the VCO shift switch (RF unit; Q29). High : Shift ON (380–550 MHz). Low : Shift OFF (274–380 MHz).
56	VVCO	Outputs control signal for the 1st VCO circuit.

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

Some adjustments must be adjusted on the adjustment mode after programmed adjustment frequency data into transceiver's memory channel. When you program adjustment frequency data into memory channel, an adjustment program, optional OPC-782 PLUG ADAPTOR CABLE and *OPC-478 are requird.

NOTE: *OPC-478 is a modified optional OPC-478 CLONING CABLE (see illustration at CLONING CABLE MODIFICATION on page 5-2).

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 3.0 V DC Current capacity : 1 A or more	DC voltmeter	Input impedance : 50 kΩ/V DC or better
RF power meter (terminated type)	Measuring range : 1 W Frequency range : 100–600 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
Frequency counter	Frequency range : 0.1–600 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Standard signal generator (SSG)	Frequency range : 0.1–300 MHz Output level : 0.1 µV–32 mV (–127 to –17 dBm)
FM deviation meter	Frequency range : 30–600 MHz Measuring range : 0 to ±10 kHz	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
		AC millivoltmeter	Measuring range : 10 mV–10 V
		Attenuator	Power attenuation : 30 or 40 dB

■ ADJUSTMENT FREQUENCY DATA

When program the adjustment frequency data (at right) into memory channel, back up the original memory data using the adjustment program, *OPC-478 and OPC-782, and re-program it after adjustment.

CAUTION: When program the adjustment frequency data into the transceiver, the transceiver's memory channel will be overwritten the data and deleted original memory data at the same time.

■ ENTERING THE ADJUSTMENT MODE

① Connect a PC with an OPC-478 and OPC-782 to the [SP/MIC] jack.

② Boot up DOS.

③ Type the following to start up the adjustment program:
A:\>**CLONE** [Enter]
- Main Menu appears at the top side of the cloning program, select the sub-menu "Edit"–"Adjust"–"Memory ch", then input adjustment frequency (at right).

④ Select "Write PC–> transceiv" of the Cloning on the Main Menu.
- Application writes adjustment frequency data to the connected transceiver.

⑤ Disconnect the cloning cable, then start the adjustments.

■ OPERATING ON THE ADJUSTMENT MODE

Change the value : [DIAL]
Change the channel [UP] : [BAND]
Change the channel [DOWN] : [BAND]

• ADJUSTMENT FREQUENCY

Channel No.	Frequency [MHz]		Display ch. No.
10	439.800		FR
11*1, *2	145.000	146.000	CA
12*1	435.000		CA
13*2	145.000	146.000	tk
14*2	435.000	445.000	tk
15	145.100		RS
16	435.100		RS
17	230.100		RS
18	851.100		RS
19	1280.100		RS

NOTE: Adjustment frequency data must be programmed into proper channels, don't turn the order of channels, otherwise adjustment value will be wrong.

*1 Europe and italy versions only.

*2 Depending on the versions.
Cannel 11: 145.000—[EUR]
146.000—[ITA]
Cannel 13: 145.000—[EUR], [TWN]
146.000—[ITA], [SEA], [USA], [USA-1]
Cannel 14: 435.000—[EUR], [ITA], [SEA], [TWN]
445.000—[USA], [USA-1]

■ EXITING THE ADJUSTMENT MODE

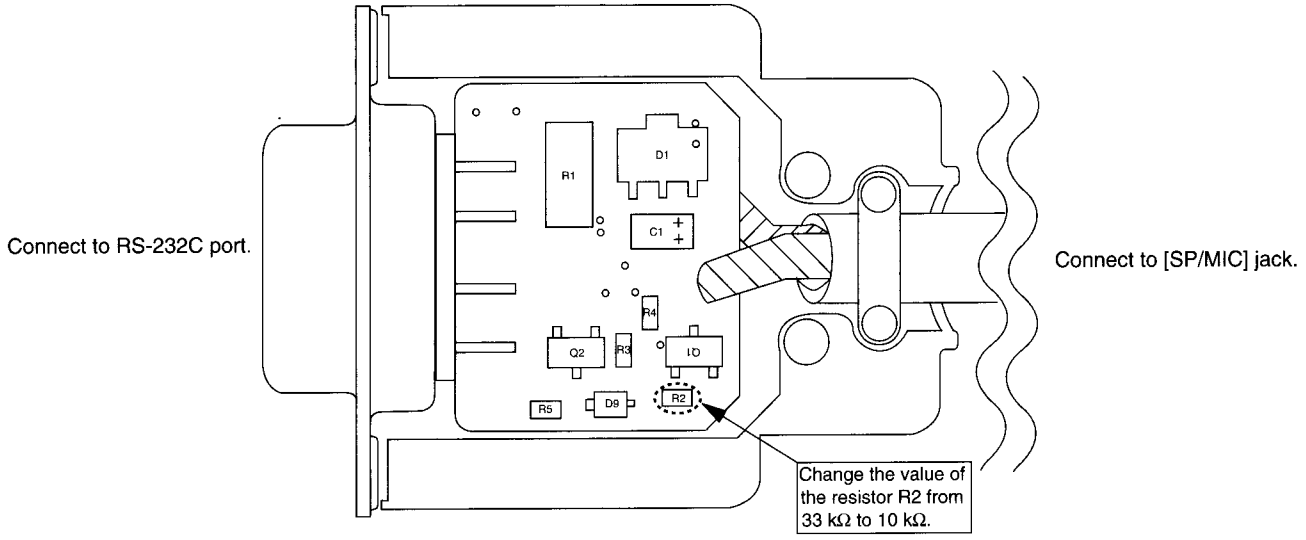
When the adjustment is finished, the transceiver must be cancelled adjustment mode to use normal operation, otherwise transceiver does not work properly.

① Turn power OFF.

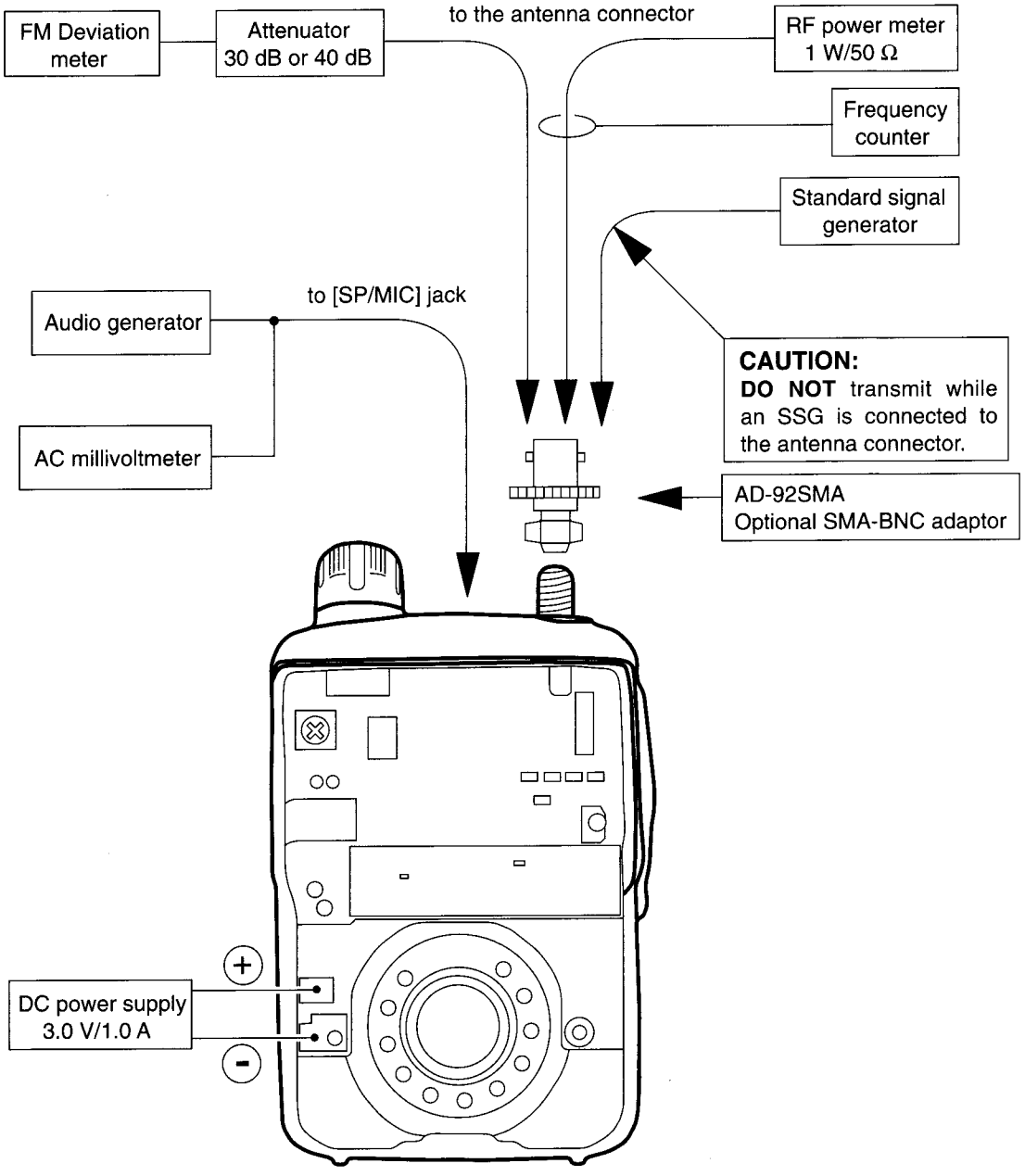
② Push and hold [FUNC] and [V/M], then turn power ON.

NOTE: All memory data except adjustment value will be cleared at this operation.

■ CLONING CABLE MODIFICATION



■ CONNECTION

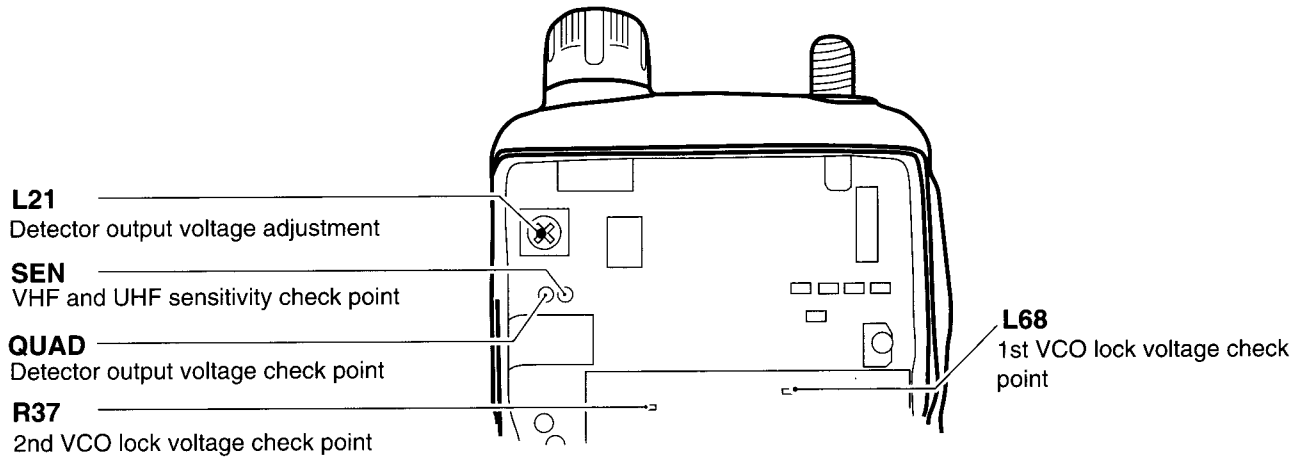


5-2 PLL ADJUSTMENT

1ST/2ND VCO LOCK VOLTAGE must be verified on the normal mode.

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
1ST VCO LOCK VOLTAGE (VVCO)	1	• Displayed frequency : 145.000 MHz • Transmitting	RF	Connect the DC voltmeter to the L68.	1.5 V – 2.5 V		Verify
	2	• Displayed frequency : 449.980 MHz • Receiving			less than 7.2 V		
(UVCO)	1	• Displayed frequency : 493.300 MHz • Receiving			1.9 V – 2.9 V		
	2	• Displayed frequency : 282.900 MHz • Receiving			less than 11.0 V		
	3	• Displayed frequency : 283.000 MHz • Receiving			1.8 V ± 2.8 V		
	4	• Displayed frequency : 493.295 MHz • Receiving			less than 9.2 V		
2ND VCO LOCK VOLTAGE	1	• Displayed frequency : 430.000 MHz • Receiving	RF	Connect the DC voltmeter to the R37.	0.2 V – 1.2 V		Verify
	2	• Displayed frequency : 433.500 MHz • Receiving			less than 2.5 V		
REFERENCE FREQUENCY	1	• Displayed frequency : (FR ch) 439.800 MHz • Transmitting	Top Pannel	Loosely couple the frequency counter to the antenna connector.	439.8000 MHz	LOGIC	[DIAL]
DETECTER OUTPUT VOLTAGE	1	• Displayed frequency : (tk ch) 145.600 MHz • Connect an SSG to the antenna connector and set as: Level : 1 mV* (–47dBm) Deviation : ± 3.5 kHz Modulation : 1 kHz • Receiving	RF	Connect a digital-voltmeter to the check point QUAD.	1.0 V	RF	L21

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



5-3 RECEIVER ADJUSTMENT

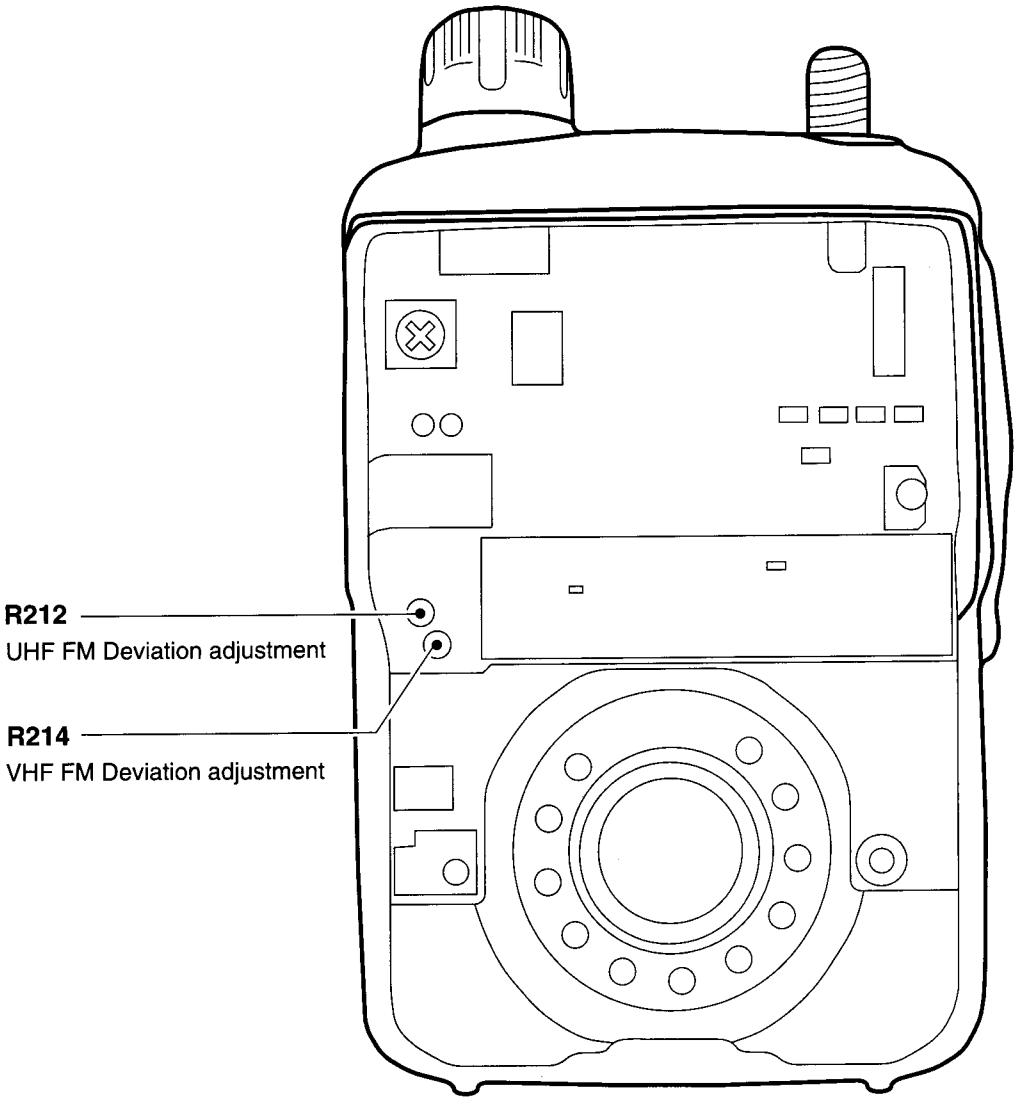
ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
RX SENSITIVITY (VHF)	1	• Displayed frequency : (tk ch) 145.600 MHz • Connect an SSG to the antenna connector and set as: Level : 1 μV* (–107 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	RF	Connect the DC voltmeter to the check point SEN.	Maximum DC voltage	LOGIC	[DIAL]
(UHF)	2	• Displayed frequency : (tk ch) 435.600 MHz • Receiving					
S-METER	1	• Displayed frequency : (RS ch) 145.100 MHz • Connect the SSG to the antenna connector and set as: Level : 0.4 μV* (– 115 dBm) Modulation : 1 kHz Deviation : ± 3.5 kHz • Receiving			Push and hold the [CALL] key. • Verify that S-Meter shows S4 (3dots).		
	2	• Displayed frequency : (RS ch) 435.100 MHz • Set the SSG as : Level : 0.5 μV* (– 113 dBm) • Receiving					
	3	• Displayed frequency : (RS ch) 230.100 MHz • Set the SSG as : Level : 0.5 μV* (– 113 dBm) • Receiving					
	4	• Displayed frequency : (RS ch) 851.100 MHz • Set the SSG as : Level : 0.5 μV* (– 113 dBm) • Receiving					
	5	• Displayed frequency : (RS ch) 1280.100 MHz • Set the SSG as : Level : 1 μV* (– 107 dBμ) • Receiving					

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

5-4 TRANSMITTER ADJUSTMENT

The following adjustment must be performed on the normal mode.

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
FM DEVIATION (VHF)	1	• Displayed frequency : 145.000 MHz [EUR], [TWN] 146.000 MHz [ITA], [SEA], [USA], [USA-1] • Connect the audio generator to the [SP/MIC] connector and set as: 50 mV/1.0 kHz. • Set the FM deviation meter as : HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	4.4 kHz	RF	R214
(UHF)	2	• Displayed frequency : 435.000 MHz [EUR], [TWN], [ITA], [SEA] 445.000 MHz [USA], [USA-1] • Transmitting					R212
TONE CALL DEVIATION (VHF) (EUR, ITA only)	1	• Displayed frequency : 145.000 MHz [EUR] 146.000 MHz [ITA] • Apply no audio signal to the [SP/MIC] connector. • Set an FM deviation meter as : HPF : OFF LPF : 3 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting	Top panel	Connect an FM deviation meter to the antenna connector though an attenuator.	3.5 kHz	LOGIC	[DIAL]
(UHF) (EUR, ITA only)	2	• Displayed frequency : 435.000 MHz [EUR], [ITA] • Transimitting					
CTCSS DEVIATION (VHF)	1	• Displayed frequency : 145.000MHz [EUR], [TWN] 146.000 MHz [ITA], [SEA], [USA], [USA-1] • Apply no audio signal to the [SP/MIC] connector. • Set an FM deviation meter as : HPF : OFF LPF : 3 kHz De-emphasis : OFF Detector : (P–P)/2 • CTCSS tone : 88.5 Hz • TONE : ON • Push [CALL] key while transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	0.5 kHz–1.0 kHz		Verify
(UHF)	2	• Displayed frequency : 435.000 MHz [EUR], [TWN], [ITA], [SEA] 445.000 MHz [USA], [USA-1] • Transmitting					


R212
UHF FM Deviation adjustment
R214
VHF FM Deviation adjustment

SECTION 6 PARTS LIST

[LOGIC UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
IC1	1130008970	S.IC	HD74LV00TELL
IC2	1140007660	S.IC	X25650-2.5
IC3	1180001820	S.IC	XC62FP3002MR
IC4	1180001720	S.IC	S-81332HG-KC-T1
IC5	1110004620	S.IC	S-80725SL-AN-T1
IC9	1110003800	S.IC	NJM2904V-TE1
IC10	1110004790	S.IC	XC6371A351PR
IC11	1140007470	S.IC	M38267M8L-209 GP
IC14	1110004520	S.IC	M5222FP 600C
IC15	1190000710	S.IC	TA31056F (TP1)
Q1	1530002280	S.TRANSISTOR	2SC4081 T107 S [EUR], [ITA] only
Q2	1590001210	S.TRANSISTOR	XP5601-(TX).AB
Q3	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q4	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q5	1590001810	S.TRANSISTOR	XP1113 (TX)
Q6	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q7	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q8	1590002430	S.TRANSISTOR	DTA144EE TL
Q10	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q11	1590002700	S.TRANSISTOR	XP4214 (TX)
Q12	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q13	1590002310	S.TRANSISTOR	DTC114EE TL
Q17	1590001390	S.FET	2SJ144-Y (TE85R)
Q18	1590002430	S.TRANSISTOR	DTA144EE TL
Q19	1590001940	S.TRANSISTOR	DTC144EE TL
Q21	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q23	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q24	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q26	1530002280	S.TRANSISTOR	2SC4081 T107 S
Q28	1590001160	S.TRANSISTOR	XP1401-(TX).AB
Q30	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q31	1530002280	S.TRANSISTOR	2SC4081 T107 S
Q32	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q35	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q36	1530002280	S.TRANSISTOR	2SC4081 T107 S
Q37	1590001390	S.FET	2SJ144-Y (TE85R)
Q38	1590001210	S.TRANSISTOR	XP5601-(TX).AB
Q39	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q40	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q41	1530003630	S.TRANSISTOR	2SC4617 TLS
D1	1790001250	S.DIODE	MA2S111-(TX)
D2	1790001170	S.ZENER	MA8068-M (TX)
D3	1790001560	S.DIODE	1SS372 (TE85R)
D4	1790000970	S.DIODE	MA729 (TX)
D5	1790001560	S.DIODE	1SS372 (TE85R)
D6	1790001250	S.DIODE	MA2S111-(TX) [TWN] only
D7	1790001250	S.DIODE	MA2S111-(TX) except [EUR], [TWN]
D8	1790001250	S.DIODE	MA2S111-(TX) [SEA] only
D9	1790001250	S.DIODE	MA2S111-(TX) except [ITA], [TWN]
D10	1790001250	S.DIODE	MA2S111-(TX) except [ITA], [SEA]
D11	1790001250	S.DIODE	MA2S111-(TX) except [ITA], [SEA]
D12	1790001250	S.DIODE	MA2S111-(TX) [TWN] only
D13	1790001250	S.DIODE	MA2S111-(TX) [USA] only
D14	1790001250	S.DIODE	MA2S111-(TX)
D15	1790001560	S.DIODE	1SS372 (TE85R)
D16	1790000850	S.DIODE	MA132WK (TX)
D17	1790001250	S.DIODE	MA2S111-(TX)
X1	6050010310	S.XTAL	CR-613 (4.935 MHz)
L1	6200008630	S.COIL	CD54-101KC
R1	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R3	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R5	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R6	7030007260	S.RESISTOR	ERJ2GEJ 330 X (33 Ω)
R8	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R9	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R11	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)

[LOGIC UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
R12	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R13	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R14	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R15	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 KΩ)
R16	7030005100	S.RESISTOR	ERJ2GEJ 154 X (150 kΩ)
R17	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R18	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R23	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R24	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R25	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R26	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R30	7030005720	S.RESISTOR	ERJ2GEJ 563 X (56 kΩ)
R32	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R33	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R34	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R35	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R37	7030005000	S.RESISTOR	ERJ2GEJ 471 X (470 Ω)
R38	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R39	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R40	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R41	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R42	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R48	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R49	7030005230	S.RESISTOR	ERJ2GEJ 334 X (330 kΩ)
R50	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R51	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R52	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R55	7030005720	S.RESISTOR	ERJ2GEJ 563 X (56 kΩ)
R56	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R57	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R58	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R59	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R60	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R61	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R67	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R68	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R69	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R70	7030005720	S.RESISTOR	ERJ2GEJ 563 X (56 kΩ)
R71	7030009290	S.RESISTOR	ERJ2GEJ 562 X (5.6 kΩ)
R72	7030005000	S.RESISTOR	ERJ2GEJ 471 X (470 Ω)
R73	7030005100	S.RESISTOR	ERJ2GEJ 154 X (150 kΩ)
R74	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R75	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R76	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R77	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R78	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R79	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R82	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R83	7030008310	S.RESISTOR	ERJ2GEJ 564 X (560 KΩ)
R84	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R86	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R87	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R88	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R89	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R90	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R91	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R92	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R93	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R94	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R95	7030005000	S.RESISTOR	ERJ2GEJ 471 X (470 Ω)
R98	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ) [EUR], [ITA] only
R100	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R101	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R102	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R103	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R107	7030009280	S.RESISTOR	ERJ2GE 391 X (390 Ω)
R108	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R109	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R112	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R113	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R114	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R116	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R117	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R118	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R119	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)

S.=Surface mount

[LOGIC UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
R120	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)
R121	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R122	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)
R123	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R124	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R125	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R126	7030008290	S.RESISTOR	ERJ2GEJ 183 X (18 KΩ)
R127	7030008290	S.RESISTOR	ERJ2GEJ 183 X (18 KΩ)
R128	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R129	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R130	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R132	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R133	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)
R136	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R137	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R138	7030009290	S.RESISTOR	ERJ2GEJ 562 X (5.6 kΩ)
R140	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)
R141	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ)
R144	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R145	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R146	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R147	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R149	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R150	7030009270	S.RESISTOR	ERJ2GEJ 821 X (820 Ω)
R153	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R156	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R157	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 kΩ)
R159	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R161	7030005210	S.RESISTOR	ERJ2GEJ 822 X (8.2 kΩ)
R162	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R163	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R164	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R165	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R166	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R169	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R171	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R172	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R173	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R174	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R175	7030009290	S.RESISTOR	ERJ2GEJ 562 X (5.6 kΩ)
R177	7030008300	S.RESISTOR	ERJ2GEJ 184 X (180 KΩ) [EUR], [ITA] only
R178	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ) [EUR], [ITA] only
R179	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R180	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R181	7030008010	S.RESISTOR	ERJ2GEJ 123X (12 kΩ)
R182	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R183	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R184	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R185	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R186	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R187	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
C1	4030014200	S.CERAMIC	ECUE1H101JCQ
C2	4030013900	S.CERAMIC	C1005 JB 1H 182K-T-N
C3	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C4	4550006760	S.TANTALUM	TEMSVB2 1A 336M-8R
C5	4030013850	S.CERAMIC	ECUE1E102KBQ
C6	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C7	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N [EUR], [ITA] only
C8	4030014120	S.CERAMIC	ECUE1H100CCQ
C9	4030014120	S.CERAMIC	ECUE1H100CCQ
C10	4030013910	S.CERAMIC	C1005 JB 1E 472K-T-N
C11	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C12	4030013950	S.CERAMIC	C1005 JB 1A 393K-T-N
C13	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C14	4030013890	S.CERAMIC	C1005 JB 1H 152K-T-N
C15	4550006670	S.TANTALUM	ECST1AD107R
C16	4030013850	S.CERAMIC	ECUE1E102KBQ
C17	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C18	4550003240	S.TANTALUM	TEMSVB 1E 335M-12L
C19	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C20	4030014200	S.CERAMIC	ECUE1H101JCQ
C21	4030014180	S.CERAMIC	ECUE1H470JCQ
C22	4030014180	S.CERAMIC	ECUE1H470JCQ
C23	4030014180	S.CERAMIC	ECUE1H470JCQ
C24	4550006200	S.TANTALUM	ECST0JY106R
C25	4030014210	S.CERAMIC	ECUE1H151JCQ
C26	4030014220	S.CERAMIC	ECUE1E471KBQ

[LOGIC UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
C27	4030014180	S.CERAMIC	ECUE1H470JCQ
C28	4030013930	S.CERAMIC	C1005 JB 1C 183K-T-N
C29	4030013920	S.CERAMIC	C1005 JB 1C 822K-T-N
C30	4030013850	S.CERAMIC	ECUE1E102KBQ
C31	4550006200	S.TANTALUM	ECST0JY106R
C32	4030013850	S.CERAMIC	ECUE1E102KBQ
C33	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C34	4550006320	S.TANTALUM	ECST0JY475R
C35	4030013850	S.CERAMIC	ECUE1E102KBQ
C36	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C37	4030013850	S.CERAMIC	ECUE1E102KBQ
C38	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C39	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C40	4030013850	S.CERAMIC	ECUE1E102KBQ
C41	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C42	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C43	4030013850	S.CERAMIC	ECUE1E102KBQ
C44	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C45	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C46	4550006200	S.TANTALUM	ECST0JY106R
C48	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C51	4030013850	S.CERAMIC	ECUE1E102KBQ
C52	4030013850	S.CERAMIC	ECUE1E102KBQ
C53	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C56	4030013850	S.CERAMIC	ECUE1E102KBQ
C57	4030013850	S.CERAMIC	ECUE1E102KBQ
C58	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C60	4550006690	S.TANTALUM	ECST1AC476R
C61	4550006550	S.TANTALUM	TEMSVD 0G 227M-12R
C62	4030013850	S.CERAMIC	ECUE1E102KBQ
C63	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C65	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C66	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C67	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C68	4030013930	S.CERAMIC	C1005 JB 1C 183K-T-N
C69	4030013910	S.CERAMIC	C1005 JB 1E 472K-T-N
C70	4030013910	S.CERAMIC	C1005 JB 1E 472K-T-N
C71	4030013880	S.CERAMIC	C1005 JB 1H 222K-T-N
C72	4030013910	S.CERAMIC	C1005 JB 1E 472K-T-N
C73	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C74	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C76	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C77	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C78	4030013960	S.CERAMIC	C1005 JB 1A 473K-T-N
C79	4030014200	S.CERAMIC	ECUE1H101JCQ
C80	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C81	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C82	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C85	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C86	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C87	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C88	4550006320	S.TANTALUM	ECST0JY475R
C89	4550006320	S.TANTALUM	ECST0JY475R
C90	4030013910	S.CERAMIC	C1005 JB 1E 472K-T-N
C91	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C92	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C93	4030013930	S.CERAMIC	C1005 JB 1C 183K-T-N
C94	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C96	4550006320	S.TANTALUM	ECST0JY475R
C97	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C98	4550006760	S.TANTALUM	TEMSVB2 1A 336M-8R
C99	4030014190	S.CERAMIC	ECUE1H680JCQ
C100	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C101	4030013850	S.CERAMIC	ECUE1E102KBQ
C102	4030014200	S.CERAMIC	ECUE1H101JCQ
C103	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C105	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N [EUR], [ITA] only
C106	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C107	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C108	4030013850	S.CERAMIC	ECUE1E102KBQ
C114	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C116	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C117	4550003220	S.TANTALUM	TEMSVA 1E 105M-8L
C118	4550006140	S.TANTALUM	ECST1EY474R
DS1	5040001760	S.LED	SEC 2422C
DS2	5040002230	S.LED	CL-200YG-C-TS
DS8	5030001610	LCD	DLC-7995YBGF

S.=Surface mount

[LOGIC UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
S8	2230000900	S.SWITCH	JPM1990-2013R
S9	2250000390	ENCODER	TP90N00E20-16F-1995
S10	2230000900	S.SWITCH	JPM1990-2013R
J1	6510020560	S.CONNECTOR	AXK5S40340P
J2	6450001910	CONNECTOR	HSJ1594-010050
W2	7030003860	S.JUMPER	ERJ3GE JPW V
W3	7030003860	S.JUMPER	ERJ3GE JPW V
W5	7030003860	S.JUMPER	ERJ3GE JPW V
WS1	8970023220	CABLE	FX1995 J lead set (1)/LO except [EUR], [ITA], [USA]
MC1	7700002310	MICROPHONE	EM-140
EP1	0910050820	PCB	B 5012J
EP2	8930046581	LCD CONTACT	SRCN-1995-SP-N-W-1
EP3	9001602001	TUBE	IRRAX 0.7(d) L=10mm
EP4	9036505001	TUBE	IRRAX 0.7(d) L=15mm

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
IC1	1110004020	S.IC	µPC2757T-E3
IC2	1110003200	S.IC	TA31136FN (EL)
IC3	1130007610	S.IC	µPD3140GS-E1 (DS8)
IC4	1110003470	S.IC	µPC2746T-E3
IC10	1110004020	S.IC	µPC2757T-E3
IC11	1130006890	S.IC	TC7S04FU (TE85R)
Q1	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q2	1560000540	S.FET	2SK880-Y (TE85R)
Q3	1590001660	S.TRANSISTOR	XP4312 (TX)
Q4	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q5	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q6	1530003610	S.TRANSISTOR	FH102-TL
Q9	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q10	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q11	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q12	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q13	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q14	1530003610	S.TRANSISTOR	FH102-TL
Q15	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q16	1590001400	S.TRANSISTOR	XP1214 (TX)
Q17	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q18	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q19	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q20	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q21	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q22	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q23	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q24	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q25	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q26	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q27	1590001160	S.TRANSISTOR	XP1401-(TX).AB
Q28	1530003260	S.TRANSISTOR	2SC5006-T1
Q29	1590001940	S.TRANSISTOR	DTC144EE TL
Q30	1530003260	S.TRANSISTOR	2SC5006-T1
Q31	1530003610	S.TRANSISTOR	FH102-TL
Q32	1530003610	S.TRANSISTOR	FH102-TL
Q33	1590001810	S.TRANSISTOR	XP1113 (TX)
Q35	1590002650	S.TRANSISTOR	UPA805T-T1
Q36	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q37	1530003630	S.TRANSISTOR	2SC4617 TLS
Q40	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q41	1590002430	S.TRANSISTOR	DTA144EE TL
Q42	1530003630	S.TRANSISTOR	2SC4617 TLS
Q43	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q44	1590001660	S.TRANSISTOR	XP4312 (TX)
Q45	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q46	1590001660	S.TRANSISTOR	XP4312 (TX)
Q47	1590001690	S.TRANSISTOR	UN9115 (TX)
Q501	1590002430	S.TRANSISTOR	DTA144EE TL

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
Q502	1590001810	S.TRANSISTOR	XP1113 (TX)
Q503	1590001810	S.TRANSISTOR	XP1113 (TX)
D1	1720000370	S.VARICAP	HVU350TRF
D2	1720000370	S.VARICAP	HVU350TRF
D3	1790001260	S.DIODE	MA2S077-(TX)
D4	1720000370	S.VARICAP	HVU350TRF
D5	1720000370	S.VARICAP	HVU350TRF
D6	1790001620	S.DIODE	ISV308 (TPL3)
D9	1790001620	S.DIODE	ISV308 (TPL3)
D11	1790001620	S.DIODE	ISV308 (TPL3)
D13	1790001620	S.DIODE	ISV308 (TPL3)
D15	1790001260	S.DIODE	MA2S077-(TX)
D16	1790001260	S.DIODE	MA2S077-(TX)
D17	1720000700	S.VARICAP	1SV305 (TPL3)
D18	1720000370	S.VARICAP	HVU350TRF
D20	1790001590	S.DIODE	MA6S718 (TX)
D21	1790001590	S.DIODE	MA6S718 (TX)
D23	1790001260	S.DIODE	MA2S077-(TX)
D25	1790001620	S.DIODE	ISV308 (TPL3)
D26	1790000850	S.DIODE	MA132WK (TX)
D27	1790001260	S.DIODE	MA2S077-(TX)
D28	1790001260	S.DIODE	MA2S077-(TX)
D29	1790001620	S.DIODE	ISV308 (TPL3)
D31	1790000850	S.DIODE	MA132WK (TX)
D32	1790001620	S.DIODE	ISV308 (TPL3)
D34	1790001620	S.DIODE	ISV308 (TPL3)
D36	1790001620	S.DIODE	ISV308 (TPL3)
D38	1790001250	S.DIODE	MA2S111-(TX)
D39	1790001250	S.DIODE	MA2S111-(TX)
D40	1790001620	S.DIODE	ISV308 (TPL3)
D42	1790001260	S.DIODE	MA2S077-(TX)
D43	1790001260	S.DIODE	MA2S077-(TX)
D44	1790001260	S.DIODE	MA2S077-(TX)
D45	1720000650	S.VARICAP	1SV286 (TPH3)
D46	1790001260	S.DIODE	MA2S077-(TX)
D47	1790001620	S.DIODE	ISV308 (TPL3)
D50	1790001620	S.DIODE	ISV308 (TPL3)
D52	1790001620	S.DIODE	ISV308 (TPL3)
D53	1790001250	S.DIODE	MA2S111-(TX)
D54	1720000650	S.VARICAP	1SV286 (TPH3)
D55	1790000850	S.DIODE	MA132WK (TX)
D56	1790000850	S.DIODE	MA132WK (TX)
D57	1790000660	S.DIODE	MA728 (TX)
D58	1790001260	S.DIODE	MA2S077-(TX)
D59	1790001260	S.DIODE	MA2S077-(TX)
D60	1790001260	S.DIODE	MA2S077-(TX)
D61	1790001260	S.DIODE	MA2S077-(TX)
D62	1790001260	S.DIODE	MA2S077-(TX)
D63	1790001260	S.DIODE	MA2S077-(TX)
D64	1790001260	S.DIODE	MA2S077-(TX)
D65	1790001260	S.DIODE	MA2S077-(TX)
FI1	2040001200	S.SAW	EFCH266MKQP1
FI2	2020001270	CERAMIC	CFWM450E
FI3	2010002280	S.MONOLITHIC	FL-293 (19.650 MHz)
X1	6050010210	S.XTAL	CR-593 (19.200 MHz)
L1	6200007740	S.COIL	LQN21A 47NJ04
L2	6200008580	S.COIL	0.30-1.4-6TL 32N
L3	6200008230	S.COIL	0.30-1.3-5TL 22N
L4	6200008210	S.COIL	0.45-1.5-5TL 23.2N
L5	6200008330	S.COIL	0.45-1.4-4TL 15N
L7	6200005700	S.COIL	ELJRE 22NG-F
L8	6200005630	S.COIL	ELJRE 5N6Z-F
L9	6200005720	S.COIL	ELJRE 33NG-F
L10	6200005700	S.COIL	ELJRE 22NG-F
L11	6200005610	S.COIL	ELJRE 3N9Z-F
L12	6200005660	S.COIL	ELJRE 10NG-F
L13	6200005620	S.COIL	ELJRE 4N7Z-F
L14	6200007750	S.COIL	LQN21A 56NJ04
L15	6200005730	S.COIL	ELJRE 39NG-F
L17	6200007170	S.COIL	MLF1608A 3R3K-T
L18	6200004480	S.COIL	MLF1608D R82K-T
L19	6200008210	S.COIL	0.45-1.5-5TL 23.2N
L20	6200005740	S.COIL	ELJRE 47NG-F
L21	6150004840	S.COIL	LS-510

S.=Surface mount

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
L22	6200007730	S.COIL	LQN21A 39NJ04
L23	6910011690	S.COIL	ACB1608M-600-T
L24	6200006990	S.COIL	ELJRE 56NG-F
L25	6200007000	S.COIL	ELJRE 82NG-F
L27	6200006980	S.COIL	ELJRE R10G-F
L28	6200008090	S.COIL	LQN21A 68NJ04
L29	6200004480	S.COIL	MLF1608D R82K-T
L30	6200004480	S.COIL	MLF1608D R82K-T
L31	6200007690	S.COIL	LQN21A 18NJ04
L32	6200004480	S.COIL	MLF1608D R82K-T
L33	6200008490	S.COIL	0.30-0.9-3TR 7.5N
L34	6910011690	S.COIL	ACB1608M-600-T
L36	6200005630	S.COIL	ELJRE 5N6Z-F
L37	6200005710	S.COIL	ELJRE 27NG-F
L38	6200008490	S.COIL	0.30-0.9-3TR 7.5N
L39	6200007730	S.COIL	LQN21A 39NJ04
L40	6200005630	S.COIL	ELJRE 5N6Z-F
L41	6200006980	S.COIL	ELJRE R10G-F
L42	6200005610	S.COIL	ELJRE 3N9Z-F
L43	6200006780	S.COIL	ELJRE 1N8Z-F
L44	6200006780	S.COIL	ELJRE 1N8Z-F
L45	6200007670	S.COIL	LQN21A 10NJ04
L47	6200004600	S.COIL	MLF1608D R15K-T
L50	6200005700	S.COIL	ELJRE 22NG-F
L51	6200005680	S.COIL	ELJRE 15NG-F
L52	6200005700	S.COIL	ELJRE 22NG-F
L53	6200005680	S.COIL	ELJRE 15NG-F
L54	6200005670	S.COIL	ELJRE 12NG-F
L55	6200005660	S.COIL	ELJRE 10NG-F
L56	6200005640	S.COIL	ELJRE 6N8Z-F
L57	6200008150	S.COIL	0.35-1.6-7TL 44N
L58	6200008260	S.COIL	0.30-1.7-8TL 60N
L59	6200008260	S.COIL	0.30-1.7-8TL 60N
L60	6200008570	S.COIL	LQN21A 6N8D04
L61	6200008570	S.COIL	LQN21A 6N8D04
L62	6200008510	S.COIL	0.30-0.9-4TR 10.5N
L63	6200008490	S.COIL	0.30-0.9-3TR 7.5N
L65	6200005680	S.COIL	ELJRE 15NG-F
L66	6200008260	S.COIL	0.30-1.7-8TL 60N
L68	6910011690	S.COIL	ACB1608M-600-T
L69	6200005700	S.COIL	ELJRE 22NG-F
L70	6200007770	S.COIL	LQN21A R10J04
L71	6200007790	S.COIL	LQN21A R15J04
L73	6200004730	S.COIL	MLF1608A 1R2K-T
L74	6200005730	S.COIL	ELJRE 39NG-F
L75	6200005700	S.COIL	ELJRE 22NG-F
L76	6200005610	S.COIL	ELJRE 3N9Z-F
L77	6200005650	S.COIL	ELJRE 8N2Z-F
L78	6200005710	S.COIL	ELJRE 27NG-F
L79	6200005700	S.COIL	ELJRE 22NG-F
L80	6200005630	S.COIL	ELJRE 5N6Z-F
R1	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R4	7030007570	S.RESISTOR	ERJ2GEJ 122 X (1.2 kΩ)
R5	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R6	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R7	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R8	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R9	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R10	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R11	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R12	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R13	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R14	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R15	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R16	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R17	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R18	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R19	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R20	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R21	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R22	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R23	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R24	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R25	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R26	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R27	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R28	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R29	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R30	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R31	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
R34	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R35	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R36	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R37	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R38	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R39	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R40	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R41	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R42	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R43	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R46	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R49	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R50	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R54	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R55	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R56	7030005000	S.RESISTOR	ERJ2GEJ 471 X (470 Ω)
R57	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R58	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R59	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R60	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R61	7030005230	S.RESISTOR	ERJ2GEJ 334 X (330 kΩ)
R62	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R64	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R65	7030009290	S.RESISTOR	ERJ2GEJ 562 X (5.6 kΩ)
R66	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R67	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R68	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R69	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R70	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R72	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R73	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R74	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R75	7030008290	S.RESISTOR	ERJ2GEJ 183 X (18 KΩ)
R76	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R78	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R79	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R81	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R82	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R84	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R85	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R86	7030008290	S.RESISTOR	ERJ2GEJ 183 X (18 KΩ)
R87	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R88	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R89	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R91	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R93	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R95	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R98	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R99	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R100	7030008010	S.RESISTOR	ERJ2GEJ 123X (12 kΩ)
R101	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R102	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R103	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R104	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R105	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R106	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R108	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R110	7030008010	S.RESISTOR	ERJ2GEJ 123X (12 kΩ)
R112	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R114	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R116	7030005100	S.RESISTOR	ERJ2GEJ 154 X (150 kΩ)
R120	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R121	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R123	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R124	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R125	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R126	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R127	7030005010	S.RESISTOR	ERJ2GEJ 681 X (680 Ω)
R128	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R129	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R130	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R131	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R132	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R133	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R134	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R135	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R137	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R138	7030005070	S.RESISTOR	ERJ2GEJ 683 X (68 kΩ)
R139	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R141	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R142	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R147	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)

S.=Surface mount

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
R151	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R152	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R154	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R155	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R156	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 KΩ)
R159	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R160	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 KΩ)
R161	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R162	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R163	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R169	7030005000	S.RESISTOR	ERJ2GEJ 471 X (470 Ω)
R170	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R171	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R172	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R174	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R176	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R177	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R178	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R179	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R181	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R182	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R183	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R184	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R186	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R187	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R188	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R194	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R196	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R197	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R198	7030005720	S.RESISTOR	ERJ2GEJ 563 X (56 kΩ)
R199	7030008010	S.RESISTOR	ERJ2GEJ 123 X (12 kΩ)
R200	7030009290	S.RESISTOR	ERJ2GEJ 562 X (5.6 kΩ)
R201	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R202	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R203	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R204	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R205	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R206	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R207	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R208	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R209	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R210	7030007260	S.RESISTOR	ERJ2GEJ 330 X (33 Ω)
R211	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R212	7310003630	S.TRIMMER	EVM-1XSX50 BQ4 (473 Ω)
R213	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R214	7310003630	S.TRIMMER	EVM-1XSX50 BQ4 (473 Ω)
R215	7030007260	S.RESISTOR	ERJ2GEJ 330 X (33 Ω)
R217	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R219	7030009530	S.RESISTOR	ERJ2GEJ 270 X (27 Ω)
R220	7030007570	S.RESISTOR	ERJ2GEJ 122X (1.2 kΩ)
R221	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R222	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R318	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R319	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R320	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
C1	4030014340	S.CERAMIC	ECUE1H390JCQ
C2	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C3	4030014120	S.CERAMIC	ECUE1H100CCQ
C4	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C5	4030014220	S.CERAMIC	ECUE1E471KBQ
C7	4030013850	S.CERAMIC	ECUE1E102KBQ
C8	4030014160	S.CERAMIC	ECUE1H270JCQ
C9	4030014030	S.CERAMIC	ECUE1H2R5BCQ
C10	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C11	4030014160	S.CERAMIC	ECUE1H270JCQ
C12	4030014180	S.CERAMIC	ECUE1H470JCQ
C13	4030014160	S.CERAMIC	ECUE1H270JCQ
C14	4030013850	S.CERAMIC	ECUE1E102KBQ
C15	4030013980	S.CERAMIC	ECUE1H010BCQ
C16	4030013850	S.CERAMIC	ECUE1E102KBQ
C18	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C19	4030014130	S.CERAMIC	ECUE1H120JCQ
C20	4030014170	S.CERAMIC	ECUE1H330JCQ
C21	4030014050	S.CERAMIC	ECUE1H030BCQ
C22	4030014100	S.CERAMIC	ECUE1H070CCQ
C23	4030014080	S.CERAMIC	ECUE1H050BCQ
C24	4030014100	S.CERAMIC	ECUE1H070CCQ
C25	4030013850	S.CERAMIC	ECUE1E102KBQ
C26	4030014220	S.CERAMIC	ECUE1E471KBQ
C27	4030013850	S.CERAMIC	ECUE1E102KBQ

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
C28	4030013850	S.CERAMIC	ECUE1E102KBQ
C30	4030013850	S.CERAMIC	ECUE1E102KBQ
C31	4030013850	S.CERAMIC	ECUE1E102KBQ
C32	4030013850	S.CERAMIC	ECUE1E102KBQ
C33	4030014120	S.CERAMIC	ECUE1H100CCQ
C35	4030014120	S.CERAMIC	ECUE1H100CCQ
C36	4030014080	S.CERAMIC	ECUE1H050BCQ
C37	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C38	4030014020	S.CERAMIC	ECUE1H020BCQ
C39	4030014020	S.CERAMIC	ECUE1H020BCQ
C40	4030014140	S.CERAMIC	ECUE1H150JCQ
C41	4030014080	S.CERAMIC	ECUE1H050BCQ
C42	4030014100	S.CERAMIC	ECUE1H070CCQ
C43	4030013850	S.CERAMIC	ECUE1E102KBQ
C44	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C45	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C46	4030014050	S.CERAMIC	ECUE1H030BCQ
C47	4030013980	S.CERAMIC	ECUE1H010BCQ
C48	4030014070	S.CERAMIC	ECUE1H040BCQ
C49	4030014050	S.CERAMIC	ECUE1H030BCQ
C50	4030013980	S.CERAMIC	ECUE1H010BCQ
C51	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C52	4030014220	S.CERAMIC	ECUE1E471KBQ
C54	4030013850	S.CERAMIC	ECUE1E102KBQ
C55	4030013850	S.CERAMIC	ECUE1E102KBQ
C56	4030013850	S.CERAMIC	ECUE1E102KBQ
C58	4030013850	S.CERAMIC	ECUE1E102KBQ
C59	4030014020	S.CERAMIC	ECUE1H020BCQ
C60	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C61	4030013850	S.CERAMIC	ECUE1E102KBQ
C62	4550006200	S.TANTALUM	ECST0JY106R
C63	4030014210	S.CERAMIC	ECUE1H151JCQ
C64	4030014140	S.CERAMIC	ECUE1H150JCQ
C65	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C66	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C67	4030014170	S.CERAMIC	ECUE1H330JCQ
C69	4030013850	S.CERAMIC	ECUE1E102KBQ
C70	4030013850	S.CERAMIC	ECUE1E102KBQ
C71	4030014070	S.CERAMIC	ECUE1H040BCQ
C73	4030013850	S.CERAMIC	ECUE1E102KBQ
C74	4030013850	S.CERAMIC	ECUE1E102KBQ
C75	4030013850	S.CERAMIC	ECUE1E102KBQ
C76	4030014220	S.CERAMIC	ECUE1E471KBQ
C77	4030014340	S.CERAMIC	ECUE1H390JCQ
C78	4550006910	S.TANTALUM	TESVSP 1C 334M-8R
C79	4030013850	S.CERAMIC	ECUE1E102KBQ
C80	4030014180	S.CERAMIC	ECUE1H470JCQ
C81	4030013850	S.CERAMIC	ECUE1E102KBQ
C82	4550006200	S.TANTALUM	ECST0JY106R
C84	4030013850	S.CERAMIC	ECUE1E102KBQ
C85	4030014240	S.CERAMIC	ECUE1H180JCQ
C86	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C87	4030014180	S.CERAMIC	ECUE1H470JCQ
C88	4030014180	S.CERAMIC	ECUE1H470JCQ
C89	4030014180	S.CERAMIC	ECUE1H470JCQ
C90	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C92	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C93	4030013850	S.CERAMIC	ECUE1E102KBQ
C94	4030013850	S.CERAMIC	ECUE1E102KBQ
C95	4030013850	S.CERAMIC	ECUE1E102KBQ
C96	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C97	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C98	4030014230	S.CERAMIC	ECUE1E681KBQ
C99	4030014230	S.CERAMIC	ECUE1E681KBQ
C100	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C101	4030014120	S.CERAMIC	ECUE1H100CCQ
C102	4030013850	S.CERAMIC	ECUE1E102KBQ
C103	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C104	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C105	4550003220	S.TANTALUM	TEMSVA 1E 105M-8L
C106	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C107	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C108	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C109	4030013850	S.CERAMIC	ECUE1E102KBQ
C110	4030014120	S.CERAMIC	ECUE1H100CCQ
C111	4030014120	S.CERAMIC	ECUE1H100CCQ
C112	4030013850	S.CERAMIC	ECUE1E102KBQ
C113	4030013850	S.CERAMIC	ECUE1E102KBQ
C115	4030014140	S.CERAMIC	ECUE1H150JCQ
C116	4030013850	S.CERAMIC	ECUE1E102KBQ
C117	4030014080	S.CERAMIC	ECUE1H050BCQ
C118	4030013850	S.CERAMIC	ECUE1E102KBQ

S.=Surface mount

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
C119	4030013850	S.CERAMIC	ECUE1E102KBQ
C121	4030013850	S.CERAMIC	ECUE1E102KBQ
C123	4030013850	S.CERAMIC	ECUE1E102KBQ
C124	4030013850	S.CERAMIC	ECUE1E102KBQ
C125	4030013850	S.CERAMIC	ECUE1E102KBQ
C126	4030014090	S.CERAMIC	ECUE1H060CCQ
C127	4030014090	S.CERAMIC	ECUE1H060CCQ
C128	4030013850	S.CERAMIC	ECUE1E102KBQ
C129	4030013850	S.CERAMIC	ECUE1E102KBQ
C131	4030014080	S.CERAMIC	ECUE1H050BCQ
C132	4030014220	S.CERAMIC	ECUE1E471KBQ
C133	4030014220	S.CERAMIC	ECUE1E471KBQ
C134	4030013850	S.CERAMIC	ECUE1E102KBQ
C135	4030013850	S.CERAMIC	ECUE1E102KBQ
C136	4030014100	S.CERAMIC	ECUE1H070CCQ
C138	4030014220	S.CERAMIC	ECUE1E471KBQ
C139	4030014080	S.CERAMIC	ECUE1H050BCQ
C141	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C142	4030013850	S.CERAMIC	ECUE1E102KBQ
C145	4030014220	S.CERAMIC	ECUE1E471KBQ
C147	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C148	4030014220	S.CERAMIC	ECUE1E471KBQ
C150	4030013850	S.CERAMIC	ECUE1E102KBQ
C151	4030014070	S.CERAMIC	ECUE1H040BCQ
C153	4030013850	S.CERAMIC	ECUE1E102KBQ
C154	4030014120	S.CERAMIC	ECUE1H100CCQ
C155	4030014080	S.CERAMIC	ECUE1H050BCQ
C156	4030014420	S.CERAMIC	ECUE1H0R5BCQ
C157	4030013850	S.CERAMIC	ECUE1E102KBQ
C158	4030013850	S.CERAMIC	ECUE1E102KBQ
C160	4030013850	S.CERAMIC	ECUE1E102KBQ
C162	4550006200	S.TANTALUM	ECST0JY106R
C163	4030013850	S.CERAMIC	ECUE1E102KBQ
C164	4030013850	S.CERAMIC	ECUE1E102KBQ
C165	4030014020	S.CERAMIC	ECUE1H020BCQ
C166	4030013850	S.CERAMIC	ECUE1E102KBQ
C167	4030013850	S.CERAMIC	ECUE1E102KBQ
C168	4030013850	S.CERAMIC	ECUE1E102KBQ
C169	4030013850	S.CERAMIC	ECUE1E102KBQ
C170	4030013850	S.CERAMIC	ECUE1E102KBQ
C171	4030013850	S.CERAMIC	ECUE1E102KBQ
C172	4030013850	S.CERAMIC	ECUE1E102KBQ
C173	4030013850	S.CERAMIC	ECUE1E102KBQ
C174	4030014120	S.CERAMIC	ECUE1H100CCQ
C175	4030013850	S.CERAMIC	ECUE1E102KBQ
C176	4030014240	S.CERAMIC	ECUE1H180JCQ
C177	4030013850	S.CERAMIC	ECUE1E102KBQ
C178	4030013850	S.CERAMIC	ECUE1E102KBQ
C179	4030013850	S.CERAMIC	ECUE1E102KBQ
C180	4030013850	S.CERAMIC	ECUE1E102KBQ
C181	4030014140	S.CERAMIC	ECUE1H150JCQ
C182	4030013850	S.CERAMIC	ECUE1E102KBQ
C183	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C184	4030013850	S.CERAMIC	ECUE1E102KBQ
C185	4030014150	S.CERAMIC	ECUE1H220JCQ
C186	4030013850	S.CERAMIC	ECUE1E102KBQ
C188	4030013850	S.CERAMIC	ECUE1E102KBQ
C190	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C191	4030014020	S.CERAMIC	ECUE1H020BCQ
C192	4030014070	S.CERAMIC	ECUE1H040BCQ
C193	4030014110	S.CERAMIC	ECUE1H080CCQ
C194	4030014150	S.CERAMIC	ECUE1H220JCQ
C195	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C196	4030014020	S.CERAMIC	ECUE1H020BCQ
C197	4030014060	S.CERAMIC	ECUE1H3R5BCQ
C198	4030014090	S.CERAMIC	ECUE1H060CCQ
C199	4030014130	S.CERAMIC	ECUE1H120JCQ
C200	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C206	4030014060	S.CERAMIC	ECUE1H3R5BCQ
C207	4030014170	S.CERAMIC	ECUE1H330JCQ
C208	4030014180	S.CERAMIC	ECUE1H470JCQ
C209	4030013850	S.CERAMIC	ECUE1E102KBQ
C210	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C211	4030013850	S.CERAMIC	ECUE1E102KBQ
C213	4030013850	S.CERAMIC	ECUE1E102KBQ
C214	4030013850	S.CERAMIC	ECUE1E102KBQ
C215	4030013850	S.CERAMIC	ECUE1E102KBQ
C216	4030014130	S.CERAMIC	ECUE1H120JCQ
C218	4030014020	S.CERAMIC	ECUE1H020BCQ
C219	4030013850	S.CERAMIC	ECUE1E102KBQ
C220	4030013850	S.CERAMIC	ECUE1E102KBQ
C221	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C222	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A

[RF UNIT]

REF NO.	ORDE NO.	DESCRIPTION	
C223	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C224	4030013850	S.CERAMIC	ECUE1E102KBQ
C225	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C226	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C227	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C228	4030013960	S.CERAMIC	C1005 JB 1A 473K-T-N
C233	4030013850	S.CERAMIC	ECUE1E102KBQ
C234	4030013850	S.CERAMIC	ECUE1E102KBQ
C235	4030013850	S.CERAMIC	ECUE1E102KBQ
C236	4030013850	S.CERAMIC	ECUE1E102KBQ
C237	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C239	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C240	4030014080	S.CERAMIC	ECUE1H050BCQ
C241	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C242	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C243	4030014240	S.CERAMIC	ECUE1H180JCQ
C244	4030014080	S.CERAMIC	ECUE1H050BCQ
C247	4030014090	S.CERAMIC	ECUE1H060CCQ
C248	4550003220	S.TANTALUM	TEMSVA 1E 105M-8L
C249	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C250	4030014110	S.CERAMIC	ECUE1H080CCQ
C251	4030014070	S.CERAMIC	ECUE1H040BCQ
C252	4030014110	S.CERAMIC	ECUE1H080CCQ
C253	4030014340	S.CERAMIC	ECUE1H390JCQ
C254	4030013850	S.CERAMIC	ECUE1E102KBQ
C255	4030013850	S.CERAMIC	ECUE1E102KBQ
C256	4030013850	S.CERAMIC	ECUE1E102KBQ
C257	4030013850	S.CERAMIC	ECUE1E102KBQ
C258	4030013850	S.CERAMIC	ECUE1E102KBQ
C259	4030014200	S.CERAMIC	ECUE1H101JCQ
C261	4030013850	S.CERAMIC	ECUE1E102KBQ
C262	4030013850	S.CERAMIC	ECUE1E102KBQ
C263	4030013850	S.CERAMIC	ECUE1E102KBQ
C264	4030013850	S.CERAMIC	ECUE1E102KBQ
C265	4030013850	S.CERAMIC	ECUE1E102KBQ
C266	4030014050	S.CERAMIC	ECUE1H030BCQ
C267	4030014240	S.CERAMIC	ECUE1H180JCQ
C268	4030014150	S.CERAMIC	ECUE1H220JCQ
C269	4030014130	S.CERAMIC	ECUE1H120JCQ
C270	4030014060	S.CERAMIC	ECUE1H3R5BCQ
C271	4030014120	S.CERAMIC	ECUE1H100CCQ
C401	4030014180	S.CERAMIC	ECUE1H470JCQ
C402	4030014180	S.CERAMIC	ECUE1H470JCQ
C406	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C409	4030013850	S.CERAMIC	ECUE1E102KBQ
C410	4030013850	S.CERAMIC	ECUE1E102KBQ
C414	4030013850	S.CERAMIC	ECUE1E102KBQ
C416	4030014160	S.CERAMIC	ECUE1H270JCQ
C423	4550003220	S.TANTALUM	TEMSVA 1E 105M-8L
C424	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C427	4030014350	S.CERAMIC	ECUE1H560JCQ
C429	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C430	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C431	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C432	4030013850	S.CERAMIC	ECUE1E102KBQ
C433	4030013850	S.CERAMIC	ECUE1E102KBQ
C434	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C435	4030013980	S.CERAMIC	ECUE1H010BCQ
C436	4030014070	S.CERAMIC	ECUE1H040BCQ
C437	4030013850	S.CERAMIC	ECUE1E102KBQ
C503	4030013850	S.CERAMIC	ECUE1E102KBQ
C504	4030013850	S.CERAMIC	ECUE1E102KBQ
C505	4030013850	S.CERAMIC	ECUE1E102KBQ
C507	4030014210	S.CERAMIC	ECUE1H151JCQ
C508	4030013850	S.CERAMIC	ECUE1E102KBQ
C509	4030013850	S.CERAMIC	ECUE1E102KBQ
C510	4030014020	S.CERAMIC	ECUE1H020BCQ
C553	4030013850	S.CERAMIC	ECUE1E102KBQ
C601	4030014110	S.CERAMIC	ECUE1H080CCQ
C602	4030014110	S.CERAMIC	ECUE1H080CCQ
C603	4030013980	S.CERAMIC	ECUE1H010BCQ
C604	4030014020	S.CERAMIC	ECUE1H020BCQ
J1	6510020550	S.CONNECTOR	AXK6S40445P
W1	7120000380	JUMPER	JPW 01 R-01
W2	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910050476	PCB	B 5171F
EP2	9029703901	TUBE	IRRAX 0.7(d) L=5mm

S.=Surface mount

SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

7-1 CABINET PARTS

[CHASSIS PARTS]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
J1	6510020950	Connector SMA-R226	1
SP1	2510000960	Speaker K036NA500-26A27	1
MP1	8210015650	1995 Front panel (A)	1
	8210015660	1995 Front panel (B)	1
MP2	8210014981	1995 Rear panel-1	1
MP3	8110006280	1995 BATT cover	1
MP4	8930044211	1995 7-Key-1	1
MP5	8930046410	1995 PTT rubber	1
MP6	8930044181	1995 Jack cap-1	1
MP7	8310041810	1995 Window plate	1
MP8	8010017352	1995 Chassis-2	1
MP9	8930011900	Sheet SP net (A)	1
MP10	8830000570	Screw (A)	1
MP11	8830001090	Screw (D)	1
MP13	8110006290	1995 Lock cover	1
MP14	8610010520	Knob N-262	1
MP15	8930044250	1995 BATT seal	1
MP22	8810009790	Screw PH B0 1.7X4NI-ZU (BT)	3
MP23	8810009560	Screw PH B0 2X6ZK (BT)	2
MP27	8930047470	1995 Mic Sheet	1
MP28	8930043440	Sponge (EY)	1

[LOGIC UNIT]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
DS8	5030001610	LCD DLC-7995	1
EP2	8930046581	LCD Contact	1
MP1	8930044290	1995 LCD Holder	1
MP2	8930046400	1995 LCD Sheet	1
MP3	8210015420	1995 Reflector	1
MP4	8810009790	Screw PH B0 1.7X4NI-ZU (BT)	2
MP5	8510011830	1995 LOGIC Shield	1

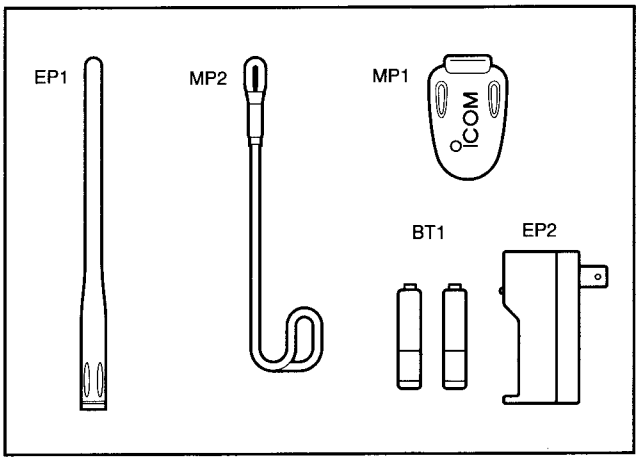
[RF UNIT]

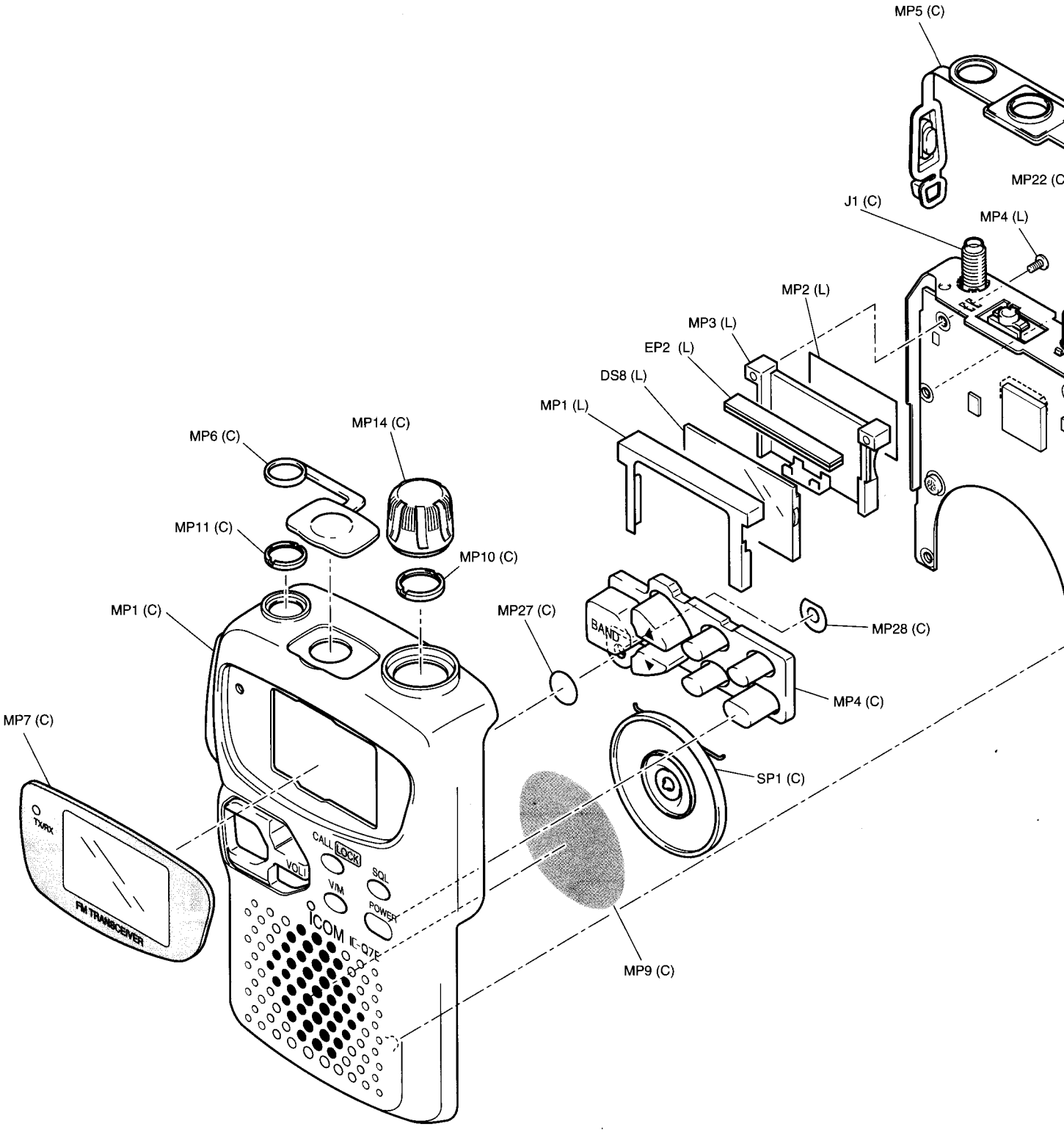
REF. NO.	ODER NO.	DESCRIPTION	QTY.
J1	6510020550	S.Connector AXK6S40445P	1

Screw abbreviations A, B0, BT: Self-tapping
PH: Pan head
FH: Flat head
BiH: Bind head
NI: Nickel
SUS: Stainless
ZK: Black

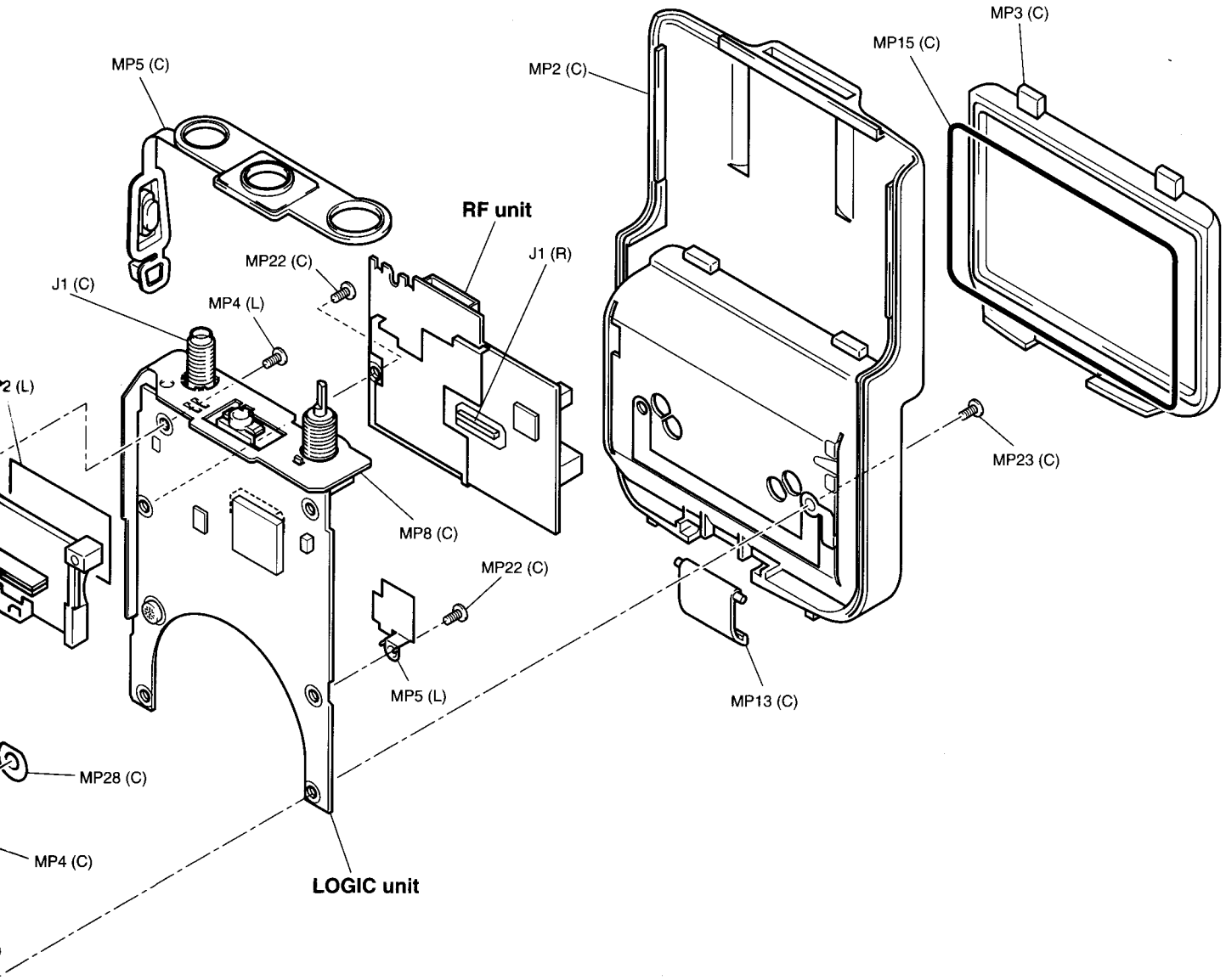
[ACCESSORIES]

REF. NO.	ODER NO.	DESCRIPTION		QTY.
BT1	3030000420	KR0.7 AAUR SAFT	[USA], [USA-1] only	2
EP1	3310002150	Antenna FA-S270C		1
EP2	0800005090	BC-127A ACC	[USA], [USA-1] only	1
MP1	8930044191	Clip 1995 Belt Clip-1		1
MP2	8010011960	Hand strap		1



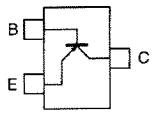
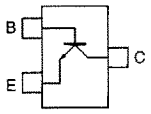
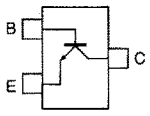
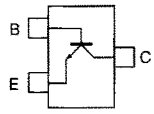
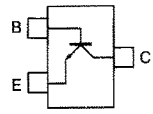
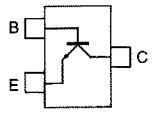
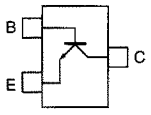
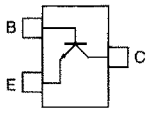
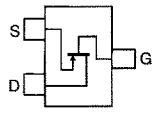
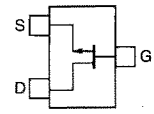
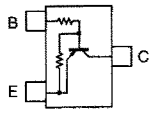
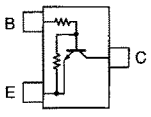
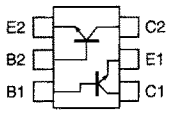
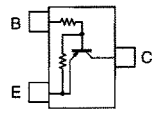
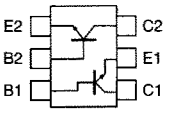
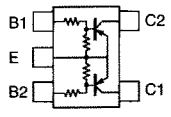
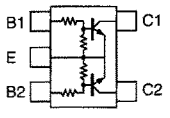
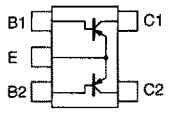
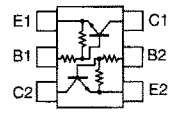
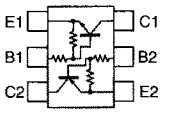
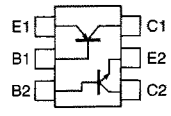
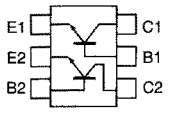


UNIT abbreviation (C): CHASSIS PARTS, (R): RF UNIT, (L): LOGIC UNIT

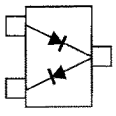
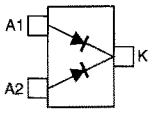
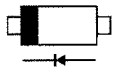
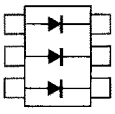
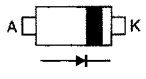
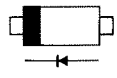
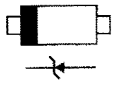


SECTION 8 SEMI-CONDUCTOR INFORMATION

• TRANSISTOR AND FET'S

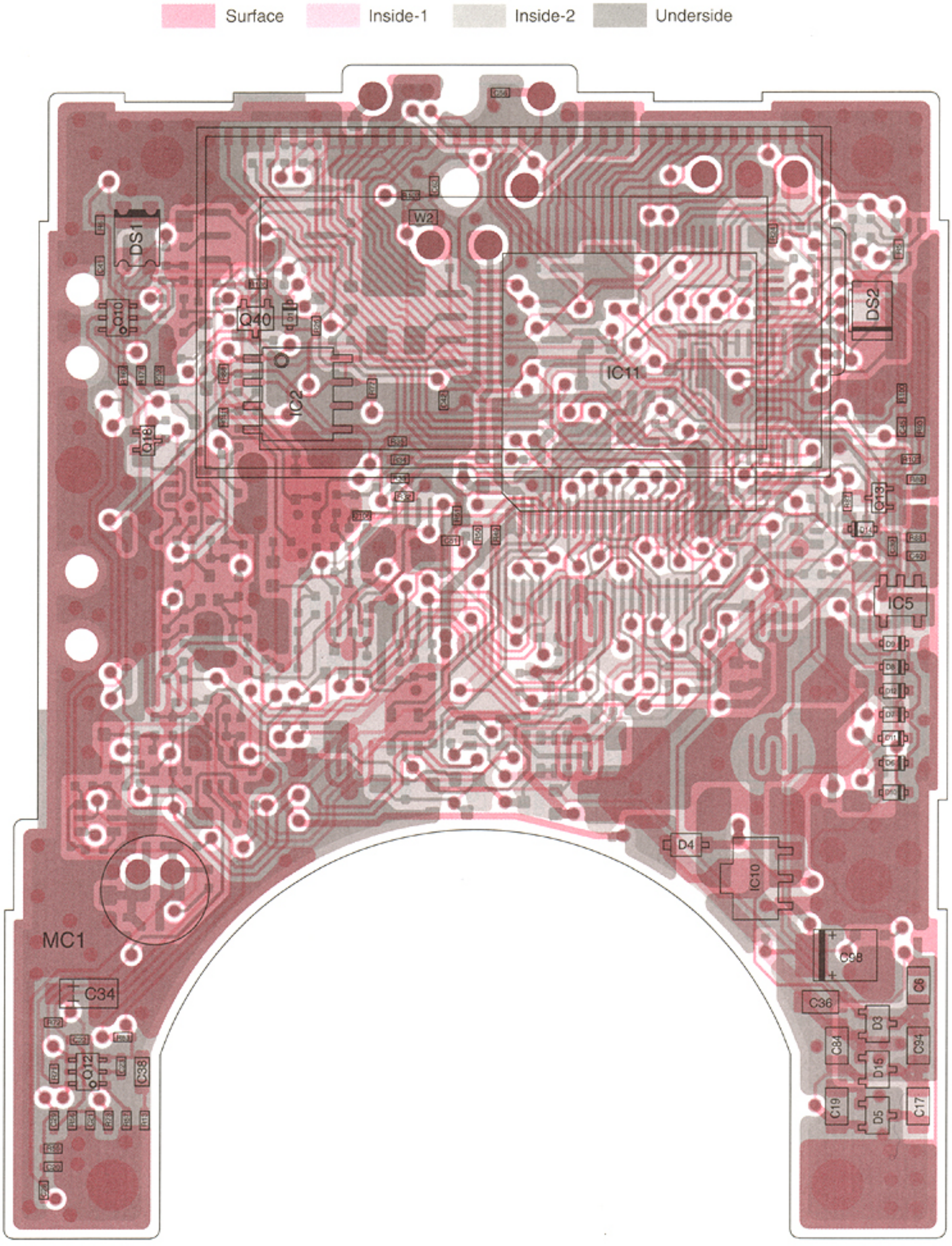
2SA1588 GR (Symbol: ZG) 	**2SC3356 R25** (Symbol: R25) 	**2SC4081 S** (Symbol: BS) 	**2SC4117 GR** (Symbol: DG) 	**2SC4617 S** (Symbol: BR) 
2SC5006 (Symbol: 24) 	**2SC5231 C8** (Symbol: C8) 	**2SC5277 D2** (Symbol: D2) 	**2SJ144 Y** (Symbol: VX) 	**2SK880 Y** (Symbol: XY) 
DTA144EE (Symbol: 16) 	**DTC144EE** (Symbol: 26) 	**FH102** (Symbol: 102) 	**UN9115** (Symbol: 6A) 	**µPA805 T** (Symbol: T82) 
XP1113 (Symbol: 7L) 	**XP1214** (Symbol: 9H) 	**XP1401 AB** (Symbol: 5V) 	**XP4214** (Symbol: BR) 	**XP4312** (Symbol: 7T) 
XP5601 AB (Symbol: 4N) 	**XP6501 AB** (Symbol: 5N) 			

• DIODES

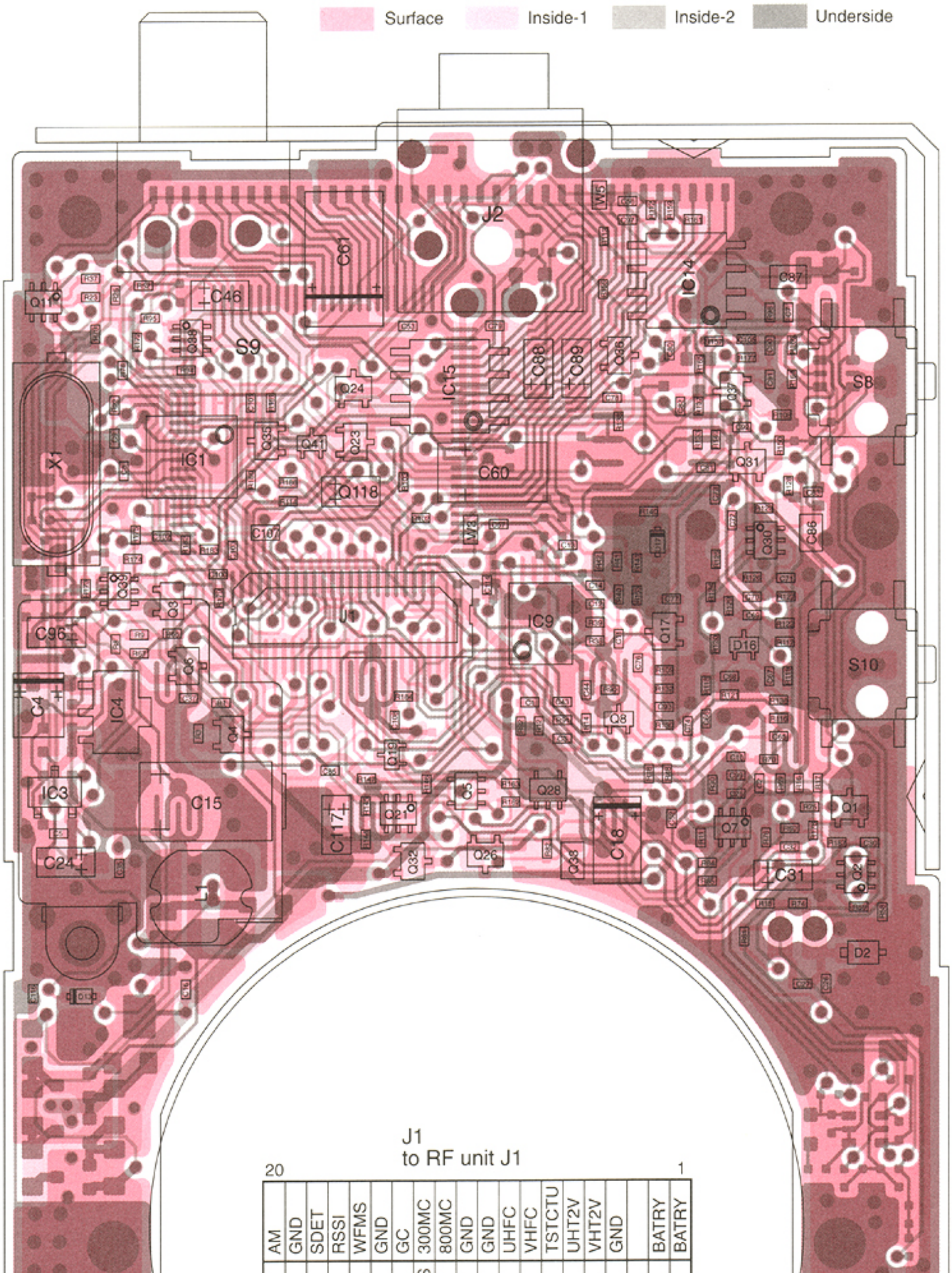
1SS372 (Symbol: N9) 	**1SV286** (Symbol: T7) 	**1SV308** (Symbol: TX) 	**HVU350** (Symbol: 4) 	**MA132WK** (Symbol: MU) 
MA2S077 (Symbol: S) 	**MA2S111** (Symbol: A) 	**MA6S718** (Symbol: M2N) 	**MA728** (Symbol: 2A) 	**MA729** (Symbol: 2B) 
MA8068 M (Symbol: 6^8) 				

SECTION 9 BOARD LAYOUTS

9 - 1 LOGIC UNIT
• TOP VIEW



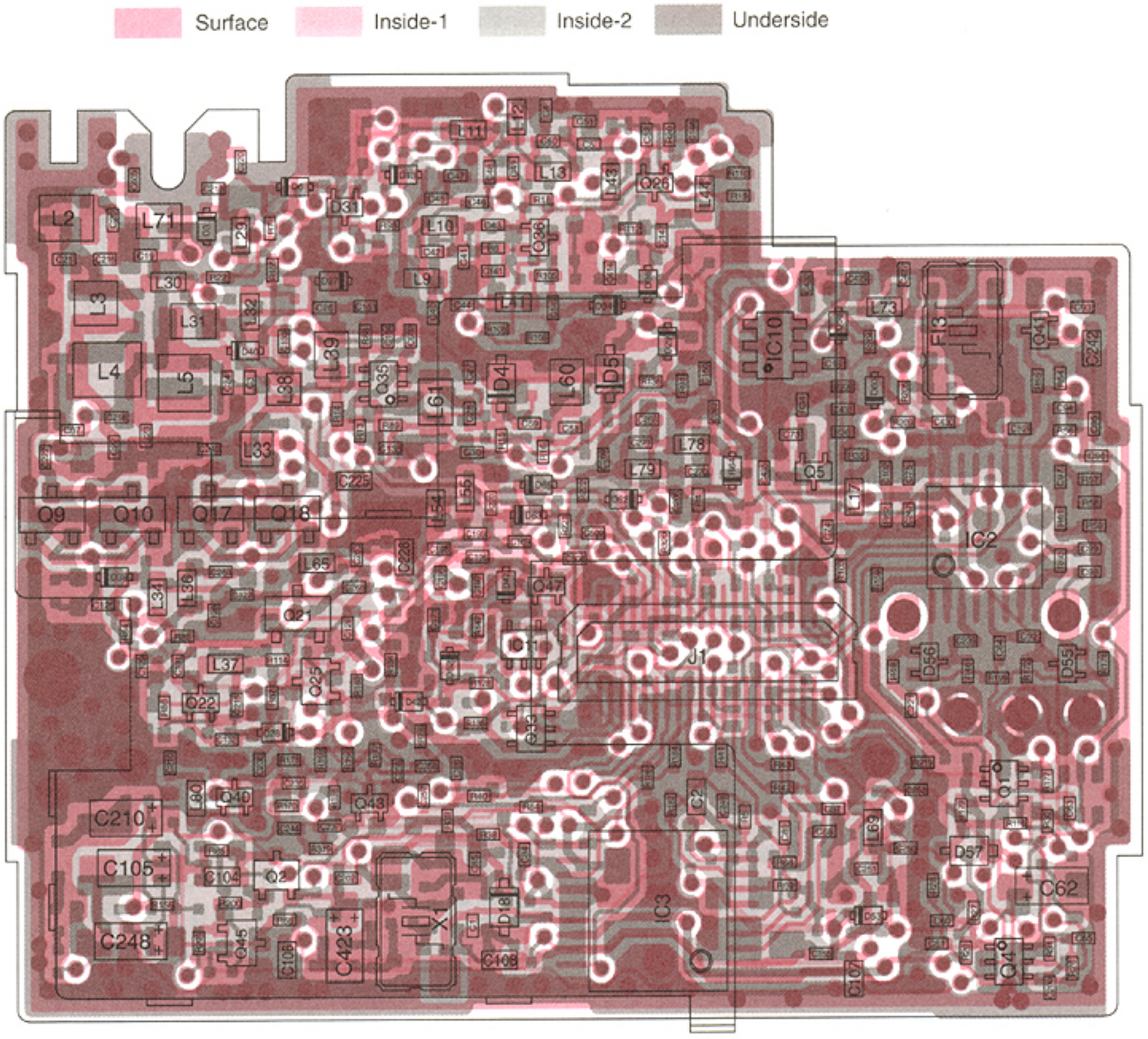
• BOTTOM VIEW



J1
to RF unit J1

20																			1
WFM	AMS	R3V	FSET	+3V	GND	PSTB	PCK_IS	PDAUL	VP	+3S	GND	UVCO	VVCO	SHIFT	MOD	DBL1	DBL2	GND	GND
AM	GND	SDET	RSSI	WFMS	GND	GC	300MC	800MC	GND	GND	UHFC	VHFC	TSTCTU	UHT2V	VHT2V	GND		BATRY	BATRY
21																			40

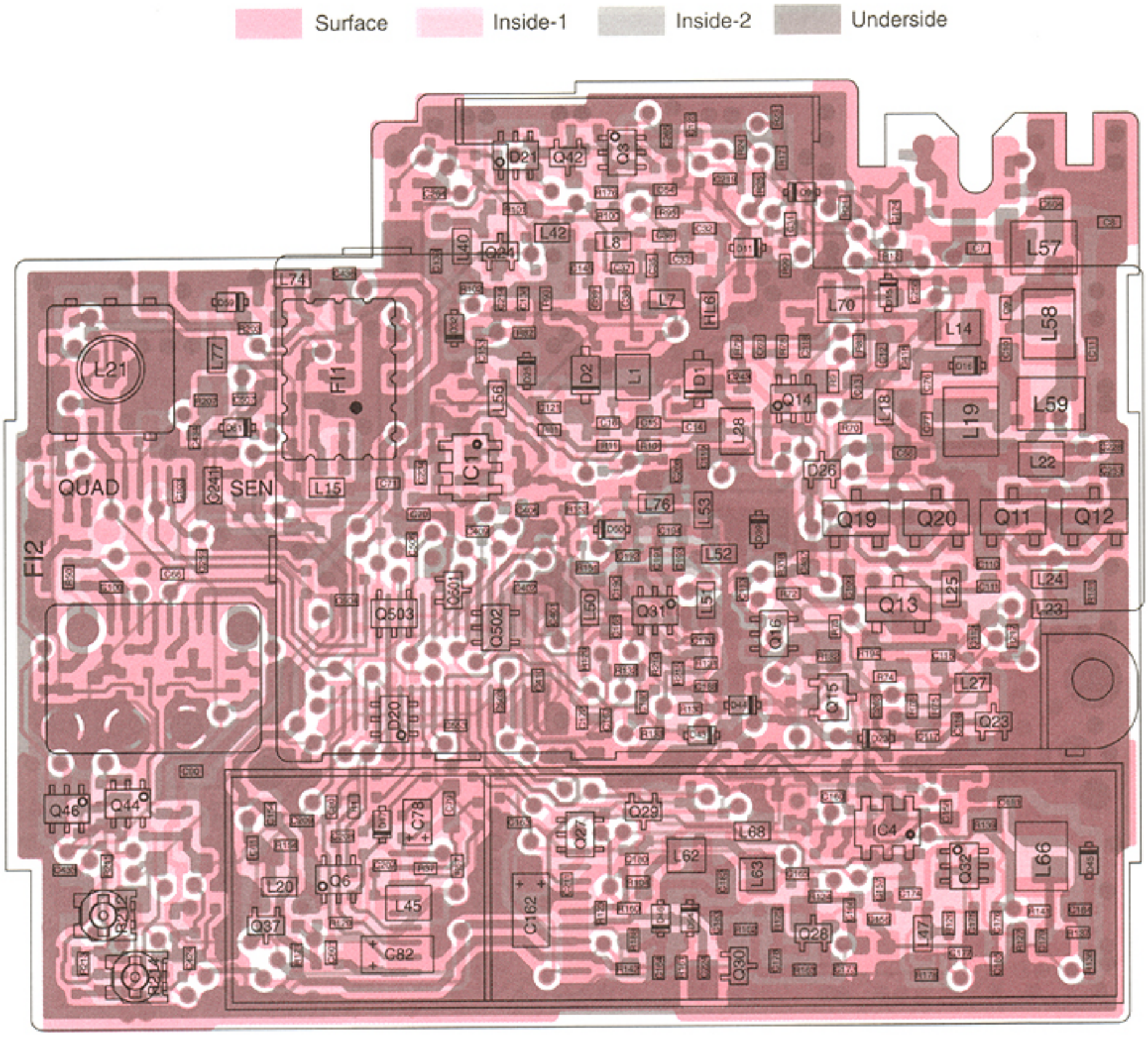
9 - 2 RF UNIT
• TOP VIEW



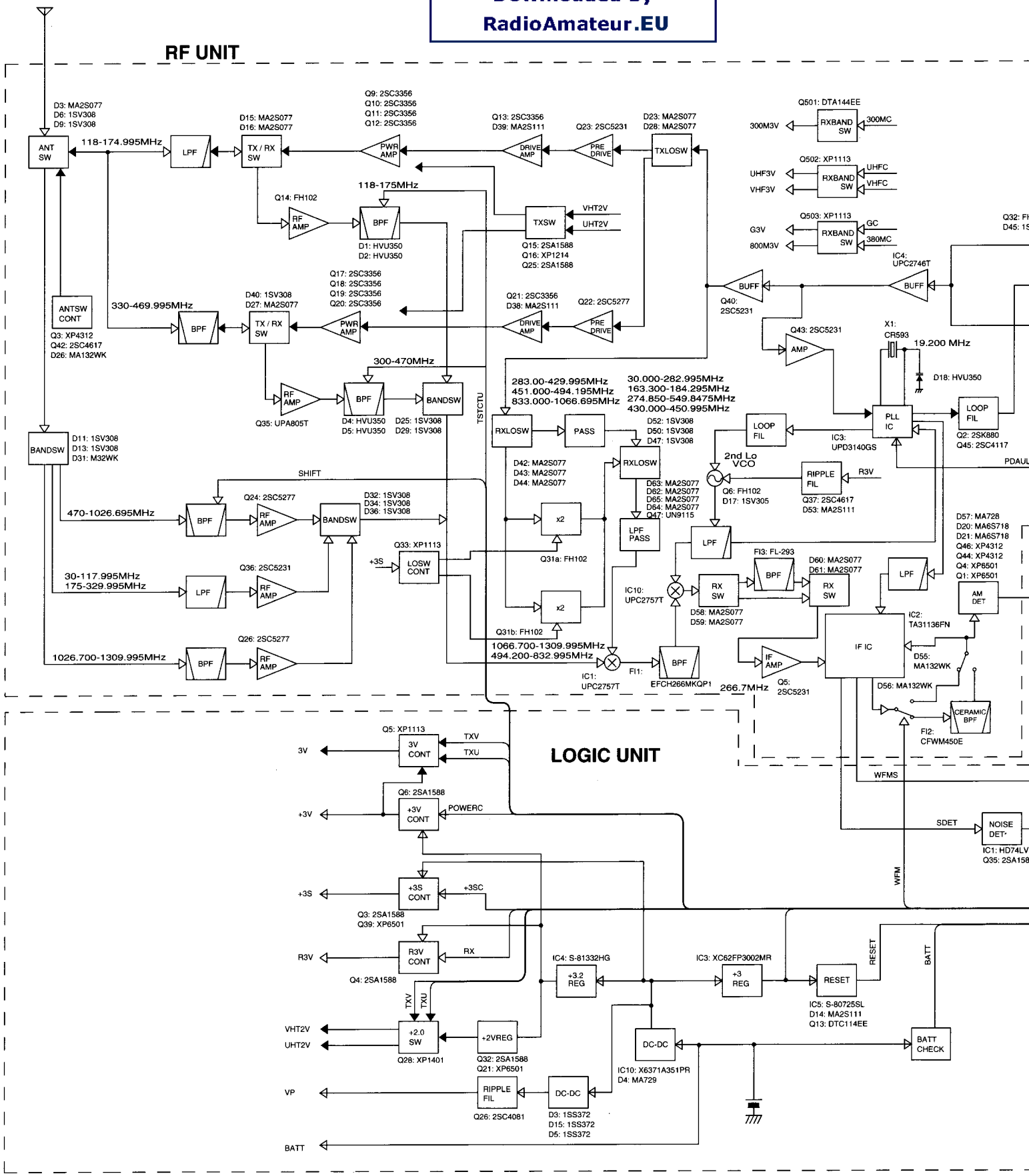
J1
to LOGIC unit J1

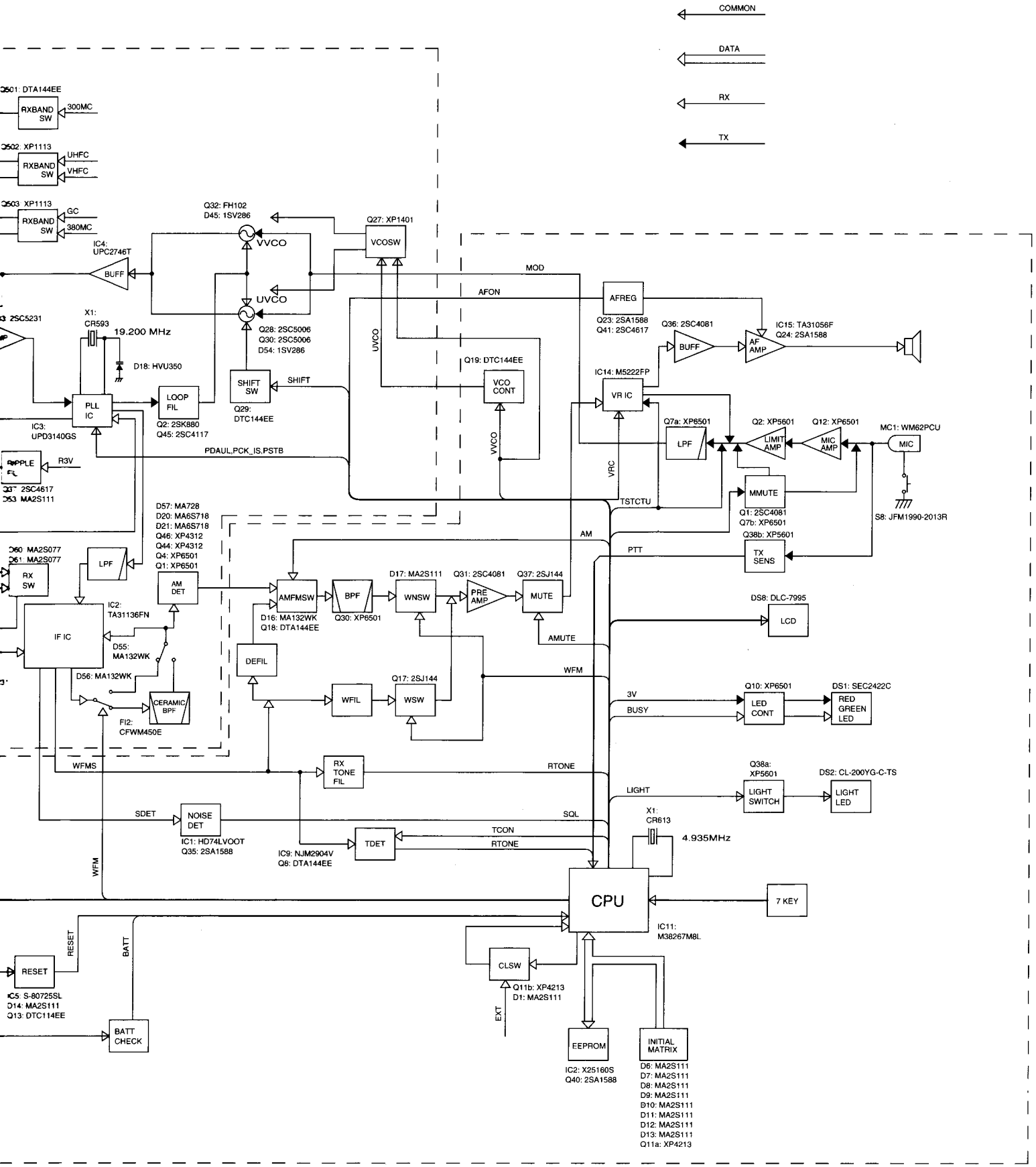
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
BATRY	BATRY		GND	VHT2V	UHT2V	TSTCTU	VHFC	UHFC	GND	GND	800MC	300MC	GC	GND	WFMS	RSSI	SDET	GND	AM
GND	GND	DBL2	DBL1	MOD	SHIFT	VVCO	UVCO	GND	+3S	VP	PDAUL	PCK_IS	PSTB	GND	+3V	FSET	R3V	AMS	WFM
40																			21

• **BOTTOM VIEW**


Surface
Inside-1
Inside-2
Underside
D21
Q42
Q3
L42
L8
Q24
L40
L74
L7
HL6
L70
L14
L57
L58
L59
L19
L22
L21
L77
FI1
L56
D2
L1
D1
Q14
L28
L18
D26
QUAD
SEN
Q241
L15
IC1
L76
L53
L52
Q19
Q20
Q11
Q12
FI2
Q503
Q501
Q502
L50
Q31
L51
Q16
Q13
L25
L24
L23
L27
Q15
Q23
D20
Q46
Q44
C78
Q29
Q27
L68
IC4
L62
L63
Q32
L66
L20
Q6
L45
Q37
C82
C162
Q28
Q30
L47

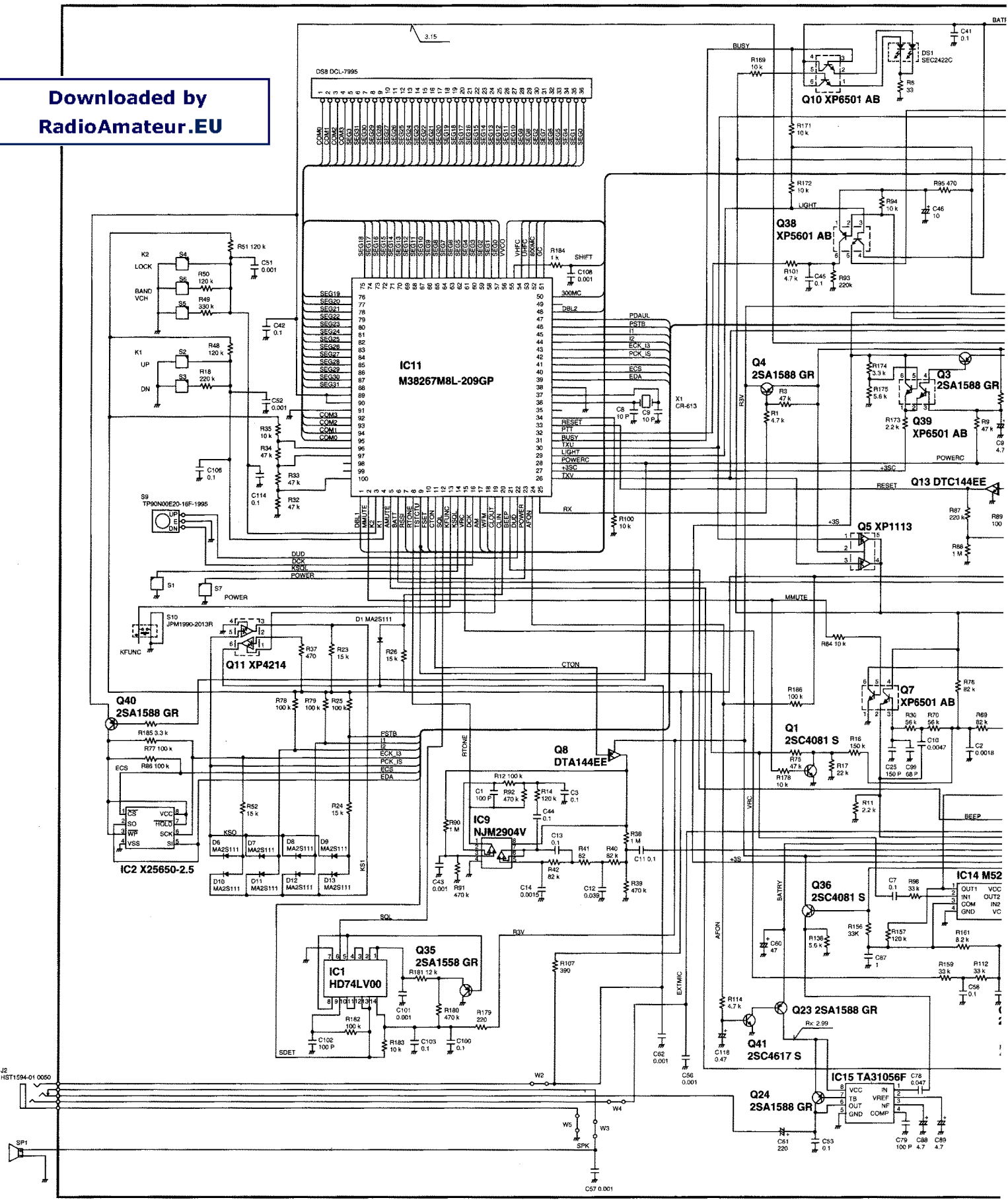
SECTION 10 BLOCK DIAGRAM

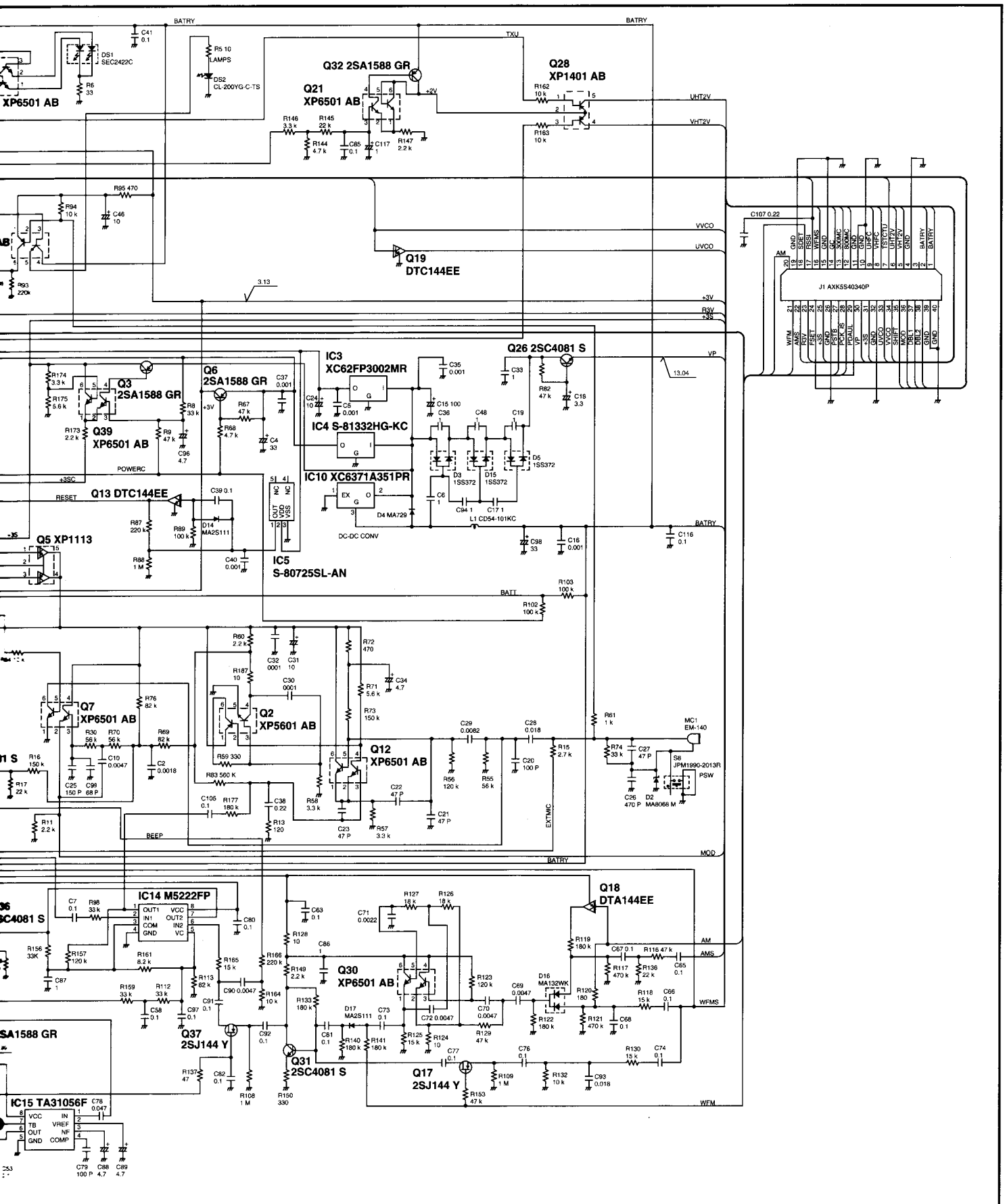



COMMON
DATA
RX
TX
Q501: DTA144EE
RXBAND SW
300MC
Q502: XP1113
RXBAND SW
UHFC
VHFC
Q503: XP1113
RXBAND SW
GC
380MC
IC4: UPC2746T
BUFF
Q32: FH102
D45: 1SV286
VVCO
UVCO
Q27: XP1401
VCOSW
MOD
AFON
AFREG
Q23: 2SA1588
Q41: 2SC4617
Q36: 2SC4081
BUFF
IC15: TA31056F
Q24: 2SA1588
AF AMP
X1: CR593
19.200 MHz
D18: HVU350
Q28: 2SC5006
Q30: 2SC5006
D54: 1SV286
Q19: DTC144EE
VCO CONT
IC14: M5222FP
VR IC
SHIFT SW
SHIFT
Q29: DTC144EE
PLL IC
IC3: UPD3140GS
LOOP FIL
Q2: 2SK880
Q45: 2SC4117
PDAUL,PCK_IS.PSTB
R3V
Q7a: XP6501
LPF
Q2: XP5601
LIMIT AMP
Q12: XP6501
MIC AMP
MC1: WM62PCU
MIC
S8: JFM1990-2013R
MMUTE
Q1: 2SC4081
Q7b: XP6501
TSTCTU
Q38b: XP5601
TX SENS
PTT
AM
D57: MA728
D20: MA6S718
D21: MA6S718
Q46: XP4312
Q44: XP4312
Q4: XP6501
Q1: XP6501
LPF
AM DET
AMFMSW
D16: MA132WK
Q18: DTA144EE
BPF
Q30: XP6501
WNSW
D17: MA2S111
PRE AMP
Q31: 2SC4081
MUTE
Q37: 2SJ144
AMUTE
DS8: DLC-7995
LCD
IC2: TA31136FN
IF IC
D55: MA132WK
D56: MA132WK
CERAMIC BPF
FI2: CFWM450E
DEFIL
WFIL
WSW
Q17: 2SJ144
WFM
3V
BUSY
Q10: XP6501
LED CONT
DS1: SEC2422C
RED GREEN LED
WFMS
RX TONE FIL
RTONE
Q38a: XP5601
LIGHT SWITCH
DS2: CL-200YG-C-TS
LIGHT LED
LIGHT
SDET
NOISE DET
IC1: HD74LVOOT
Q35: 2SA1588
SQL
TCON
RTONE
TDET
IC9: NJM2904V
Q8: DTA144EE
X1: CR613
4.935MHz
CPU
IC11: M38267M8L
7 KEY
RESET
IC5: S-80725SL
D14: MA2S111
Q13: DTC114EE
BATT
BATT CHECK
CLSW
Q11b: XP4213
D1: MA2S111
EXT
EEPROM
IC2: X25160S
Q40: 2SA1588
INITIAL MATRIX
D6: MA2S111
D7: MA2S111
D8: MA2S111
D9: MA2S111
D10: MA2S111
D11: MA2S111
D12: MA2S111
D13: MA2S111
Q11a: XP4213

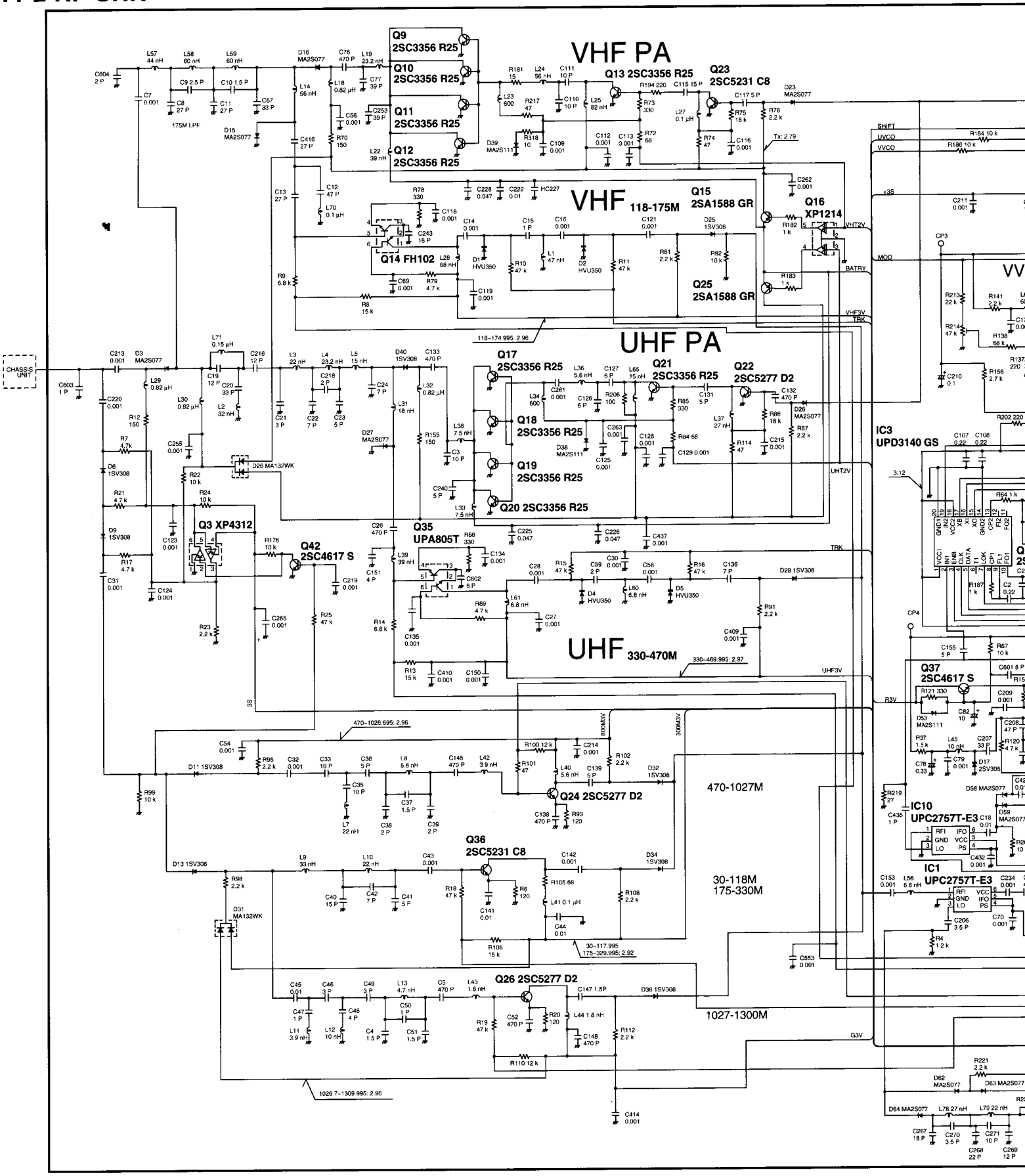
SECTION 11 VOLTAGE DIAGRAM

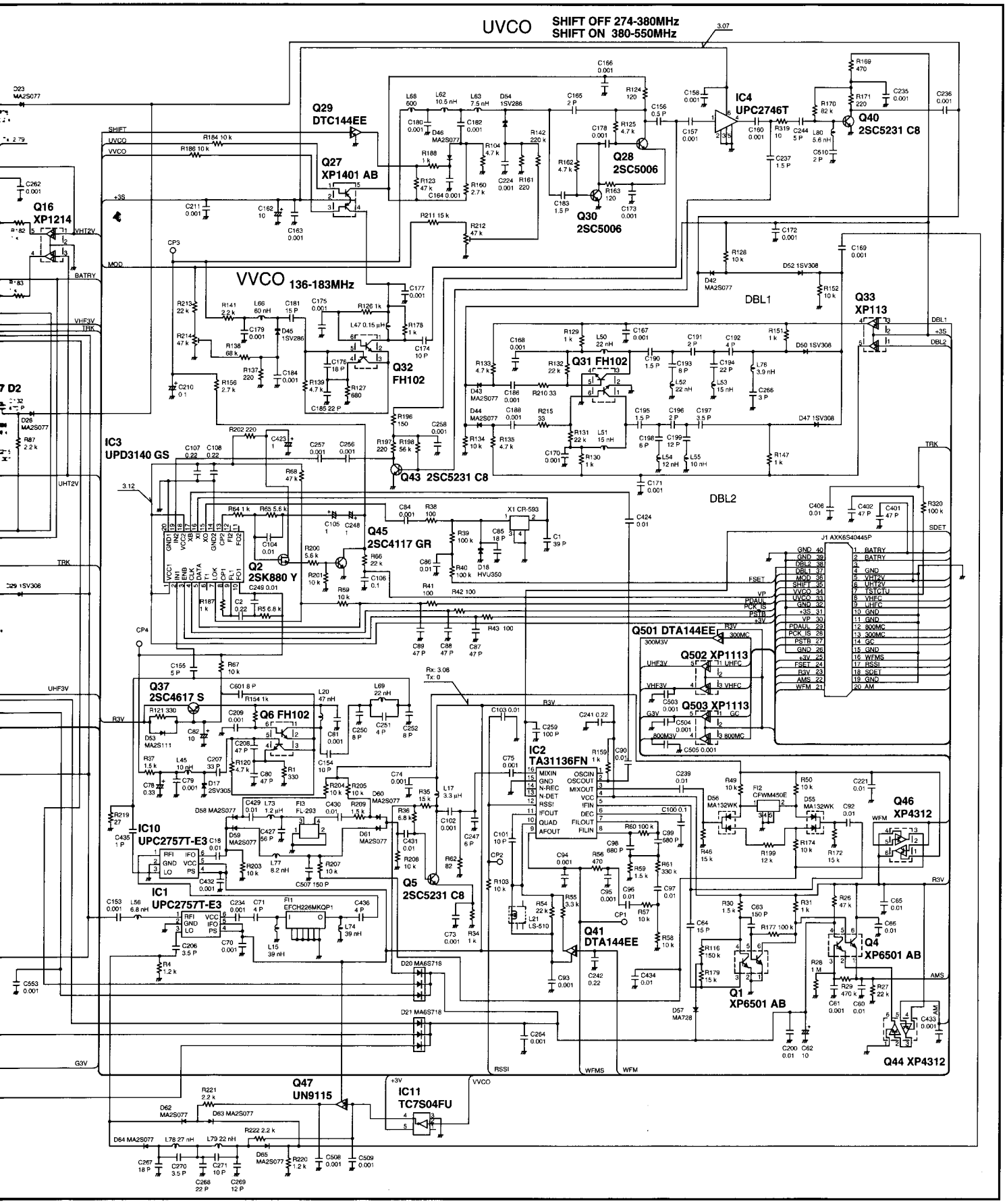
11-1 LOGIC UNIT




BATRY
TXU
Q32 2SA1588 GR
Q21 XP6501 AB
Q28 XP1401 AB
UHT2V
VHT2V
VVCO
UVCO
Q19 DTC144EE
+3V
+3S
VP
IC3 XC62FP3002MR
Q26 2SC4081 S
IC4 S-81332HG-KC
IC10 XC6371A351PR
D4 MA729
L1 CD54-101KC
DC-DC CONV
Q3 2SA1588 GR
Q6 2SA1588 GR
Q39 XP6501 AB
POWERC
Q13 DTC144EE
Q5 XP1113
IC5 S-80725SL-AN
BATT
Q7 XP6501 AB
Q2 XP5601 AB
Q12 XP6501 AB
MC1 EM-140
S8 JPM1990-2013R
PSW
EXTMIC
BEEP
MOD
IC14 M5222FP
Q18 DTA144EE
Q30 XP6501 AB
Q37 2SJ144 Y
Q31 2SC4081 S
Q17 2SJ144 Y
AM
AMS
WFMS
WFM
IC15 TA31056F
J1 AXK5S40340P

11-2 RF UNIT




UVCO
SHIFT OFF 274-380MHz
SHIFT ON 380-550MHz
VVCO 136-183MHz
Q29 DTC144EE
Q27 XP1401 AB
Q28 2SC5006
Q30 2SC5006
IC4 UPC2746T
Q40 2SC5231 C8
Q16 XP1214
Q32 FH102
Q31 FH102
Q33 XP113
DBL1
DBL2
IC3 UPD3140 GS
Q43 2SC5231 C8
Q45 2SC4117 GR
Q2 2SK880 Y
Q501 DTA144EE
Q502 XP1113
Q503 XP1113
Q37 2SC4617 S
Q6 FH102
IC2 TA31136FN
IC10 UPC2757T-E3
IC1 UPC2757T-E3
Q5 2SC5231 C8
Q41 DTA144EE
Q46 XP4312
Q4 XP6501 AB
Q1 XP6501 AB
Q44 XP4312
Q47 UN9115
IC11 TC7S04FU
SHIFT
UVCO
VVCO
+3S
MOD
BATRY
VHF3V
TRK
UHT2V
UHF3V
R3V
G3V
SDET
FSET
RSSI
WFMS
WFM
AMS
J1 AXK6S40445P

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