SERVICE MANUAL

COMMUNICATIONS RECEIVER

IC-R2

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-R2** at the time of publication.

MODEL	VERSION	SYMBOL
IC-R2	Europe	EUR
	Italy	ITA
	Taiwan	TPE
	U.S.A.	USA
	Canada	CAN
	Other	OTH
		OTH-1

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

DANGER

NEVER connect the receiver 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 receiver to rain, snow or any liquids.

DO NOT reverse the polarities of the power supply when connecting the receiver.

DO NOT apply an RF signal of more than 20 dBm (100mW) to the antenna connector. This could damage the receiver'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**>

8930046581	LCD Contact	IC-R2	LOGIC UNIT	5 pieces
8810009560	Screw PH BO M2x6 ZK	IC-R2	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 receiver.
2. **DO NOT** open the receiver until the receiver 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 receiver is defective.
6. **READ** the instructions of test equipment thoroughly before connecting equipment to the receiver.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

• Frequency range :

Version	Receive Frequencies (MHz)
EUR, U.K., CAN, OTH, OTH-1	0.495 – 1309.995
U.S.A.	0.495 – 823.995 849.000 – 868.995 894.000 – 1309.995

• Mode : FM, WFM, AM
• No. of memory channel : 450 channel
• Frequency stability : ±6 ppm max. (–10˚C to +60˚)
• 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, 6.25 kHz
• Current drain (at 3.0 V) :
Rated audio 170 mA typical
Standby 100 mA typical
Power saved 41 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; 2 9/32 (W) × 3 3/8 (H) × 1 1/16 (D) in
• Weight (with antenna and battely) : 170 (g); 6 (oz)
• External SP connector : 3-conductor 3.5(d) mm (1/8") / 8Ω

■ RECEIVER

• Receiver system : Tripple super heterodyne
• Intermediate frequency : 1st 266.7 MHz
2nd 19.65 MHz
3rd 450 kHz
• Sensitivity* : (except spurious points)

Frequency (MHz)	FM	WFM	AM
0.495 – 1.625	—	—	2.5 µV
1.625 – 5.0	0.56 µV		
5.0 – 30.0	0.4 µV		1.8 µV
30.0 – 76.0			—
76.0 – 108.0		1.8 µV	
108.0 – 118.0		—	
118.0 – 136.0			1.8 µV
136.0 – 175.0			—
175.0 – 222.0		1.8 µV	
222.0 – 247.0		—	1.8 µV
247.0 – 330.0	0.56 µV		
330.0 – 470.0			—
470.0 – 770.0		2.5 µV	
770.0 – 833.0		—	
833.0 – 1309.995	0.79 µV		

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

• Squelch Sensitivity :

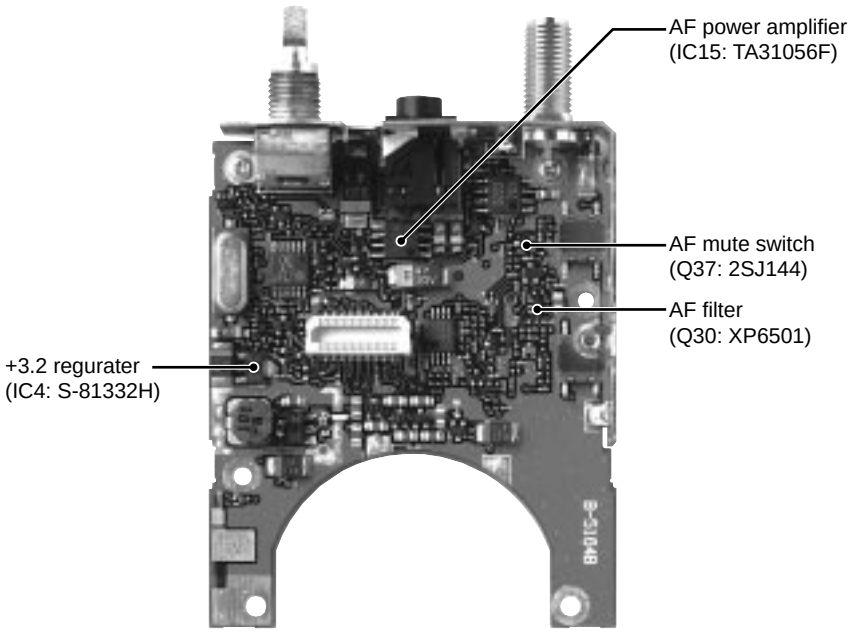
Frequency (MHz)	FM	WFM	AM
0.495 – 1.625	—	—	2.5 µV
1.625 – 5.0	0.56 µV		
5.0 – 30.0	0.4 µV		1.8 µV
30.0 – 76.0			—
76.0 – 108.0		5.6 µV	
108.0 – 118.0		—	
118.0 – 136.0			1.8 µV
136.0 – 175.0			—
175.0 – 222.0		5.6 µV	
222.0 – 247.0		—	1.8 µV
247.0 – 330.0	0.56 µV		
330.0 – 470.0			—
470.0 – 770.0		5.6 µV	
770.0 – 833.0		—	
833.0 – 1309.995	0.79 µV		

• Selectivity :
AM / FM 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

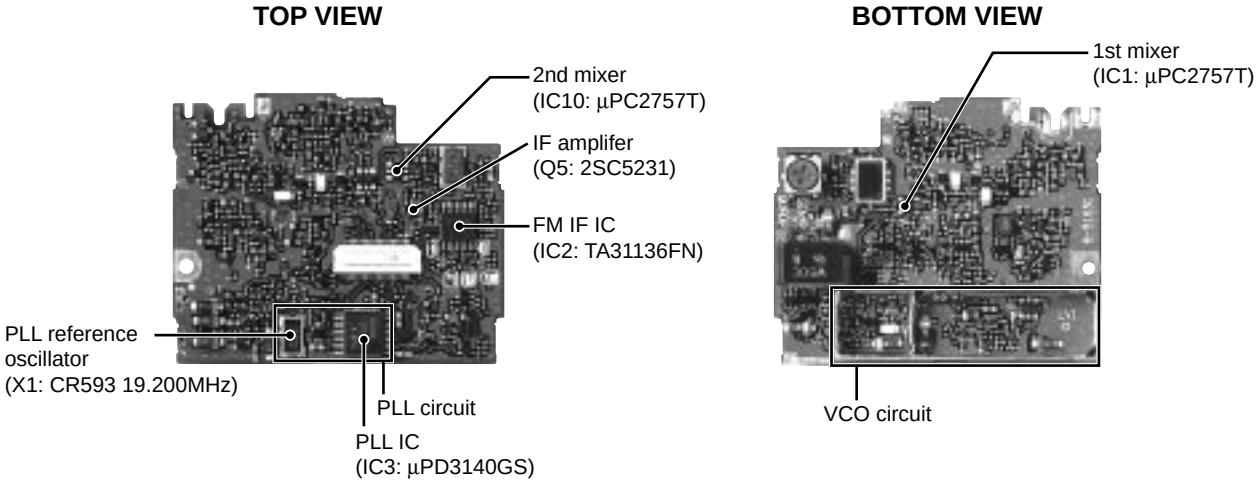
All stated specifications are subject to change without notice or obligation.

SECTION 2 INSIDE VIEWS

● LOGIC UNIT



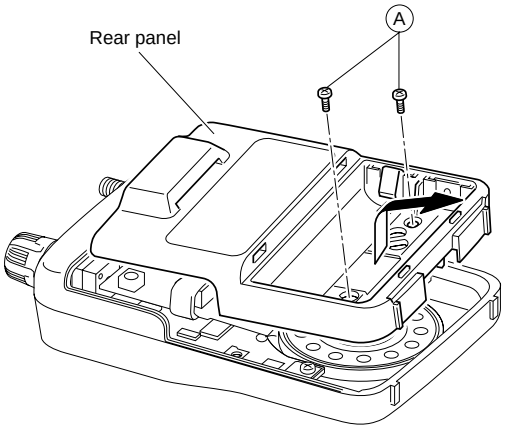
● RF UNIT



SECTION 3 DISASSEMBLY INSTRUCTIONS

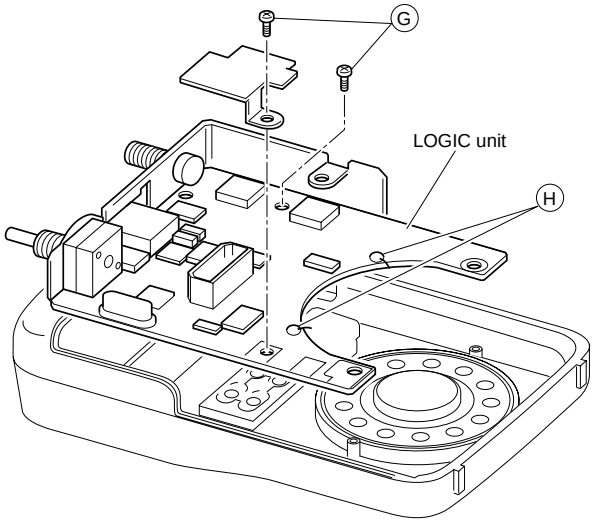
● REMOVING THE REAR PANEL

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



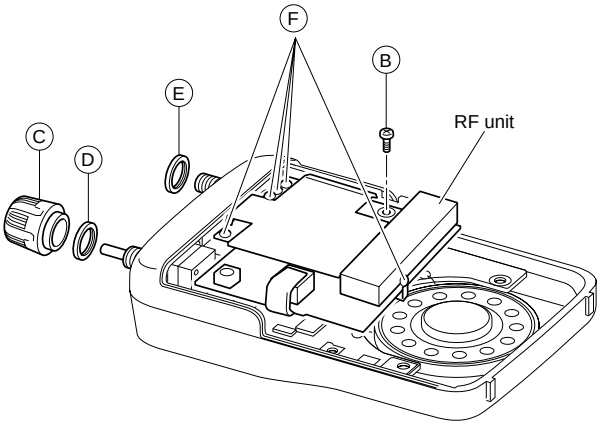
● REMOVING THE LOGIC UNIT

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 limitter (D68) and an attenuator (D69). The signals are then applied to the RF circuit the antenna switching circuit (D13, D73, D75) which suppress out-of-band signals.

4-1-2 RF CIRCUIT (RF UNIT)

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

(1) 0.495 MHz–29.999 MHz

RF signals (0.495–29.999MHz) from an antenna switching circuit (D73) pass through a low-pass filter (C511–C515, L81, L82). The filtered signals are amplified at an RF amplifier (Q505) passing through each band-pass filter depending on the receiving frequency. The amplified signals are then applied to the 1st mixer circuit (IC1) after being amplified at another RF amplifier (IC11) via the band switching diode(D71).

The signals below 1.9 MHz pass through a low-pass filter (C534, C535, C657, C658, L88, L89) via the band switching diode (D66), and are then applied to the RF amplifier circuit (Q505) via the band switching diode (D67).

The 1.9 MHz–14.995 MHz signals pass through the band switching diode (D65) and band-pass filter (C522–C531, L85–L87, L91), and are then applied to the RF amplifier circuit (Q505) via the band switching diode (D70).

The 15 MHz–29.995 MHz signals pass through the band switching diode (D63) and high-pass filter (C516–C520, L83, L84) and are then applied to the RF amplifier circuit (Q505) via the band switching diode (D64).

(2) 118 MHz–174.995 MHz, 330 MHz–832.995 MHz

RF signals (118 MHz–174.995 MHz, 330 MHz–832.995 MHz) from an antenna switching diode (D75) are passed through each bandpass filter and RF amplifier, and are then applied to the 1st mixer circuit (IC1) via the band switching diode (D71) and RF amplifier (IC11).

The 118 MHz–174.995 MHz signals pass through the band switching diode (D74) and low-pass filter (C8–C13, C67, C416, L14, L57–L59, L70), and are then amplified at RF amplifier (Q14). The amplified signal passes through the tunable band-pass filters (D1, D2) and band switching diode (D25).

The 330 MHz–469.995 MHz signals are amplified at RF amplifier (Q35) via the band switching diode (D3) and band-pass filter (C19–C23, C216, L2–L5). The amplified signal passes through the tunable band-pass filters (D3, D4) and band switching diode (D29).

The 470 MHz–832.995 MHz signals are amplified at RF amplifier (Q24) via the band-pass filter (C32, C33, C35–C37, C39, C144, C145), between the band switching diode (D11, D32).

(3) 30–117.995 MHz, 175–329.995 MHz

The 30 MHz–117.95 MHz, 175 MHz–329.995 MHz signals pass through the low-pass filter (C40–C43, C665, C666, L9, L10, L92), and are then applied to the RF amplifier (Q36). The amplified signals are amplified at the RF amplifier (IC11) via band switching diodes (D34, D71). The amplified signals are applied to the 1st mixer circuit (IC1).

(4) 833 MHz–1309.995 MHz

The 833 MHz–1309.995 MHz signals pass through the bandpass filter (C5, C45–51, L11–L13, L43), and are then applied to the RF amplifier (Q26). The amplified signals are amplified at the RF amplifier (IC11) via band switching diodes (D36). The amplified signals are applied to 1st mixer circuit (IC1).

4-1-3 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 filters at the next stage of the 1st mixer.

The filtered RF signals are mixed with 1st LO signals at the 1st mixer circuit (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 1st VCO (Q28, Q30, D45) and are applied to the 1st mixer (IC1, pin 3) directly or passing through the doubler circuit (Q31) after being amplified at the buffer amplifiers (IC4, Q40).

4-1-4 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 is mixed with the 2nd LO signal at the 2nd mixer circuit (IC10, pin 1) to produce a 19.65 MHz 2nd IF signal. The 2nd IF signal pass through (except WFM mode) or bypass (WFM mode) the bandpass filter (FI3), and is then amplified at the 2nd IF amplifier (Q5). The amplified signal is applied to the demodulator circuit.

4-1-5 DEMODULATOR CIRCUITS (RF UNIT)

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

The 19.65 MHz 2nd IF signal from the 2nd IF 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 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 converted into AF signals, and the signals are applied to the AF circuit (LOGIC unit).

4-1-6 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 circuit (R118, C66, C68) with frequency characteristics of –6 dB/octave, and are then applied to the pre-amplifier (Q31) via the bandpass filter (Q30).

While in AM mode, AF signals are pass through the bandpass filter 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 circuit (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 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.

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

4-1-7 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.

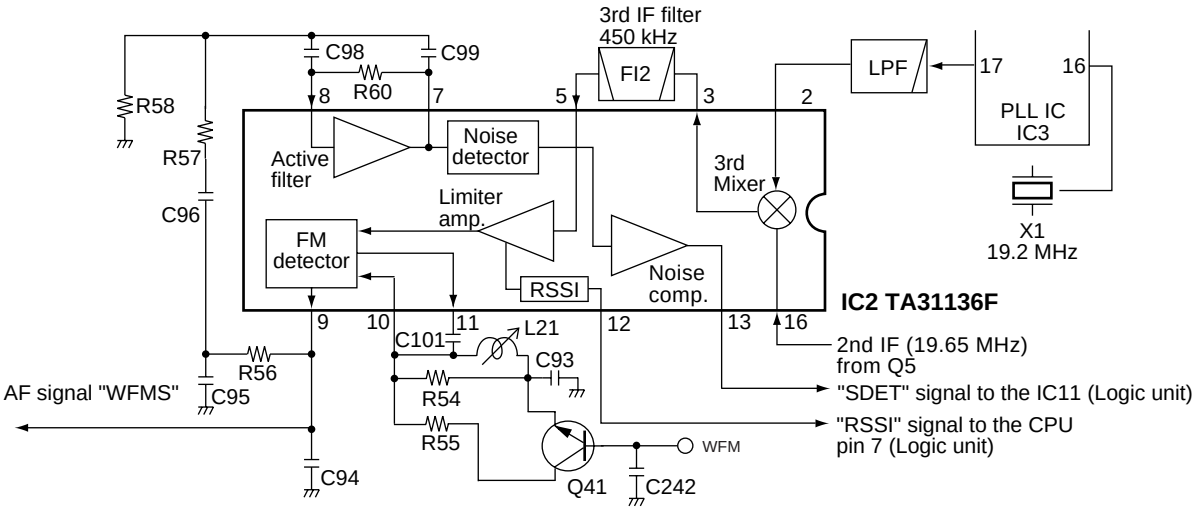
A portion of the AF signals from the FM IF IC (RF unit; IC2, pin 9) are applied to the active filter section (IC2, pin 8). The active filter section amplifies and filters noise components.

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 the "SQL" line. The CPU analyzes the noise condition and outputs the "AMUTE" signal to the AF mute switch (Q37).

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

• 2nd IF AND DEMODULATOR CIRCUITS



• 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) via the "WFMS" line 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 PLL CIRCUITS

4-2-1 PLL CIRCUIT (RF UNIT)

A PLL circuit provides stable oscillation of 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 passes thorough 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 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 1ST VCO circuit as the lock voltage.

4-2-2 REFERENCE OSCILLATOR CIRCUIT (RF UNIT)

The reference oscillator circuit (X1, IC3) generates a 19.2 MHz reference frequency which is stabilized within the temperature range –10˚C (+14˚F) to +60˚C (+140˚F). The reference frequency is applied to the PLL IC (IC3, pin 16) and the signal is output from the pin 17, and is then applied to the FM IF IC (IC2, pin 2) via the low-pass fileter.

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

The oscillated signal is applied to the buffer amplifiers (IC4, Q40). The amplified signal is applied to the 1st mixer circuit (IC1) via the RX LO swtich circuit (D42–D44) and doubler circuit (Q31).

The 1st VCO circuit (Q28, Q30, D54) oscillates 267.2 MHz–380 MHz and 380 MHz–550 MHz by switching the SHIFT switch (Q29) "High" and "Low" respectively.

A portion of the signal from IC4 is amplified at the buffer amplifier (Q43) and is then fed back to the PLL IC (IC3, pin 2) as the comparison signal.

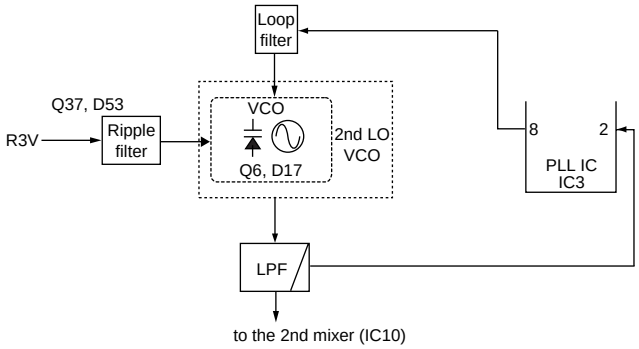
4-2-4 2nd VCO CIRCUIT (RF UNIT)

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

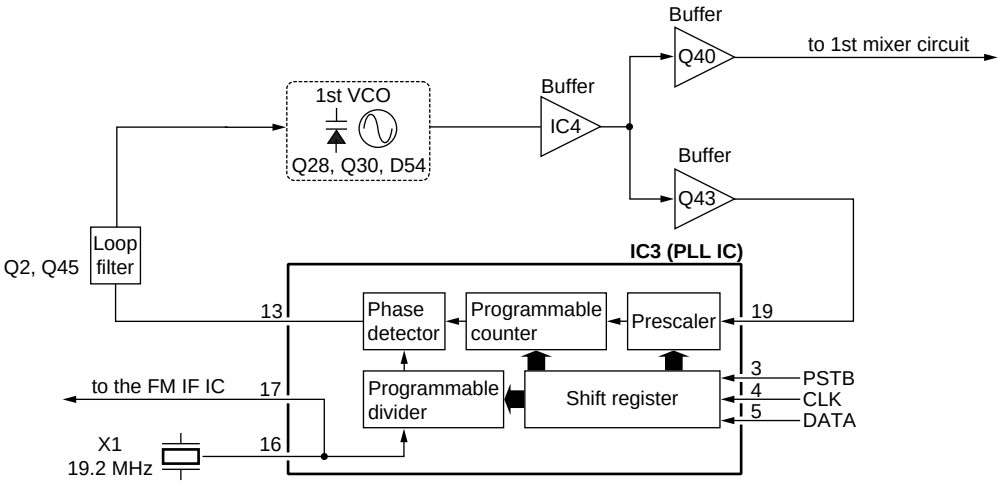
The 2nd VCO circuit (Q6, L45, C80, C207, C208) oscillates 260 MHz. The oscillated signal is applied to the 2nd mixer (IC10, pin 3), and is then mixed with the 1st IF signal.

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



4-3 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).
R3V	Receive 3V controlled by the R3V 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 converted by the +3V regulator circuit (Q6) using the “POWERC” signal from CPU (IC11).

4-4 PORT ALLOCATIONS

4-4-1 CPU (LOGIC UNIT IC11)

Pin number	Port name	Description
1	ADJ	Output control signal for the adjustment mode.
2	ATT	Outputs RF attenuator control signal to attenuator switch.
3	K2	Input port for [LOCK], [BAND], [V/M] switches.
4	K1	Input port for [UP], [DOWN] switches.
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, pin12) to detect receiving signal strength.
8	RTONE	Input port for the receiving tone signal.
9	TRC	Outputs control signal for the tunable band-pass filter.
10	FSET	Outputs control signal for the RIT frequency.
11	CTON	Outputs control signal for the CTCSS requlator 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	KTS	Input port for the [TS] switch. Low : While [TS] switch is pushed.
15	VRC	Outputs level control signal for AF volume.
16	DCK	Input port for the DOWN signal from the [DIAL].
17	AM	Outputs AM mode select signals. Low : When AM is selected.
18	WFM	Outputs WFM mode select signals. Low : When WFM is selected.
21	BEEP	Outputs beep audio signals.
22	DUD	Input port for the UP signal from the [DIAL].
23	POWER	Input 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	DBL1	Outputs control signal for the 1st doubler circuit. Low : Activates the 1st doubler circuit.

Pin number	Port name	Description
26	LIGHT	Output LCD backlight control signal. High : Lights ON
27	+3SC	Outputs +3S requlator control singal for the receiver circuit. Low : Receiving.
28	POWERC	Outputs +3V requlator control singals.
29	B3	Outputs high-pass filter select signal. Low : When frequency 15 to 30 MHz are displayed.
30	B2	Outputs band-pass filter select signal. Low : When frequency 1.9 to 15 MHz are displayed.
31	B1	Outputs low-pass filter select signal. Low : When frequency 0.5 to 1.5 MHz are displayed.
32	KSQL	Input port for the [SQL] switch. High : While [SQL] 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 (LOGIC unit; IC2).
43	ECK/I3	Outputs clock signal to EEPROM IC.
44, 45	I2, I1	Input ports for Initial matrix.
46	PSTB	Outputs strobe signals for the PLL IC.
47	PDA	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. Low : Activates the 2nd doubler circuit.
50	300MC	Outputs low-pass filter select signal. Low : When frequencies 30 to 118 MHz or 175 to 330 MHz are displayed.
51	GC	Outputs band-pass filter select signal. Low :When frequencies 833 to 1309.995 MHz are displayed.
52	800MC	Outputs band-pass filter select signal. Low : When frequencies 470 to 1027 MHz are displayed.
53	UHFC	Outputs band-pass filter select signal. Low : When frequencies 330 to 470 MHz are displayed.
54	VHFC	Outputs band-pass filter select signal. Low : When frequencies 118 to 175 MHz are displayed.
55	SHIFT	Output port for 1st VCO SHIFT signals to the shift switch (RF unit; Q29). High : Shift ON (380 – 550 MHz). Low : Shift OFF (267.2 – 380 MHz).
56	HFC	Output control signal for the 0.5–30 MHz band RF amplifier. Low : Receiving 0.5–30 MHz bands.

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

The receiver (IC-R2) must be adjusted on the adjustment mode after programmed adjustment frequency data into memory channel. When you program adjustment frequency data into memory channel, optional CS-R2 PROGRAMMING SOFTWARE, OPC-478 CLONING CABLE are requird.

■ 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	Frequency counter	Frequency range : 0.1–600 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better
AC millivoltmeter	Measuring range : 10 mV–10 V		
External speaker	Input impedance : 8 Ω Capacity : 1 W or more	Standard signal generator (SSG)	Frequency range : 0.1–1300 MHz Output level : 0.1 µV–32 mV (–127 to –17 dBm)

■ SOFTWARE INSTALLATION

NOTE: Before using the program, make a backup copy of the original disk. After making a backup copy, keep the original disk in a safe place.

① Boot up DOS.
② Insert the backup disk into the floppy drive A.
③ Type the following to install the adjustment program:
A:\>**INSTALL A C:\CSR2** [Enter]

■ ADJUSTMENT FREQUENCY DATA

When program adjustment frequency data (at right) into memory channel, back up the original memory data using the optional CS-R2, OPC-478, and re-program it after adjustment.

CAUTION: When clone the adjustment frequency data to the receiver, the receiver's memory channel wiil be over-written the data and deleted original memory data at same time.

• ADJUSTMENT FREQUENCY

Channel No.	Frequency [MHz]	Display ch. No.
0	280.100	FR
1	145.600	tk
2	435.600	tk
3	14.100	RS
4	145.100	RS
5	200.100	RS
6	435.100	RS
7	650.100	RS
8	1100.100	RS

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

■ ENTERING THE ADJUSTMENT MODE

① Connect a JIG (see illustration at CONNECTION) to the [SP] jack.
② Push and hold [FUNC], then turn power ON.
③ Disconnect the JIG and connect a PC with an OPC-478.
④ Boot up DOS.
⑤ Type the following to start up the adjustment program:
C:\>**CD CSR2** [Enter]
C:\CSR2>**CSR2** [Enter]
• Main menu appears at the top side of the cloning program, select the sub-menu "Screen"–"Memory CH"–"Bank 1", then input adjustment frequency (at right).
⑥ Select "Write –> Receiver" of the Clone on the top menu.
• Application writes adjustment frequency data to the connected receiver.
⑦ Disconnect the cloning cable and turn power OFF, then turn power ON to start adjustment.

■ OPERATING ON THE ADJUSTMENT MODE

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

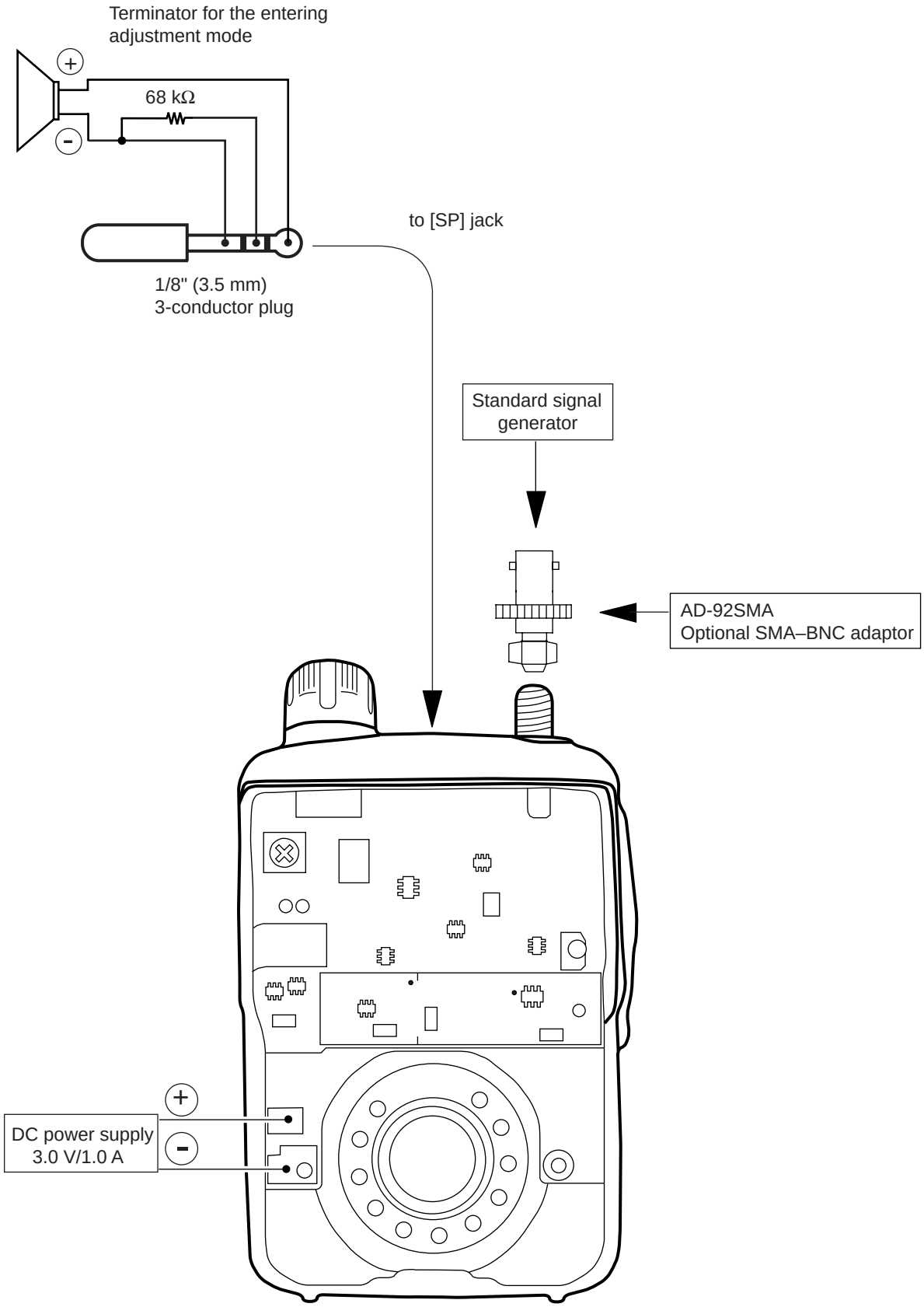
■ EXITING THE ADJUSTMENT MODE

When the adjustment is finished, the receiver must be cancelled adjustment mode to use normal operation, otherwise receiver 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.

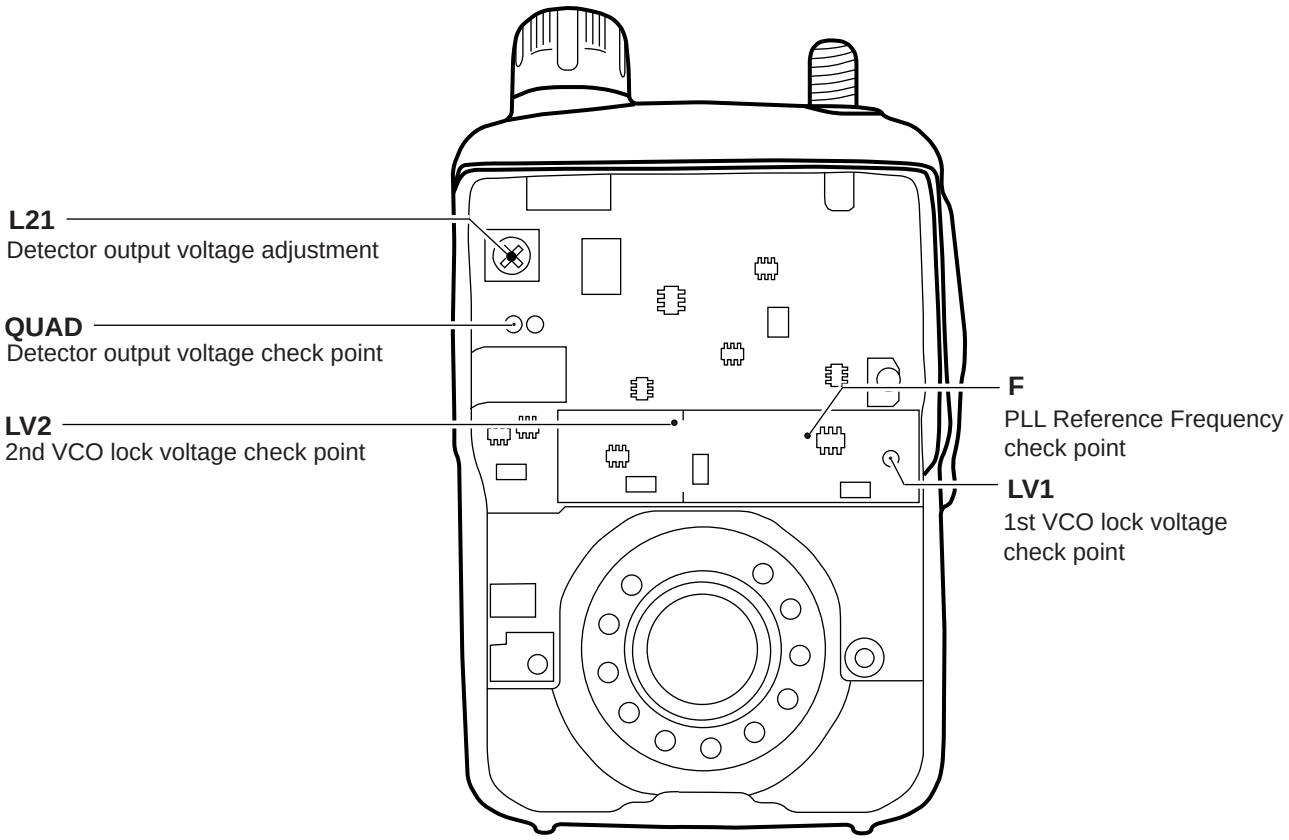
■ CONNECTION



5-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
1ST VCO LOCK VOLTAGE (SHIFT ON)	1	• Displayed frequency : 493.300 MHz • Receiving	RF	Connect the digital multi-meter to the check point LV1.	1.9 V – 2.9 V		Verify
	2	• Displayed frequency : 282.900 MHz • Receiving			less than 12 V		
(SHIFT OFF)	1	• Displayed frequency : 0.495 MHz • Receiving			1.4 V – 2.4 V		
	2	• Displayed frequency : 493.295 MHz • Receiving			less than 12 V		
2ND VCO LOCK VOLTAGE	1	• Displayed frequency : 430.000 MHz • Receiving	RF	Connect the digital multi-meter to the check point LV2.	0.4 V – 1.0 V		
	2	• Displayed frequency : 493.300 MHz • Receiving			less than 2.5 V		
REFERENCE FREQUENCY	1	• Displayed frequency : (FR ch) 280.100 MHz • Receiving	RF	Connect the frequency counter to the check point F.	546.7999 MHz – 546.8001 MHz	LOGIC	[DIAL]
DETECTOR OUTPUT VOLTAGE	1	• Displayed frequency : (tk ch) 145.600 MHz • Connect an SSG to the antenna connector and set as: Level : 1 mV* (60 dBµ) Deviation : ± 3.5 kHz Modulation : 1 kHz • Receiving	RF	Connect the digital multi-meter to check point QUAD.	1.0 V	RF	L21

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

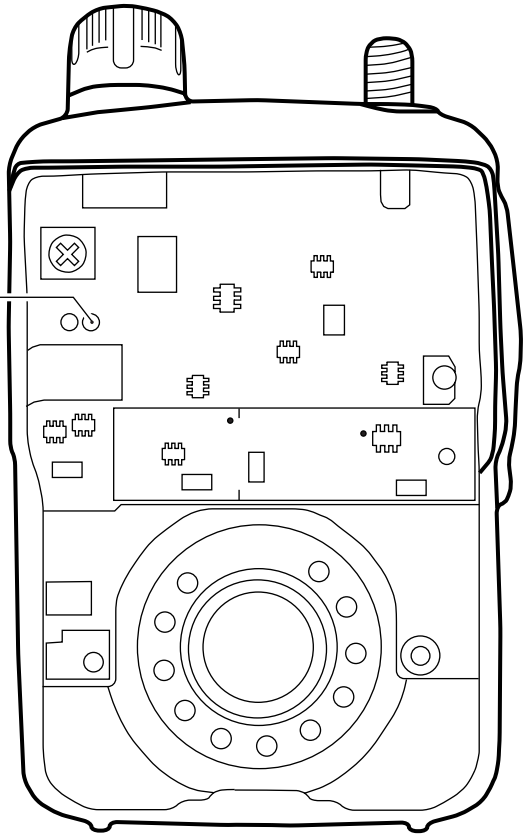


5-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
VHF SENSITIVITY	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 SENSITIVITY	1	• Displayed frequency : (tk ch) 435.600 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]
S-METER	1	• Displayed frequency : (RS ch) 14.100 MHz • Connect the SSG to the antenna connector and set as : Level : 0.5 µV* (–113 dBm) Modulation : 1 kHz Deviation : ± 3.5 kHz • Receiving			Push and hold the [MOD] key. • Verify that S-Meter shows S4 (3dots).		
	2	• Displayed frequency : (RS ch) 145.100 MHz • Set the SSG as : Level : 0.5 µV* (–113 dBm) • Receiving					
	3	• Displayed frequency : (RS ch) 200.100 MHz • Set the SSG as : Level : 0.5 µV* (–113 dBm) • Receiving					
	4	• Displayed frequency : (RS ch) 435.100 MHz • Set the SSG as : Level : 0.5 µV* (–113 dBm) • Receiving					
	5	• Displayed frequency : (RS ch) 650.100 MHz • Set the SSG as : Level : 0.5 µV* (–113 dBm) • Receiving					
	6	• Displayed frequency : (RS ch) 1100.100 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.

SEN
VHF and UHF sensitivity check point.



SECTION 6 PARTS LIST

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION		
IC1	1130008970	S.IC	HD74LV00TELL	
IC2	1130009020	S.IC	X25650S8I-2.5T6	
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	1140007760	S.IC	M38267M8L-218GP	[USA] only
	1140007720	S.IC	M38267M8L-222GP	other
IC14	1110004520	S.IC	M5222FP 600C	
IC15	1190000710	S.IC	TA31056F (TP1)	
Q3	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q4	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q6	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q8	1590002430	S.TRANSISTOR	DTA144EE TL	
Q11	1590001780	S.TRANSISTOR	XP4213 (TX)	
Q13	1590002310	S.TRANSISTOR	DTC114EE TL	
Q17	1590001390	S.FET	2SJ144-Y (TE85R)	
Q18	1590002430	S.TRANSISTOR	DTA144EE TL	
Q23	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q24	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q26	1530002280	S.TRANSISTOR	2SC4081 T107 S	
Q30	1590001190	S.TRANSISTOR	XP6501-(TX).AB	
Q31	1530002280	S.TRANSISTOR	2SC4081 T107 S	
Q35	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	
Q36	1530002280	S.TRANSISTOR	2SC4081 T107 S	
Q37	1590001390	S.FET	2SJ144-Y (TE85R)	
Q38	1530002280	S.TRANSISTOR	2SC4081 T107 S	
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)	
D3	1790001560	S.DIODE	1SS372 (TE85R)	
D4	1790000970	S.DIODE	MA729 (TX)	
D5	1790001560	S.DIODE	1SS372 (TE85R)	
D6	1790001250	S.DIODE	MA2S111-(TX)	[OTH-1] only
D7	1790001250	S.DIODE	MA2S111-(TX)	[USA], [CAN], [OTH]
D8	1790001250	S.DIODE	MA2S111-(TX)	[UK], [OTH], [OTH-1]
D9	1790001250	S.DIODE	MA2S111-(TX)	except [OTH-1]
D10	1790001250	S.DIODE	MA2S111-(TX)	[USA], [CAN] 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)	
R8	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)	
R9	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)	
R12	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)	
R14	7030005310	S.RESISTOR	ERJ2GEJ 124 X (120 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	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 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)	

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
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)
R67	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R68	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 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)
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)
R94	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R100	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R102	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R103	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
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)
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)
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)
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)
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)
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)

S.=Surface mount

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C1	4030014200	S.CERAMIC	ECUE1H101JCQ
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
C8	4030014120	S.CERAMIC	ECUE1H100CCQ
C9	4030014120	S.CERAMIC	ECUE1H100CCQ
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	4510007130	S.ELECTROLYTIC	EEFCD0J470R
C15	4550006670	S.TANTALUM	ECST1AD107R
C16	4030013850	S.CERAMIC	ECUE1E102KBQ
C17	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C18	4550006920	S.TANTALLUM	TEMSVB2 1E 335M-8R
C19	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C24	4550006200	S.TANTALUM	ECST0JY106R
C33	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C35	4030013850	S.CERAMIC	ECUE1E102KBQ
C36	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C37	4030013850	S.CERAMIC	ECUE1E102KBQ
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
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
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
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
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
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
C118	4550006140	S.TANTALUM	ECST1EY474R
C119	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C120	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C121	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C123	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
DS2	5040002230	S.LED	CL-200YG-C-TS
DS8	5030001610	LCD	DLC-7995YBGF
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
EP1	0910050773	PCB	B 5164C
EP2	8930046581	LCD CONTACT	SRCN-1995-SP-N-W-1

[RF UNIT]

REF NO.	ORDER 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	1110003470	S.IC	µPC2746T-E3
Q1	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q2	1560000540	S.FET	2SK880-Y (TE85R)
Q4	1590001190	S.TRANSISTOR	XP6501-(TX).AB
Q5	1530003580	S.TRANSISTOR	2SC5231C8-TL
Q6	1530003610	S.TRANSISTOR	FH102-TL
Q14	1530003610	S.TRANSISTOR	FH102-TL
Q24	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q26	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q28	1530003260	S.TRANSISTOR	2SC5006-T1
Q29	1590001940	S.TRANSISTOR	DTC144EE TL
Q30	1530003260	S.TRANSISTOR	2SC5006-T1
Q31	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
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)
Q501	1590002430	S.TRANSISTOR	DTA144EE TL
Q502	1590001810	S.TRANSISTOR	XP1113 (TX)
Q503	1590001810	S.TRANSISTOR	XP1113 (TX)
Q504	1590001810	S.TRANSISTOR	XP1113 (TX)
Q505	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q506	1590002430	S.TRANSISTOR	DTA144EE TL
Q507	1530003590	S.TRANSISTOR	2SC5277D2-TL
Q508	1590001660	S.TRANSISTOR	XP4312 (TX)
Q509	1590002430	S.TRANSISTOR	DTA144EE TL
D1	1720000370	S.VARICAP	HVU350TRF
D2	1720000370	S.VARICAP	HVU350TRF
D3	1790001620	S.DIODE	ISV308 (TPL3)
D4	1720000370	S.VARICAP	HVU350TRF
D5	1720000370	S.VARICAP	HVU350TRF
D11	1790001620	S.DIODE	ISV308 (TPL3)
D13	1790001620	S.DIODE	ISV308 (TPL3)
D17	1720000700	S.VARICAP	1SV305 (TPL3)
D18	1720000370	S.VARICAP	HVU350TRF
D20	1790001590	S.DIODE	MA6S718 (TX)
D21	1790001590	S.DIODE	MA6S718 (TX)

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
D25	1790001620	S.DIODE	ISV308 (TPL3)
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)
D42	1790001260	S.DIODE	MA2S077-(TX)
D43	1790001260	S.DIODE	MA2S077-(TX)
D44	1790001260	S.DIODE	MA2S077-(TX)
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	1790000660	S.DIODE	MA728 (TX)
D63	1790001260	S.DIODE	MA2S077-(TX)
D64	1790001260	S.DIODE	MA2S077-(TX)
D65	1790001260	S.DIODE	MA2S077-(TX)
D66	1790001260	S.DIODE	MA2S077-(TX)
D67	1790001260	S.DIODE	MA2S077-(TX)
D68	1720000240	S.DIODE	1SV172 (TE85R)
D69	1790001260	S.DIODE	MA2S077-(TX)
D70	1790001260	S.DIODE	MA2S077-(TX)
D71	1790001620	S.DIODE	ISV308 (TPL3)
D72	1790001620	S.DIODE	ISV308 (TPL3)
D73	1790001620	S.DIODE	ISV308 (TPL3)
D74	1790001620	S.DIODE	ISV308 (TPL3)
D75	1790001620	S.DIODE	ISV308 (TPL3)
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	6200005720	S.COIL	ELJRE 33NG-F
L3	6200005700	S.COIL	ELJRE 22NG-F
L4	6200005700	S.COIL	ELJRE 22NG-F
L5	6200005680	S.COIL	ELJRE 15NG-F
L7	6200005710	S.COIL	ELJRE 27NG-F
L8	6200005630	S.COIL	ELJRE 5N6Z-F
L9	6200005720	S.COIL	ELJRE 33NG-F
L10	6200005700	S.COIL	ELJRE 22NG-F
L11	6200005680	S.COIL	ELJRE 15NG-F
L12	6200005660	S.COIL	ELJRE 10NG-F
L13	6200005630	S.COIL	ELJRE 5N6Z-F
L14	6200006990	S.COIL	ELJRE 56NG-F
L15	6200005730	S.COIL	ELJRE 39NG-F
L17	6200007170	S.COIL	MLF1608A 3R3K-T
L20	6200005740	S.COIL	ELJRE 47NG-F
L21	6150004840	S.COIL	LS-510
L28	6200008090	S.COIL	LQN21A 68NJ04
L39	6200005730	S.COIL	ELJRE 39NG-F
L40	6200005650	S.COIL	ELJRE 8N2Z-F
L41	6200006980	S.COIL	ELJRE R10G-F
L42	6200005630	S.COIL	ELJRE 5N6Z-F
L43	6200005620	S.COIL	ELJRE 4N7Z-F
L44	6200005620	S.COIL	ELJRE 4N7Z-F
L45	6200007670	S.COIL	LQN21A 10NJ04
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	6200005740	S.COIL	ELJRE 47NG-F
L58	6200006990	S.COIL	ELJRE 56NG-F
L59	6200006990	S.COIL	ELJRE 56NG-F
L60	6200008570	S.COIL	LQN21A 6N8D04

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
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
L68	6910011690	S.COIL	ACB1608M-600-T
L69	6200005700	S.COIL	ELJRE 22NG-F
L70	6200004720	S.COIL	MLF1608D R10K-T
L73	6200004730	S.COIL	MLF1608A 1R2K-T
L74	6200005730	S.COIL	ELJRE 39NG-F
L77	6200005650	S.COIL	ELJRE 8N2Z-F
L80	6200005630	S.COIL	ELJRE 5N6Z-F
L81	6200004940	S.COIL	MLF1608D R27K-T
L82	6200005140	S.COIL	MLF1608D R33K-T
L83	6200004790	S.COIL	MLF1608D R47K-T
L84	6200004790	S.COIL	MLF1608D R47K-T
L85	6200006970	S.COIL	MLF1608A 3R9K-T
L86	6200004790	S.COIL	MLF1608D R47K-T
L87	6200003630	S.COIL	MLF1608D R68K-T
L88	6200007170	S.COIL	MLF1608A 3R3K-T
L89	6200007170	S.COIL	MLF1608A 3R3K-T
L90	6200002040	S.COIL	NL 252018T-101J
L91	6200006970	S.COIL	MLF1608A 3R9K-T
L92	6200005180	S.COIL	MLF1608D R39K-T
R1	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R4	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R5	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R6	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
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)
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)
R18	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R19	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R20	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
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)
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	7030009280	S.RESISTOR	ERJ2GEJ 391 X (390 Ω)
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)
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)
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	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R99	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
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	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 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)
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)
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)
R147	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
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)
R156	7030008410	S.RESISTOR	ERJ2GEJ 392 X (3.9 kΩ)
R159	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R160	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 kΩ)
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)
R177	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R179	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R187	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R188	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
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 123X (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)
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)
R215	7030007260	S.RESISTOR	ERJ2GEJ 330 X (33 Ω)
R216	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R219	7030009530	S.RESISTOR	ERJ2GEJ 270 X (27 Ω)
R220	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R221	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R222	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R223	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R224	7030007300	S.RESISTOR	ERJ2GEJ 332 X (3.3 kΩ)
R225	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R226	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R227	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R228	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R229	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R230	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R231	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R232	7030007280	S.RESISTOR	ERJ2GEJ 331 X (330 Ω)
R233	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R234	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R235	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
R236	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R237	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 kΩ)
R238	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R239	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R319	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R323	7030005710	S.RESISTOR	ERJ2GEJ 121 X (120 Ω)
R324	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R325	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R326	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R327	7030005030	S.RESISTOR	ERJ2GEJ 152 X (1.5 kΩ)
C1	4030014340	S.CERAMIC	ECUE1H390JCQ
C2	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C5	4030014220	S.CERAMIC	ECUE1E471KBQ
C8	4030014240	S.CERAMIC	ECUE1H180JCQ
C9	4030014030	S.CERAMIC	ECUE1H2R5BCQ
C10	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C11	4030014150	S.CERAMIC	ECUE1H220JCQ
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
C27	4030013850	S.CERAMIC	ECUE1E102KBQ
C28	4030013850	S.CERAMIC	ECUE1E102KBQ
C30	4030013850	S.CERAMIC	ECUE1E102KBQ
C32	4030013850	S.CERAMIC	ECUE1E102KBQ
C33	4030014170	S.CERAMIC	ECUE1H330JCQ
C35	4030014120	S.CERAMIC	ECUE1H100CCQ
C36	4030014120	S.CERAMIC	ECUE1H100CCQ
C37	4030014030	S.CERAMIC	ECUE1H2R5BCQ
C39	4030014070	S.CERAMIC	ECUE1H040BCQ
C40	4030014140	S.CERAMIC	ECUE1H150JCQ
C41	4030014080	S.CERAMIC	ECUE1H050BCQ
C42	4030014060	S.CERAMIC	ECUE1H3R5BCQ
C43	4030014200	S.CERAMIC	ECUE1H101JCQ
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	4030014090	S.CERAMIC	ECUE1H060CCQ
C48	4030014090	S.CERAMIC	ECUE1H060CCQ
C49	4030014050	S.CERAMIC	ECUE1H030BCQ
C50	4030013980	S.CERAMIC	ECUE1H010BCQ
C51	4030014050	S.CERAMIC	ECUE1H030BCQ
C52	4030014220	S.CERAMIC	ECUE1E471KBQ
C54	4030013850	S.CERAMIC	ECUE1E102KBQ
C55	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
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

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
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
C118	4030013850	S.CERAMIC	ECUE1E102KBQ
C119	4030013850	S.CERAMIC	ECUE1E102KBQ
C121	4030013850	S.CERAMIC	ECUE1E102KBQ
C134	4030013850	S.CERAMIC	ECUE1E102KBQ
C135	4030013850	S.CERAMIC	ECUE1E102KBQ
C136	4030014100	S.CERAMIC	ECUE1H070CCQ
C138	4030014220	S.CERAMIC	ECUE1E471KBQ
C139	4030014120	S.CERAMIC	ECUE1H100CCQ
C141	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C142	4030013850	S.CERAMIC	ECUE1E102KBQ
C145	4030014220	S.CERAMIC	ECUE1E471KBQ
C147	4030014030	S.CERAMIC	ECUE1H2R5BCQ
C148	4030014220	S.CERAMIC	ECUE1E471KBQ
C150	4030013850	S.CERAMIC	ECUE1E102KBQ
C151	4030014070	S.CERAMIC	ECUE1H040BCQ
C153	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C154	4030014120	S.CERAMIC	ECUE1H100CCQ
C155	4030014080	S.CERAMIC	ECUE1H050BCQ
C156	4030014420	S.CERAMIC	ECUE1H0R5BCQ
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
C178	4030013850	S.CERAMIC	ECUE1E102KBQ
C180	4030013850	S.CERAMIC	ECUE1E102KBQ
C182	4030013850	S.CERAMIC	ECUE1E102KBQ
C183	4030014000	S.CERAMIC	ECUE1H1R5BCQ
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
C214	4030013850	S.CERAMIC	ECUE1E102KBQ
C216	4030014130	S.CERAMIC	ECUE1H120JCQ
C218	4030013980	S.CERAMIC	ECUE1H010BCQ
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
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

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C250	4030014110	S.CERAMIC	ECUE1H080CCQ
C251	4030014070	S.CERAMIC	ECUE1H040BCQ
C252	4030014110	S.CERAMIC	ECUE1H080CCQ
C256	4030013850	S.CERAMIC	ECUE1E102KBQ
C257	4030013850	S.CERAMIC	ECUE1E102KBQ
C258	4030013850	S.CERAMIC	ECUE1E102KBQ
C259	4030014200	S.CERAMIC	ECUE1H101JCQ
C264	4030013850	S.CERAMIC	ECUE1E102KBQ
C402	4030014180	S.CERAMIC	ECUE1H470JCQ
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	4030013850	S.CERAMIC	ECUE1E102KBQ
C436	4030014070	S.CERAMIC	ECUE1H040BCQ
C503	4030013850	S.CERAMIC	ECUE1E102KBQ
C504	4030013850	S.CERAMIC	ECUE1E102KBQ
C505	4030013850	S.CERAMIC	ECUE1E102KBQ
C507	4030014210	S.CERAMIC	ECUE1H151JCQ
C510	4030014020	S.CERAMIC	ECUE1H020BCQ
C511	4030014170	S.CERAMIC	ECUE1H330JCQ
C512	4030014130	S.CERAMIC	ECUE1H120JCQ
C513	4030014440	S.CERAMIC	ECUE1H820JCQ
C514	4030014210	S.CERAMIC	ECUE1H151JCQ
C515	4030014200	S.CERAMIC	ECUE1H101JCQ
C516	4030014330	S.CERAMIC	ECUE1H221JCQ
C517	4030014320	S.CERAMIC	ECUE1H181JCQ
C518	4030009810	S.CERAMIC	C1005 JB 1E 102K-T-A
C519	4030013890	S.CERAMIC	C1005 JB 1H 152K-T-N
C520	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C521	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C522	4030013880	S.CERAMIC	C1005 JB 1H 222K-T-N
C523	4030013890	S.CERAMIC	C1005 JB 1H 152K-T-N
C524	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C525	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C526	4030013950	S.CERAMIC	C1005 JB 1A 393K-T-N
C527	4030014440	S.CERAMIC	ECUE1H820JCQ
C528	4030014160	S.CERAMIC	ECUE1H270JCQ
C529	4030014210	S.CERAMIC	ECUE1H151JCQ
C530	4030014490	S.CERAMIC	ECUE1E331KBQ
C531	4030014320	S.CERAMIC	ECUE1H181JCQ
C532	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C533	4030013890	S.CERAMIC	C1005 JB 1H 152K-T-N
C534	4030014490	S.CERAMIC	ECUE1E331KBQ
C535	4030013850	S.CERAMIC	ECUE1E102KBQ
C536	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C537	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C538	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C539	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C540	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C541	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C542	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C543	4030013850	S.CERAMIC	ECUE1E102KBQ
C544	4030013850	S.CERAMIC	ECUE1E102KBQ
C545	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C546	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C548	4030013850	S.CERAMIC	ECUE1E102KBQ
C550	4030014110	S.CERAMIC	ECUE1H080CCQ
C553	4030013850	S.CERAMIC	ECUE1E102KBQ
C557	4030013850	S.CERAMIC	ECUE1E102KBQ
C558	4030013850	S.CERAMIC	ECUE1E102KBQ
C560	4030013850	S.CERAMIC	ECUE1E102KBQ
C561	4030013850	S.CERAMIC	ECUE1E102KBQ
C562	4030013850	S.CERAMIC	ECUE1E102KBQ
C563	4030013850	S.CERAMIC	ECUE1E102KBQ
C654	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C655	4550000510	S.TANTALUM	TESVA 1V 473M1-8L
C656	4030014110	S.CERAMIC	ECUE1H080CCQ
C657	4030014230	S.CERAMIC	ECUE1E681KBQ
C658	4030013880	S.CERAMIC	C1005 JB 1H 222K-T-N
C659	4550006200	S.TANTALUM	ECST0JY106R
C662	4030013850	S.CERAMIC	ECUE1E102KBQ
C663	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C664	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C665	4030014200	S.CERAMIC	ECUE1H101JCQ
C666	4030014470	S.CERAMIC	ECUE1E391KBQ
C667	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
J1	6510020550	S.CONNECTOR	AXK6S40445P
EP1	0910050763	PCB	B 5163C

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	8210015690	1995 Front panel (C)	1
MP2	8210014981	1995 Rear panel-1	1
MP3	8110006280	1995 BATT cover	1
MP4	8930044211	1995 7-Key-1	1
MP5	8930047620	2127 PTT rubber	1
MP6	8930047610	2127 Jack cap	1
MP7	8310044470	1995 Window plate (A)	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
MP26	8930047470	1995 Mic sheet	1
MP27	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	8510012030	2127 Shield case	1

[RF UNIT]

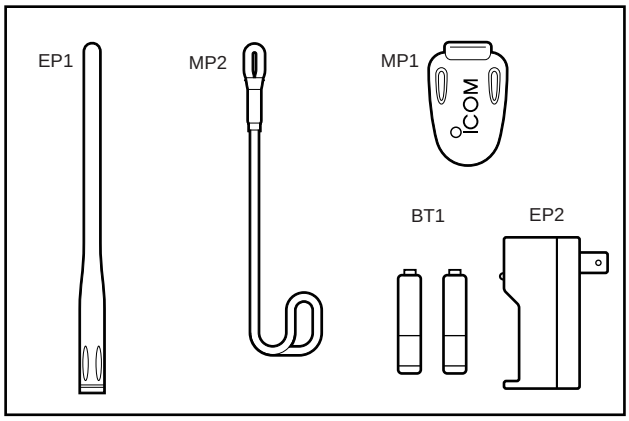
REF. NO.	ODER NO.	DESCRIPTION	QTY.
J1	6510020550	S.Connector AXK6S40445P	1

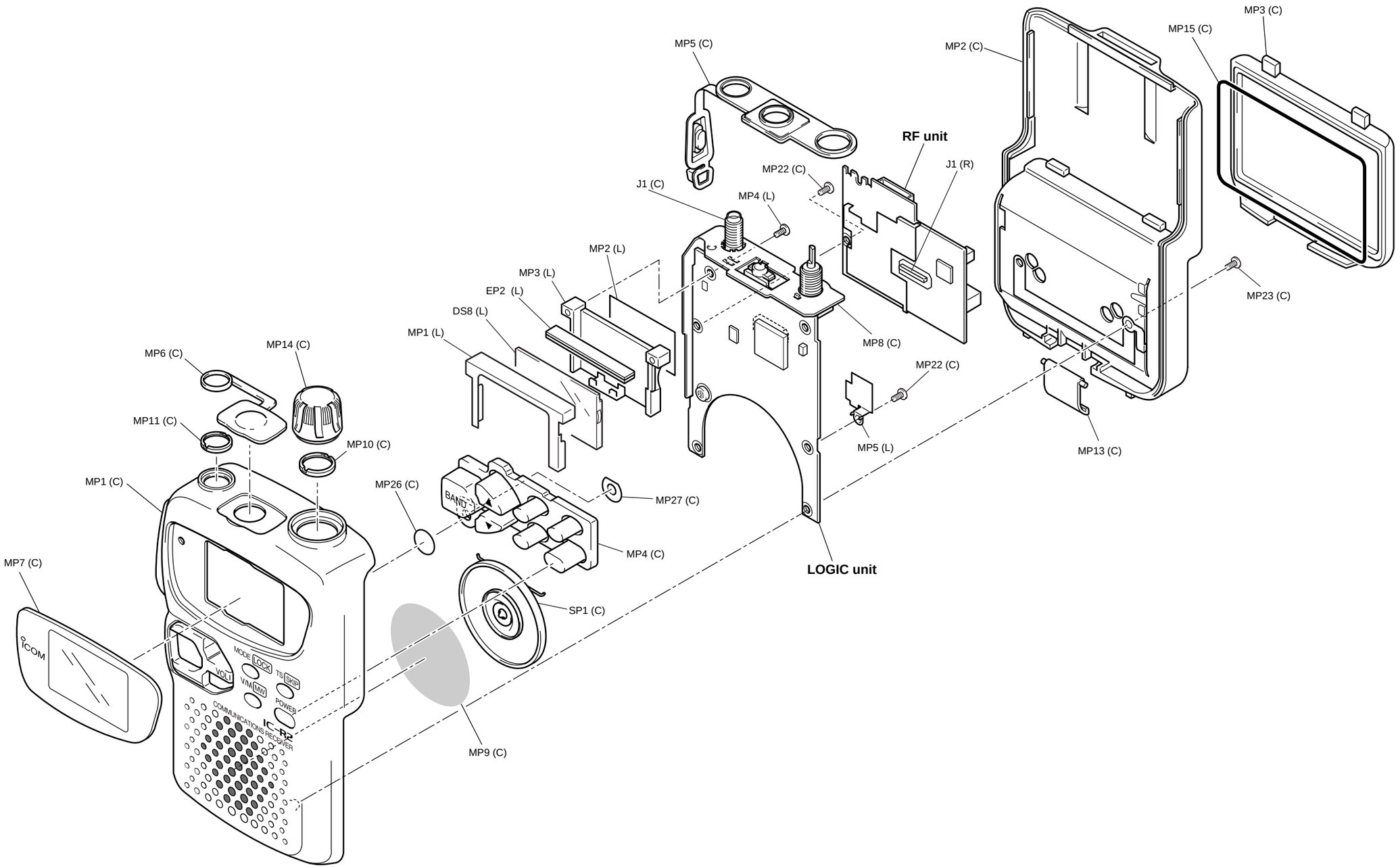
Screw abbreviations

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	NICD CEL	[EUR], [USA], [CAN]	2
	3030000450	NICD CEL	[OTH] only	2
EP1	3310002150	Antenna FA-S270C		1
EP2	0800005090	Chager BC-127A ACC	[USA], [CAN] only	1
	0800005100	Chager BC-127D ACC	[EUR], [OTH] only	1
MP1	8930044191	1995 Belt clip-1		1
MP2	8010011960	Handstrap		1

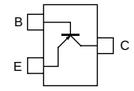
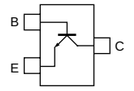
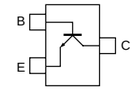
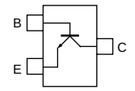
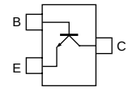
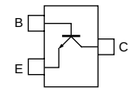
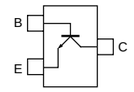
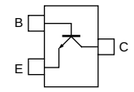
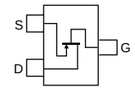
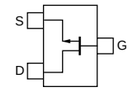
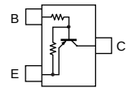
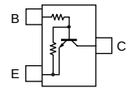
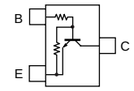
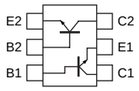
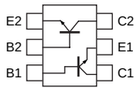
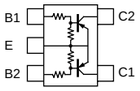
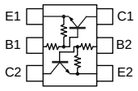
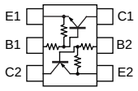
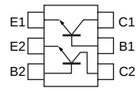




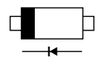
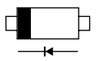
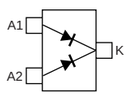
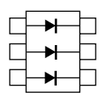
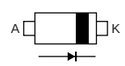
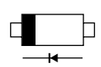
UNIT abbreviation (C): CHASSIS PARTS, (R): RF UNIT, (L): LOGIC UNIT

SECTION 8 SEMI-CONDUCTOR INFORMATION

• TRANSISTOR AND FET'S

2SA1588 GR (Symbol: A6) 	**2SC4081 S** (Symbol: BS) 	**2SC4117 GR** (Symbol: DG) 	**2SC4215 O** (Symbol: QO) 	**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) 	**DTC114EE** (Symbol: 24) 	**DTC144EE** (Symbol: 26) 	**FH102** (Symbol: 102) 	**μPA805T** (Symbol: T82) 
XP1113 (Symbol: 7L) 	**XP4213** (Symbol: 8S) 	**XP4312** (Symbol: 7T) 	**XP6501 AB** (Symbol: 5N) 	

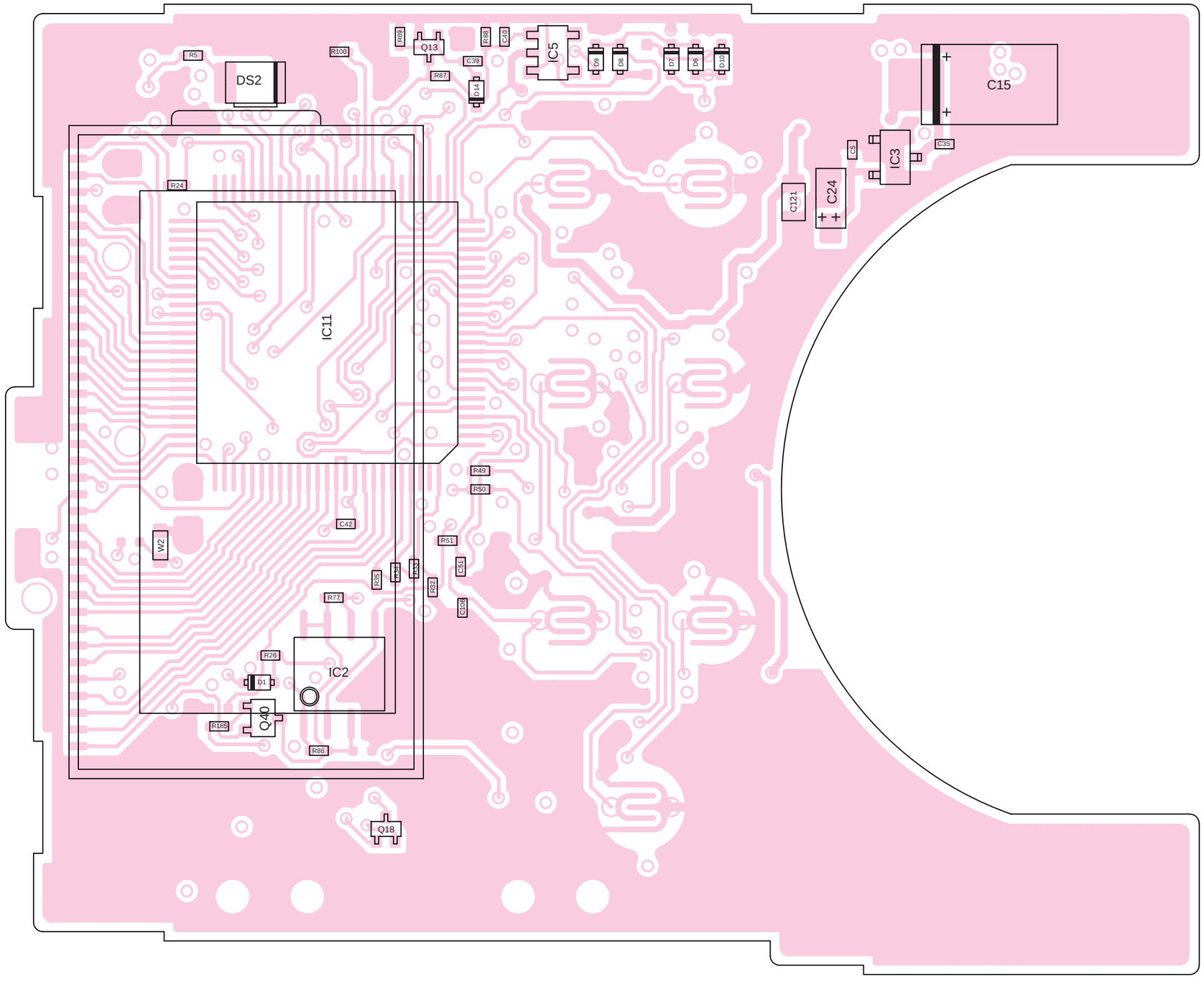
• DIODES

1SS372 (Symbol: N9) 	**1SV172** (Symbol: BE) 	**1SV286** (Symbol: T7) 	**1SV305** (Symbol: TV) 	**1SV308** (Symbol: TX) 
HVU350 (Symbol: 4) 	**MA132WK** (Symbol: MU) 	**MA2S077** (Symbol: S) 	**MA2S111** (Symbol: A) 	**MA6S718** (Symbol: M2N) 
MA728 (Symbol: 2A) 	**MA729** (Symbol: 2B) 			

SECTION 9 BOARD LAYOUTS

9 - 1 LOGIC UNIT

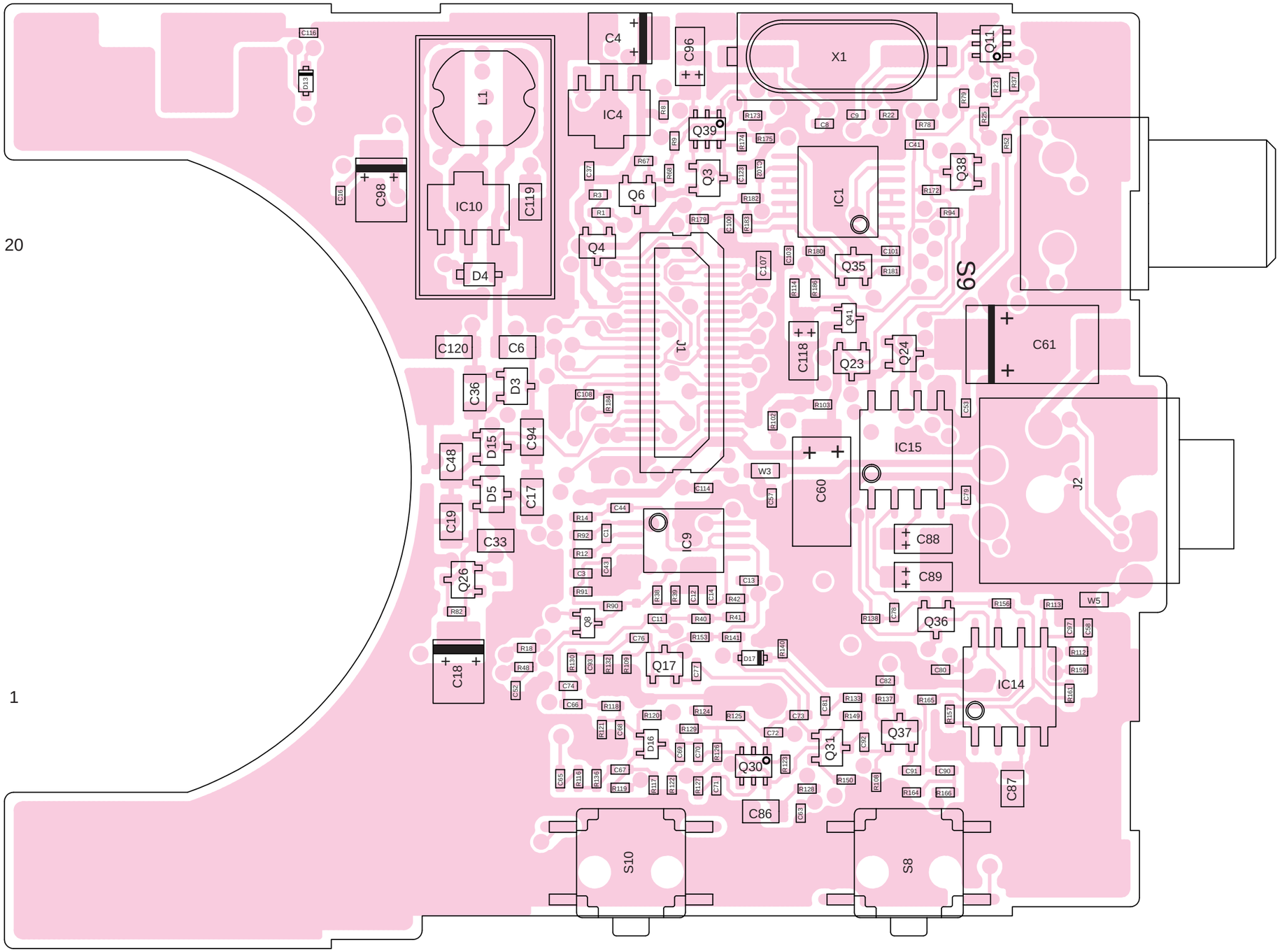
• TOP VIEW



• BOTTOM VIEW

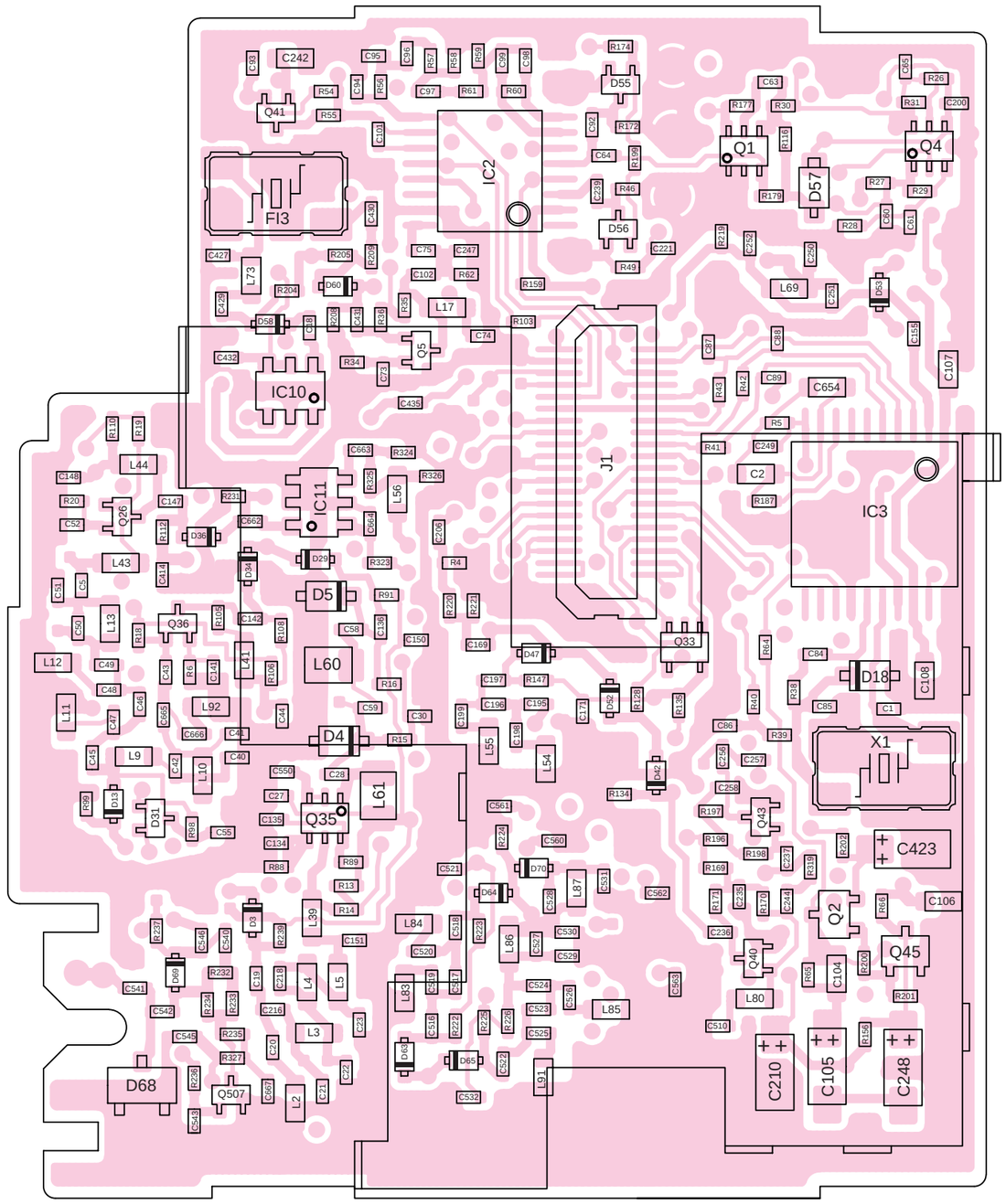
J1
to RF unit J1

21	WFM	AM	20
	AMS	GND	
	R3V	SDET	
	FSET	RSSI	
	+3V	WFMS	
	GND	GND	
	PSTB	GC	
	PCK_IS	300MC	
	PDAUL	800MC	
	VP	GND	
	+3S	GND	
	GND	UHFC	
	B1	VHFC	
	HFC	TRAC	
	SHIFT	B3	
	ATT	B2	
	DBL1	GND	
	DBL2		
	GND	BATRY	
40	GND	BATRY	1



9 - 2 RF UNIT

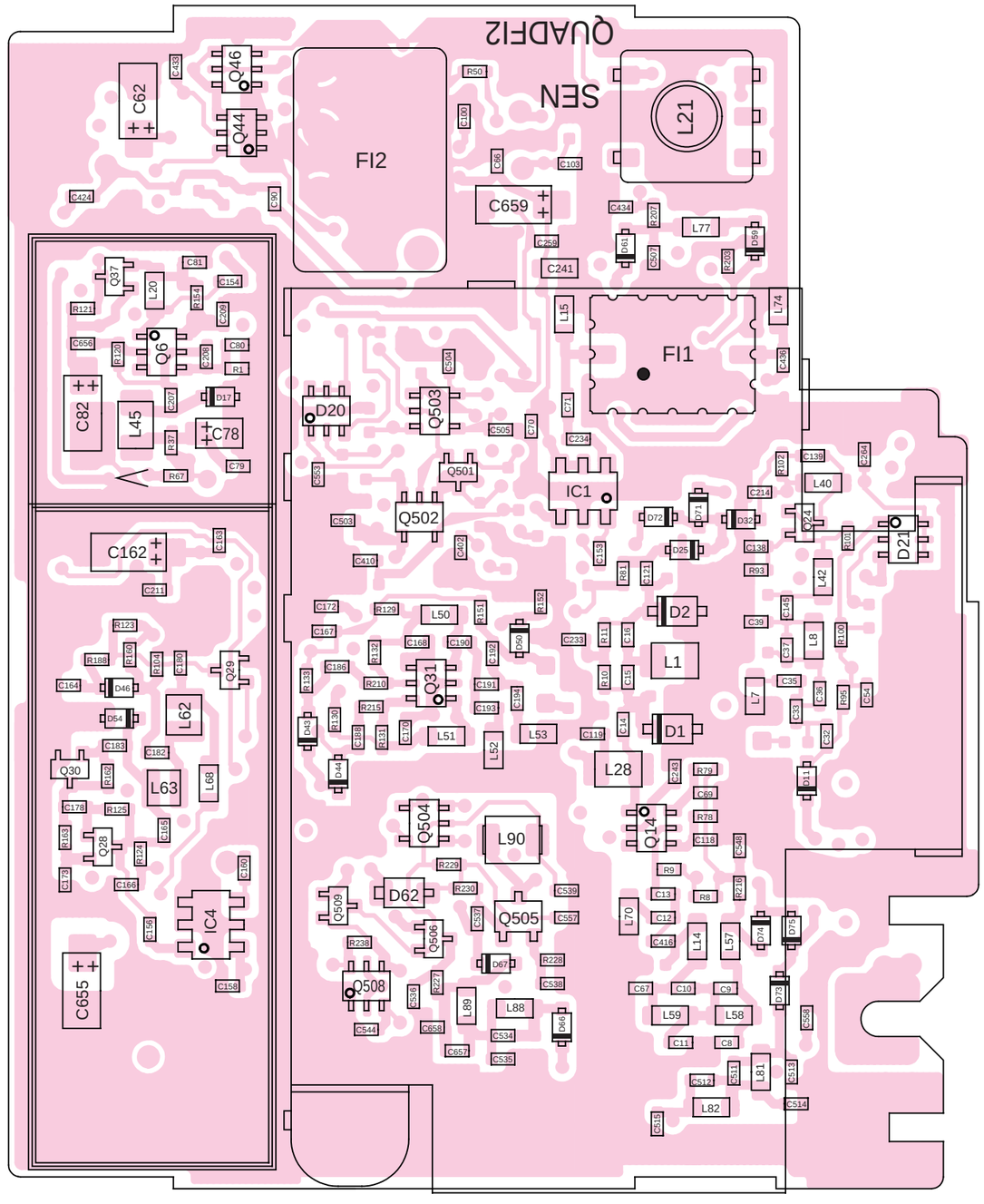
• TOP VIEW



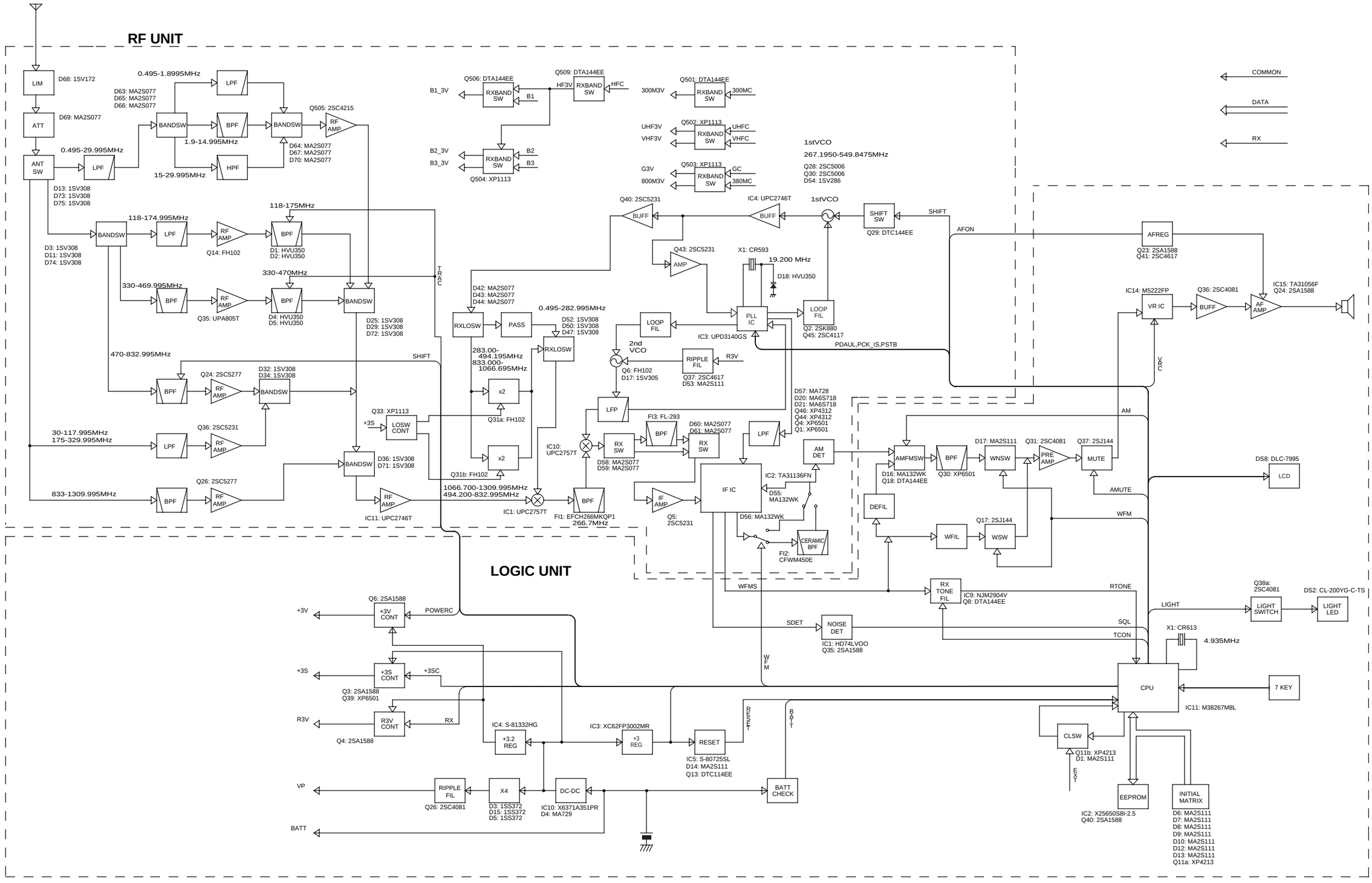
J1
to RF unit J1

20	AM	WFM	21
	GND	AMS	
	SDET	R3V	
	RSSI	FSET	
	WFMS	+3V	
	GND	GND	
	GC	PSTB	
	300MC	PCK_IS	
	800MC	PDAUL	
	GND	VP	
	GND	+3S	
	UHFC	GND	
	VHFC	B1	
	TRAC	HFC	
	B3	SHIFT	
	B2	ATT	
	GND	DBL1	
	GND	DBL2	
	BATRY	GND	
1	BATRY	GND	40

• **BOTTOM VIEW**

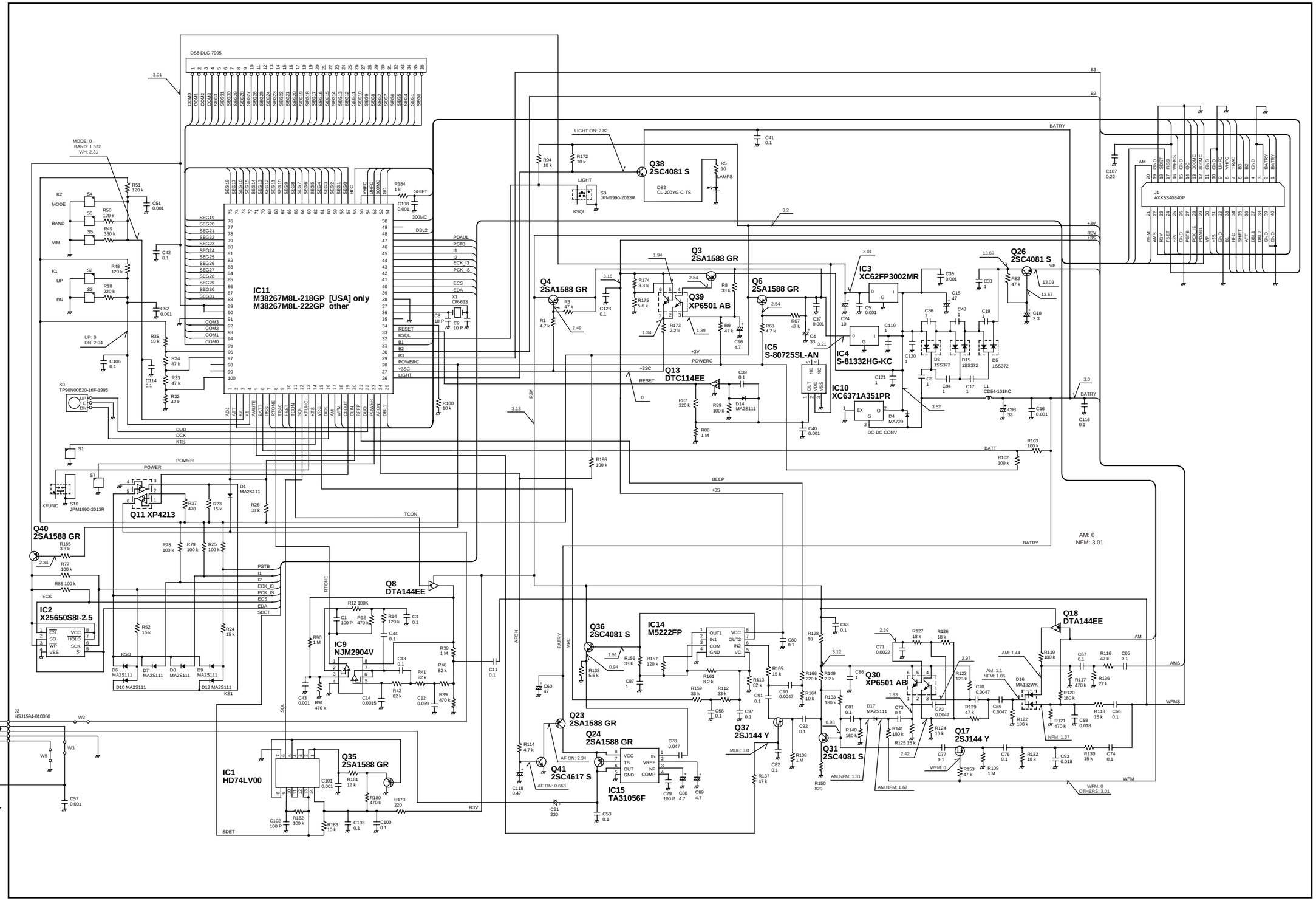


SECTION 10 BLOCK DIAGRAM

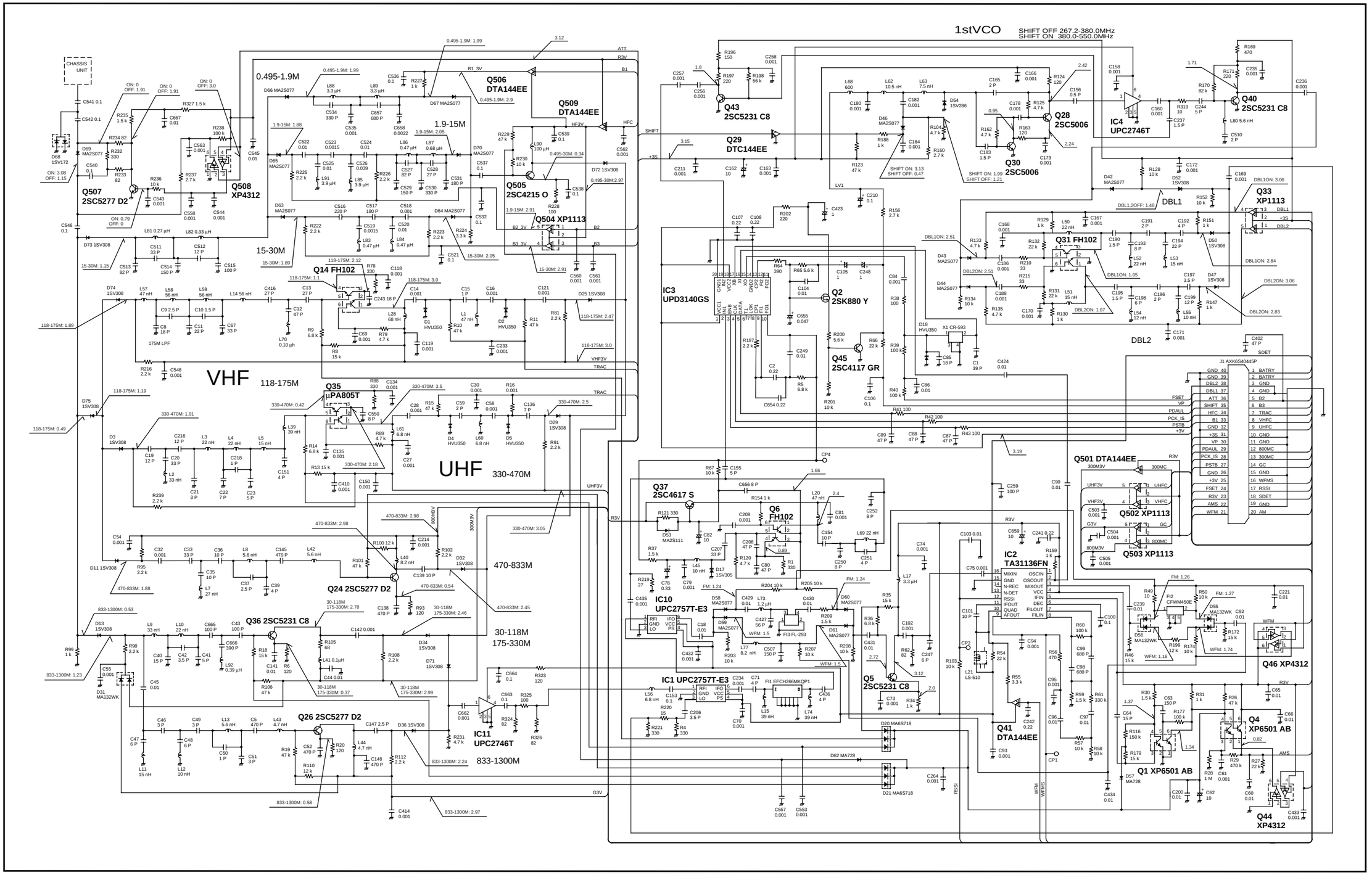


SECTION 11 VOLTAGE DIAGRAM

- **LOGIC UNIT**



• RF UNIT



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