

**ICOM**

**SERVICE  
MANUAL**

MULTIBAND FM TRANSCEIVER

**IC-T81A  
IC-T81E**

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## INTRODUCTION

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This service manual describes the latest service information for the IC-T81A/E at the time of publication.

MODEL	VERSION	SYMBOL
IC-T81A	U.S.A.	USA-1
	Australia	AUS
	S.E.Asia	SEA
IC-T81E	Europe	EUR
	U.K.	UK
	Italy	ITA

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

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## DANGER

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**NEVER** connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 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.

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## ORDERING PARTS

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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>

1130009370 S.IC TB31242FN IC-T81A/E RF UNIT 1 pieces  
8810008990 Screw PH BT M2x10 ZK IC-T81A/E Chassis 10 pieces

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



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## REPAIR NOTES

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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 40 dB to 50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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# SECTION 1 SPECIFICATIONS

## ■ GENERAL

- Frequency range

Version	50 MHz	145 MHz	440 MHz	1200 MHz	91.5 MHz (RX only)
U.S.A.	50 – 53.995	TX: 144 – 148 RX: 118 – 173.995* <sup>1</sup>	TX: 430 – 450* <sup>3</sup> RX: 400 – 469.995* <sup>3</sup>	1240 – 1300	76 – 107.995* <sup>4</sup>
Australia	50 – 53.995	144 – 148	430 – 440	1240 – 1300	88 – 107.995* <sup>4</sup>
S.E.Asia	50 – 53.995	TX: 136 – 173.995* <sup>1</sup> RX: 118 – 173.995* <sup>1</sup>	400 – 469.995* <sup>2</sup>	1240 – 1300	76 – 107.995* <sup>4</sup>
Europe, U.K.	50 – 52	144 – 146	430 – 440	1240 – 1300	88 – 107.995* <sup>4</sup>
Italy	50 – 52	TX: 136 – 173.995* <sup>1</sup> RX: 118 – 173.995* <sup>1</sup>	400 – 469.995* <sup>2</sup>	1240 – 1300	88 – 107.995* <sup>4</sup>

\*<sup>1</sup> Specifications guaranteed 144 – 148 MHz, \*<sup>2</sup> Specifications guaranteed 430 – 440 MHz

\*<sup>3</sup> Specifications guaranteed 440 – 450 MHz, \*<sup>4</sup> Not guaranteed

- Mode : FM and AM (RX only), WFM (Rx only)
- No. of memory channels : 124 (incl. 10 pairs of scan edges and 4 call channels)
- Frequency stability :  $\pm 3$  ppm max. ( $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ ;  $14^{\circ}\text{F}$  to  $140^{\circ}\text{F}$ )
- Tuning steps : 5\*, 10, 12.5, 15\*, 20, 25, 30, 50 and 100 kHz  
\*Not available for 1200 MHz band
- Usable temperature range :  $-10^{\circ}\text{C}$  to  $+60^{\circ}\text{C}$ ;  $14^{\circ}\text{F}$  to  $140^{\circ}\text{F}$
- Usable battery pack/case : BP-198, BP-199, BP-200 and BP-197
- Power supply requirement : 4.5 – 16 V DC or specified battery pack
- Polarity : Negative ground
- Frequency resplution : 5 kHz and 12.5 kHz (10 kHz and 12.5 kHz for 1200 MHz band)
- Current drain (at 13.5 V DC) : (typical value)

		50/144 MHz	440 MHz	1200 MHz
TX	High power	1.4 A	1.3 A	0.8 A
	Low power	0.6 A	0.5 A	0.4 A
RX	Rated output	220 mA		
	Standby	80 mA (at 9.6 V)		
	Power saved	40 mA (at 9.6 V)		

- Antenna connector : SMA (50  $\Omega$ )
- Dimensions (projections not included) : 58(W)  $\times$  106(H)  $\times$  28.5(D) mm; 2 $\frac{5}{16}$ (W)  $\times$  4 $\frac{3}{16}$ (H)  $\times$  1 $\frac{1}{8}$ (D) in
- Weight (with BP-197/Ant.) : 290 g; 10.2 oz

## ■ TRANSMITTER

- Output power (at 13.5 V DC) : High 5.0 W typical (1.0 W at 1200 MHz band)  
Low 1.0 W typical (0.1 W at 1200 MHz band)
- Modulation system : Variable reactance modulation
- Max. freq. deviation :  $\pm 5$  kHz
- Spurious Emissions : Less than  $-60$  dB (50 MHz, 144 MHz and 440 MHz)  
Less than  $-40$  dB (other)  
Less than  $-50$  dB (Europe version at 1200 MHz)
- External MIC connector : 3-conductor 2.5(d) mm ( $\frac{1}{8}$ "); 2 k $\Omega$

## ■ RECEIVER

- Receiver system : Double-conversion superheterodyne
- Intermediate frequency : 1st 69.45 MHz (13.35 MHz: WFM)  
2nd 450 kHz
- Sensitivity\* : (except spurious points; typical values)

Band	FM	AM	WFM
50 MHz	0.18 $\mu$ V	0.56 $\mu$ V	–
144 MHz	0.18 $\mu$ V	–	–
440 MHz	0.18 $\mu$ V	–	–
1200 MHz	0.25 $\mu$ V	–	–
91.5 MHz	–	–	2.0 $\mu$ V

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

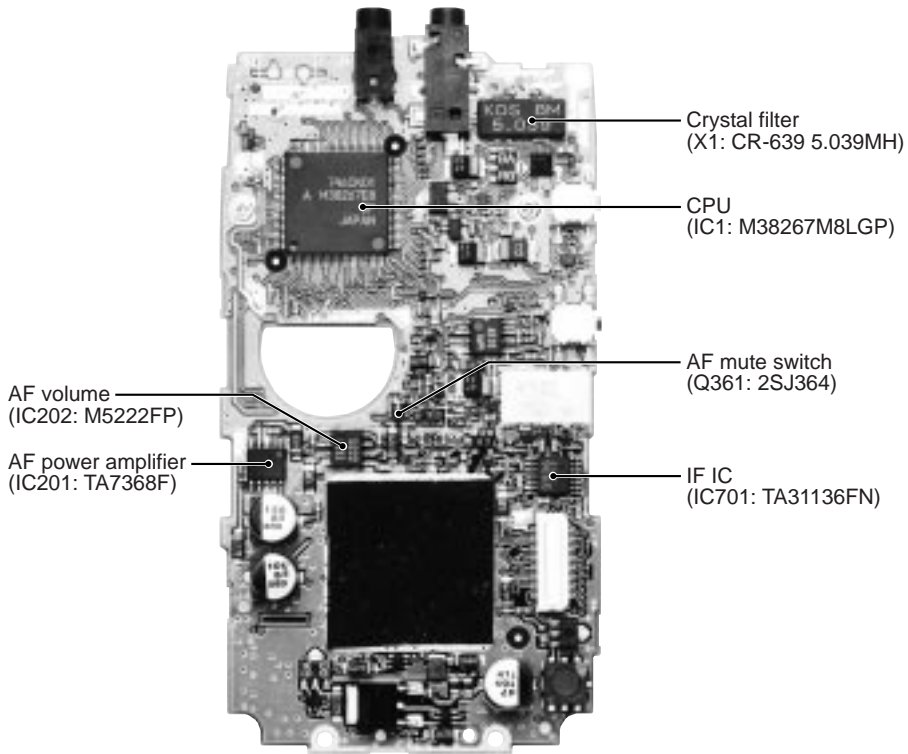
- Squelch sensitivity : 50, 144, 440 MHz Less than 0.18  $\mu$ V (Threshold)  
1200 MHz Less than 0.25  $\mu$ V (Threshold)  
AM (50 MHz only) Less than 0.56  $\mu$ V (Threshold)  
WFM Less than 5.6  $\mu$ V (Threshold)
- Selectivity (except WFM) : More than 15 kHz/–6 dB  
Less than 30 kHz/–60 dB
- Spurious and image rejection ratio : 50, 144 MHz More than 60 dB  
440 MHz More than 50 dB  
1200 MHz More than 38 dB  
(except half IF, 2nd image, 50 MHz band IF and WFM)
- Audio output power : 250 mW typical at 10 % distortion with an 8  $\Omega$  load

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

# SECTION 2 INSIDE VIEWS

## • LOGIC UNIT

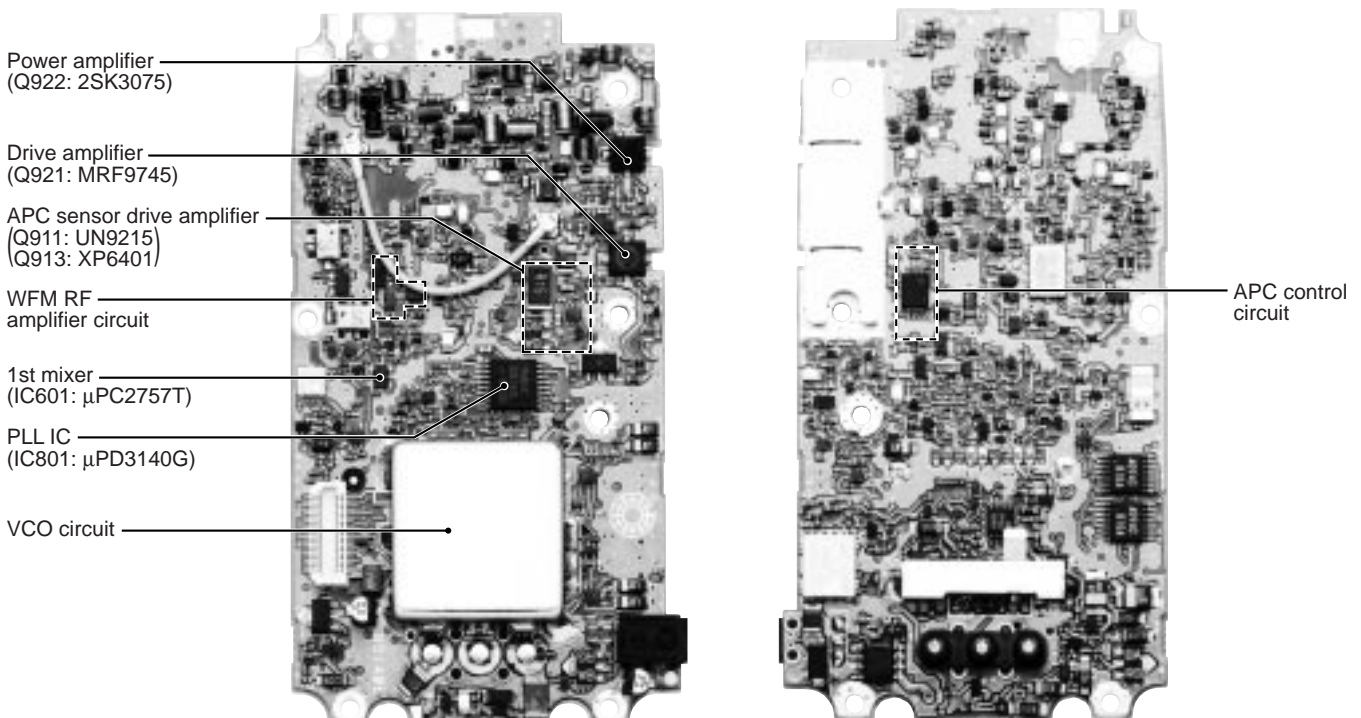
**BOTTOM VIEW**



## • RF UNIT

**TOP VIEW**

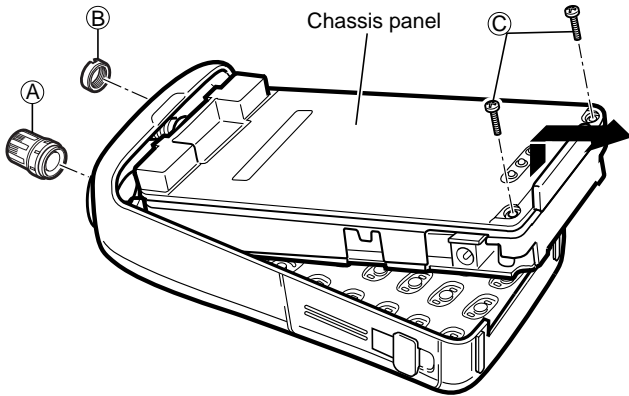
**BOTTOM VIEW**



## SECTION 3 DISASSEMBLY INSTRUCTIONS

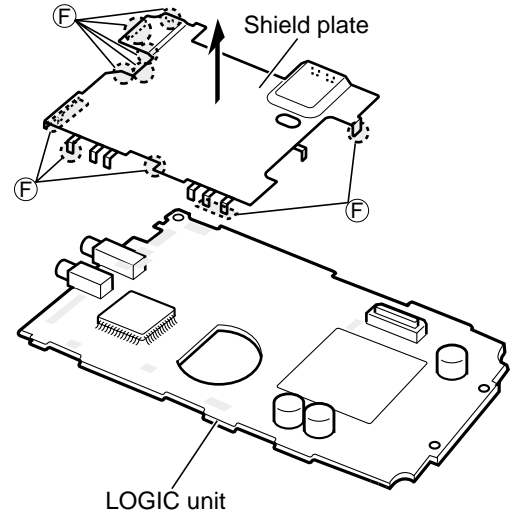
### ● REMOVING THE CHASSIS PANEL

- ① Remove 1 knob (A), and unscrew 1 nut (B).
- ② Unscrew 2 screws (C).
- ③ Remove the chassis panel in the direction of the arrow.



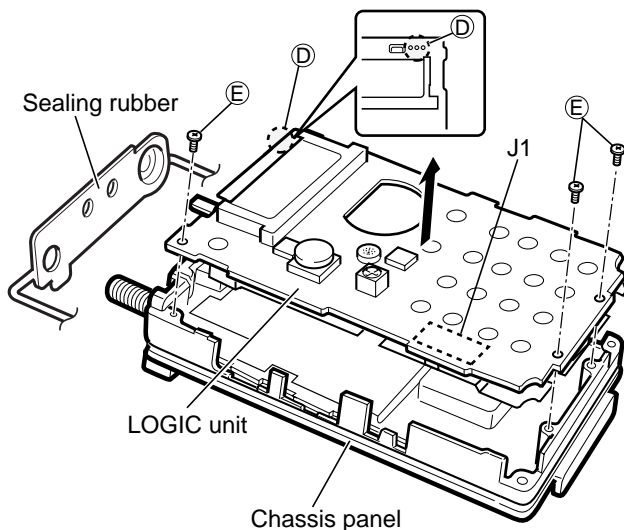
### ● REMOVING THE SHIELD PLATE

- ① Unsolder 10 points (F), to separate the shield plate and LOGIC unit.



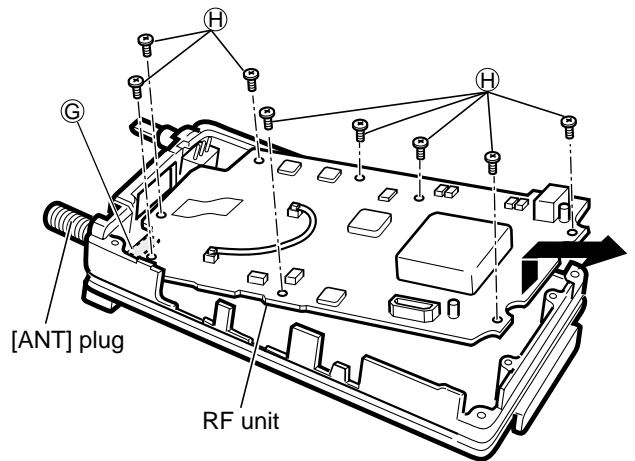
### ● REMOVING THE LOGIC UNIT

- ① Remove the sealing rubber.
- ② Unsolder 1 point (D), to separate a SENSOR control.
- ③ Unscrew 3 screws (E).
- ④ Unplug J1 to separate LOGIC unit and RF unit.
- ⑤ Remove the LOGIC unit in the direction of the arrow.



### ● REMOVING THE RF UNIT

- ① Unsolder 1 point (G), to separate [ANT] plug.
- ② Unscrew 8 screws (H), to separate the RF unit.
- ③ Remove the RF unit in the direction of the thick arrow.



# SECTION 4 CIRCUIT DESCRIPTION

## 4-1 RECEIVER CIRCUITS

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

The transceiver has a duplexer (low-pass and high-pass filters) on the first stage from the antenna connector to separate the signals into below UHF and SHF signals. The high-pass filter (L51–L55, C41–C46 and C48–C50) is for SHF (1200 MHz) signal and the low-pass filter (C9, C10, C12–C14 and L7–L9) is for below UHF (50 MHz, 144 MHz, 440 MHz and WFM) signals. The filtered SHF signal is applied to the low-pass filter (C51–C54, L56 and L57).

The RF signals below UHF pass through the duplexer circuit and are separated into VHF (50 MHz, 144 MHz and WFM band) and UHF (440 MHz band) signals. The high-pass filter (C4–C8, L5, L6) is for UHF (440 MHz band) signal and the low-pass filter (C15–C20, L10–L12) is for VHF (50 MHz, 144 MHz and WFM band) signals.

The VHF signals are applied to the another duplexer circuit for separation into 50 MHz and above WFM band signals. The high-pass filter (C21–C24, C84 and L13–L15) is for 144 MHz and WFM band signals and the low-pass filter (C27–C33 and L16–L18) is for 50 MHz band signal.

The separated signals are applied to each RF circuits.

### 4-1-2 ANTENNA SWITCHING CIRCUITS (RF UNIT)

The antenna switching circuit functions as a low-pass filter while receiving. However, its impedance becomes very high while transmitting by applying a current to D101 and D102 (50 MHz), D302 and D303 (144MHz and WFM), D402 and D403 (440 MHz), D51 and D52 (1200 MHz).

Thus, transmit signals are blocked from entering the receiver circuits. The antenna switching circuit employs a  $1/4\lambda$  type diode switching system. The passed signals are then applied to each RF amplifier circuit.

### 4-1-3 50 MHz BAND RF CIRCUIT (RF UNIT)

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

The signals from the antenna switching circuit (D101 and D102) are amplified at the RF amplifier (Q101). The amplified signals pass through the tunable bandpass filter (L108–L110, C115, C117, C120, D106, D107) to suppress out-of-band signals, and are then applied to the 1st mixer circuit (IC601, pin 1).

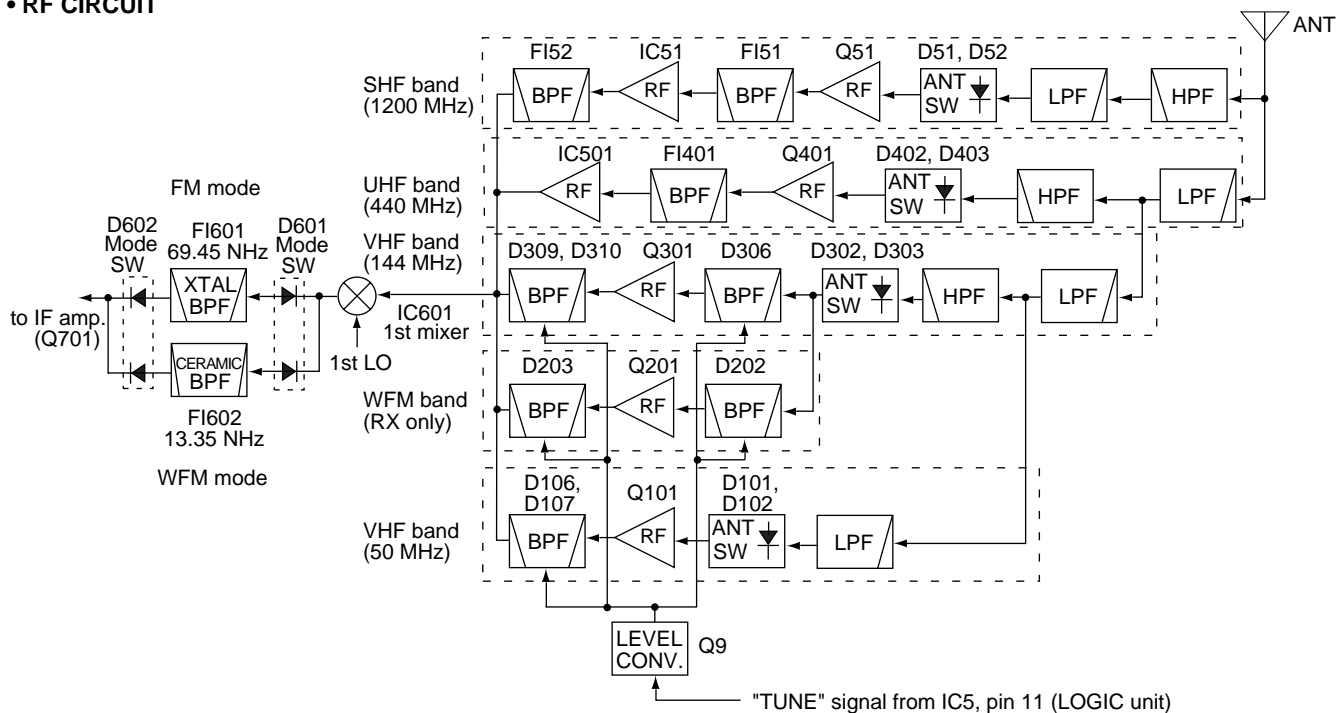
### 4-1-4 144 MHz AND WFM BANDS RF CIRCUITS (RF UNIT)

The signal from the antenna switching circuit (D302, D303) are applied to the each band-pass filters and RF amplifier.

#### • RF signals 144 MHz band

The 144 MHz band signals are applied to the RF amplifier (Q301) via the tunable bandpass filter (L303, L304, C306, D306). The amplified signals pass through the tunable bandpass filter (C318–C321, D309, D310, L305, L306), and are then applied to the 1st mixer circuit (IC601, pin 1).

#### • RF CIRCUIT





• **RF signals WFM band**

The WFM band signals are applied to the RF amplifier (Q201) via the tunable band-pass filter (D202). The amplified signals pass through the tunable bandpass filter (D203), and are then applied to the 1st mixer circuit (IC601, pin 1).

Varactor diodes (D106, D107, D202, D203, D306, D309, D310) are employed by the tunable bandpass filter to tune the center frequency of the bandpass filter. These diodes are controlled by the PLL lock voltage and obtain good image response rejection.

**4-1-5 440 MHz BAND RF CIRCUIT (RF UNIT)**

The signals from the antenna switching circuit (D402 and D403) are amplified at the RF amplifier (Q401). The amplified signals pass through the bandpass filter (FI401), and are then applied to the 1st mixer circuit (IC601, pin 1) after being amplified at another RF amplifier (IC501).

**4-1-6 1200 MHz BAND RF CIRCUIT (RF UNIT)**

The signals from the antenna switching circuit (D51 and D52) are amplified at the RF amplifier (Q51). The amplified signals pass through the bandpass filter (FI51), and are then applied to the RF amplifier (IC51). The amplified signal is applied to the 1st mixer circuit (IC601, pin 1) via the band-pass filter (FI52).

**4-1-7 1ST MIXER CIRCUIT (RF UNIT)**

The 1st mixer circuit converts the received RF signals into a fixed frequency of the 1st IF signal with a 1st LO output frequency. By changing the PLL frequency, only the desired frequency will pass through at the next stage of the 1st mixer. 1st mixer circuit produces the different 1st IF signal for WFM and other band signals.

• **50, 144, 440 and 1200 MHz band**

The applied RF signals are mixed with 1st LO signals at the 1st mixer (IC601) to produce a 69.45 MHz 1st IF signal. The 1st IF signal is output from the 1st mixer (IC601, pin 6), and then passed through the crystal bandpass filter (FI601) to suppress unwanted harmonic components. The filtered 1st IF signal is applied to the IF amplifier (IC701). The amplified signal is applied to the 2nd mixer circuit (LOGIC unit; IC701, pin 16).

• **WFM band**

The RF signals are mixed with 1st LO signals at the 1st mixer (IC601) to produce a 13.35 MHz 1st IF signal. The 1st IF signal is output from the 1st mixer (IC601, pin 6), and then passed through the 1st IF filter (FI602) to suppress unwanted harmonic components. The filtered signal is applied to the 2nd mixer circuit (LOGIC unit; IC701, pin 16).

The 1st LO signals are generated at the VCO circuit which consists of Q301, Q302, D301, Q311, Q312, D302, D311 for 50 MHz, 144 MHz and WFM, Q321, Q322, D321, D322 for 440 MHz, Q350, D351, D352 for 1200 MHz on the VCO unit.

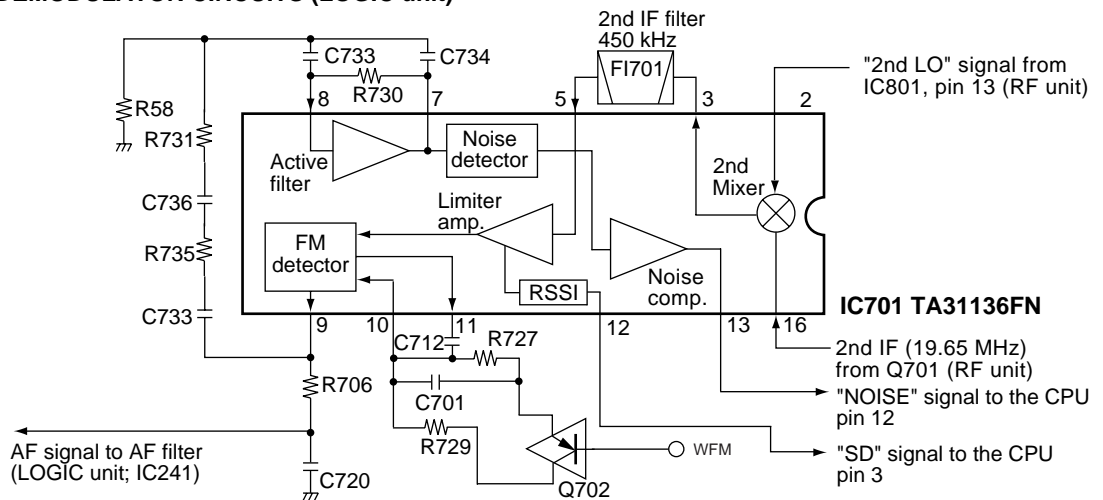
• **The 1st LO signal for 50, 144, 440, WFM band**

The 1st LO signals which are generated on the VCO unit are applied to the buffer-amplifier (Q313 and D312 for 50 MHz, 144 MHz and WFM, Q323 for 440 MHz). The buffer-amplified signals are applied to the LO-amplifier (Q822 for 50 MHz, 144 MHz and WFM, Q823 for 440 MHz), and are then applied to the 1st mixer circuit via the TX/RX switch (D802 and D803 for 50 MHz, 144 MHz and WFM, D804 and D805 for 440 MHz) on the RF unit.

• **The 1st LO signal for 1200 MHz band**

The 1st LO signals which are generated on the VCO unit are applied to the buffer-amplifier (Q351). The buffer-amplified signals are applied to the doubler circuit (Q353), and passes through the high-pass and low-pass filter. The filtered signals are applied to the 1st mixer circuit (Q601) on the LOGIC unit after being amplified at the LO-amplifier (Q824).

• **2nd IF AND DEMODULATOR CIRCUITS (LOGIC unit)**



## **4-1-8 2ND IF AND DEMODULATOR CIRCUITS (RF AND LOGIC UNITS)**

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

The FM IF IC (LOGIC unit; IC701) contains 2nd local oscillator, 2nd mixer, limiter amplifier, quadrature detector and S-meter detector circuits.

The filtered 1st IF signal from the 1st IF filter (RF unit; FI601 or FI602) is mixed with the 2nd LO signal at the 2nd mixer (LOGIC unit; IC701) to produce the 450 kHz 2nd IF signal. The 2nd IF signal passes through or bypasses (WFM mode signal) 2nd IF filter (FI701) where unwanted heterodyne signals are suppressed via the mode switch (LOGIC unit; D701, D702). The filtered signals are applied to the limiter amplifier section (LOGIC unit; IC701, pin 5), and then applied to the quadrature detector section to demodulate the 2nd IF signal into AF signals.

The demodulated AF signals are output from pin 9 of the IF IC (LOGIC unit; IC701) and are applied to the AF circuit.

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

The AF amplifier circuit which is included a low-pass and high-pass filter, AF mute switch, AF volume controller and AF amplifier amplifies the demodulated AF signals to drive a speaker.

The demodulated AF signals (DETO signal) from the FM IF IC (IC701) are passed through the AF filter (low-pass and high-pass filters). The filtered signals are applied to the AF mute switch (Q361) which is controlled by "RM/MM" signals from the CPU (IC1, pin 31), and are then applied to the electric volume control circuit (IC202, IC203). The level controlled AF signals are output from volume IC (IC202, pin 7) and are then applied to the AF amplifier (IC201, pin 4). The AF signals are then applied to the internal speaker (SP1) via the [EXT SP] jack (LOGIC unit; J3) when no plug is connected to the jack.

The AF filter circuit (IC241) removes AF signals below 300 Hz (CTCSS signals) for clear AF output and these are applied to the CPU (IC1, pin4) for CTCSS squelch detection via the "CTCIN" line.

### **4-1-10 SQUELCH CIRCUIT (LOGIC UNIT)**

#### **• 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 (IC701, pin 9) are applied to the active filter section (IC701, pin 7, 8). The active filter section amplifies and filters noise components. The filtered signals are applied to the noise detector section and output from IC701 (pin 13) as "NOISE" signal.

The "NOISE" signal from IC701 (pin 13) is applied to the CPU (IC1, pin 12). The CPU analyzes the noise condition and outputs the "RM/MM" signal to AF mute switch (Q361).

Even when the squelch is closed, the AF mute switch (Q361) 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 (IC701, pin9) passes through the AF filter (IC241) to remove AF (voice) signals and is applied to the CTCSS decoder inside the CPU (IC1, pin 4) via the "CTCIN" line to control the AF mute switch.

## **4-2 TRANSMITTER CIRCUITS**

### **4-2-1 MICROPHON AMPLIFIER CIRCUIT (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 AF signals from the internal microphone (MC1) or external [MIC] jack (J4) are applied to the microphone (limiter) amplifier (IC301, pin 3) which has +6 dB/octave pre-emphasis characteristics, and are then passed through the low-pass filter (IC301, pin 6 and 7). The filtered signals are applied to the modulation circuit for each band in the RF unit via the band switch (Q304: for 144 MHz band, Q305: for UHF band, Q306: for 50 MHz band, Q309: for 120MHz band) as the "MOD" signal.

### **4-2-2 MODULATION CIRCUIT (VCO AND RF UNIT)**

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

#### **(1) 50 MHz band**

The signals from the limiter amplifier (RF unit; IC301) changes the reactance of a diode (RF unit; D341) to modulate the oscillated signal at the 50-VCO circuit (RF unit; Q341, D341, L341–343). The modulated signals are amplified at the buffer-amplifier (Q342) and the LO amplifier (Q821). The amplified signals are applied to the drive/power amplifier circuits for VHF band.

#### **(2) 144 MHz band**

The signals from the limiter amplifier (RF unit; IC301) changes the reactance of a diode (VCO unit; D302) to modulate the oscillated signal at the 144-VCO circuit (VCO unit; Q311, Q312, D302, D311–D313). The modulated signals are amplified at the buffer-amplifier (Q312, Q313) and the LO amplifier (Q822). The amplified signals are applied to the drive/power amplifier circuits for VHF band.

**(3) 440 MHz band**

The signals from the limiter amplifier (RF unit; IC301) changes the reactance of a diode (VCO unit; D321) to modulate the oscillated signal at the 440-VCO circuit (VCO unit; Q321, Q322, D321, D322, L322). The modulated signals are amplified at the buffer-amplifier (Q323) and the LO amplifier (Q823). The amplified signals are applied to the drive/power amplifier circuits for UHF band.

**(4) 1200 MHz band**

The signals from the limiter amplifier (RF unit; IC301) changes the reactance of a diode (VCO unit; D352) to modulate the oscillated signal at the 1200-VCO circuit (VCO unit; Q350, D351, D352, L330). The modulated signals are amplified at the buffer-amplifier (Q351). The amplified signals are applied to the doubler circuit (Q353), and then passed through the high-pass (C376–C380, L334, L335) and the low-pass (C381–C386, L336, L337) filters. The filtered signals are amplified at the buffer-amplifier (Q354) and the LO amplifier (Q824). The amplified signals are applied to the drive/power amplifier circuits for SHF band.

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

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

**(1) 50 MHz PA**

The signal from the LO amplifiers (Q821) is amplified at the buffer-amplifier (Q133) and the YGR amplifier (Q134). The amplified signal is applied to the driver amplifiers (Q921), and is then amplified at the power amplifier (Q922) to obtain 5.0 W of RF power.

The amplified signal is passed through the antenna switching circuit (D101 and D102) and low-pass filters, and is then applied to the antenna connector.

**(2) 144 MHz PA**

The signal from the LO amplifiers (Q822) is passed through the Tx/Rx switch (D802 and D803), and is amplified at the buffer-amplifier (Q133) and the YGR amplifier (Q134). The amplified signal is applied to the driver amplifiers (Q921), and is then amplified at the power amplifier (Q922) to obtain 5.0 W of RF power.

The amplified signal is passed through the antenna switching circuit (D101 and D102), low-pass filters and high-pass filters. The signal is applied to the antenna connector.

**(3) 440 MHz PA**

The signal from the LO amplifiers (Q823) is passed through the Tx/Rx switch (D804 and D805), and is amplified at the buffer amplifier (Q135) and the YGR amplifier (Q136). The amplified signal is applied to the driver amplifier (Q921), and is then amplified at the power amplifier (Q922) to obtain 5.0 W of RF power.

The amplified signal is passed through the antenna switching circuit (D402 and D403), low-pass filters and high-pass filters. The low-pass filtered signal is applied to the antenna connector.

**(4) 1200 MHz PA**

The signal from the LO amplifiers (Q824) is passed through the Tx/Rx switch (D806 and D807), and is amplified at the buffer-amplifiers (Q131 and Q132) and the YGR amplifier (Q138). The amplified signal is applied to the driver amplifiers (Q921) to obtain 1.0 W of RF power.

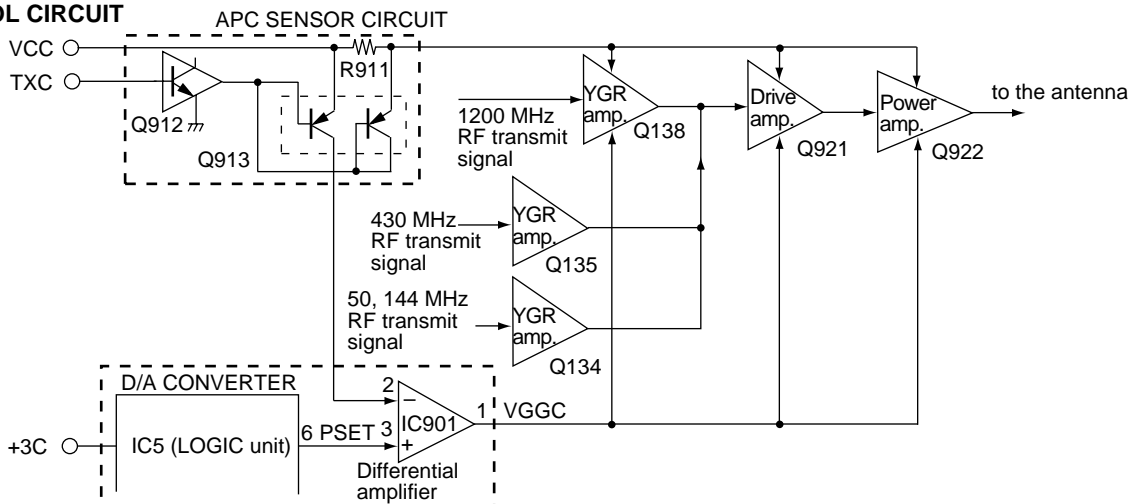
The amplified signal is passed through the antenna switching circuit (D51 and D52), low-pass filter and high-pass filters. The high-pass filtered signal is applied to the antenna connector.

Collector voltages for the drive amplifier (Q921) and control voltage for the power amplifier (Q922) and YGR amplifier (Q138) are controlled by the APC circuit to protect the power module from a mismatched condition as well as to stabilize the output power.

**4-2-4 APC CIRCUITS (RF UNIT)**

The APC circuit protects the power amplifier from a mismatched output load and stabilizes the output power. The APC circuit is designed to use VHF, UHF and SHF bands commonly.

**• APC CONTROL CIRCUIT**



The APC sensor (R911) detects driving current from the drive voltage at the YGR (Q138), drive (Q921) and power (Q922) amplifiers. The detected current is converted into DC voltage at Q913, then applied to the APC control circuit (IC901, pin 2). The applied voltage is compared with a "PSET" voltage from the CPU via the D/A converter (LOGIC unit; IC5), and the APC control circuit outputs "VGGC" voltage from pin 1 to control the YGR, drive and power amplifiers.

When the driving current is increased, input voltage of the differential amplifier (IC901, pin 2) will be increased. In such cases, the differential amplifier output voltage (IC901, pin 1) is decreased to reduce the driving current.

### 4-3 PLL CIRCUITS

#### 4-3-1 50 MHz BAND PLL CIRCUIT (RF UNIT)

The oscillated signal at the 6MVCO (Q341, D341) is amplified at the buffer amplifiers (Q342, Q343). The amplified signal is applied to the PLL IC (IC801, pin 2) via the buffer-amplifier (Q813).

The signal which is applied to the PLL IC (IC801) is divided by N-data from the CPU and phase-detected with the divided reference frequency (5 kHz) then output from pin 8. The output signal is converted into DC voltage at the active filter (Q804, Q805) and is fed back to the 6MVCO as the lock voltage.

#### 4-3-2 144 MHz BAND PLL CIRCUIT (VCO BOARD AND RF UNIT)

The oscillated signal at the 144-VCO circuit (VCO unit; Q311, Q312, D302 and D311) is amplified at the buffer amplifiers (VCO unit; Q313). The amplified signal is applied to the PLL IC (IC801, pin 19) via a buffer-amplifier (Q807).

The applied signal is divided by serial data from the CPU (N-data) and phase-detected with the divided reference frequency (5 kHz) at the phase detector section in the PLL IC. The phase-detected signal is output from IC801 (pin 13) and converted DC voltage at the active filter (Q811, Q812). The converted DC voltage is fed back to the VCO board as the "VLV" signal of the lock voltage.

While operating in the 144 MHz band, the lock voltage is applied to the CPU (LOGIC unit; IC1) via the tune control circuit (Q803) to track the center frequency of the tunable bandpass filters (D306, D309, D310) as the "TUNE" signal.

#### 4-3-3 440 MHz BAND PLL CIRCUIT (VCO BOARD AND RF UNIT)

The oscillated signal at the 440-VCO circuit (VCO unit; Q321, Q322, D321 and Q322) is amplified at the buffer-amplifiers (VCO unit; Q323). The amplified signal is applied to the PLL IC (IC801, pin 19) via a buffer-amplifier (Q807).

The applied signal is divided by serial data from the CPU (N-data) and phase-detected with the divided reference frequency (5 kHz) at the phase detector section in the PLL IC. The phase-detected signal is output from IC801 (pin 13) and converted DC voltage at the active filter (Q811, Q812). The converted DC voltage is fed back to the VCO board as the "VLV" signal of the lock voltage.

#### 4-3-4 1200MHz BAND PLL CIRCUIT (VCO BOARD AND RF UNIT)

The oscillated signal at the 1200-VCO circuit (VCO unit; Q350, D351 and D352) is amplified at the buffer-amplifiers (VCO unit; Q351 and Q353). The signal passes through the buffer amplifier (Q354), the high-pass (C376–C380, L334 and L335) and the low-pass filter (C381–C385, L336 and L337). The filtered signal is applied to the PLL IC (IC802, pin 1) via the buffer amplifier (Q816).

The applied signal is divided by serial data from the CPU (N-data) and phase-detected with the divided reference frequency (5 kHz) at the phase detector section in the PLL IC. The phase-detected signal is output from IC801 (pin 13) and converted DC voltage at the active filter (Q811, Q812). The converted DC voltage is fed back to the VCO board as the "VLV" signal of the lock voltage.

### 4-4 POWER SUPPLY CIRCUITS VOLTAGE LINE

LINE	DESCRIPTION
HV	The voltage from the external power supply or attached battery pack.
VCC	The same voltage as the "HV" line (external power supply or battery pack) passed through a diode (RF unit; D1).
+3CPU	Common 3V converted from the "VCC" line by +3C CPU regulator IC (LOGIC unit; IC141). The output voltage is supplied to the +3C regulator circuits, etc.
+3C	Common 3V converted from the "VCC" line by the +3C regulator circuit (LOGIC unit; Q142 and Q145) using the +3CPU regulator (LOGIC unit; IC141.)
+3	Common 3V converted from the "VCC" line by the +3 regulator circuit (LOGIC unit; IC5, Q1, Q2 and Q3) using the +3C regulator (LOGIC unit; Q142 and Q145).
R+3	3V for receiver circuit converted from the "VCC" line by the "R+3" regulator circuit (RF unit; Q7 and Q8).
T4	4V for transmitter circuit converted from the "VCC" line by the T4 regulator circuit (RF unit; Q901–Q903 and D901). The T4 regulator circuit is controlled by the CPU (LOGIC unit; IC1, pin 21) via the "TXC" line.

## 4-5 PORT ALLOCATIONS

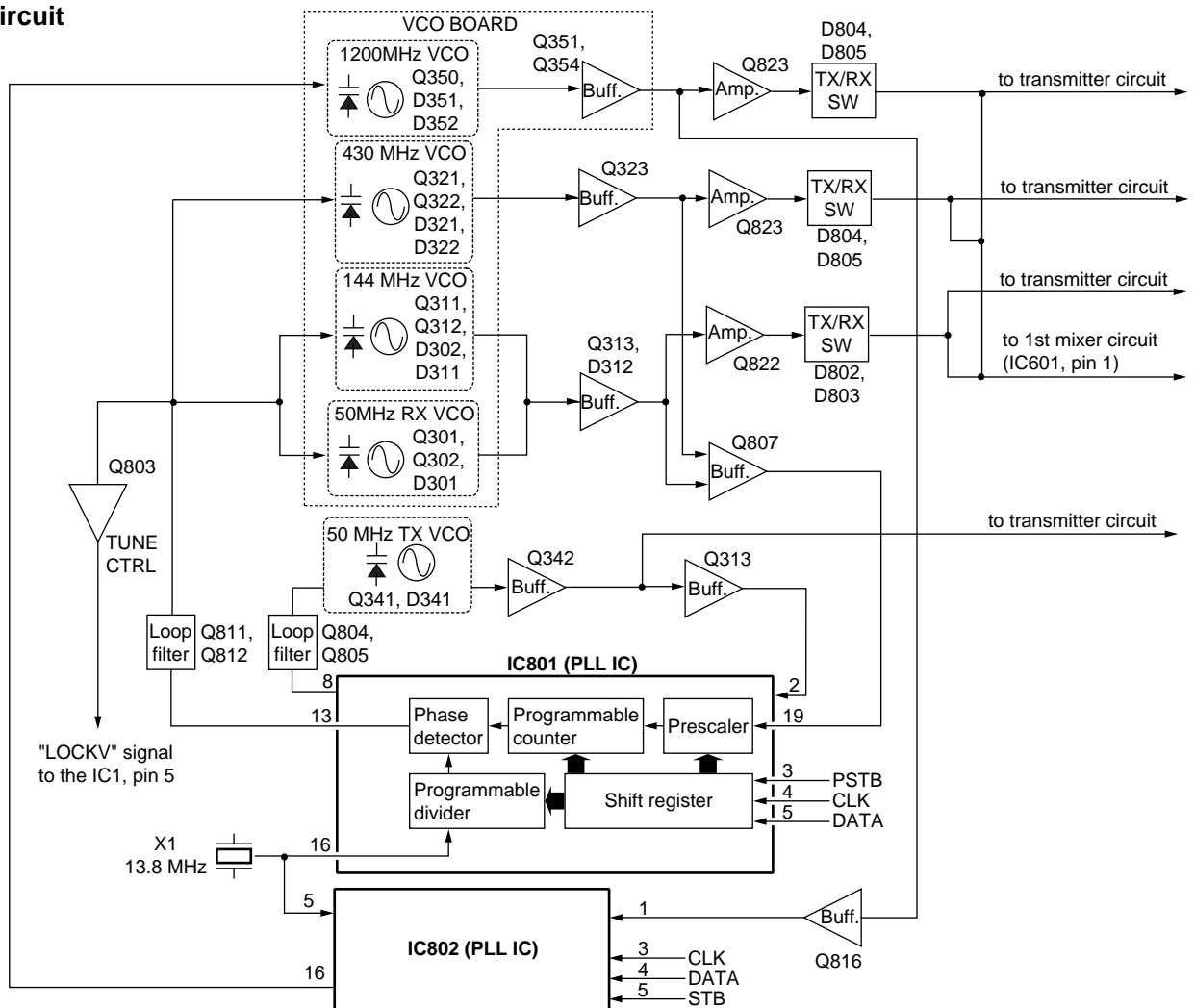
### 4-5-1 I/O EXPANDER IC (RF UNIT; IC2)

Pin number	Port name	Description
4	Q1	Outputs VHVCO3 regulator control signal.
5	Q2	Outputs VLVCO3 regulator control signal.
6	Q3	Outputs 6MVCO3 regulator control signal.
7	Q4	Outputs VCO shift signal for SHF, UHF, 144 MHz and 50 MHz.
11	Q8	Outputs 12VCO3 regulator control signal.
12	Q7	Outputs UHVCO3 regulator control signal.
13	Q6	Outputs UHF TX and RX regulator control signal.
14	Q5	Outputs 1200 MHz TX and RX regulator control signal.

### 4-5-2 I/O EXPANDER IC (RF UNIT; IC3)

Pin number	Port name	Description
4	Q1	Outputs 300 MHz band RX regulator control signal.
6	Q3	Outputs AM mode regulator control signal.
7	Q4	Outputs WFM band RX switching control signal.
11	Q8	Outputs WFM band RX regulator control signal.
12	Q5	Outputs 50 MHz band TX and RX regulator control signal.
13	Q6	Outputs VHF band TX and RX regulator control signal.

### • PLL circuit



### 4-5-3 CPU (LOGIC UNIT; IC1)

Pin number	Port name	Description
1	VIN	Input port for the over-voltage detection from connected battery pack or external power supply.
2	REMOTE	Input port for remote control signals from an optional HM-75A microphone via the [MIC] jack.
3	SD	Input port for the S-meter voltage.
4	CTCIN	Input port for CTCSS decoded signals.
5	LOCKV	Input port for the PLL lock voltage.
6	THERMC	Input port for the transceiver's internal temperature.
7	SBATT	Input port for the VCC voltage (connected battery voltage).
8	CONT	Outputs control signal for the LCD contrast. High : The LCD contrast is deep.
9	CTCOUT	Outputs CTCSS signals while transmitting.
10	BEEP	Output port for: • Beep audio signals while receiving. • DTMF signals or 1750 Hz Europe tone signal while transmitting. [EUR], [ITA], [UK]
11	BPCPI	Input port for the bias control voltage to judge kinds of battery types. High : Supply the bias control voltage.
12	NOISE	Input port for the noise signal (pulse-type) from the IF IC (RF unit; IC 701, pin 13).
13	PDA2/UL	Outputs data signals to the PLL IC2 (RF unit; IC802, pin 4). Input port for the PLL unlock signal from the PLL IC2 (RF unit; IC802, pin 4).
14	PDA1/UL	Outputs data signals to the PLL IC1 (RF unit; IC801, pin 5). Input port for the PLL unlock signal from the PLL IC1 (RF unit; IC801, pin 5).
15	DAST	Outputs strobe signals to the D/A IC (LOGIC unit; IC5, pin2).
16	IOST	Outputs strobe signals to the I/O IC (RF unit; IC2, pin 1 and IC3, pin 1).
17	PLST2	Outputs strobe signals to the PLL IC2 (RF unit, IC802, pin5).
18	PLST1	Outputs strobe signals to the PLL IC1 (RF unit, IC801, pin 3).
19	CLONEOUT	Output port for the cloning signal.

Pin number	Port name	Description
20	CLONEIN	Input port for the cloning signal.
21	TXC	Outputs T4 regulator control signal. High : While transmitting.
22	R3C	Outputs R3 regulator control signal. High : While receiving.
23	CPUHV	Input port for the reset signal from Q151 (LOGIC unit).
24	CHGC	Outputs control signal for charger circuit (RF unit; Q5). High : While battery is charging.
25	AFON	Outputs control signal for the AF amplifier regulator circuit. High : Activates the AF amplifier circuit.
26	PCON	Outputs +3C regulator control signal (LOGIC unit; Q142 and Q145).
27	TCON	Outputs control signal for the Europe tone and DTMF. Low : Activates the Europe tone. High : Activates DTMF.
28	BLED	Outputs BUSY LED control signal. Low : The BUSY LED is ON.
29	LIGHT	Outputs LCD backlight control signal. High : Lights ON.
30	MICC	Outputs control signal for the regulator section of MIC amplifier (LOGIC unit; IC301). Low : Activates the MIC amplifier circuit.
31	RM/MM	Outputs AF mute and MIC mute control signals. High : Mute is ON.
32	POWER	Input port for the [POWER] switch.
33	RESET	Input port for the RESET signal from IC142, pin 1 (LOGIC unit).
39	PTT	Input port for the [PTT] switch.
41	CK	Outputs clock signal to the PLL IC1 (IC801), PLL IC2 (IC802), D/A IC (IC5), I/O IC (IC2, IC3) on the RF unit and EEPROM IC (LOGIC unit; IC2).
42	ESIO	Data bus line for the EEPROM (LOGIC unit; IC2).
43-46	KR3-KR0	Input ports for key matrix.
47, 48	I1, I2	Input ports for Initial matrix.
49-54	KS5-KS0	Outputs port for key matrix.
55, 56	DICK, DIUK	Input port for the up/down signal from the main dial (LOGIC unit; S1).

# SECTION 5 ADJUSTMENT PROCEDURES

## 5-1 PREPARATION

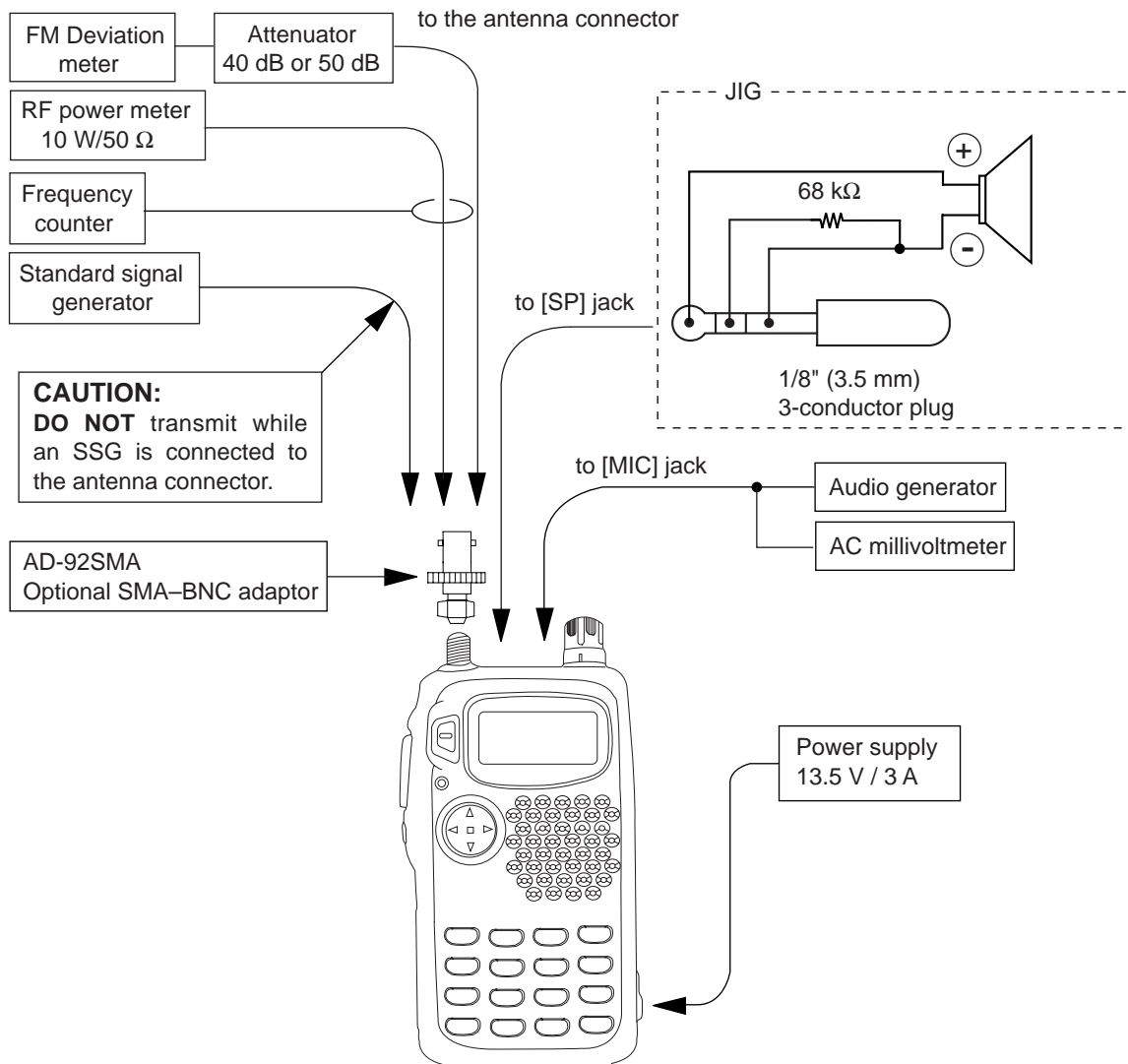
### ■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 13.5 V DC Current capacity : 3 A or more	DC voltmeter	Input impedance : 50 k $\Omega$ /V DC or better
RF power meter (terminated type)	Measuring range : 1–10 W Frequency range : 28–1500 MHz Impedance : 50 $\Omega$ SWR : Less than 1.2 : 1	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
Frequency counter	Frequency range : 0.1–1500 MHz Frequency accuracy : $\pm 1$ ppm or better Sensitivity : 100 mV or better	Standard signal generator (SSG)	Frequency range : 28–1300 MHz Output level : 0.1 $\mu$ V–32 mV (–127 to –17 dBm)
FM deviation meter	Frequency range : 30–1500 MHz Measuring range : 0 to $\pm 10$ kHz	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
		AC millivoltmeter	Measuring range : 10 mV–10 V
		Attenuator	Power attenuation : 40 or 50 dB

### ■ ENTERING THE ADJUSTMENT MODE

- Connect a 68 k $\Omega$  terminator to the [SP] jack.
  - Push and hold the [SQL] key, and then turn power ON.
- Note: The frequency of wide range appears at the display using this operation.

### ■ CONNECTION



## 5-2 PLL ADJUSTMENT

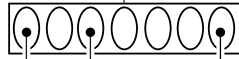
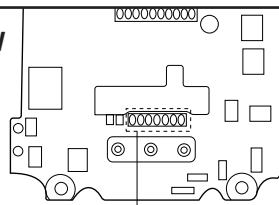
The following adjustment must be performed at "ADJUSTMENT MODE".

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
PLL LOCK VOLTAGE	1	• Displayed frequency : 51.000 MHz	RF	Connect the DC voltmeter or an oscilloscope to VLV.	0.8 V – 1.8 V		Verify
	2	• Receiving		Connect the DC voltmeter or an oscilloscope to 6MLV.			
	3	• Transmitting		Connect the DC voltmeter or an oscilloscope to VLV.	1.4 V – 2.4 V		
	4	• Displayed frequency : 88.000 MHz		1.5 V – 2.5 V			
	5	• Receiving					
	6	• Transmitting					
	7	• Displayed frequency : 145.000 MHz		Connect the DC voltmeter or an oscilloscope to ULV.	2.0 V – 2.5 V		
	8	• Receiving		2.0 V – 2.5 V			
	9	• Transmitting					
10	• Displayed frequency : 440.000 MHz	Connect the DC voltmeter or an oscilloscope to 12LV.	1.9 V – 2.9 V				
11	• Receiving						
12	• Transmitting						
REFERENCE FREQUENCY	1	• Displayed frequency : 1270.000 MHz	Top Pannel	Loosely couple the frequency counter to the antenna connector.	1270.0000 MHz	Top panel	Push and hold the [SQL] key, then turn the [DIAL]
DETECTOR OUTPUT VOLTAGE	1	• Displayed frequency : 445.000 MHz [USA-1] only 435.000 MHz [other]	LOGIC	Connect a digital-voltmeter to the check point Q.	1.0 V	LOGIC	L702
		• Connect an SSG to the antenna connector and set as: Level : 1 mV* (-47dBm) Modulation : OFF					
		• Receiving					

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

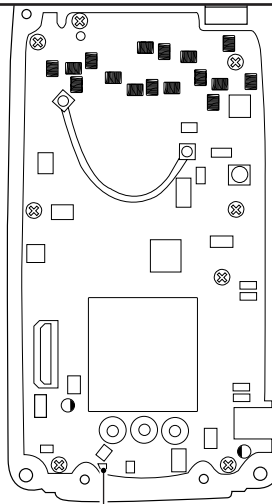


• RF UNIT BOTTOM VIEW



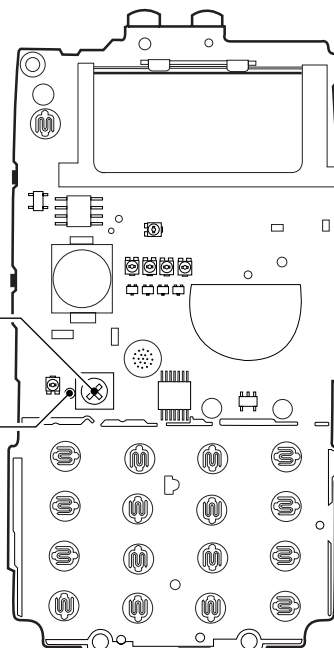
- 12LV**  
PLL lock voltage check point  
(for 1200 MHz)
- ULV**  
PLL lock voltage check point  
(for 440 MHz)
- VLV**  
PLL lock voltage check point  
(for 50 MHz RX, WFM and 144 MHz)

• RF UNIT TOP VIEW



- 6MLV**  
PLL lock voltage check point  
(for 50 MHz TX)

• LOGIC UNIT TOP VIEW



- L702**  
Detector Output voltage adjustment

- Q**  
Detector Output voltage check point

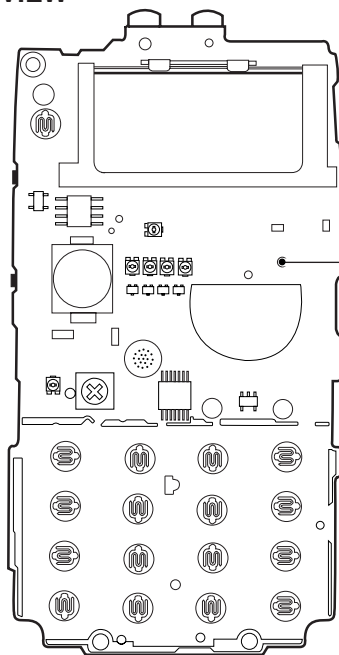
### 5-3 RECEIVER ADJUSTMENT

The following adjustment must be performed at "ADJUSTMENT MODE".

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
50 MHz SENSITIVITY	1 • Displayed frequency : 50.000 MHz • Connect an SSG to the antenna connector and a SINAD meter with an 8 Ω load to the [SP] jack. • Set an SSG as : Level : 1 μV* (-107 dBm) Deviation : ± 3.5 kHz Modulation : 1 kHz • Receiving	LOGIC	Connect a multimeter to check point SD.	Maximum voltage	Top panel	[DIAL]
	2 • Displayed frequency : 54.000 MHz [EUR], [UK], [ITA] • Receiving					
WFM SENSITIVITY	1 • Displayed frequency : 76.000 MHz [SEA], [USA-1] 88.000 MHz [EUR], [UK], [ITA], [AUS] • Set an SSG as : Level : 3.2 μV* (-97 dBm) Deviation : ± 52.5 kHz Modulation : 1 kHz • Receiving	LOGIC	Connect a multimeter to check point SD.	Maximum voltage	Top panel	[DIAL]
	2 • Displayed frequency : 107.000 MHz • Receiving					
AM SENSITIVITY	1 • Displayed frequency : 108.000 MHz • Set an SSG as : Frequency : 108.000 MHz Level : 1.0 μV* (AM) (-107 dBm) Modulation : 1 kHz Mod. depth : 30 % • Receiving	LOGIC	Connect a multimeter to check point SD.	Maximum voltage	Top panel	[DIAL]
	2 • Displayed frequency : 135.980 MHz • Set an SSG as : Frequency : 135.980 MHz • Receiving					
VHF SENSITIVITY	1 • Displayed frequency : 136.000 MHz • Set an SSG as : Level : 3.2 μV* (-97 dBm) Deviation : ± 3.5 kHz Modulation : 1 kHz • Receiving	LOGIC	Connect a multimeter to check point SD.	Maximum voltage	Top panel	[DIAL]
	2 • Displayed frequency : 160.000 MHz • Receiving					

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

• LOGIC UNIT TOP VIEW



**SD**  
50 MHz, WFM BAND, AIR BAND and 145 MHz  
Sensitivity check point

## RECEIVER ADJUSTMENT (Continued)

The following adjustment must be performed on the normal mode after "SENSITIVITY ADJUSTMENT" in SECTION 5-3.

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT	
		UNIT	LOCATION			
S-METER (50 MHz band)	1	<ul style="list-style-type: none"> <li>Displayed frequency : 51.000 MHz [EUR], [UK], [ITA] 52.000 MHz [AUS], [SEA], [USA-1]</li> <li>Connect the SSG to the antenna connector and set as: Level : 1 <math>\mu</math>V* (- 107 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 3.5 kHz</li> <li>Connect a terminator to the [SP] jack.</li> <li>Receiving</li> </ul>	Top panel			Push and hold the [SQL] key
	2	<ul style="list-style-type: none"> <li>Set an SSG output level for the S-meter to S3.</li> <li>Receiving</li> </ul>			0.56 $\mu$ V – 1.8 $\mu$ V (-112dBm – -102 dBm)	Verify
	3	<ul style="list-style-type: none"> <li>Increase an SSG output level.</li> <li>Receiving</li> </ul>	Front panel	S-meter	Full scale	Verify
(WFM band)	4	<ul style="list-style-type: none"> <li>Displayed frequency : 92.000 MHz [SEA], [USA-1] 98.000 MHz [EUR], [UK],[ITA], [AUS]</li> <li>Connect the SSG to the antenna connector and set as: Level : 2 <math>\mu</math>V* (- 101 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 52.5 kHz</li> <li>Connect a terminator to the [SP] jack.</li> <li>Receiving</li> </ul>	Top panel			Push and hold the [SQL] key
	5	<ul style="list-style-type: none"> <li>Increase an SSG output level.</li> <li>Receiving</li> </ul>	Front panel	S-meter	Full scale	Verify
(144 MHz band)	6	<ul style="list-style-type: none"> <li>Displayed frequency : 145.000 MHz [EUR], [UK] 146.000 MHz [ITA], [AUS], [SEA], [USA-1]</li> <li>Connect the SSG to the antenna connector and set as: Level : 0.5 <math>\mu</math>V* (- 113 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 3.5 kHz</li> <li>Connect a terminator to the [SP] jack.</li> <li>Receiving</li> </ul>	Top panel			Push and hold the [SQL] key
	7	<ul style="list-style-type: none"> <li>Set an SSG output level for the S-meter to S3.</li> <li>Receiving</li> </ul>	SSG	Output level	0.28 $\mu$ V – 0.89 $\mu$ V (-118dBm – -108 dBm)	Verify
	8	<ul style="list-style-type: none"> <li>Increase an SSG output level.</li> <li>Receiving</li> </ul>	Front panel	S-meter	Full scale	Verify

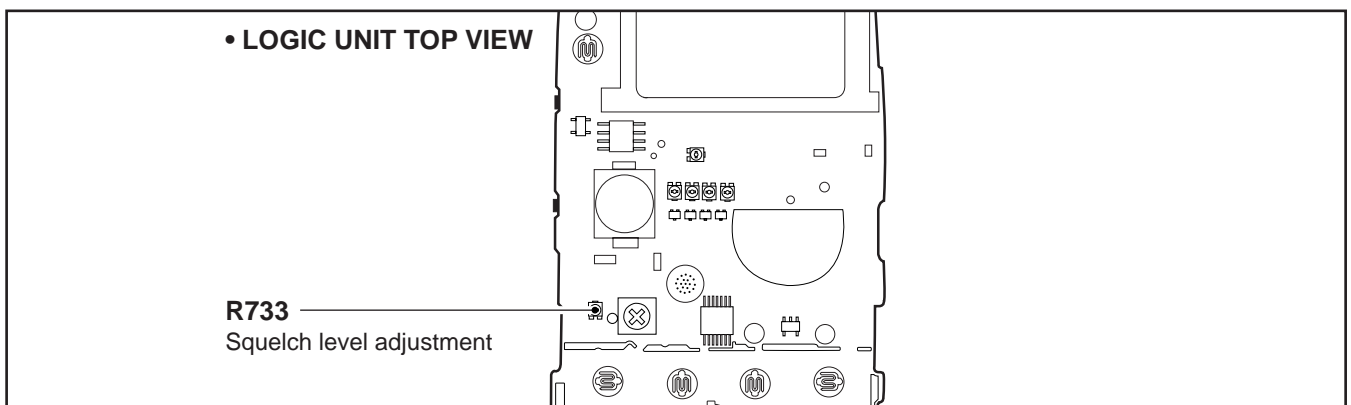
\*This output level of the standard signal generator (SSG) is indicated as SSG's open circuit.

## RECEIVER ADJUSTMENT (Continued)

The SQUELCH LEVEL adjustment must be performed on the normal mode after "S-METER ADJUSTMENT".

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
S-METER (440 MHz band)	9	<ul style="list-style-type: none"> <li>Displayed frequency : 445.000 MHz [USA-1] 435.000 MHz [other]</li> <li>Connect the SSG to the antenna connector and set as: Level : 0.63 <math>\mu\text{V}^*</math> (- 111 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 3.5 kHz</li> <li>Connect a terminator to the [SP] jack.</li> <li>Receiving</li> </ul>	Top panel			Push and hold the [SQL] key	
	10	<ul style="list-style-type: none"> <li>Set an SSG output level for the S-meter to S3.</li> <li>Receiving</li> </ul>	SSG	Output level	0.35 $\mu\text{V}$ – 1.1 $\mu\text{V}$ (-116dBm – -106 dBm)	Verify	
	11	<ul style="list-style-type: none"> <li>Increase an SSG output level.</li> <li>Receiving</li> </ul>	Front panel	S-meter	Full scale	Verify	
(1200 MHz band)	12	<ul style="list-style-type: none"> <li>Displayed frequency : 1270.000 MHz</li> <li>Connect the SSG to the antenna connector and set as: Level : 1 <math>\mu\text{V}^*</math> (- 107 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 3.5 kHz</li> <li>Connect a terminator to the [SP] jack.</li> <li>Receiving</li> </ul>	Top panel			Push and hold the [SQL] key	
	13	<ul style="list-style-type: none"> <li>Set an SSG output level for the S-meter to S3.</li> <li>Receiving</li> </ul>	SSG	Output level	0.56 $\mu\text{V}$ – 1.8 $\mu\text{V}$ (-102dBm – -112 dBm)	Verify	
	14	<ul style="list-style-type: none"> <li>Increase an SSG output level.</li> <li>Receiving</li> </ul>	Front panel	S-meter	Full scale	Verify	
SQUELCH LEVEL	1	<ul style="list-style-type: none"> <li>Displayed frequency : 445.000 MHz [USA-1] 435.000 MHz [other]</li> <li>Connect the SSG to the antenna connector and set as: Level : 0.1 <math>\mu\text{V}^*</math> (- 127 dBm) Modulation : 1 kHz Deviation : <math>\pm</math> 3.5 kHz</li> <li>Pre-set the R733 to maximum clock-wise.</li> <li>Receiving</li> </ul>	Speaker		At the point where the AF signal just disappears	LOGIC	R733

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

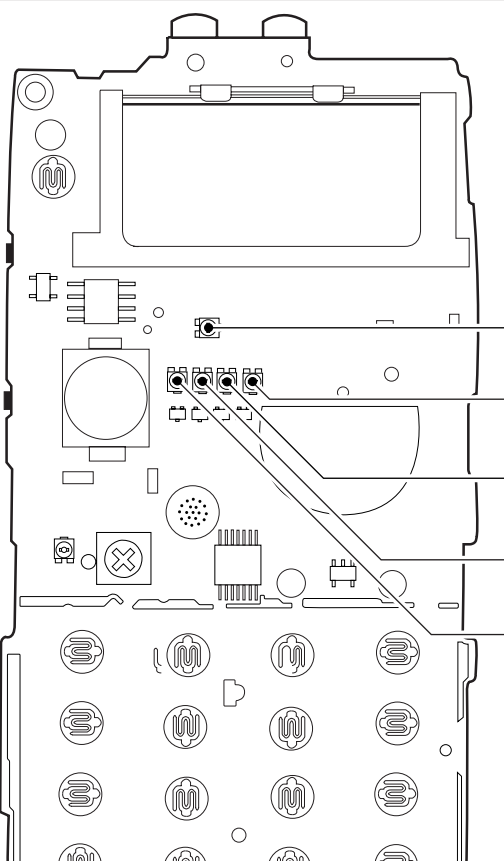


## 5-4 TRANSMITTER ADJUSTMENT

The following adjustment must be performed at "ADJUSTMENT MODE".

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT
		UNIT	LOCATION		
OUTPUT POWER (50 MHz)	1 • Displayed frequency : 51.000 MHz [EUR], [UK], [ITA] 52.000 MHz [AUS], [SEA], [USA-1] • Output power : High • transmitting	Top panel	Connect an RF power meter to the antenna connector.	more than 5 W	[DIAL]
	2 • Output power : Low • Transmitting			0.5 W	
(144 MHz)	3 • Displayed frequency : 145.000 MHz [EUR], [UK] 147.000 MHz [ITA], [AUS], [SEA], [USA-1] • Output power : High • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	more than 5 W	[DIAL]
	4 • Output power : Low • Transmitting			0.5 W	
(440 MHz)	5 • Displayed frequency : 445.000 MHz [USA-1] 435.000 MHz [Other] • Output power : High • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	more than 5 W	[DIAL]
	6 • Output power : Low • Transmitting			0.5 W	
(1200 MHz)	7 • Displayed frequency : 1270.000 MHz • Output power : High • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	more than 5 W	[DIAL]
	8 • Output power : Low • Transmitting			0.5 W	

### • LOGIC UNIT TOP VIEW



- R322**  
DTMF or TONE CALL deviation adjustment
- R326**  
440 MHz FM deviation adjustment
- R327**  
50 MHz BAND FM deviation adjustment
- R338**  
1200 MHz FM deviation adjustment
- R325**  
144 MHz BAND FM deviation adjustment

## TRANSMITTER ADJUSTMENT (Continued)

The following adjustment must be performed after "REFERENCE FREQUENCY ADJUSTMENT" in SECTION 5-2.

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT			
		UNIT	LOCATION		UNIT	ADJUST		
FM DEVIATION (50 MHz)	1	<ul style="list-style-type: none"> <li>Displayed frequency : 51.000 MHz [EUR], [UK], [ITA] 52.000 MHz [AUS], [SEA], [USA-1]</li> <li>Connect the audio generator to the [MIC] connector and set as: 95 mV/1.0 kHz.</li> <li>Set the FM deviation meter as : HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P-P)/2</li> <li>Output power : High</li> <li>Transmitting</li> </ul>	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	4.5 kHz	LOGIC	R327	
	(144 MHz)	2					<ul style="list-style-type: none"> <li>Displayed frequency : 145.000 MHz [EUR], [UK] 146.000 MHz [ITA], [AUS], [SEA], [USA-1]</li> <li>Transmitting</li> </ul>	R325
	(440 MHz)	3					<ul style="list-style-type: none"> <li>Displayed frequency : 445.000 MHz [USA-1] 435.000 MHz [Other]</li> <li>Transmitting</li> </ul>	R326
	(1200 MHz)	4					<ul style="list-style-type: none"> <li>Displayed frequency : 1270.000 MHz</li> <li>Transmitting</li> </ul>	R338
DTMF DEVIATION (AUS, SEA, USA-1 only)	1	<ul style="list-style-type: none"> <li>Displayed frequency : 445.000 MHz [USA-1] only 435.000 MHz [AUS], [SEA] only</li> <li>Push [D] key while transmitting.</li> <li>Transmitting</li> </ul>	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	3.5 kHz	LOGIC	R322	
TONE CALL DEVIATION (EUR, UK, ITA only)	1	<ul style="list-style-type: none"> <li>Displayed frequency : 435.000 MHz</li> <li>Push [center of the multi-function] key while transmitting.</li> <li>Transmitting</li> </ul>	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	3.5 kHz	LOGIC	R322	
CTCSS DEVIATION (50 MHz)	1	<ul style="list-style-type: none"> <li>Displayed frequency : 51.000 MHz [EUR], [UK], [ITA] 52.000 MHz [AUS], [SEA], [USA-1]</li> <li>Tone frequency : 88.5 Hz</li> <li>Set an FM deviation meter as : LPF : 3 kHz</li> <li>Apply no audio signal to the [MIC] jack.</li> <li>Transmitting</li> </ul>	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	0.5 – 1.0 kHz		Verify	
	(144 MHz)	2						<ul style="list-style-type: none"> <li>Displayed frequency : 145.000 MHz [EUR], [UK] 146.000 MHz [ITA], [AUS], [SEA], [USA-1]</li> <li>Transmitting</li> </ul>
	(440 MHz)	3						<ul style="list-style-type: none"> <li>Displayed frequency : 445.000 MHz [USA-1] 435.000 MHz [other]</li> <li>Transmitting</li> </ul>
	(1200 MHz)	4						<ul style="list-style-type: none"> <li>Displayed frequency : 1270.000 MHz</li> <li>Transmitting</li> </ul>

# SECTION 6 PARTS LIST

## [LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1140008110	S.IC	M38267E8GP [USA-1] only
	1140008100	S.IC	M38267M8L-230GP [other]
IC2	1130009160	S.IC	X24320S8I-2.5T4
IC3	1110004890	S.IC	XC6371A500PR
IC4	1130006220	S.IC	TC4W53FU (TE12L)
IC5	1110004530	S.IC	M62368GP 70ED
IC141	1180001720	S.IC	S-81332HG-KC-T1
IC142	1110004540	S.IC	S-80928ALMP-DAR-T2
IC201	1110001810	S.IC	TA7368F (TP1)
IC202	1110004520	S.IC	M5222FP 600C
IC203	1110002750	S.IC	TA75S01F (TE85R)
IC241	1110003780	S.IC	NJM2902V-TE1
IC301	1110004110	S.IC	BA4510F-T1
IC701	1110003490	S.IC	TA31136FN (D,EL)
IC751	1130004200	S.IC	TC4S66F (TE85R)
Q1	1590001690	S.TRANSISTOR	UN9115 (TX)
Q3	1590001980	S.TRANSISTOR	XP4315 (TX)
Q7	1590001170	S.TRANSISTOR	XP1501-(TX) AB
Q8	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q141	1590001140	S.TRANSISTOR	UN9210 (TX)
Q142	1590001170	S.TRANSISTOR	XP1501-(TX) AB
Q145	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q151	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q201	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q202	1590001170	S.TRANSISTOR	XP1501-(TX) AB
Q301	1590001690	S.TRANSISTOR	UN9115 (TX)
Q302	1520000430	S.TRANSISTOR	2SB1462-R (TX)
Q303	1590001440	S.TRANSISTOR	UN9214 (TX)
Q304	1550000010	S.FET	2SJ364-Q (TX)
Q305	1550000010	S.FET	2SJ364-Q (TX)
Q306	1550000010	S.FET	2SJ364-Q (TX)
Q307	1590001440	S.TRANSISTOR	UN9214 (TX)
Q308	1590001210	S.TRANSISTOR	XP5601-(TX) AB
Q309	1550000010	S.FET	2SJ364-Q (TX)
Q341	1590001440	S.TRANSISTOR	UN9214 (TX)
Q361	1550000010	S.FET	2SJ364-Q (TX)
Q602	1590001690	S.TRANSISTOR	UN9115 (TX)
Q603	1590001660	S.TRANSISTOR	XP4312 (TX)
Q702	1590001690	S.TRANSISTOR	UN9115 (TX)
Q751	1590001170	S.TRANSISTOR	XP1501-(TX) AB
Q752	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q753	1590001690	S.TRANSISTOR	UN9115 (TX)
Q754	1540000350	S.TRANSISTOR	2SD2216-S (TX)
D2	1790000970	S.DIODE	MA729 (TX)
D3	1790001250	S.DIODE	MA2S111-(TX)
D4	1790001250	S.DIODE	MA2S111-(TX)
D51	1790000820	S.DIODE	MA132K (TX) [UK], [AUS]
	1790000830	S.DIODE	MA132HK (TX) [EUR], [USA-1]
	1790000850	S.DIODE	MA132WK (TX) [SEA]
D52	1790000830	S.DIODE	MA132HK (TX) [ITA], [AUS], [SEA], [USA-1]
D53	1790000850	S.DIODE	MA132WK (TX) except [ITA]
D55	1790001250	S.DIODE	MA2S111-(TX) except [ITA]
D58	1790001200	S.DIODE	MA6S121 (TX)
D59	1790001200	S.DIODE	MA6S121 (TX)
D61	1790001250	S.DIODE	MA2S111-(TX) except [ITA]
D141	1790001250	S.DIODE	MA2S111-(TX)
D143	1790001250	S.DIODE	MA2S111-(TX)
D144	1790001240	S.DIODE	MA2S728-(TX)
D151	1730002330	S.ZENER	MA8100-M (TX)
D152	1790001250	S.DIODE	MA2S111-(TX)
D304	1730000020	S.ZENER	RD5.1M-T2B3
D701	1750000360	S.DIODE	1SS364 (TE85L)
D702	1750000360	S.DIODE	1SS364 (TE85L)
FI701	2020001480	S.CERAMIC	PBFC450R15DR
X1	6050010530	S.XTAL	CR-639 (5.039 MHz)

## [LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
L1	6200006720	S.COIL	5CA-395KN-0369AQ=P3
L2	6200003550	S.COIL	MLF1608A 4R7K-T
L3	6200001820	S.COIL	LQH 3N 331K 04
L702	6150005010	S.COIL	LS-528 (637AN-0223GW=P3)
R1	7510000910	S.THERMISTOR	NTCCF2012 4AH 473KC-T
R2	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R4	7030008280	S.RESISTOR	ERJ2GEJ 271 X (270 Ω)
R5	7030008280	S.RESISTOR	ERJ2GEJ 271 X (270 Ω)
R8	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R9	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R10	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R12	7030005840	S.RESISTOR	RR0510R-473-D (47 kΩ)
R13	7030005840	S.RESISTOR	RR0510R-473-D (47 kΩ)
R14	7030005840	S.RESISTOR	RR0510R-473-D (47 kΩ)
R16	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R17	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R18	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R19	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R21	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R22	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R23	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R24	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R25	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R26	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R27	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R28	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R29	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R30	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R31	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R32	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R33	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R34	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R35	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R36	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R37	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R38	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R39	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R42	7030008280	S.RESISTOR	ERJ2GEJ 271 X (270 Ω)
R51	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R53	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R54	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R55	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R56	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R141	7030007340	S.RESISTOR	ERJ2GEJ 153 X (15 kΩ)
R142	7030005830	S.RESISTOR	RR0510R-223-D (22 kΩ)
R143	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R144	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R145	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R146	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R148	7030008270	S.RESISTOR	RR0510R-104-D (100 kΩ)
R151	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R153	7030005240	S.RESISTOR	ERJ2GEJ 473 X (47 kΩ)
R154	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R196	7030005110	S.RESISTOR	ERJ2GEJ 224 X (220 kΩ)
R197	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R201	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R202	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R203	7030000240	S.RESISTOR	MCR10EZJH 68 Ω (680)
R204	7030000240	S.RESISTOR	MCR10EZJH 68 Ω (680)
R205	7030000240	S.RESISTOR	MCR10EZJH 68 Ω (680)
R206	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R207	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R208	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R209	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R210	7030005950	S.RESISTOR	RR0510R-123-D (12 kΩ)
R211	7030005820	S.RESISTOR	RR0510P-103-D (10 kΩ)
R212	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R213	7030005830	S.RESISTOR	RR0510R-223-D (22 kΩ)
R214	7030008270	S.RESISTOR	RR0510R-104-D (100 kΩ)
R215	7030005040	S.RESISTOR	ERJ2GEJ 472 X (4.7 kΩ)
R241	7030005160	S.RESISTOR	ERJ2GEJ 105 X (1 MΩ)
R242	7030005170	S.RESISTOR	ERJ2GEJ 474 X (470 kΩ)
R243	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)
R244	7030005080	S.RESISTOR	ERJ2GEJ 823 X (82 kΩ)

S.=Surface mount





[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C307	4030013850	S.CERAMIC	ECUE1E102KBQ
C308	4030014500	S.CERAMIC	ECUE1H121JCQ
C309	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C310	4030014220	S.CERAMIC	ECUE1E471KBQ
C311	4550005980	S.TANTALUM	TEMSVA 1A 475M-8L
C312	4030014220	S.CERAMIC	ECUE1E471KBQ
C313	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C314	4030013850	S.CERAMIC	ECUE1E102KBQ
C315	4030013850	S.CERAMIC	ECUE1E102KBQ
C316	4550005980	S.TANTALUM	TEMSVA 1A 475M-8L
C317	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C318	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C319	4030013850	S.CERAMIC	ECUE1E102KBQ
C320	4030013850	S.CERAMIC	ECUE1E102KBQ
C321	4030013850	S.CERAMIC	ECUE1E102KBQ
C322	4030013850	S.CERAMIC	ECUE1E102KBQ
C323	4030013850	S.CERAMIC	ECUE1E102KBQ
C324	4030013850	S.CERAMIC	ECUE1E102KBQ
C325	4030013850	S.CERAMIC	ECUE1E102KBQ
C326	4030013850	S.CERAMIC	ECUE1E102KBQ
C328	4030013850	S.CERAMIC	ECUE1E102KBQ
C361	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C362	4030013850	S.CERAMIC	ECUE1E102KBQ
C700	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C701	4030014320	S.CERAMIC	ECUE1H181JCQ
C703	4030013850	S.CERAMIC	ECUE1E102KBQ
C706	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C707	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C708	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C709	4550006680	S.TANTALUM	ECSTOJY156R
C712	4030014170	S.CERAMIC	ECUE1H330JCQ
C713	4030013850	S.CERAMIC	ECUE1E102KBQ
C714	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C715	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C716	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C718	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C719	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C720	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C733	4030013850	S.CERAMIC	ECUE1E102KBQ
C734	4030013850	S.CERAMIC	ECUE1E102KBQ
C735	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C736	4030013850	S.CERAMIC	ECUE1E102KBQ
C737	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C751	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C752	4030014150	S.CERAMIC	ECUE1H220JCQ
C753	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C754	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C755	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C756	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C757	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C758	4550005980	S.TANTALUM	TEMSVA 1A 475M-8L
C759	4030013850	S.CERAMIC	ECUE1E102KBQ
C901	4030013850	S.CERAMIC	ECUE1E102KBQ
C903	4030013850	S.CERAMIC	ECUE1E102KBQ
C904	4030013850	S.CERAMIC	ECUE1E102KBQ
C906	4030013850	S.CERAMIC	ECUE1E102KBQ
C907	4030013850	S.CERAMIC	ECUE1E102KBQ
C909	4030013850	S.CERAMIC	ECUE1E102KBQ
C910	4030013850	S.CERAMIC	ECUE1E102KBQ
C912	4030013850	S.CERAMIC	ECUE1E102KBQ
C913	4030013850	S.CERAMIC	ECUE1E102KBQ
C914	4030013850	S.CERAMIC	ECUE1E102KBQ
C917	4030013850	S.CERAMIC	ECUE1E102KBQ
C918	4030013850	S.CERAMIC	ECUE1E102KBQ
C919	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C923	4030014180	S.CERAMIC	ECUE1H470JCQ
C926	4030013850	S.CERAMIC	ECUE1E102KBQ
C927	4030013850	S.CERAMIC	ECUE1E102KBQ
J1	6510019860	S.CONNECTOR	AXK6S40645P
J3	6450002010	S.CONNECTOR	HSJ1501-011010
J4	6450001680	S.CONNECTOR	HSJ1122-010010
DS1	5040002230	S.LED	CL-200YG-C-TS
DS3	5010000150	S.LED	LT1EP53A
DS4	5030001700	LCD	LM-1782B
MC1	7700002310	MICROPHONE	EM-140

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
S7	2260002530	S.SWITCH	EVQ-WRR001
S401	2230000900	S.SWITCH	JPM1990-2013R
S402	2230000900	S.SWITCH	JPM1990-2013R
W1	9020720180	WIRE	71/98/040/X98/X98
EP1	0910051324	PCB	B 5136D
EP2	8930048950	LCD CONTACT	SRCN-2135-SP-N-W

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC2	1130007510	S.IC	BU4094BCFV-E1
IC3	1130007510	S.IC	BU4094BCFV-E1
IC6	1180001720	S.IC	S-81332HG-KC-T1
IC51	1110003370	S.IC	µPC2748T-E3
IC501	1110003370	S.IC	µPC2748T-E3
IC601	1110004020	S.IC	µPC2757T-E3
IC801	1130007610	S.IC	µPD3140GS-E1 (DS8)
IC802	1130009370	S.IC	TB31242FN (EL)
IC901	1110004050	S.IC	NJM3404AV-TE1
Q1	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q2	1590001170	S.TRANSISTOR	XP1501-(TX) AB
Q3	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q4	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q5	1590001140	S.TRANSISTOR	UN9210 (TX)
Q6	1590002580	S.FET	HAT1024R-EL
Q9	1590001650	S.TRANSISTOR	XP4601 (TX)
Q51	1530003650	S.TRANSISTOR	2SC5319 (TE85L)
Q53	1590001690	S.TRANSISTOR	UN9115 (TX)
Q101	1530003560	S.TRANSISTOR	2SC5195-T1
Q131	1530003560	S.TRANSISTOR	2SC5195-T1
Q132	1530003660	S.TRANSISTOR	2SC5454-T1 R54
Q133	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q134	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q135	1530003310	S.TRANSISTOR	2SC5107-O (TE85R)
Q136	1530000371	S.TRANSISTOR	2SC3356 R25-T2B
Q138	1590002640	S.FET	MXR9745RT1
Q139	1590001690	S.TRANSISTOR	UN9115 (TX)
Q140	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q201	1580000700	S.FET	3SK292 (TE85R)
Q202	1590001690	S.TRANSISTOR	UN9115 (TX)
Q301	1580000690	S.FET	3SK291 (TE85R)
Q302	1590002380	S.TRANSISTOR	XP1115 (TX)
Q341	1530003640	S.TRANSISTOR	2SC4215-O (T5RICOM)
Q342	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q343	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q401	1530003560	S.TRANSISTOR	2SC5195-T1
Q403	1590001690	S.TRANSISTOR	UN9115 (TX)
Q501	1530003560	S.TRANSISTOR	2SC5195-T1
Q502	1590002380	S.TRANSISTOR	XP1115 (TX)
Q503	1590001860	S.TRANSISTOR	UN9215 (TX)
Q602	1590001980	S.TRANSISTOR	XP4315 (TX)
Q701	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q721	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q803	1560000540	S.FET	2SK880-Y (TE85R)
Q804	1560000540	S.FET	2SK880-Y (TE85R)
Q805	1530003000	S.TRANSISTOR	2SC4117-BL (TE85R)
Q807	1530003310	S.TRANSISTOR	2SC5107-O (TE85R)
Q811	1560000540	S.FET	2SK880-Y (TE85R)
Q812	1530003000	S.TRANSISTOR	2SC4117-BL (TE85R)
Q813	1530003310	S.TRANSISTOR	2SC5107-O (TE85R)
Q816	1530002930	S.TRANSISTOR	2SC4228 (M) -T1 R45
Q817	1590001150	S.TRANSISTOR	UN9211 (TX)
Q818	1590002560	S.TRANSISTOR	XP1116 (TX)
Q819	1590002560	S.TRANSISTOR	XP1116 (TX)
Q820	1590001850	S.TRANSISTOR	UN9116 (TX)
Q821	1530002560	S.TRANSISTOR	2SC4403-3-TL
Q822	1530003310	S.TRANSISTOR	2SC5107-O (TE85R)
Q823	1530003310	S.TRANSISTOR	2SC5107-O (TE85R)
Q824	1530003560	S.TRANSISTOR	2SC5195-T1
Q825	1590001970	S.TRANSISTOR	UN921E (TX)

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
Q826	1590001910	S.TRANSISTOR	UN911D (TX)
Q827	1590001970	S.TRANSISTOR	UN921E (TX)
Q828	1590001910	S.TRANSISTOR	UN911D (TX)
Q829	1590001970	S.TRANSISTOR	UN921E (TX)
Q901	1590001150	S.TRANSISTOR	UN9211 (TX)
Q902	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q903	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q904	1590001150	S.TRANSISTOR	UN9211 (TX)
Q905	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q906	1590001150	S.TRANSISTOR	UN9211 (TX)
Q907	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q908	1590001150	S.TRANSISTOR	UN9211 (TX)
Q909	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q910	1590001150	S.TRANSISTOR	UN9211 (TX)
Q911	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q912	1590001860	S.TRANSISTOR	UN9215 (TX)
Q913	1590002160	S.TRANSISTOR	XP6401-(TX)
Q921	1590002600	S.FET	MRF9745 T1
Q922	1560001060	S.FET	2SK3075 (TE12L)
Q923	1540000350	S.TRANSISTOR	2SD2216-S (TX)
Q924	1590001860	S.TRANSISTOR	UN9215 (TX)
Q925	1590001860	S.TRANSISTOR	UN9215 (TX)
Q926	1590001860	S.TRANSISTOR	UN9215 (TX)
Q927	1590001860	S.TRANSISTOR	UN9215 (TX)
Q928	1590001150	S.TRANSISTOR	UN9211 (TX)
Q929	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)
Q931	1590001660	S.TRANSISTOR	XP4312 (TX)
Q932	1540000350	S.TRANSISTOR	2SD2216-S (TX)
D1	1750000540	S.DIODE	RB060L-40 TE-25
D4	1790001240	S.DIODE	MA2S728-(TX)
D5	1790000860	S.DIODE	MA133 (TX)
D6	1790000670	S.DIODE	SB07-03C-TB
D10	1790001250	S.DIODE	MA2S111-(TX)
D12	1790000850	S.DIODE	MA132WK (TX)
D31	1790001260	S.DIODE	MA2S077-(TX)
D32	1790001620	S.DIODE	1SV308 (TPL3)
D51	1790001260	S.DIODE	MA2S077-(TX)
D52	1790001260	S.DIODE	MA2S077-(TX)
D53	1790001620	S.DIODE	1SV308 (TPL3)
D101	1790001620	S.DIODE	1SV308 (TPL3)
D102	1790001620	S.DIODE	1SV308 (TPL3)
D103	1790001260	S.DIODE	MA2S077-(TX)
D106	1720000370	S.VARICAP	HVU350TRF
D107	1720000370	S.VARICAP	HVU350TRF
D108	1790001620	S.DIODE	1SV308 (TPL3)
D132	1790001620	S.DIODE	1SV308 (TPL3)
D134	1790001620	S.DIODE	1SV308 (TPL3)
D141	1790001620	S.DIODE	1SV308 (TPL3)
D142	1790001250	S.DIODE	MA2S111-(TX)
D143	1790001250	S.DIODE	MA2S111-(TX)
D201	1790001620	S.DIODE	1SV308 (TPL3)
D202	1720000730	S.VARICAP	MA2S30400L
D203	1720000730	S.VARICAP	MA2S30400L
D204	1790001620	S.DIODE	1SV308 (TPL3)
D302	1790001260	S.DIODE	MA2S077-(TX)
D303	1790001260	S.DIODE	MA2S077-(TX)
D304	1790001620	S.DIODE	1SV308 (TPL3)
D306	1750000610	S.VARICAP	MA2SV0500L
D309	1750000610	S.VARICAP	MA2SV0500L
D310	1750000610	S.VARICAP	MA2SV0500L
D311	1790001620	S.DIODE	1SV308 (TPL3)
D341	1720000660	S.VARICAP	1SV288 (TPH2)
D402	1790001260	S.DIODE	MA2S077-(TX)
D403	1790001260	S.DIODE	MA2S077-(TX)
D404	1790001260	S.DIODE	MA2S077-(TX)
D405	1790001620	S.DIODE	1SV308 (TPL3)
D406	1790001250	S.DIODE	MA2S111-(TX)
D407	1790001260	S.DIODE	MA2S077-(TX)
D501	1790001620	S.DIODE	1SV308 (TPL3)
D503	1790001620	S.DIODE	1SV308 (TPL3)
D505	1790001620	S.DIODE	1SV308 (TPL3)
D507	1790001620	S.DIODE	1SV308 (TPL3)
D508	1790000850	S.DIODE	MA132WK (TX)
D509	1790001260	S.DIODE	MA2S077-(TX)
D510	1790001200	S.DIODE	MA6S121 (TX)
D601	1750000360	S.DIODE	1SS364 (TE85L)
D602	1750000360	S.DIODE	1SS364 (TE85L)
D721	1750000360	S.DIODE	1SS364 (TE85L)
D801	1790000850	S.DIODE	MA132WK (TX)
D802	1790001260	S.DIODE	MA2S077-(TX)

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
D803	1790001260	S.DIODE	MA2S077-(TX)
D804	1790001260	S.DIODE	MA2S077-(TX)
D805	1790001260	S.DIODE	MA2S077-(TX)
D806	1790001260	S.DIODE	MA2S077-(TX)
D807	1790001260	S.DIODE	MA2S077-(TX)
D808	1790001260	S.DIODE	MA2S077-(TX)
D810	1790001200	S.DIODE	MA6S121 (TX)
D901	1790000860	S.DIODE	MA133 (TX)
D902	1750000530	S.DIODE	1SV271 (TPH3)
D903	1790001260	S.DIODE	MA2S077-(TX)
D904	1750000530	S.DIODE	1SV271 (TPH3)
D906	1790001620	S.DIODE	1SV308 (TPL3)
D907	1790001620	S.DIODE	1SV308 (TPL3)
D908	1790001260	S.DIODE	MA2S077-(TX)
D909	1750000530	S.DIODE	1SV271 (TPH3)
D910	1750000530	S.DIODE	1SV271 (TPH3)
D913	1790001620	S.DIODE	1SV308 (TPL3)
D914	1790001620	S.DIODE	1SV308 (TPL3)
D918	1790001620	S.DIODE	1SV308 (TPL3)
D919	1730002360	S.ZENER	MA8062-M (TX)
F151	2040001360	S.FILTER	LFL30-13C1270B060
F152	2040001360	S.FILTER	LFL30-13C1270B060
F1401	2040001020	S.SAW	EFCH445MWNPN1
	2040001000	S.SAW	EFCH435MWNPN1
F1601	2010002340	S.FILTER	FL-299 (69.450 MHz)
F1602	2020001500	S.CERAMIC	SFECV13.35MA
X1	6050010520	S.XTAL	CR-638 (13.800 MHz)
L1	6200008510	S.COIL	0.30-0.9-4TR 10.5N
L2	6200008440	S.COIL	LQN21A 8N2D04
L3	6200008440	S.COIL	LQN21A 8N2D04
L4	6200008240	S.COIL	0.30-0.9-5TL 14N
L5	6200008540	S.COIL	0.26-0.9-6TR 19N
L6	6200008690	S.COIL	0.26-0.9-7TR 23N
L7	6200008530	S.COIL	0.30-1.0-4TR 12N
L8	6200008210	S.COIL	0.45-1.5-5TL 23.2N
L9	6200008220	S.COIL	0.40-1.4-5TR 21N
L10	6200008150	S.COIL	0.35-1.6-7TL 44N
L11	6200008170	S.COIL	0.35-1.6-8TL 54N
L12	6200008170	S.COIL	0.35-1.6-8TL 54N
L13	6200008080	S.COIL	LQN21A R22J04
L14	6200008190	S.COIL	0.25-1.9-8TL 80N
L15	6200008180	S.COIL	0.25-1.9-10TL 107N
L16	6200008180	S.COIL	0.25-1.9-10TL 107N
L17	6200008360	S.COIL	0.25-1.9-13TL
L18	6200008360	S.COIL	0.25-1.9-13TL
L51	6200008680	S.COIL	0.26-0.8-3TR 6.8N
L52	6200008490	S.COIL	0.30-0.9-3TR 7.5N
L53	6200008680	S.COIL	0.26-0.8-3TR 6.8N
L54	6200008680	S.COIL	0.26-0.8-3TR 6.8N
L55	6200008930	S.COIL	0.26-0.7-3TL 5.6N
L56	6200008680	S.COIL	0.26-0.8-3TR 6.8N
L57	6200008520	S.COIL	0.30-0.7-3TR 4.9N
L58	6200005650	S.COIL	ELJRE 8N2Z-F
L59	6200005600	S.COIL	ELJRE 3N3Z-F
L61	6200008420	S.COIL	HF50ACC 453215P-T
L62	6200003590	S.COIL	EXCCL3225U1
L63	6200003590	S.COIL	EXCCL3225U1
L64	6200005610	S.COIL	ELJRE 3N9Z-F
L65	6200005490	S.COIL	NL 322522T-331J
L101	6200007790	S.COIL	LQN21A R15J04
L102	6200007790	S.COIL	LQN21A R15J04
L108	6200007120	S.COIL	ELJND 1R0J 1U
L109	6200007360	S.COIL	ELJND R47J 0.47U
L110	6200007360	S.COIL	ELJND R47J 0.47U
L121	6200005610	S.COIL	ELJRE 3N9Z-F
L122	6200005630	S.COIL	ELJRE 5N6Z-F
L123	6200006770	S.COIL	ELJRE 1N5Z-F
L124	6200005590	S.COIL	ELJRE 2N7Z-F
L125	6200005590	S.COIL	ELJRE 2N7Z-F
L134	6200004480	S.COIL	MLF1608D R82K-T
L135	6200007800	S.COIL	LQN21A R18J04
L136	6200005720	S.COIL	ELJRE 33NG-F
L137	6200005710	S.COIL	ELJRE 27NG-F
L138	6200007700	S.COIL	LQN21A 22NJ04
L139	6200005630	S.COIL	ELJRE 5N6Z-F
L142	6200005730	S.COIL	ELJRE 39NG-F

[USA-1] only  
[other]

S.=Surface mount

**[RF UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
L143	6200006770	S.COIL ELJRE 1N5Z-F
L201	6200008730	S.COIL ELJND R10J 0.1U
L202	6200008730	S.COIL ELJND R10J 0.1U
L205	6200008730	S.COIL ELJND R10J 0.1U
L206	6200008730	S.COIL ELJND R10J 0.1U
L301	6200007750	S.COIL LQN21A 56NJ04
L302	6200007750	S.COIL LQN21A 56NJ04
L303	6200007720	S.COIL LQN21A 33NJ04
L304	6200007760	S.COIL LQN21A 82NJ04
L305	6200007780	S.COIL LQN21A R12J04
L306	6200007780	S.COIL LQN21A R12J04
L341	6200004920	S.COIL MLF1608A 2R2K-T
L342	6200007670	S.COIL LQN21A 10NJ04
L343	6200008750	S.COIL LQN1H R29J04
L344	6200006980	S.COIL ELJRE R10G-F
L345	6200007000	S.COIL ELJRE 82NG-F
L346	6200006670	S.COIL ELJRE 68NG-F
L347	6200006990	S.COIL ELJRE 56NG-F
L348	6200007000	S.COIL ELJRE 82NG-F
L401	6200007690	S.COIL LQN21A 18NJ04
L402	6200007690	S.COIL LQN21A 18NJ04
L403	6200005680	S.COIL ELJRE 15NG-F
L404	6200005690	S.COIL ELJRE 18NG-F
L501	6200005720	S.COIL ELJRE 33NG-F
L502	6200005660	S.COIL ELJRE 10NG-F
L503	6200005660	S.COIL ELJRE 10NG-F
L504	6200005700	S.COIL ELJRE 22NG-F
L505	6200005700	S.COIL ELJRE 22NG-F
L507	6200005700	S.COIL ELJRE 22NG-F
L701	6200002710	S.COIL ELJFC 1R8K-F
L721	6200005190	S.COIL MLF1608D R56K-T
L723	6200004720	S.COIL MLF1608D R10K-T
L724	6200003640	S.COIL MLF1608K 100K-T
L725	6200003640	S.COIL MLF1608K 100K-T
L726	6200005190	S.COIL MLF1608D R56K-T
L801	6200003550	S.COIL MLF1608A 4R7K-T
L802	6200003550	S.COIL MLF1608A 4R7K-T
L804	6200003550	S.COIL MLF1608A 4R7K-T
L806	6200005630	S.COIL ELJRE 5N6Z-F
L807	6200003540	S.COIL MLF1608D R22K-T
L808	6200006980	S.COIL ELJRE R10G-F
L809	6200005700	S.COIL ELJRE 22NG-F
L810	6200005670	S.COIL ELJRE 12NG-F
L811	6200005620	S.COIL ELJRE 4N7Z-F
L905	6200008700	S.COIL 0.30-0.9-6TR 17.5N
L906	6200003590	S.COIL EXCCL3225U1
L907	6200003590	S.COIL EXCCL3225U1
L908	6200008100	S.COIL LQN1H R14J04
L909	6200005640	S.COIL ELJRE 6N8Z-F
L910	6200005580	S.COIL ELJRE 2N2Z-F
L911	6200005580	S.COIL ELJRE 2N2Z-F
L912	6200008180	S.COIL 0.25-1.9-10TL 107N
L913	6200008370	S.COIL 0.40-1.3-2TL [USA-1] only
	6200008200	S.COIL 0.40-1.4-2TL [other]
L914	6200008080	S.COIL LQN21A R22J04
L915	6200008080	S.COIL LQN21A R22J04
L916	6200008210	S.COIL 0.45-1.5-5TL 23.2N
L917	6200008190	S.COIL 0.25-1.9-8TL 80N
L918	6200008400	S.COIL 0.35-1.6-6TL 36N
L919	6200008300	S.COIL 0.35-1.6-9TL 65N
L920	6200008360	S.COIL 0.25-1.9-13TL
L921	6200004480	S.COIL MLF1608D R82K-T
L922	6200004480	S.COIL MLF1608D R82K-T
L923	6200004480	S.COIL MLF1608D R82K-T
L924	6200004480	S.COIL MLF1608D R82K-T
L925	6200008080	S.COIL LQN21A R22J04
L926	6200007770	S.COIL LQN21A R10J04
L931	6200004480	S.COIL MLF1608D R82K-T
L932	6200003640	S.COIL MLF1608K 100K-T
L933	6200005580	S.COIL ELJRE 2N2Z-F [EUR], [UK], [ITA]
R1	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R2	7030005050	S.RESISTOR ERJ2GEJ 103 X (10 kΩ)
R3	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R4	7030005050	S.RESISTOR ERJ2GEJ 103 X (10 kΩ)
R7	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R8	7030000180	S.RESISTOR MCR10EZHJ 22 Ω (220)
R9	7030000180	S.RESISTOR MCR10EZHJ 22 Ω (220)
R10	7030005050	S.RESISTOR ERJ2GEJ 103 X (10 kΩ)
R13	7510000910	S.THERMISTOR NTCCF2012 4AH 473K-T
R14	7030005240	S.RESISTOR ERJ2GEJ 473 X (47 kΩ)

**[RF UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
R15	7030005220	S.RESISTOR ERJ2GEJ 223 X (22 kΩ)
R16	7030005220	S.RESISTOR ERJ2GEJ 223 X (22 kΩ)
R31	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R32	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R33	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R51	7030005290	S.RESISTOR ERJ2GEJ 682 X (6.8 kΩ)
R52	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R53	7030005570	S.RESISTOR ERJ2GEJ 820 X (82 Ω)
R57	7030005120	S.RESISTOR ERJ2GEJ 102 X (1 kΩ)
R58	7030007270	S.RESISTOR ERJ2GEJ 151 X (150 Ω)
R100	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R103	7030005060	S.RESISTOR ERJ2GEJ 333 X (33 kΩ)
R106	7030007280	S.RESISTOR ERJ2GEJ 331 X (330 Ω)
R110	7030005170	S.RESISTOR ERJ2GEJ 474 X (470 kΩ)
R111	7030007280	S.RESISTOR ERJ2GEJ 331 X (330 Ω)
R112	7030005170	S.RESISTOR ERJ2GEJ 474 X (470 kΩ)
R113	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R121	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R122	7030004980	S.RESISTOR ERJ2GEJ 101 X (100 Ω)
R123	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R124	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R125	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R126	7030007250	S.RESISTOR ERJ2GEJ 220 X (22 Ω)
R128	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R131	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R132	7030009160	S.RESISTOR ERJ2GEJ 181 X (180 Ω)
R133	7030007250	S.RESISTOR ERJ2GEJ 220 X (22 Ω)
R134	7030005530	S.RESISTOR ERJ2GEJ 120 X (10 Ω)
R135	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R138	7030007270	S.RESISTOR ERJ2GEJ 151 X (150 Ω)
R139	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R140	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R141	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R142	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R143	7030009140	S.RESISTOR ERJ2GEJ 272 X (2.7 kΩ)
R144	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R145	7030007270	S.RESISTOR ERJ2GEJ 151 X (150 Ω)
R146	7030009290	S.RESISTOR ERJ2GEJ 562 X (5.6 kΩ)
R147	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R149	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R150	7030009140	S.RESISTOR ERJ2GEJ 272 X (2.7 kΩ)
R152	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R156	7030004980	S.RESISTOR ERJ2GEJ 101 X (100 Ω)
R157	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R158	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R159	7030005080	S.RESISTOR ERJ2GEJ 823 X (82 kΩ)
R160	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R161	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R163	7030008410	S.RESISTOR ERJ2GEJ 392 X (3.9 kΩ)
R165	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R166	7030007300	S.RESISTOR ERJ2GEJ 332 X (3.3 kΩ)
R201	7030005080	S.RESISTOR ERJ2GEJ 823 X (82 kΩ)
R202	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R203	7030005310	S.RESISTOR ERJ2GEJ 124 X (120 kΩ)
R204	7030005220	S.RESISTOR ERJ2GEJ 223 X (22 kΩ)
R205	7030005160	S.RESISTOR ERJ2GEJ 105 X (1 MΩ)
R206	7030004980	S.RESISTOR ERJ2GEJ 101 X (100 Ω)
R207	7030005050	S.RESISTOR ERJ2GEJ 103 X (10 kΩ)
R208	7030004980	S.RESISTOR ERJ2GEJ 101 X (100 Ω)
R209	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R210	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R301	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R302	7030005120	S.RESISTOR ERJ2GEJ 102 X (1 kΩ)
R303	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R304	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R306	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R307	7030005310	S.RESISTOR ERJ2GEJ 124 X (120 kΩ)
R308	7030005530	S.RESISTOR ERJ2GEJ 100 X (10 Ω)
R309	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R310	7030005050	S.RESISTOR ERJ2GEJ 103 X (10 kΩ)
R311	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R312	7030005090	S.RESISTOR ERJ2GEJ 104 X (100 kΩ)
R316	7030005040	S.RESISTOR ERJ2GEJ 472 X (4.7 kΩ)
R341	7030006610	S.RESISTOR ERJ2GEJ 394 X (390 kΩ)
R342	7030009140	S.RESISTOR ERJ2GEJ 272 X (2.7 kΩ)
R343	7030004970	S.RESISTOR ERJ2GEJ 470 X (47 Ω)
R344	7030005720	S.RESISTOR ERJ2GEJ 563 X (56 kΩ)
R345	7030004980	S.RESISTOR ERJ2GEJ 101 X (100 Ω)
R346	7030004990	S.RESISTOR ERJ2GEJ 221 X (220 Ω)
R347	7030005080	S.RESISTOR ERJ2GEJ 823 X (82 kΩ)
R348	7030005080	S.RESISTOR ERJ2GEJ 823 X (82 kΩ)
R349	7030005710	S.RESISTOR ERJ2GEJ 121 X (120 Ω)

S.=Surface mount



## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C6	4030014090	S.CERAMIC ECUE1H060CCQ
C7	4030014170	S.CERAMIC ECUE1H330JCQ
C8	4030014120	S.CERAMIC ECUE1H100CCQ
C9	4030014420	S.CERAMIC ECUE1H0R5BCQ
C10	4030014090	S.CERAMIC ECUE1H060CCQ
C12	4030014100	S.CERAMIC ECUE1H070CCQ
C13	4030014420	S.CERAMIC ECUE1H0R5BCQ
C14	4030014020	S.CERAMIC ECUE1H020BCQ
C15	4030014050	S.CERAMIC ECUE1H030BCQ
C16	4030014240	S.CERAMIC ECUE1H180JCQ
C17	4030014080	S.CERAMIC ECUE1H050BCQ
C18	4030014150	S.CERAMIC ECUE1H220JCQ
C19	4030014050	S.CERAMIC ECUE1H030BCQ
C20	4030014140	S.CERAMIC ECUE1H150JCQ
C21	4030014180	S.CERAMIC ECUE1H470JCQ
C22	4030014490	S.CERAMIC ECUE1E331KBQ
C23	4030014160	S.CERAMIC ECUE1H270JCQ
C24	4030014500	S.CERAMIC ECUE1H121JCQ
C25	4030014050	S.CERAMIC ECUE1H030BCQ
C27	4030014120	S.CERAMIC ECUE1H100CCQ
C28	4030014190	S.CERAMIC ECUE1H680JCQ
C29	4030010080	S.CERAMIC C1005 CH 1E 240J-T-A
C30	4030014440	S.CERAMIC ECUE1H820JCQ
C31	4030014140	S.CERAMIC ECUE1H150JCQ
C32	4030014180	S.CERAMIC ECUE1H470JCQ
C33	4030013850	S.CERAMIC ECUE1E102KBQ
C34	4030013850	S.CERAMIC ECUE1E102KBQ
C35	4030013850	S.CERAMIC ECUE1E102KBQ
C36	4030013850	S.CERAMIC ECUE1E102KBQ
C37	4030013850	S.CERAMIC ECUE1E102KBQ
C41	4030014050	S.CERAMIC ECUE1H030BCQ
C42	4030013850	S.CERAMIC ECUE1E102KBQ
C43	4030014020	S.CERAMIC ECUE1H020BCQ
C44	4030013850	S.CERAMIC ECUE1E102KBQ
C45	4030014000	S.CERAMIC ECUE1H1R5BCQ
C46	4030014020	S.CERAMIC ECUE1H020BCQ
C48	4030014050	S.CERAMIC ECUE1H030BCQ
C49	4030014420	S.CERAMIC ECUE1H0R5BCQ
C50	4030014000	S.CERAMIC ECUE1H1R5BCQ
C51	4030014030	S.CERAMIC ECUE1H2R5BCQ
C52	4030014030	S.CERAMIC ECUE1H2R5BCQ
C53	4030014030	S.CERAMIC ECUE1H2R5BCQ
C54	4030013850	S.CERAMIC ECUE1E102KBQ
C55	4030013850	S.CERAMIC ECUE1E102KBQ
C56	4030014140	S.CERAMIC ECUE1H150JCQ
C57	4030013850	S.CERAMIC ECUE1E102KBQ
C58	4030014070	S.CERAMIC ECUE1H040BCQ
C59	4030013850	S.CERAMIC ECUE1E102KBQ
C60	4030013850	S.CERAMIC ECUE1E102KBQ
C61	4030014110	S.CERAMIC ECUE1H080CCQ
C62	4030013850	S.CERAMIC ECUE1E102KBQ
C63	4030013850	S.CERAMIC ECUE1E102KBQ
C64	4030014020	S.CERAMIC ECUE1H020BCQ
C65	4030013850	S.CERAMIC ECUE1E102KBQ
C70	4030013850	S.CERAMIC ECUE1E102KBQ
C71	4030013850	S.CERAMIC ECUE1E102KBQ
C72	4030013850	S.CERAMIC ECUE1E102KBQ
C73	4030013850	S.CERAMIC ECUE1E102KBQ
C78	4030013850	S.CERAMIC ECUE1E102KBQ
C82	4030013850	S.CERAMIC ECUE1E102KBQ
C84	4030014350	S.CERAMIC ECUE1H560JCQ
C85	4030013850	S.CERAMIC ECUE1E102KBQ
C86	4550006710	S.TANTALUM ECST1AX226R
C87	4550006710	S.TANTALUM ECST1AX226R
C88	4030013850	S.CERAMIC ECUE1E102KBQ
C89	4030013850	S.CERAMIC ECUE1E102KBQ
C90	4510005600	S.ELECTROLYTIC ECEV1CS100SR
C91	4030013850	S.CERAMIC ECUE1E102KBQ
C92	4550005980	S.TANTALUM TEMSVA 1A 475M-8L
C93	4030013850	S.CERAMIC ECUE1E102KBQ
C94	4030013850	S.CERAMIC ECUE1E102KBQ
C95	4550002980	S.TANTALUM TEMSVA 1C 225M-8L
C101	4030014190	S.CERAMIC ECUE1H680JCQ
C102	4030014500	S.CERAMIC ECUE1H121JCQ
C103	4030014180	S.CERAMIC ECUE1H470JCQ
C107	4030013850	S.CERAMIC ECUE1E102KBQ
C108	4030013850	S.CERAMIC ECUE1E102KBQ
C114	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C115	4030014290	S.CERAMIC ECUE1H090CCQ
C116	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C117	4030014050	S.CERAMIC ECUE1H030BCQ
C119	4030013850	S.CERAMIC ECUE1E102KBQ

## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C120	4030016820	S.CERAMIC ECUE1HR75BCQ
C121	4030013850	S.CERAMIC ECUE1E102KBQ
C123	4030014120	S.CERAMIC ECUE1H100CCQ
C124	4030013850	S.CERAMIC ECUE1E102KBQ
C131	4030013850	S.CERAMIC ECUE1E102KBQ
C132	4030013850	S.CERAMIC ECUE1E102KBQ
C133	4030014050	S.CERAMIC ECUE1H030BCQ
C135	4030013850	S.CERAMIC ECUE1E102KBQ
C136	4030014050	S.CERAMIC ECUE1H030BCQ
C137	4030014070	S.CERAMIC ECUE1H040BCQ
C138	4030013850	S.CERAMIC ECUE1E102KBQ
C139	4030014050	S.CERAMIC ECUE1H030BCQ
C141	4030013850	S.CERAMIC ECUE1E102KBQ
C142	4030013850	S.CERAMIC ECUE1E102KBQ
C143	4030013850	S.CERAMIC ECUE1E102KBQ
C144	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C145	4030013850	S.CERAMIC ECUE1E102KBQ
C146	4030014210	S.CERAMIC ECUE1H151JCQ
C147	4030014140	S.CERAMIC ECUE1H150JCQ
C149	4030013850	S.CERAMIC ECUE1E102KBQ
C150	4030013850	S.CERAMIC ECUE1E102KBQ
C151	4030013850	S.CERAMIC ECUE1E102KBQ
C152	4030013850	S.CERAMIC ECUE1E102KBQ
C153	4030014080	S.CERAMIC ECUE1H050BCQ
C154	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C155	4030013850	S.CERAMIC ECUE1E102KBQ
C156	4030014100	S.CERAMIC ECUE1H070CCQ
C157	4030014120	S.CERAMIC ECUE1H100CCQ
C159	4030013850	S.CERAMIC ECUE1E102KBQ
C160	4030013850	S.CERAMIC ECUE1E102KBQ
C161	4030013850	S.CERAMIC ECUE1E102KBQ
C163	4030013850	S.CERAMIC ECUE1E102KBQ
C170	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C171	4030013850	S.CERAMIC ECUE1E102KBQ
C172	4030013850	S.CERAMIC ECUE1E102KBQ
C173	4030013850	S.CERAMIC ECUE1E102KBQ
C175	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C178	4030014080	S.CERAMIC ECUE1H050BCQ
C180	4030013850	S.CERAMIC ECUE1E102KBQ
C181	4030013850	S.CERAMIC ECUE1E102KBQ
C182	4030013850	S.CERAMIC ECUE1E102KBQ
C183	4030013850	S.CERAMIC ECUE1E102KBQ
C190	4030013850	S.CERAMIC ECUE1E102KBQ
C191	4030013850	S.CERAMIC ECUE1E102KBQ
C192	4030013850	S.CERAMIC ECUE1E102KBQ
C193	4510005600	S.ELECTROLYTIC ECEV1CS100SR
C194	4030013850	S.CERAMIC ECUE1E102KBQ
C195	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C196	4030013850	S.CERAMIC ECUE1E102KBQ
C197	4030013850	S.CERAMIC ECUE1E102KBQ
C198	4030013850	S.CERAMIC ECUE1E102KBQ
C199	4030013850	S.CERAMIC ECUE1E102KBQ
C200	4030013850	S.CERAMIC ECUE1E102KBQ
C201	4030009820	S.CERAMIC C1005 JB 1C 103K-T-A
C202	4030013850	S.CERAMIC ECUE1E102KBQ
C203	4030013850	S.CERAMIC ECUE1E102KBQ
C204	4030013850	S.CERAMIC ECUE1E102KBQ
C205	4030013850	S.CERAMIC ECUE1E102KBQ
C206	4030013850	S.CERAMIC ECUE1E102KBQ
C207	4030013850	S.CERAMIC ECUE1E102KBQ
C208	4030013850	S.CERAMIC ECUE1E102KBQ
C209	4030013850	S.CERAMIC ECUE1E102KBQ
C210	4030013850	S.CERAMIC ECUE1E102KBQ
C211	4030013850	S.CERAMIC ECUE1E102KBQ
C212	4030013850	S.CERAMIC ECUE1E102KBQ
C213	4030013850	S.CERAMIC ECUE1E102KBQ
C301	4030014150	S.CERAMIC ECUE1H220JCQ
C302	4030014170	S.CERAMIC ECUE1H330JCQ
C303	4030014240	S.CERAMIC ECUE1H180JCQ
C304	4030013850	S.CERAMIC ECUE1E102KBQ
C305	4030013850	S.CERAMIC ECUE1E102KBQ
C306	4030014180	S.CERAMIC ECUE1H470JCQ
C307	4030013850	S.CERAMIC ECUE1E102KBQ
C308	4030013850	S.CERAMIC ECUE1E102KBQ
C310	4030013850	S.CERAMIC ECUE1E102KBQ
C311	4030013850	S.CERAMIC ECUE1E102KBQ
C313	4030013850	S.CERAMIC ECUE1E102KBQ
C314	4030013850	S.CERAMIC ECUE1E102KBQ
C315	4030013850	S.CERAMIC ECUE1E102KBQ
C318	4030014280	S.CERAMIC ECUE1H0R3BCQ
C319	4030014110	S.CERAMIC ECUE1H030CCQ
C320	4030014180	S.CERAMIC ECUE1H470JCQ

S.=Surface mount

## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C321	4030014180	S.CERAMIC	ECUE1H470JCQ
C322	4030013850	S.CERAMIC	ECUE1E102KBQ
C323	4030014020	S.CERAMIC	ECUE1H020BCQ
C324	4030013850	S.CERAMIC	ECUE1E102KBQ
C325	4030014110	S.CERAMIC	ECUE1H080CCQ
C326	4030013980	S.CERAMIC	ECUE1H010BCQ
C327	4030014080	S.CERAMIC	ECUE1H050BCQ
C341	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C342	4030013850	S.CERAMIC	ECUE1E102KBQ
C343	4030014200	S.CERAMIC	ECUE1H101JCQ
C344	4030013850	S.CERAMIC	ECUE1E102KBQ
C345	4030014200	S.CERAMIC	ECUE1H101JCQ
C346	4030014280	S.CERAMIC	ECUE1H0R3BCQ
C347	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C348	4030014050	S.CERAMIC	ECUE1H030BCQ
C349	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C350	4030013850	S.CERAMIC	ECUE1E102KBQ
C351	4030014180	S.CERAMIC	ECUE1H470JCQ
C352	4030014440	S.CERAMIC	ECUE1H820JCQ
C353	4030014150	S.CERAMIC	ECUE1H220JCQ
C354	4030014340	S.CERAMIC	ECUE1H390JCQ
C355	4030014240	S.CERAMIC	ECUE1H180JCQ
C356	4030014240	S.CERAMIC	ECUE1H180JCQ
C357	4030014340	S.CERAMIC	ECUE1H390JCQ
C358	4030014060	S.CERAMIC	ECUE1H3R5BCQ
C359	4030014150	S.CERAMIC	ECUE1H220JCQ
C401	4030014110	S.CERAMIC	ECUE1H080CCQ
C402	4030014120	S.CERAMIC	ECUE1H100CCQ
C403	4030014050	S.CERAMIC	ECUE1H030BCQ
C404	4030013850	S.CERAMIC	ECUE1E102KBQ
C405	4030013850	S.CERAMIC	ECUE1E102KBQ
C409	4030014110	S.CERAMIC	ECUE1H080CCQ
C410	4030014500	S.CERAMIC	ECUE1H121JCQ
C411	4030013850	S.CERAMIC	ECUE1E102KBQ
C412	4030013850	S.CERAMIC	ECUE1E102KBQ
C413	4030013850	S.CERAMIC	ECUE1E102KBQ
C415	4030013850	S.CERAMIC	ECUE1E102KBQ
C416	4030013850	S.CERAMIC	ECUE1E102KBQ
C417	4030013850	S.CERAMIC	ECUE1E102KBQ
C418	4030014080	S.CERAMIC	ECUE1H050BCQ
C502	4030013850	S.CERAMIC	ECUE1E102KBQ
C503	4030013850	S.CERAMIC	ECUE1E102KBQ
C504	4030013850	S.CERAMIC	ECUE1E102KBQ
C505	4030014020	S.CERAMIC	ECUE1H020BCQ
C506	4030013980	S.CERAMIC	ECUE1H010BCQ
C507	4030014020	S.CERAMIC	ECUE1H020BCQ
C508	4030014110	S.CERAMIC	ECUE1H080CCQ
C509	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C510	4030014080	S.CERAMIC	ECUE1H050BCQ
C511	4030013850	S.CERAMIC	ECUE1E102KBQ
C512	4030013850	S.CERAMIC	ECUE1E102KBQ
C513	4030013850	S.CERAMIC	ECUE1E102KBQ
C514	4030013850	S.CERAMIC	ECUE1E102KBQ
C515	4030013850	S.CERAMIC	ECUE1E102KBQ
C516	4030013850	S.CERAMIC	ECUE1E102KBQ
C517	4030013850	S.CERAMIC	ECUE1E102KBQ
C518	4030013850	S.CERAMIC	ECUE1E102KBQ
C519	4030013850	S.CERAMIC	ECUE1E102KBQ
C521	4030013850	S.CERAMIC	ECUE1E102KBQ
C522	4030014080	S.CERAMIC	ECUE1H050BCQ
C523	4030013850	S.CERAMIC	ECUE1E102KBQ
C524	4030014100	S.CERAMIC	ECUE1H070CCQ
C525	4030013850	S.CERAMIC	ECUE1E102KBQ
C526	4030013850	S.CERAMIC	ECUE1E102KBQ
C527	4030013850	S.CERAMIC	ECUE1E102KBQ
C601	4030013850	S.CERAMIC	ECUE1E102KBQ
C602	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C603	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C608	4030014020	S.CERAMIC	ECUE1H020BCQ
C609	4030013850	S.CERAMIC	ECUE1E102KBQ
C610	4030013850	S.CERAMIC	ECUE1E102KBQ
C612	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C613	4030013850	S.CERAMIC	ECUE1E102KBQ
C702	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C704	4030013850	S.CERAMIC	ECUE1E102KBQ
C705	4030013850	S.CERAMIC	ECUE1E102KBQ
C717	4030013850	S.CERAMIC	ECUE1E102KBQ
C722	4030014120	S.CERAMIC	ECUE1H100CCQ
C724	4030014120	S.CERAMIC	ECUE1H100CCQ
C725	4030014020	S.CERAMIC	ECUE1H020BCQ
C726	4030014100	S.CERAMIC	ECUE1H070CCQ
C727	4030014280	S.CERAMIC	ECUE1H0R3BCQ

## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C728	4030014100	S.CERAMIC	ECUE1H070CCQ
C729	4030014020	S.CERAMIC	ECUE1H020BCQ
C730	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C731	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C741	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C748	4030013850	S.CERAMIC	ECUE1E102KBQ
C749	4030013850	S.CERAMIC	ECUE1E102KBQ
C801	4030013850	S.CERAMIC	ECUE1E102KBQ
C802	4030013850	S.CERAMIC	ECUE1E102KBQ
C803	4030013850	S.CERAMIC	ECUE1E102KBQ
C805	4030013850	S.CERAMIC	ECUE1E102KBQ
C806	4030014180	S.CERAMIC	ECUE1H470JCQ
C807	4030014180	S.CERAMIC	ECUE1H470JCQ
C808	4030014180	S.CERAMIC	ECUE1H470JCQ
C815	4550006250	S.TANTALUM	TEMSVA 1A 106M-8L
C816	4030013850	S.CERAMIC	ECUE1E102KBQ
C817	4550006250	S.TANTALUM	TEMSVA 1A 106M-8L
C818	4030014170	S.CERAMIC	ECUE1H330JCQ
C821	4030013850	S.CERAMIC	ECUE1E102KBQ
C822	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C823	4550006160	S.TANTALUM	ECST1CY155R
C824	4550006160	S.TANTALUM	ECST1CY155R
C825	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C827	4030014050	S.CERAMIC	ECUE1H030BCQ
C830	4030014050	S.CERAMIC	ECUE1H030BCQ
C831	4030013850	S.CERAMIC	ECUE1E102KBQ
C832	4030013850	S.CERAMIC	ECUE1E102KBQ
C833	4030013850	S.CERAMIC	ECUE1E102KBQ
C835	4030013850	S.CERAMIC	ECUE1E102KBQ
C836	4030013850	S.CERAMIC	ECUE1E102KBQ
C839	4030013850	S.CERAMIC	ECUE1E102KBQ
C840	4030013850	S.CERAMIC	ECUE1E102KBQ
C841	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C842	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C843	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C844	4550000550	S.TANTALUM	TESVA 1V 224M1-8L
C845	4030013850	S.CERAMIC	ECUE1E102KBQ
C849	4550004040	S.TANTALUM	TEMSVA 0J 685M-8L
C850	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C851	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C852	4030013850	S.CERAMIC	ECUE1E102KBQ
C853	4030013850	S.CERAMIC	ECUE1E102KBQ
C854	4030013850	S.CERAMIC	ECUE1E102KBQ
C855	4030013850	S.CERAMIC	ECUE1E102KBQ
C856	4030013850	S.CERAMIC	ECUE1E102KBQ
C857	4030014200	S.CERAMIC	ECUE1H101JCQ
C858	4030013850	S.CERAMIC	ECUE1E102KBQ
C860	4030014020	S.CERAMIC	ECUE1H020BCQ
			[AUS], [SEA], [USA-1]
C861	4030014110	S.CERAMIC	ECUE1H080CCQ [EUR], [UK], [ITA]
			ECUE1E102KBQ
C862	4030013850	S.CERAMIC	ECUE1E102KBQ
C863	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C864	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C865	4030013850	S.CERAMIC	ECUE1E102KBQ
C866	4030013850	S.CERAMIC	ECUE1E102KBQ
C867	4030013850	S.CERAMIC	ECUE1E102KBQ
C868	4550006680	S.TANTALUM	ECST0JY156R
C869	4030013850	S.CERAMIC	ECUE1E102KBQ
C870	4550006680	S.TANTALUM	ECST0JY156R
C871	4030013850	S.CERAMIC	ECUE1E102KBQ
C872	4550006680	S.TANTALUM	ECST0JY156R
C873	4030013850	S.CERAMIC	ECUE1E102KBQ
C874	4550006680	S.TANTALUM	ECST0JY156R
C875	4030013850	S.CERAMIC	ECUE1E102KBQ
C876	4550006680	S.TANTALUM	ECST0JY156R
C877	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C878	4030013850	S.CERAMIC	ECUE1E102KBQ
C879	4030014050	S.CERAMIC	ECUE1H030BCQ
C880	4030014080	S.CERAMIC	ECUE1H050BCQ
C881	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C882	4030013850	S.CERAMIC	ECUE1E102KBQ
C883	4030013850	S.CERAMIC	ECUE1E102KBQ
C884	4030013850	S.CERAMIC	ECUE1E102KBQ
C885	4030014150	S.CERAMIC	ECUE1H220JCQ
C886	4030013850	S.CERAMIC	ECUE1E102KBQ
C888	4030013850	S.CERAMIC	ECUE1E102KBQ
C889	4030013850	S.CERAMIC	ECUE1E102KBQ
C890	4030014080	S.CERAMIC	ECUE1H050BCQ
C891	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C892	4030013850	S.CERAMIC	ECUE1E102KBQ
C894	4030013850	S.CERAMIC	ECUE1E102KBQ

S.=Surface mount

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C895	4030013850	S.CERAMIC	ECUE1E102KBQ
C896	4030014050	S.CERAMIC	ECUE1H030BCQ
C897	4030014090	S.CERAMIC	ECUE1H060CCQ
C898	4030013850	S.CERAMIC	ECUE1E102KBQ
C899	4030013850	S.CERAMIC	ECUE1E102KBQ
C900	4030014020	S.CERAMIC	ECUE1H020BCQ
			[AUS], [SEA], [USA-1]
C901	4030014090	S.CERAMIC	ECUE1H060CCQ [EUR], [UK], [ITA]
C902	4030013850	S.CERAMIC	ECUE1E102KBQ
C903	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C904	4030013850	S.CERAMIC	ECUE1E102KBQ
C907	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C908	4030013850	S.CERAMIC	ECUE1E102KBQ
C911	4030013850	S.CERAMIC	ECUE1E102KBQ
C912	4550002980	S.TANTALUM	TEMSVA 1C 225M-8L
C913	4030013850	S.CERAMIC	ECUE1E102KBQ
C914	4030013850	S.CERAMIC	ECUE1E102KBQ
C915	4030013850	S.CERAMIC	ECUE1E102KBQ
C916	4030013980	S.CERAMIC	ECUE1H010BCQ
C921	4030013850	S.CERAMIC	ECUE1E102KBQ
C923	4030013850	S.CERAMIC	ECUE1E102KBQ
C924	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C928	4030013850	S.CERAMIC	ECUE1E102KBQ
C930	4030013850	S.CERAMIC	ECUE1E102KBQ
C931	4030013850	S.CERAMIC	ECUE1E102KBQ
C932	4030013850	S.CERAMIC	ECUE1E102KBQ
C933	4030013850	S.CERAMIC	ECUE1E102KBQ
C934	4030013850	S.CERAMIC	ECUE1E102KBQ
C935	4030013850	S.CERAMIC	ECUE1E102KBQ
C937	4030013850	S.CERAMIC	ECUE1E102KBQ
C938	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C939	4030013850	S.CERAMIC	ECUE1E102KBQ
C940	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C941	4030013850	S.CERAMIC	ECUE1E102KBQ
C942	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C943	4030013850	S.CERAMIC	ECUE1E102KBQ
C944	4030009350	S.CERAMIC	C1608 CH 1H 3R5B-T-A
C945	4030014180	S.CERAMIC	ECUE1H470JCQ
C948	4030013850	S.CERAMIC	ECUE1E102KBQ
C949	4030013850	S.CERAMIC	ECUE1E102KBQ
C950	4030013850	S.CERAMIC	ECUE1E102KBQ
C951	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
			[AUS], [SEA], [USA-1]
	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A [EUR], [UK], [ITA]
C952	4030013850	S.CERAMIC	ECUE1E102KBQ
C953	4030013850	S.CERAMIC	ECUE1E102KBQ
C954	4030014250	S.CERAMIC	GRH708 CH 150J 200PT
C955	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C956	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C957	4030013850	S.CERAMIC	ECUE1E102KBQ
C958	4030013850	S.CERAMIC	ECUE1E102KBQ
C960	4030004960	S.CERAMIC	C2012 CH 1H 560J-T-A
C961	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C962	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C963	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C964	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C965	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C966	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C967	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C968	4030013850	S.CERAMIC	ECUE1E102KBQ
C969	4030005030	S.CERAMIC	C2012 CH 1H 221J-T-A
C970	4030004960	S.CERAMIC	C2012 CH 1H 560J-T-A
C971	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C972	4030013850	S.CERAMIC	ECUE1E102KBQ
C973	4030013850	S.CERAMIC	ECUE1E102KBQ
C974	4030013850	S.CERAMIC	ECUE1E102KBQ
C975	4030013850	S.CERAMIC	ECUE1E102KBQ
C976	4030013850	S.CERAMIC	ECUE1E102KBQ
C977	4030013850	S.CERAMIC	ECUE1E102KBQ
C978	4030013850	S.CERAMIC	ECUE1E102KBQ
C979	4030013850	S.CERAMIC	ECUE1E102KBQ
C980	4030013850	S.CERAMIC	ECUE1E102KBQ
C981	4030013850	S.CERAMIC	ECUE1E102KBQ
C982	4030013850	S.CERAMIC	ECUE1E102KBQ
C983	4030013850	S.CERAMIC	ECUE1E102KBQ
C985	4030013850	S.CERAMIC	ECUE1E102KBQ
C986	4030013850	S.CERAMIC	ECUE1E102KBQ
C987	4030013850	S.CERAMIC	ECUE1E102KBQ
C988	4030013850	S.CERAMIC	ECUE1E102KBQ
C989	4030013850	S.CERAMIC	ECUE1E102KBQ

[RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C991	4030014200	S.CERAMIC	ECUE1H101JCQ
C992	4030014200	S.CERAMIC	ECUE1H101JCQ
C993	4030013850	S.CERAMIC	ECUE1E102KBQ
C994	4030014200	S.CERAMIC	ECUE1H101JCQ
C995	4030013850	S.CERAMIC	ECUE1E102KBQ
C997	4030013850	S.CERAMIC	ECUE1E102KBQ
J3	6450000870	CONNECTOR	HEC2711-01-020
J4	6510019870	S.CONNECTOR	AXK5S40045P
J951	6510020400	S.CONNECT	MM7329-2700
J952	6510020400	S.CONNECT	MM7329-2700
W1	8900008750	CABLE	OPC-868 (MXFG76FG0400)
EP1	0910051346	PCB	B 5140F

[VCO BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
Q301	1530003560	S.TRANSISTOR	2SC5195-T1
Q302	1530003560	S.TRANSISTOR	2SC5195-T1
Q311	1530003560	S.TRANSISTOR	2SC5195-T1
Q312	1530003560	S.TRANSISTOR	2SC5195-T1
Q313	1530003560	S.TRANSISTOR	2SC5195-T1
Q321	1530003560	S.TRANSISTOR	2SC5195-T1
Q322	1530003560	S.TRANSISTOR	2SC5195-T1
Q323	1530003560	S.TRANSISTOR	2SC5195-T1
Q350	1530003260	S.TRANSISTOR	2SC5006-T1
Q351	1530003560	S.TRANSISTOR	2SC5195-T1
Q353	1530003560	S.TRANSISTOR	2SC5195-T1
Q354	1530003560	S.TRANSISTOR	2SC5195-T1
D301	1720000690	S.VARICAP	1SV282 (TPH2)
D302	1790001260	S.DIODE	MA2S077-(TX)
D311	1750000610	S.VARICAP	MA2SV0500L
D312	1750000360	S.DIODE	1SS364 (TE85L)
D321	1790001260	S.DIODE	MA2S077-(TX)
D322	1720000370	S.VARICAP	HVU350TRF
D351	1790001310	S.VARICAP	1SV270 (TPH3)
D352	1790001260	S.DIODE	MA2S077-(TX)
L301	6200004480	S.COIL	MLF1608D R82K-T
L302	6200008190	S.COIL	0.25-1.9-8TL 80N
L311	6200004480	S.COIL	MLF1608D R82K-T
L312	6200008280	S.COIL	0.30-1.7-7TL 50N
L313	6200008170	S.COIL	0.35-1.6-8TL 54N
L321	6200004480	S.COIL	MLF1608D R82K-T
L322	6200008330	S.COIL	0.45-1.4-4TL 15N
L330	6200008230	S.COIL	0.30-1.3-5TL 22N
L331	6200003640	S.COIL	MLF1608K 100K-T
L332	6200005680	S.COIL	ELJRE 15NG-F
L333	6200005640	S.COIL	ELJRE 6N8Z-F
L334	6200005640	S.COIL	ELJRE 6N8Z-F
L335	6200005630	S.COIL	ELJRE 5N6Z-F
L336	6200005620	S.COIL	ELJRE 4N7Z-F
L337	6200005640	S.COIL	ELJRE 6N8Z-F
L338	6200005650	S.COIL	ELJRE 8N2Z-F
L360	6200003640	S.COIL	MLF1608K 100K-T
R301	7030005700	S.RESISTOR	ERJ2GEJ 274 X (270 kΩ)
R302	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R303	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R304	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R305	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R306	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R307	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R308	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R311	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R312	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R313	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)

S.=Surface mount



[VCO BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
R314	7030005290	S.RESISTOR	ERJ2GEJ 682 X (6.8 kΩ)
R315	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R316	7030004990	S.RESISTOR	ERJ2GEJ 221 X (220 Ω)
R317	7030005070	S.RESISTOR	ERJ2GEJ 683 X (68 kΩ)
R318	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R319	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R321	7030005120	S.RESISTOR	ERJ2GEJ 102 X (1 kΩ)
R322	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R323	7030005590	S.RESISTOR	ERJ2GEJ 680 X (68 Ω)
R324	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 kΩ)
R325	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 kΩ)
R326	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R327	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R328	7030007270	S.RESISTOR	ERJ2GEJ 151 X (150 Ω)
R329	7030005070	S.RESISTOR	ERJ2GEJ 683 X (68 kΩ)
R330	7030005300	S.RESISTOR	ERJ2GEJ 150 X (15 Ω)
R360	7030005050	S.RESISTOR	ERJ2GEJ 103 X (10 kΩ)
R361	7030005220	S.RESISTOR	ERJ2GEJ 223 X (22 kΩ)
R362	7030009140	S.RESISTOR	ERJ2GEJ 272 X (2.7 kΩ)
R363	7030009160	S.RESISTOR	ERJ2GEJ 181 X (180 Ω)
R364	7030007290	S.RESISTOR	ERJ2GEJ 222 X (2.2 kΩ)
R365	7030005530	S.RESISTOR	ERJ2GEJ 100 X (10 Ω)
R366	7030005060	S.RESISTOR	ERJ2GEJ 333 X (33 kΩ)
R367	7030008010	S.RESISTOR	ERJ2GEJ 123 (12 kΩ)
R368	7030005570	S.RESISTOR	ERJ2GEJ 820 X (82 Ω)
R369	7030004970	S.RESISTOR	ERJ2GEJ 470 X (47 Ω)
R371	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R372	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
R373	7030004980	S.RESISTOR	ERJ2GEJ 101 X (100 Ω)
R374	7030005090	S.RESISTOR	ERJ2GEJ 104 X (100 kΩ)
C301	4030013850	S.CERAMIC	ECUE1E102KBQ
C302	4030013850	S.CERAMIC	ECUE1E102KBQ
C303	4030013850	S.CERAMIC	ECUE1E102KBQ
C304	4030014020	S.CERAMIC	ECUE1H020BCQ
C305	4030014020	S.CERAMIC	ECUE1H020BCQ
C306	4030013850	S.CERAMIC	ECUE1E102KBQ
C307	4030014280	S.CERAMIC	ECUE1H0R3BCQ
C308	4030013850	S.CERAMIC	ECUE1E102KBQ
C309	4030013850	S.CERAMIC	ECUE1E102KBQ
C310	4030013850	S.CERAMIC	ECUE1E102KBQ
C311	4030013850	S.CERAMIC	ECUE1E102KBQ
C312	4030013850	S.CERAMIC	ECUE1E102KBQ
C313	4030013980	S.CERAMIC	ECUE1H010BCQ
C314	4030013980	S.CERAMIC	ECUE1H010BCQ
C315	4030013850	S.CERAMIC	ECUE1E102KBQ
C316	4030014280	S.CERAMIC	ECUE1H0R3BCQ
C317	4030013850	S.CERAMIC	ECUE1E102KBQ
C318	4030013850	S.CERAMIC	ECUE1E102KBQ
C319	4030013850	S.CERAMIC	ECUE1E102KBQ
C320	4030013850	S.CERAMIC	ECUE1E102KBQ
C321	4030014150	S.CERAMIC	ECUE1H220JCQ
C322	4030014180	S.CERAMIC	ECUE1H470JCQ
C323	4030013850	S.CERAMIC	ECUE1E102KBQ
C324	4030013980	S.CERAMIC	ECUE1H010BCQ
C325	4030013980	S.CERAMIC	ECUE1H010BCQ
C326	4030013850	S.CERAMIC	ECUE1E102KBQ
C327	4030014420	S.CERAMIC	ECUE1H0R5BCQ
C328	4030013850	S.CERAMIC	ECUE1E102KBQ
C329	4030013850	S.CERAMIC	ECUE1E102KBQ
C330	4030013850	S.CERAMIC	ECUE1E102KBQ
C331	4030013850	S.CERAMIC	ECUE1E102KBQ
C332	4030013850	S.CERAMIC	ECUE1E102KBQ
C333	4030013850	S.CERAMIC	ECUE1E102KBQ
C334	4030013850	S.CERAMIC	ECUE1E102KBQ
C360	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
C361	4030013850	S.CERAMIC	ECUE1E102KBQ
C362	4030013850	S.CERAMIC	ECUE1E102KBQ
C363	4030009820	S.CERAMIC	C1005 JB 1C 103K-T-A
C364	4030014130	S.CERAMIC	ECUE1H120JCQ
C365	4030014020	S.CERAMIC	ECUE1H020BCQ
C366	4030014100	S.CERAMIC	ECUE1H070CCQ
C367	4030013850	S.CERAMIC	ECUE1E102KBQ
C368	4030013850	S.CERAMIC	ECUE1E102KBQ
C369	4030014100	S.CERAMIC	ECUE1H070CCQ
C370	4550006120	S.TANTALUM	TEMSVA 0G 226M-8L
C371	4030014090	S.CERAMIC	ECUE1H060CCQ
C372	4030013850	S.CERAMIC	ECUE1E102KBQ
C373	4030013980	S.CERAMIC	ECUE1H010BCQ
C374	4030014050	S.CERAMIC	ECUE1H030BCQ
C375	4030013850	S.CERAMIC	ECUE1E102KBQ

[VCO BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
C376	4030014070	S.CERAMIC	ECUE1H040BCQ
C377	4030014110	S.CERAMIC	ECUE1H080CCQ
C378	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C379	4030010080	S.CERAMIC	C1005 CH 1E 240J-T-A
C380	4030014050	S.CERAMIC	ECUE1H030BCQ
C381	4030014000	S.CERAMIC	ECUE1H1R5BCQ
C382	4030013980	S.CERAMIC	ECUE1H010BCQ
C383	4030014050	S.CERAMIC	ECUE1H030BCQ
C384	4030014420	S.CERAMIC	ECUE1H0R5BCQ
C385	4030014020	S.CERAMIC	ECUE1H020BCQ
C386	4030014050	S.CERAMIC	ECUE1H030BCQ
C387	4030013850	S.CERAMIC	ECUE1E102KBQ
C388	4030014020	S.CERAMIC	ECUE1H020BCQ
C389	4030013970	S.CERAMIC	C1005 JB 0J 104K-T-N
J301	6910012160	CONNECTOR	IMSA-9230B-1-07Z057-T
J302	6910011770	CONNECTOR	IMSA-9230B-1-10Z057-T
EP1	0910051333	PCB	B 5137C

S.=Surface mount

# SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

## [CHASSIS PARTS]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
J1	6510020650	Connector SMA-R224	1
S1	7600000210	Encoder TP70N00E20-15F-1903	1
SP1	2510000960	Speaker CS028014-12	1
MP1	8210016140	2135 Front panel (A) [EUR], [UK], [ITA]	1
	8210016130	2135 Front panel (B) [AUS], [SEA], [USA-1]	1
MP2	8010017680	2135 chassis	1
MP3	8930048450	2135 10-Key	1
MP6	8930048470	2135 PW button	1
MP7	8310045560	2135 Window plate	1
MP9	8930048840	2135 Mic sponge	1
MP10	8830001450	2135 Hex nut	1
MP13	8930048480	2135 Main seal	1
MP14	8930048490	2135 Mic cap	1
MP17	8930045940	1903 Botton sheet	1
MP18	8930046020	1123 Sheet (A)-1	1
MP19	8610010530	Knob N-263	1
MP20	8930044460	1903 Contact rubber	1
MP21	8930044530	1903 Rubber sheet	1
MP22	8950004810	1903 SP spring	2
MP23	8830001220	Nut (F)	1
MP24	8930048630	1903 Rear sheet (G) [USA-1]	1
	8930048640	1903 Rear sheet (H) [AUS], [SEA]	1
	8930048650	1903 Rear sheet (I) [EUR], [UK], [ITA]	1
MP25	8930044470	1903 DC cap	1
MP26	8930044480	1903 Lens	1
MP28	8810008990	Screw PH BT M2x10 ZX	2
MP29	8810009510	Screw FH BT M2x4 NI-ZU	11
MP30	8810009630	Screw FH No.0 M2x4.5 NI B	2
MP31	8930049140	2135 Earth plate	1
MP32	8930049040	Thermally sheet (FQ)	1

## [RF UNIT]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
MP1	8410002280	2135 PA heatsink-2	1
MP2	8950004800	1903 Contact spring	1

## [LOGIC UNIT]

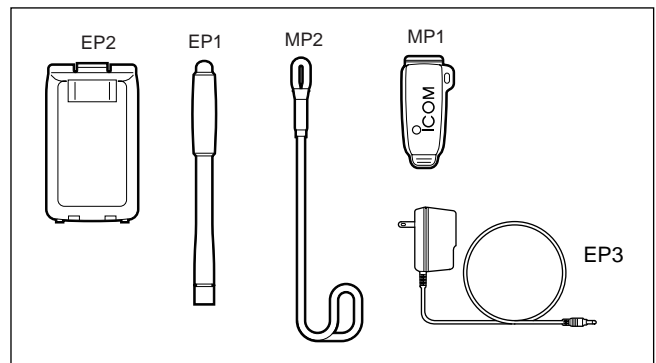
REF. NO.	ODER NO.	DESCRIPTION	QTY.
DS4	5030001700	LCD LM-1782	1
EP2	8930048950	LCD Contact SRCN-2135-SP-N-W	1
MP1	8930048500	2135 LCD Holder	1
MP2	8930015960	2135 Reflector	1
MP4	8610010680	Knob N-271	1
MP5	8810009790	Screw PH BT 1.7x4 NI-ZU	2
MP6	8510012200	2135 LOGIC shield	1
MP9	8930049020	2315 LOGIC sheet	1

## [VCO UNIT]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
MP1	8510012100	2135 VCO case	1

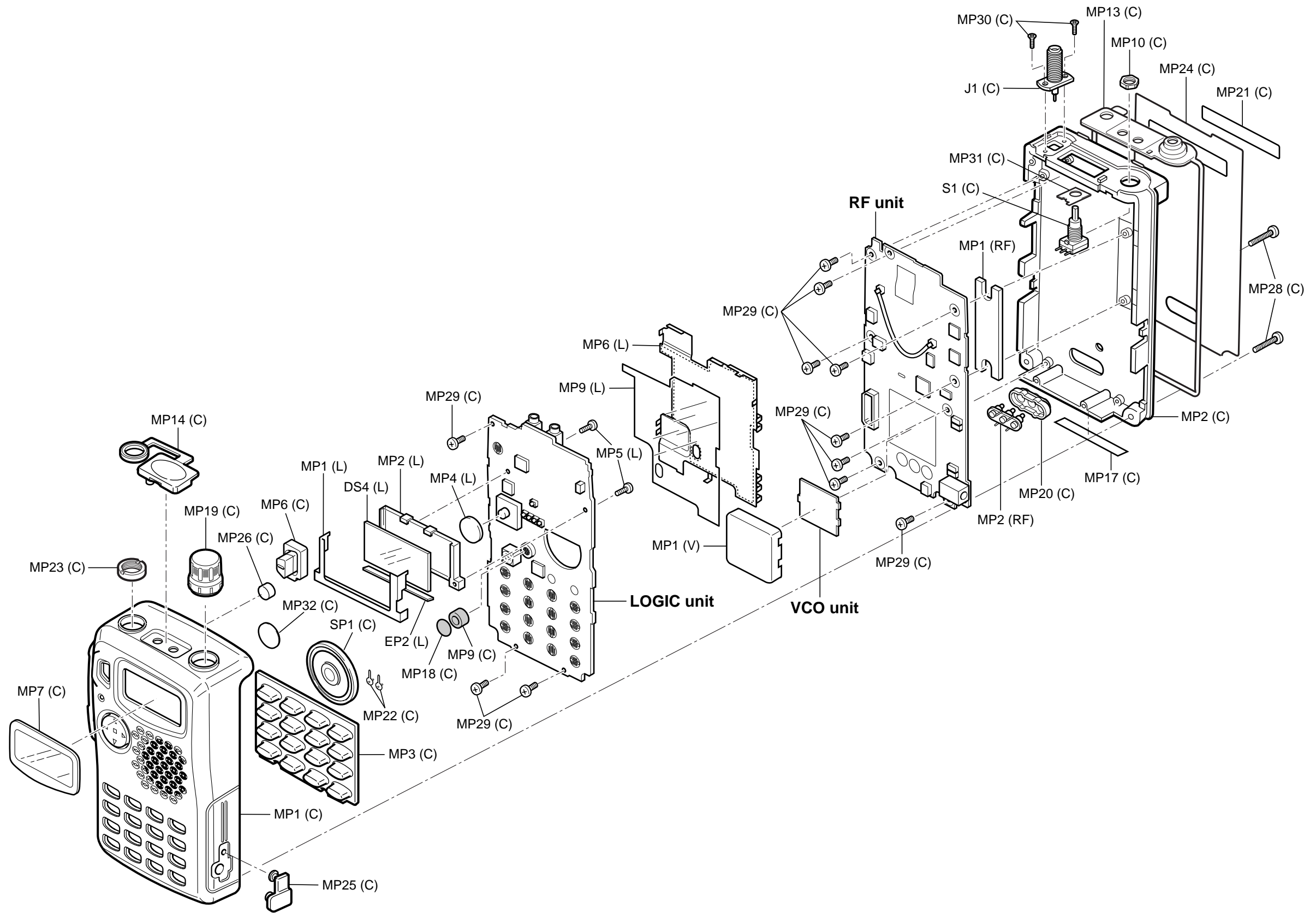
## [ACCESSORIES]

REF. NO.	ODER NO.	DESCRIPTION	QTY.
EP1	Optional product	Antenna FA-S6270A	1
EP2	Optional product	Battery BP-200 [USA-1] only	1
	Optional product	Battery BP-199 [EUR], [UK], [ITA], [AUS]	1
EP3	Optional product	Charger BC-110A [USA-1] only	1
	Optional product	Charger BC-110V [AUS] only	1
	Optional product	Charger BC-110D [EUR], [ITA]	1
MP1	8930044450	1903 Belt clip	1
MP2	8010011960	Strap belt HK-005	1



### Screw abbreviations

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



**UNIT abbreviation** (C): CHASSIS PARTS, (L): LOGIC UNIT (RF): RF UNIT, (V): VCO UNIT

# SECTION 8 SEMI-CONDUCTOR INFORMATION

## • TRANSISTOR AND FET'S

<b>2SA1588 GR</b> (Symbol: ZG) 	<b>2SB1132 R</b> (Symbol: BARB) 	<b>2SB1201 S</b> (Symbol: B1201) 	<b>2SB1462 R</b> (Symbol: BR) 	<b>2SC3356 R25</b> (Symbol: R25) 
<b>2SC4117 BL</b> (Symbol: CL) 	<b>2SC4215 0</b> (Symbol: QO) 	<b>2SC4226 R25</b> (Symbol: R25) 	<b>2SC4228 R45</b> (Symbol: R45) 	<b>2SC4403 3</b> (Symbol: LY3) 
<b>2SC5006</b> (Symbol: 24) 	<b>2SC5107 0</b> (Symbol: MFO) 	<b>2SC5195</b> (Symbol: 88) 	<b>2SC5319</b> (Symbol: MT) 	<b>2SC5454 R54</b> (Symbol: R54) 
<b>2SD2216 S</b> (Symbol: Y) 	<b>2SJ364 Q</b> (Symbol: 4M) 	<b>2SK3075</b> (Symbol: UB F) 	<b>2SK880 Y</b> (Symbol: XY) 	<b>3SK291</b> (Symbol: UF) 
<b>HAT1024 R</b> (Symbol: 1024) 	<b>MRF9745</b> (Symbol: M745) 	<b>MXR9745-RT1</b> (Symbol: RG) 	<b>UN9115</b> (Symbol: 6E) 	<b>UN9116</b> (Symbol: 6F) 
<b>UN911D</b> (Symbol: 6M) 	<b>UN9210</b> (Symbol: 8L) 	<b>UN9211</b> (Symbol: 8A) 	<b>UN9214</b> (Symbol: 8A) 	<b>UN9215</b> (Symbol: 8E) 
<b>UN921E</b> (Symbol: 8N) 	<b>XP1115</b> (Symbol: 9L) 	<b>XP1116</b> (Symbol: 7N) 	<b>XP1501 AB</b> (Symbol: 5R) 	<b>XP4312</b> (Symbol: 7T) 
<b>XP4315</b> (Symbol: CB) 	<b>XP4601</b> (Symbol: 5C) 	<b>XP5601 AB</b> (Symbol: 4N) 	<b>XP6401</b> (Symbol: 5O) 	

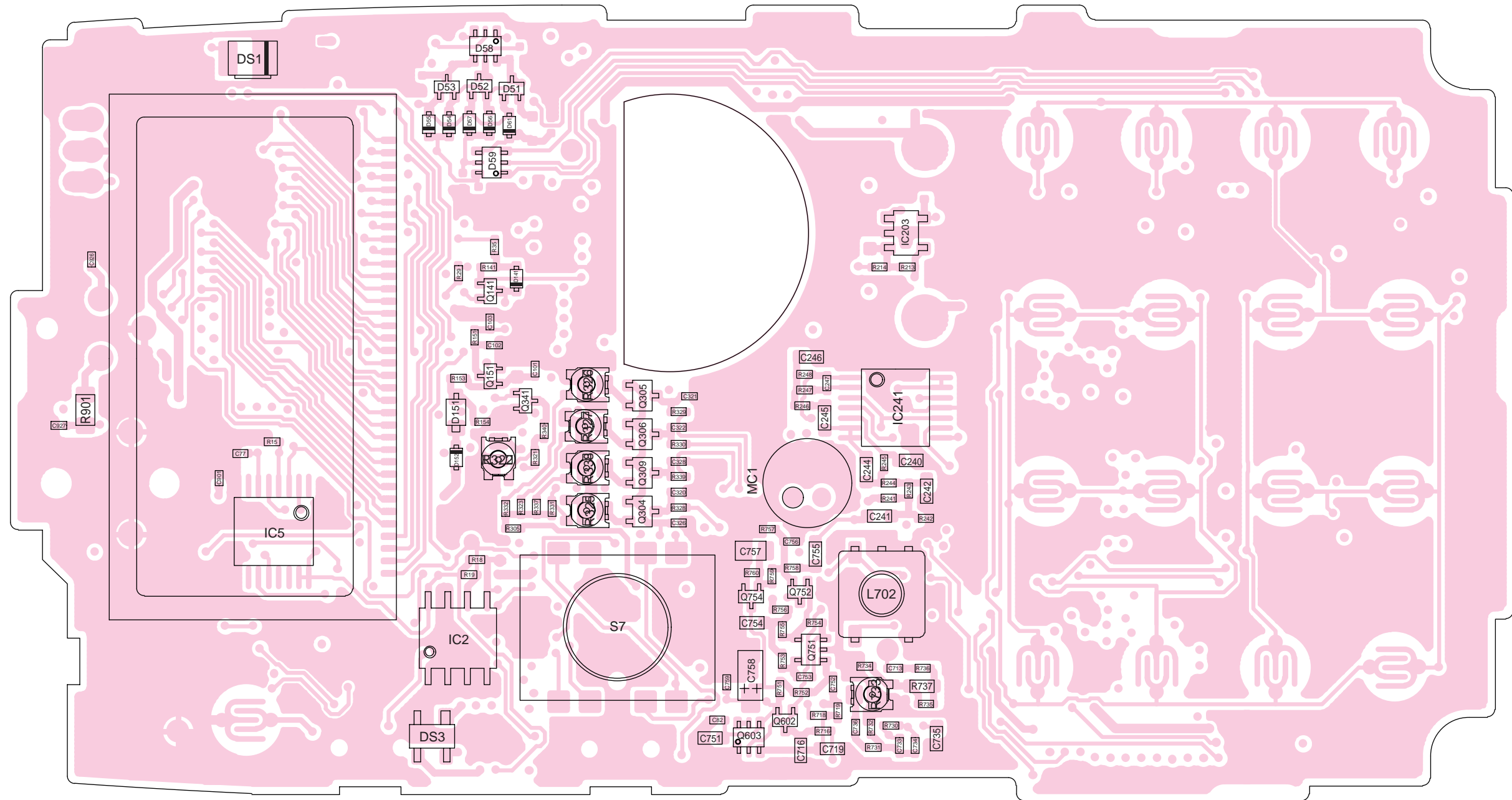
## • DIODES

<b>1SS364</b> (Symbol: BF) 	<b>1SV270</b> (Symbol: TF) 	<b>1SV271</b> (Symbol: TG) 	<b>1SV282</b> (Symbol: TD) 	<b>1SV288</b> (Symbol: TJ) 
<b>1SV308</b> (Symbol: TX) 	<b>HVU350</b> (Symbol: 4) 	<b>MA132HK</b> (Symbol: M3N) 	<b>MA132K</b> (Symbol: 7N) 	<b>MA132WK</b> (Symbol: MU) 
<b>MA133</b> (Symbol: MP) 	<b>MA2S077</b> (Symbol: S) 	<b>MA2S111</b> (Symbol: A) 	<b>MA2S728</b> (Symbol: B) 	<b>MA2SV05</b> (Symbol: A) 
<b>MA6S121</b> (Symbol: M2D) 	<b>MA729</b> (Symbol: 2B) 	<b>MA8062 M</b> (Symbol: 8^6) 	<b>MA8100 M</b> (Symbol: 10-) 	<b>RB060L-40</b> (Symbol: 36) 
<b>RD5.1M B3</b> (Symbol: 513) 	<b>SB07-03C</b> (Symbol: J) 			

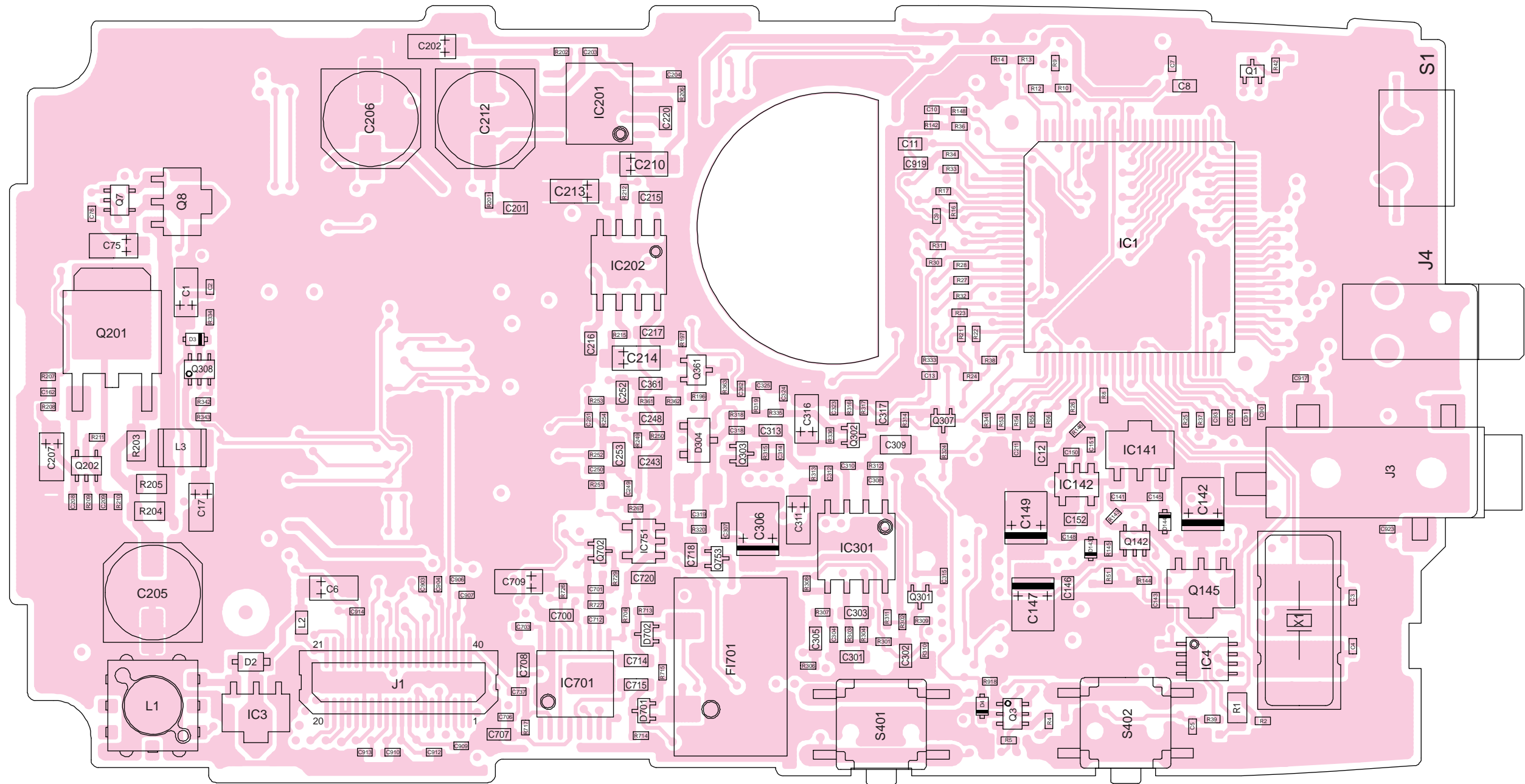
# SECTION 9 BOARD LAYOUTS

## 9-1 LOGIC UNIT

- TOP VIEW



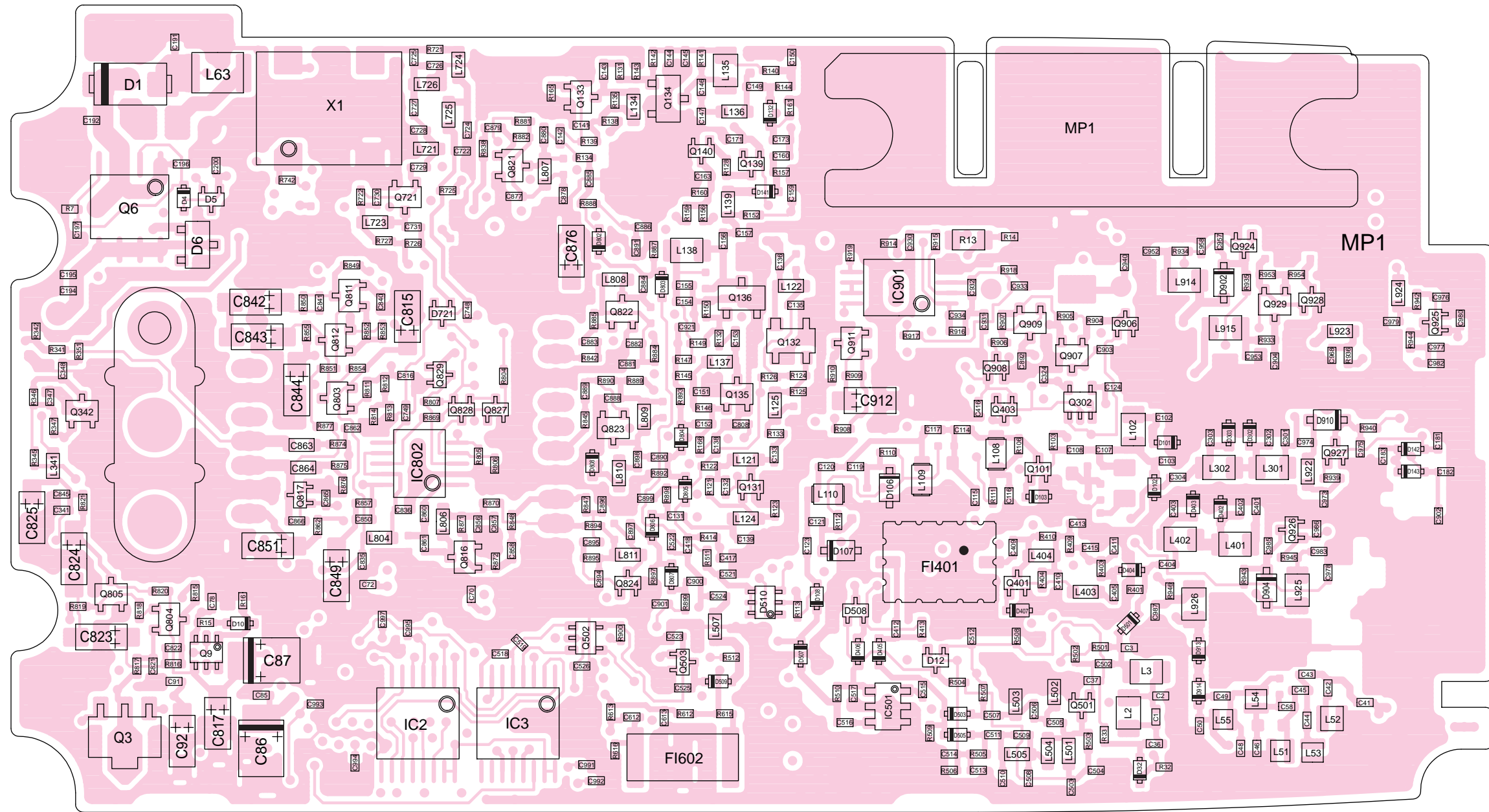
● BOTTOM VIEW



21	J1 to RF unit J4	40
EURDEV	DC-DC	
FSET	GND	
HV	6MVCO	
HV	CHGC	
PLST2	R+3	
GND	GND	
GND	AM	
GND	WFM	
BDET	12VCO	
PDA1/UL	TXC	
PLST1	UVCO	
LOCKV	VHVC0	
TUNE	TUNE	
VCC	AGC	
PDA2/UL	CK	
+3C	DATA	
GND	IOST	
PSET	THERM	
GND	GND	
IFIN	2NDLO	
20		1



● BOTTOM VIEW



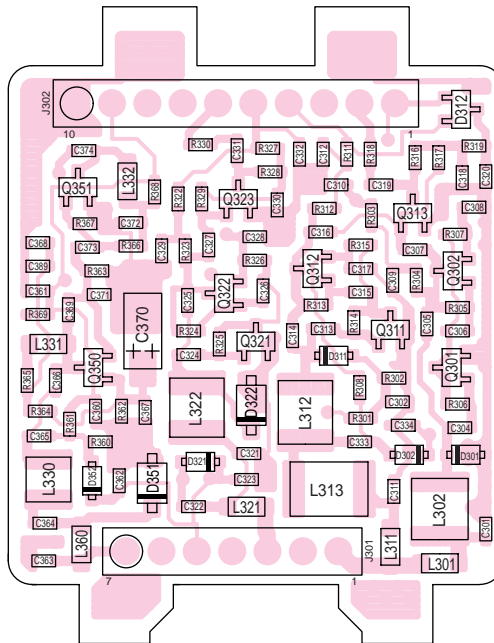


# 9-3 VCO BOARD

- TOP VIEW

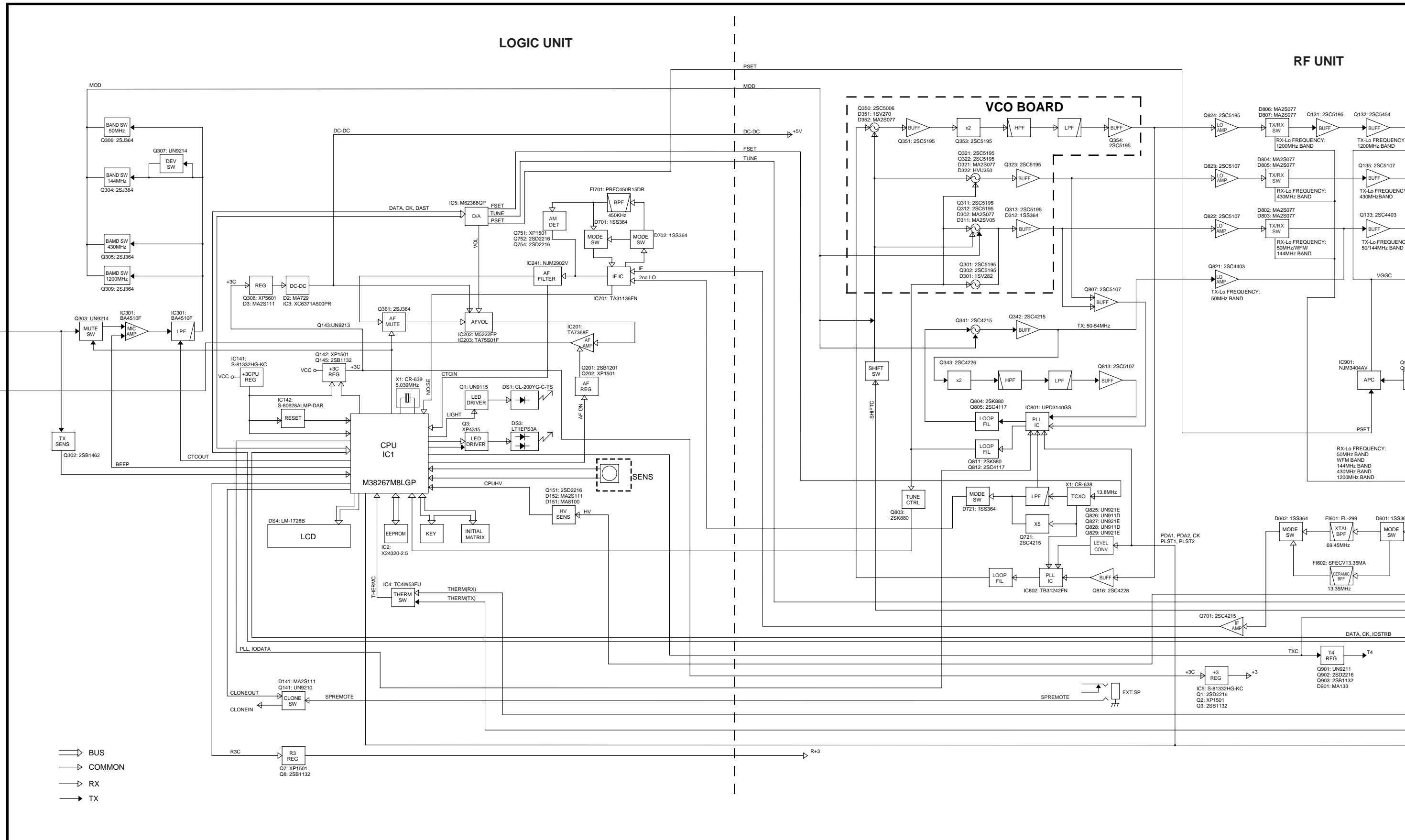
10	J302 to RF unit	1
VLVCO3	VHF OUT	
GND		
VHVC03	UHVC03	
UHFOUT	GND	
12VCOOUT	12VCO3	
GND		

7	J301 to RF unit	1
VLV	GND	
ULV	MOD	
SHIFT	GND	
12LV		

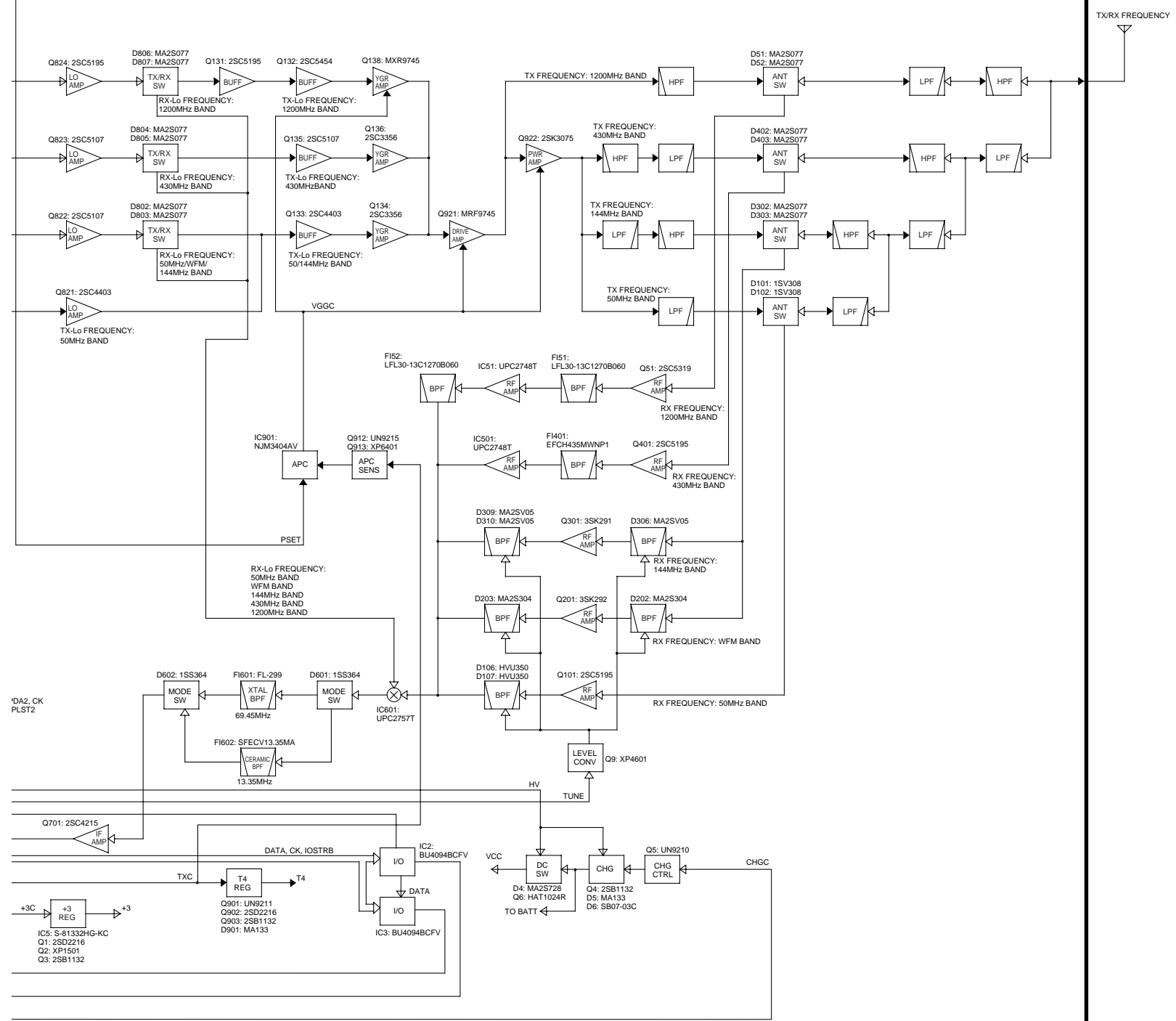




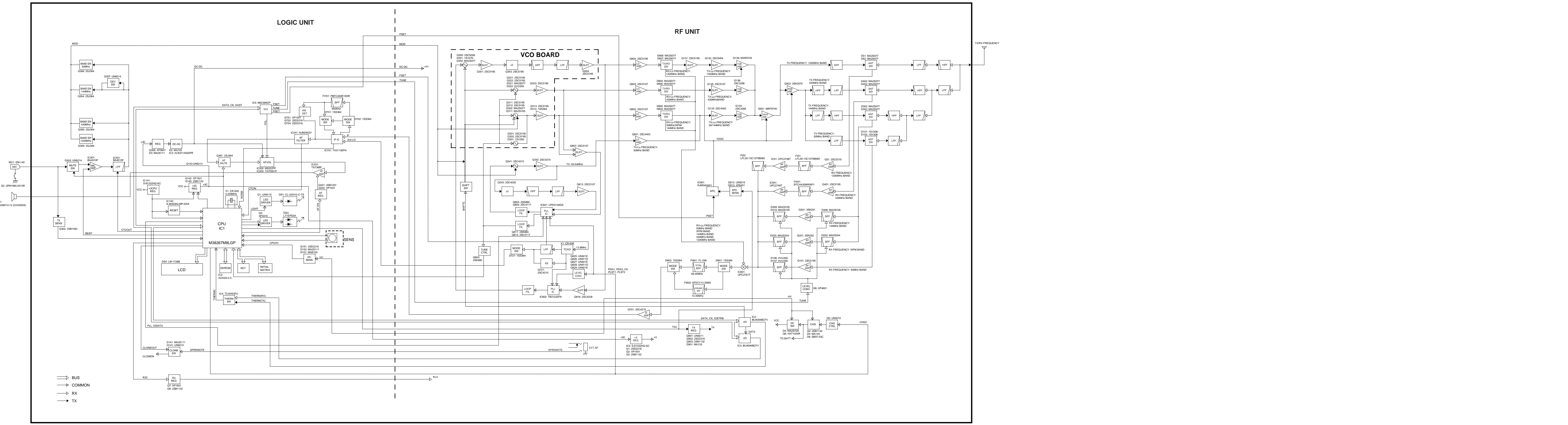
# SECTION 10 BLOCK DIAGRAM



# RF UNIT

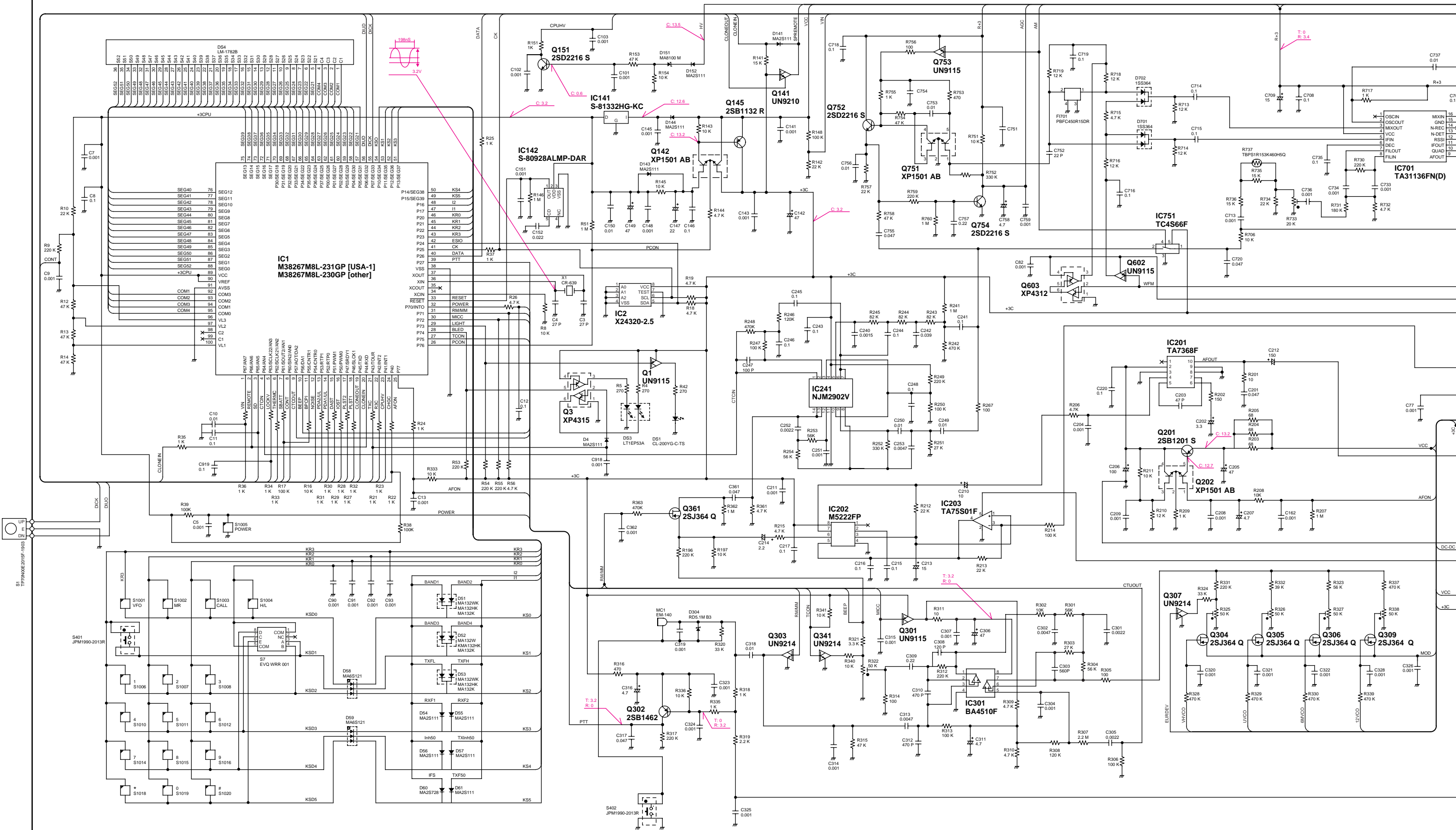


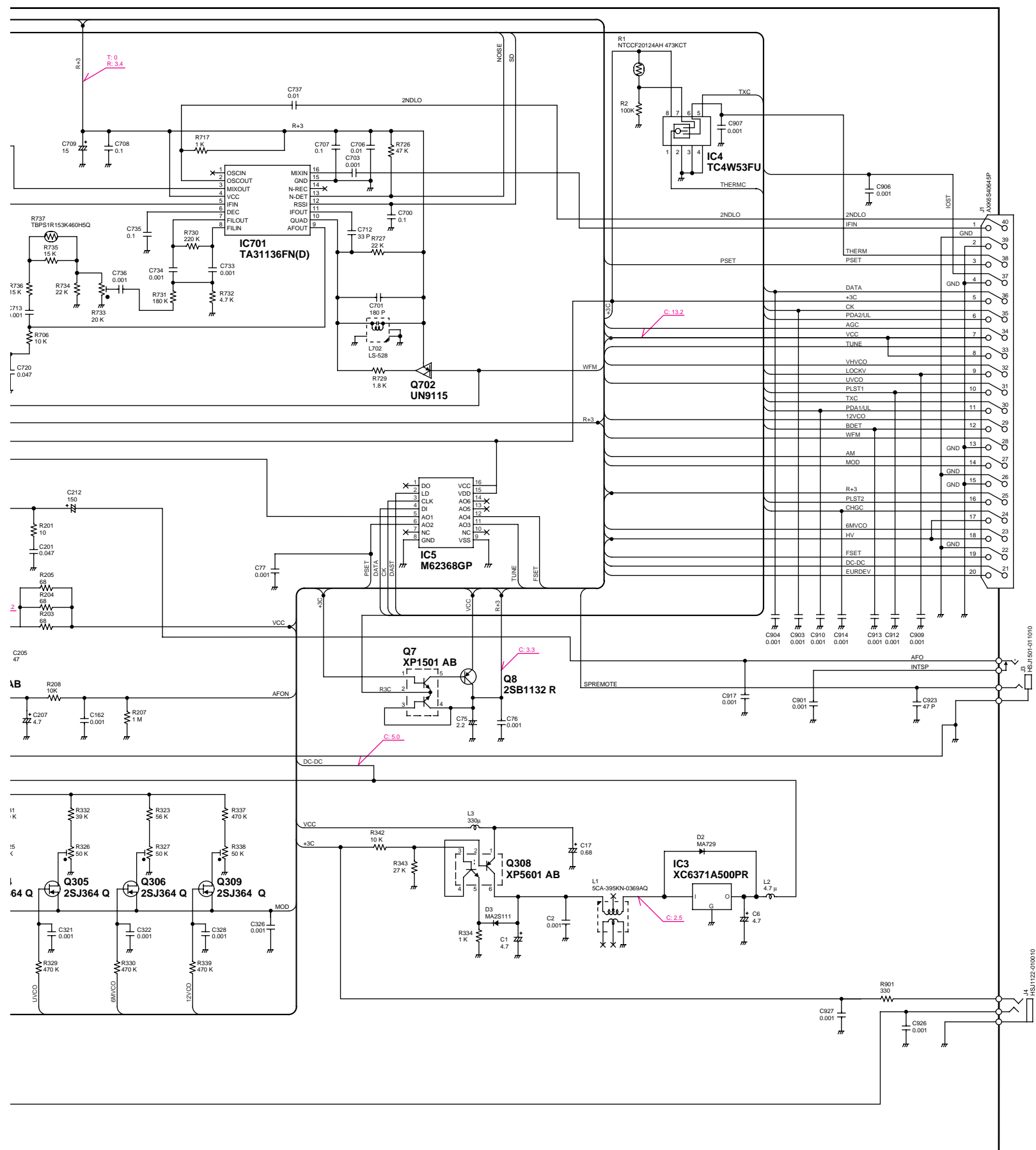
# SECTION 10 BLOCK DIAGRAM



# SECTION 11 VOLTAGE DIAGRAM

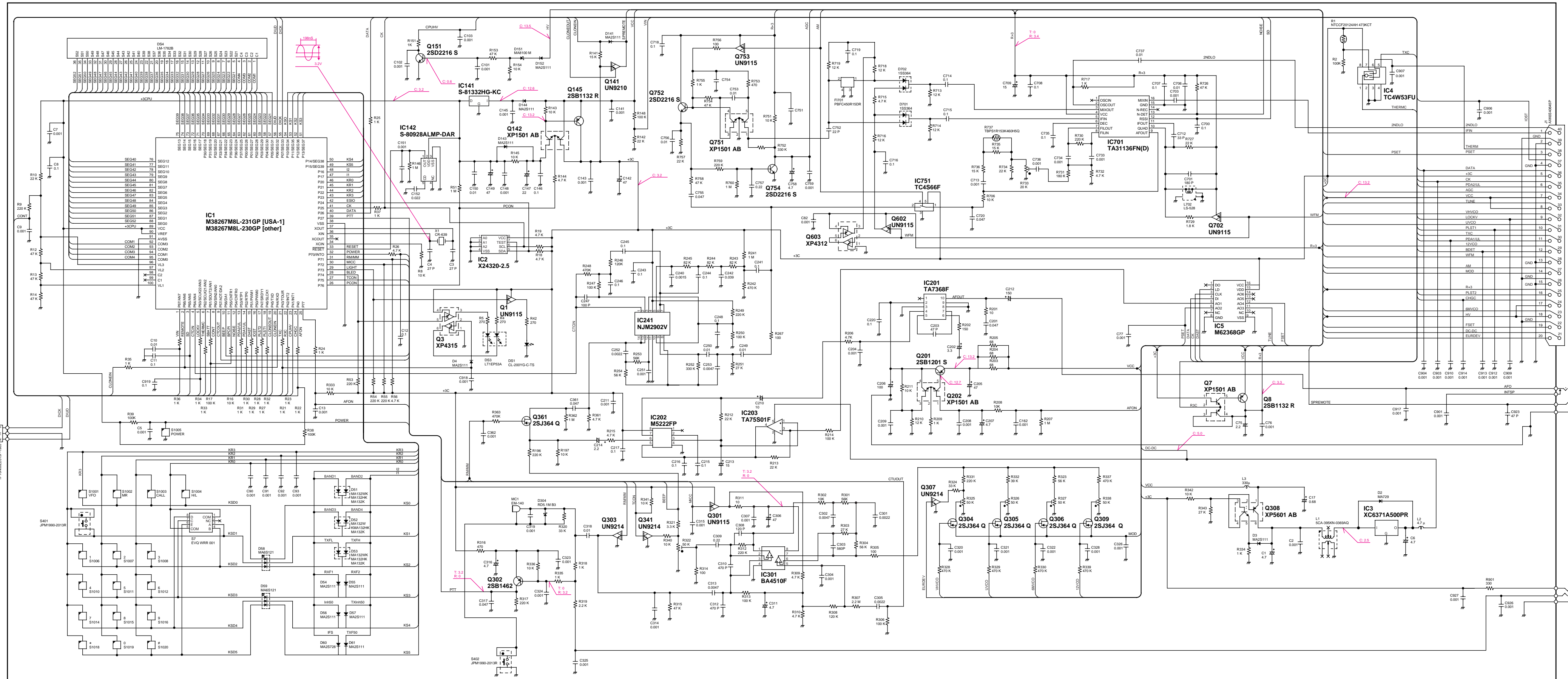
## 11-1 LOGIC UNIT





# SECTION 11 VOLTAGE DIAGRAM

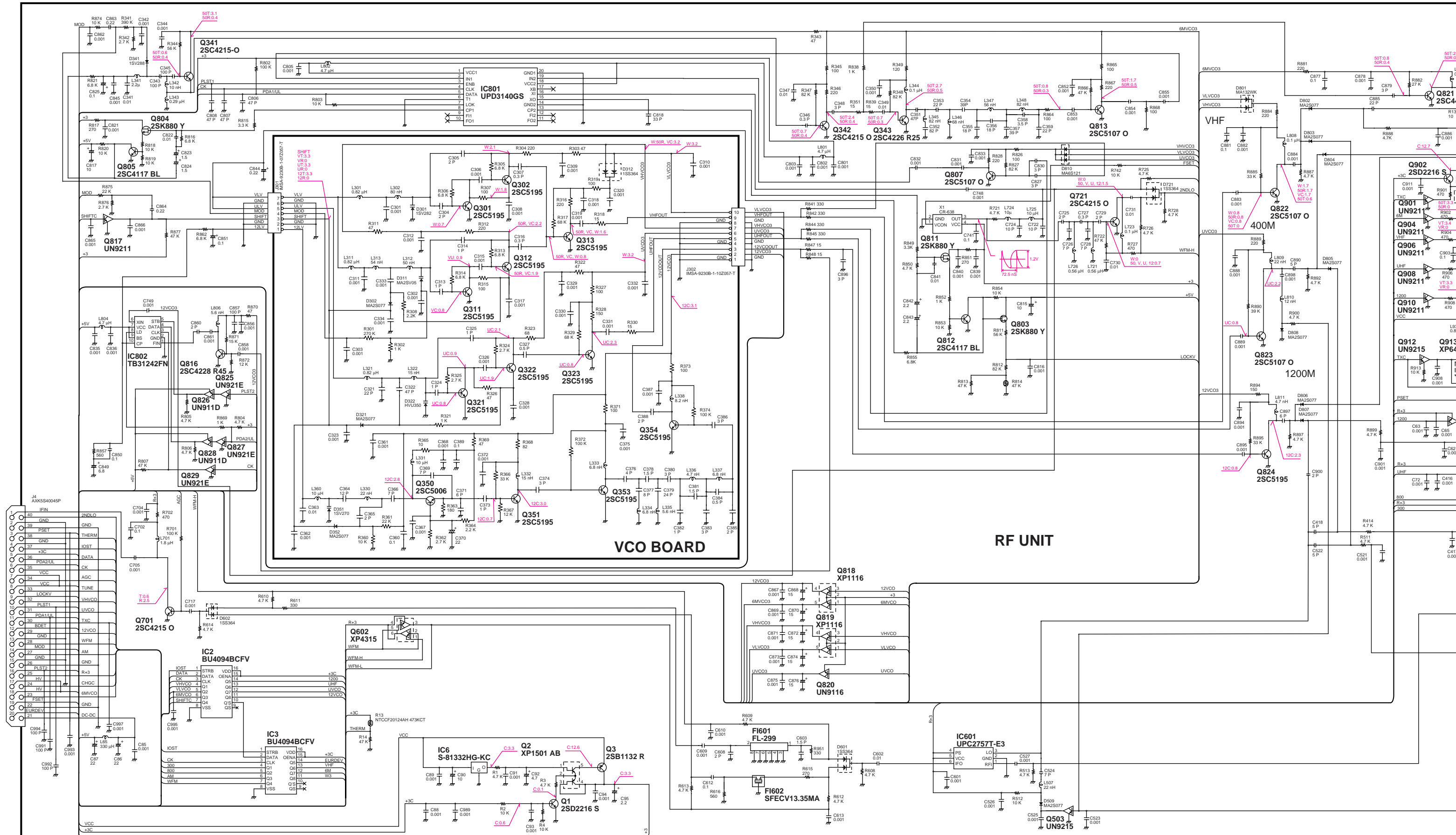
11-1 LOGIC UNIT

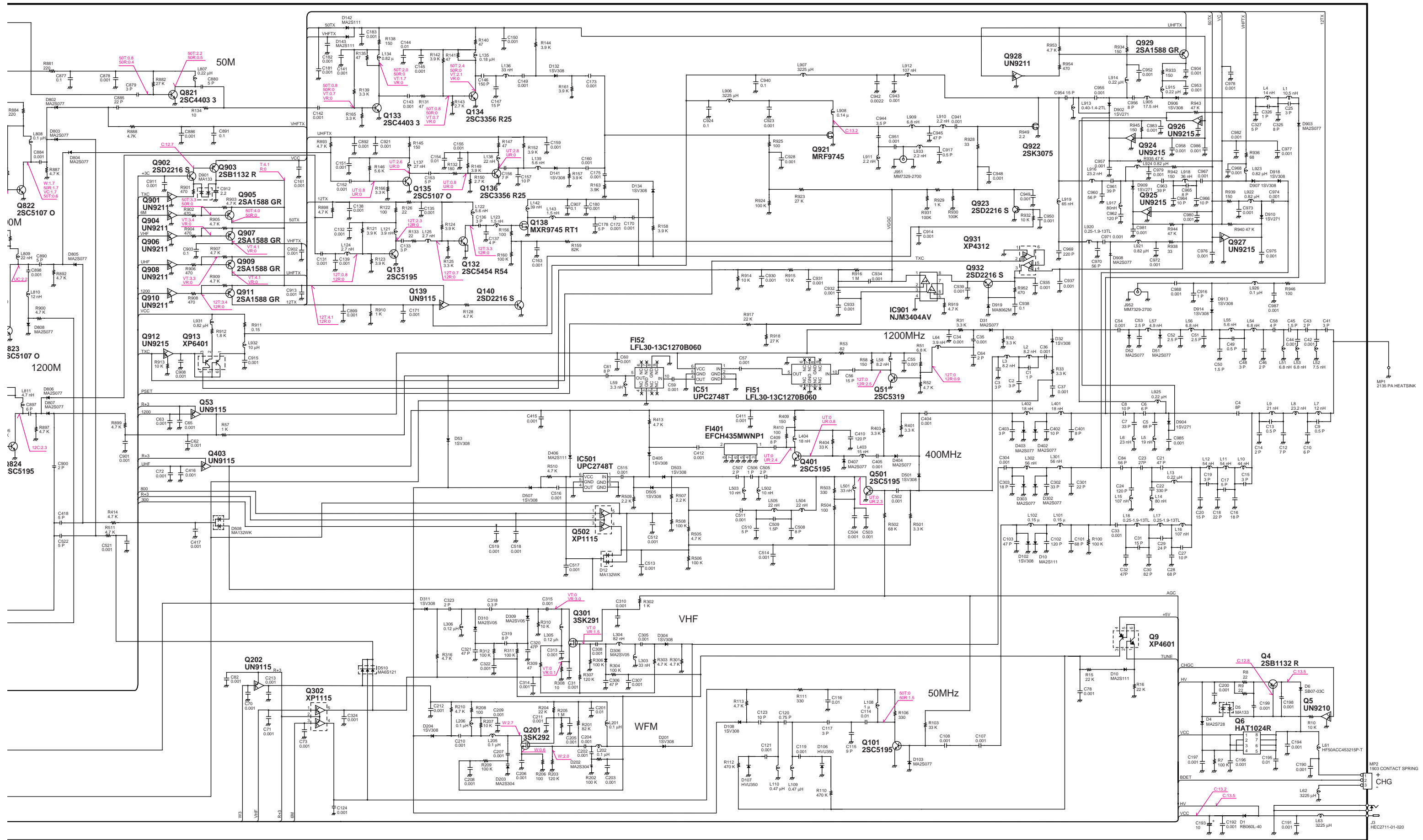


LEFT SIDE

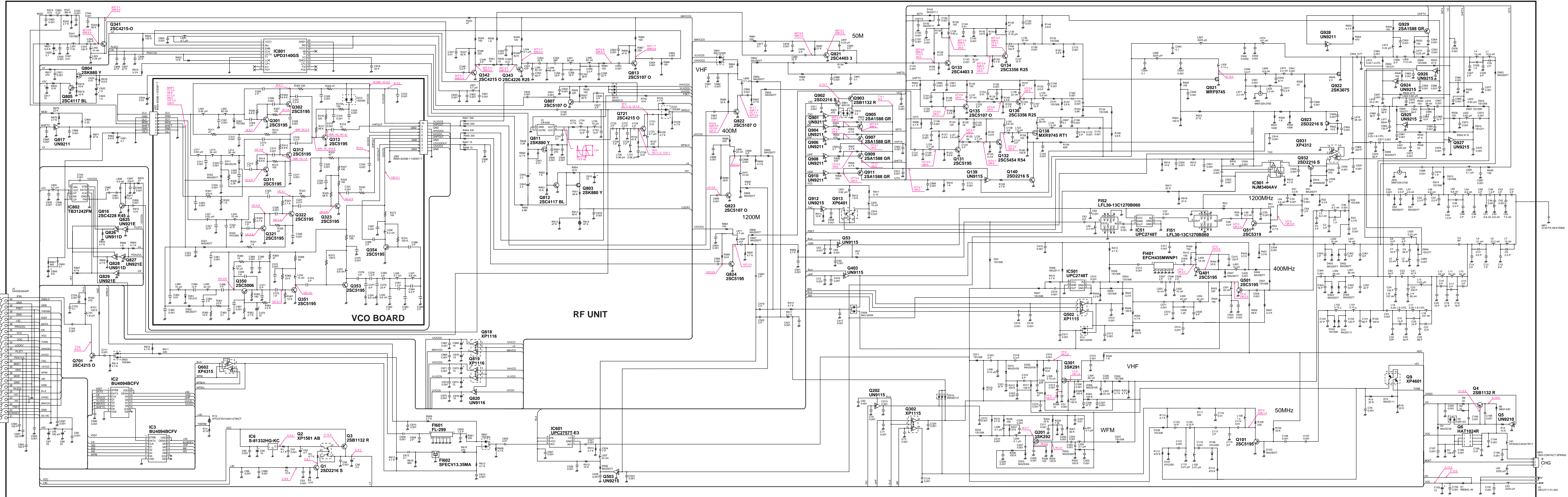
RIGHT SIDE







COMPLETE VIEW



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