



SERVICE MANUAL

VHF MARINE TRANCEIVER

IC-M1V

INTRODUCTION

This service manual describes the latest service information for the IC-M1V VHF MARINE TRANSCEIVER at the time of publication.

| MODEL | VERSION | SYMBOL |
|--------|----------|--------|
| IC-M1V | U.S.A. | USA |
| | S.E.Asia | SEA |

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

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 10 V. This will ruin the transceiver.

DO NOT expose the transceiver to rain, snow or any liquids.

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

DO NOT apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front end.

ORDERING PARTS

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

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

<SAMPLE ORDER>

1140003830 S.IC TC4W66F IC-M1V MAIN UNIT 1 piece
8810003160 SET Screw 3 × 6 ZK IC-M1V CHASSIS 6 pieces

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



REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 40 dB or 50 dB attenuator between the transceiver and a deviation meter or spectrum analyser 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 coverage : 156.025–157.425 MHz (Tx)
156.025–163.275 MHz (Rx)
- Mode : 16K0G3E (FM)
- Power supply requirement : BP-215 (7.4 V DC)
- Usable temperature range : –20°C to +60°C; –4°F to +140°F
- Frequency stability : ±10 ppm
- Current drain (at 7.4 V DC) : Transmit at 5.0 W 1.5 A max.
at 1.0 W 0.7 A max.
Receive maximum audio 200 mA
stand-by 20 mA
- Antenna connector : SMA (50 Ω)
- Dimensions (projections not included) : 52.5(W) × 129(H) × 30(D) mm; 2 1/16(W) × 5 3/32(H) × 1 3/16(D) in.
- Weight (with ant., battery case and cells) : 280 g; 9.9 oz.

■ TRANSMITTER

- RF output power (at 7.4 V DC) : 5 W / 1 W / 0.5 W (High / Low / Extra low)
(with supplied battery pack)
- Modulation : Variable reactance frequency modulation
- Maximum frequency deviation : ±5.0 kHz
- Spurious emissions : 65 dB
- Adjacent channel power : 60 dB
- Residual modulation : 40 dB
- Audio harmonic distortion : Less than 10% at 60% deviation
- Microphone impedance : 2 kΩ

■ RECEIVER

- Receive system : Double conversion superheterodyne system
- Intermediate frequencies : 1st 21.7 MHz
2nd 450 kHz
- Sensitivity : 0.35 μV at 12 dB SINAD
- Squelch sensitivity : 0.35 μV at threshold
- Adjacent channel selectivity : 70 dB (typical)
- Spurious response rejection : 70 dB (typical)
- Intermodulation rejection ratio : 70 dB (typical)
- Hum and noise : 40 dB
- Audio output power (at 7.4 V DC) : 350 mW typical at 10% distortion with an 8 Ω load
- Audio frequency response : –3 dB to +1 dB of –6 dB octave from 300 Hz to 3000 Hz

Specifications are measured in accordance with EIA-603.

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

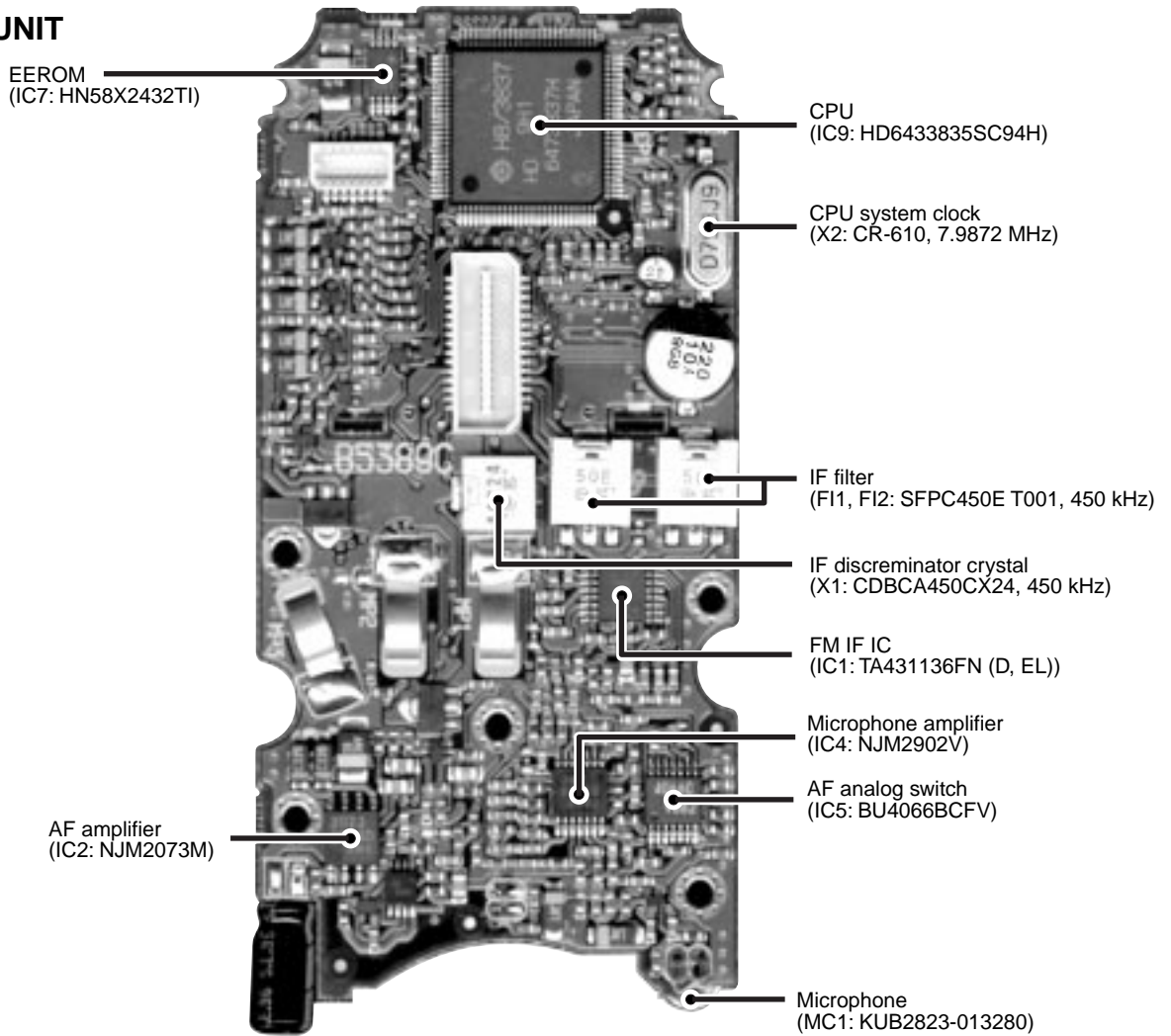
■ VHF MARINE CHANNEL LIST

| Channel number | | | Frequency (MHz) | | Channel number | | | Frequency (MHz) | |
|----------------|-----|-----|-----------------|---------|----------------|-----|-----|-----------------|---------|
| INT | USA | CAN | Transmit | Receive | INT | USA | CAN | Transmit | Receive |
| 01 | | 01 | 156.050 | 160.650 | | 61A | 61A | 156.075 | 156.075 |
| | 01A | | 156.050 | 156.050 | 62 | | | 156.125 | 160.725 |
| 02 | | 02 | 156.100 | 160.700 | | | 62A | 156.125 | 156.125 |
| | 02A | | 156.100 | 156.100 | 63 | | | 156.175 | 160.775 |
| 03 | | 03 | 156.150 | 160.750 | | 63A | | 156.175 | 156.175 |
| | 03A | | 156.150 | 156.150 | 64 | | 64 | 156.225 | 160.825 |
| 04 | | | 156.200 | 160.800 | | 64A | 64A | 156.225 | 156.225 |
| | | 04A | 156.200 | 156.200 | 65 | | | 156.275 | 160.875 |
| 05 | | | 156.250 | 160.850 | 65A | 65A | 65A | 156.275 | 156.275 |
| | 05A | 05A | 156.250 | 156.250 | 66 | | | 156.325 | 160.925 |
| 06 | 06 | 06 | 156.300 | 156.300 | 66A | 66A | 66A | 156.325 | 156.325 |
| 07 | | | 156.350 | 160.950 | 67 | 67 | 67 | 156.375 | 156.375 |
| | 07A | 07A | 156.350 | 156.350 | 68 | 68 | 68 | 156.425 | 156.425 |
| 08 | 08 | 08 | 156.400 | 156.400 | 69 | 69 | 69 | 156.475 | 156.475 |
| 09 | 09 | 09 | 156.450 | 156.450 | 70 | 70 | 70 | 156.525 | 156.525 |
| 10 | 10 | 10 | 156.500 | 156.500 | 71 | 71 | 71 | 156.575 | 156.575 |
| 11 | 11 | 11 | 156.550 | 156.550 | 72 | 72 | 72 | 156.625 | 156.625 |
| 12 | 12 | 12 | 156.600 | 156.600 | 73 | 73 | 73 | 156.675 | 156.675 |
| 13 | 13 | 13 | 156.650 | 156.650 | 74 | 74 | 74 | 156.725 | 156.725 |
| 14 | 14 | 14 | 156.700 | 156.700 | 77 | 77 | 77 | 156.825 | 156.825 |
| 15 | 15 | 15 | 156.750 | 157.750 | 78 | | | 156.925 | 161.525 |
| 16 | 16 | 16 | 156.800 | 156.800 | | 78A | 78A | 156.925 | 156.925 |
| 17 | 17 | 17 | 156.850 | 156.850 | 79 | | | 156.975 | 161.575 |
| 18 | | | 156.900 | 161.500 | | 79A | 79A | 156.975 | 156.975 |
| | 18A | 18A | 156.900 | 156.900 | 80 | | | 157.025 | 161.625 |
| 19 | | | 156.950 | 161.550 | | 80A | 80A | 157.025 | 157.025 |
| | 19A | 19A | 156.950 | 156.950 | 81 | | | 157.075 | 161.675 |
| 20 | 20 | 20 | 157.000 | 161.600 | | 81A | 81A | 157.075 | 157.075 |
| | 20A | | 157.000 | 157.000 | 82 | | | 157.125 | 161.725 |
| 21 | | 21 | 157.050 | 161.650 | | 82A | 82A | 157.125 | 157.125 |
| | 21A | 21A | 157.050 | 157.050 | 83 | | 83 | 157.125 | 161.775 |
| 22 | | | 157.100 | 161.700 | | 83A | 83A | 157.175 | 157.175 |
| | 22A | 22A | 157.100 | 157.100 | 84 | 84 | 84 | 157.225 | 161.825 |
| 23 | | 23 | 157.150 | 161.750 | | 84A | | 157.225 | 157.225 |
| | 23A | | 157.150 | 157.150 | 85 | 85 | 85 | 157.275 | 161.875 |
| 24 | 24 | 24 | 157.200 | 161.800 | | 85A | | 157.275 | 157.275 |
| 25 | 25 | 25 | 157.250 | 161.850 | 86 | 86 | 86 | 157.325 | 161.925 |
| 26 | 26 | 26 | 157.300 | 161.900 | | 86A | | 157.325 | 157.325 |
| 27 | 27 | 27 | 157.350 | 161.950 | 87 | 87 | 87 | 157.375 | 161.975 |
| 28 | 28 | 28 | 157.400 | 162.000 | | 87A | | 157.375 | 157.375 |
| 60 | | 60 | 156.025 | 160.625 | 88 | 88 | 88 | 157.425 | 162.025 |
| | 60A | | 156.025 | 156.025 | | 88A | | 157.425 | 157.425 |
| 61 | | | 156.075 | 160.675 | | | | | |

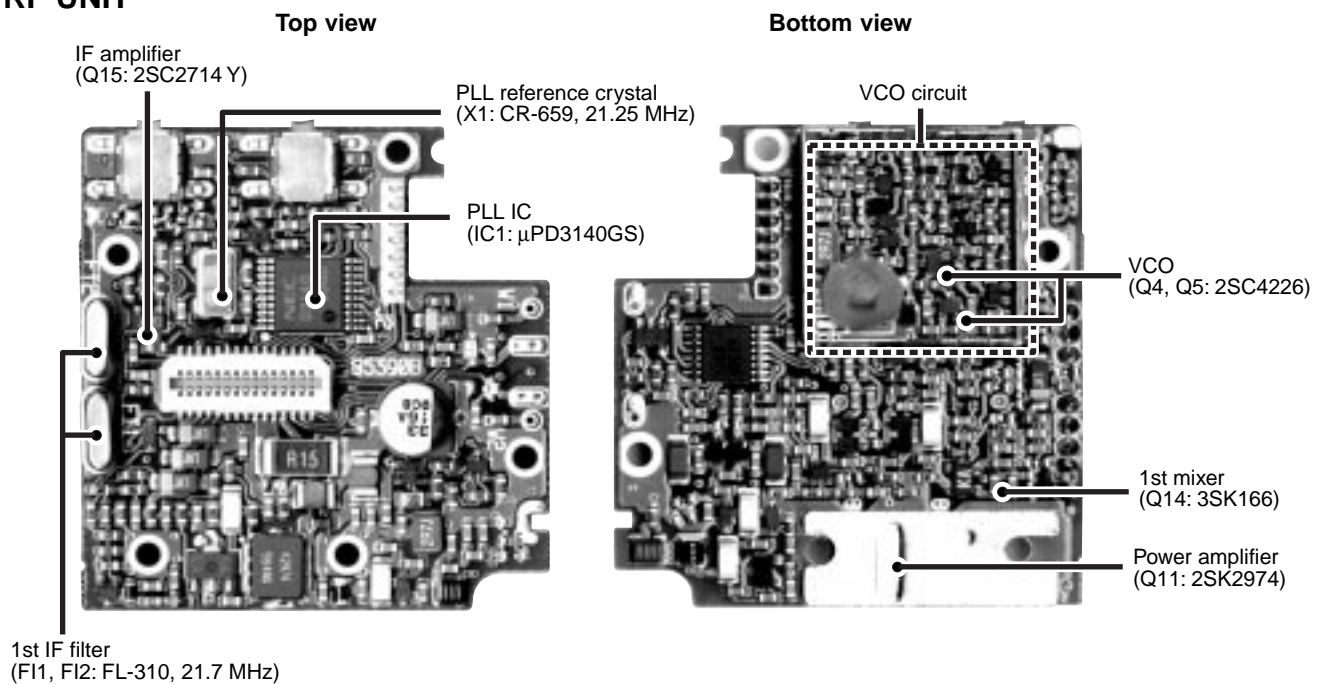
| Weather channel | Frequency (MHz) | | Weather channel | Frequency (MHz) | |
|-----------------|-----------------|---------|-----------------|-----------------|---------|
| | Transmit | Receive | | Transmit | Receive |
| WX01 | Receive only | 162.550 | WX06 | Receive only | 162.500 |
| WX02 | Receive only | 162.400 | WX07 | Receive only | 162.525 |
| WX03 | Receive only | 162.475 | WX08 | Receive only | 161.650 |
| WX04 | Receive only | 162.425 | WX09 | Receive only | 161.775 |
| WX05 | Receive only | 162.450 | WX10 | Receive only | 163.275 |

SECTION 2 INSIDE VIEWS

• MAIN UNIT

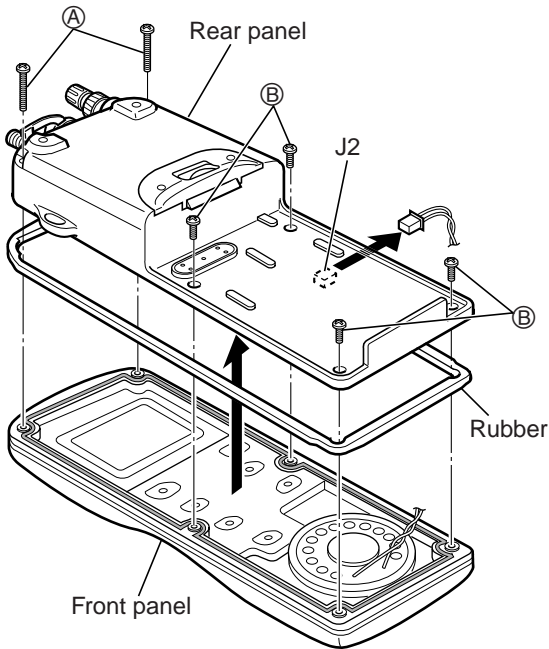


• RF UNIT




SECTION 3 DISASSEMBLY AND OPTION INSTRUCTIONS

• Removing the Rear panel

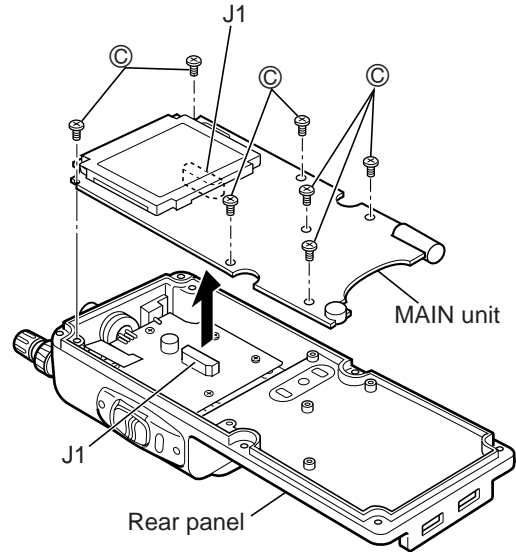


Unscrew 2 screws ① (2 × 20 mm), and 4 screws ② (2 × 5 mm, black) from the rear panel.

NOTE : Once the front panel is removed, grease must be applied to  areas before assembly.

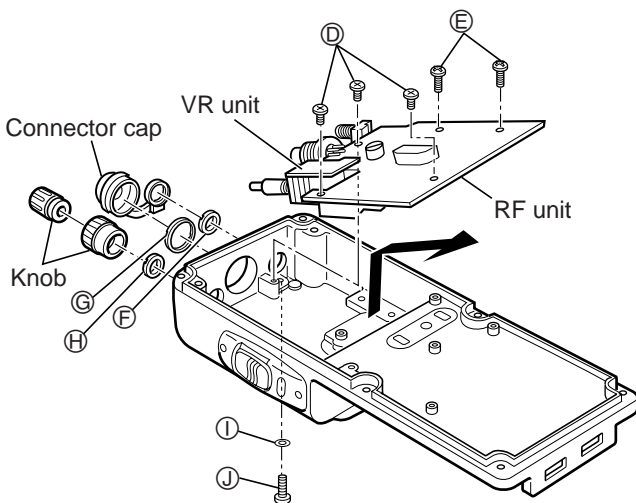
Manufacture : Shin-Etsu Chemical
Type : G-501

• Removing the MAIN unit



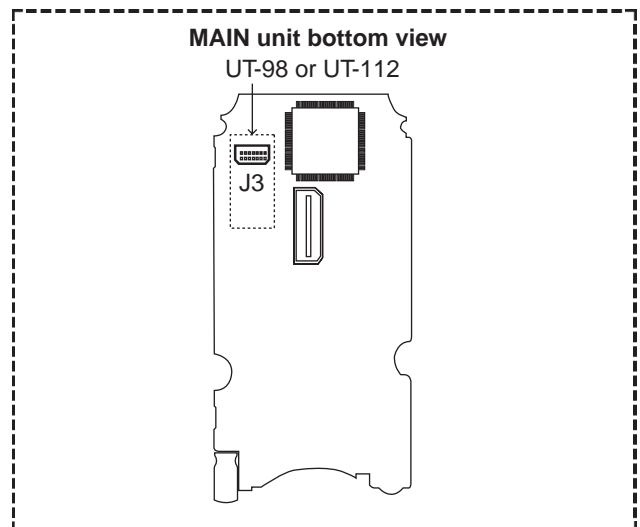
- ① Unscrew 7 screws ③ (2 × 3.5 mm, silver) from the MAIN unit.
- ② Unplug J1 to separate the rear panel and the MAIN unit.

• Removing the RF unit



- ① Remove connector cap.
- ② Remove 2 knobs, and unscrew 3 nuts (④, ⑤, ⑥)
- ③ Unscrew 3 screws ⑦ (2 × 3.5 mm, silver), and 2 screws ⑧ (2 × 5 mm, black) from the RF unit.
- ④ Unscrew 1 screw ⑨ (2 × 5 mm, black), and remove 1 washer ⑩.
- ⑤ Take off the RF unit in the direction of the arrow.

• Install the optional unit (UT-98 or UT-112) to the connector (MAIN unit ; J3)



4-1-5 SQUELCH CIRCUIT (MAIN UNIT)

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 (IC1, pin 9) are applied to the active filter section (IC1, pin 8). The active filter section amplifies and filters noise components. The filtered signals are applied to the noise detector section and output from IC1 (pin 14) as the "NOIS" signal.

The "NOIS" signal from IC1 (pin 14) is applied to the CPU (IC9, pin 99) to analyze the noise condition. The "SQLV" signal from R1 (VR unit) is applied to the CPU (IC9, pin 95) to detect squelch level. The CPU detects the receiving signal strength and cut the AF signal line.

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER CIRCUIT (MAIN UNIT)

The microphone amplifier circuit amplifies audio signals with +6 dB/octave pre-emphasis characteristics from the microphone to a level needed for the modulation circuit.

The AF signals from the microphone are passed through the pre-emphasis circuit (R31, C36) and are then applied to the microphone amplifier (IC4d). The amplified AF signals are applied to the optional voice scrambler unit to scramble the audio via the "MICOUT" signal, or are bypassed around the unit via an analog switch (IC5, pin 4).

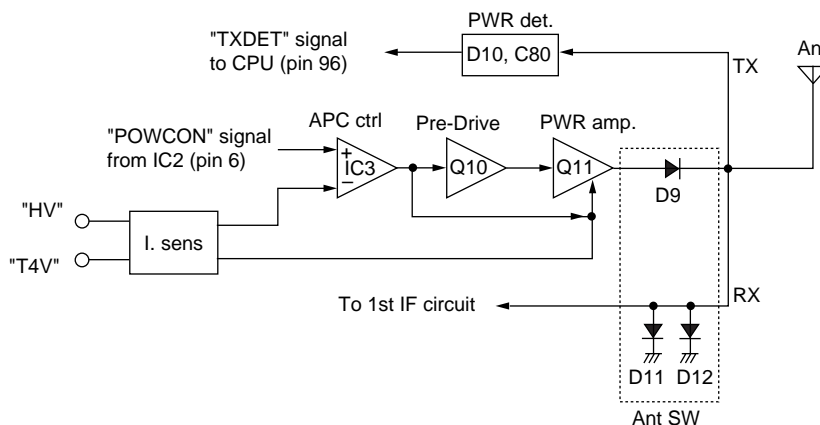
The AF signals which bypassed or passed through the voice scrambler unit are amplified again at the limiter-amplifier (IC4a) and then passed through the low-pass filter (IC4b, pins 6 and 7). The filtered audio is applied to the RF unit as the "MOD" signal.

4-2-2 MODULATION CIRCUIT (RF UNIT)

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

The audio signals "MOD" change the reactance of D4 to modulate an oscillated signal at the transmitter VCO (Q4, Q5). The oscillated signal is amplified at the buffer-amplifiers (Q6, Q8).

• APC circuit



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

The signal from the VCO circuit passes through the transmit/receive switching circuit (D7, D8) and is applied to the buffer-amplifier (Q9). The amplified signal is amplified by the pre-driver (Q10) and the power amplifier (Q11) to obtain 5 W of RF power (at 7.4 V). The amplified signal passes through the antenna switching circuit (D9), and low-pass filter (L15–L17, C72–C77) and is then applied to the antenna connector.

The bias current of the power amplifier (Q11) is controlled by the APC circuit to stabilize the output power.

4-2-4 APC CIRCUIT (RF AND MAIN UNITS)

The APC circuit provides stable output power from the power amplifier even when the input voltage or temperature changes, and, selects HIGH, LOW or EXTRA LOW output power. The APC circuit consists of an APC sensor and APC control circuits.

• APC SENSOR CIRCUIT (RF UNIT)

The APC sensor circuit (D10, C80, C81, R53, R54) detects the transmit output power level and converts it to DC voltage as an "TXDET" signal. The detected signal is applied to the APC control circuit on the MAIN unit.

• APC CONTROL CIRCUIT (MAIN UNIT)

The "TXDET" signal from the APC sensor circuit is applied to the CPU (IC9, pin 96) to control the input voltage of the pre-driver (RF unit; Q10) and the power amplifier (RF unit; Q11). When the output power changes, the CPU (IC9) outputs "POWCON" signal to the D/A converter (RF unit; IC2). And then "POWCON" signal controls the APC controller (RF unit; IC3) to provide stable output power.

4-3 PLL CIRCUIT (RF UNIT)

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

The PLL circuit contains a VCO (Q4, Q5, D4, D6). The oscillated signal is amplified at the buffer-amplifiers (Q6, Q7) and then applied to the PLL IC (IC1, pin 2).

The PLL IC contains the prescalers, programmable counter, programmable divider, phase selector and etc. The entered signal is divided at the prescaler and programmable counter sections by the N-data ratio from the CPU. The divided signal is detected on phase at the phase detector using the reference frequency.

If the oscillated signal drifts, the phase of its frequency changes from the reference frequency, causing a lock voltage changes to compensate for the drift in the oscillated frequency.

A portion of the VCO signal is amplified at buffer-amplifiers (Q6, Q8) and is then applied to the receive 1st mixer (Q14) or transmit driver via the TX/RX switching diode (D7, D8).

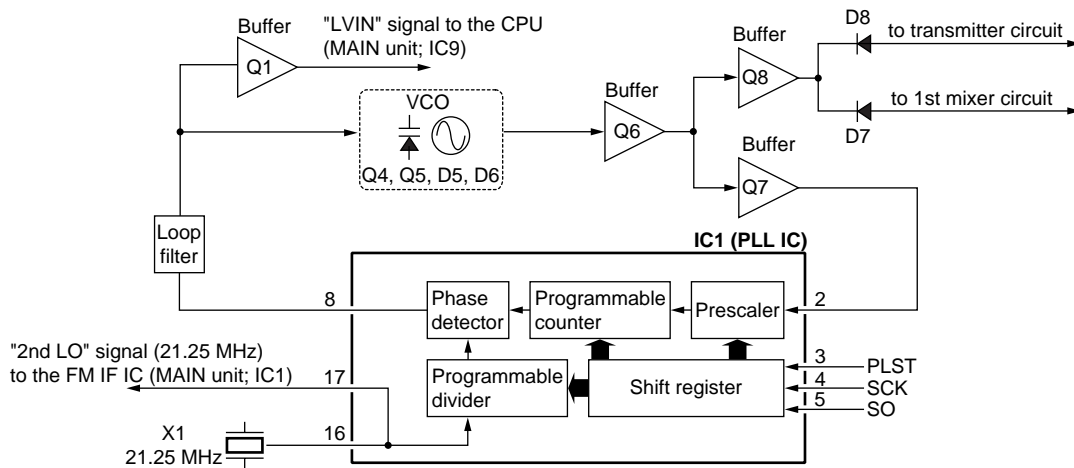
The lock voltage is also used for the receiver tunable bandpass filter to match the filter's center frequency to the desired receive frequency. The lock voltage is amplified at the buffer-amplifier (Q1) and then applied to the CPU (MAIN unit; IC9, pin 93).

The amplified signal is controlled by the CPU (MAIN unit; IC9), and is then applied to bandpass filters (D13–D18) as "T1", "T2", "T3", "T4" signals via the D/A converter (IC2).

4-4 POWER SUPPLY CIRCUITS VOLTAGE LINES

| LINE | DESCRIPTION |
|------|---|
| HV | The voltage from the attached battery pack. |
| VCC | The same voltage as the HV line (battery voltage) which is controlled by the power switch ([OFF/VOL] control). |
| 4V | Common 4V converted from the VCC line by the 4V regulator circuit (MAIN unit; Q8–Q10). The output voltage is applied to the D/A converter (RF unit; IC2) and PLL IC (RF unit; IC1), etc. |
| R4V | Receive 4V converted from the 4V line by the R4 regulator circuit (MAIN unit; Q5). The regulated voltage is applied to the MOD MUTE circuit (RF unit; Q2, D2) and receiver circuit. |
| T4V | Transmit 4V converted from the 4V line by the T4 regulator circuit (MAIN unit; Q6). The regulated voltage is applied to the transmitter circuit. |
| S4V | Common 4V converted from the VCC line by the S4V regulator circuit (MAIN unit; Q7). The regulated voltage is applied to the optional scrambler unit, limiter amplifier (MAIN unit; IC4), etc. |

• PLL circuit



4-5 PORT ALLOCATIONS

4-5-1 CPU (MAIN UNIT; IC9)

| Pin number | Port name | Description |
|------------|-----------|---|
| 1 | BATT | Input port for the low battery detection. |
| 11 | RM | Outputs the AF mute switch control signal when the voice scrambler is OFF. LOW : While squelched. |
| 12 | SRM | Outputs the AF mute switch control signal when the voice scrambler is ON. LOW : While squelched. |
| 13 | SMM | Outputs the MIC mute switch control signal when the voice scrambler is ON. LOW : While muted. |
| 14 | MM | Outputs the MIC mute switch control signal when the voice scrambler is OFF. LOW : While muted. |
| 15 | AFON | Outputs control signal for the AF amplifier regulator circuit. HIGH: Activates the AF amplifier circuit (MAIN unit; Q2). |
| 16 | OPST | Outputs strobe signals to the optional voice scrambler unit |
| 17 | DST | Outputs strobe signals to the D/A converter IC (RF unit; IC2, pin 2). |
| 18 | PLST | Outputs strobe signals to the PLL IC (RF unit; IC1, pin 3). |
| 19 | SCK | Outputs serial clock. |
| 20 | UNLK | Input port for unlock signal. HIGH: PLL is unlocked. LOW : PLL is locked. |
| 21 | SO | Outputs serial data. |
| 23 | OPTIN | Input port for the optional voice scrambler unit connection. LOW : The optional voice scrambler unit is connected. |
| 24 | MONI | Input port for the [MONI] switch. LOW : While [MONI] switch is pushed. |
| 25 | 16CH | Input port for the [16/9] switch. LOW : While [16/9] switch is pushed. |
| 77 | LIGHT | Outputs back light control signal. HIGH: Light ON. |
| 78 | BEEP | Outputs beep audio signals. |
| 79 | 4VC | Outputs 4V regulator control signal. |
| 80 | R4C | Outputs R4 regulator control signals. LOW : While receiving. |
| 81 | T4C | Outputs T4 regulator control signals. LOW : While transmitting. |

| Pin number | Port name | Description |
|------------|-----------|--|
| 82 | S4C | Outputs S4 regulator control signals. |
| 83 | SPSEL | Outputs speaker select signal LOW : The internal speaker is selected. |
| 85 | ESDA | Input port for EEPROM serial data. Outputs serial data to the EEPROM. |
| 86 | CLIN | Input port for the cloning signal. |
| 87 | CLOUT | Outputs the cloning signal. |
| 88 | PTT | Input port for the [PTT] switch. HIGH: While [PTT] switch is pushed. |
| 90 | MKEY | Input port for [MIC/SP] connector detection. |
| 91 | SWA | Input port for the [CH/WX], [UP], [DOWN] switches. |
| 92 | SWB | Input port for the [H/L], [DW], [SCN] switches. |
| 93 | LVIN | Input port for the PLL lock voltage detection. |
| 94 | TEMPS | Input port for the transceiver's internal temperature detection. |
| 95 | SQLV | Input port to adjust the squelch level. |
| 96 | TXDET | Input port for the TX power detection. |
| 97 | TONE | Input port for the WX tone detection. |
| 98 | SD | Input port for the receive signal strength detection. |
| 99 | NOIS | Input port for noise signals (pulse-type) for squelch operation. |
| 100 | BTYPE | Input port for the battery's type detection. |

4-5-2 D/A converter IC (RF UNIT; IC2)

| Pin number | Port name | Description |
|------------|-----------|---|
| 5 | FRQCON | Output signal to adjust the reference frequency. |
| 6 | POWCON | Output signal to adjust TX power. |
| 11, 12, 13 | T1-T3 | Output tunable bandpass filter control signals. |
| 14 | T4 | Output tunable bandpass filter control signals while receiving. |
| | MODCON | Output signal to adjust modulation while transmitting. |

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

IC-M1V can be adjusted by sending adjustment data to the RS-232C port via a PC. When you adjust the IC-M1V, the optional CS-M1V ADJ ADJUSTMENT SOFTWARE (Rev. 1.0 or later), *OPC-973 CLONING AND ADJUSTMENT CABLE are required.

NOTE: *OPC-973 is a modified optional OPC-973 CLONING AND ADJUSTMENT CABLE (see illustration at CLONING AND ADJUSTMENT CABLE MODIFICATION).

■ REQUIRED TEST EQUIPMENT

| EQUIPMENT | GRADE AND RANGE | EQUIPMENT | GRADE AND RANGE |
|----------------------------------|--|---------------------------------|---|
| DC power supply | Output voltage : 7.4 V DC Current capacity : 2 A or more | FM deviation meter | Frequency range : 30–300 MHz Measuring range : 0 to ±10 kHz |
| RF power meter (terminated type) | Measuring range : 0.1–10 W Frequency range : 100–300 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1 | Audio generator | Frequency range : 300–3000 Hz Measuring range : 1–500 mV |
| Frequency counter | Frequency range : 0.1–300 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better | Standard signal generator (SSG) | Frequency range : 100–300 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm) |
| | | Attenuator | Power attenuation : 40 dB or more Capacity : 10 W or more |

■ SYSTEM REQUIREMENTS

- IBM PC compatible computer with an RS -232C serial port (38400 bps or faster).
- Microsoft Windows 95 or Windows 98
- Intel i486DX processor or faster (Pentium 100 MHz or faster recommended)
- At least 16 MB RAM and 10 MB of hard disk space
- 640×480 pixel display (800×600 pixel display recommended)

■ ADJUSTMENT SOFTWARE INSTALLATION

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

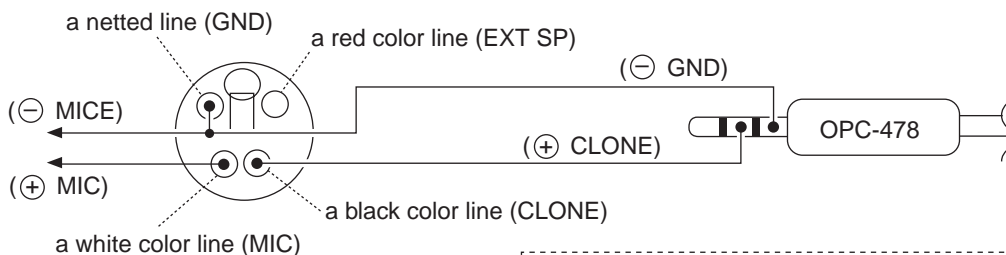
- ① Boot up Windows.
- Quit all applications when Windows is running.
- ② Insert the backup disk1 into the appropriate floppy drive.
- ③ Select 'Run' from the [Start] menu.
- ④ Type the setup program name using the full path name, then push the [Enter] key. (A:\ setup)
- ⑤ Follow the prompts.
- ⑥ Program group 'CS-M1V ADJ' appears in the 'Programs' folder of the [Start] menu.

■ STARTING THE PROGRAM

- ① Connect IC-M1V and PC with the optional cables OPC-478, *OPC-973.
- ② Boot up Windows.
- ③ Click the program group 'CS-M1V ADJ' in the 'Programs' folder of the [Start] menu, then CS-M1V ADJ's window is appeared.
- ④ Click 'Connect' on the CS-M1V's window, then appears IC-M1V's up-to-date condition.
- ⑤ Set or modify adjustment data as desired. See illustration at ADJUSTMENT SOFTWARE'S SCREEN DISPLAY EXAMPLE on page 5-2.

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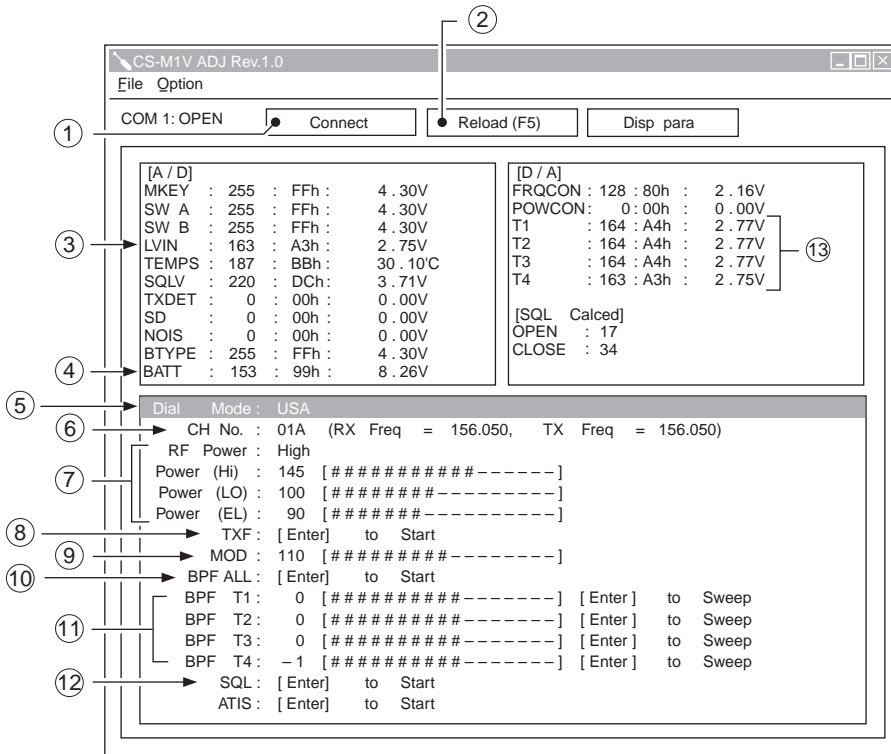
• CLONING AND ADJUSTMENT CABLE MODIFICATION



INFORMATION: When ordering OPC-973

Part Name: OPC-973
Order Number: 8900009890

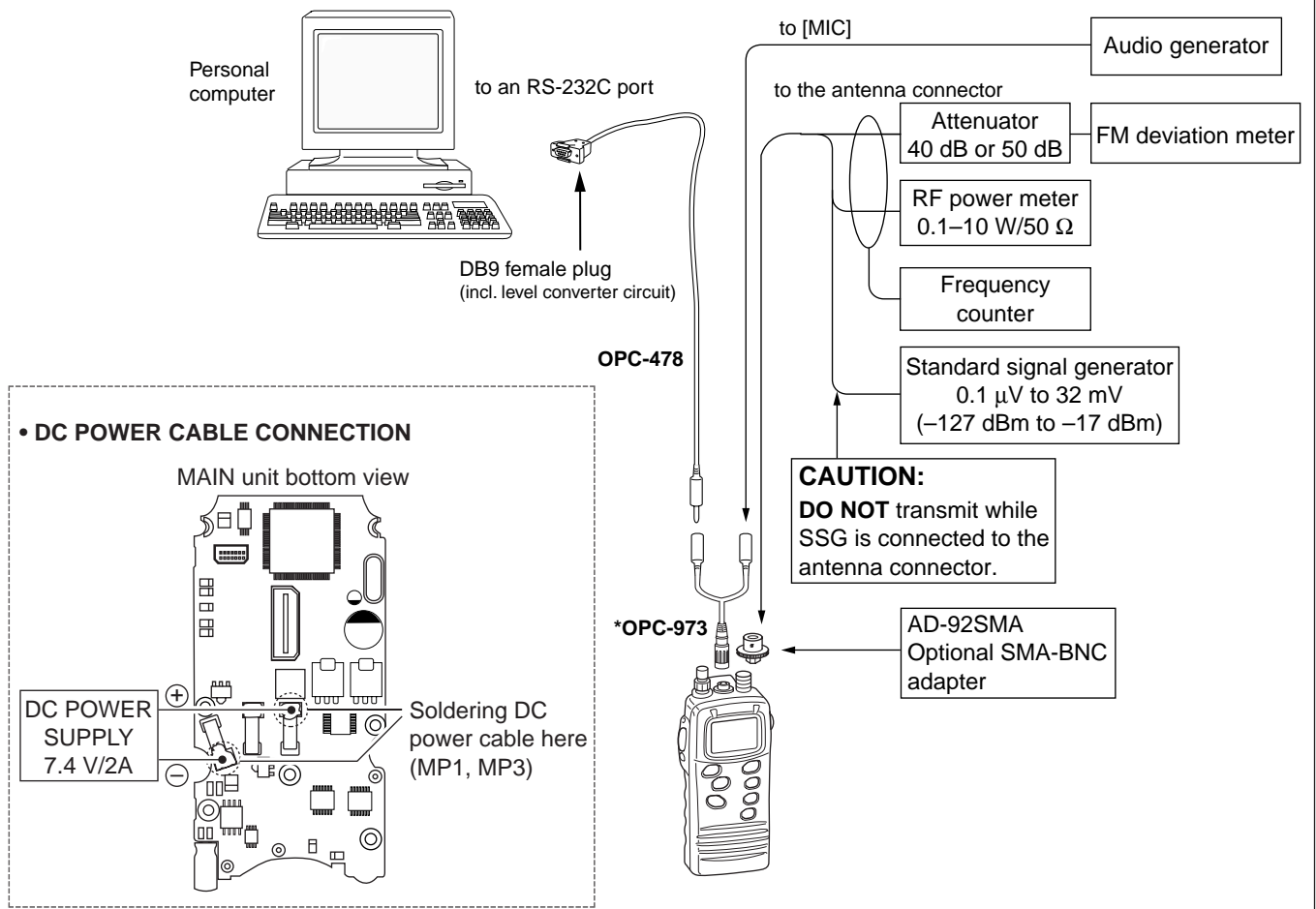
• ADJUSTMENT SOFTWARE'S SCREEN DISPLAY EXAMPLE



- ①: Connect IC-M1V with PC via an RS-232C serial cable
- ②: Renew adjustment data
- ③: PLL lock voltage measurement
- ④: Connected DC voltage measurement
- ⑤: Version select
- ⑥: Operating channel select
- ⑦: RF output power adjustments
- ⑧: Reference frequency adjustment
- ⑨: FM deviation adjustment
- ⑩: Receive sensitivity adjustment (automatically)
- ⑪: Receive sensitivity adjustments (manually)
- ⑫: Squelch level adjustment
- ⑬: Receive sensitivity measurement

NOTE: The above values for settings are example only. Each transceiver has its own specific values for each setting.

• CONNECTION



5-2 PLL AND TRANSMITTER ADJUSTMENTS

Select an operation using [↑] / [↓] keys, then set specified value using [←] / [→] keys on the connected computer keyboard.

| ADJUSTMENT | ADJUSTMENT CONDITION | MEASUREMENT | | VALUE |
|------------------------|--|-------------|---|--|
| | | UNIT | LOCATION | |
| PLL LOCK VOLTAGE | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • Receiving | | Use the adjustment program. (see page 5-2) | 2.3–3.3 V Verify on the computer display (LVIN) |
| | 2 <ul style="list-style-type: none"> • Operating channel : ch 16 • Connect the RF power meter or 50 Ω dummy load to the antenna connector. • Transmitting | | | |
| REFERENCE FREQUENCY | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • Connect the RF power meter or 50 Ω dummy load to the antenna connector. • Transmitting | Top panel | Loosely couple the frequency counter to the antenna connector. | 156.800000 MHz |
| OUTPUT POWER | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • [H/L] switch : High • Transmitting | Top panel | Connect the RF power meter to the antenna connector. | 5.0 W |
| | 2 <ul style="list-style-type: none"> • [H/L] switch : Low • Transmitting | | | 1.0 W |
| | 3 <ul style="list-style-type: none"> • [H/L] switch : Extra low • Transmitting | | | 0.5 W |
| FM DEVIATION | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • [H/L] switch : High • Connect the audio generator to the [MIC] jack and set as: 1.0 kHz/40 mV rms. • Set the FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting | Top panel | Connect the FM deviation meter to the antenna connector through the attenuator. | ±4.3 kHz |

5-3 RECEIVER ADJUSTMENT

Select an operation using [\uparrow] / [\downarrow] keys, then set specified value using [\leftarrow] / [\rightarrow] keys on the connected computer keyboard.

| ADJUSTMENT | ADJUSTMENT CONDITION | VALUE |
|----------------|--|--|
| RX SENSITIVITY | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • Connect a standard signal generator to the antenna connector and set as: <ul style="list-style-type: none"> Frequency : 156.800 MHz Level : 3.2 μV* (-97 dBm) Modulation : 1 kHz Deviation : \pm3.5 kHz • Receiving | Maxmun level on the computer display (T1–T4) respectively. |
| | <p>CONVENIENT: The BPF T1–BPF T4 can be adjusted automatically.</p> <p>①-1: Set the cursor to “BPF ALL” on the adjustment program and then push [ENTER] key.</p> <p>①-2: The connected PC tunes BPF T1–BPF T4 to peak levels.</p> <p style="text-align: center;">or</p> <p>②-1: Set the cursor to one of BPF T1, T2, T3, or T4 as desired.</p> <p>②-2: Push [ENTER] key to start tuning.</p> <p>②-3: Repeat ②-1 and ②-2 to perform additional BPF tuning.</p> | |
| SQUELCH LEVEL | 1 <ul style="list-style-type: none"> • Operating channel : ch 16 • No RF signals are applied to the antenna connector. • Receiving • Set the cursor to “SQL” on the adjustment program and push [ENTER] key, then push [ENTER] key again. | NOTE: Squelch level adjustment is adjusted automatically by the adjustment program. |
| | 2 <ul style="list-style-type: none"> • Operating channel : ch 16 • Connect a standard signal generator to the antenna connector and set as : <ul style="list-style-type: none"> Level : 1.3 μV* (-105 dBm) Modulation : OFF • Receiving • Push [ENTER] key on the keyboard. | |

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

SECTION 6 PARTS LIST

[MAIN UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-----------------|-------------------------|
| IC1 | 1110003490 | S.IC | TA31136FN (D,EL) |
| IC2 | 1110002420 | S.IC | NJM2073M-T1 |
| IC3 | 1130007300 | S.IC | TC4W66FU (TE12L) |
| IC4 | 1110003780 | S.IC | NJM2902V-TE1 |
| IC5 | 1130008090 | S.IC | BU4066BCFV-E1 |
| IC6 | 1180001990 | S.IC | XC62FP4302MR |
| IC7 | 1130009680 | S.IC | HN58X2432TI |
| IC8 | 1130009110 | S.IC | S-80942ANMP-DD6-T2 |
| IC9 | 1140008550 | S.IC | HD6433835SC94H |
| Q1 | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R |
| Q2 | 1590001190 | S.TRANSISTOR | XP6501-(TX) .AB |
| Q3 | 1590000430 | S.TRANSISTOR | DTC144EUA T106 |
| Q4 | 1590002530 | S.TRANSISTOR | UN911H (TX) |
| Q5 | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q6 | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q7 | 1510000670 | S.TRANSISTOR | 2SA1588-GR (TE85R) |
| Q8 | 1590000430 | S.TRANSISTOR | DTC144EUA T106 |
| Q9 | 1590001190 | S.TRANSISTOR | XP6501-(TX) .AB |
| Q10 | 1520000460 | S.TRANSISTOR | 2SB1132 T100 R |
| Q11 | 1590000660 | S.TRANSISTOR | DTC144TU T107 |
| Q12 | 1530000160 | S.TRANSISTOR | 2SC2712-Y (TE85RTEM) |
| Q13 | 1530000160 | S.TRANSISTOR | 2SC2712-Y (TE85RTEM) |
| Q14 | 1530000160 | S.TRANSISTOR | 2SC2712-Y (TE85RTEM) |
| Q15 | 1530000160 | S.TRANSISTOR | 2SC2712-Y (TE85RTEM) |
| D1 | 1750000130 | S.DIODE | DA204U T107 |
| FI1 | 2020001490 | S.CERAMIC | SFPC450E-TC01 |
| FI2 | 2020001490 | S.CERAMIC | SFPC450E-TC01 |
| X1 | 6070000210 | S.DISCRIMINATOR | CDBCA450CX24 |
| X2 | 6050010290 | S.XTAL | CR-610 (7.9872 MHz) |
| R1 | 7030003390 | S.RESISTOR | ERJ3GEYJ 391 V (390 Ω) |
| R2 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R3 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R4 | 7030003490 | S.RESISTOR | ERJ3GEYJ 272 V (2.7 kΩ) |
| R5 | 7030003690 | S.RESISTOR | ERJ3GEYJ 124 V (120 kΩ) |
| R6 | 7030003450 | S.RESISTOR | ERJ3GEYJ 122 V (1.2 kΩ) |
| R7 | 7030003400 | S.RESISTOR | ERJ3GEYJ 471 V (470 Ω) |
| R8 | 7030003610 | S.RESISTOR | ERJ3GEYJ 273 V (27 kΩ) |
| R9 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R10 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R11 | 7030003480 | S.RESISTOR | ERJ3GEYJ 222 V (2.2 kΩ) |
| R12 | 7030003500 | S.RESISTOR | ERJ3GEYJ 332 V (3.3 kΩ) |
| R13 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R14 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R17 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R18 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R19 | 7030003570 | S.RESISTOR | ERJ3GEYJ 123 V (12 kΩ) |
| R20 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R21 | 7030003720 | S.RESISTOR | ERJ3GEYJ 224 V (220 kΩ) |
| R23 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R24 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R25 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R26 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R27 | 7030003620 | S.RESISTOR | ERJ3GEYJ 333 V (33 kΩ) |
| R28 | 7030003400 | S.RESISTOR | ERJ3GEYJ 471 V (470 Ω) |
| R29 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R30 | 7030003790 | S.RESISTOR | ERJ3GEYJ 824 V (820 kΩ) |
| R31 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R32 | 7030003760 | S.RESISTOR | ERJ3GEYJ 474 V (470 kΩ) |
| R33 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R34 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R35 | 7030003760 | S.RESISTOR | ERJ3GEYJ 474 V (470 kΩ) |
| R36 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R37 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R38 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R39 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R40 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |

[MAIN UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-------------|-------------------------|
| R41 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R42 | 7030003580 | S.RESISTOR | ERJ3GEYJ 153 V (15 kΩ) |
| R43 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R44 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R45 | 7030003480 | S.RESISTOR | ERJ3GEYJ 222 V (2.2 kΩ) |
| R46 | 7030003720 | S.RESISTOR | ERJ3GEYJ 224 V (220 kΩ) |
| R48 | 7030003610 | S.RESISTOR | ERJ3GEYJ 273 V (27 kΩ) |
| R49 | 7030003690 | S.RESISTOR | ERJ3GEYJ 124 V (120 kΩ) |
| R50 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R51 | 7030003690 | S.RESISTOR | ERJ3GEYJ 124 V (120 kΩ) |
| R52 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R53 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R54 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R55 | 7030003750 | S.RESISTOR | ERJ3GEYJ 394 V (390 kΩ) |
| R56 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R57 | 7030003710 | S.RESISTOR | ERJ3GEYJ 184 V (180 kΩ) |
| R58 | 7030003650 | S.RESISTOR | ERJ3GEYJ 563 V (56 kΩ) |
| R59 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R60 | 7030003690 | S.RESISTOR | ERJ3GEYJ 124 V (120 kΩ) |
| R61 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R62 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R63 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R64 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R65 | 7030003510 | S.RESISTOR | ERJ3GEYJ 392 V (3.9 kΩ) |
| R66 | 7030003470 | S.RESISTOR | ERJ3GEYJ 182 V (1.8 kΩ) |
| R67 | 7030003280 | S.RESISTOR | ERJ3GEYJ 470 V (47 Ω) |
| R68 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R69 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R70 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R71 | 7030003480 | S.RESISTOR | ERJ3GEYJ 222 V (2.2 kΩ) |
| R72 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R73 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R74 | 7030005520 | S.RESISTOR | RR0816R-334-D (330 kΩ) |
| R75 | 7030005630 | S.RESISTOR | RR0816R-154-D (150 kΩ) |
| R76 | 7030003760 | S.RESISTOR | ERJ3GEYJ 474 V (470 kΩ) |
| R77 | 7030003580 | S.RESISTOR | ERJ3GEYJ 153 V (15 kΩ) |
| R78 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R79 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R81 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R82 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R83 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R84 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R85 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R86 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R87 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R88 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R89 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R90 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R91 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R92 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R93 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R94 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R95 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R96 | 7030004120 | S.RESISTOR | ERJ3GEYJ 203 V (20 kΩ) |
| R97 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R98 | 7030003760 | S.RESISTOR | ERJ3GEYJ 474 V (470 kΩ) |
| R99 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R100 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R101 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R102 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R103 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R104 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R105 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R106 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R107 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R108 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R109 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R110 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R111 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R113 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R114 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R115 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R117 | 7030005320 | S.RESISTOR | RR0816P-103-D (10 kΩ) |
| R118 | 7030006560 | S.RESISTOR | RR0816P-223-D (22 kΩ) |
| R119 | 7030005330 | S.RESISTOR | RR0816P-562-D (5.6 kΩ) |
| R120 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |

S.=Surface mount

[MAIN UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|----------------|-------------------------|
| R121 | 7030005320 | S.RESISTOR | RR0816P-103-D (10 kΩ) |
| R122 | 7030006560 | S.RESISTOR | RR0816P-223-D (22 kΩ) |
| R123 | 7030005330 | S.RESISTOR | RR0816P-562-D (5.6 kΩ) |
| R124 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R125 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R126 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R127 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R128 | 7030003270 | S.RESISTOR | ERJ3GEYJ 390 V (39 Ω) |
| R129 | 7030003270 | S.RESISTOR | ERJ3GEYJ 390 V (39 Ω) |
| R130 | 7030003650 | S.RESISTOR | ERJ3GEYJ 563 V (56 kΩ) |
| R131 | 7030003500 | S.RESISTOR | ERJ3GEYJ 332 V (3.3 kΩ) |
| R132 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R134 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R135 | 7030003480 | S.RESISTOR | ERJ3GEYJ 222 V (2.2 kΩ) |
| C1 | 4030007100 | S.CERAMIC | C1608 CH 1H 560J-T-A |
| C2 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C3 | 4030007140 | S.CERAMIC | C1608 CH 1H 121J-T-A |
| C4 | 4030007140 | S.CERAMIC | C1608 CH 1H 121J-T-A |
| C5 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C6 | 4030012600 | S.CERAMIC | C2012 JB 1A 105M-T-A |
| C7 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C8 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C9 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C10 | 4030007120 | S.CERAMIC | C1608 CH 1H 820J-T-A |
| C11 | 4030008900 | S.CERAMIC | C1608 JB 1C 333K-T-A |
| C12 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C13 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C14 | 4030012600 | S.CERAMIC | C2012 JB 1A 105M-T-A |
| C15 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C16 | 4550006210 | S.TANTALUM | ECST1CX106R |
| C17 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C18 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C19 | 4510005960 | ELECTROLYTIC | 10 MV 220 HC |
| C20 | 4510005370 | S.ELECTROLYTIC | ECEV1AA221P |
| C21 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C22 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C23 | 4550006390 | S.TANTALUM | TEMSVA 1C 335M-8L |
| C24 | 4550006390 | S.TANTALUM | TEMSVA 1C 335M-8L |
| C25 | 4030011810 | S.CERAMIC | C1608 JB 1A 224K-T-N |
| C26 | 4030012600 | S.CERAMIC | C2012 JB 1A 105M-T-A |
| C27 | 4030012600 | S.CERAMIC | C2012 JB 1A 105M-T-A |
| C28 | 4030012600 | S.CERAMIC | C2012 JB 1A 105M-T-A |
| C29 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C30 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C31 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C32 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C33 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C34 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C35 | 4030008860 | S.CERAMIC | C1608 JB 1C 153K-T-A |
| C36 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C37 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C38 | 4030008890 | S.CERAMIC | C1608 JB 1C 273K-T-A |
| C39 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C40 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C41 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C42 | 4030009490 | S.CERAMIC | C1608 JB 1H 821K-T-A |
| C43 | 4030010770 | S.CERAMIC | C1608 JB 1H 392K-T-A |
| C44 | 4030007160 | S.CERAMIC | C1608 CH 1H 181J-T-A |
| C45 | 4030008890 | S.CERAMIC | C1608 JB 1C 273K-T-A |
| C46 | 4030008890 | S.CERAMIC | C1608 JB 1C 273K-T-A |
| C47 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C48 | 4030008770 | S.CERAMIC | C1608 JB 1H 562K-T-A |
| C50 | 4030007150 | S.CERAMIC | C1608 CH 1H 151J-T-A |
| C51 | 4030008890 | S.CERAMIC | C1608 JB 1C 273K-T-A |
| C52 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C53 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C54 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C55 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C56 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C57 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C58 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C59 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C60 | 4030011810 | S.CERAMIC | C1608 JB 1A 224K-T-N |
| C61 | 4550006950 | S.TANTALUM | ECST0JX476R |
| C62 | 4510005600 | S.ELECTROLYTIC | ECEV1CS100SR |
| C63 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C64 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C65 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C66 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C67 | 4030007090 | S.CERAMIC | C1608 CH 1H 470J-T-A |
| C68 | 4030007090 | S.CERAMIC | C1608 CH 1H 470J-T-A |

[MAIN UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-------------|----------------------|
| C69 | 4030008650 | S.CERAMIC | C1608 JB 1H 332K-T-A |
| C71 | 4030006850 | S.CERAMIC | C1608 JB 1H 471K-T-A |
| C72 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C73 | 4030007050 | S.CERAMIC | C1608 CH 1H 220J-T-A |
| C74 | 4030009650 | S.CERAMIC | C1608 CH 1H 240J-T-A |
| C75 | 4030008890 | S.CERAMIC | C1608 JB 1C 273K-T-A |
| C76 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C77 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C78 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C79 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C80 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C81 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C82 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C83 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C84 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C85 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C86 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C87 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C88 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C89 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C90 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C91 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| C92 | 4030008920 | S.CERAMIC | C1608 JB 1C 473K-T-A |
| J1 | 6510021960 | S.CONNECTOR | AXN430C040P |
| J2 | 6510010960 | CONNECTOR | PI28B-02M |
| J3 | 6510016430 | S.CONNECTOR | 53307-1491 |
| DS1 | 5030001810 | LCD | A0081A |
| DS2 | 5010000120 | S.LED | LN1371G-(TR) |
| DS3 | 5010000120 | S.LED | LN1371G-(TR) |
| DS4 | 5010000120 | S.LED | LN1371G-(TR) |
| DS5 | 5010000120 | S.LED | LN1371G-(TR) |
| DS6 | 5010000160 | S.LED | LNJ310M6URA |
| DS7 | 5010000160 | S.LED | LNJ310M6URA |
| DS8 | 5010000160 | S.LED | LNJ310M6URA |
| DS9 | 5010000160 | S.LED | LNJ310M6URA |
| MC1 | 7700002440 | MICROPHONE | KUB2823-013280 |
| EP1 | 0910051883 | PCB | B 5389C |
| EP2 | 8930051120 | LCD CONTACT | SRCN-2320-SP-N-W |

[RF UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|--------------|--------------------|
| IC1 | 1130007610 | S.IC | μPD3140GS-E1 (DS8) |
| IC2 | 1110004530 | S.IC | M62368GP 70ED |
| IC3 | 1120002830 | S.IC | NJM2125F-TE1 |
| Q1 | 1560000540 | S.FET | 2SK880-Y (TE85R) |
| Q2 | 1590000430 | S.TRANSISTOR | DTC144EUA T106 |
| Q4 | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25 |
| Q5 | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25 |
| Q6 | 1530002600 | S.TRANSISTOR | 2SC4215-O (TE85R) |
| Q7 | 1530002600 | S.TRANSISTOR | 2SC4215-O (TE85R) |
| Q8 | 1530002600 | S.TRANSISTOR | 2SC4215-O (TE85R) |
| Q9 | 1530002920 | S.TRANSISTOR | 2SC4226-T2 R25 |
| Q10 | 1560001020 | S.FET | 2SK2973 (MTS101P) |
| Q11 | 1560001050 | S.FET | 2SK2974 |
| Q13 | 1580000720 | S.FET | 3SK239AXRTL |
| Q14 | 1580000490 | S.FET | 3SK166A-2-T7 |
| Q15 | 1530002360 | S.TRANSISTOR | 2SC2714-Y (TE85R) |
| Q16 | 1530002060 | S.TRANSISTOR | 2SC4081 T107 R |
| Q17 | 1590002160 | S.TRANSISTOR | XP6401-(TX) |

S.=Surface mount

[RF UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|--------------|-------------------------|
| D1 | 1720000670 | S.VARICAP | HVU17TRF |
| D2 | 1790000620 | S.DIODE | MA77 (TX) |
| D4 | 1790001650 | S.DIODE | MA77 (TX) -AB |
| D5 | 1720000370 | S.VARICAP | HVU350TRF |
| D6 | 1720000370 | S.VARICAP | HVU350TRF |
| D7 | 1790000620 | S.DIODE | MA77 (TX) |
| D8 | 1790000620 | S.DIODE | MA77 (TX) |
| D9 | 1790000620 | S.DIODE | MA77 (TX) |
| D10 | 1790000490 | S.DIODE | HSM88AS-TR |
| D11 | 1790000620 | S.DIODE | MA77 (TX) |
| D12 | 1790000620 | S.DIODE | MA77 (TX) |
| D13 | 1720000370 | S.VARICAP | HVU350TRF |
| D14 | 1720000370 | S.VARICAP | HVU350TRF |
| D15 | 1720000370 | S.VARICAP | HVU350TRF |
| D16 | 1720000370 | S.VARICAP | HVU350TRF |
| D17 | 1720000370 | S.VARICAP | HVU350TRF |
| D18 | 1720000370 | S.VARICAP | HVU350TRF |
| D19 | 1730002300 | S.ZENER | MA8082-M (TX) |
| FI1 | 2010002420 | MONOLITH | FL-310 |
| FI2 | 2010002420 | MONOLITH | FL-310 |
| X1 | 6050010800 | S.XTAL | CR-659 (21.25 MHz) |
| L1 | 6200007000 | S.COIL | ELJRE 82NG-F |
| L2 | 6200008070 | S.COIL | MLF1608E 6R8K 6.8U |
| L3 | 6200003090 | S.COIL | NL 322522T-2R7J-3 |
| L4 | 6200008190 | S.COIL | 0.25-1.9-8TL 80N |
| L5 | 6200006980 | S.COIL | ELJRE R10G-F |
| L6 | 6200006980 | S.COIL | ELJRE R10G-F |
| L7 | 6200006980 | S.COIL | ELJRE R10G-F |
| L8 | 6200006980 | S.COIL | ELJRE R10G-F |
| L9 | 6200006670 | S.COIL | ELJRE 68NG-F |
| L10 | 6200002320 | S.COIL | LQN 1A 8N8J04 |
| L11 | 6200008460 | S.COIL | 0.26-0.9-5TR 15N |
| L12 | 6200008460 | S.COIL | 0.26-0.9-5TR 15N |
| L13 | 6200002370 | S.COIL | LQN 1A 39NJ04 |
| L14 | 6200003090 | S.COIL | NL 322522T-2R7J-3 |
| L15 | 6200008450 | S.COIL | 0.35-1.6-5TL 28N |
| L16 | 6200008450 | S.COIL | 0.35-1.6-5TL 28N |
| L17 | 6200008400 | S.COIL | 0.35-1.6-6TL 36N |
| L18 | 6200002820 | S.COIL | LQN 1A 47NJ04 |
| L19 | 6200002820 | S.COIL | LQN 1A 47NJ04 |
| L20 | 6200007160 | S.COIL | LQN1H 54NK04 |
| L21 | 6200007160 | S.COIL | LQN1H 54NK04 |
| L22 | 6200002360 | S.COIL | LQN 1A 33NJ04 |
| L23 | 6200002360 | S.COIL | LQN 1A 33NJ04 |
| L24 | 6200005740 | S.COIL | ELJRE 47NG-F |
| L25 | 6200006980 | S.COIL | ELJRE R10G-F |
| L26 | 6200004790 | S.COIL | MLF1608D R47K-T |
| L27 | 6200003590 | S.COIL | EXCCL3225U1 |
| L28 | 6200003590 | S.COIL | EXCCL3225U1 |
| L29 | 6200008190 | S.COIL | 0.25-1.9-8TL 80N |
| R1 | 7030003760 | S.RESISTOR | ERJ3GEYJ 474 V (470 kΩ) |
| R2 | 7030003640 | S.RESISTOR | ERJ3GEYJ 473 V (47 kΩ) |
| R3 | 7030003380 | S.RESISTOR | ERJ3GEYJ 331 V (330 Ω) |
| R4 | 7510001160 | S.THERMISTOR | NTCCM1608 4LH 473KC |
| R5 | 7030005870 | S.RESISTOR | RR0816R-104-D (100 kΩ) |
| R6 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R7 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R8 | 7030003640 | S.RESISTOR | ERJ3GEYJ 473 V (47 kΩ) |
| R9 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R10 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R11 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R12 | 7030003480 | S.RESISTOR | ERJ3GEYJ 222 V (2.2 kΩ) |
| R13 | 7030003410 | S.RESISTOR | ERJ3GEYJ 561 V (560 Ω) |
| R14 | 7030003660 | S.RESISTOR | ERJ3GEYJ 683 V (68 kΩ) |
| R15 | 7030003580 | S.RESISTOR | ERJ3GEYJ 153 V (15 kΩ) |
| R16 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R17 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R19 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R20 | 7030003640 | S.RESISTOR | ERJ3GEYJ 473 V (47 kΩ) |
| R22 | 7030003470 | S.RESISTOR | ERJ3GEYJ 182 V (1.8 kΩ) |
| R23 | 7030003550 | S.RESISTOR | ERJ3GEYJ 822 V (8.2 kΩ) |
| R24 | 7030003550 | S.RESISTOR | ERJ3GEYJ 822 V (8.2 kΩ) |
| R26 | 7030003390 | S.RESISTOR | ERJ3GEYJ 391 V (390 Ω) |
| R27 | 7030003350 | S.RESISTOR | ERJ3GEYJ 181 V (180 Ω) |

[RF UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-------------|-------------------------|
| R28 | 7030003660 | S.RESISTOR | ERJ3GEYJ 683 V (68 kΩ) |
| R29 | 7030003420 | S.RESISTOR | ERJ3GEYJ 681 V (680 Ω) |
| R30 | 7030003660 | S.RESISTOR | ERJ3GEYJ 683 V (68 kΩ) |
| R31 | 7030003400 | S.RESISTOR | ERJ3GEYJ 471 V (470 Ω) |
| R32 | 7030003630 | S.RESISTOR | ERJ3GEYJ 393 V (39 kΩ) |
| R33 | 7030003390 | S.RESISTOR | ERJ3GEYJ 391 V (390 Ω) |
| R34 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R35 | 7030004050 | S.RESISTOR | ERJ3GEYJ 1R0 V (1 Ω) |
| R36 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R37 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R38 | 7030003500 | S.RESISTOR | ERJ3GEYJ 332 V (3.3 kΩ) |
| R39 | 7030003450 | S.RESISTOR | ERJ3GEYJ 122 V (1.2 kΩ) |
| R40 | 7030003310 | S.RESISTOR | ERJ3GEYJ 820 V (82 Ω) |
| R41 | 7030003260 | S.RESISTOR | ERJ3GEYJ 330 V (33 Ω) |
| R42 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R43 | 7030003580 | S.RESISTOR | ERJ3GEYJ 153 V (15 kΩ) |
| R44 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R46 | 7030003280 | S.RESISTOR | ERJ3GEYJ 470 V (47 Ω) |
| R47 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R48 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R49 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R51 | 7030000280 | S.RESISTOR | MCR10EZJH 150 Ω (151) |
| R52 | 7030003670 | S.RESISTOR | ERJ3GEYJ 823 V (82 kΩ) |
| R53 | 7030003600 | S.RESISTOR | ERJ3GEYJ 223 V (22 kΩ) |
| R54 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R56 | 7030003280 | S.RESISTOR | ERJ3GEYJ 470 V (47 Ω) |
| R57 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R58 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R59 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R60 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R61 | 7030003780 | S.RESISTOR | ERJ3GEYJ 684 V (680 kΩ) |
| R62 | 7030003720 | S.RESISTOR | ERJ3GEYJ 224 V (220 kΩ) |
| R63 | 7030003770 | S.RESISTOR | ERJ3GEYJ 564 V (560 kΩ) |
| R64 | 7030003780 | S.RESISTOR | ERJ3GEYJ 684 V (680 kΩ) |
| R65 | 7030003360 | S.RESISTOR | ERJ3GEYJ 221 V (220 Ω) |
| R67 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R68 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R69 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R70 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R71 | 7030003800 | S.RESISTOR | ERJ3GEYJ 105 V (1 MΩ) |
| R72 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R73 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R74 | 7030003520 | S.RESISTOR | ERJ3GEYJ 472 V (4.7 kΩ) |
| R78 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R80 | 7030003340 | S.RESISTOR | ERJ3GEYJ 151 V (150 Ω) |
| R82 | 7030003200 | S.RESISTOR | ERJ3GEYJ 100 V (10 Ω) |
| R83 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R86 | 7030003460 | S.RESISTOR | ERJ3GEYJ 152 V (1.5 kΩ) |
| R87 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R88 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R89 | 7030003400 | S.RESISTOR | ERJ3GEYJ 471 V (470 Ω) |
| R90 | 7030005320 | S.RESISTOR | RR0816P-103-D (10 kΩ) |
| R91 | 7030008120 | S.RESISTOR | RR0816P-682-D (6.8 kΩ) |
| R92 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R94 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R95 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R96 | 7030003580 | S.RESISTOR | ERJ3GEYJ 153 V (15 kΩ) |
| R97 | 7030003440 | S.RESISTOR | ERJ3GEYJ 102 V (1 kΩ) |
| R98 | 7030007330 | S.RESISTOR | ERJ1WRSJR15U (0.15 Ω) |
| R99 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R100 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R101 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| R102 | 7030003680 | S.RESISTOR | ERJ3GEYJ 104 V (100 kΩ) |
| R103 | 7030003320 | S.RESISTOR | ERJ3GEYJ 101 V (100 Ω) |
| R104 | 7030003620 | S.RESISTOR | ERJ3GEYJ 333 V (33 kΩ) |
| R105 | 7030003560 | S.RESISTOR | ERJ3GEYJ 103 V (10 kΩ) |
| C1 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C2 | 4030007170 | S.CERAMIC | C1608 CH 1H 221J-T-A |
| C3 | 4030007010 | S.CERAMIC | C1608 CH 1H 100D-T-A |
| C4 | 4030007020 | S.CERAMIC | C1608 CH 1H 120J-T-A |
| C5 | 4030008630 | S.CERAMIC | C1608 JF 1C 104Z-T-A |
| C6 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C7 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C8 | 4030007000 | S.CERAMIC | C1608 CH 1H 090D-T-A |
| C9 | 4030007000 | S.CERAMIC | C1608 CH 1H 090D-T-A |
| C10 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C11 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C13 | 4030009520 | S.CERAMIC | C1608 CH 1H 020B-T-A |
| C15 | 4030009520 | S.CERAMIC | C1608 CH 1H 020B-T-A |
| C16 | 4550000510 | S.TANTALUM | TESVA 1V 473M1-8L |

S.=Surface mount

[RF UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|----------------|----------------------|
| C17 | 4550006590 | S.TANTALUM | ECST1CY684R |
| C18 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C19 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C20 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C21 | 4030008650 | S.CERAMIC | C1608 JB 1H 332K-T-A |
| C22 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C23 | 4030008770 | S.CERAMIC | C1608 JB 1H 562K-T-A |
| C24 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C25 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C27 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C28 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C29 | 4030007090 | S.CERAMIC | C1608 CH 1H 470J-T-A |
| C30 | 4030007080 | S.CERAMIC | C1608 CH 1H 390J-T-A |
| C31 | 4030009540 | S.CERAMIC | C1608 CH 1H 1R5B-T-A |
| C32 | 4030009540 | S.CERAMIC | C1608 CH 1H 1R5B-T-A |
| C33 | 4030007170 | S.CERAMIC | C1608 CH 1H 221J-T-A |
| C34 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C35 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C36 | 4030009570 | S.CERAMIC | C1608 CH 1H 0R3B-T-A |
| C37 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C38 | 4030009920 | S.CERAMIC | C1608 CH 1H 050B-T-A |
| C39 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C40 | 4030007050 | S.CERAMIC | C1608 CH 1H 220J-T-A |
| C41 | 4030007020 | S.CERAMIC | C1608 CH 1H 120J-T-A |
| C42 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C43 | 4030007040 | S.CERAMIC | C1608 CH 1H 180J-T-A |
| C44 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C45 | 4030007050 | S.CERAMIC | C1608 CH 1H 220J-T-A |
| C46 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C47 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C48 | 4030007030 | S.CERAMIC | C1608 CH 1H 150J-T-A |
| C49 | 4030009650 | S.CERAMIC | C1608 CH 1H 240J-T-A |
| C50 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C52 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C53 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C56 | 4510004870 | S.ELECTROLYTIC | ECEV1CA330P |
| C57 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C58 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C59 | 4030010760 | S.CERAMIC | C1608 CH 1H 331J-T-A |
| C61 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C63 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C64 | 4030007090 | S.CERAMIC | C1608 CH 1H 470J-T-A |
| C66 | 4030006990 | S.CERAMIC | C1608 CH 1H 080D-T-A |
| C67 | 4030011540 | S.CERAMIC | C1608 CH 1H 750J-T-A |
| C68 | 4030007040 | S.CERAMIC | C1608 CH 1H 180J-T-A |
| C69 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C71 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C72 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C73 | 4030009530 | S.CERAMIC | C1608 CH 1H 030B-T-A |
| C74 | 4030007010 | S.CERAMIC | C1608 CH 1H 100D-T-A |
| C75 | 4030007020 | S.CERAMIC | C1608 CH 1H 120J-T-A |
| C76 | 4030009350 | S.CERAMIC | C1608 CH 1H 3R5B-T-A |
| C77 | 4030007030 | S.CERAMIC | C1608 CH 1H 150J-T-A |
| C80 | 4030009520 | S.CERAMIC | C1608 CH 1H 020B-T-A |
| C81 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C83 | 4030007030 | S.CERAMIC | C1608 CH 1H 150J-T-A |
| C84 | 4030007050 | S.CERAMIC | C1608 CH 1H 220J-T-A |
| C85 | 4030007010 | S.CERAMIC | C1608 CH 1H 100D-T-A |
| C86 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C87 | 4030009910 | S.CERAMIC | C1608 CH 1H 040B-T-A |
| C88 | 4030009350 | S.CERAMIC | C1608 CH 1H 3R5B-T-A |
| C89 | 4030007130 | S.CERAMIC | C1608 CH 1H 101J-T-A |
| C90 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C91 | 4030009540 | S.CERAMIC | C1608 CH 1H 1R5B-T-A |
| C93 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C94 | 4030007140 | S.CERAMIC | C1608 CH 1H 121J-T-A |
| C95 | 4030009920 | S.CERAMIC | C1608 CH 1H 050B-T-A |
| C96 | 4030009910 | S.CERAMIC | C1608 CH 1H 040B-T-A |
| C97 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C98 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C99 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C100 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C101 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C102 | 4030006990 | S.CERAMIC | C1608 CH 1H 080D-T-A |
| C103 | 4030007130 | S.CERAMIC | C1608 CH 1H 101J-T-A |
| C104 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C105 | 4030009540 | S.CERAMIC | C1608 CH 1H 1R5B-T-A |
| C107 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C108 | 4030007130 | S.CERAMIC | C1608 CH 1H 101J-T-A |
| C109 | 4030006990 | S.CERAMIC | C1608 CH 1H 080D-T-A |
| C110 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C111 | 4030009920 | S.CERAMIC | C1608 CH 1H 050B-T-A |

[RF UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-------------|-----------------------|
| C112 | 4030007070 | S.CERAMIC | C1608 CH 1H 330J-T-A |
| C113 | 4030007100 | S.CERAMIC | C1608 CH 1H 560J-T-A |
| C114 | 4030011530 | S.CERAMIC | C1608 CH 1H 110J-T-A |
| C116 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C117 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C118 | 4030007140 | S.CERAMIC | C1608 CH 1H 121J-T-A |
| C119 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C120 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C121 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C123 | 4030006970 | S.CERAMIC | C1608 CH 1H 060D-T-A |
| C126 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C127 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C128 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C129 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C130 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C131 | 4550006200 | S.TANTALUM | ECST0JY106R |
| C132 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| C133 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C134 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C135 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C136 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C137 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C138 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C139 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C140 | 4030011600 | S.CERAMIC | C1608 JB 1C 104KT-N |
| C141 | 4030006860 | S.CERAMIC | C1608 JB 1H 102K-T-A |
| C142 | 4030006900 | S.CERAMIC | C1608 JB 1E 103K-T-A |
| J1 | 6510021970 | S.CONNECTOR | AXN330C130P |
| J2 | 6510021950 | CONNECTOR | IMSA-9230B-1-07Z107-T |
| S1 | 2230000900 | S.SWITCH | JPM1990-2013R |
| S2 | 2230000900 | S.SWITCH | JPM1990-2013R |
| W1 | 7120000470 | JUMPER | ERDS2T0 |
| W2 | 7120000470 | JUMPER | ERDS2T0 |
| EP1 | 0910051892 | PCB | B 5390B |

[VR UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | |
|---------|------------|-------------|------------------------------|
| R1 | 7210003070 | VARIABLE | TP76D995N-20F-10KB-10KA-2320 |
| EP1 | 0910051902 | PCB | B 5391B |

S.=Surface mount

SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

[CHASSIS PARTS]

| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------|---------------------------------|------|
| J1 | 6510019610 | SMA-R209 | 1 |
| J2 | 6510021940 | 246S-550-4P | 1 |
| J3 | 6510021930 | 2320 Contact | 1 |
| SP1 | 2510000930 | SU-36W08040C | 1 |
| WS1 | 8600036580 | FX2320 P01CH | 1 |
| MP1 | 8210016480 | 2320 Front panel | 1 |
| MP3 | 8930050730 | 2320 Key board | 1 |
| MP5 | 8930039000 | 1757 Sheet | 1 |
| MP6 | 8930050680 | 2320 Main seal | 1 |
| MP7 | 8210016490 | 2320 Rear panel | 1 |
| MP8 | 8110007020 | 2320 Release cover | 1 |
| MP9 | 8930050700 | 2320 Release butto | 1 |
| MP10 | 8930051490 | Push spring (AF) | 2 |
| MP11 | 8810009290 | Screw PH No.0 M2 × 3 SUS ZK | 2 |
| MP12 | 8930050690 | 2320 PTT rubber | 1 |
| MP13 | 8310047210 | 2320 PTT plate | 1 |
| MP14 | 8810009290 | Screw PH No.0 M2 × 3 SUS ZK | 2 |
| MP15 | 8930050710 | 2320 Rubber | 1 |
| MP16 | 8930050671 | 2320 C rubber-1 | 1 |
| MP17 | 8810009290 | Screw PH No.0 M2 × 3 SUS ZK | 2 |
| MP18 | 8610010760 | Knob N274 | 1 |
| MP19 | 8610010770 | Knob N275 | 1 |
| MP20 | 8930051500 | O ring (AB) | 1 |
| MP21 | 8830001470 | VR nut (N) | 1 |
| MP22 | 8930039840 | 1757 Ant seal | 1 |
| MP23 | 8830001160 | VR nut (K) | 1 |
| MP24 | 8930039850 | Sealing washer (J) | 1 |
| MP25 | 8810009340 | Screw PH M2 × 5 SUS ZK | 1 |
| MP26 | 8830001480 | VR nut (O) | 1 |
| MP27 | 8930050660 | 2320 Connector cap | 1 |
| MP28 | 8810008970 | Screw FH BT No.0 M2 × 3.5 NI-ZU | 3 |
| MP29 | 8810009560 | Screw PH BT M2 × 6 ZK | 2 |
| MP30 | 8810008970 | Screw FH BT M2 × 3.5 NI-ZU | 7 |
| MP31 | 8810009170 | Screw PH B0 M2 × 5 SUS ZK | 4 |
| MP32 | 8810009160 | Screw PH B0 M2 × 20 SUS ZK | 2 |

[MAIN UNIT]

| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------|------------------|------|
| DS1 | 5030001810 | A0081A | 1 |
| EP2 | 8930051120 | SRCN-2320-SP-N-W | 2 |
| MP4 | 8930050490 | 2320 LCD holder | 1 |
| MP5 | 8210016430 | 2320 Reflector | 1 |

[RF UNIT]

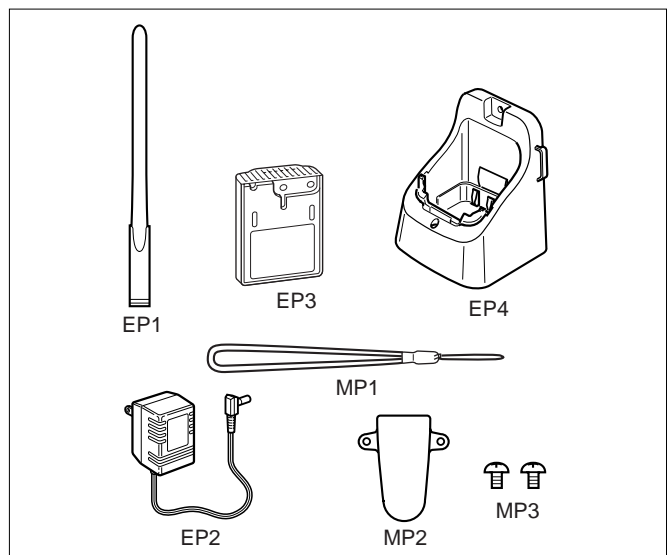
| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------|----------------|------|
| MP2 | 8510012710 | 2320 VCO cover | 1 |

Screw abbreviations

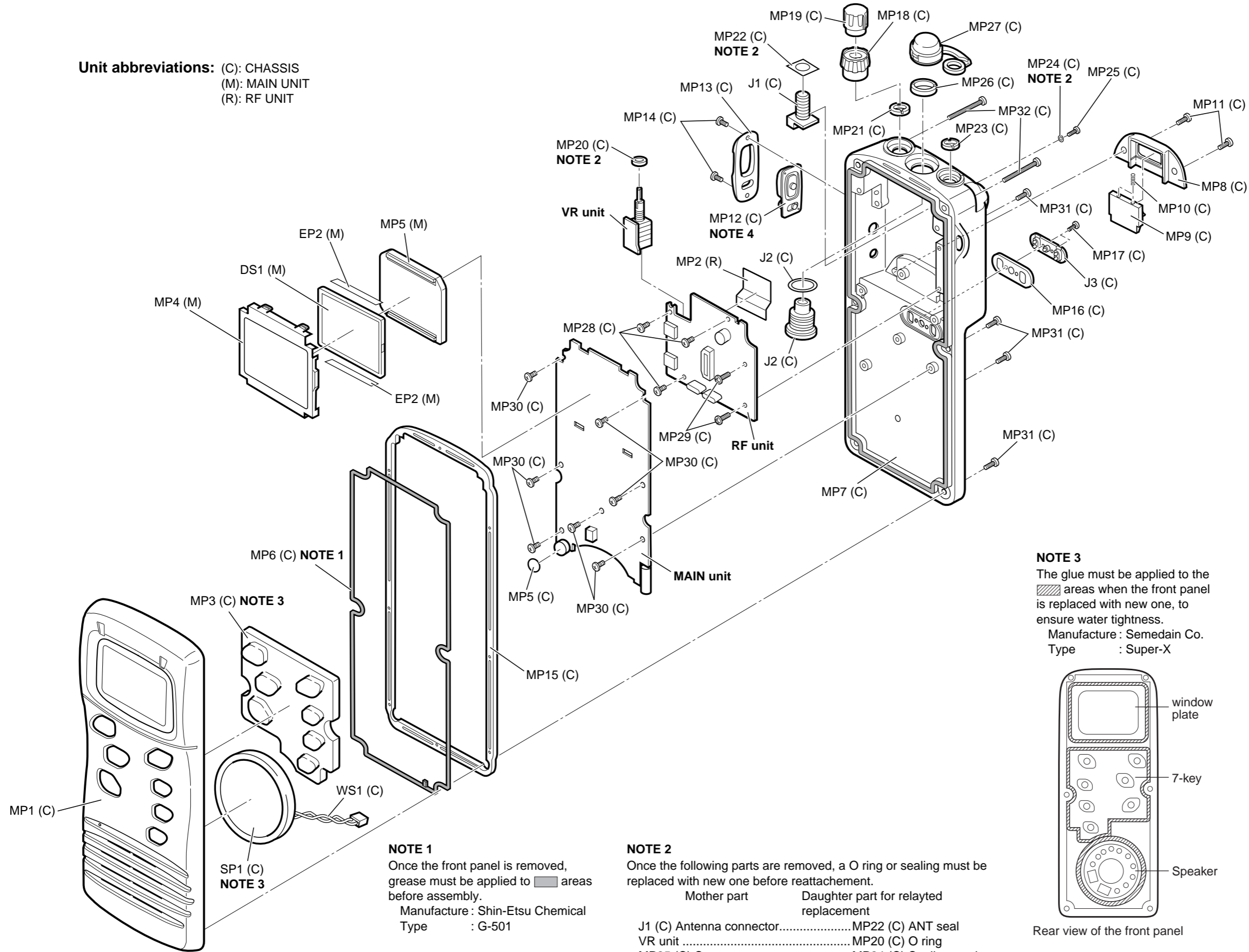
B0, BT: Self-tapping PH: Pan head FH: Flat head
 NI-ZU: Nickel-Zinc SUS: Stainless ZK: Black


[ACCESSORIES]

| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------------|-----------------------------|------|
| EP1 | Optional product | Antenna FA-S57V-1 | 1 |
| EP2 | Optional product | Charger BC-122A [USA] | 1 |
| | | Charger BC-122E [SEA] | 1 |
| EP3 | Optional product | Battery BP-215 ACC | 1 |
| EP4 | Optional product | Adapter EX-2329 (AD-95 ACC) | 1 |
| MP1 | 8010018080 | Strap belt HK-009 | 1 |
| MP2 | 8930039290 | 1757 Belt clip | 1 |
| MP3 | 8810009270 | Screw M3 × 4 SUS ZK | |




Unit abbreviations: (C): CHASSIS
(M): MAIN UNIT
(R): RF UNIT

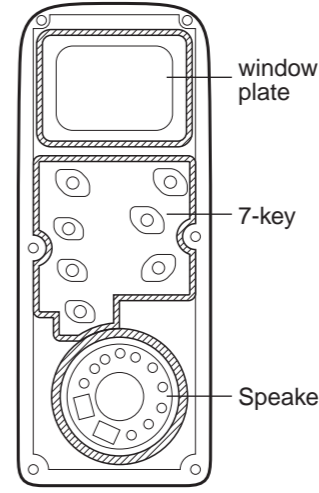


NOTE 1
Once the front panel is removed, grease must be applied to  areas before assembly.
Manufacture : Shin-Etsu Chemical
Type : G-501

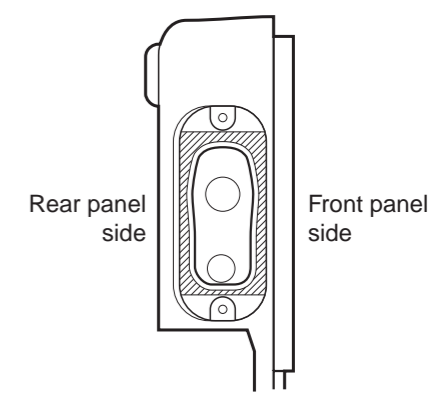
NOTE 2
Once the following parts are removed, a O ring or sealing must be replaced with new one before reattachment.
Mother part Daughter part for relayed replacement
J1 (C) Antenna connector.....MP22 (C) ANT seal
VR unitMP20 (C) O ring
MP25 (C) Screw.....MP24 (C) Sealing washer

NOTE 3
The glue must be applied to the  areas when the front panel is replaced with new one, to ensure water tightness.
Manufacture : Semedain Co.
Type : Super-X

NOTE 4
Once the PTT rubber (MP12 (C)) is removed, the glue must be applied between the PTT rubber and rear panel.



Rear view of the front panel



• AD-95 CHARGER PARTS LIST

ELECTRICAL PARTS

[CHARGE UNIT]

| REF NO. | ORDER NO. | DESCRIPTION |
|---------|------------|----------------------------------|
| IC1 | 1190001180 | S.IC MM1332BFBE |
| IC2 | 1180001160 | S.IC S-80740SN-D4-T1 |
| Q1 | 1540000550 | S.TRANSISTOR 2SD1664 T100Q |
| Q2 | 1590002880 | S.FET 2SJ417-TL |
| Q3 | 1520000450 | S.TRANSISTOR 2SB1132 T100 Q |
| Q4 | 1510000500 | S.TRANSISTOR 2SA1162-GR (TE85R) |
| Q5 | 1510000500 | S.TRANSISTOR 2SA1162-GR (TE85R) |
| Q6 | 1530001950 | S.TRANSISTOR 2SC2712-GR (TE85R) |
| D1 | 1790000670 | S.DIODE SB07-03C-TB |
| D2 | 1730002540 | S.ZENER MA8130-L (TX) |
| D3 | 1750000130 | S.DIODE DA204U T107 |
| D4 | 1730002460 | S.ZENER MA8330-M (TX) |
| R1 | 7030000380 | S.RESISTOR MCR10EZHZJ 1 kΩ |
| R2 | 7030000140 | S.RESISTOR MCR10EZHZJ 10 Ω (100) |
| R3 | 7030000140 | S.RESISTOR MCR10EZHZJ 10 Ω (100) |
| R4 | 7030000530 | S.RESISTOR MCR10EZHZJ 18 kΩ |
| R5 | 7030000580 | S.RESISTOR MCR10EZHZJ 47 kΩ |
| R6 | 7030000420 | S.RESISTOR MCR10EZHZJ 2.2 kΩ |
| R7 | 7030000020 | S.RESISTOR MCR10EZHZJ 1 Ω (010) |
| R8 | 7030000020 | S.RESISTOR MCR10EZHZJ 1 Ω (010) |
| R9 | 7030000420 | S.RESISTOR MCR10EZHZJ 2.2 kΩ |
| R10 | 7030000420 | S.RESISTOR MCR10EZHZJ 2.2 kΩ |
| R11 | 7030000500 | S.RESISTOR MCR10EZHZJ 10 kΩ |
| R12 | 7030000570 | S.RESISTOR MCR10EZHZJ 39 kΩ |
| R13 | 7520000180 | S.POSISTOR PTH9C32 BE 471Q-T |
| R14 | 7030000580 | S.RESISTOR MCR10EZHZJ 47 kΩ |
| R15 | 7030004490 | S.RESISTOR MCR10EZHFZ 12.1 kΩ |
| R16 | 7030002860 | S.RESISTOR MCR10EZHFZ 8.2 kΩ |
| R19 | 7030000570 | S.RESISTOR MCR10EZHZJ 39 kΩ |
| C1 | 4030004750 | S.CERAMIC C2012 JB 1H 103K-T-A |
| C2 | 4510005380 | ELECTROLYTIC 25 MV 47 HWS (5X11) |
| C3 | 4030004750 | S.CERAMIC C2012 JB 1H 103K-T-A |
| C5 | 4510006160 | ELECTROLYTIC 25 MV 10 HC |
| C6 | 4030004750 | S.CERAMIC C2012 JB 1H 103K-T-A |
| C7 | 4030004750 | S.CERAMIC C2012 JB 1H 103K-T-A |
| C8 | 4030004750 | S.CERAMIC C2012 JB 1H 103K-T-A |
| C9 | 4030004720 | S.CERAMIC C2012 JB 1H 102K-T-A |
| C10 | 4030004720 | S.CERAMIC C2012 JB 1H 102K-T-A |
| J1 | 6450000410 | CONNECTOR HEC0470-01-630 |
| DS1 | 5040001390 | LED TLG124A |
| W1 | 7030003970 | S.JUMPER MCR18EZHZJ JPW (000) |
| W2 | 7030003970 | S.JUMPER MCR18EZHZJ JPW (000) |
| W3 | 7030003970 | S.JUMPER MCR18EZHZJ JPW (000) |
| W4 | 7030003970 | S.JUMPER MCR18EZHZJ JPW (000) |
| W5 | 7030003970 | S.JUMPER MCR18EZHZJ JPW (000) |
| EP1 | 0910051992 | PCB B 5392B |
| EP2 | 6910013110 | SPACER TLE60-20 |

S.=Surface mount

MECHANICAL PARTS

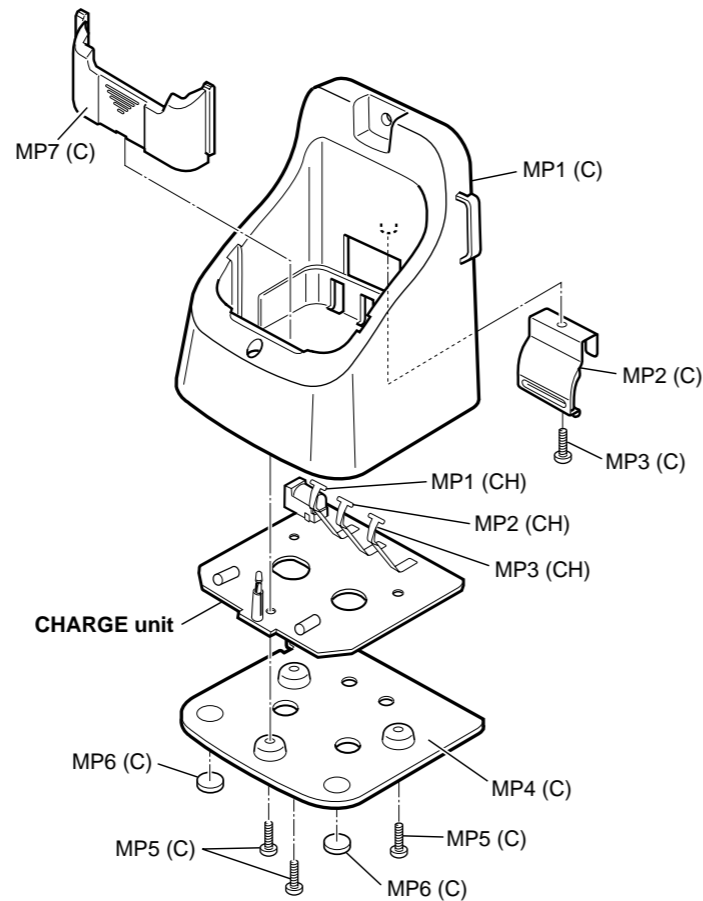
[CHASSIS]

| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------|----------------------------|------|
| MP1 | 8010018010 | 2329 Case | 1 |
| MP2 | 8930051060 | 2329 Lock plate | 1 |
| MP3 | 8810008660 | Screw PH BT B0 3 × 8 NI-ZU | 1 |
| MP4 | 8110007040 | 2329 Cover | 1 |
| MP5 | 8810008660 | Screw PH BT B0 3 × 8 NI-ZU | 3 |
| MP6 | 8930039620 | Leg cushion (A) | 2 |

[CHARGE UNIT]

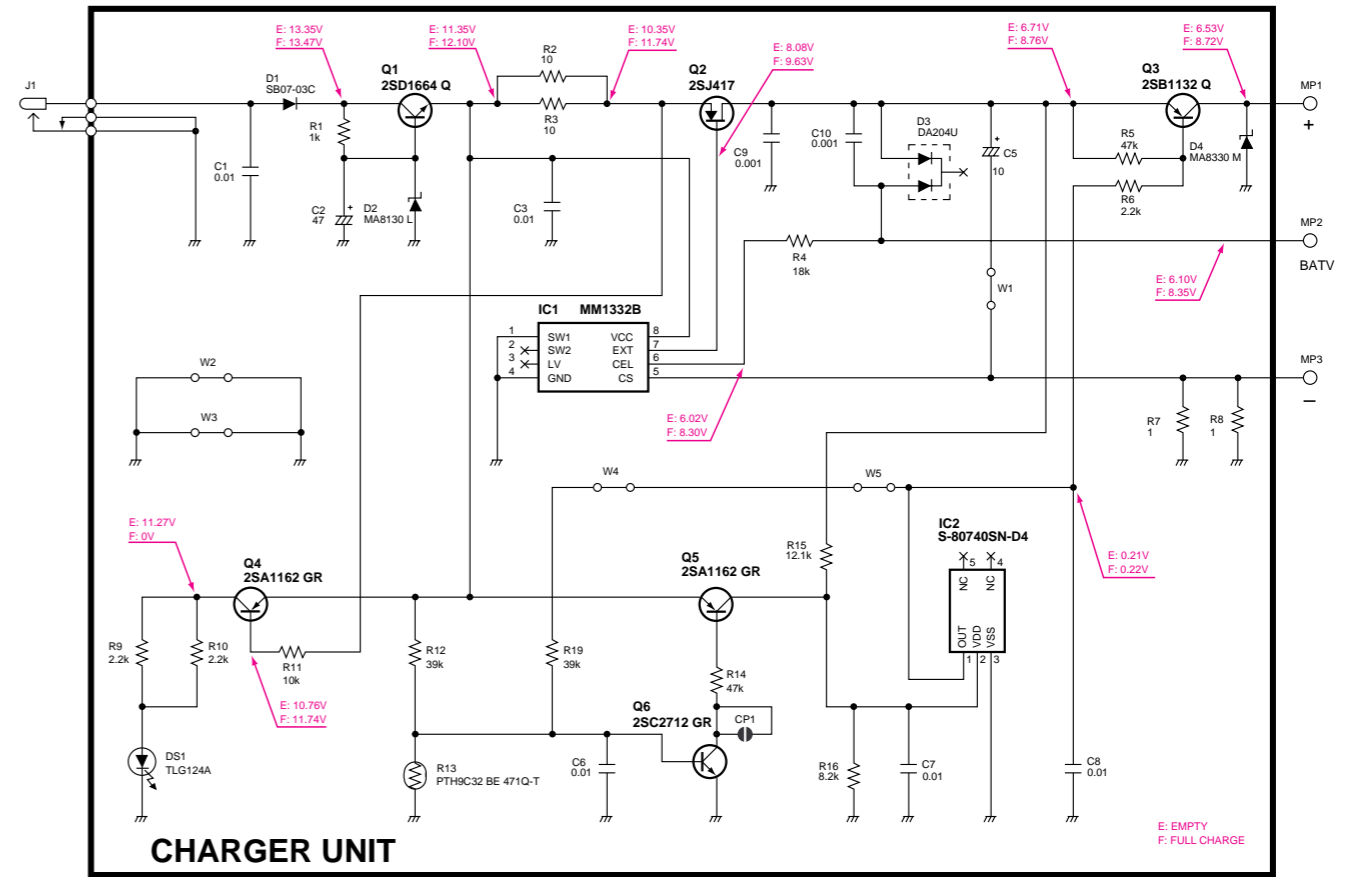
| REF NO. | ORDER NO. | DESCRIPTION | QTY. |
|---------|------------|---------------|------|
| MP1 | 8930051050 | 2329 Terminal | 1 |
| MP2 | 8930051050 | 2329 Terminal | 1 |
| MP3 | 8930051050 | 2329 Terminal | 1 |

Screw abbreviations B0, BT: Self-tapping PH: Pan head
NI-ZU: Nickel-Zinc



NOTE: (C) : CHASSIS
(CH): CHARGE UNIT

• AD-95 VOLTAGE DIAGRAM



SECTION 8 SEMI-CONDUCTOR INFORMATION

8 - 1 TRANSISTORS and FETS

| NAME | SYMBOL | INSIDE VIEW |
|---|-----------------------------------|-------------|
| 2SA1588 GR 2SA1162 GR | ZG SG | |
| 2SB1132 R 2SB1132 Q | BARB BAQ | |
| 2SC2712 Y 2SC2712 GR 2SC2714 Y 2SC4081 R 2SC4215 O 2SC4226 R25 | LY LG QY BR QO R25 | |
| 2SD1664 Q | DAQ | |
| 2SJ417-TL | J417 | |
| 2SK2973 | K1 | |
| 2SK2974 | K2974 | |

| NAME | SYMBOL | INSIDE VIEW |
|---------------------|----------|-------------|
| 2SK880 Y | XY | |
| 3SK166 2 3SK239A | K AXR | |
| DTC144EU | 26 | |
| DTC144TU | 06 | |
| UN911H | 6P | |
| XP6401 | 5O | |
| XP6501 AB | 5N | |

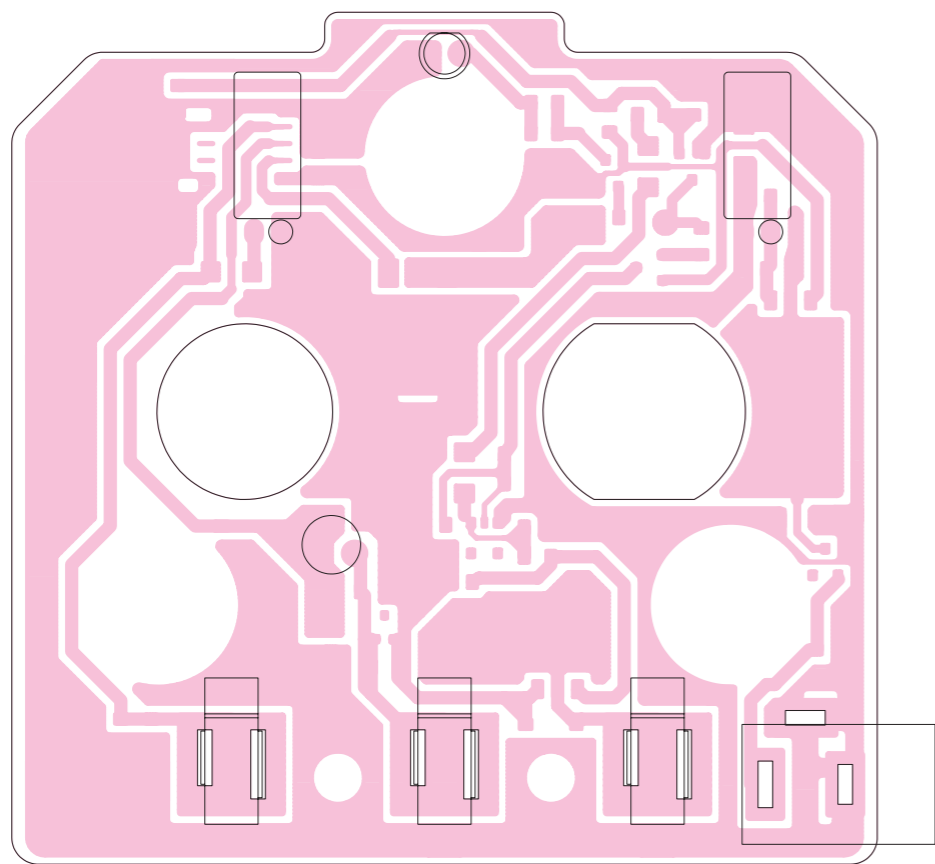
8 - 2 DIODES

| NAME | SYMBOL | INSIDE VIEW |
|----------------------------------|-------------------|-------------|
| DA204U HSM88AS TR | K C1 | |
| HVU17TRF | E | |
| HVU350TRF | 4 | |
| MA8082 M MA8130 L MA8330 M | 8-2 13_ 33- | |
| MA77 MA77 AB | 4B 4B | |
| SB07-03C | J | |

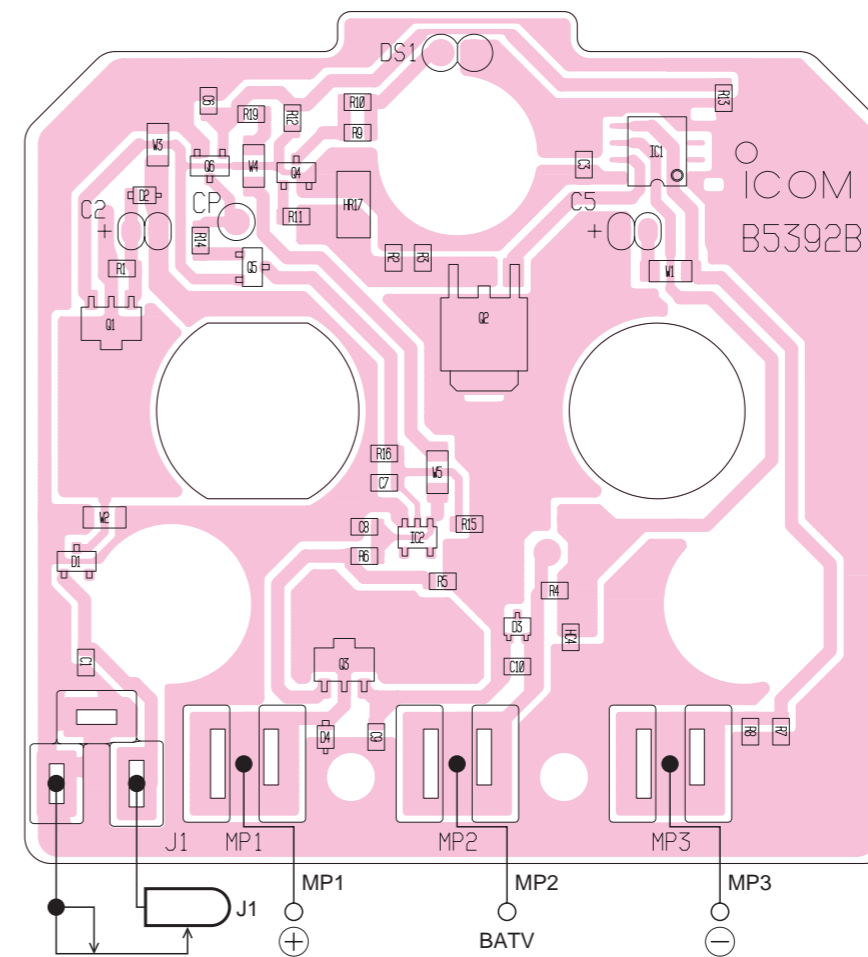
SECTION 9 BOARD LAYOUTS

9 - 1 CHARGE UNIT (AD-95)

• TOP VIEW



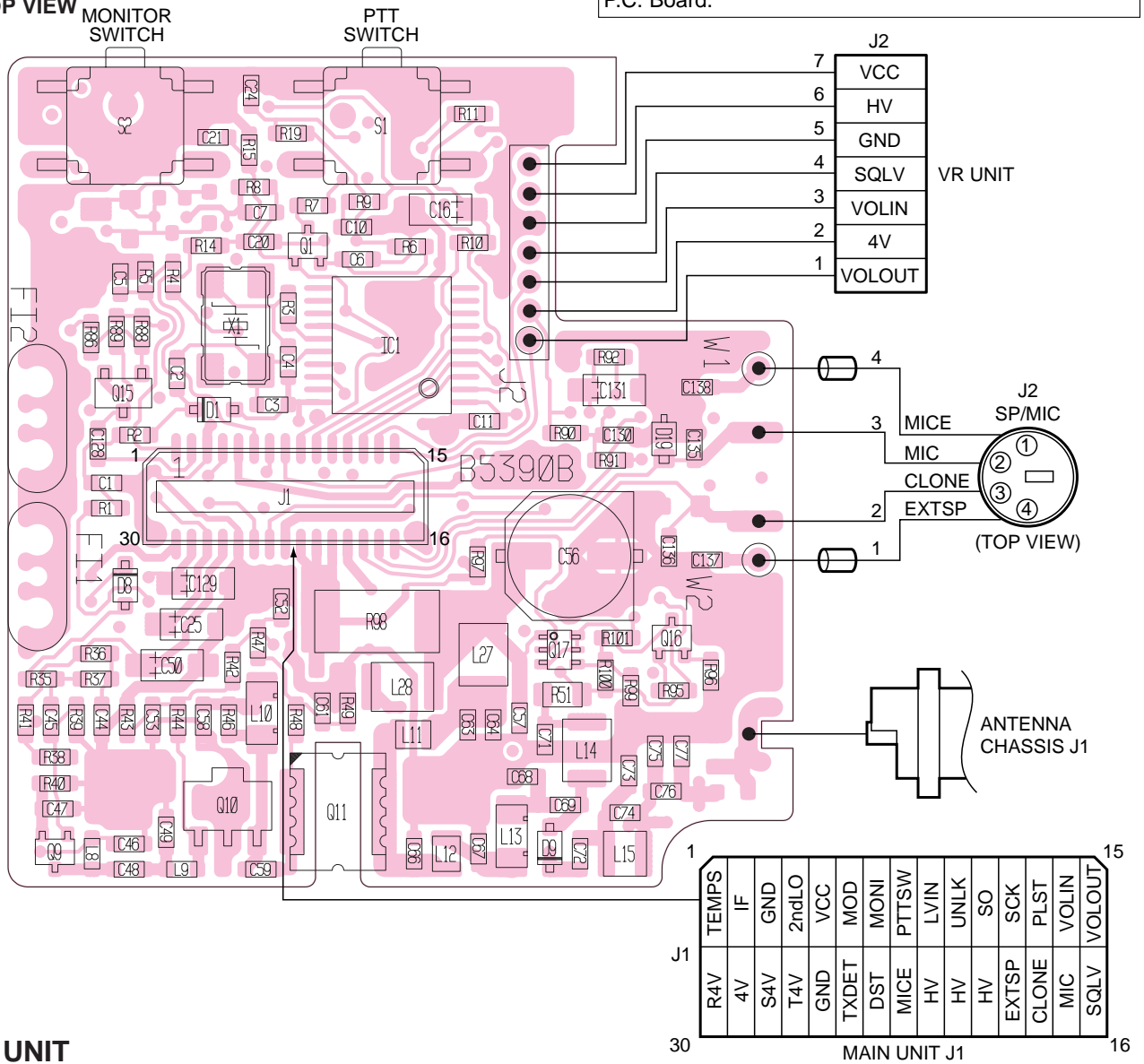
• BOTTOM VIEW



9 - 2 RF AND VR UNITS

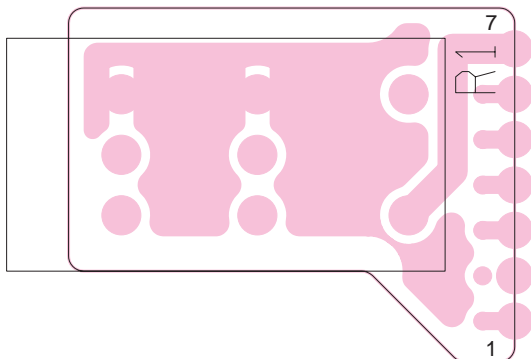
RF UNIT

• TOP VIEW



VR UNIT

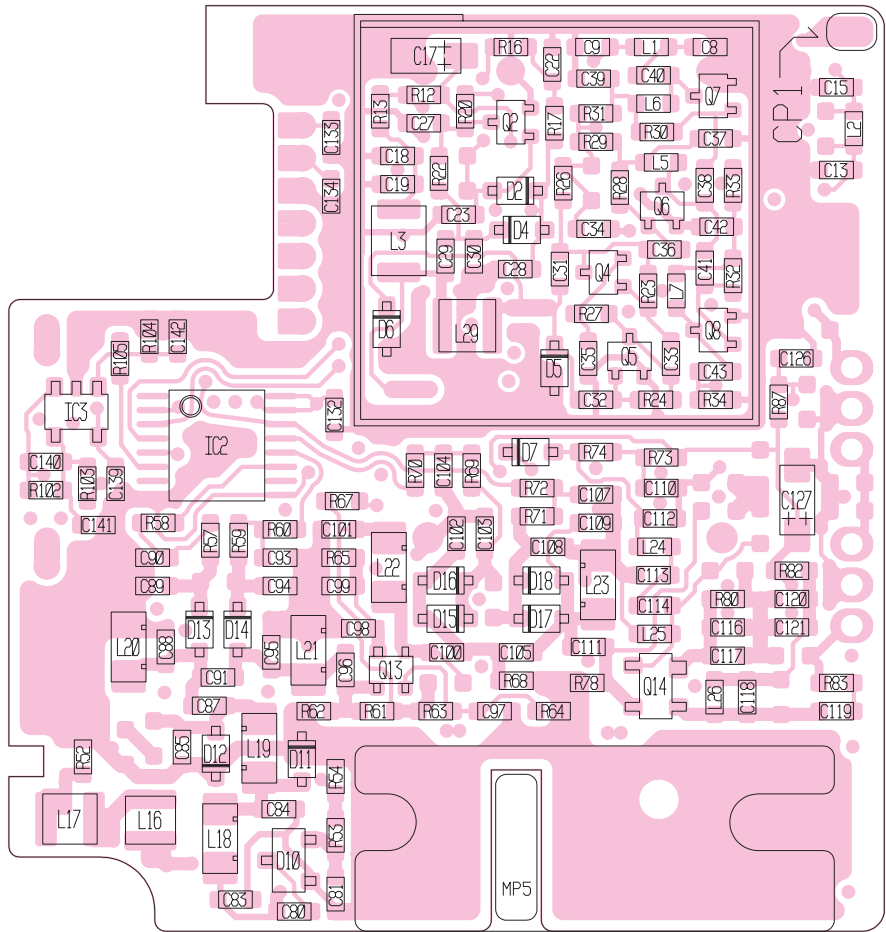
• TOP VIEW



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

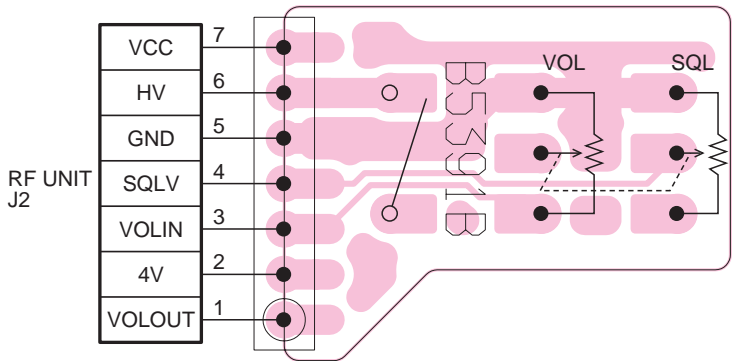
RF UNIT

• BOTTOM VIEW



VR UNIT

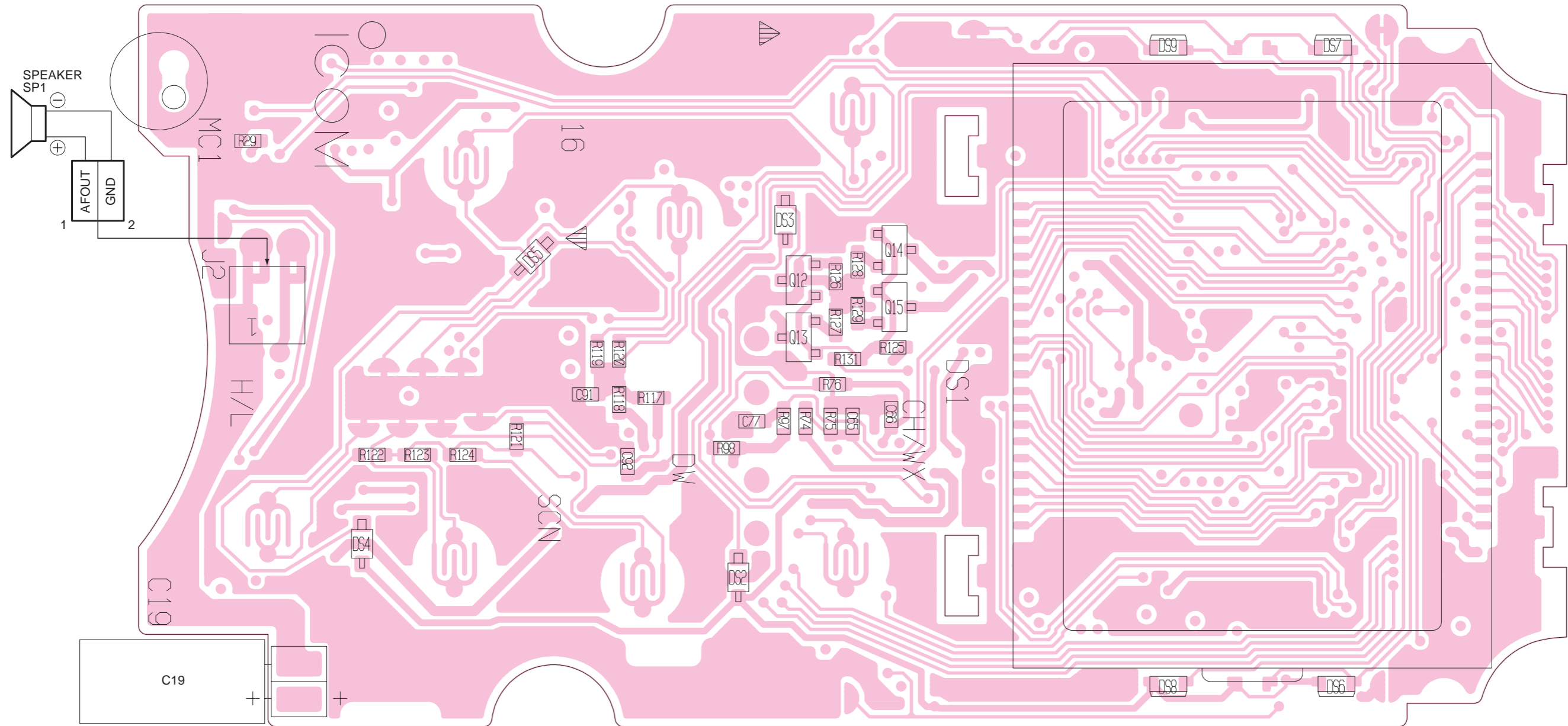
• BOTTOM VIEW



9 - 3 MAIN UNIT

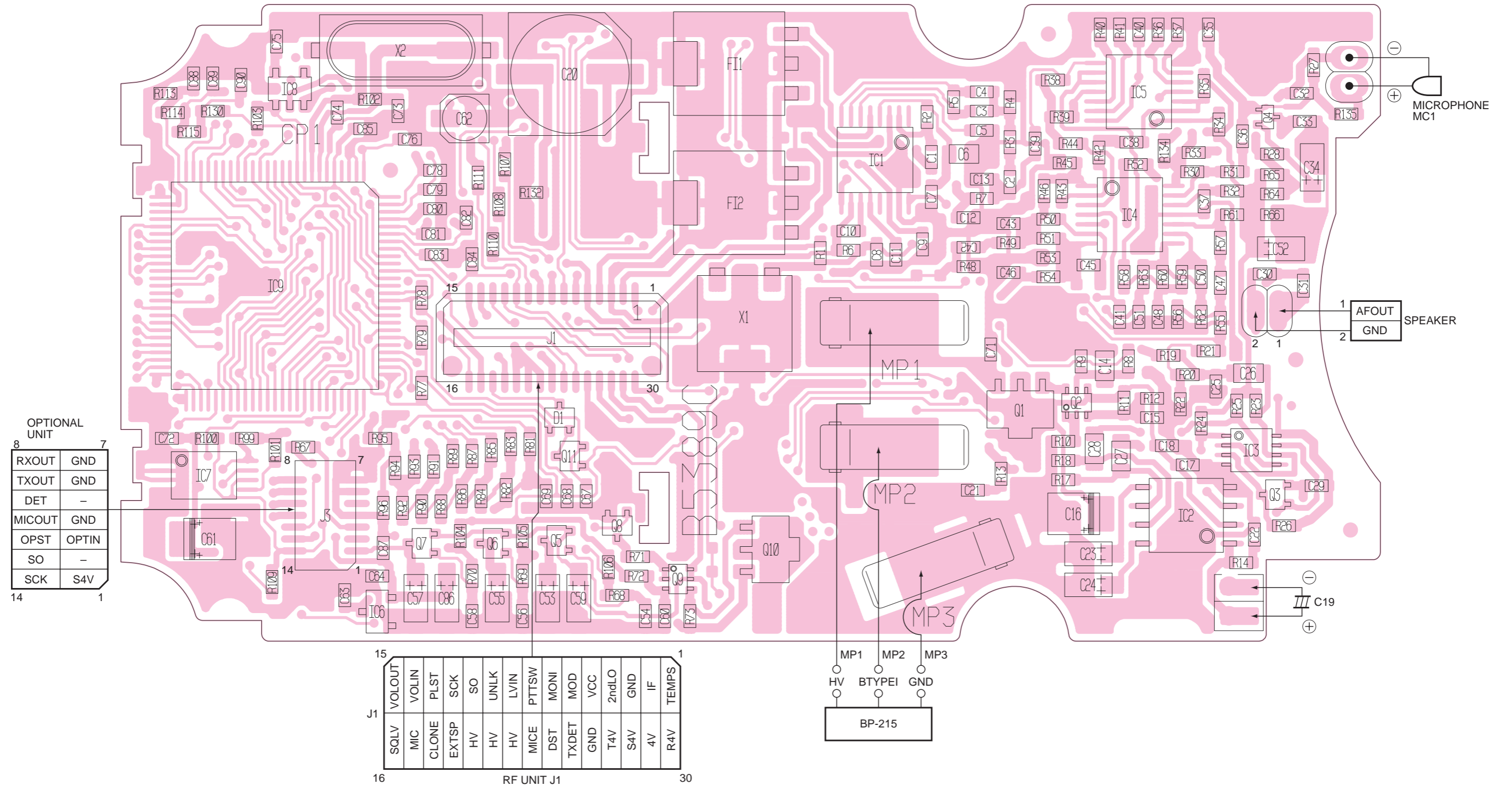
• TOP VIEW

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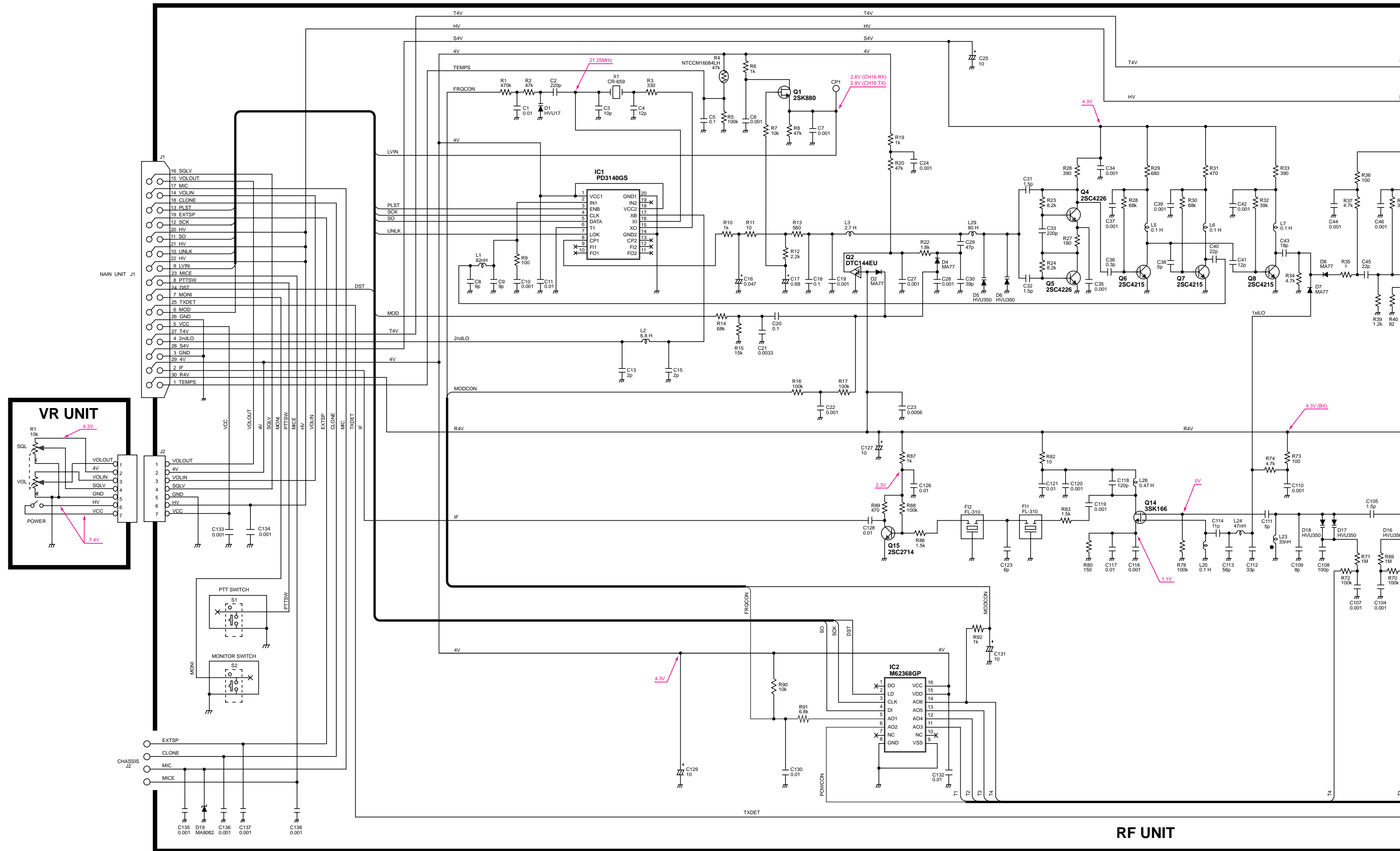


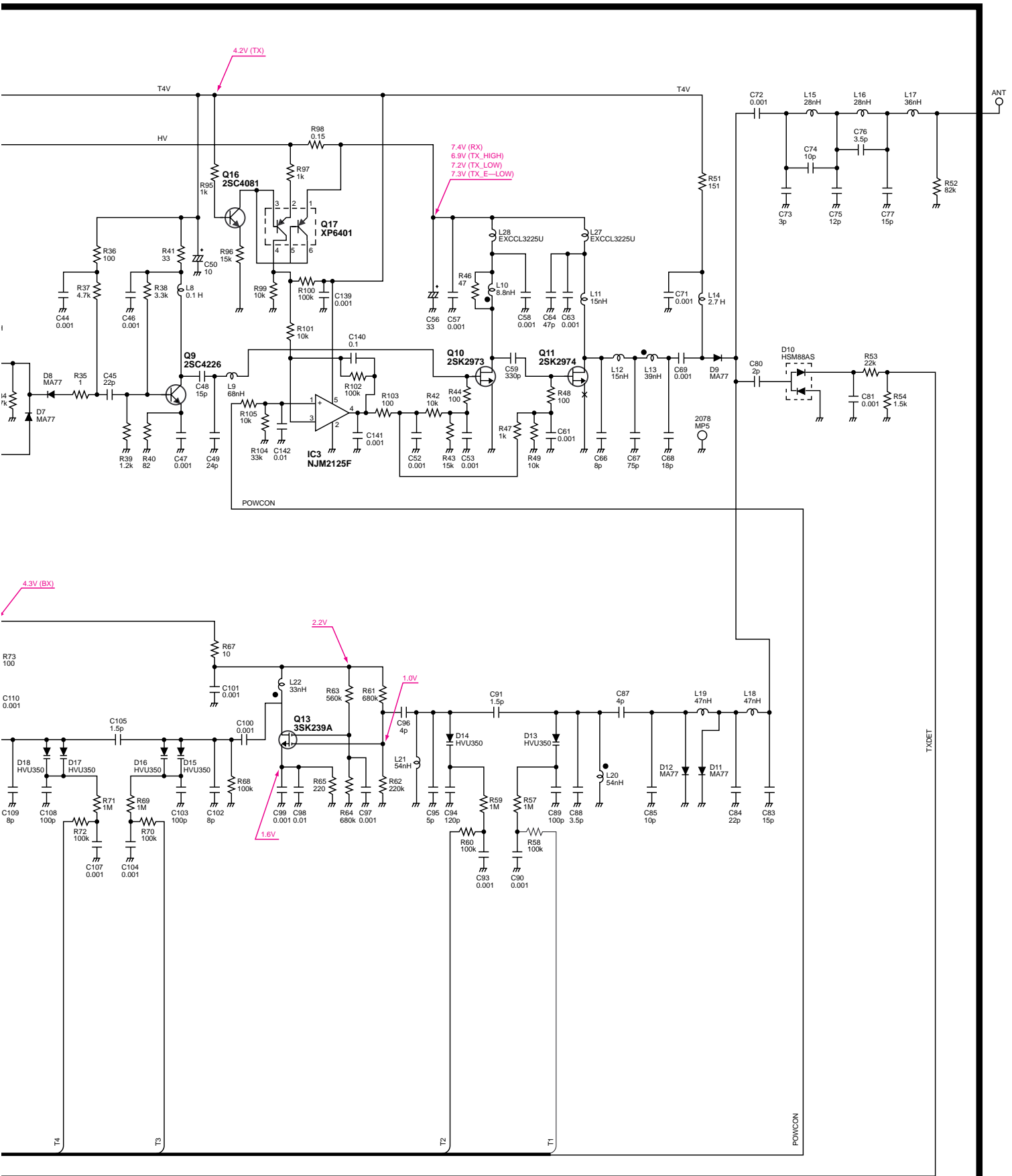
• BOTTOM VIEW

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



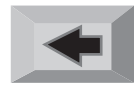
SECTION 11 VOLTAGE DIAGRAM



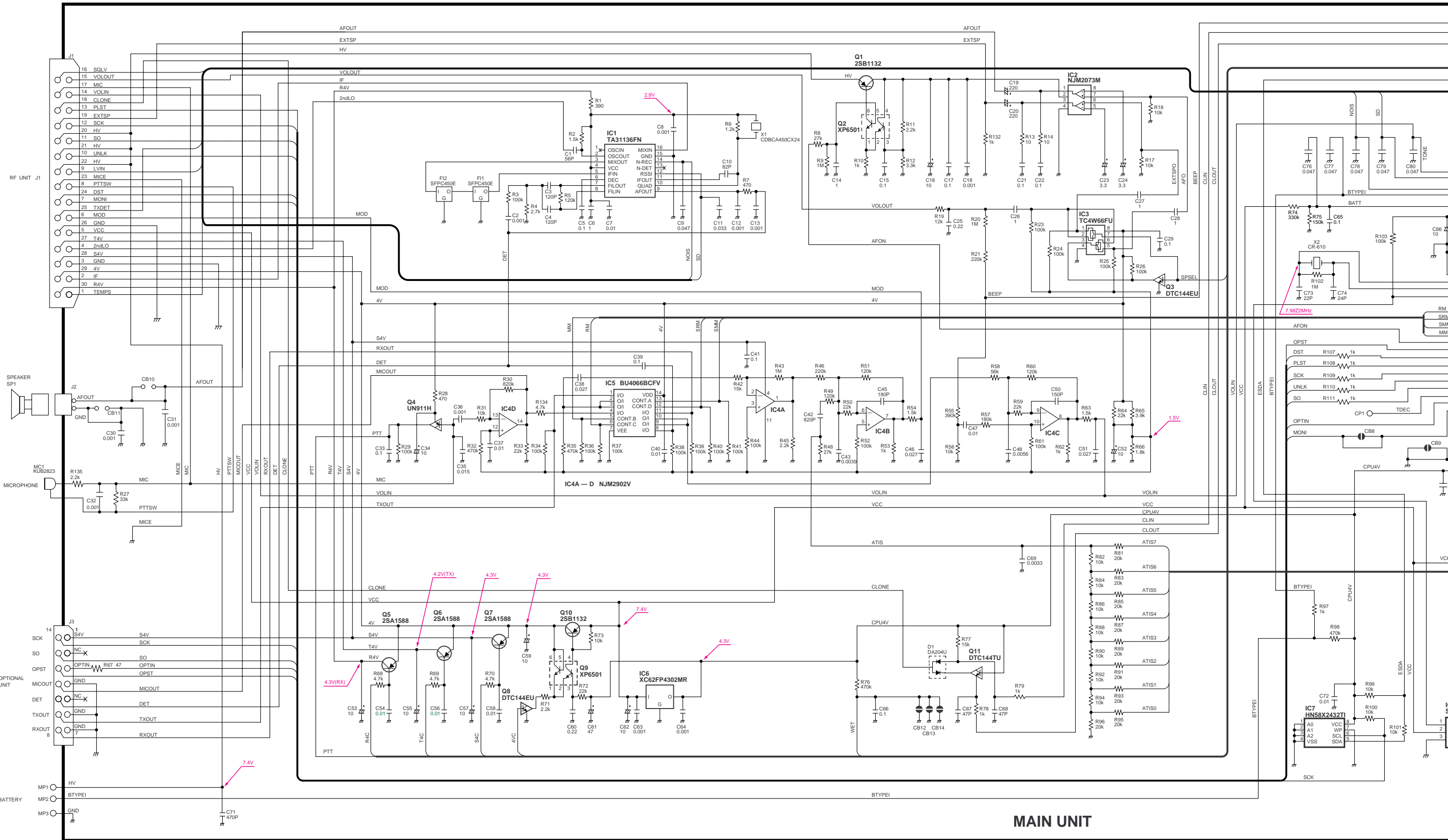


TX/RX

POWCON

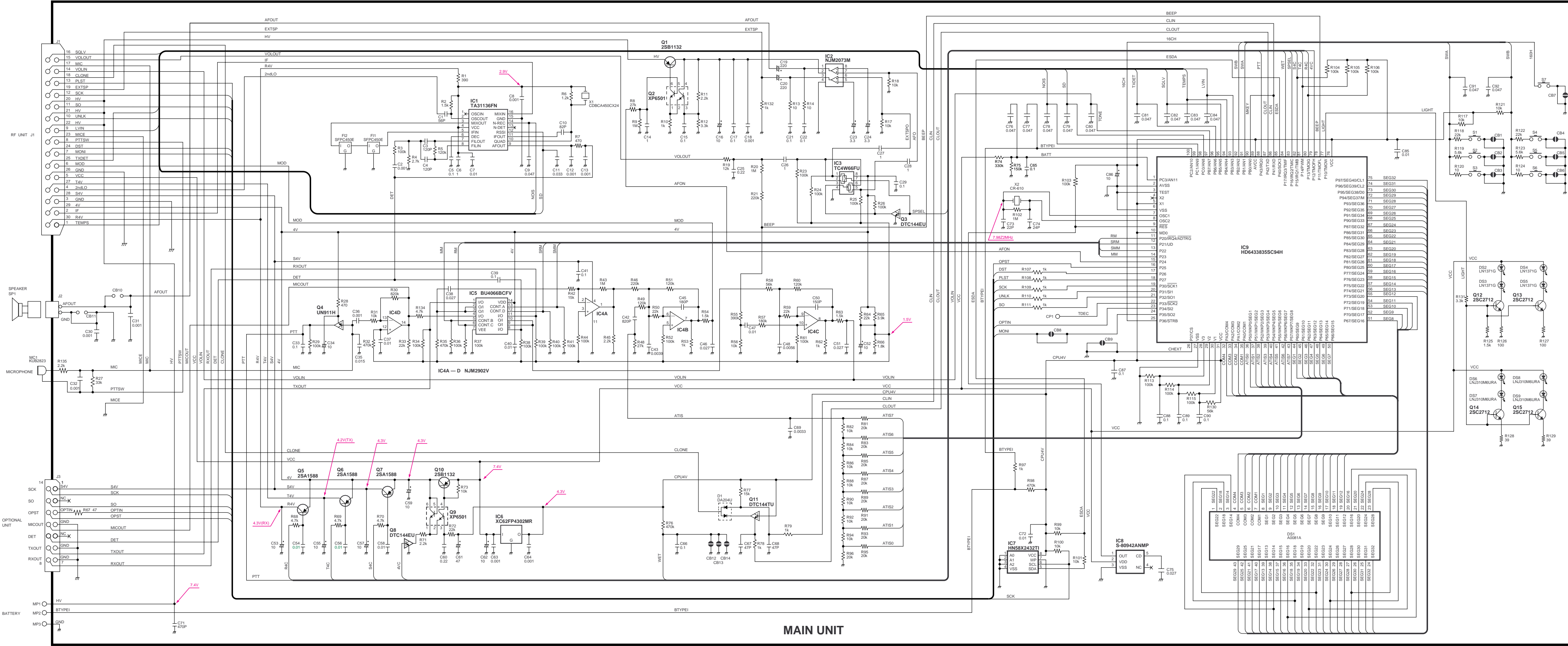


COMPLETE VIEW



MAIN UNIT





LEFT SIDE

MAIN UNIT

RIGHT SIDE

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