ICOM

SERVICE MANUAL

VHF MARINE TRANSCEIVER

IC-M501EURO

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-M501EURO** VHF MARINE TRANSCEIVER at the time of publication

MODEL	VERSION	SYMBOL
IC-M501EURO	Italy	ITA
	United Kingdom	UK
	Europe	EUR
	Holland	HOL
	Germany	FRG

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

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. This will ruin the transceiver.

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

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

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

1110003200 S.IC TA31136FN IC-M501EURO MAIN UNIT 5 pieces
8810006050 Screw Icom screw E7 IC-M501EURO CHASSIS 10 pieces

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

REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 40 dB to 50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

• Frequency coverage	: 156.025–157.425 MHz (Tx) 156.025–162.025 MHz (Rx)
• Mode	: 16K0G3E (FM)
• Usable channels	: All international and USA* channels *availability depending on version
• Power supply requirement	: 13.8 V DC (negative ground)
• Usable temperature range	: –20˚C to +60˚C
• Frequency stability	: ±10 ppm (–20˚C to +60˚C)
• Current drain (at 13.8 V DC)	: Transmit at 25 W 6.0 A Receive max. audio 1.2 A
• Antenna connector	: SO-239 (50 Ω)
• Dimensions (projections not included)	: 165(W)×110(H)×109.4(D) mm
• Weight	: 1130 g

■ TRANSMITTER

• Output power (at 13.8 V DC)	: High 25 W Low 1 W
• Modulation	: Variable reactance frequency modulation
• Maximum frequency deviation	: ±5.0 kHz
• Spurious emissions	: 0.25 µW
• Adjacent channel power	: 70 dB
• Residual modulation	: 40 dB
• Audio harmonic distortion	: Less than 10% at 60% deviation
• Audio frequency response	: +1 dB to –3 dB of 6 dB octave from 300 Hz to 3000 Hz
• Microphone impedance	: 600 Ω

■ RECEIVER

• Receive system	: Double conversion superheterodyne system
• Intermediate frequencies	: 1st 21.7 MHz 2nd 450 kHz
• Sensitivity	: 6 dBµ emf at 20 dB SINAD
• Squelch sensitivity	: –10 dBµ at threshhold
• Adjacent channel selectivity	: 70 dB
• Spurious response	: 70 dB
• Intermodulation rejection ratio	: 68 dB
• Hum and noise	: 40 dB
• Audio output power (at 13.8 V DC)	: 3.5 W typical at 10% distortion with an 4 Ω load
• Audio frequency responce	: +1 dB to –3 dB of –6 dB octave from 300 Hz to 3000 Hz

Specifications are measured in accordance with ETS300-162 2nd Edition

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

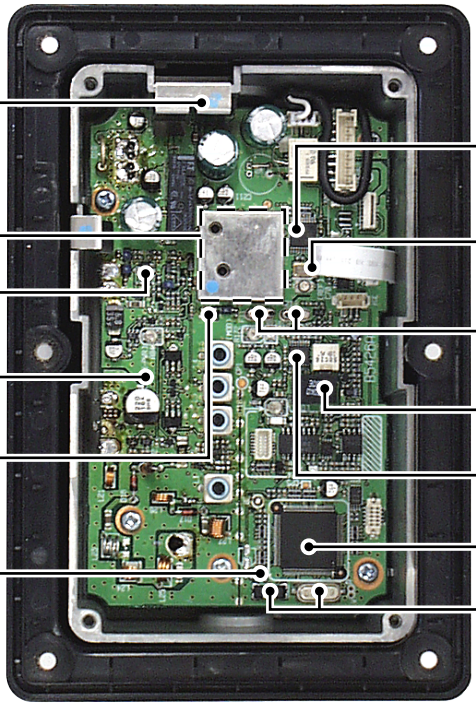
■ VHF MARINE CHANNEL LIST

Channel No.		Frequency (MHz)		Channel No.		Frequency (MHz)		Channel No.		Frequency (MHz)	
USA	INT	Transmit	Receive	USA	INT	Transmit	Receive	USA	INT	Transmit	Receive
	01	156.050	160.650	20	20	157.000	161.600	67*1	67	156.375	156.375
01A		156.050	156.050	20A		157.000	157.000	68	68	156.425	156.425
	02	156.100	160.700		21	157.050	161.650	69	69	156.475	156.475
02A		156.100	156.100	21A		157.050	157.050	70*2	70*2	156.525	156.525
	03	156.150	160.750		22	157.100	161.700	71	71	156.575	156.575
03A		156.150	156.150	22A		157.100	157.100	72	72	156.625	156.625
	04	156.200	160.800		23	157.150	161.750	73	73	156.675	156.675
04A		156.200	156.200	23A		157.150	157.150	74	74	156.725	156.725
	05	156.250	160.850	24	24	157.200	161.800	77	77	156.875	156.875
05A		156.250	156.250	25	25	157.250	161.850		78	156.925	161.525
06	06	156.300	156.300	26	26	157.300	161.900	78A		156.925	156.925
	07	156.350	160.950	27	27	157.350	161.950		79	156.975	161.575
07A		156.350	156.350	28	28	157.400	162.000	79A		156.975	156.975
08	08	156.400	156.400		60	156.025	160.625		80	157.025	161.625
09	09	156.450	156.450	60A		156.025	156.025	80A		157.025	157.025
10	10	156.500	156.500		61	156.075	160.675		81	157.075	161.675
11	11	156.550	156.550	61A		156.075	156.075	81A		157.075	157.075
12	12	156.600	156.600		62	156.125	160.725		82	157.125	161.725
13*1	13	156.650	156.650	62A		156.125	156.125	82A		157.125	157.125
14	14	156.700	156.700		63	156.175	160.775		83	157.175	161.775
15*2	15*1	156.750	156.750	63A		156.175	156.175	83A		157.175	157.175
16	16	156.800	156.800		64	156.225	160.825	84	84	157.225	161.825
17*1	17*1	156.850	156.850	64A		156.225	156.225	85	85	157.275	161.875
	18	156.900	161.500		65	156.275	160.875	86	86	157.325	161.925
18A		156.900	156.900	65A		156.275	156.275	87	87	157.375	161.975
	19	156.950	161.550		66	156.325	160.925	88	88	157.425	162.025
19A		156.950	156.950	66A		156.325	156.325	88A		157.425	157.425

*1 Low power only, *2 Receive only

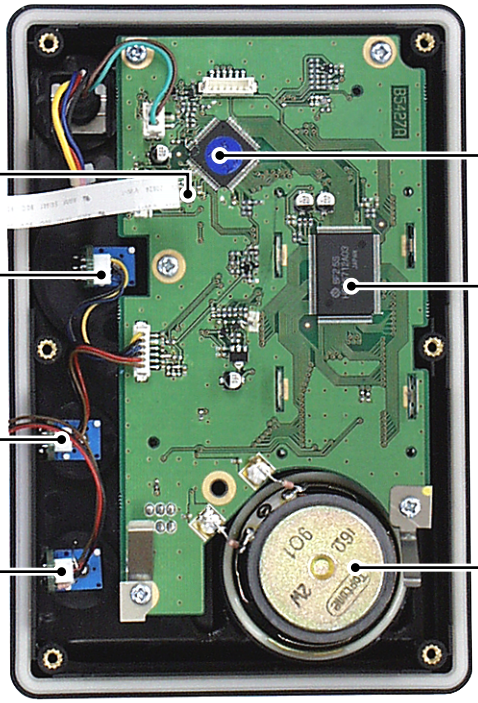
SECTION 2 INSIDE VIEWS

• MAIN UNIT



* Located under side of the point

• LOGIC UNIT



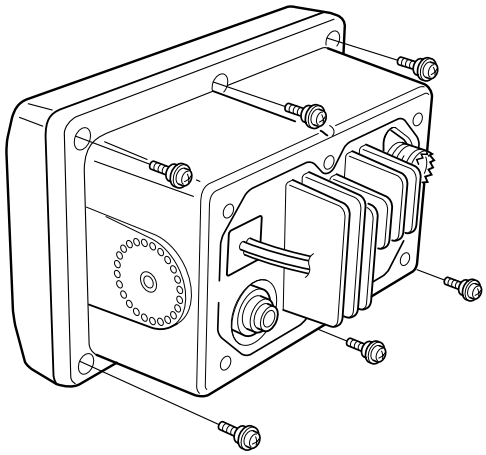
SECTION 3 OPTIONAL UNIT INSTALLATION

CAUTION: DISCONNECT the DC power cable from the transceiver before performing any work on the transceiver. Otherwise, there is danger of electric shock and/or equipment damage.

• Opening the transceiver case

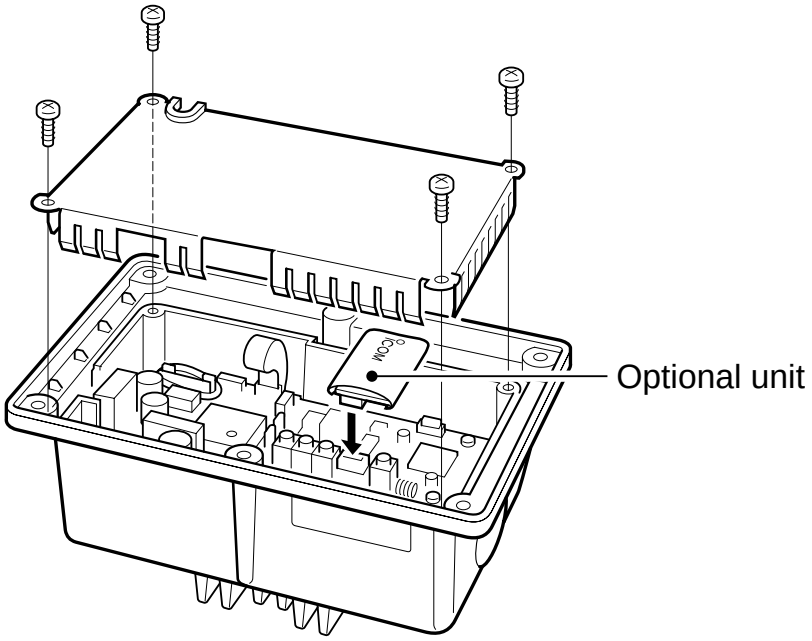
Follow the case opening procedure shown here when you want to install an optional unit, etc.

① Remove the 6 screws as shown below and open the transceiver.



② Remove the 4 screws from the shielding plate, then lift up the shielding plate.

③ Plug an optional unit to J6 on the MAIN unit as shown below.



④ Return the shielding plate and assemble the units to their original positions.

SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT

The antenna switching circuit functions as a low-pass filter while receiving and as resonator circuit while transmitting. The circuit does not allow transmit signals to enter receiver circuits.

Received signals enter the MAIN unit from the antenna connector and pass through the low-pass filter (L23–L25, C134, C136–C139). The signals are then applied to the RF circuit via the antenna switching circuit (D17, L26, L27, C141–C143).

4-1-2 RF CIRCUIT

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

The signals from the antenna switching circuit pass through a tunable bandpass filter (D1, L1, C2–C4) where the object signals are led to the RF amplifier circuit (Q2).

The amplified signals at Q2 are applied to the 3-stage tunable bandpass filter (D2–D4, L2–L4, C13, C14, C16–C18, C20–C24) to suppress unwanted signals and improve the selectivity. The signals are then applied to the 1st mixer circuit.

D1–D4 employ varactor diodes, that are controlled by the PLL lock voltage, to track the band pass filters.

4-1-3 1ST MIXER AND 1ST IF CIRCUITS

The 1st mixer circuit converts the received signal to a fixed frequency of the 1st IF signal with a 1st LO (VCO output) frequency. By changing the 1st LO frequency, only the desired frequency will pass through a pair of crystal filters at the next stage of the mixer.

The signals from the RF circuit are mixed with the VCO signals at the 1st mixer circuit (Q3) to produce a 21.7 MHz 1st IF signal.

The 1st IF signal is applied to a pair of crystal filters (FI1, FI2) to suppress out-of-band signals and is then amplified at the IF amplifier (Q4). The amplified signal is applied to the 2nd mixer circuit (IC1).

4-1-4 2ND IF AND DEMODULATOR CIRCUITS

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

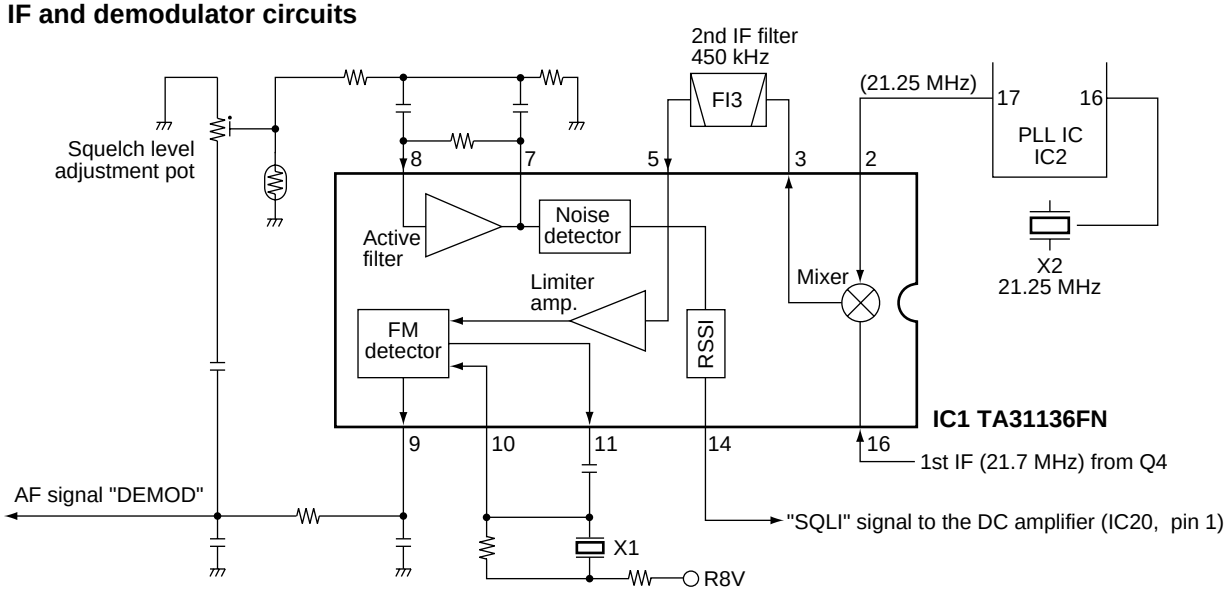
The FM IF IC (IC1) contains the 2nd local oscillator, 2nd mixer, limiter amplifier, quadrature detector, and noise detector circuits, etc.

The 1st IF signal from Q4 is applied to the 2nd mixer section of IC1 (pin 16), and is mixed with a 21.25 MHz 2nd LO signal generated at the PLL circuit using the reference frequency (21.25 MHz) to produce a 450 kHz 2nd IF signal.

The 2nd IF signal from IC1 (pin 3) is passed through the ceramic filter (FI3), where unwanted signals are suppressed, and is then applied to the 2nd IF (limiter) amplifier in IC1 (pin 5). The signal is applied to the FM detector section in IC1 for demodulation into AF signals.

The FM detector circuit employs a quadrature detection method (linear phase detection), which uses a ceramic discriminator (X1) for phase delay to obtain a non-adjusting circuit. The detected signal from IC1 (pin 9) is applied to the AF circuit.

• 2nd IF and demodulator circuits



4-1-5 AF AMPLIFIER CIRCUIT

The AF amplifier circuit amplifies the detected signals to drive a speaker. The AF circuit includes an AF mute circuit for the squelch.

AF signals from IC1 (pin 9) are passed through the analog switch (IC12, pins 10, 11), and are applied to the de-emphasis circuit (R118, C182). The de-emphasis circuit is an integrated circuit with frequency characteristic of –6 dB/octave.

The integrated signals are applied to the active filters (Q24, Q25). Q24 functions as a high-pass filter to suppress unwanted lower noise signals and Q25 functions as a low-pass filter to suppress higher noise signals.

The filtered signals are passed through the [VOLUME] control, and are then applied to the AF power amplifier (IC14, pin 1). The output signal from IC14 (pin 4) drives the internal (external) speaker.

4-1-6 SQUELCH CIRCUIT

A 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) pass through the squelch adjustment pot (R33), and are then 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 pin 14 as the “SQLI” signal. The “SQLI” signal is amplified at the DC amplifier (IC20) and applied to the CPU (IC16, pin 39) as the “SQL” signal. The CPU analyzes the noise condition and outputs the “RMUTM”, “RMUTS” signals to toggle the AF mute switches (Q26, Q27).

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER CIRCUIT

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

The AF signals from the microphone are amplified at the microphone amplifier (IC11a) via the analog switch (IC10, pins 11, 10). A capacitor (C214) and resistor (R147) are connected to the amplifier to obtain the pre-emphasis characteristics.

The amplified signals are applied to the IDC amplifier (IC13a, pin 2) via the analog switch (IC12, pins 8, 9 and pins 4, 3) and are passed through the splatter filter (IC13b) to suppress unwanted 3 kHz or higher signals. The filtered signals are then applied to the modulation circuit.

4-2-2 MODULATION CIRCUIT

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

Audio signals from the splatter filter (IC13b) pass through the frequency deviation adjustment pot (R172) and are then applied to the modulation circuit (D8) to change the reactance of D8, and modulate the oscillated signal at the TX-VCO (Q7).

4-2-3 DRIVE AMPLIFIER CIRCUIT

The drive amplifier circuit amplifies the VCO oscillating signal to a level needed at the power amplifier.

The VCO output is buffer-amplified by Q9 and Q10, and is then applied to the Tx/Rx switch (D12). The transmit signal from the Tx/Rx switch is amplified to the pre-drive (Q11) and drive (Q12) amplifiers to obtain an approximate 200 mW signal level. The amplified signal is then applied to the RF power amplifier (IC3).

4-2-4 POWER AMPLIFIER CIRCUIT

The power amplifier circuit amplifies the driver signal to an output power level.

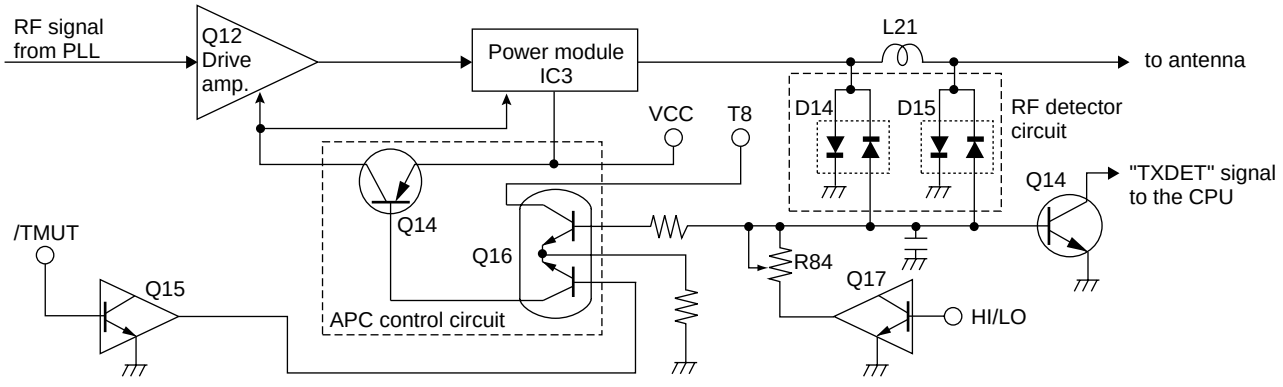
IC3 is a power module which has amplification output capabilities of about 35 W with 300 mW input. The output from IC3 (pin 4) is passed through the antenna switching circuit (D16) and is then applied to the antenna connector via the low-pass filter.

4-2-5 APC CIRCUIT

The APC circuit stabilizes transmit output power.

The RF output signal from the power amplifier (IC3) is detected at the power detector circuit (D14, D15, L21) and is then applied to one of the differential amplifier inputs (Q16, pin 5) via the High/Low control circuit (R84, Q17). The applied voltage controls the differential amplifier output (Q16, pin 2) and the bias voltage control (Q14). Thus the APC circuit maintains a constant output power.

• APC circuit



4-3 PLL CIRCUITS

4-3-1 GENERAL

The PLL circuit provides stable oscillation of the transmit frequency and receive 1st LO frequency. The PLL circuit compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by a crystal oscillator and the divided ratio of the programmable divider.

IC2 is a dual PLL IC which controls both VCO circuits for Tx and Rx, and contains a prescaler, programmable counter, programmable divider phase detector, charge pomp and etc.

The PLL circuit, using a one chip PLL IC (IC2), directly generates the transmit frequency and receive 1st IF frequency with VCOs. The PLL sets the divided ratio based on serial data from the CPU and compares the phases of VCO signals with the reference oscillator frequency. The PLL IC detects the out-of-step phase and output from pins 8 and 13 for Tx and Rx, respectively. The reference frequency (21.25 MHz) is oscillated at X2.

4-3-2 TX LOOP

The generated signal at the TX-VCO (Q7, D6–D8) enters the PLL IC (IC2, pin 2) and is divided at the programmable divider section and is then applied to the phase detector section.

The phase detector compares the input signal with a reference frequency, and then outputs the out-of-phase signal (pulse-type signal) from pin 8.

The pulse-type signal is converted into DC voltage (lock voltage) at the loop filter (R252–R254, C292–C294), and is then applied to varactor diodes (D6, D7) of the TX-VCO to stabilize the oscillated frequency.

4-3-3 RX LOOP

The generated signal at the RX-VCO (Q8, D9, D10) enters the PLL IC (IC2, pin 19) and is divided at the programmable divider section and is then applied to the phase detector section.

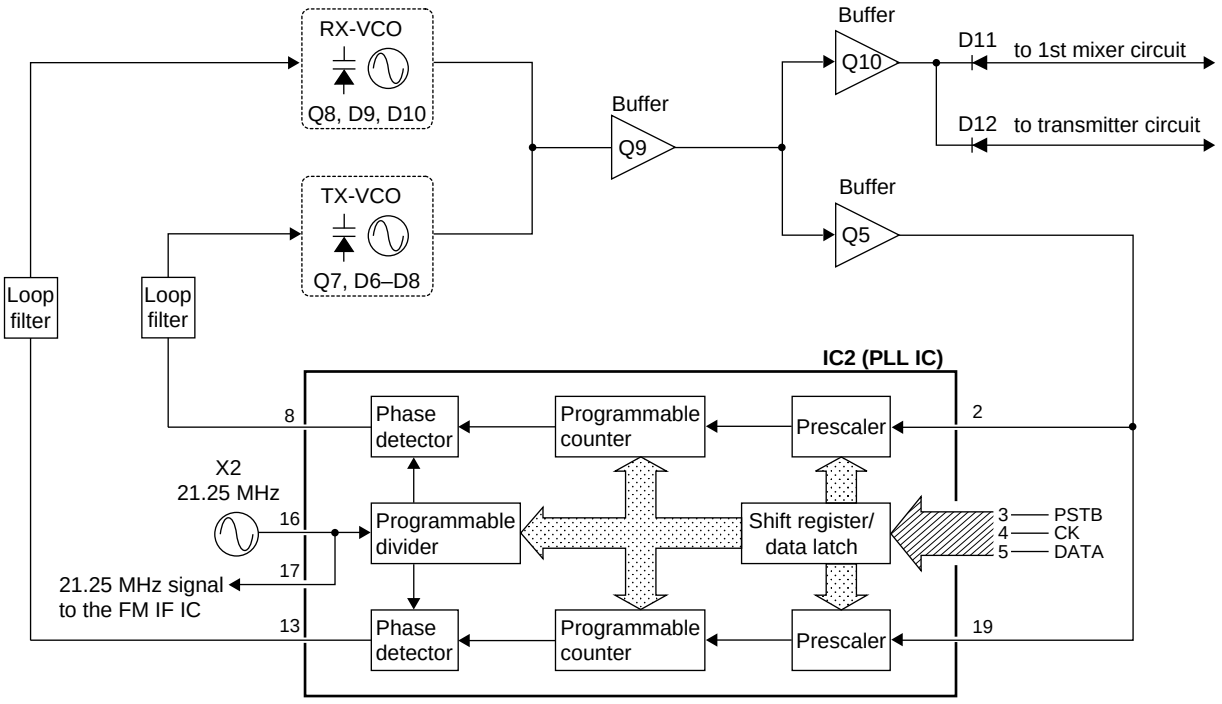
The phase detector compares the input signal with a reference frequency, and then outputs the out-of-phase signal (pulse-type signal) from pin 13.

The pulse-type signal is converted into DC voltage (lock voltage) at the loop filter (R255–R257, C295, C296), and is then applied to varactor diodes (D9, D10) of the RX-VCO to stabilize the oscillated frequency. The lock voltage is also used for the receiver circuit for the bandpass filter center frequency. The lock voltage from the loop filter is amplified at the buffer-amplifier (Q6) and then applied to the RF circuit.

4-3-4 VCO CIRCUIT

The VCO outputs from TX-VCO (Q7) and RX-VCO (Q8) are amplified at the buffer amplifiers (Q9 and Q10), and are then sent to the Tx/Rx switch (D11, D12). The receive LO signal is applied to the 1st mixer circuit (Q3) through a low-pass filter, and the transmit signal is applied to the pre-drive amplifier (Q11). A portion of the VCO output is reapplied to the PLL IC (IC2, pin 2 or pin 13) via the buffer amplifier (Q5).

• PLL circuit



4-4 DSC CIRCUITS (DSC UNIT)

4-4-1 DATA INTERFACE CIRCUIT

The control signals from DS-100 CLASS D/DSC TERMINAL are shaped waveform at the SCHMITT circuit (IC3) via the photo-coupler (IC2), and are then applied to the MAIN unit via J2 (pin 11).

4-4-2 DSC MODULATION CIRCUT

The modulation signals from DS-100 are converted into a 600 Ω impedance at T1 and passed through the high-pass filter (IC1a) with +6 dB/octave characteristics.

The signals from the high-pass filter (IC1a) are passed through the splatter filter (IC1b) to suppress unwanted 3 kHz or higher signals. The filtered signals are then applied to the TX modulation circuit via the buffer amplifier (Q30) and analog switch (IC12, pins 1, 2) on the MAIN unit as a DSC modulation signal.

4-5 POWER SUPPLY CIRCUITS

4-5-1 VOLTAGE LINE (MAIN UNIT)

LINE	DESCRIPTION
HV	The voltage from the connected DC power supply.
HVS	Same voltage as the HV line which is passed through the [PWR] switch (LOGIC unit; S1).
VCC	Same voltage as the HVS line which is passed through the power controller (RL1).
8V	Common 8 V converted from the VCC line at the 8V regulator circuit (IC8).
A5V	Common 5 V converted from the 8V line at the analog 5V regulator circuit (IC9).
D5V	Common 5 V converted from the 8V line at the digital 5V regulator circuit (IC7).
T8	Transmit 8 V controlled by the T8 control circuit (Q20, Q21) using the SEND signal from CPU.
R8	Receive 8 V controlled by the R8 control circuit (Q22, Q23) using the RCV signal from CPU. The controlled voltage is applied to the receiver circuits.

4-6 LOGIC CIRCUITS

4-6-1 MAIN UNIT

• MPU

IC16 is a 16 bit multifunction micro-computer and contains FLASH memory, serial I/O, timer, A/D converter, D/A converter, programmable I/O, ROM and RAM.

• SYSTEM CLOCK CIRCUIT

X3, X4 are crystal oscillators and oscillate 7.9872 MHz and 32.768 kHz system clocks for the MPU (IC16) respectively.

• RESET CIRCUIT

IC15 is a reset IC. When turn power ON, IC15 outputs a reset signal (“LOW” pulse) to MPU (IC16, pin 75).

• LOW BATTERY DETECTOR

VCC voltage is divided by R204, R205 and is applied to the low battery detector section in the MPU (IC16, pin 42).

4-6-2 LOGIC UNIT

• CPU

IC1 is an 8 bit single chip micro-computer and contains LCD driver, serial I/O, timer, A/D converter, programmable I/O, ROM and RAM.

• SYSTEM CLOCK CIRCUIT

X1 is a ceramic oscillator and oscillates a 4.91 MHz system clock for the CPU (IC1).

• LCD DRIVER

IC2 is a LCD driver for a dot matrix LCD.

• DIMMER CIRCUIT

CPU (IC1) and Q2, Q3, Q8 are dimmer circuit and control the LCD backlight (LED).

• CONTRAST CIRCUIT

CPU (IC1) and Q1, Q4 are contrast circuit and control the 8 step display contrast.

4-7 PORT ALLOCATIONS

4-7-1 SUB CPU (LOGIC unit; IC1)

Pin number	Port name	Description
27, 28, 29, 30	LRESET, E, RW, RS	Output ports for the LCD driver (IC2) control signals.
31–38	DB7–DB0	I/O port for the LCD driver (IC2) control signals.
42	SCAN	Input port for the [SCAN] key.
43	CHWX	Input port for the [DIAL] key.
44	CH16	Input port for the [CALL] key.
46	SQLV	Input port for the squelch volume level.
47	KEYM	Input port from the microphone (HM-126) for remote control signal
51, 52	DIALA, DIALB	Input ports for the [CHANNEL].
54	SRXD	Outputs communication data for main CPU (MAIN unit; IC16).
55	STXD	Input port for the communication data from main CPU (MIAN unit; IC16).
58–60	CONTSEG3–CONTSEG1	Output port for the LCD contrast.
61	DTRS	Input port for the [16] key.
62	IC	Input port for the [DIMMER] key.
63	DSC	Input port for the [DUAL] key.
64	HL	Input port for the [HI/LO] key.
75–77	DIM3–DIM1	Output LCD backlight control signal for the dimmer circuit (Q2, Q3, Q8).
78–80	CONDOT3–CONDOT1	Output port for the LCD contrast.

4-7-2 MAIN CPU (MAIN unit; IC17)

Pin number	Port name	Description
1	STRU	Outputs control signal to the analog switch (IC12) for passing through the optional VOICE SCRAMBLER unit (UT98 or UT-112).
2	SCON	Outputs ON/OFF control signal for the optional VOICE SCRAMBLER unit (UT-98 or UT-112).
3	OPSTB	Outputs strobe signals for the optional VOICE SCRAMBLER unit UT-98 or UT-112.
4	PSTB	Outputs strobe signals to PLL IC (IC2, pin 2).
5	CK	Outputs clock signal to PLL IC (IC2, pin 3).
6	DATA	Outputs clock signal to PLL IC (IC2, pin 4).
7	PTTM	Outputs main microphone (HM-126) select signal to the analog switch (IC10) while intercom operation.
8	PTTS	Outputs optional remote microphone (HM-127) select signal to the analog switch (IC10) while intercom operation.
10	MMUTE	Outputs select signal for the speaker of main microphone (HM-126) to the analog switch (IC10) while intercom operation.
11	SMUTE	Outputs select signal for the speaker of optional remote microphone (HM-127) to the analog switch (IC10) while intercom operation.
12	SP	Outputs ON/OFF control signal for the internal speaker to the AF mute circuit (Q32, D23, RL2). Low : While internal speaker is ON.
13	HI/LO	Output port for RF output power (High or Low) select signal. Low : While low power is selected.
14	SEND	Outputs the T8 regulator (Q20, Q21) control signal. Low : While transmitting
15	TMUTE	Outputs transmit mute signal. High : While transmitting
16	SRXD	Input port for the communication data from sub CPU (LOGIC unit; IC1).
17	STXD	Outputs communication data for sub CPU (LOGIC unit; IC1).
19	CLRX	Input port for the cloning data from the buffer (D24).
20	CLTX	Output port for the cloning data to the buffer (MAIN unit; Q37).
23	ECK	Outputs clock signal for EEPROM (IC17).
24	EDA	Outputs serial data signal for EEP-ROM (IC17).
27	MICDSC	Outputs select signal to the analog switch (IC12) for the microphone audio signal or DSC signal.
30	DSC	D/A output port for the ATIS/DSC encode signal to the buffer amplifier (Q33).
39	SQL	Input port from the FM IF IC (IC1) for the squelch operation.
42	LBAT	Input port for the connected power supply voltage detection (low battery indicator).
44	TXDET	Input port for the “TX” indicator from the power detector circuit (D14, D15).
45	DSDEC	Input port for the ATIS/DSC decode signal.
46	UNLK	Input port for the PLL unlock signal. Low : While PLL is locked.
57	DATAS	Input port for the communication data from DS-100 via the DSC connector (DSC unit; J1), photo coupler (DSC unit; IC2) and buffer amplifier (DSC unit; IC3).
58	DATAM	Outputs the communication data to DS-100 via the buffer amplifier (DSC unit; Q1, Q2, D4).
60	PTT	Input port for the PTT switch.
61	HANG	Input port for the microphone hanger detection signal. Low : Microphone on hook
62	OPTIN	Input port for the optional unit connection detection.
66	RCV	Outputs the R8 regulator (Q22, Q23) control signal. Low : While receiving
67	RMUTM	Outputs the AF mute switch (Q26) control signal for main body. Low : While squelched
68	RMUTS	Outputs the AF mute switch (Q27) control signal for the optional remote microphone (HM-127). Low : While squelched
69	BEEPM	Outputs beep audio for main body.
71	BPLVM	Outputs beep audio for the optional remote microphone (HM-127).
75	RESET	Input port for the reset signal.
100	SRESET	Outputs the reset signal for sub CPU (LOGIC unit; IC1).

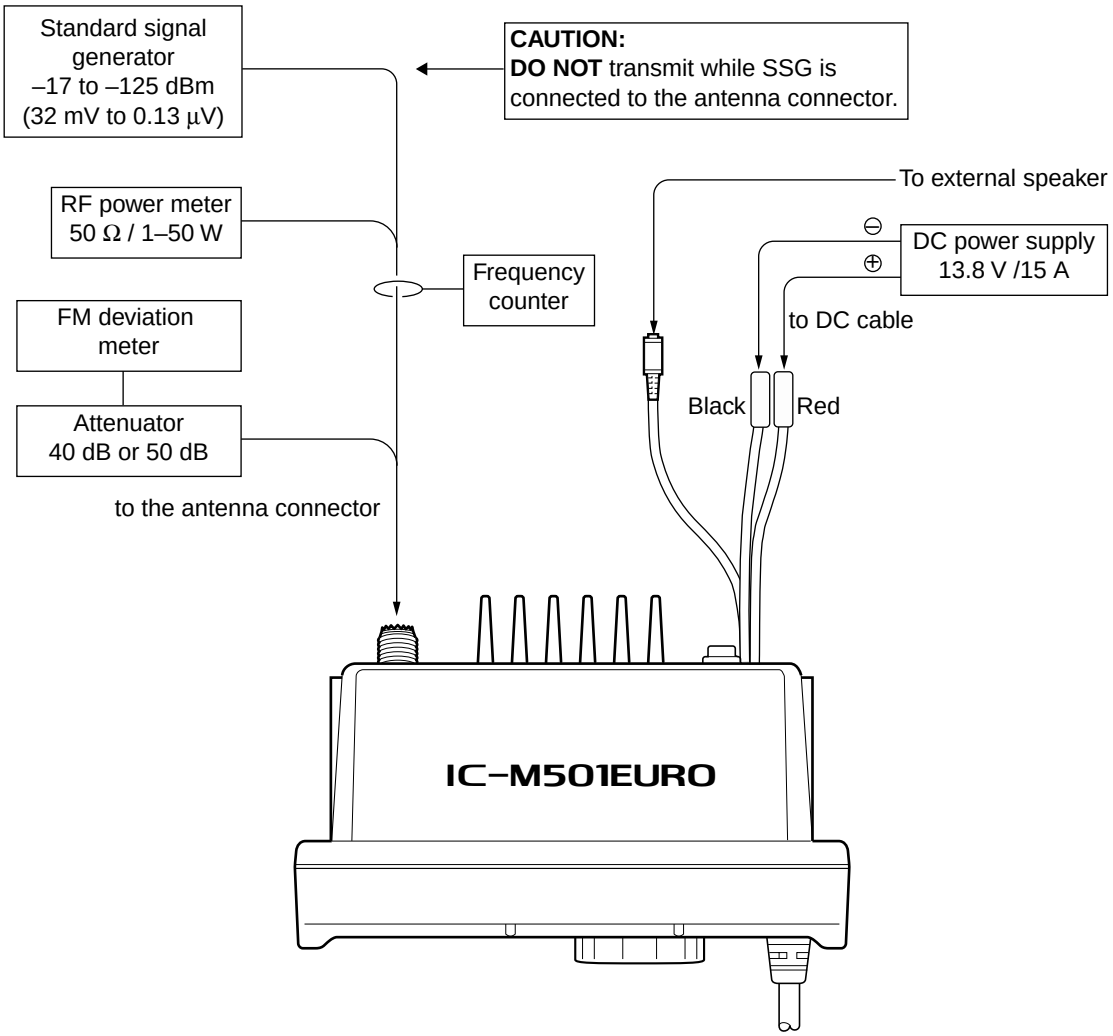
SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 13.8 V DC Current capacity : 10 A or more	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 1–50 W Frequency range : 100–300 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–300 MHz Output level : 0.1 µV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–300 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
FM deviation meter	Frequency range : 30–300 MHz Measuring range : 0 to ±10 kHz	AC millivoltmeter	Measuring range : 10 mV–10 V
DC voltmeter	Input impedance : 50 kΩ/V DC or better	External speaker	Input impedance : 4 Ω Capacity : 5 W or more
		Attenuator	Power attenuation : 50 or 60 dB Capacity : 50 W or more

■ CONNECTIONS



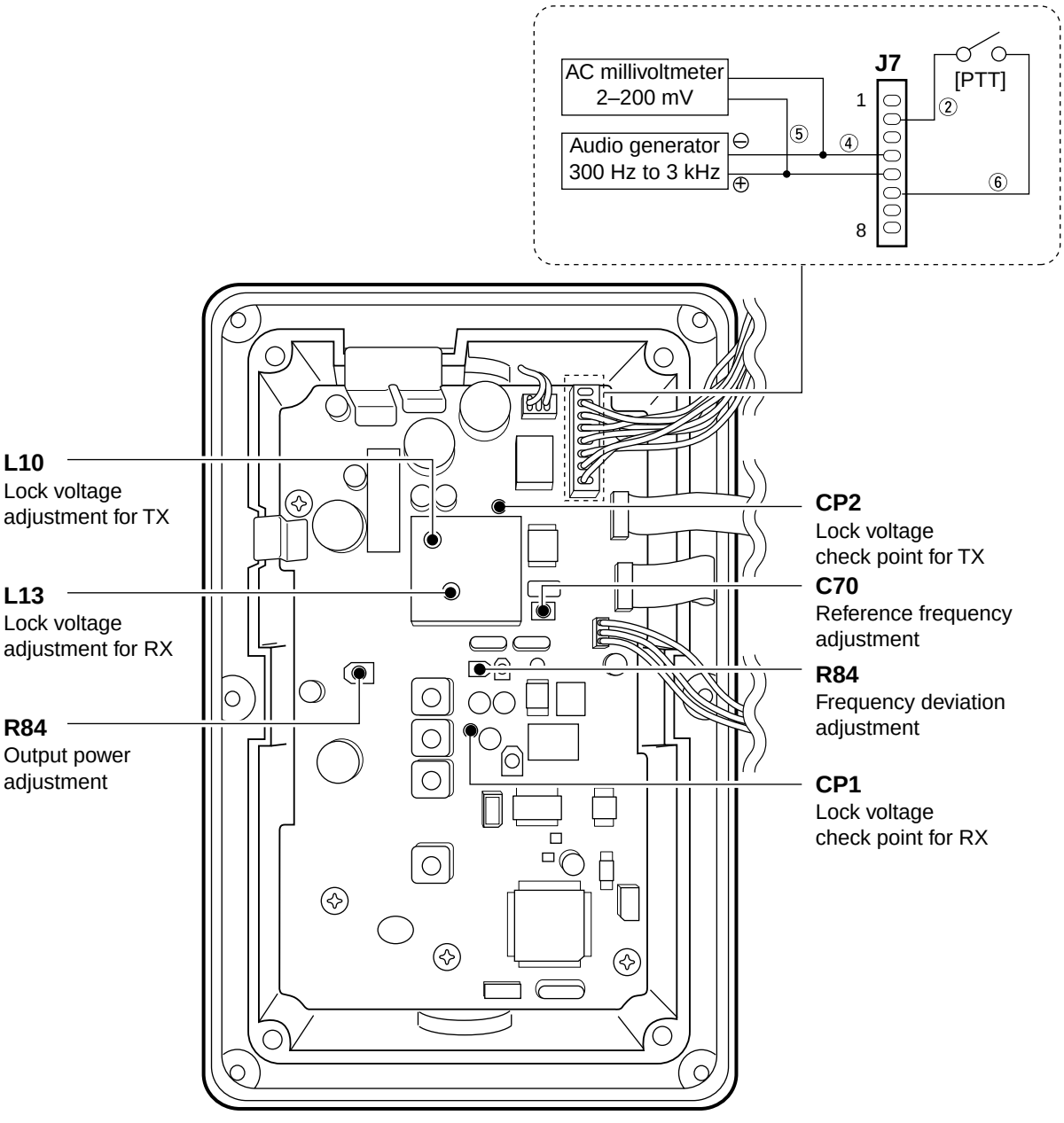
5-2 PLL ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
LOCK VOLTAGE	1	• Operating channel : ch16 • Receiving	MAIN	Connect a digital multi-meter or oscilloscope to check point CP1.	2.5 V	MAIN	L13
	2	• Operating channel : ch116 • Receiving			3.4–4.1 V		Verify
	3	• Operating channel : ch16 • Output power : Low • Transmitting		Connect a digital multi-meter or oscilloscope to check point CP2.	2.8 V		L10
	4	• Operating channel : ch116 • Output power : Low • Transmitting			2.5–3.5 V		Verify
REFERENCE FREQUENCY	1	• Operating channel : ch16 • Output power : Low • Connect an RF power meter or a 50 Ω dummy load to the antenna connector. • Transmitting	Rear Panel	Loosely couple the frequency counter to the antenna connector.	156.8000 MHz	MAIN	C70

5-3 TRANSMITTER ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1	• Operating channel : ch16 • Output power : High • Transmitting	Rear Panel	Connect an RF power meter to the antenna connector.	25 W	MAIN	R84
FREQUENCY DEVIATION	1	• Operating channel : ch16 • Output power : Low • Connect an audio generator to J7 (pin 5) with an AC millivoltmeter and set as: Frequency : 1 kHz Level : 30 mV • Set an FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting	Rear Panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.3 kHz	MAIN	R172

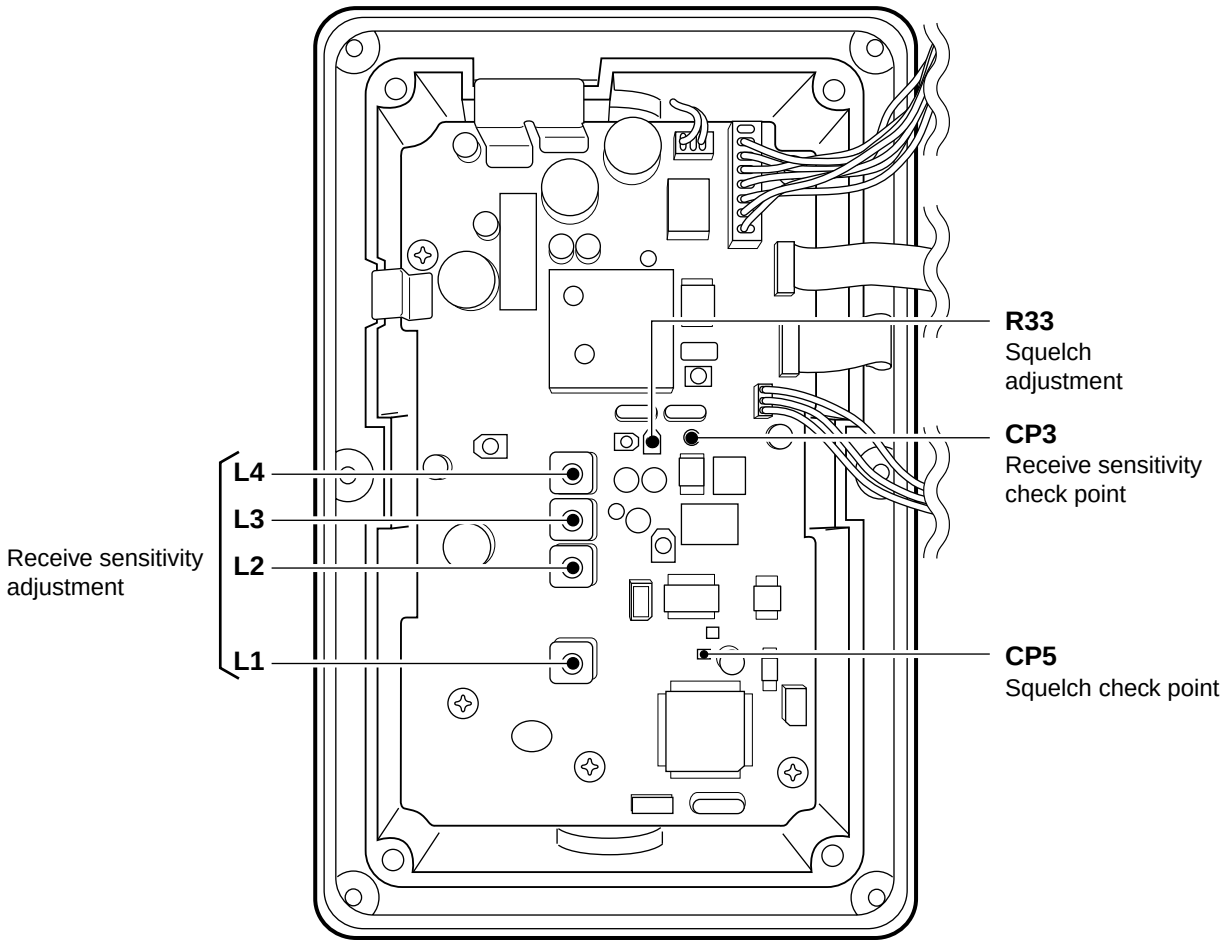
*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.


AC millivoltmeter
2–200 mV
Audio generator
300 Hz to 3 kHz
J7
1
8
[PTT]
⑤
④
②
⑥
L10
Lock voltage
adjustment for TX
L13
Lock voltage
adjustment for RX
R84
Output power
adjustment
CP2
Lock voltage
check point for TX
C70
Reference frequency
adjustment
R84
Frequency deviation
adjustment
CP1
Lock voltage
check point for RX

5-4 RECEIVER ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	1	• Operating channel : ch16 • [SQUELCH] control: Max. counterclockwise • Set the internal speaker OFF in the SET mode, and connect a distortion meter with a 4 Ω load to [EXT SP] receptacle. • Connect an SSG to the antenna connector and set as: Frequency : 156.800 MHz Level : 10 µV* (–97 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	MAIN	Connect a DC voltmeter to check point CP3.	Maximum voltage	MAIN	L1, L2, L3, L4
SQUELCH	1	• Operating channel : ch16 • [SQUELCH] control: Max. counterclockwise • Connect an SSG to the antenna connector and set as: Frequency : 156.800 MHz Level : 0.18 µV* (–122 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	MAIN	Connect a DC voltmeter to check point CP5.	2 V	MAIN	R33

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


R33
Squelch
adjustment
CP3
Receive sensitivity
check point
L4
L3
L2
L1
Receive sensitivity
adjustment
CP5
Squelch check point

SECTION 6 PARTS LIST

6-1 IC-M501EURO

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1140008670	S.IC	µPD78F9418AGK-9EU
IC2	1140008960	S.IC	HD66712SA03FS
Q1	1560000810	S.FET	2SK1069-4-TL
Q2	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q3	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q4	1560000810	S.FET	2SK1069-4-TL
Q5	1590000720	S.TRANSISTOR	DTA144EUA T106
Q6	1590000430	S.TRANSISTOR	DTC144EUA T106
Q8	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
D1	1790001010	S.ZENER	MA8043-L (TX)
X1	6060000630	S.CERAMIC	PBRC 4.91 BR
R1	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R2	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R3	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R6	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R7	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R8	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R9	7510001150	S.THERMISTOR	NTCCM1608 4BH 103KC
R10	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R11	7030004120	S.RESISTOR	ERJ3GEYJ 203 V (20 kΩ)
R12	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R13	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R14	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R15	7030004120	S.RESISTOR	ERJ3GEYJ 203 V (20 kΩ)
R16	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R17	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R18	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R19	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R20	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R22	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R23	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R24	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R25	7510001150	S.THERMISTOR	NTCCM1608 4BH 103KC
R26	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R27	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R28	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R29	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R30	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R31	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R32	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R33	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R34	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R35	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R36	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R37	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R38	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R41	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R42	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R43	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R44	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R45	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R46	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R47	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R48	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R49	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R50	7030003750	S.RESISTOR	ERJ3GEYJ 394 V (390 kΩ)
R51	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R52	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R53	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R54	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R55	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R56	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R64	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R65	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R66	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R67	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R68	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R69	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R70	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
C1	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C4	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C5	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C7	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C8	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C9	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C11	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C12	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C13	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C14	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C15	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C16	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C17	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C18	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C19	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C20	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C21	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C22	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C23	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C24	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C25	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
J1	6510021600	S.CONNECTOR	S2B-PH-SM3-TB
J2	6510021440	S.CONNECTOR	B6B-ZR-SM3-TF
J3	6510021440	S.CONNECTOR	B6B-ZR-SM3-TF
J4	6510022020	S.CONNECTOR	14FLT-SM1-TB
DS1	5030001880	LCD	TSD0393-UFFDCW
DS2	5040002310	S.LED	SML-311YTT86
DS3	5040002310	S.LED	SML-311YTT86
DS4	5040002310	S.LED	SML-311YTT86
DS5	5040002310	S.LED	SML-311YTT86
DS6	5040002310	S.LED	SML-311YTT86
DS7	5040002310	S.LED	SML-311YTT86
DS8	5040002310	S.LED	SML-311YTT86
DS9	5040002310	S.LED	SML-311YTT86
DS10	5040002310	S.LED	SML-311YTT86
DS11	5040002310	S.LED	SML-311YTT86
DS12	5040002310	S.LED	SML-311YTT86
DS13	5040002310	S.LED	SML-311YTT86
DS14	5040002310	S.LED	SML-311YTT86
DS15	5040002310	S.LED	SML-311YTT86
DS16	5040002310	S.LED	SML-311YTT86
DS17	5040002310	S.LED	SML-311YTT86
S1	2230000250	SWITCH	SPPH22014A
EP1	8930052590	LCD CONTACT	SRCN-2345-SP-N-W
EP2	0910052113	PCB	B 5427C

S.=Surface mount

[VOL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210003080	VARIABLE	TP96N97-15F-10KA-2345
J1	6510009470	CONNECTOR	S3B-ZR
W2	7120000470	JUMPER	ERDS2T0
EP1	0910052123	PCB	B 5428C

[SQL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210002360	VARIABLE	TP96N97-15F-10KB-1301
W1	8900009870	CABLE	OPC-971
EP1	0910052133	PCB	B 5429C

[DIAL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
S1	2250000220	ENCODER	TP90N937E20-15F-1540
EP1	0910052142	PCB	B 5430B

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1110003200	S.IC	TA31136FN (EL)
IC2	1130007610	S.IC	µPD3140GS-E1 (DS8)
IC3	1150001540	IC	M57710-A/SC-1302
IC4	1110003750	S.IC	M5218AFP 600C [HOL], [FRG]
IC5	1110003650	S.IC	NJM2211M-TE1 [HOL], [FRG]
IC6	1130007420	S.IC	TC7W14FU (TE12L) [HOL], [FRG]
IC7	1180000420	S.IC	TA78L05F (TE12R)
IC8	1110002030	IC	TA7808S
IC9	1180001070	S.IC	TA7805F (TE16L)
IC10	1130007690	S.IC	BU4066BCF-T1
IC11	1110003750	S.IC	M5218AFP 600C
IC12	1130007690	S.IC	BU4066BCF-T1
IC13	1110003750	S.IC	M5218AFP 600C
IC14	1110003090	IC	LA4425A
IC15	1110004710	S.IC	S-80928ANMP-DDR-T2
IC16	1140008660	S.IC	MB90F583BPFV-G
IC17	1140008650	S.IC	HN58X2464TI
IC18	1130007420	S.IC	TC7W14FU (TE12L)
IC20	1120002830	S.IC	NJM2125F-TE1
Q2	1580000700	S.FET	3SK292 (TE85R)
Q3	1580000490	S.FET	3SK166A-2-T7
Q4	1530002360	S.TRANSISTOR	2SC2714-Y (TE85R)
Q5	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q6	1560000540	S.FET	2SK880-Y (TE85R)
Q7	1560000330	S.FET	2SK210-GR (TE85R)
Q8	1560000330	S.FET	2SK210-GR (TE85R)
Q9	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q10	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q11	1530002240	S.TRANSISTOR	2SC3775-3-TB
Q12	1530002340	S.TRANSISTOR	2SC2954-T2B
Q14	1520000380	TRANSISTOR	2SB1143 S
Q15	1590000430	S.TRANSISTOR	DTC144EUA T106
Q16	1590000670	S.TRANSISTOR	FMW1 T148
Q17	1590000430	S.TRANSISTOR	DTC144EUA T106
Q18	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q20	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q21	1590000430	S.TRANSISTOR	DTC144EUA T106
Q22	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q23	1590000430	S.TRANSISTOR	DTC144EUA T106
Q24	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q25	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q26	1590001390	S.FET	2SJ144-Y (TE85R)
Q27	1590001390	S.FET	2SJ144-Y (TE85R)
Q28	1560000810	S.FET	2SK1069-4-TL
Q29	1590000430	S.TRANSISTOR	DTC144EUA T106
Q30	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q31	1590000430	S.TRANSISTOR	DTC144EUA T106
Q32	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q33	1560000810	S.FET	2SK1069-4-TL
Q34	1590000720	S.TRANSISTOR	DTA144EUA T106
Q35	1590000720	S.TRANSISTOR	DTA144EUA T106
Q36	1590000660	S.TRANSISTOR	DTC144TU T107
Q37	1590000660	S.TRANSISTOR	DTC144TU T107
Q38	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q39	1510000510	S.TRANSISTOR	2SA1576A T106R
Q40	1560000810	S.FET	2SK1069-4-TL
Q41	1590000720	S.TRANSISTOR	DTA144EUA T106
Q42	1590000720	S.TRANSISTOR	DTA144EUA T106
Q44	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
Q45	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
D1	1790001310	S.VARICAP	1SV270 (TPH3)
D2	1790001310	S.VARICAP	1SV270 (TPH3)
D3	1790001310	S.VARICAP	1SV270 (TPH3)
D4	1790001310	S.VARICAP	1SV270 (TPH3)
D5	1790001330	S.ZENER	MA8036-L (TX)
D6	1790000640	S.VARICAP	MA363B (TX)
D7	1790000640	S.VARICAP	MA363B (TX)
D8	1790000640	S.VARICAP	MA363B (TX)
D9	1790000640	S.VARICAP	MA363B (TX)
D10	1790000640	S.VARICAP	MA363B (TX)
D11	1790000620	S.DIODE	MA77 (TX)
D12	1790000620	S.DIODE	MA77 (TX)
D13	1750000550	S.DIODE	1SS355 TE-17
D14	1790000690	S.DIODE	HSM88ASR-TR
D15	1790000690	S.DIODE	HSM88ASR-TR
D16	1710001080	DIODE	XB15A308
D17	1710001080	DIODE	XB15A308

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
D18	1750000550	S.DIODE	1SS355 TE-17
D19	1790000700	DIODE	DSA3A1
D20	1750000130	S.DIODE	DA204U T107
D21	1750000130	S.DIODE	DA204U T107
D22	1750000130	S.DIODE	DA204U T107
D23	1750000550	S.DIODE	1SS355 TE-17
D24	1750000130	S.DIODE	DA204U T107
D26	1720000360	S.DIODE	HSU88TRF
D28	1160000050	S.DIODE	DAP202U T107
D29	1750000550	S.DIODE	1SS355 TE-17
D33	1790001210	S.DIODE	1SS375-TL
FI1	2010002420	MONOLITH	FL-310
FI2	2010002420	MONOLITH	FL-310
FI3	2020001680	CERAMIC	ALFY450E
X1	6070000210	S.DISCRIMINATOR	CDBCA450CX24
X2	6050010800	S.XTAL	CR-659 (21.25 MHz)
X3	6050011030	S.XTAL	DMX-26S (32.768 kHz)
X4	6050010290	S.XTAL	CR-610 (7.9872 MHz)
L1	6150003820	COIL	LS-440
L2	6150003820	COIL	LS-440
L3	6150003820	COIL	LS-440
L4	6150003820	COIL	LS-440
L5	6200003050	S.COIL	NL 322522T-R82J-3
L7	6200002410	S.COIL	NL 252018T-056J
L8	6200004700	S.COIL	MLR1608M R10K-T
L9	6200003320	S.COIL	NL 322522T-3R3J-3
L10	6130002370	S.COIL	LB-258
L11	6200003090	S.COIL	NL 322522T-2R7J-3
L12	6200003100	S.COIL	NL 322522T-3R9J-3
L13	6130002360	S.COIL	LB-257
L14	6200003090	S.COIL	NL 322522T-2R7J-3
L15	6200004700	S.COIL	MLR1608M R10K-T
L16	6200004700	S.COIL	MLR1608M R10K-T
L17	6200002430	S.COIL	NL 252018T-082J
L18	6200002430	S.COIL	NL 252018T-082J
L19	6200002600	S.COIL	NL 252018T-047J
L20	6200002600	S.COIL	NL 252018T-047J
L21	6110001600	COIL	LA-243
L22	6170000230	COIL	LW-25
L23	6110001130	COIL	LA-149
L24	6110001600	COIL	LA-243
L25	6110001670	COIL	LA-253
L26	6110001600	COIL	LA-243
L27	6110001580	COIL	LA-238
L28	6200004920	S.COIL	MLF1608A 2R2K-T
L29	6200003960	S.COIL	MLF1608A 1R0K-T
L30	6200004600	S.COIL	MLF1608D R15K-T
R2	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R3	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R4	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R5	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R6	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R7	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R8	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R9	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R10	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R11	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R12	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R16	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R18	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R19	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R20	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R21	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R22	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R23	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R25	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R26	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R27	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R28	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R29	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R30	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R31	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R32	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R33	7310003590	S.TRIMMER	EVM-1XSX50 B24 (203)

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R35	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R36	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R37	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R38	7030003300	S.RESISTOR	ERJ3GEYJ 680 V (68 Ω)
R39	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R40	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R41	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R42	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R43	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R44	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R45	7410000950	S.ARRAY	EXB-V8V 102JV
R55	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R56	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R57	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R58	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R59	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R60	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R61	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R62	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R63	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R64	7030003270	S.RESISTOR	ERJ3GEYJ 390 V (39 Ω)
R65	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R66	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R67	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R68	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R69	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R70	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R71	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R72	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R73	7030004700	S.RESISTOR	MCR18EZHJ 10 Ω (100)
R74	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R75	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R76	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R77	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R78	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R79	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R80	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R81	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R82	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R83	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R84	7310002670	S.TRIMMER	RV-143 (RH03A3AS2) 471
R85	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R86	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R87	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R88	7030001150	S.RESISTOR	MCR50JZHJ 150 Ω (151)
R89	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R90	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω) [HOL], [FRG]
R95	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [HOL], [FRG]
R96	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [HOL], [FRG]
R97	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) [HOL], [FRG]
R98	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ) [HOL], [FRG]
R99	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ) [HOL], [FRG]
R100	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ) [HOL], [FRG]
R101	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ) [HOL], [FRG]
R102	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) [HOL], [FRG]
R103	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) [HOL], [FRG]
R104	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ) [HOL], [FRG]
R105	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ) [HOL], [FRG]
R106	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ) [HOL], [FRG]
R107	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ) [HOL], [FRG]
R108	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ) [HOL], [FRG]
R109	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ) [HOL], [FRG]
R110	7310002720	S.TRIMMER	RV-148 (RH03A3AS3X0DA) 472 [HOL], [FRG]
R111	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω) [HOL], [FRG]

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R112	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R113	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R114	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R115	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R116	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R117	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R118	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R119	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R120	7030003770	S.RESISTOR	ERJ3GEYJ 564 V (560 kΩ)
R121	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R122	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R123	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R124	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R125	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R126	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R127	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R128	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R129	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R130	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R131	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R132	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R133	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R134	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R135	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R136	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R137	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R138	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R139	7410000950	S.ARRAY	EXB-V8V 102JV
R140	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R141	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R142	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R143	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R144	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R145	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R147	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R148	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R149	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R150	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R151	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R152	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R153	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R154	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R155	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R156	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R157	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R158	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R159	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R160	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R161	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R162	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R163	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R164	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R165	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R166	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R167	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R168	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R169	7510001150	S.THERMISTOR	NTCCM1608 4BH 103KC
R170	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R171	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R172	7310002600	S.TRIMMER	RV-110 (RH03A3AS4X0AA) 473
R173	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R174	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R175	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R176	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R177	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R178	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R179	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R180	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R181	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R182	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R183	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R184	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R185	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R186	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R187	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R188	7030003750	S.RESISTOR	ERJ3GEYJ 394 V (390 kΩ)
R189	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R190	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R191	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R192	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R193	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R194	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R195	7410000950	S.ARRAY	EXB-V8V 102JV
R196	7410000950	S.ARRAY	EXB-V8V 102JV
R197	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R198	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R199	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R200	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R201	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R202	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R203	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R204	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R205	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R206	7410000950	S.ARRAY	EXB-V8V 102JV
R207	7410000950	S.ARRAY	EXB-V8V 102JV
R208	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R209	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R210	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R211	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R212	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R213	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R214	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R215	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R216	7410000950	S.ARRAY	EXB-V8V 102JV
R217	7410000950	S.ARRAY	EXB-V8V 102JV
R218	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R219	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R220	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R221	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R222	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R223	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R224	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R225	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R226	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R227	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R228	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R229	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R230	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R231	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R233	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R234	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R235	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R236	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R238	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R239	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R240	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R241	7030003290	S.RESISTOR	ERJ3GEYJ 560 V (56 Ω)
R243	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R244	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R245	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R246	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R247	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R248	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R249	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R250	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R251	7030003310	S.RESISTOR	ERJ3GEYJ 820 V (82 Ω)
R252	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R253	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R254	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R255	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R256	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R257	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R258	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R259	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R260	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R261	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R262	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R263	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R264	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R265	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R266	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R267	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R268	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R270	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R276	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R279	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R280	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R281	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R282	7030003270	S.RESISTOR	ERJ3GEYJ 390 V (39 Ω)
R283	7510001050	S.THERMISTOR	NTCCM1608 4LH 333KC-T

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C2	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C3	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C4	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C5	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C6	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C7	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C8	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C10	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C11	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C12	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C13	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C14	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C15	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C16	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C17	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C18	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C19	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C20	4030009550	S.CERAMIC	C1608 CH 1H 2R5B-T-A
C21	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C22	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C23	4030009550	S.CERAMIC	C1608 CH 1H 2R5B-T-A
C24	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C25	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C26	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C27	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C28	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C30	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C31	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C32	4030008880	S.CERAMIC	C1608 JB 1C 223K-T-A
C33	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C34	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C36	4030011770	S.CERAMIC	C1608 CH 1H 060B-T-A
C38	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C39	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C40	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C41	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C42	4030008880	S.CERAMIC	C1608 JB 1C 223K-T-A
C43	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C45	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C46	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C47	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C48	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C49	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C50	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C51	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C52	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C53	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C54	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C55	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C56	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C57	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C58	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C59	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C60	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C61	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C62	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C63	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C64	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C65	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C66	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A
C67	4030009990	S.CERAMIC	C1608 CH 1H 200J-T-A
C68	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C69	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C70	4610002150	S.TRIMMER	CTZ3S-10A-W1-AF
C71	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C72	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C73	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C74	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C75	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C76	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C77	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C78	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C79	4030008880	S.CERAMIC	C1608 JB 1C 223K-T-A
C81	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C96	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C97	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C98	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C99	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C100	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C101	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C102	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C103	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C104	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C105	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C106	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C107	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C108	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C109	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C110	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C111	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C112	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A
C113	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C114	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C115	4550002830	S.TANTALUM	TESVD2 1V 685M-12R
C116	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C117	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C118	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C119	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C120	4510006240	S.ELECTROLYTIC	ECEV1CA221P
C121	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C122	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C123	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C124	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C125	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C126	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C127	4030011290	S.CERAMIC	GRM42-6 CH 240J 500PT
C128	4030011170	S.CERAMIC	GRM42-6 CH 180J 500PT
C129	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C130	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C131	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C132	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C133	4030011260	S.CERAMIC	GRM42-6 W5R 102K 500PT
C134	4030011100	S.CERAMIC	GRM42-6 CH 080D 500PT
C136	4030011140	S.CERAMIC	GRM42-6 CH 120J 500PT
C137	4030011070	S.CERAMIC	GRM42-6 CH 050C 500PT
C138	4030011190	S.CERAMIC	GRM42-6 CH 270J 500PT
C139	4030011060	S.CERAMIC	GRM42-6 CH 040C 500PT
C141	4030011210	S.CERAMIC	GRM42-6 CH 330J 500PT
C142	4030011190	S.CERAMIC	GRM42-6 CH 270J 500PT
C143	4030011730	S.CERAMIC	GRM42-6 CH 101J 500PT
C147	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C148	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C149	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A [HOL], [FRG]
C150	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A [HOL], [FRG]
C151	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A [HOL], [FRG]
C152	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C153	4030008850	S.CERAMIC	C1608 JB 1C 123K-T-A [HOL], [FRG]
C154	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A [HOL], [FRG]
C155	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A [HOL], [FRG]
C156	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A [HOL], [FRG]
C157	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A [HOL], [FRG]
C158	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C159	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N [HOL], [FRG]
C160	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C161	4340000020	S.MYLAR	ECWU 1C 333JB5 [HOL], [FRG]
C162	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N [HOL], [FRG]
C163	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A [HOL], [FRG]
C164	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A [HOL], [FRG]
C165	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A [HOL], [FRG]
C166	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C167	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C168	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C169	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C170	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C171	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C172	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C173	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C174	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C175	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C176	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C177	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C178	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C179	4510007470	ELECTROLYTIC	16 MV 1000 CA
C180	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C181	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C182	4550006130	S.TANTALUM	ECST1VY224R
C183	4030008890	S.CERAMIC	C1608 JB 1C 273K-T-A
C184	4030008890	S.CERAMIC	C1608 JB 1C 273K-T-A
C185	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C186	4030009490	S.CERAMIC	C1608 JB 1H 821K-T-A
C188	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C189	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C190	4030010770	S.CERAMIC	C1608 JB 1H 392K-T-A
C191	4030010770	S.CERAMIC	C1608 JB 1H 392K-T-A
C192	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C193	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C194	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C195	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C196	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C197	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C198	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C199	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C200	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C201	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C202	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C203	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C204	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C205	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C206	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C207	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C208	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C209	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C210	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C212	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C213	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C214	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A
C215	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C216	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C217	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C218	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C219	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C220	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C221	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C222	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C223	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C224	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C225	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C226	4030008650	S.CERAMIC	C1608 JB 1H 332K-T-A
C227	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C228	4030008470	S.CERAMIC	C1608 JB 1H 272K-T-A
C229	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C230	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C231	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C232	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C233	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C234	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C235	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C236	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C237	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C238	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C239	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C240	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C241	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C242	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C243	4510007470	ELECTROLYTIC	16 MV 1000 CA
C244	4510007470	ELECTROLYTIC	16 MV 1000 CA
C245	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C246	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C248	4030008890	S.CERAMIC	C1608 JB 1C 273K-T-A
C249	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C250	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C251	4030009650	S.CERAMIC	C1608 CH 1H 240J-T-A
C252	4030009650	S.CERAMIC	C1608 CH 1H 240J-T-A
C253	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C254	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C255	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C256	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C257	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C258	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C259	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C260	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C261	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C262	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C264	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C265	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C266	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C267	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C268	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C269	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C270	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C271	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C272	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C273	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C274	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C278	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C279	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C282	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C283	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C284	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A
C285	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C286	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C287	4030006980	S.CERAMIC	C1608 CH 1H 070D-T-A
C288	4030009910	S.CERAMIC	C1608 CH 1H 040B-T-A
C289	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C290	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C291	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C292	4550006130	S.TANTALUM	ECST1VY224R
C293	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C294	4550006560	S.TANTALUM	ECST1CY225R
C295	4550006810	S.TANTALUM	ECST1VY473R
C296	4550006810	S.TANTALUM	ECST1VY473R
C297	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A
C298	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C299	4030009910	S.CERAMIC	C1608 CH 1H 040B-T-A
C300	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C301	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C302	4030009560	S.CERAMIC	C1608 CH 1H R75B-T-A
C303	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C304	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C305	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C306	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C307	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C308	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C309	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C312	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C313	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C314	4550006700	S.TANTALUM	ECST1AY106R
C317	4550006700	S.TANTALUM	ECST1AY106R
C318	4550006700	S.TANTALUM	ECST1AY106R
C319	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C320	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C321	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C322	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C323	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C324	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C325	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C326	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C327	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
RL1	6330001620	RELAY	FTR-F3AA012E
RL2	6310000030	S.RELAY	FTR-B3GA4.5Z-B10
J1	6510021300	S.CONNECTOR	52365-1091
J3	6510022020	S.CONNECTOR	14FLT-SM1-TB
J4	6510022020	S.CONNECTOR	14FLT-SM1-TB
J6	6510016430	S.CONNECTOR	53307-1491
J7	6510018920	S.CONNECTOR	B8B-PH-SM3-TB
J8	6510018960	S.CONNECTOR	B2B-PH-SM3-TB
W1	8900010210	CABLE	OPC-1026
W5	7030003860	S.JUMPER	ERJ3GE JPW V
W6	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910052102	PCB	B 5426B

S.=Surface mount

[DSC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1110003750	S.IC	M5218AFP 600C
IC2	1170000280	S.IC	TLP121 (GB-TPL)
IC3	1130007430	S.IC	TC7S14FU (TE85R)
Q1	1590000660	S.TRANSISTOR	DTC144TU T107
Q2	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R)
D1	1730002360	S.ZENER	MA8062-M (TX)
D2	1730002360	S.ZENER	MA8062-M (TX)
D3	1730002360	S.ZENER	MA8062-M (TX)
D4	1750000130	S.DIODE	DA204U T107
D5	1750000550	S.DIODE	1SS355 TE-17
D6	1730002360	S.ZENER	MA8062-M (TX)
R1	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R2	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R3	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R4	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R10	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R11	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R12	7030003210	S.RESISTOR	ERJ3GEYJ 120 V (12 Ω)
R13	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R14	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R15	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R16	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R17	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R18	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R19	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R20	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R21	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R22	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
C1	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C7	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C8	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C9	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C10	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C11	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C12	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C13	4030011330	S.CERAMIC	C1608 CH 1H 391J-T-A
C14	4030008650	S.CERAMIC	C1608 JB 1H 332K-T-A
C15	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A
J1	6510022240	CONNECTOR	272MRW-12P
J2	6510022020	S.CONNECTOR	14FLT-SM1-TB
T1	5920000570	TRANSFORMER	12T01
EP1	0910052833	PCB	B 5472C

[PWR-CORD UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
FI1	2040001440	S.LC	NFM60R20T152
FI2	2040001440	S.LC	NFM60R20T152
C1	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C5	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C7	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C8	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C9	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C10	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
J1	6510003130	CONNECTOR	SB4P-HVQ-22
EP1	0910052482	PCB	B 5486B

[ANT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C5	4030011110	S.CERAMIC	GRM42-6 CH 090D 500PT
C6	4030011110	S.CERAMIC	GRM42-6 CH 090D 500PT
EP1	0910052812	PCB	B 5470B

S.=Surface mount

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[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7010004330	RESISTOR	R20J 12 kΩ
R2	7010004300	RESISTOR	R20J 6.8 kΩ
R3	7010004340	RESISTOR	R20J 15 kΩ
R4	7010004390	RESISTOR	R20J 33 kΩ
R5	7070000860	RESISTOR	ERG2SJ 150
C1	4010000460	CERAMIC	DD104 B 471K 50V
J1	6510003550	CONNECTOR	S07B-EH-S
MC1	7700001600	MICROPHONE	KUC2123-030245
S1	2260000980	SWITCH	SKHHLP014A
S2	2260000080	SWITCH	SKHHAM024A
S3	2260000080	SWITCH	SKHHAM024A
S4	2260000080	SWITCH	SKHHAM024A
SP1	2510000930	SPEAKER	SU-36W08040C
EP1	0910052553	PCB	B 5431C
EP2	9029701901	TUBE	IRRAX 0.7 (d) L=4 mm

S.=Surface mount

SECTION 7 MECHANICAL PARTS

7-1 IC-M501EURO

[CHASSIS PARTS]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J2	6510004880	Antenna connector MR-DS-E 01	1
W1	8900009730	Cable OPC-944	1
EP1	6950000400	Cover 272B-3	1
MP1	8210017181	2345 front panel (B)-1 assembly	1
MP2	8210017150	2345 rear panel assembly	1
MP3	8410002351	2345 heatsink-1	1
MP4	8310048890	2345 window plate (B)	1
MP5	8930052060	2345 F-packing	1
MP6	8930052050	2345 R-packing	1
MP7	8610010851	Knob N279-1	2
MP8	8610010861	Knob N280-1	1
MP9	8930051970	2345 A-bush plate	1
MP12	8510013460	2345 module cover assembly	1
MP18	8110007180	2345 shield cover	1
MP21	8930052280	O-ring (AC)	3
MP22	8930052290	O-ring (AD)	6
MP27	8930034300	1542 ANT seal	1
MP29	8930049320	2288 VENT. sheet	1
MP30	8810008660	Screw PH BT M3 × 8 NI-ZU	1
MP31	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP32	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP33	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP34	8810008660	Screw PH BT M3 × 8 NI-ZU	5
MP35	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP36	8810008660	Screw PH BT M3 × 8 NI-ZU	5
MP37	8810004540	Screw M3 × 8 SUS	2
MP38	8810004540	Screw M3 × 8 SUS	6
MP40	8850000690	Flat washer M3 (3×7×0.5) SUS	6
MP41	8810006050	Icom screw E 7	6
MP42	8830001490	2345 nut	1
MP43	8930052430	2345 A-IC Clip	1
MP44	8930052440	2345 B-IC Clip	1
MP45	8930053030	2345 earth plate	1
MP46	8930053030	2345 earth plate	1
MP47	8010004340	Edging rubber FX452	1
MP51	8950000180	Cable tie-80	2

[DSC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510022240	Connector 272MRW-12P	1

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8510013150	2345 VCO case	1
MP2	8930014140	Earth spring (D)	1
MP3	8930053480	2345 plate	1
MP4	8930013590	Alminum sheet (N)	1

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
S1	2230000250	Switch SPPH22014A	1
DS1	5030001880	LCD TSD0393-UFFDCW	1
EP1	8930052590	LCD contact SRCN-2345-SP-N-W	2
MP1	8210016830	2345 reflector	1
MP2	8930052000	2345 LCD holder	1
MP3	8930052630	2345 LCD filter	1

[UNPACKING]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
W1	8900009760	Cable OPC-947	1
W2	8900005640	Microphone hanger OPC-562 (black)	1
MP1	8010018151	2345 mobile bracket-1	1
MP2	8610010560	2040 knob bolt (black)	2
MP3	8810001470	Screw PH A M3.5 × 30 SUS	2
MP4	8810001490	Screw PH A M5 × 20 SUS	2
MP5	8850000180	Flat washer M5 SUS	2
MP6	8850000500	Spring washer M5 SUS	2

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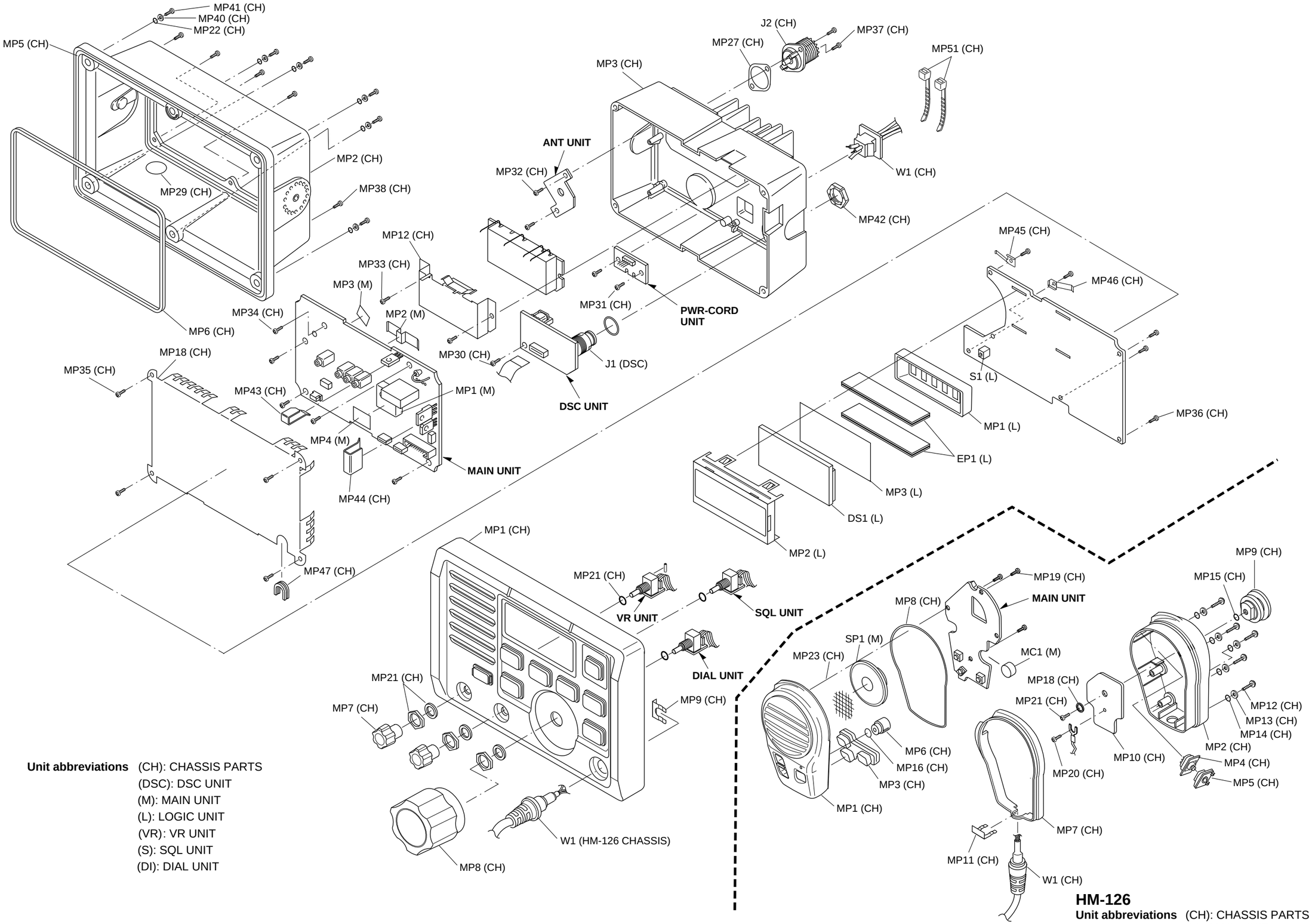
[CHASSIS PARTS]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
W1	8900009770	Cable OPC-948	1
	8900009780	Cable OPC-949	1
MP1	8210016861	2352 front panel-1	1
	8210016961	2352 front panel (A)-1	1
MP2	8210016850	2352 rear panel	1
	8210017110	2352 rear panel (A)	1
MP3	8930052160	2352 key	1
MP4	8930052150	2352 PTT rubber	1
MP5	8930052140	2352 PTT holder	1
MP6	8930052690	2352 MIC rubber	1
MP7	8930052120	2352 rubber	1
MP8	8930052110	2352 main seal	1
MP9	8610010870	2352 hanger knob	1
MP10	8310048760	2352 R-plate	1
MP11	8310048780	2352 MIC plate	1
MP12	8820001150	2352 screw	5
MP13	8850001850	ICOM washer (Y)	5
MP14	8930052340	O-ring (AE)	5
MP15	8930052350	O-ring (AF)	1
MP16	8930039000	1757 sheet	1
MP17	8930053040	2352 SP net	1
MP18	8850001610	Spring washer M4 SUS	1
MP19	8810009260	Screw PH BT 2 × 6 NI	3
MP20	8810008900	Screw PH M3 × 6 NI	1
MP21	8810009240	Screw M4 × 10 ZK	1
MP23	8930053850	2352 SP rubber	1

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MC1	7700002120	Microphone KUC2123-030245	1
SP1	2510001070	Speaker S36G04K-4	1

Screw abbreviations BT: Self-Tapping PH: Pan head
NI: Nickel SUS: Stainless
NI-ZU: Nickel-zinc ZK: Black



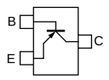
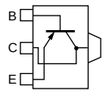
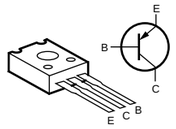
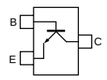
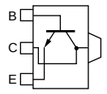
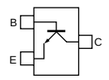
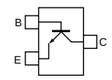
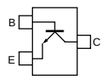
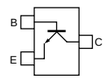
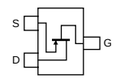
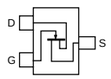
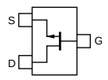
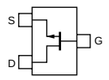
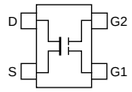
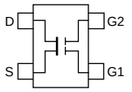
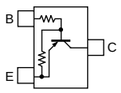
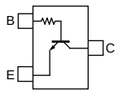
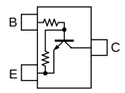
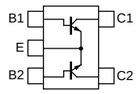
Unit abbreviations (CH): CHASSIS PARTS
(DSC): DSC UNIT
(M): MAIN UNIT
(L): LOGIC UNIT
(VR): VR UNIT
(S): SQL UNIT
(DI): DIAL UNIT

HM-126

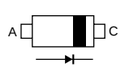
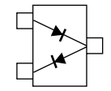
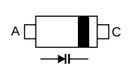
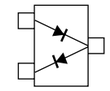
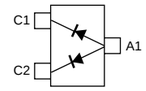
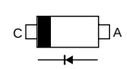
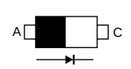
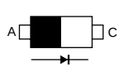
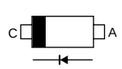
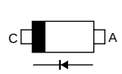
Unit abbreviations (CH): CHASSIS PARTS
(M): MAIN UNIT

SECTION 8 SEMI-CONDUCTOR INFORMATION

• TRANSISTORS AND FET'S

2SA1576A T106R (Symbol: FR) 	**2SB1132 T100 R** (Symbol: BARB) 	**2SB1143 S** (Symbol: B1143) 	**2SC2714-Y** (Symbol: QY) 	**2SC2954 T2B** (Symbol: QK) 
2SC3775-3-TB (Symbol: OY3) 	**2SC4081 T107 R** (Symbol: BR) 	**2SC4116 BL** (Symbol: LL) 	**2SC4215 O** (Symbol: QO) 	**2SJ144 Y** (Symbol: VX) 
2SK210 GR (Symbol: YG) 	**2SK880 Y** (Symbol: XY) 	**2SK1069-4-TL** (Symbol: FJ) 	**3SK166A-2-T7** (Symbol: K) 	**3SK292** (Symbol: UK) 
DTA144EUA T106 (Symbol: 16) 	**DTC144 TU T107** (Symbol: 06) 	**DTC144EUA T106** (Symbol: 26) 	**FMW1 T148** (Symbol: W1) 	

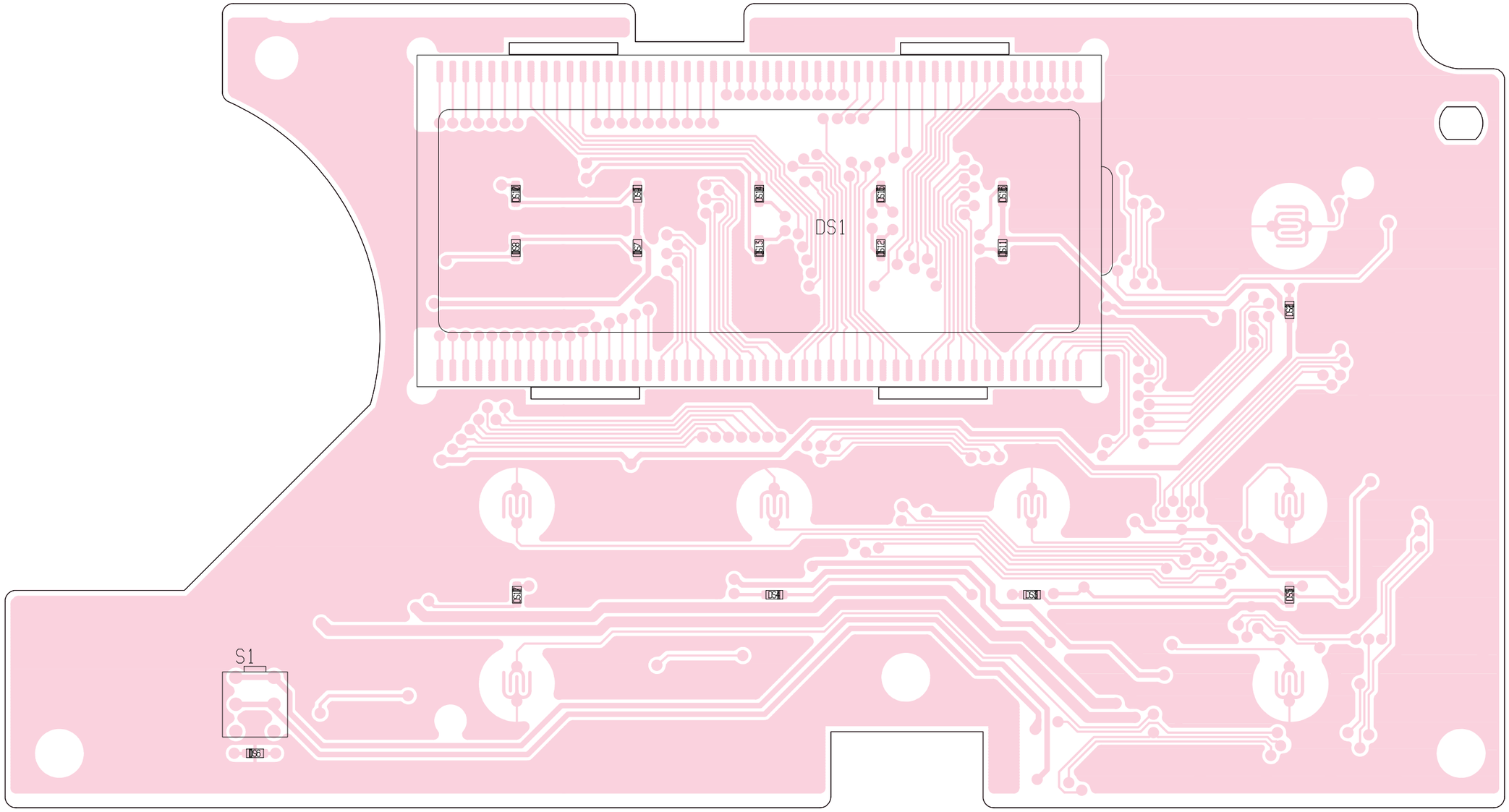
• DIODES

1SS355 (Symbol: A) 	**1SS375-TL** (Symbol: FH) 	**1SV270** (Symbol: TF) 	**DA204 U** (Symbol: K) 	**DAP202 U** (Symbol: P) 
HSM88ASR TR (Symbol: C3) 	**HSU88TRF** (Symbol: 9) 	**MA363 B** (Symbol: 6D) 	**MA77** (Symbol: 4B) 	**MA8036 L** (Symbol: 3_6) 
MA8043 L (Symbol: 4_3) 				

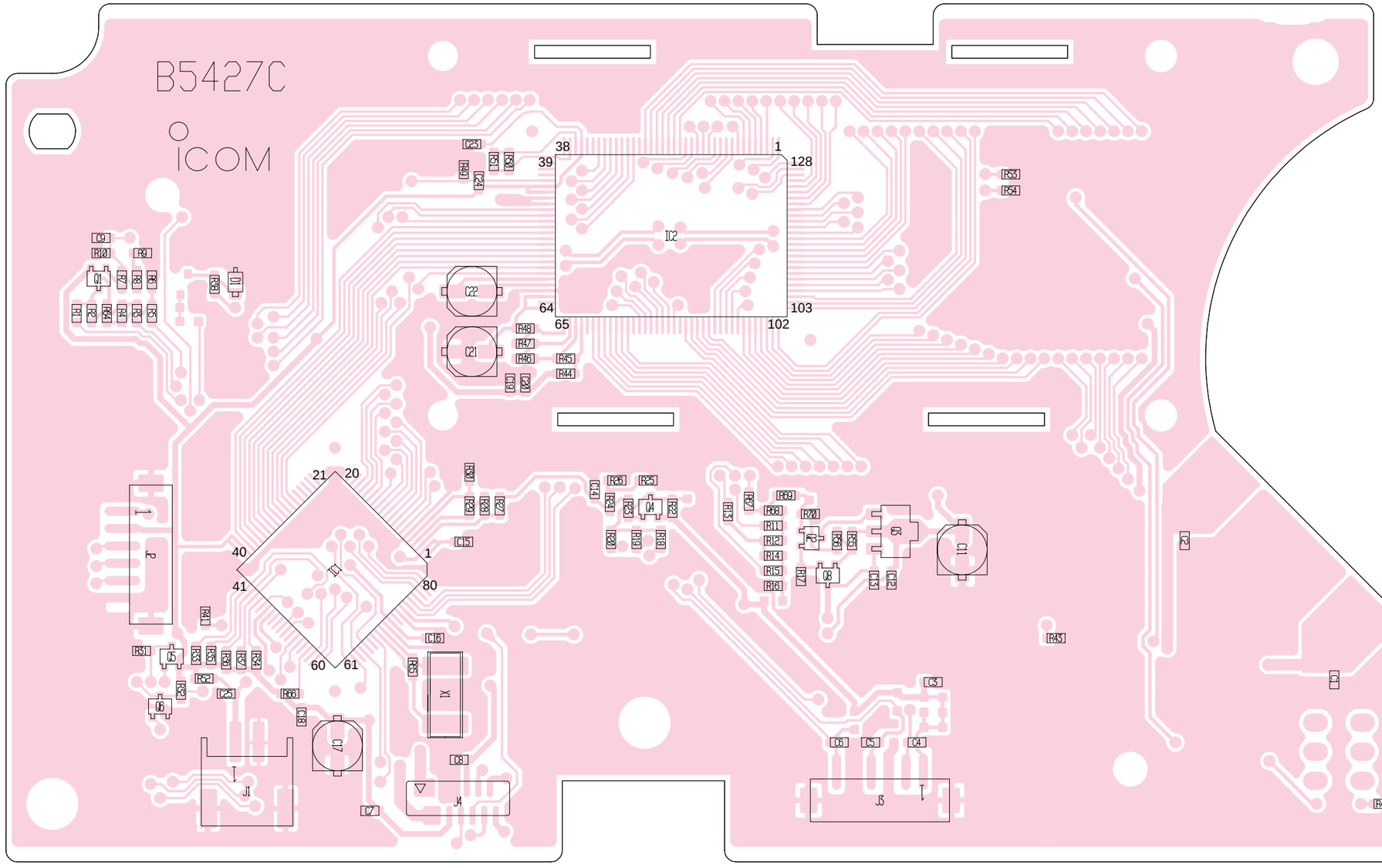
SECTION 9 BOARD LAYOUTS

9-1 LOGIC UNIT

• TOP VIEW



• **BOTTOM VIEW**



J2

1	VPP
	D5V
	RESET
	STXD
	SRXD
6	GND

J1 (1 2)

KEYM	GND

to HM-126 J2

J4

1							13
SP−	SP−	GND	GND	8V	MLDA	HVS	
SP+	SP+	D5V	SRESET	VPP	LMDA	HV	
2							14

to MAIN unit J4

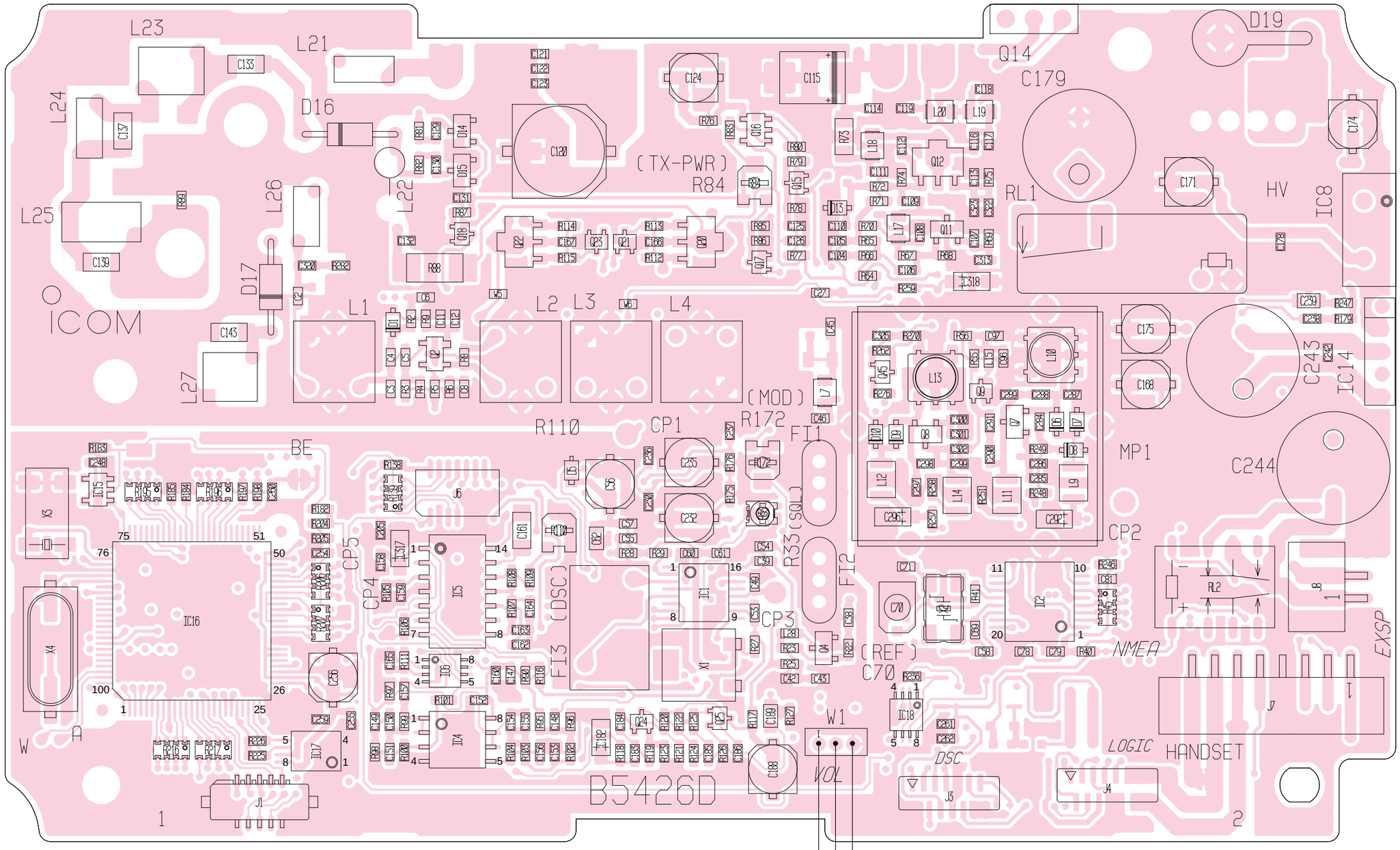
J3 (6 1)

DIALB	GND	DIALA	SQLG	SQLV	SQL5V

to SQL and DIAL units

9-2 MAIN UNIT

• TOP VIEW



J8

AFG	2
AF	1

EXT SP

J1 — for FLASH

GND	TMODE	TRES	SOT0	GND	DTV	TAUX3	P01	SIN0	SCK0

1 9 / 2 10

J6 — to OPTION UT-98 or UT-112

SCK	SDATA	OPSTB	MICI	DETI	MICO	DETO	+5V	GND	OPTIN	SCON	GND	GND	GND

1 9 / 2 10

W1 — to VR unit J1

VOL1	VOL2	GND

J3 — from DSC unit J3

GND	DMDA	CMDA	VCC	DSCMOD	GND	MICG	ICF3	MDDA	MCDA	D5V	VCC	SAFO	SMIC

1 13 / 2 14

J4 — from LOGIC unit J4

HVS	MLDA	8V	GND	GND	SP−	SP−	HV	LMDA	VPP	SRESET	D5V	SP+	SP+

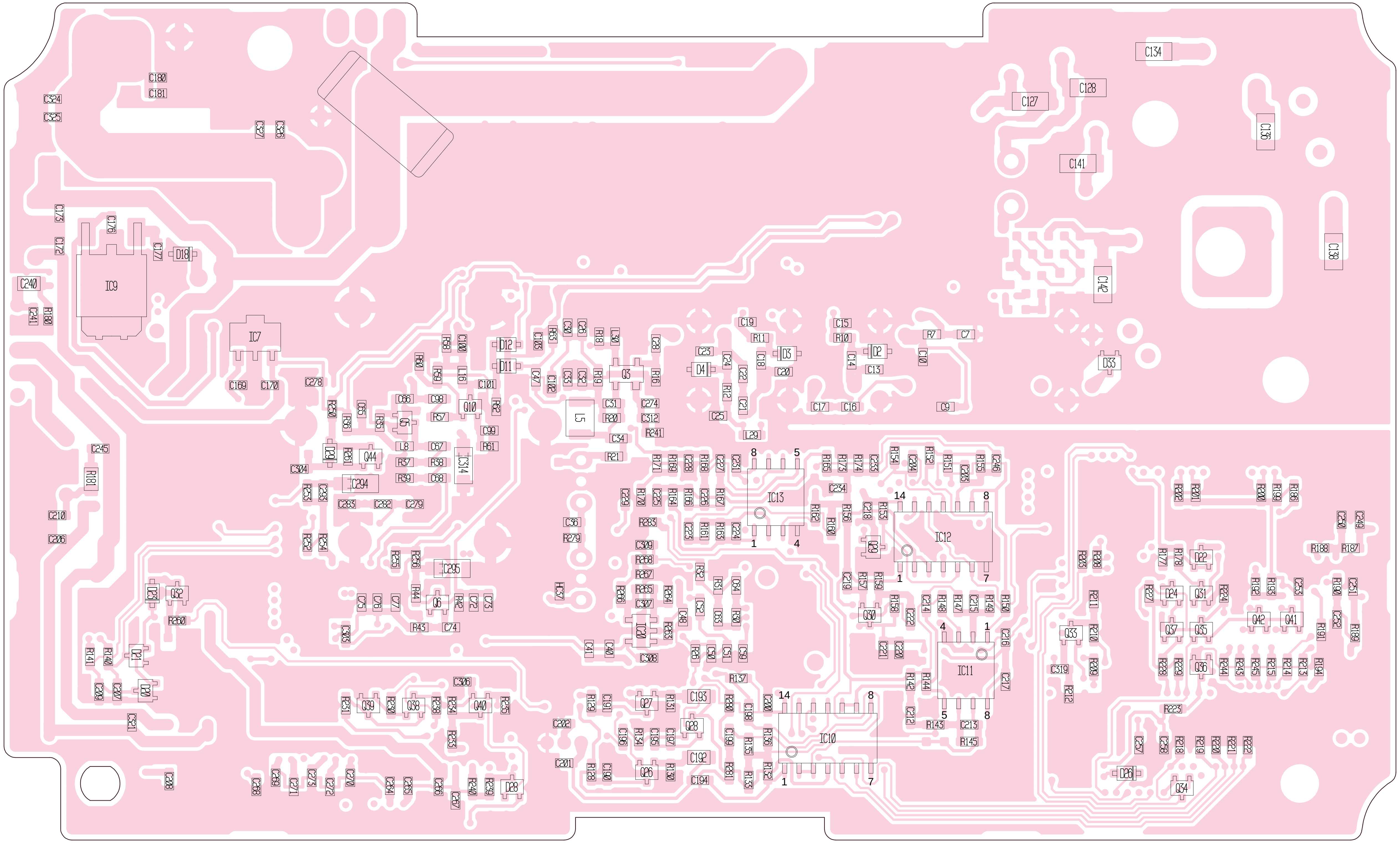
1 13 / 2 14

J7 — to HM-126 J1

SPMIC	AF2	GND	MIC	MICE	HANG	PTT	AF1

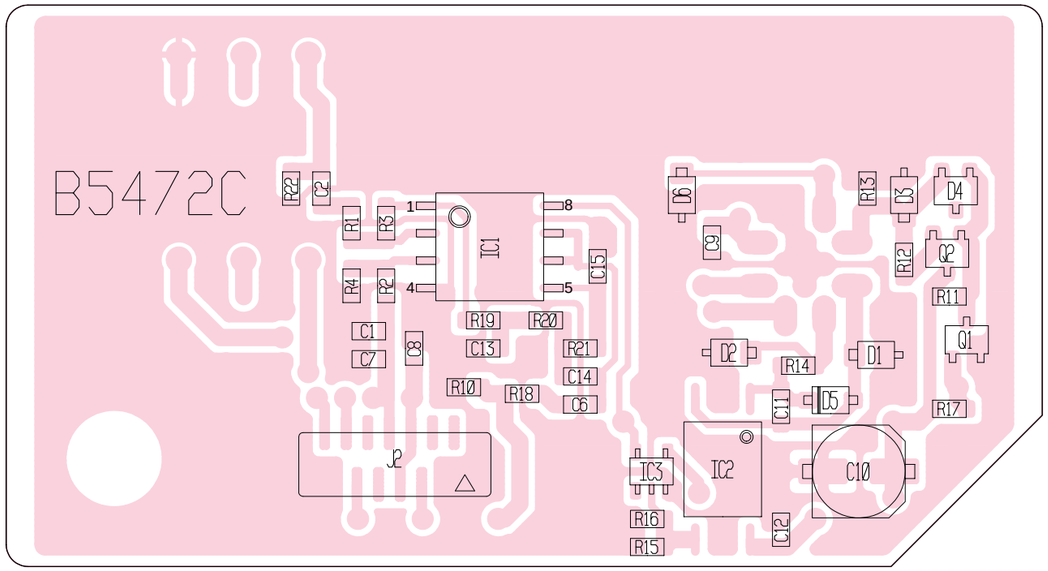
8 1

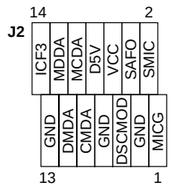
• **BOTTOM VIEW**



9-3 DSC UNIT

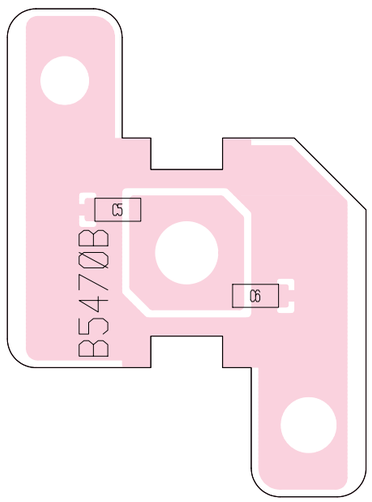
• TOP VIEW





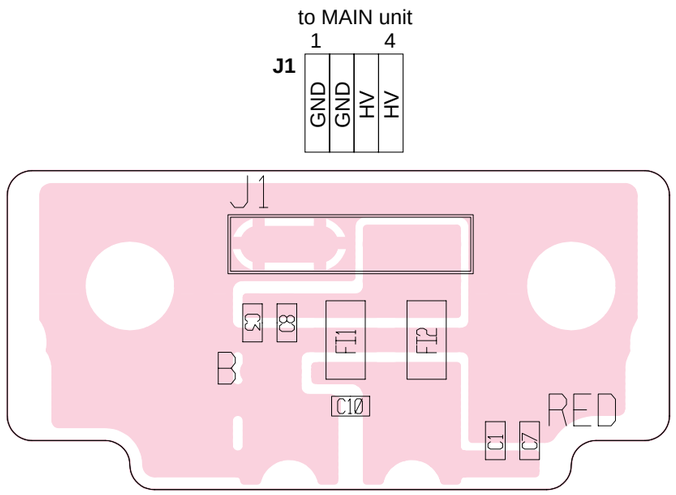
to MAIN unit J3

9-4 ANT UNIT

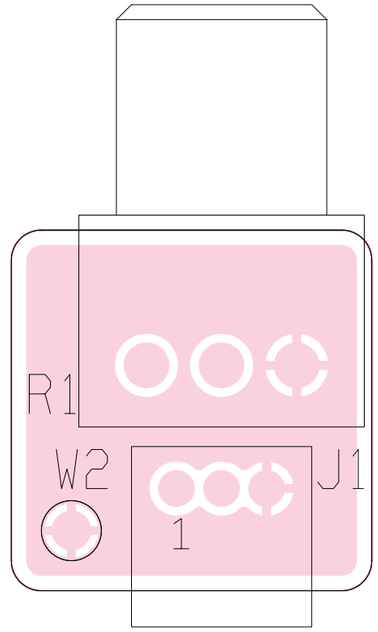


9-5 PWR-CORD UNIT

• TOP VIEW

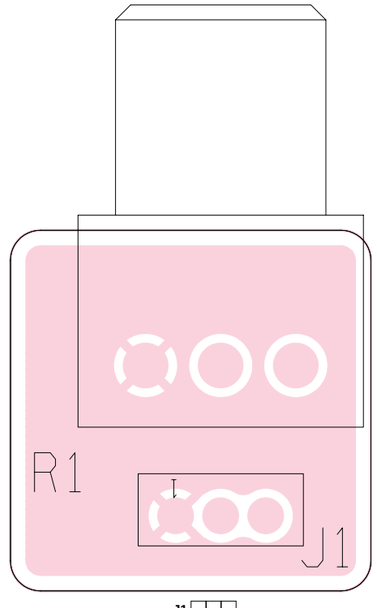


9-6 VR UNIT



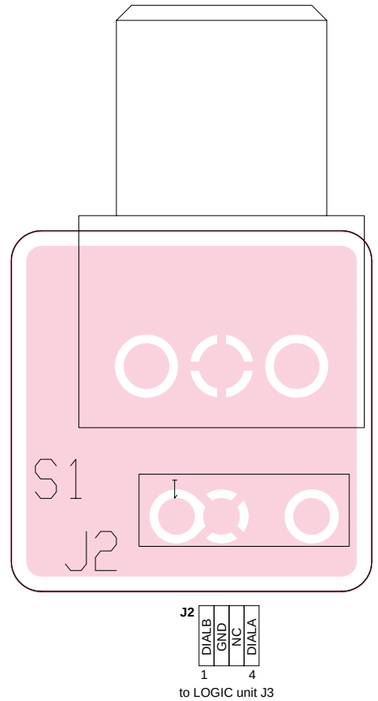
to MAIN unit W1

9-7 SQL UNIT



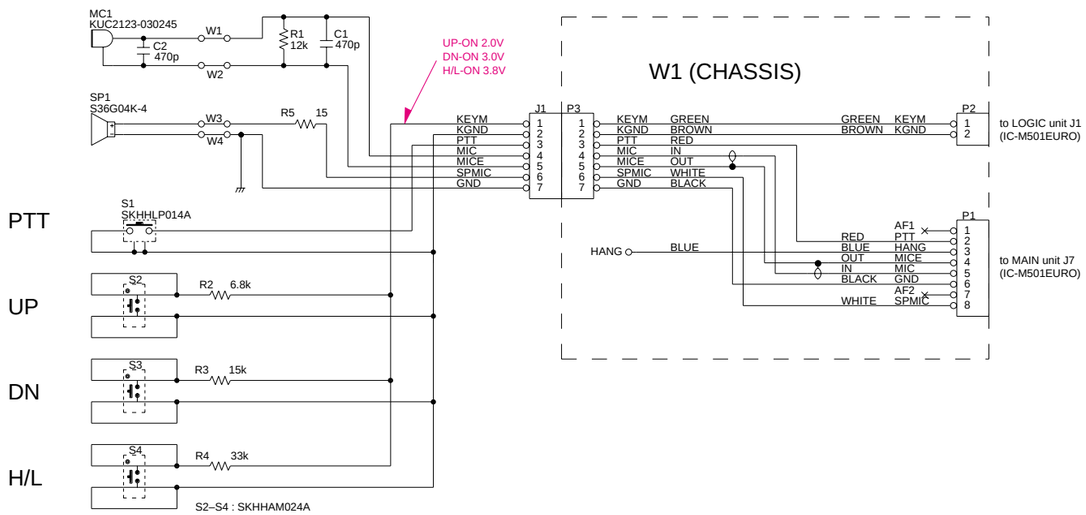
to LOGIC unit J3

9-8 DIAL UNIT

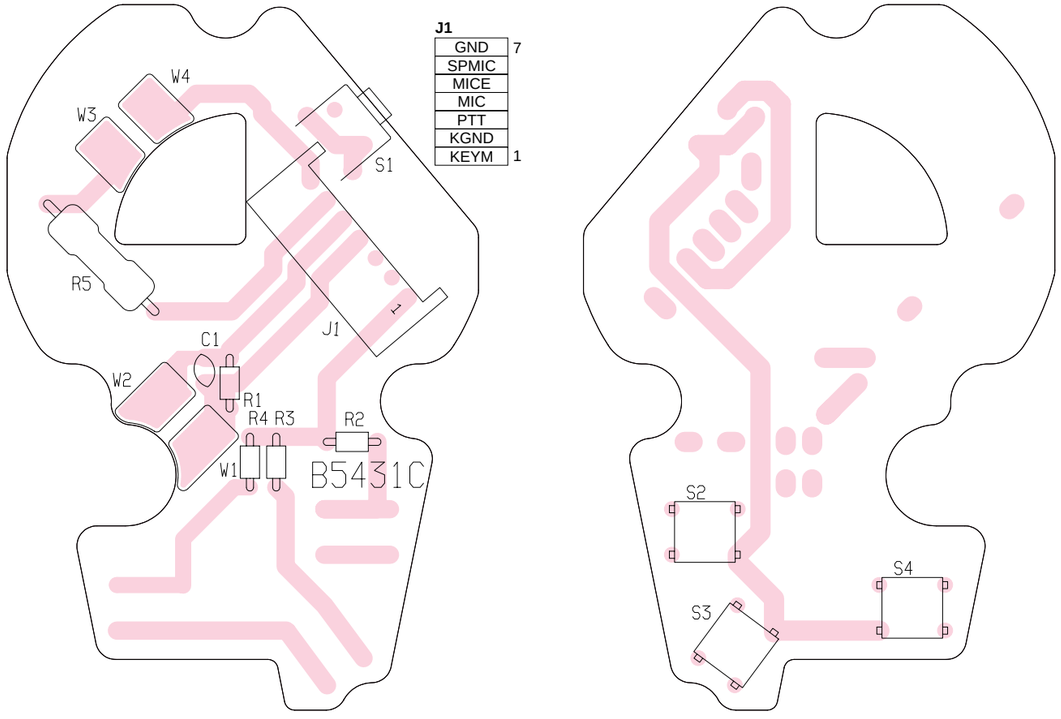


to LOGIC unit J3

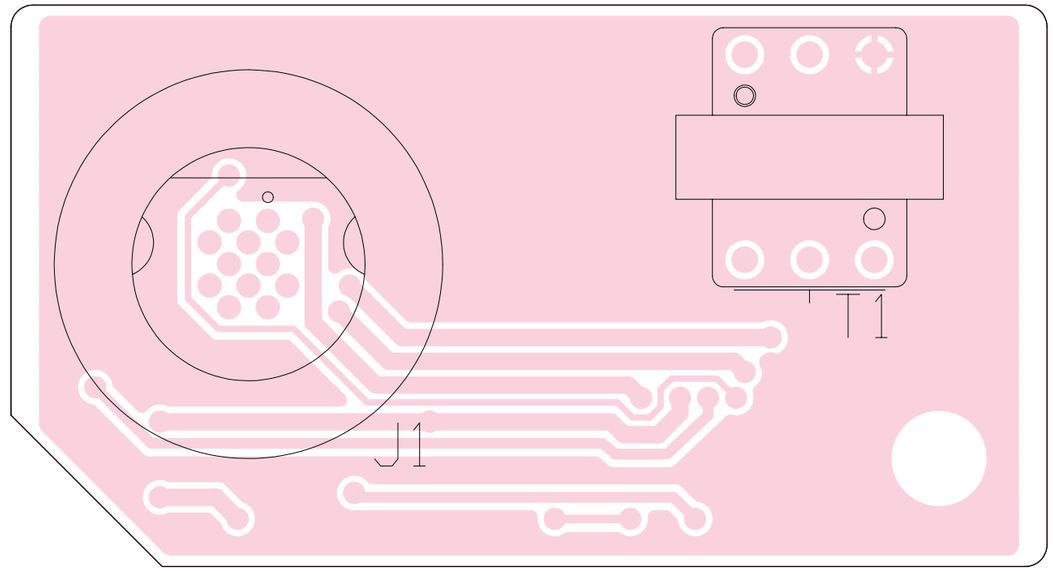
9-9 HM-126



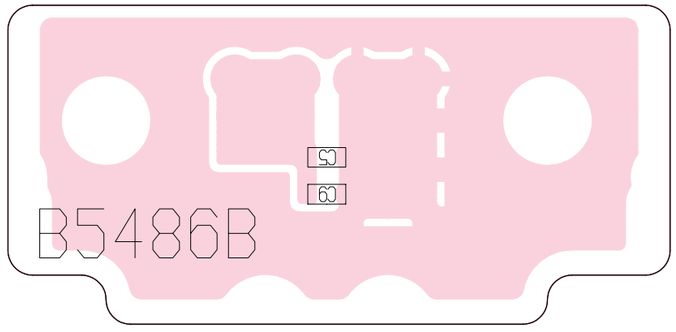
• Board layout



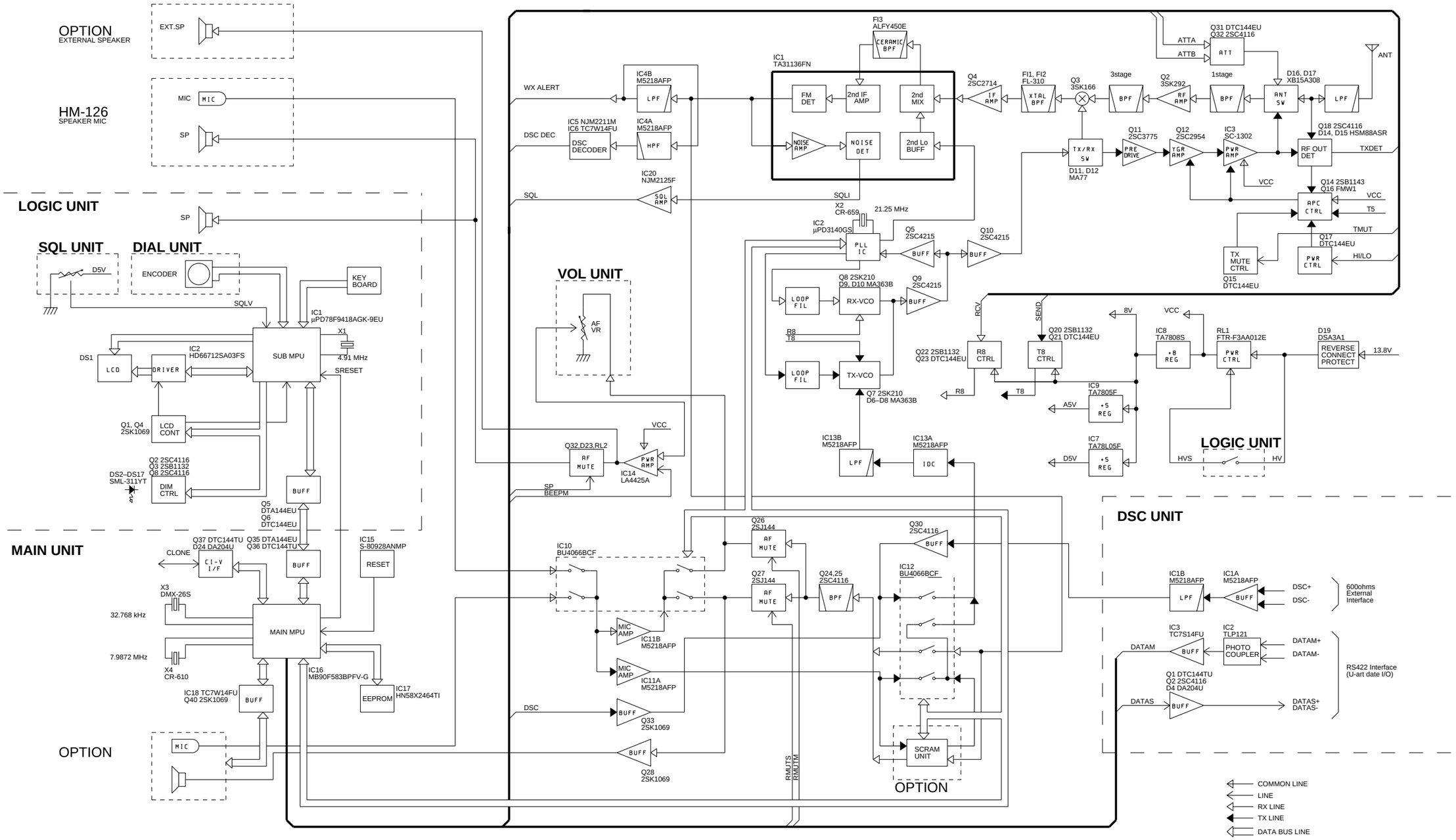
• BOTTOM VIEW (DSC)



• BOTTOM VIEW (PWR-CORD)

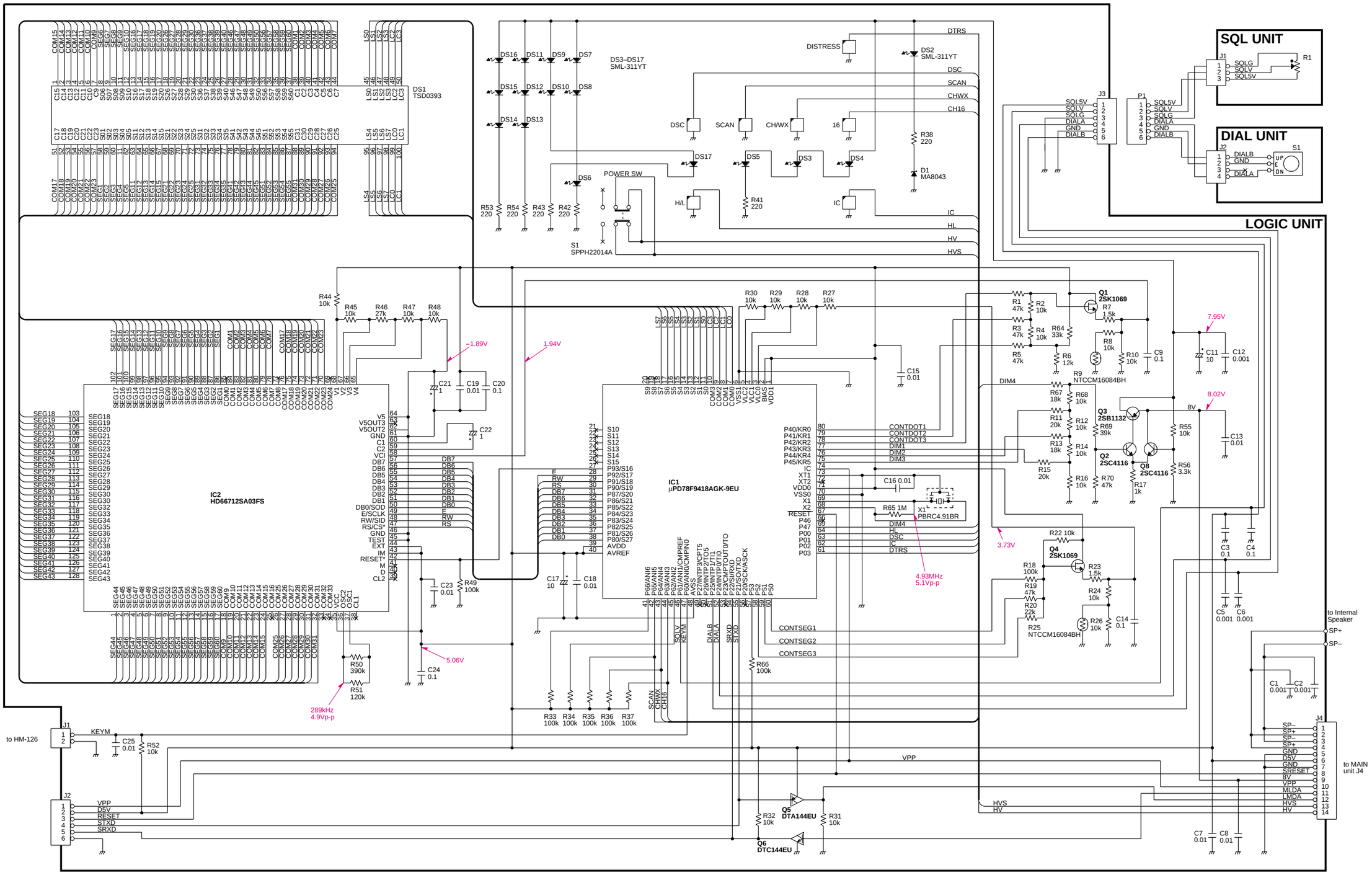


SECTION 10 BLOCK DIAGRAM

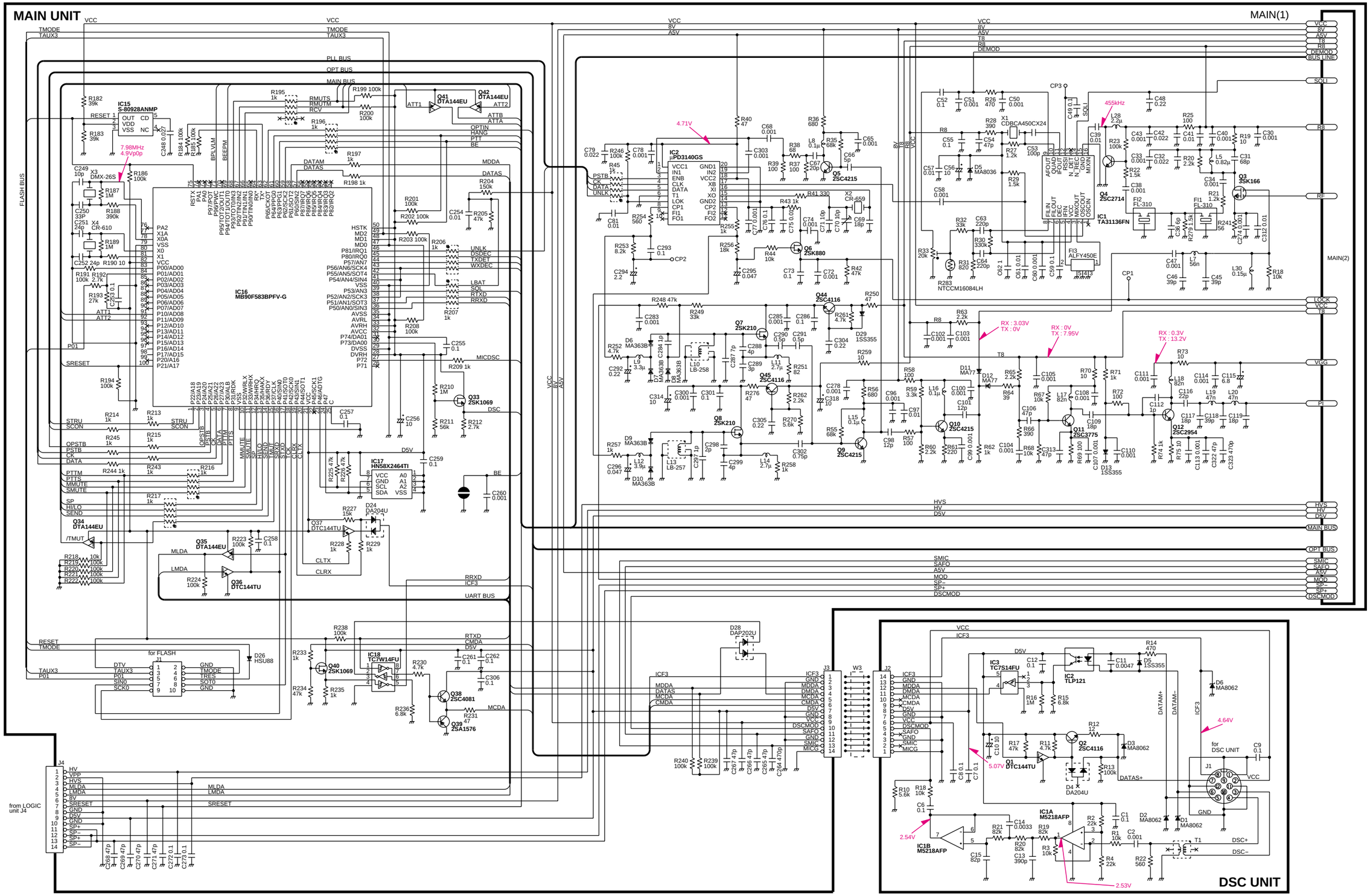


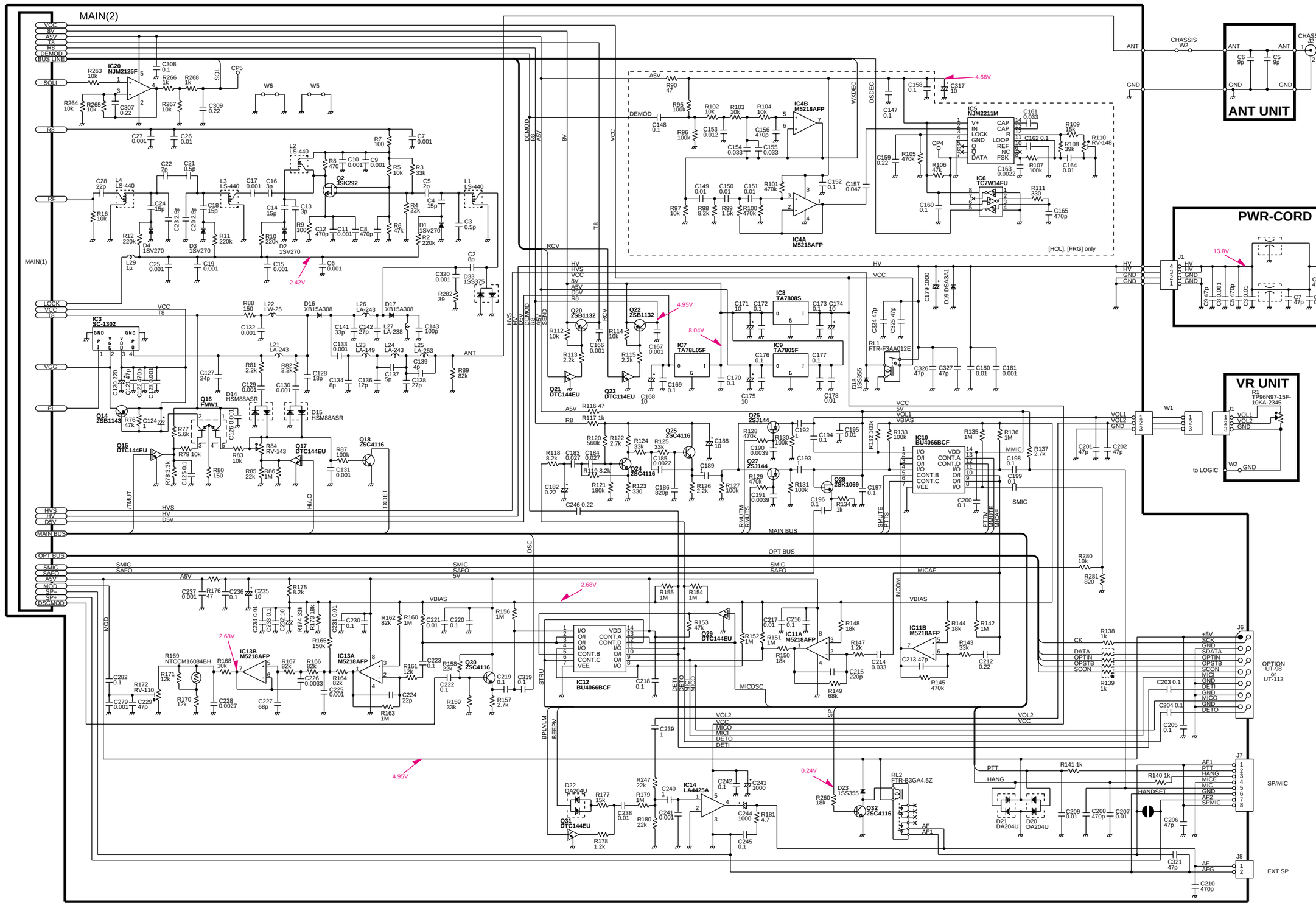
SECTION 11 VOLTAGE DIAGRAM

11-1 LOGIC UNIT



11-2 MAIN UNIT




MAIN(2)
MAIN(1)
ANT UNIT
PWR-CORD BOARD
VR UNIT
OPTION UT-98 or UT-112
SP/MIC
EXT SP
to LOGIC
[HOL], [FRG] only
IC20 NJM2125F
IC4B M5218AFP
IC4A M5218AFP
IC5 NJM2211M
IC6 TC7W14FU
IC8 TA7808S
IC9 TA7805F
IC7 TA78L05F
IC10 BU4066BCF
IC12 BU4066BCF
IC11A M5218AFP
IC11B M5218AFP
IC13A M5218AFP
IC13B M5218AFP
IC3 SC-1302
IC14 LA4425A
Q2 2SK292
Q16 FMW1
Q20 2SB1132
Q22 2SB1132
Q21 DTC144EU
Q23 DTC114EU
Q25 2SC4116
Q24 2SC4116
Q26 2SJ144
Q27 2SJ144
Q28 2SK1069
Q29 DTC144EU
Q30 2SC4116
Q31 DTC144EU
Q32 2SC4116
Q14 2SB1143
Q15 DTC144EU
Q17 DTC144EU
Q18 2SC4116
4.66V
4.95V
8.04V
13.8V
2.42V
2.68V
0.24V

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