ICOM

SERVICE MANUAL

VHF MARINE TRANSCEIVER

IC-M127

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-M127** VHF MARINE TRANSCEIVER at the time of publication.
2 versions of the **IC-M127** have been designed. This service manual covers each version.

MODEL	VERSION	SYMBOL
IC-M127	U.S.A.	BLACK
	U.S.A.-1	WHITE

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 (100mW) to the antenna connector. This could damage the transceiver's front end.

ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:
1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

〈SAMPLE ORDER〉

1180001250 IC TA7808F IC-M127 MAIN UNIT 5pieces
8810008660 Screw PH BO M3×8 NI IC-M127 Chassis 10pieces
Addresses are provided on the inside back cover for your convenience.

REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated turning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 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 range	: Transmit	156.025 MHz to 157.425 MHz	
	: Receive	156.025 MHz to 163.275 MHz	
• Mode	: FM (16K0G3E), DSC (16K0G2B; with optional UX-130)		
• Power supply requirement	: 13.8 V DC ±15 % (negative ground)		
• Current drain (at 13.8 V DC)	: Receive	Max. audio	1.5 A
		Standby	500 mA
	Transmit	at 25 W	6.3 A
		at 1 W	2.0A
• Frequency stability	: ±5 ppm (±0.0005 %)		
• Usable temperature range	: −20 ℃ to +60 ℃; −4 ℉ to +140 ℉		
• Antenna connector	: SO-239 (50 Ω)		
• Dimensions (projections not included)	: 229 (W) × 78 (H) × 220 (D) mm 9 1/32 (W) × 3 3/32 (H) × 8 11/16 (D) in		
• Weight	: 2.5 kg (5.5 lb)		

■ TRANSMITTER

• Output power (at 13.8 V)	: High	25 W
	Low	1 W
• Modulation system	: Variable reactance phase modulation	
• Maximum frequency deviation	: ±5.0 kHz	
• Spurious emissions	: Less than −70 dB	
• Microphone impedance	: 600 Ω	
• Audio frequency response	: −3 dB to +1 dB in a 6 dB/octave range with 300 Hz to 3000 Hz input	
• Noise and hum	: More than 40 dB	

■ RECEIVER

• Receive system	: Double conversion superheterodyne	
• Intermediate frequencies	: 1st	21.8 MHz
	2nd	455 kHz
• Sensitivity	: 0.25 μV (typical) for 12 dB SINAD	
• Squelch sensitivity	: 0.32 μV (Threshold), 1.0 μV (Tight)	
• Adjacent channel selectivity	: More than −75 dB	
• Spurious response	: More than −75 dB	
• Intermodulation rejection	: More than −75 dB	
• Audio frequency response	: −3 dB to +1 dB in a −6 dB/octave range with 300 Hz to 3000 Hz modulation	
• Audio output power (at 13.8 V DC)	: More than 5.0 W at 10 % distortion with a 4 Ω load (10W for Hailer function)	

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

■ VHF MARINE CHANNEL LIST

Channel number			Frequency (MHz)		Channel number			Frequency (MHz)	
USA	INT	CAN	Transmit	Receive	USA	INT	CAN	Transmit	Receive
	01	01	156.050	160.650		61		156.075	160.675
01A			156.050	156.050	61A		61A	156.075	156.075
	02	02	156.100	160.700		62		156.125	160.725
02A			156.100	156.100	62A		62A	156.125	156.125
	03	03	156.150	160.750		63		156.175	160.775
03A			156.150	156.150	63A			156.175	156.175
	04		156.200	160.800		64	64	156.225	160.825
04A		04A	156.200	156.200	64A		64A	156.225	156.225
	05		156.250	160.850		65		156.275	160.875
05A		05A	156.250	156.250	65A	65A	65A	156.275	156.275
06	06	06	156.300	156.300		66		156.325	160.925
	07		156.350	160.950	66A	66A	66A*1	156.325	156.325
07A		07A	156.350	156.350	67*2	67	67	156.375	156.375
08	08	08	156.400	156.400	68	68	68	156.425	156.425
09	09	09	156.450	156.450	69	69	69	156.475	156.475
10	10	10	156.500	156.500	70*3	70*3	70*3	156.525	156.525
11	11	11	156.550	156.550	71	71	71	156.575	156.575
12	12	12	156.600	156.600	72	72	72	156.625	156.625
13*2	13	13*1	156.650	156.650	73	73	73	156.675	156.675
14	14	14	156.700	156.700	74	74	74	156.725	156.725
15*2	15*1	15*1	156.750	156.750	77*1	77	77*1	156.875	156.875
16	16	16	156.800	156.800		78		156.925	161.525
17*1	17	17*1	156.850	156.850	78A		78A	156.925	156.925
	18		156.900	161.500		79		156.975	161.575
18A		18A	156.900	156.900	79A		79A	156.975	156.975
	19		156.950	161.550		80		157.025	161.625
19A		19A	156.950	156.950	80A		80A	157.025	157.025
20	20	20*1	157.000	161.600		81		157.075	161.675
20A			157.000	157.000	81A		81A	157.075	157.075
	21		157.050	161.650		82		157.125	161.725
21A		21A	157.050	157.050	82A		82A	157.125	157.125
		21B		161.250		83	83	157.175	161.775
	22		157.100	161.700	83A		83A	157.175	157.175
22A		22A	157.100	157.100	83B	83B	83B		161.775
	23	23	157.150	161.750	84	84		157.225	161.825
23A			157.150	157.150	84A		84	157.225	157.225
24	24	24	157.200	161.800	85	85		157.275	161.875
25	25	25	157.250	161.850	85A		85	157.275	157.275
		25B		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
28B	28B	28B		162.000	88	88	88	157.425	162.025
	60	60	156.025	160.625	88A			157.425	157.425
60A			156.025	156.025					

Weather channel (U.S.A version only)	Frequency (MHz)		Weather channel (U.S.A version only)	Frequency (MHz)	
	Transmitter	Receiver		Transmitter	Receiver
WX 01	RX only	162.550	WX 06	RX only	162.500
WX 02	RX only	162.400	WX 07	RX only	162.525
WX 03	RX only	162.475	WX 08	RX only	161.650
WX 04	RX only	162.425	WX 09	RX only	161.775
WX 05	RX only	162.450	WX 10	RX only	163.275

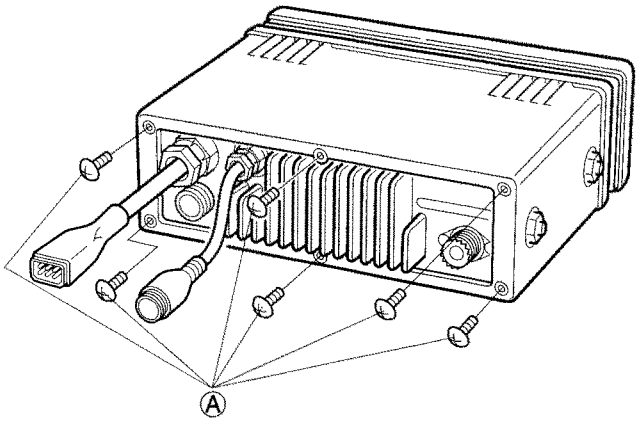
*1Low power only. *2Momentary high power. *3Receive only (except DSC transmission).

SECTION 2 DISASSEMBLY AND OPTION INSTALLATIONS

● REMOVING THE CASE

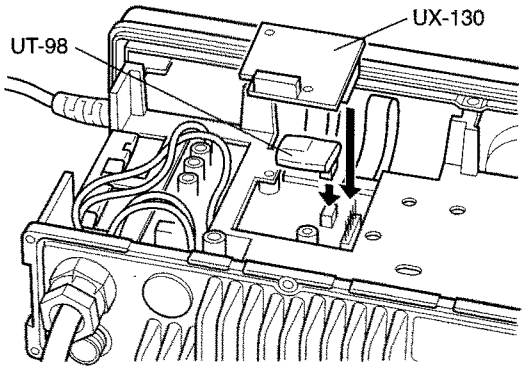
Unscrew the 6 screws, Ⓐ, as shown below, and slide the case free of the chassis.

Note: When replacing the screw, 10–12 kg of torque MUST be applied to ensure water resistance.



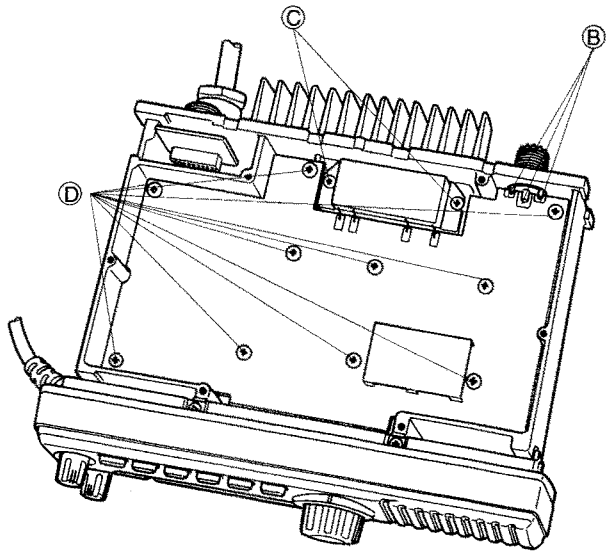
● OPTIONAL UNITS INSTALLATION

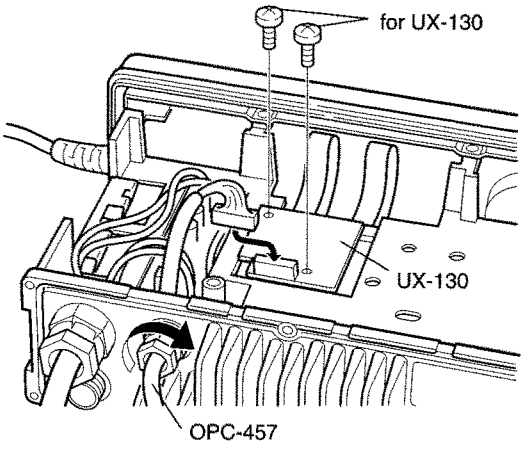
① Remove the transceiver case as at left.
② Install the OPC-457, UT-98 or UX-130 as shown below.
  • When installing the UX-130, be sure to secure it in place with the 2 supplied screws as illustrated.
③ Replace the case and secure with the 6 screws as at left.



● REMOVING THE MAIN UNIT

① Unsolder DC cable (2 points) and antenna connector, Ⓑ (3 points), as shown below.
② Unscrew 2 screws, Ⓒ, and 10 screws, Ⓓ, to remove the MAIN unit.





SECTION 3 CIRCUIT DESCRIPTION

3-1 RECEIVER CIRCUITS

3-1-1 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 (L50–L52, C62–C66, C68). The signals are then applied to the RF circuit via the antenna switching circuit (D10, C69, C70, L17).

3-1-2 SQUELCH ATTENUATOR CIRCUIT

The current flow of D10 is controlled by the [SQUELCH] control and DC amplifier (IC11a). When the attenuator function is turned ON and the [SQUELCH] control is rotated clockwise deeper than 12 o'clock, the current of D10 is increased. In this case, D10 acts as an attenuator.

3-1-3 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 (D11, L19) where the object signals are led to the RF amplifier circuit (Q20).

The amplified signals at Q20 are then applied to the 3-stage tunable bandpass filter (D12–D14, L20–L22) to suppress unwanted signals. The signals are then applied to the 1st mixer circuit.

D11–D14 employ varactor diodes, that are controlled by the PLL lock voltage, to track the band pass filters. The PLL lock voltage is current-amplified at IC11b via Q30 and then applied to these diodes.

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

The 1st mixer circuit converts the received signals 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 be passed through a pair of crystal filters at the next stage of the mixer.

The signals from the RF circuit are mixed with the VCO signal at the 1st mixer circuit (D39, L61, L62) to produce a 21.8 MHz 1st IF signal.

The 1st IF signal is amplified at the IF amplifier (Q45, Q46) and is then applied to a pair of crystal filters (FI2) to suppress out-of-band signals. The filtered signal is applied to the 2nd mixer circuit (IC3).

3-1-5 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.

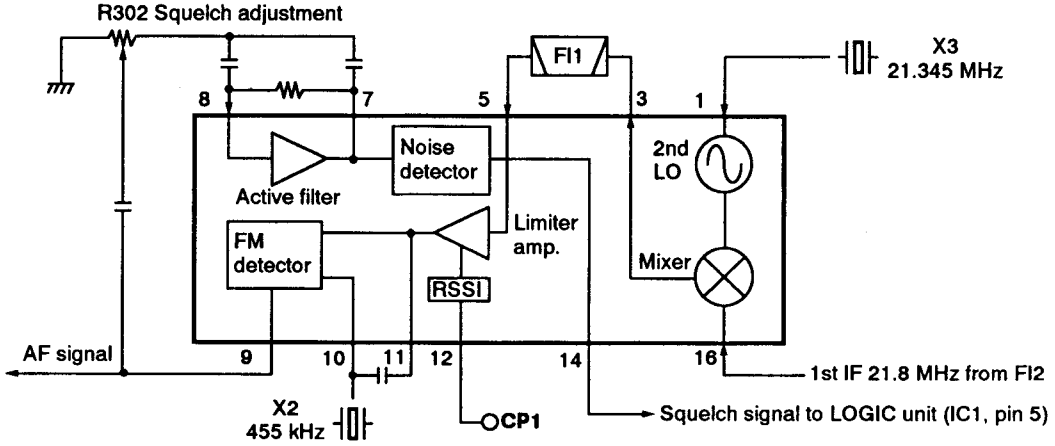
The FM IF IC (IC3) contains the 2nd local oscillator, 2nd mixer, limiter amplifier, quadrature detector, and noise detector circuits, etc.

The 1st IF signal from FI2 is applied to the 2nd mixer section of IC3 (pin 16), and is mixed with a 21.345 MHz 2nd LO signal generated by X3 to produce a 455 kHz 2nd IF signal.

The 2nd IF signal from IC3 (pin 3) is passed through the ceramic filter (FI1), where unwanted signals are suppressed, and is then applied to the 2nd IF and limiter amplifiers in IC3 (pin 5). The signal is applied to the FM detector section in IC3 for demodulation into AF signals.

The FM detector circuit employs a quadrature detection method (linear phase detection), which uses a ceramic discriminator (X2) for phase delay to obtain a non-adjusting circuit. The detected signal from IC3 (pin 9) is applied to the AF circuit.

• 2ND MIXER AND DEMODULATOR CIRCUIT



3-1-6 AF AMPLIFIER CIRCUIT

AF signals from IC3 (pin 9) are amplified at IC22b and then enter an optional voice scrambler board to demodulate scrambled audio, or bypass the board via an analog switch (IC15, pins 8, 9). The signal is then applied to the de-emphasis circuit (R122, C144). The de-emphasis circuit is an integrated circuit with frequency characteristics of - 6 dB/octave.

The integrated signal is applied to the active filters (Q32, Q25). Q32 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 signal is passed through the [VOLUME] control and is then applied to the AF power amplifier (IC18, pin 2). The output signal from IC18 (pin 11) drives the internal speaker via the switching relay (RL3).

3-1-7 SQUELCH CIRCUIT

In an FM receiver, noise audio is produced in the IF and AF circuits when no RF signal is received. However, the noise is suppressed when receiving a signal. The noise squelch circuit acts in accordance with this phenomenon.

Noise components in the detected signals from IC3 (pin 9) are passed through the squelch adjustment pot (R302), and are detected at the noise detector section via the active filter in IC3 (pin 8). The noise detector converts this to a DC voltage and applies it to the DC amplifier (IC22a).

The amplified DC voltages are applied to the CPU (LOGIC unit; IC1, pin 7) as the SQLI signal to control the analog switches (IC15).

The SQLV signal which is controlled by the [SQUELCH] (VR board, R1) is applied to the CPU (LOGIC unit; IC1, pin 8) for reference of the squelch control.

3-1-8 WEATHER ALERT DECODER CIRCUIT [U.S.A. version only]

When the weather alert function is activated and a 1050 Hz alert tone from an NOAA weather radio broadcast is received, the IC-M127 emits beep and flashes "ALT" on the display to inform of an emergency weather report on the air.

AF signals from the FM IF IC (IC3, pin 9) are amplified at IC22b, and are then applied to the tone decoder (IC4, pin 3). When a 1050 Hz signal is detected, the tone decoder outputs a low level signal from pin 8 and the output signal is applied to the CPU (LOGIC unit, IC1) via the I/O expander IC (IC23) to control beep tones and the "ALT" indicator.

This tone decoder employs a PLL method, and response frequency is determined by R87, R88, C131.

3-2 TRANSMITTER CIRCUITS

3-2-1 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 pass through the MIC mute switch (IC28), when the PTT switch is ON, and are then amplified at the microphone amplifier (IC21b). A capacitor (C273) and resistor (R284) are connected to the amplifier to obtain the pre-emphasis characteristics.

The amplified signals enter an optional voice scrambler board to scramble the audio via the "MICAO" line, or are applied to the IDC amplifier (IC7a, pin 2) via the analog switch (IC15, pins 4, 3).

The amplified signals are passed through the splatter filter (IC7b) to suppress unwanted 3 kHz or higher signals. The filtered signals are then applied to the modulation circuit.

When an optional UX-130 DSC unit is installed, DSC signals from the UX-130 via J5 pass through the analog switch (IC14, pin 3, 4), and are then applied to the limiter amplifier (IC7 pin 2) as a microphone input signal.

3-2-2 MODULATION CIRCUIT

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

Audio signals from splatter filter (IC7b) pass through the frequency deviation adjustment pot (R117), are then applied to the modulation circuit (D37) to change the reactance of D37, and modulate the oscillated signal at the VCO (Q40).

3-2-3 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 Q55 and Q11 , and is then applied to the T/R switch (D5). The transmit signal from the T/R switch is amplified at the pre-drive (Q12) and drive (Q13) amplifiers to obtain an approximate 400 mW signal level. The amplified signal is then applied to the RF power amplifier (IC2).

3-2-4 POWER AMPLIFIER CIRCUIT

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

IC2 is a power module which has amplification output capabilities of about 35 W. The output from IC2 (pin 4) is passed through the antenna switching circuit (D25) and is then applied to the antenna connector (J1) via the low-pass filter.

3-2-5 APC CIRCUIT

The APC circuit stabilizes transmit output power.

The RF output signal from the power amplifier (IC2) is detected at the power detector circuit (D7). The detected voltage is applied to one of the differential amplifier inputs (Q17, pin 5) via the High/Low control circuit (Q18, R44, R46). The applied voltage controls the differential amplifier output (Q17, pin 2) and the bias voltage control (Q56). Thus the APC circuit maintains a constant output power.

3-2-6 REFLECTED POWER DETECTOR CIRCUIT

The reflected power detector circuit protects the power module (IC2) from a mismatched output load.

The reflected power from the antenna connector is detected at the reflected power detector circuit (D24). The detected voltage is applied to the CPU (LOGIC unit; IC1, pin3) via the "ANT" line. The detected voltage increases when the antenna is mismatched, causing the output power to be switched from HIGH to LOW to protect the power module (IC2).

3-3 HAILER AND INTERCOM CIRCUITS

3-3-1 HAILER

When the hailer function is activated and the PTT switch is pushed, the signals from the microphone are amplified at the microphone amplifier (IC21a). The amplified signals pass through the analog switch (IC14, pins 1, 2) and are applied to the electronic volume control (IC16, pins 3, 2). The signals from the electronic volume control are applied to the AF power amplifier (IC17, pin 9) via the AF buffer amplifier (IC20a). The output signal from IC17 (pin 2) drives the external hailer speaker via the relay (RL1).

While the PTT switch is released, the hailer speaker functions as a microphone. The audio signals from the hailer speaker pass through the relay (RL1) and analog switch (IC14, pins 8, 9), and are then amplified at the preamplifier (IC19). The amplified signals pass through the analog switch (IC14, pins 11, 10), and are then applied to the active filters (Q32, Q25). The filtered signals are amplified at the receiver AF power amplifier circuit, and drive the internal speaker.

3-3-2 INTERCOM

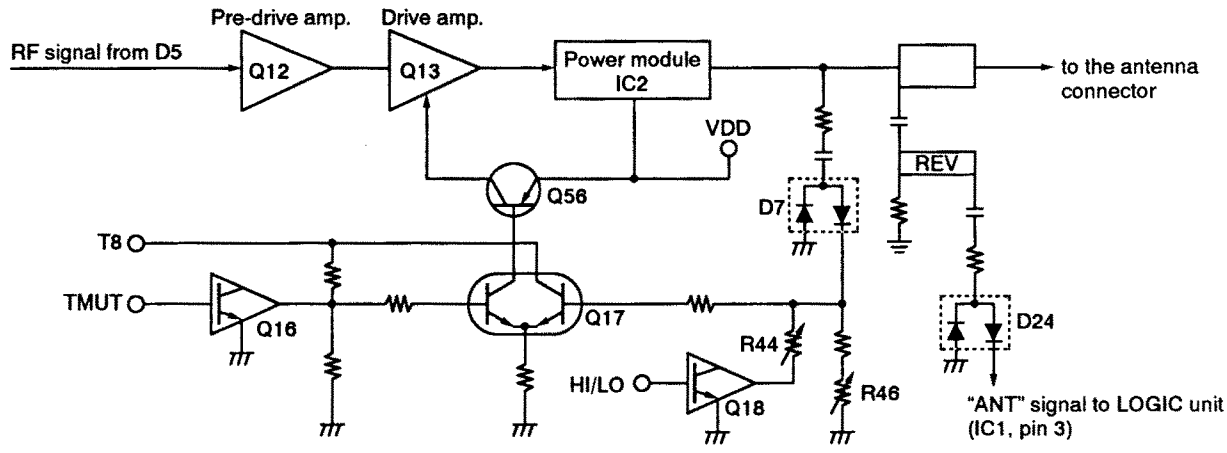
When the intercom function is activated and the PTT switch is pushed, microphone sighals from the microphone amplifier (IC21a) are level controlled at the electronic volume control (IC16, pins 14, 15), and are then amplified at the buffer amplifier (IC20b) and power amplifier (IC18, pins 5, 7) to drive the external intercom speaker via the relay (RL2).

When the external intercom-1 switch is turned ON, the audio signals from the intercom speaker pass through the relay (RL2). The amplified signals at the preamplifier (IC19) pass through the analog switch (IC14, pins 11, 10), and are then applied to the active filters (Q32, Q25). The filtered signals are amplified at the receiver AF power amplifier circuit, and drive the internal speaker.

3-3-3 AUTOMATIC FOG HORN

When the automatic fog horn function is activated, the square wave signal (preset frequency 200–850 Hz) from the CPU (IC1 pin 12) on the LOGIC unit passes through the electronic volume control (IC16, pin 3, 2). The signals from the electronic volume control are applied to the AF power amplifier (IC17, pin 9) via the AF buffer amplifier (IC20a). The output signal from IC17 (pin 2) drives the external hailer speaker via the switching relay (RL1).

• APC CIRCUIT



3-4 PLL CIRCUITS

3-4-1 PLL CIRCUIT

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

The oscillation outputs from Q40 (TX) and Q41 (RX) are buffer-amplified at Q55 (TX), Q44 (RX) and Q31, and then applied to the PLL IC (IC10, pin 5). IC10 divides this input with the serial data from the CPU and phase-detects it with the divided reference frequency and then outputs the phase difference as a pulse.

The output signals from IC10 (pin 7) are amplified at the charge pump (Q28, Q29) to expand the lock voltage, the amplified signals are then converted to DC voltage (lock voltage) by the loop filter (R137, C155–C158, C160, IC9) and controls the varactor diodes (D33, D35, D36).

The DC voltage is also applied to the RX tunable bandpass filter as the tuning signal via Q30.

3-4-2 REFERENCE OSCILLATOR CIRCUIT

The reference oscillator circut (X1, Q33, C211–C213) generates the 12.8 MHz reference frequency. The resistance of a thermistor (R181) changes with the temperature and controls the reverse bias voltage of a varactor diode (D23) that is highly-stabilized within the temperature range - 20 ℃ to +60 ℃ (-4 ℉ to +140 ℉). The reference frequency is applied to the PLL IC (IC10, pin 19).

3-4-3 VCO CIRCUIT

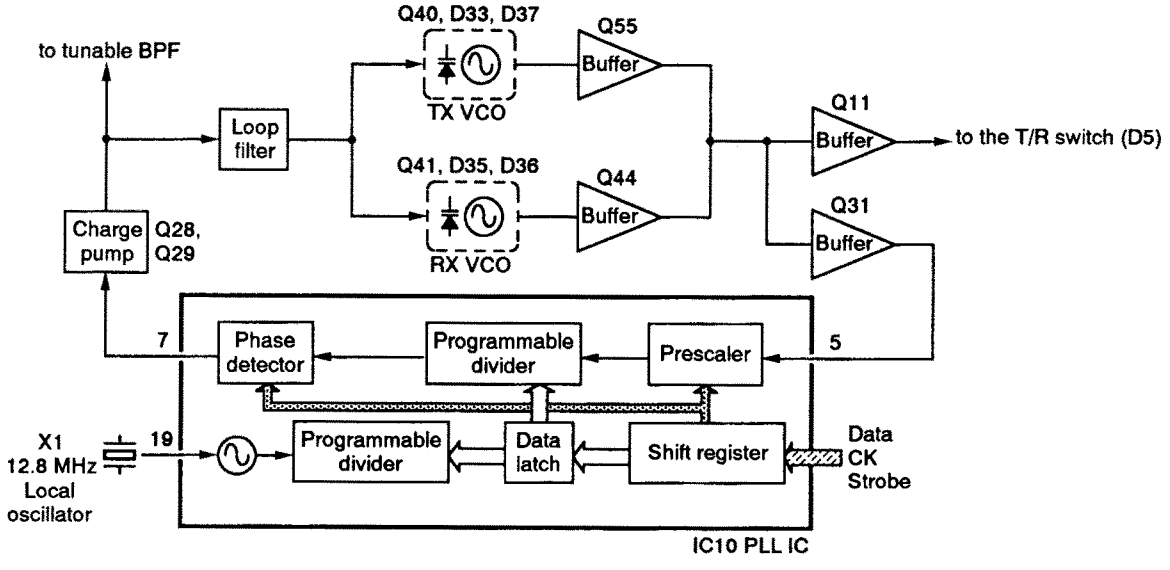
The VCO outputs from Q40 (TX) and Q41 (RX) are buffer-amplified at Q55 (TX), Q44 (RX) and Q11, and are then sent to the T/R switch (D5). The receive LO signal is applied to the 1st mixer circuit (D39, L61, L62) through a low-pass filter, and the transmit signal is applied to the pre-drive amplifier (Q12). A portion of the VCO output is reapplied to the PLL IC (IC10, pin 5) via Q31.

3-5 POWER SUPPLY CIRCUITS

3-5-1 VOLTAGE LINES

Line	Description
HV	The 13.8 V from the connected DC power supply.
HVS	The same voltage as the HV line which is passed through the [POWER] switch (SW board, R1).
VDD	The same voltage as the HV line, passed through the switching relay RL4 which is controlled by the [POWER] switch.
5 V	Common 5 V converted from the HVS line at the 5 V regulator circuit (LOGIC unit, IC4). The output voltage is applied to the CPU (LOGIC unit, IC1), PLL, expander ICs, etc.
8 V	Common 8V converted from the VDD line at the 8 V regulator circuit (IC1).
T8	Transmit 8V converted from the 8 V line at the T8 regulator circuit (Q5, Q6).
R8	Receive 8V converted from the 8 V line at the R8 regulator circuit (Q3, Q4).

• PLL CIRCUIT



3-6 PORT ALLOCATIONS

3-6-1 CPU (LOGIC UNIT, IC1)

Pin	Port	Description
2	LBATT	Input port for the connected power supply voltage detection (low battery indicator.
3	ANT	Input port for the detected reflective power level.
4	TXDET	Input port for power detector circuit (D7) used for the "TX" indicator and RF meter.
5	SMET	Input port for S-meter signal.
6	KEY.M	Input port for smart mic functions. 2.02V: [UP] is pushed 3.00V: [DN] is pushed 3.84V: [HI/LO] is pushed
7	SQLIN	Input port for the noise signal level which is used for the noise squelch.
8	SQLV	Input port for squelch volume level.
9	S.STB	Data bus line for optional voice scrambler unit.
10	BEEP1	Outputs beep audio for general and emergency sitiuations.
11	OEX.STB	Outputs strobe signals to output expander ICs (IC24–IC26).
12	BEEP2	Outputs beep audio for automatic fog horn.
13–15	LAMP3–LAMP1	Output LCD/KEY back light control signal.
16	CALL1/CL12	Input port for an external intercom switch-1 and ICF-3 (1200 bps) data. Low: Intercom switch-1 ON
17	E.SI	Input port for EEPROM data.
18	IEX.PS	Outputs mode select signal to the input expander IC (MAIN unit, IC23). High: Parallel mode Low : Serial mode
19	DATAM	Output port for optional UX-130 and ICF-3 (9600 bps) data.
20	DATAS	Input port for optional UX-130 and ICF-3 (9600 bps) data.
21, 22	DIAL.B, DIAL.A	Input port for the [DIAL] (SENSOR unit, S1).
23	PTT	Input port for the PTT switch.
24	IEX.D	Input port for the data signal from input expander IC (MAIN unit, IC23).
26	SCAN	Input port for the [SCAN] switch.
27	DUAL	Input port for the [DUAL] switch.
31	CALL	Input port for the [CALL] switch.
32	DL/WX	Input port for the [DL/WX] switch.
33	16	Input port for the [CH16] switch.
34	H/L	Input port for the [H/L] switch.
35	HL/IC	Input port for the [HA/IN] switch.
36	COM	Input port for the [COM] switch.
37	EMER	Input port for the [EMER] switch.
38	INDV	Input port for the [ALL/IND] switch.
41	V.STB	Output strobe signals to the electronic volume IC (MAIN unit, IC15).
42	V.CK	Outputs clock signal to the electronic volume IC (MAIN unit, IC15).
43	V.DAT	Outputs serial data to the electronic volume IC (MAIN unit, IC15).
47	DATA	Output port for serial data.
48	CK	Output port for serial clock.
52	P.STB	Output strobe signals to the PLL IC (MAIN unit, IC10).

3-6-2 INPUT EXPANDER IC (MAIN UNIT, IC23)

Pin No.	Port name	Description
1	CALL2	Input port for an external intercom switch-2. Low: Intercom switch-2 ON
4	OPTIN	Input port for detection of optional voice scrambler unit. High: Voice scrambler is installed
5	HANG	Input port for a hang switch.
7	UNLK	Input port for unlock signal. High: PLL is unlocked
13	TONE	Input port for a tone decoder signal from the weather alert decoder circuit (MAIN unit IC4). Low: Weather alert (1050 Hz) is detected
14	UA-4	Input port for an external audio amplifier UA-4 connection. High: UA-4 is connected

3-6-3 OUTPUT EXPANDER ICs

(1) MAIN unit, IC24

Pin No.	Port name	Description
4	RCV	Outputs a control signal for the R8 regulator circuit (Q3, Q4). High: While receiving
5	SEND	Outputs a control signal for the T8 regulator corcuit (Q5, Q6). High: While transmittimg
6	DSCON	Outputs transmit audio select signal to the analog switch (IC14). High: DSC is selected Low : Microphone audio is selected
11	RMUT	Outputs the analog switch (IC15) control signal. High: Squelched
12	TMUT	Outputs transmit mute signal. High: Transmit mute
13	OP.RST	Outputs reset signal for optional UX-130. High: UX-130 does not function
14	DETSCN	Outputs time constant for the loop filter select signal. Low: During dual/tri-watch or scanning

(2) MAIN unit, IC25

Pin No.	Port name	Description
4	S.CON	Outputs control signal to optional voice scrambler unit. Low: Scrambler is activated
5	SCT1	Outputs a control signal for scrambler through. High: Scrambler unit is not installed
6	SLCT.C	Outputs switching signal for ICF-3 transmit line. High: ICF-3 transmit line OFF
7	HI/LOW	Outputs RF output power (High or Low) select signal. High: High power
11	SQLATT	Outputs switching signal for squelch attenuator function. High: Squelch attenuator is ON
12	UAC	Outputs control data for UA-4 transmit or receive. High: Receive through the UA-4. Low : Transmit through the UA-4.
13, 14	BEPV1, BEPV2	Outputs control signals for beep audio.

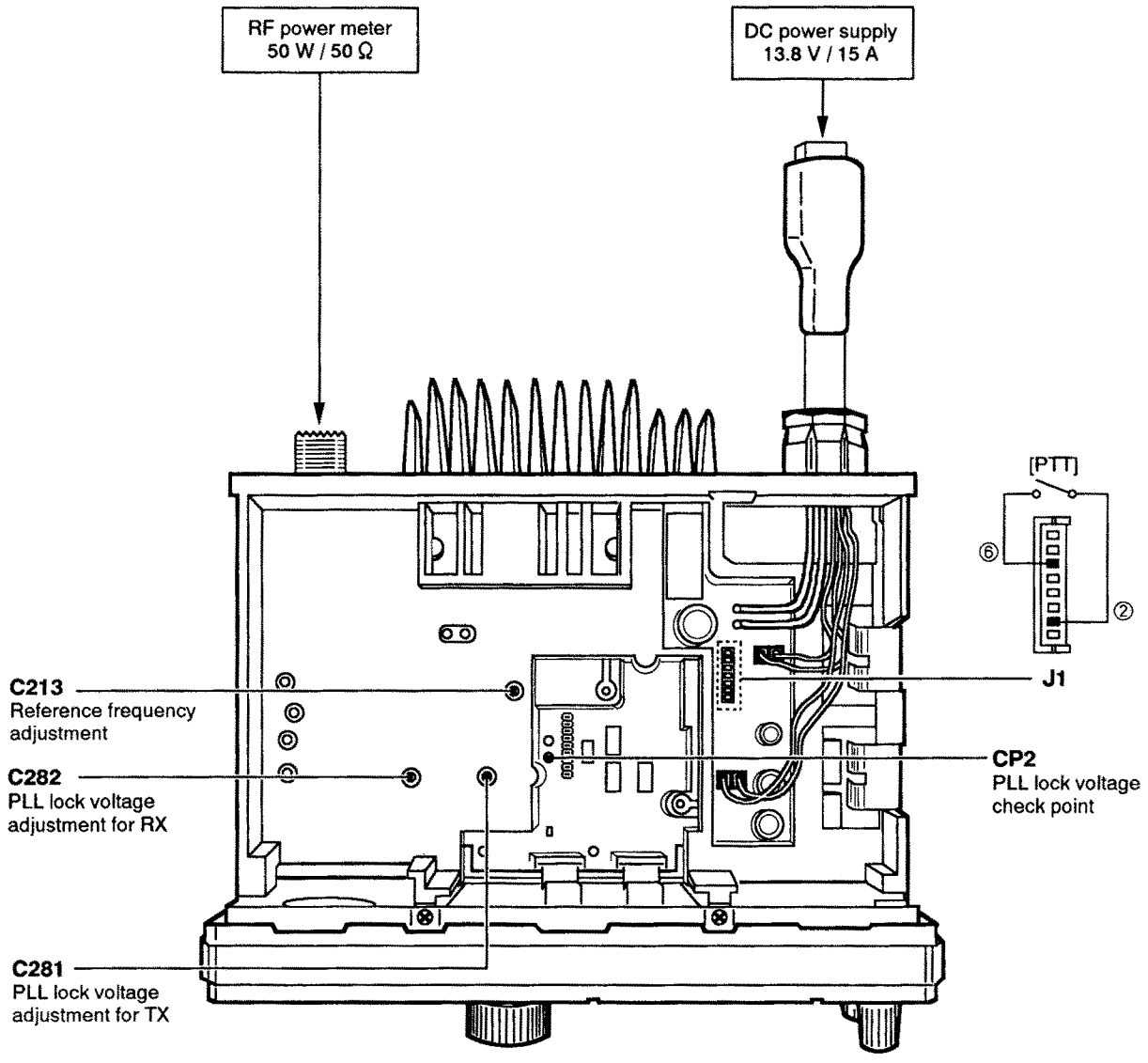
(3) MAIN unit, IC26

Pin No.	Port name	Description
4	SCR2	Outputs scrambler control signals while receiving. High: While receiving with SCRM ON
5	SCT2	Outputs scrambler control signals while transmitting. High: While transmitting with SCRM ON
6	HLIC1	Outputs control signal for hailer transmit line. High: Hailer transmit line is ON
7	HLIC2	Outputs control signal for hailer/intercom receive line. High: Receive line is ON
11	RL3	Outputs speaker ON/OFF signal for hailer function. High: Hailer speaker is ON
12	RL2	Outputs speaker ON/OFF signal for intercom function. High: Intercom speaker is ON
13	RL1	Outputs inhibit signal for internal speaker. High: Internal speaker is OFF
14	HLIC3	Outputs control signal for hailer receive line. High: Hailer receive line is ON

SECTION 4 ADJUSTMENT PROCEDURES

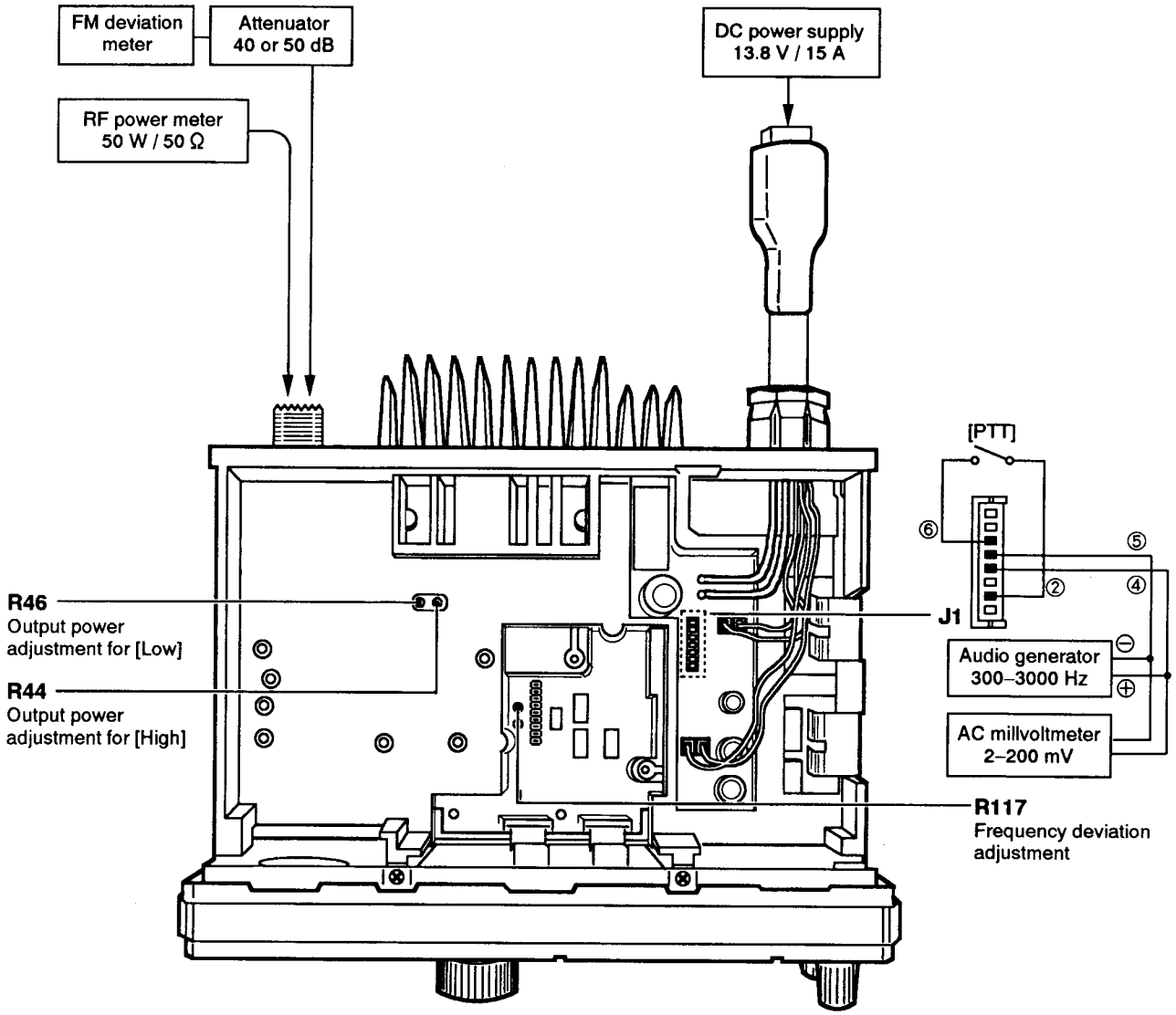
4-1 PLL ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
LOCK VOLTAGE	1	• Operating channel: ch 16 • Receiving	MAIN	Connect a digital multi-meter or oscilloscope to CP2.	3.5 V	MAIN	C282
	2	• Transmitting			3.0 V		C281
REFERENCE FREQUENCY	1	• Operating channel: ch 16 • Connect an RF power meter or a 50 Ω dummy load to the antenna connector. • Output power: Low • Transmitting	MAIN	Loosely couple the frequency counter to the antenna connector.	156.800000 MHz	MAIN	C213



4-2 TRANSMITTER ADJUSTMENTS

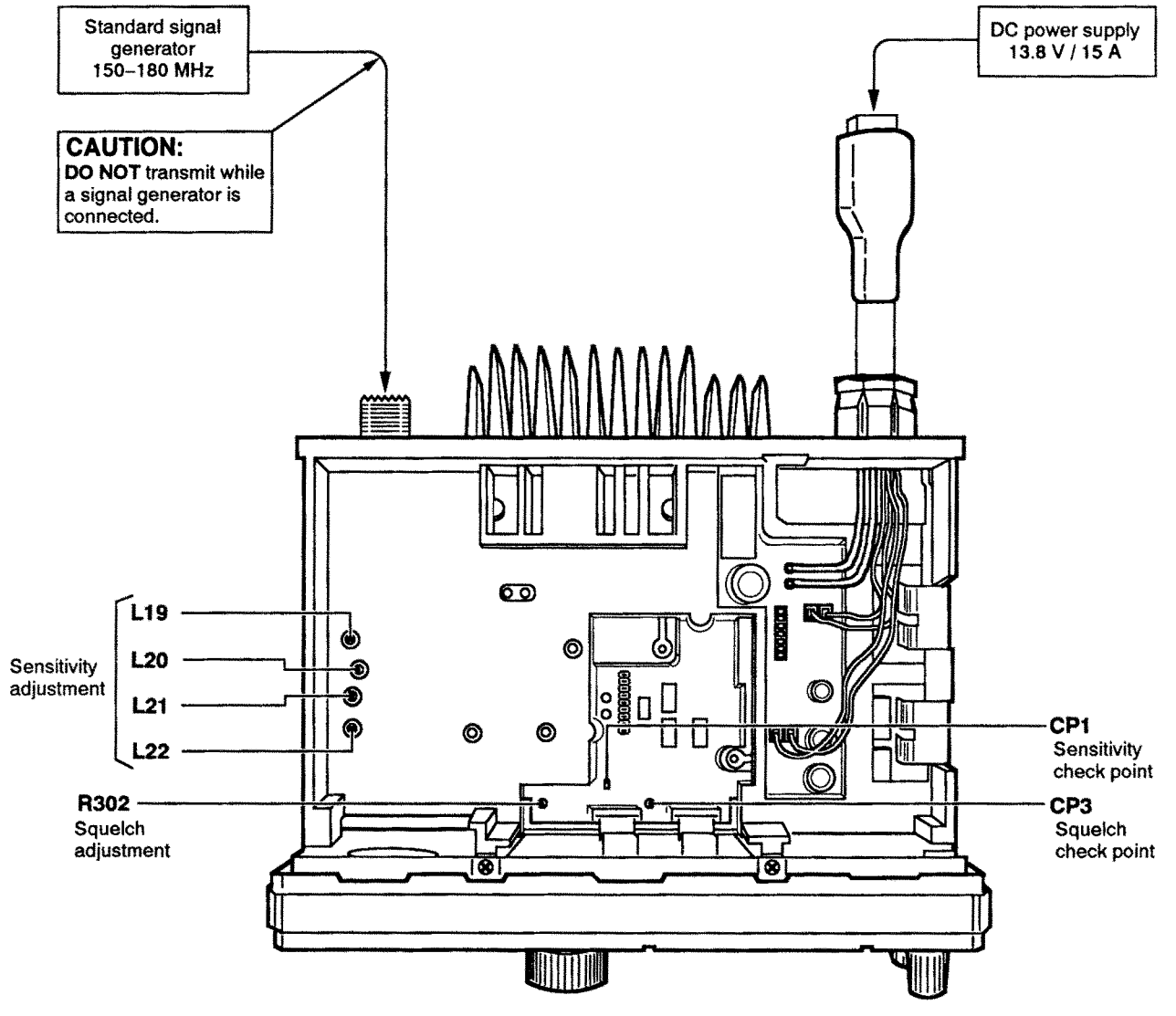
ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1	• Operating channel: ch 16 • Output power : High • Transmitting	Rear panel	Connect an RF power meter to the antenna connector.	25 W	MAIN	R44
	2	• Output power : Low • Transmitting			1.0 W		R46
FREQUENCY DEVIATION	1	• Operating channel: ch 16 • Connect an audio generator to J1 (pin 5) with an AC millivoltmeter and set as; Frequency : 1 kHz Level : 150 mV • Set an FM deviation meter as; HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P – P)/2 • Output power : Low • Transmitting	Rear panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.3 kHz	MAIN	R117



4-3 RECEIVER ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	1	• Operating channel: ch 16 • [SQUELCH] control: Max. counterclockwise • Connect an SSG to the antenna connector and set as; Frequency: 156.800 MHz Level : 1 μV*(−107 dBm) Modulation: 1 kHz Deviation : ±3.5 kHz • Receiving	MAIN	Connect a DC voltmeter to CP1.	Maximum voltage	MAIN	Adjust in sequence L19, L20 L21, L22
SQUELCH	1	• Operating channel: ch 16 • Connect an SSG to the antenna connector and set as; Frequency: 156.800 MHz Level : 0.28 μV*(−118 dBm) Modulation: OFF • Receiving	MAIN	Connect a DC voltmeter to CP3.	3.0V	MAIN	R302

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



SECTION 5 PARTS LIST

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1180001250	S.IC	TA7808F(TE16L)
IC2	1150001540	IC	SC-1302
IC3	1110003200	S.IC	TA31136FN(EL)
IC4	1110003640	S.IC	BA1604F-T
IC7	1110000960	S.IC	NJM4558M(T1)
IC9	1130004200	S.IC	TC4S66F (TE85R)
IC10	1110003420	S.IC	M64073GP 600G
IC11	1110002210	S.IC	TA75358CF(TP1)
IC14	1130004730	S.IC	BU4066BF-T1
IC15	1130004730	S.IC	BU4066BF-T1
IC16	1130008370	S.IC	TC9260F (HR)
IC17	1110002940	IC	LA4461N
IC18	1110002540	IC	LA4445
IC19	1130007370	S.IC	TA75S558F(TE85L)
IC20	1110000960	S.IC	NJM4558M(T1)
IC21	1110000960	S.IC	NJM4558M(T1)
IC22	1110002210	S.IC	TA75358CF(TP1)
IC23	1130004670	S.IC	BU4021BF-T1
IC24	1130007700	S.IC	BU4094BCF-T1
IC25	1130007700	S.IC	BU4094BCF-T1
IC26	1130007700	S.IC	BU4094BCF-T1
IC27	1130004170	S.IC	TC4S01F (TE85R)
IC28	1130004200	S.IC	TC4S66F (TE85R)
IC29	1130004200	S.IC	TC4S66F (TE85R)
IC30	1130004170	S.IC	TC4S01F (TE85R)
Q3	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q4	1590000430	S.TRANSISTOR	DTC144EU T107
Q5	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q6	1590000430	S.TRANSISTOR	DTC144EU T107
Q11	1530003420	S.TRANSISTOR	2SC5110-O (TE85R)
Q12	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q13	1530002340	S.TRANSISTOR	2SC2954-T2B
Q14	1590000430	S.TRANSISTOR	DTC144EU T107
Q15	1520000600	S.TRANSISTOR	2SB1184 TL Q
Q16	1590000430	S.TRANSISTOR	DTC144EU T107
Q17	1590000670	S.TRANSISTOR	FMW1 T148
Q18	1590001320	S.TRANSISTOR	DTC143ZU T107
Q20	1580000280	S.FET	3SK131-T1
Q25	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q27	1590000430	S.TRANSISTOR	DTC144EU T107
Q28	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q29	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q30	1560000540	S.FET	2SK880-Y (TE85R)
Q31	1530003420	S.TRANSISTOR	2SC5110-O (TE85R)
Q32	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q33	1530003010	S.TRANSISTOR	2SC4117-GR (TE85R)
Q35	1590002230	S.TRANSISTOR	UMG2N TL
Q36	1590001320	S.TRANSISTOR	DTC143ZU T107
Q37	1590001320	S.TRANSISTOR	DTC143ZU T107
Q38	1590001320	S.TRANSISTOR	DTC143ZU T107
Q40	1560000990	S.FET	PMBFJ310
Q41	1560000990	S.FET	PMBFJ310
Q44	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q45	1560000990	S.FET	PMBFJ310
Q46	1560000990	S.FET	PMBFJ310
Q47	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q48	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q49	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q50	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q51	1510000500	S.TRANSISTOR	2SA1162-GR (TE85R)
Q52	1530000160	S.TRANSISTOR	2SC2712-Y (TE85RTEM)
Q53	1590000430	S.TRANSISTOR	DTC144EU T107
Q54	1590000430	S.TRANSISTOR	DTC144EU T107
Q55	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q56	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q57	1590000430	S.TRANSISTOR	DTC144EU T107
Q58	1590000720	S.TRANSISTOR	DTA144EU T107
Q59	1590000430	S.TRANSISTOR	DTC144EU T107
Q60	1590001330	S.TRANSISTOR	DTA114EU T107

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q61	1590000520	S.FET	2SJ106-GR (TE85R)
D1	1790000700	DIODE	DSA3A1
D5	1790000450	S.DIODE	MA862(TX)
D6	1750000550	S.DIODE	1SS355 TE-17
D7	1790000690	S.DIODE	HSM88ASR-TR
D10	1710000290	DIODE	MI308
D11	1720000180	S.VARICAP	1SV164-T2B
D12	1720000180	S.VARICAP	1SV164-T2B
D13	1720000180	S.VARICAP	1SV164-T2B
D14	1720000180	S.VARICAP	1SV164-T2B
D16	1730002320	S.ZENER	MA8051-M(TX)
D18	1750000550	S.DIODE	1SS355 TE-17
D19	1730002320	S.ZENER	MA8051-M(TX)
D20	1750000550	S.DIODE	1SS355 TE-17
D21	1750000550	S.DIODE	1SS355 TE-17
D22	1730002320	S.ZENER	MA8051-M(TX)
D23	1790000540	S.VARICAP	MA338(TX)
D24	1790000690	S.DIODE	HSM88ASR-TR
D25	1710000290	DIODE	MI308
D27	1730002320	S.ZENER	MA8051-M(TX)
D28	1730002320	S.ZENER	MA8051-M(TX)
D29	1750000550	S.DIODE	1SS355 TE-17
D30	1750000550	S.DIODE	1SS355 TE-17
D31	1750000550	S.DIODE	1SS355 TE-17
D33	1720000270	S.VARICAP	1SV217 (TPH2)
D35	1720000270	S.VARICAP	1SV217 (TPH2)
D36	1720000270	S.VARICAP	1SV217 (TPH2)
D37	1720000270	S.VARICAP	1SV217 (TPH2)
D39	1790000891	S.DIODE	ND433G-E1
D40	1730002370	S.ZENER	MA8120-H(TX)
D41	1750000550	S.DIODE	1SS355 TE-17
D42	1750000550	S.DIODE	1SS355 TE-17
D43	1750000550	S.DIODE	1SS355 TE-17
D44	1750000550	S.DIODE	1SS355 TE-17
D45	1750000550	S.DIODE	1SS355 TE-17
D46	1750000550	S.DIODE	1SS355 TE-17
D47	1750000550	S.DIODE	1SS355 TE-17
D48	1750000550	S.DIODE	1SS355 TE-17
FI1	2020001040	CERAMIC	CFWS455E
FI2	2010001710	XTAL	FL-210 (21.800 MHz)
X1	6050009280	XTAL	CR-503 (12.8 MHz)
X2	6070000130	DISCRIMINATOR	CDBM455C24
X3	6050009060	XTAL	CR-488 (21.345 MHz)
L7	6200001630	S.COIL	ELJNC R10K-F
L8	6200002160	S.COIL	ELJNC 82NK-F
L9	6200002160	S.COIL	ELJNC 82NK-F
L10	6200001770	S.COIL	ELJNC 47NK-F
L11	6200001770	S.COIL	ELJNC 47NK-F
L13	6170000180	COIL	LW-19
L17	6110001600	COIL	LA-243
L19	6150003820	COIL	LS-440
L20	6150003820	COIL	LS-440
L21	6130002940	COIL	LB-340
L22	6150003820	COIL	LS-440
L24	6200002160	S.COIL	ELJNC 82NK-F
L25	6200003040	S.COIL	NL 322522T-R68J-3
L27	6200001630	S.COIL	ELJNC R10K-F
L28	6200001770	S.COIL	ELJNC 47NK-F
L50	6110001600	COIL	LA-243
L51	6110001600	COIL	LA-243
L52	6110001600	COIL	LA-243
L53	6110001600	COIL	LA-243
L54	6200003320	S.COIL	NL 322522T-3R3J-3

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L55	6200003320	S.COIL	NL 322522T-3R3J-3
L58	6200003320	S.COIL	NL 322522T-3R3J-3
L59	6200003320	S.COIL	NL 322522T-3R3J-3
L60	6200003320	S.COIL	NL 322522T-3R3J-3
L61	6140002550	S.COIL	B4F-617DB-1010=P3
L62	6140002550	S.COIL	B4F-617DB-1010=P3
L63	6200003920	S.COIL	LER 015T 100K
L64	6200006760	S.COIL	MC152-E558HN-100097=P3
L65	6200006760	S.COIL	MC152-E558HN-100097=P3
L66	6200003320	S.COIL	NL 322522T-3R3J-3
L67	6200004650	S.COIL	MLR1608M 68NJ-T
R6	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R7	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R8	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R9	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R19	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R20	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R21	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R22	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R23	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R24	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R25	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R26	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R27	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R28	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R29	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R30	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R31	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R32	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R33	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R34	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R35	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R36	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R37	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R38	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R39	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R40	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R41	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R42	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R43	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R44	7310002690	S.TRIMMER	RV-145 (102)
R45	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R46	7310002760	S.TRIMMER	RV-152 (223)
R47	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R49	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R51	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R52	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R53	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R54	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R55	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R56	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R57	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R58	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R59	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R60	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R61	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R62	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R63	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R64	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R65	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)
R66	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R72	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R73	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R78	7030003730	S.RESISTOR	ERJ3GEYJ 274 V (270 kΩ)
R79	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R80	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R81	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R82	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R83	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R85	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R86	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R87	7030003840	S.RESISTOR	ERJ3GEYJ 225 V (2.2 MΩ)
R88	7030007590	S.RESISTOR	RR0816R-433-D (43 kΩ)
R92	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R95	7030003730	S.RESISTOR	ERJ3GEYJ 274 V (270 kΩ)
R97	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R100	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R103	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R104	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R105	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R106	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R107	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R108	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R109	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R110	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R111	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)
R112	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R113	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R114	7510000930	S.THERMISTOR	NTCCF2012 3NH 103KC-T
R115	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R116	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R117	7310002600	S.TRIMMER	RV-110 (473)
R122	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R123	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R124	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R125	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R126	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R128	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R134	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R135	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R136	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R137	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R138	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R139	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R140	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R141	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R142	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R143	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R144	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R145	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R146	7030003820	S.RESISTOR	ERJ3GEYJ 155 V (1.5 MΩ)
R147	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R148	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R149	7030003820	S.RESISTOR	ERJ3GEYJ 155 V (1.5 MΩ)
R150	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R151	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R152	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R156	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R159	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R160	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R164	7410000990	S.ARRAY	EXB-V8V 470JV
R165	7410000990	S.ARRAY	EXB-V8V 470JV
R166	7410000990	S.ARRAY	EXB-V8V 470JV
R167	7410000990	S.ARRAY	EXB-V8V 470JV
R168	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R169	7030003770	S.RESISTOR	ERJ3GEYJ 564 V (560 kΩ)
R170	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)
R171	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R172	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R176	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R177	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R178	7030003790	S.RESISTOR	ERJ3GEYJ 824 V (820 kΩ)
R179	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R180	7030003690	S.RESISTOR	ERJ3GEYJ 124 V (120 kΩ)
R181	7510000850	S.THERMISTOR	NTCCF2012 3BH 102KC-T
R182	7030003650	S.RESISTOR	ERJ3GEYJ 563 V (56 kΩ)
R183	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R184	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)
R185	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R186	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R187	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R188	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R189	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R190	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R191	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R192	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R194	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R195	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R196	7030004040	S.RESISTOR	ERJ3GEYJ 4R7 V (4.7 Ω)
R197	7030004040	S.RESISTOR	ERJ3GEYJ 4R7 V (4.7 Ω)

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R198	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)
R199	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R200	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)
R201	7030004040	S.RESISTOR	ERJ3GEYJ 4R7 V (4.7 Ω)
R202	7030004040	S.RESISTOR	ERJ3GEYJ 4R7 V (4.7 Ω)
R204	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R205	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R208	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R209	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R210	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R212	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R213	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R215	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R216	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R217	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R218	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R220	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R221	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R222	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 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	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R227	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R228	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R229	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R230	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R231	7030003730	S.RESISTOR	ERJ3GEYJ 274 V (270 kΩ)
R235	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R239	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R240	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R241	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R242	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R243	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R244	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R245	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R249	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R250	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R251	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R252	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R253	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R254	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R255	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R256	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R257	7030003240	S.RESISTOR	ERJ3GEYJ 220 V (22 Ω)
R258	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R259	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R260	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R261	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R262	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R264	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R265	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R266	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R267	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R268	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R269	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R270	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R271	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R272	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R273	7410000990	S.ARRAY	EXB-V8V 470JV
R274	7410000990	S.ARRAY	EXB-V8V 470JV
R275	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R276	7030005270	S.RESISTOR	ERJ3GEYJ 204 V (200 kΩ)
R277	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R278	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R279	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R280	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R282	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R284	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R285	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R286	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R287	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R288	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R289	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R290	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R291	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R292	7030005270	S.RESISTOR	ERJ3GEYJ 204 V (200 kΩ)
R293	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R294	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R295	7030000370	S.RESISTOR	MCR10EZHJ 820 Ω (821)
R296	7030000370	S.RESISTOR	MCR10EZHJ 820 Ω (821)
R297	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)
R298	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R299	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R300	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R301	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R302	7310002760	S.TRIMMER	RV-152 (223)
R303	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R304	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)
R305	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R306	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R307	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R308	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R309	7030003680	S RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R310	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R311	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R312	7510000930	S.THERMISTOR	NTCCF2012 3NH 103KC-T
R313	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R316	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R317	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R318	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
C1	4510006020	ELECTROLYTIC	16 MV 2200 HC
C2	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C3	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C4	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C5	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C6	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C7	4510003910	ELECTROLYTIC	16 MV 47 HW
C8	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C9	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C29	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C30	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C31	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C33	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C34	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C35	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C36	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C38	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C39	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C40	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C41	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C42	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C43	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C44	4030008750	S.CERAMIC	C1608 CH 1H 360J-T-A
C45	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C46	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C47	4510003900	ELECTROLYTIC	16 MV 22 HW
C48	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C49	4510004590	ELECTROLYTIC	16 MV 470 HC
C50	4550000460	S.TANTALUM	TESVA 1C 105M1-8L
C51	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C52	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C53	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C54	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C55	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C57	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C60	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C61	4030011730	S.CERAMIC	GRM42-6 CH 680J 500PT
C62	4030011170	S.CERAMIC	GRM42-6 CH 101J 500PT
C63	4030011190	S.CERAMIC	GRM42-6 CH 270J 500PT
C64	4030011180	S.CERAMIC	GRM42-6 CH 220J 500PT
C66	4030011190	S.CERAMIC	GRM42-6 CH 270J 500PT
C67	4030011180	S.CERAMIC	GRM42-6 CH 220J 500PT
C68	4030011190	S.CERAMIC	GRM42-6 CH 270J 500PT
C69	4030011180	S.CERAMIC	GRM42-6 CH 220J 500PT
C70	4030009990	S.CERAMIC	C1608 CH 1H 200J-T-A
C72	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C73	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C74	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C75	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C78	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C77	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C78	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C79	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C80	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C81	4030009510	S.CERAMIC	C1608 CH 1H 010B-T-A
C82	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C83	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C84	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C85	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C86	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C87	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C89	4030011770	S.CERAMIC	C1608 CH 1H 060B-T-A
C90	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C91	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C92	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C93	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C94	4030006990	S.CERAMIC	C1608 CH 1H 080D-T-A
C95	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C96	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C97	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C100	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C102	4030007100	S.CERAMIC	C1608 CH 1H 560J-T-A
C103	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C104	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C105	4030009920	S.CERAMIC	C1608 CH 1H 050B-T-A
C108	4030007140	S.CERAMIC	C1608 CH 1H 121J-T-A
C109	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A
C110	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C111	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C112	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C113	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C114	4030007170	S.CERAMIC	C1608 CH 1H 221J-T-A
C115	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C117	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C118	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C119	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C120	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C121	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C123	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C125	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C126	4510003900	ELECTROLYTIC	16 MV 22 HW
C127	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C128	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C129	4550000460	S.TANTALUM	TESVA 1C 105M1-8L
C130	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C131	4340000010	S.MYLAR	ECWU 1C 223JB5
C132	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C134	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C136	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C137	4030008650	S.CERAMIC	C1608 JB 1H 332K-T-A
C138	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C139	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C140	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C141	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C142	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C144	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C145	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C146	4030009490	S.CERAMIC	C1608 JB 1H 821K-T-A
C147	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C148	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C155	4550004040	S.TANTALUM	TEMSVA 0J 685M-8L
C156	4550004040	S.TANTALUM	TEMSVA 0J 685M-8L
C157	4550003080	S.TANTALUM	TEMSVA 1A 335M-8L
C158	4550003080	S.TANTALUM	TEMSVA 1A 335M-8L
C159	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C160	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C161	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C162	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C163	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C164	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C165	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C166	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C167	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C168	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C169	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C174	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C175	4550002890	S.TANTALUM	TESVA 1A 225M1-8L
C176	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C177	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C179	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C181	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C182	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C183	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C187	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C198	4030008910	S.CERAMIC	C1608 JB 1C 393K-T-A
C199	4030008910	S.CERAMIC	C1608 JB 1C 393K-T-A
C200	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C201	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C202	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C207	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C209	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C210	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C211	4030007010	S.CERAMIC	C1608 CH 1H 100D-T-A
C212	4030007080	S.CERAMIC	C1608 CH 1H 390J-T-A
C213	4610001910	S.TRIMMER	CTZ3E-10A-W1
C214	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C215	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C216	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C217	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C219	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C220	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C221	4030011170	S.CERAMIC	GRM42-6 CH 180J 500PT
C223	4030009560	S.CERAMIC	C1608 CH 1H 0R75B-T-A
C225	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C226	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C227	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C228	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C230	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C231	4030008660	S.CERAMIC	C2012 JB 1H 333K-T-A
C232	4030008660	S.CERAMIC	C2012 JB 1H 333K-T-A
C233	4510004540	S.ELECTROLYTIC	ECEV0JA470SR
C234	4510004540	S.ELECTROLYTIC	ECEV0JA470SR
C235	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C236	4510004990	ELECTROLYTIC	16 MV 100 HC
C237	4510004540	S.ELECTROLYTIC	ECEV0JA470SR
C238	4510004540	S.ELECTROLYTIC	ECEV0JA470SR
C239	4510004600	ELECTROLYTIC	16 MV 1000 HC
C240	4510004600	ELECTROLYTIC	16 MV 1000 HC
C241	4510004990	ELECTROLYTIC	16 MV 100 HC
C242	4510004990	ELECTROLYTIC	16 MV 100 HC
C243	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C244	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C245	4510005000	ELECTROLYTIC	16 MV 220 HC
C246	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C247	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C250	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C251	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C252	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C253	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C254	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C256	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C257	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C261	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C262	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C263	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C264	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C266	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C267	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C269	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C270	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C272	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C273	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C274	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C275	4550000530	S.TANTALUM	TESVA 1V 104M1-8L
C276	4030007040	S.CERAMIC	C1608 CH 1H 180J-T-A
C277	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C278	4030007110	S.CERAMIC	C1608 CH 1H 680J-T-A
C279	4030009910	S.CERAMIC	C 1608 CH 1H 040B-T-A
C280	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A
C281	4610001910	S.TRIMMER	CTZ3E-10A-W1
C282	4610001910	S.TRIMMER	CTZ3E-10A-W1

S.=Surface mount

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C285	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C286	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C287	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C288	4030008560	S.CERAMIC	C1608 CH 1H 300J-T-A
C289	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C290	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C292	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C295	4030009560	S.CERAMIC	C1608 CH 1H R75B-T-A
C296	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C297	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C299	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C300	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C304	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C305	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C306	4030010070	S.CERAMIC	C1608 X7S 1C 104K-T-A
C307	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C308	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C309	4510005600	S.ELECTROLYTIC	ECEV1CS100SR
C310	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C311	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C312	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C313	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C315	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C316	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C317	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C318	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C319	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C320	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C321	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C322	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C325	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C326	4030007060	S.CERAMIC	C1608 CH 1H 270J-T-A
C327	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C328	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C329	4030006870	S.CERAMIC	C1608 JB 1H 222K-T-A
C330	4030009530	S.CERAMIC	C1608 CH 1H 030B-T-A
C332	4030009520	S.CERAMIC	C1608 CH 1H 020B-T-A
C333	4510004990	ELECTROLYTIC	16 MV 100 HC
C334	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C335	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C336	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C337	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C338	4030008630	S.CERAMIC	C1608 JB 1H 471K-T-A
C339	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C340	4030009990	S.CERAMIC	C1608 CH 1H 200J-T-A
C341	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C342	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C344	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C345	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C347	4510003900	ELECTROLYTIC	16 MV 22 HW
C348	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C350	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C351	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C356	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C358	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C359	4030009000	S.CERAMIC	C2012 JB 1C 224K-T-A
C360	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C361	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C362	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C364	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C365	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C366	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C367	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C368	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C369	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C370	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
RL1	6330001410	S.RELAY	NAS-12W-K-B05
RL2	6330000180	RELAY	MZ-12HG
RL3	6330000180	RELAY	MZ-12HG
RL4	6330001400	RELAY	FTR-H1AA012V
J1	6510003430	CONNECTOR	B07B-EH-S
J5	6510004890	CONNECTOR	3022-09A

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
J6	6510016430	S.CONNECTOR	53307-1491
J7	6510003440	CONNECTOR	B08B-EH-S
J9	6510019490	S.CONNECTOR	52435-2291
J10	6510019490	S.CONNECTOR	52435-2291
J11	6510020060	CONNECTOR	60284-2
J12	6510020060	CONNECTOR	60284-2
J14	6510011590	CONNECTOR	B2P-VH
J16	6510011590	CONNECTOR	B2P-VH
W1	6910001020	JUMPER	IPS-1041-2
W2	6910001020	JUMPER	IPS-1041-2
W17	7030003860	S.JUMPER	ERJ3GE JPW V
W19	7030003860	S.JUMPER	ERJ3GE JPW V
W21	7030003860	S.JUMPER	ERJ3GE JPW V
W22	7030003860	S.JUMPER	ERJ3GE JPW V
W23	7030003860	S.JUMPER	ERJ3GE JPW V
W24	7030003860	S.JUMPER	ERJ3GE JPW V
W25	7030003860	S.JUMPER	ERJ3GE JPW V
W26	7030003860	S.JUMPER	ERJ3GE JPW V
W27	7030003860	S.JUMPER	ERJ3GE JPW V
W28	7030003860	S.JUMPER	ERJ3GE JPW V
W29	7030003860	S.JUMPER	ERJ3GE JPW V
W30	7030003860	S.JUMPER	ERJ3GE JPW V
W31	7030003860	S.JUMPER	ERJ3GE JPW V
W32	7030003860	S.JUMPER	ERJ3GE JPW V
W33	7030003860	S.JUMPER	ERJ3GE JPW V
W34	7030003860	S.JUMPER	ERJ3GE JPW V
W35	7030003860	S.JUMPER	ERJ3GE JPW V
W36	7030003860	S.JUMPER	ERJ3GE JPW V
W37	7030003860	S.JUMPER	ERJ3GE JPW V
W38	7030003860	S.JUMPER	ERJ3GE JPW V
W39	7030003860	S.JUMPER	ERJ3GE JPW V
W40	7030003860	S.JUMPER	ERJ3GE JPW V
W41	7030003860	S.JUMPER	ERJ3GE JPW V
W42	7030003860	S.JUMPER	ERJ3GE JPW V
W43	7030003860	S.JUMPER	ERJ3GE JPW V
W44	7030003860	S.JUMPER	ERJ3GE JPW V
W45	7030003860	S.JUMPER	ERJ3GE JPW V
W48	7030003860	S.JUMPER	ERJ3GE JPW V
W49	7030003860	S.JUMPER	ERJ3GE JPW V
W50	7030003860	S.JUMPER	ERJ3GE JPW V
W51	7030003860	S.JUMPER	ERJ3GE JPW V
W52	7030003860	S.JUMPER	ERJ3GE JPW V
W53	7030003860	S.JUMPER	ERJ3GE JPW V
W54	7030003860	S.JUMPER	ERJ3GE JPW V
W55	7030003860	S.JUMPER	ERJ3GE JPW V
W56	7030003860	S.JUMPER	ERJ3GE JPW V
W58	7030003860	S.JUMPER	ERJ3GE JPW V
W59	7030003860	S.JUMPER	ERJ3GE JPW V
W60	7030003860	S.JUMPER	ERJ3GE JPW V
W61	7030003860	S.JUMPER	ERJ3GE JPW V
W62	7030003860	S.JUMPER	ERJ3GE JPW V
W63	7030003860	S.JUMPER	ERJ3GE JPW V
W64	7030003860	S.JUMPER	ERJ3GE JPW V
W65	7030003860	S.JUMPER	ERJ3GE JPW V
W66	7030003860	S.JUMPER	ERJ3GE JPW V
W67	7030003860	S.JUMPER	ERJ3GE JPW V
W68	7030003860	S.JUMPER	ERJ3GE JPW V
W69	7030003860	S.JUMPER	ERJ3GE JPW V
W70	7120000380	JUMPER	JPW 01 R-01
W71	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910048347	PCB	B 4908G
EP2	9040901901	TUBE	0.7(d) L=12 mm
EP3	9026352901	TUBE	0.7(d) L=25 mm

S.=Surface mount

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140006380	S.IC	M38223M4-129GP
IC2	1130008220	S.IC	SED1510F0C
IC3	1110003500	S.IC	S-80742SL-A6-T1
IC4	1180001070	S.IC	TA7805F(TE16L)
IC5	1140005880	S.IC	X25320S8I-2.7T6
Q1	1530001950	S.TRANSISTOR	2SC2712-GR (TE85R)
Q2	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q3	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q4	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q5	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q6	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q7	1530002550	S.TRANSISTOR	2SC3326-B (TE85R)
D1	1750000060	S.DIODE	1SS196 (TE85R)
D2	1750000550	S.DIODE	1SS355 TE-17
X1	6060000630	S.CERAMIC	PBRC 4.91 BR
R1	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R2	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R3	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R6	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R7	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R8	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R9	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R10	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R11	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R12	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R13	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R14	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R15	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R16	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R17	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R18	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R19	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R20	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R24	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R25	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R26	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R27	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R28	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R29	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R33	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R34	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R35	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R36	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R37	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R38	7030000100	S.RESISTOR	MCR10EZHJ 4.7 Ω (4R7)
R47	7030003780	S.RESISTOR	ERJ3GEYJ 684 V (680 kΩ)
R48	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R51	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R52	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R53	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R54	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R55	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R56	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R57	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R58	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R59	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R60	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
C1	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C2	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C3	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C4	4030009660	S.CERAMIC	C1608 JF 1C 224Z-T-A
C5	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C6	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C7	4510004630	S.ELECTROLYTIC	ECEV1CA100SR

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C8	4510004540	S.ELECTROLYTIC	ECEV0JA470SR
C9	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C10	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C13	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C14	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C15	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C16	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C17	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C18	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C19	4550000460	S.TANTALUM	TESVA 1C 105M1-8L
DS1	5030001480	LCD	DLC-7985YBGF
DS2	5040002140	S.LED	CL-200Y-C-TS
DS3	5040002140	S.LED	CL-200Y-C-TS
DS4	5040002140	S.LED	CL-200Y-C-TS
DS5	5040002140	S.LED	CL-200Y-C-TS
DS6	5040002140	S.LED	CL-200Y-C-TS
DS7	5040002140	S.LED	CL-200Y-C-TS
DS8	5040002140	S.LED	CL-200Y-C-TS
DS9	5040002140	S.LED	CL-200Y-C-TS
DS10	5040002030	S.LED	CL-170Y-CD-T
DS11	5040002030	S.LED	CL-170Y-CD-T
DS12	5040002030	S.LED	CL-170Y-CD-T
DS13	5040002030	S.LED	CL-170Y-CD-T
DS14	5040002030	S.LED	CL-170Y-CD-T
DS15	5040002030	S.LED	CL-170Y-CD-T
DS16	5040002030	S.LED	CL-170Y-CD-T
DS17	5040002030	S.LED	CL-170Y-CD-T
DS18	5040002030	S.LED	CL-170Y-CD-T
S1	2260002050	S.SWITCH	EVQ-PJX 05M
S2	2260002050	S.SWITCH	EVQ-PJX 05M
S3	2260002050	S.SWITCH	EVQ-PJX 05M
S4	2260002050	S.SWITCH	EVQ-PJX 05M
S5	2260002050	S.SWITCH	EVQ-PJX 05M
S6	2260002050	S.SWITCH	EVQ-PJX 05M
S7	2260002050	S.SWITCH	EVQ-PJX 05M
S8	2260002050	S.SWITCH	EVQ-PJX 05M
S9	2260002050	S.SWITCH	EVQ-PJX 05M
S10	2260002050	S.SWITCH	EVQ-PJX 05M
J1	6510019500	S.CONNECTOR	52559-2290
J2	6510019500	S.CONNECTOR	52559-2290
J3	6510014960	S.CONNECTOR	B2B-ZR-SM3-TF
J4	6510019370	S.CONNECTOR	B3B-ZR-SM3-TF
J5	6510014960	S.CONNECTOR	B2B-ZR-SM3-TF
J6	6510019420	S.CONNECTOR	B8B-ZR-SM3-TF
W3	8900006530	CABLE	OPC-618 (N:22 L:107)
W4	8900006530	CABLE	OPC-618 (N:22 L:107)
W5	7030003860	S.JUMPER	ERJ3GE JPW V
W6	7030003860	S.JUMPER	ERJ3GE JPW V
W7	7030003860	S.JUMPER	ERJ3GE JPW V
W8	7030003860	S.JUMPER	ERJ3GE JPW V
W9	7030003860	S.JUMPER	ERJ3GE JPW V
W10	7030003860	S.JUMPER	ERJ3GE JPW V
W11	7030003860	S.JUMPER	ERJ3GE JPW V
W12	7030003860	S.JUMPER	ERJ3GE JPW V
W13	7030003860	S.JUMPER	ERJ3GE JPW V
W14	7030003860	S.JUMPER	ERJ3GE JPW V
W15	7030003860	S.JUMPER	ERJ3GE JPW V
W16	7030003860	S.JUMPER	ERJ3GE JPW V
W17	7030003860	S.JUMPER	ERJ3GE JPW V
W18	7030003860	S.JUMPER	ERJ3GE JPW V
W19	7030003860	S.JUMPER	ERJ3GE JPW V
W20	7030003860	S.JUMPER	ERJ3GE JPW V
WS1	8600035560	CABLE	P01LO
WS2	8970022720	CABLE	(1)/LO

S.=Surface mount

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
SP1	2510000970	SPEAKER	F66G50-2(F66G-6521)
EP1	0910048353	PCB	B 4909C
EP2	8930042801	LCD CONTACT	SRCN-1909-SP-N-W-1

[VR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7210001360	VARIABLE	RK097111004NA (10KB)
EP1	0910048361	PCB	B 4910A

[SW BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7210001190	VARIABLE	RK0971112001A (10KA)
J1	6510016940	CONNECTOR	5P-SCN
P1	6510009640	CONNECTOR	ZHR-8
WS1	8600035570	CABLE	P01×J01SW
EP1	0910048372	PCB	B 4911B

[SENSOR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
S1	2250000360	ENCODER SD12(U1)(9X5)S(SRB124PHDC)25KC	
WS1	8600035580	CABLE	P01×J01SE
EP1	0910048382	PCB	B 4912B

[CONNECT BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	
J2	6510020070	CONNECTOR	8S-L-D-SS
WS1	8600035591	CABLE	P01×J01CO-1
EP1	0910048392	PCB	B 4913B

S.=Surface mount

SECTION 6 MECHANICAL PARTS

[CHASSIS PARTS]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510004880	Antenna connector MR-DSE-01	1
MC1	Optional product	Microphone HM-114B [Black]	1
	Optional product	Microphone HM-114W [White]	1
W1	8900006960	Cable OPC-671	1
MP1	8410002051	1909 Heatsink-1	1
MP3	8930030770	1428 Clip	2
MP4	8930033490	1542 Jack cap	1
MP5	8930034300	1542 ANT seal	1
MP6	8930015610	F-sealing	1
MP7	8930003000	R-sealing	1
MP8	8010013011	Case (A) -1	1
	8010002501	Case-1 (White)	1
MP10	8010000520	Chassis side plate	2
MP11	8820000970	1909 Bracket screw	4
MP13	8850000090	Washer	4
MP15	8810008660	Screw PH BT M3×8 NI-ZU	10
MP16	8810005560	Screw PH M3×8 SUS ZK	2
MP17	8810008660	Screw PH BT M3×8 NI-ZU	2
MP18	8810004430	Screw PH M3×6 ZK	4
MP19	8810009060	Screw FH M3×6 ZK	4
MP24	8810002950	Screw BiH M3×6 SUS	6
MP31	8930042330	Washer (M)	1
MP32	8930043270	Sheet (EX)	1
MP33	8860001080	1909 Earth RUG	1

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
DS1	5030001480	LCD DLC-7985 YBGF	1
SP1	2510000970	Speaker F66G50-2 (F66G-6521)	1
W3	8900006530	Cable OPC-618	1
W4	8900006530	Cable OPC-618	1
EP2	8930042801	LCD Contact SRCN-1909-SP-N-W-1	2
MP1	8210013990	1909 Front panel [Black]	1
	8210014240	1909 Front panel (B) [White]	1
MP2	8010016760	1909 Sub chassis	1
MP3	8810008660	Screw PH BT M3×8 NI-ZU	9
MP4	8930041420	1909 10-Key	1
MP5	8210014250	1909 Reflector	1
MP6	8930014980	59 Net	1
MP7	8310039160	1909 Window plate	1
MP8	8930041620	1909 LCD Holder	1
MP10	8610010300	Knob N256 [Black]	2
	8610010500	Knob N256 (A) [White]	2
MP11	8610010290	Knob N255 [Black]	1
	8610010490	Knob N255 (A) [White]	1
MP12	8810008660	Screw BT M3×8 NI-ZU	5
MP14	8210014000	Sub Reflector	1
MP15	8930032380	Shaft Tape (B)	3
MP16	8930042490	White sheet (Q)	1

[VR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R1	7210001360	Variable resistor RK097111004NA [SQUELCH] (incl. nut)	1

[SW BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R1	7210001190	Variable resistor RK0971112001A [PWR/VOL] (incl. nut)	1

[SENSOR BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
S1	2250000360	Encoder SD12 [CHANNEL] (incl. nut)	1

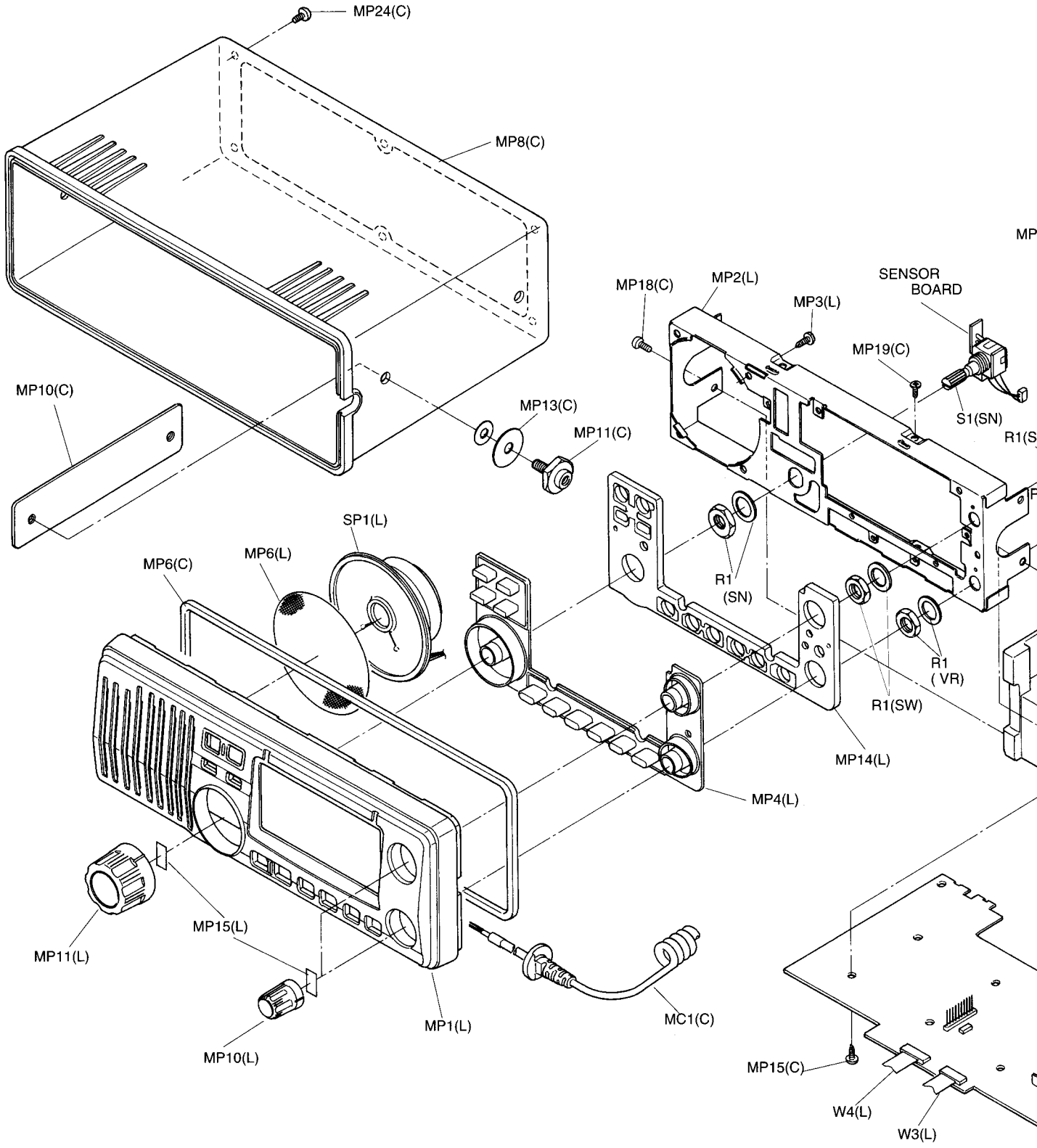
[CONNECT BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J2	6510020070	Connector 8S-L-D-SS (incl. nut)	1

[UNPACKING]

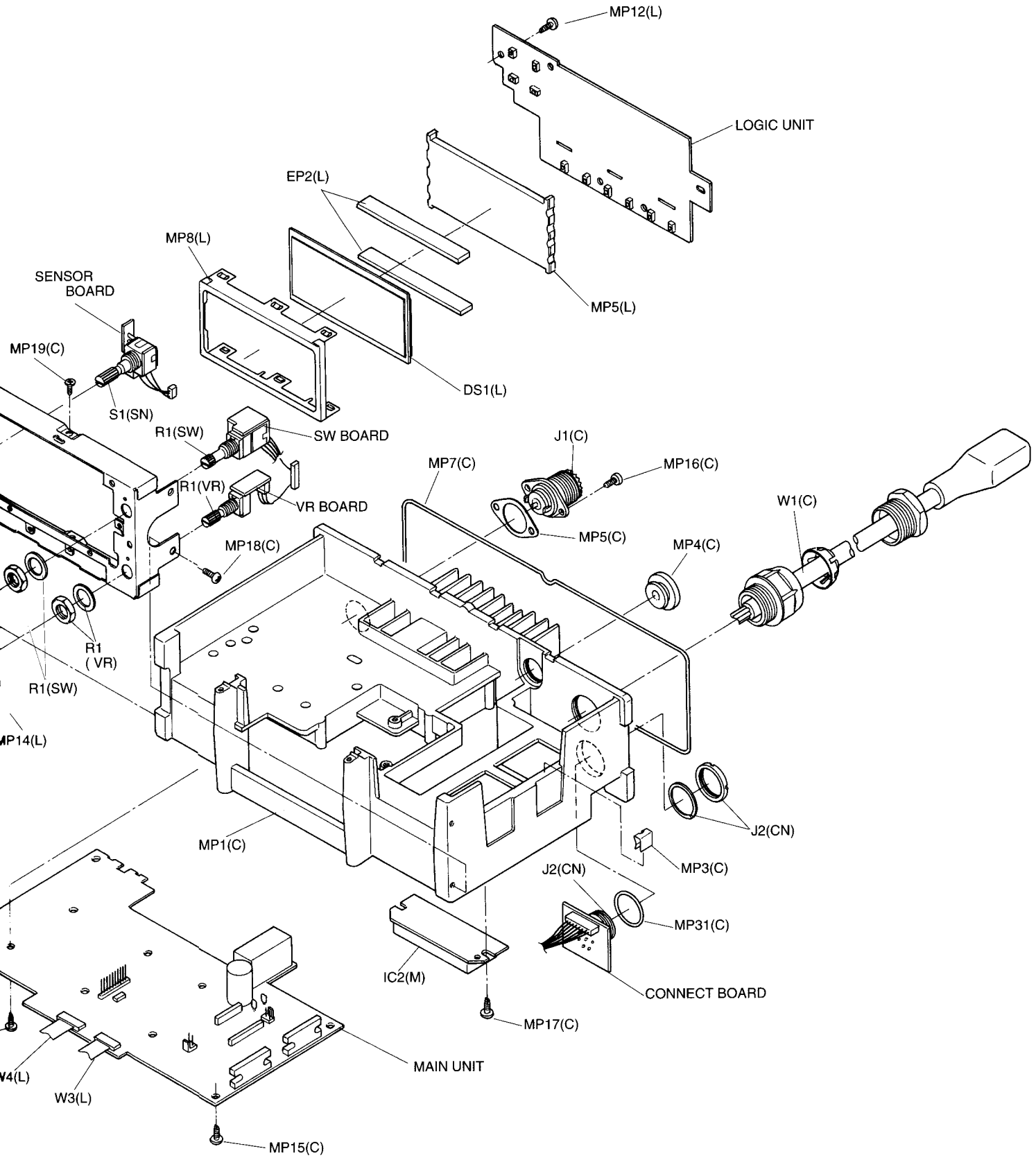
REF. NO.	ORDER NO.	DESCRIPTION	QTY.
F1	5210000070	Fuse FGB 10A	1
J1	6510007740	Connector NS1008 8P	1
W1	8900006970	DC Power cable OPC-672	1
MP1	8010016810	Mounting bracket	1
MP3	8810001500	Screw PH A M6×30 SUS	4
MP4	8810003500	Bolt M6×50 SUS	4
MP5	8850000200	Flat washer M6 SUS	8
MP6	8830000260	Nut M6 SUS	4
MP7	8850000510	Spring washer M6 SUS	4
MP8	8810001470	Screw PH A M3.5×30 SUS	2
MP9	8930010000	Connector cover FX537	1
MP10	8810009550	Knob bolt G1-5-4 SUS	4

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



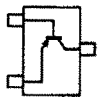
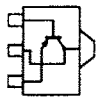
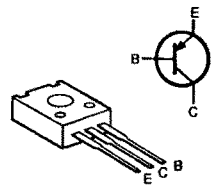
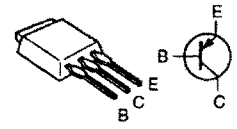
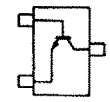
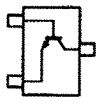
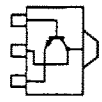
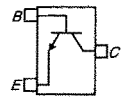
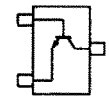
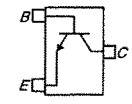
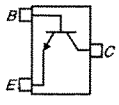
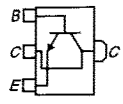
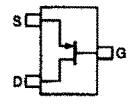
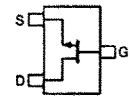
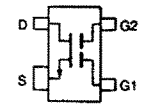
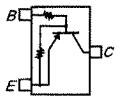
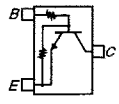
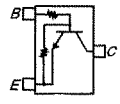
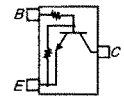
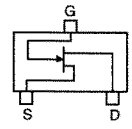
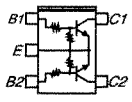
Unit abbreviations (C): CHASSIS PARTS (L): LOGIC UNIT (V): VR BOARD
(SW): SW BOARD (SN): SENSOR BOARD (CN): CONNECT BOARD

Note : Refer to the IC-M59 service manual for HM-114 microphone details.

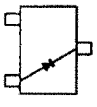
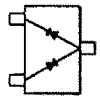
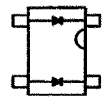
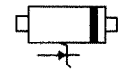
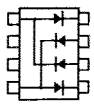

MP12(L)
LOGIC UNIT
EP2(L)
MP8(L)
SENSOR BOARD
MP5(L)
MP19(C)
DS1(L)
S1(SN)
R1(SW)
SW BOARD
J1(C)
MP7(C)
MP16(C)
R1(VR)
VR BOARD
W1(C)
MP5(C)
MP18(C)
MP4(C)
R1 (VR)
R1(SW)
MP14(L)
J2(CN)
MP1(C)
MP3(C)
J2(CN)
MP31(C)
IC2(M)
CONNECT BOARD
MP17(C)
MAIN UNIT
W4(L)
W3(L)
MP15(C)

SECTION 7 SEMI-CONDUCTOR INFORMATION

• TRANSISTORS AND FET'S

2SA1162 GR (Symbol: SR) 	**2SB1132/R** (Symbol: BA/BAR) 	**2SB1143 S** 	**2SB1184 Q** (Symbol: B1184) 	**2SC2712 GR** (Symbol: LG) 
2SC2712 Y (Symbol: LY) 	**2SC2954** (Symbol: QK) 	**2SC3326 B** (Symbol: CCB) 	**2SC4117 GR** (Symbol: CG) 	**2SC4226-R25** (Symbol: R25) 
2SC5110 O (Symbol: MGO) 	**2SD1664 Q** (Symbol: DA) 	**2SJ106 GR** (Symbol: VG) 	**2SK880 Y** (Symbol: XY) 	**3SK131 LA** (Symbol: V12) 
DTA114 EU (Symbol: 14) 	**DTC143 ZU** (Symbol: 123) 	**DTC144 EU** (Symbol: 26) 	**FMW1** (Symbol: W1) 	**PMBFJ310** (Symbol: M10) 
UMG2N (Symbol: G2) 				

• DIODES

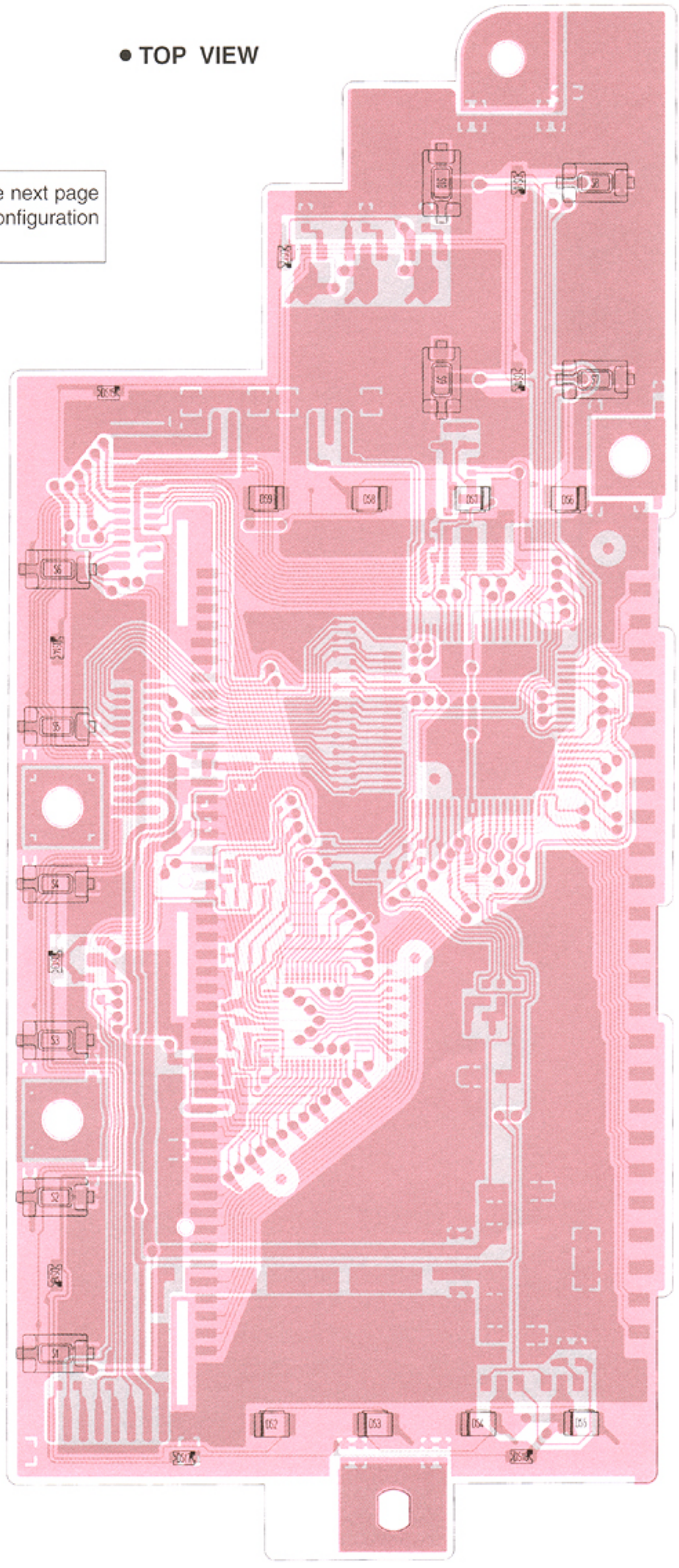
1SS196 (Symbol: G3) 	**1SS355** (Symbol: A) 	**HSM88ASR** (Symbol: C3) 	**MA862** (Symbol: M1I) 	**MA8051-M** (Symbol: 5-1) 
MA8120-H (Symbol: 12^) 	**ND433 G** (Symbol: 433) 			

SECTION 8 BOARD LAYOUTS

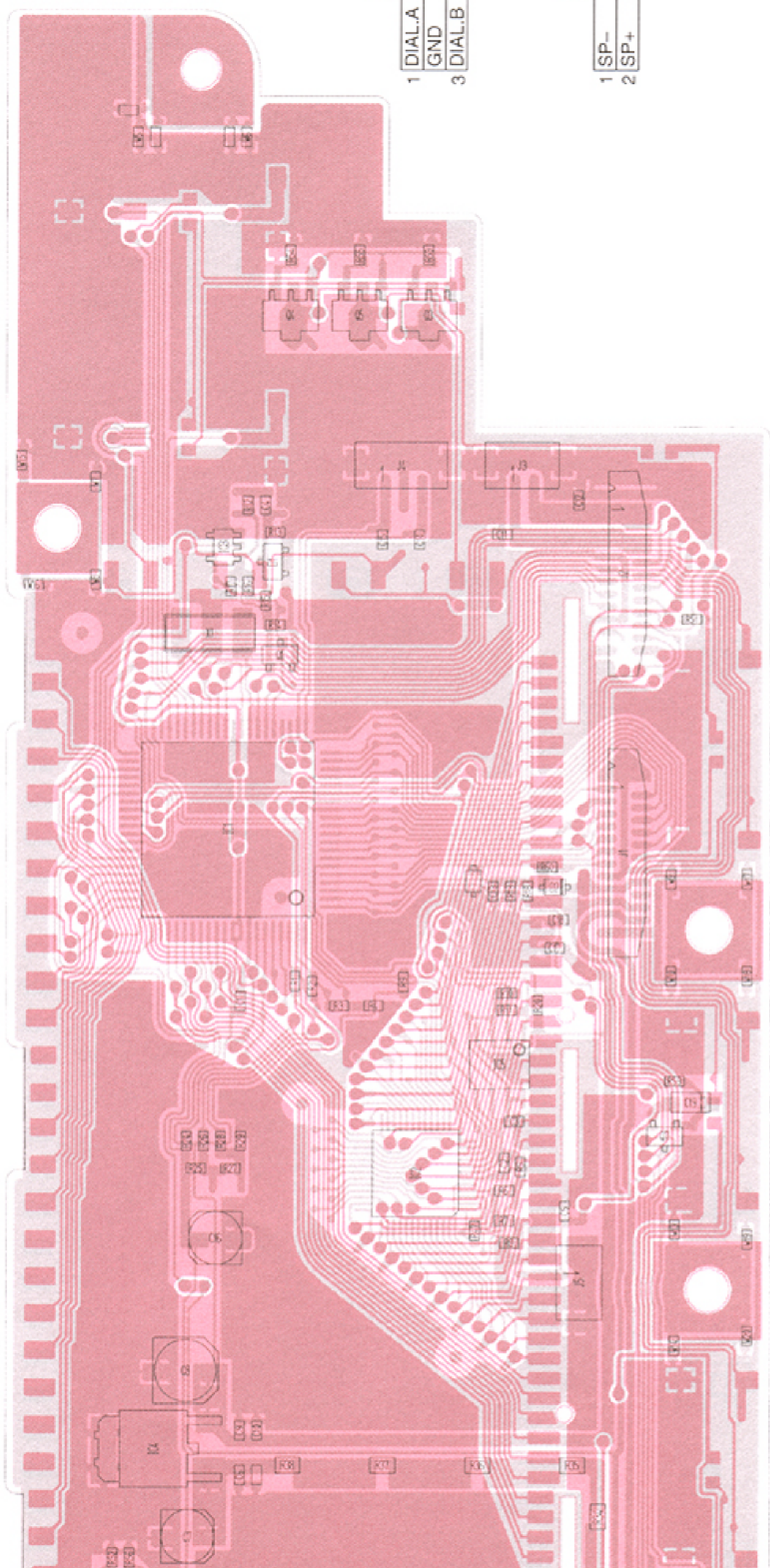
8-1 LOGIC UNIT

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

● TOP VIEW



• BOTTOM VIEW



FROM
SENSOR BOARD P1

J4

1	2	3
DIAL.A	GND	DIAL.B

TO SPEAKER P1

J3

1	2
SP−	SP+

J2

1	SP+
	SP+
	SP+
	SP+
	SP−
	SP−
	SP−
	SP−
	GND
	V.DAT
	DATA
	V.CK
	CK
	V.STB
	IEX.D
	S.STB
	PTT
	P.STB
	GND
	A.GND
	VOL.2
22	VOL.1

TO MAIN UNIT J9

J1

1	BEEP 1
	OXE.STB
	OXE.OE
	BEEP 2
	SQL V
	CALL1/CL12
	SQL I
	IEX.P/S
	SMET
	DATA M
	TXDET
	DATA S
	ANT
	GND
	GND
	5V
	5V
	HVS
	HVS
	HV
22	HV

TO MAIN UNIT J10

J5 FROM MICROPHONE

1	KEY M
2	GND

J6

8	7	6	5	4	3	2	1
HVS	HV	A.GND	VOL.2	VOL.1	SQL H	SQL V	SQL L

FROM SW BOARD P1

8-2 MAIN UNIT

• MAIN UNIT (TOP VIEW)

FROM OPTIONAL DSC UNIT
UX–130 J2

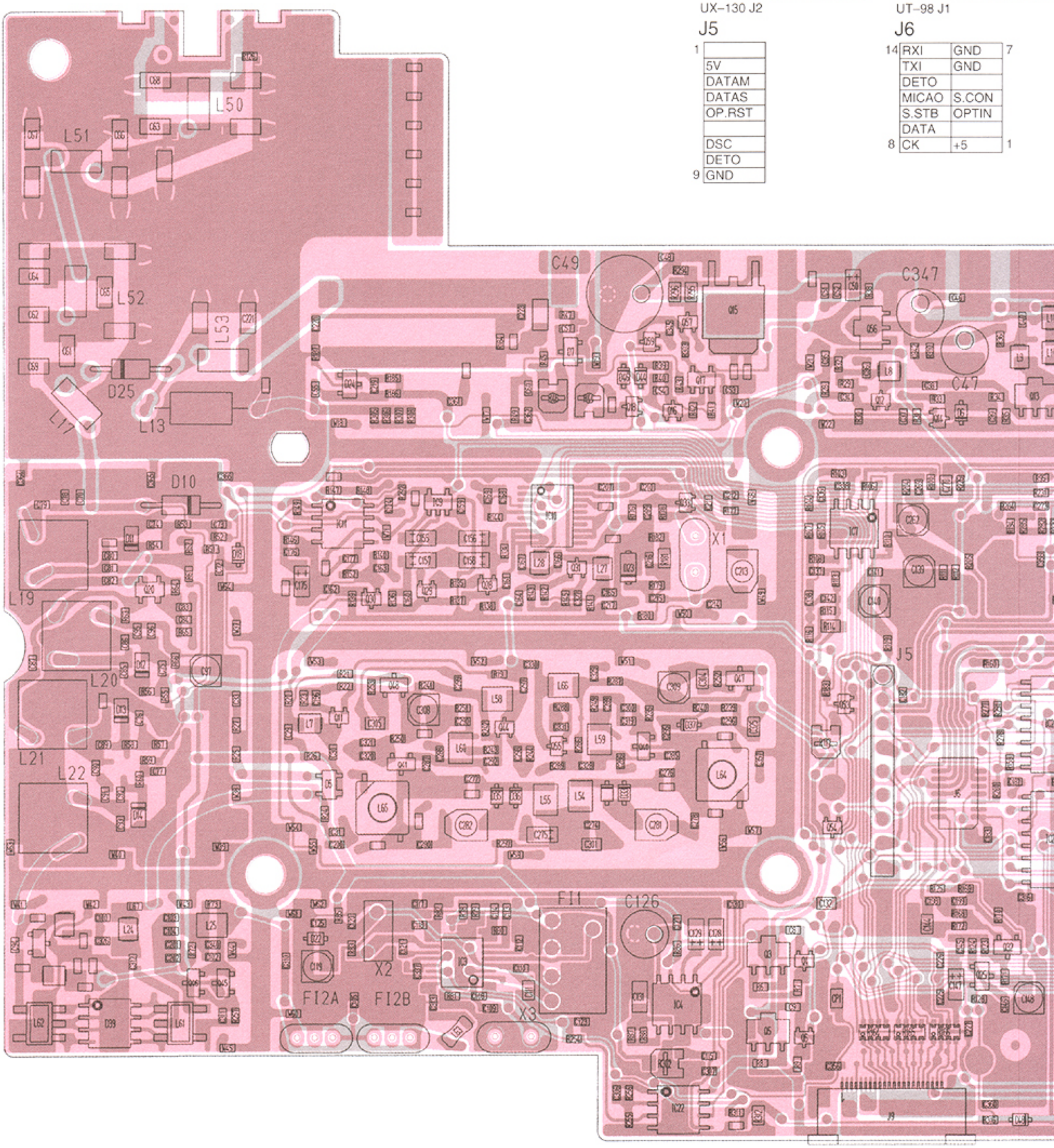
J5

1		
	5V	
	DATAM	
	DATAS	
	OP.RST	
	DSC	
	DETO	
9	GND	

FROM OPTIONAL SCRM U
UT–98 J1

J6

14	RXI	GND	7
	TXI	GND	
	DETO		
	MICAO	S.CON	
	S.STB	OPTIN	
	DATA		
8	CK	+5	1

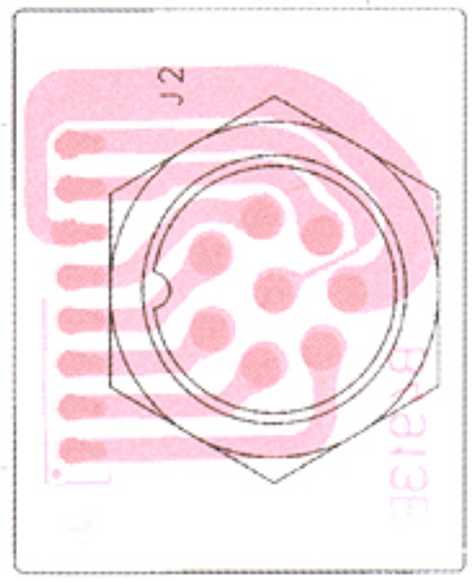


J9

SP+	SP+	SP+	SP+	SP–	SP–	SP–	SP–	GND	V.DAT	DATA	V.CK	CK	V.STB	IEX.D	S.STB	PTT	P.STB	GND	A.GND	VOL.2	VOL.1
1																					22

FROM LOGIC UNIT J2

● CONNECT BOARD



M OPTIONAL SCRM UNIT
8 J1

	GND	7
	GND	
O		
AO	S.CON	
TB	OPTIN	
A		
	+5	1

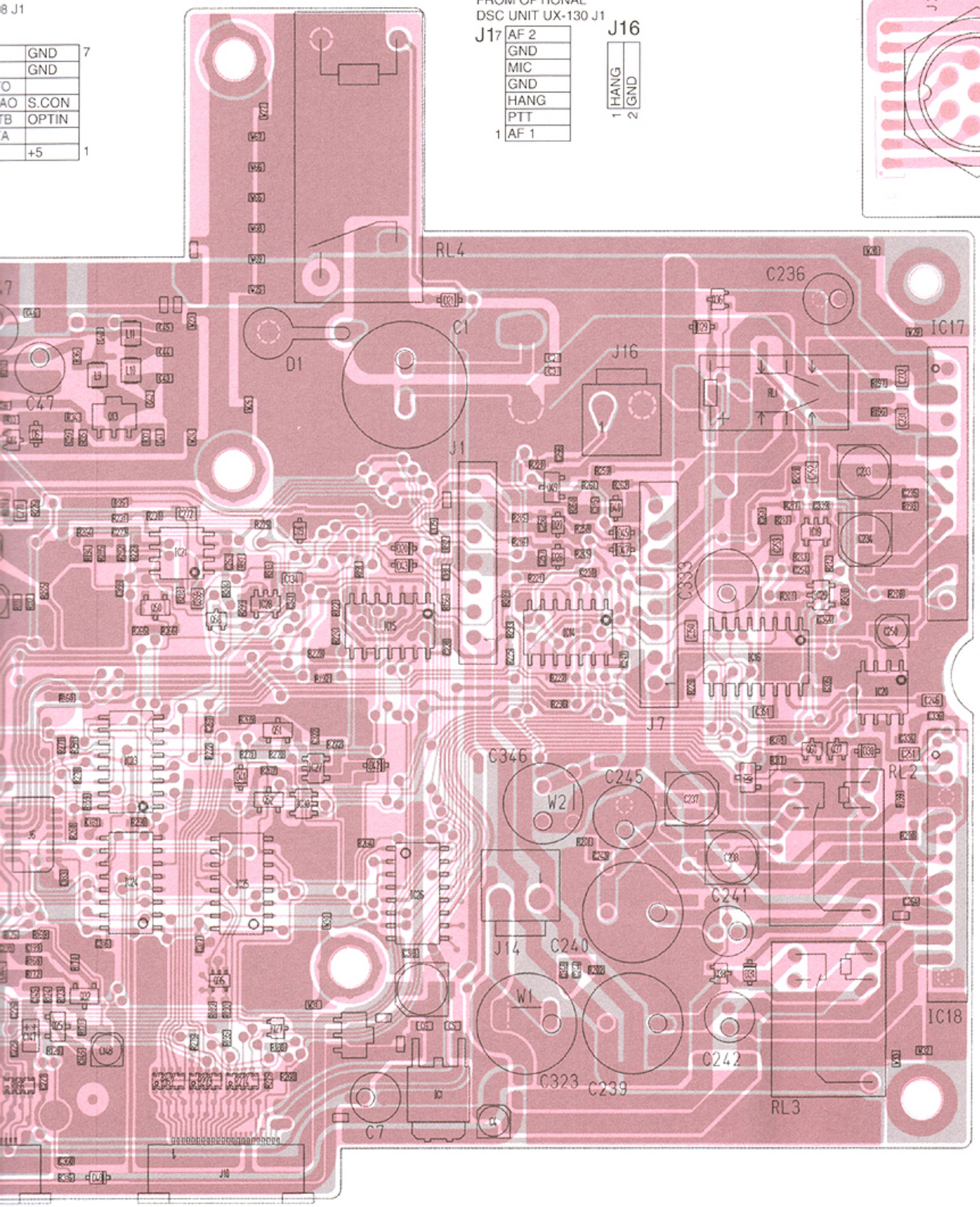
FROM OPTIONAL
DSC UNIT UX-130 J1

J17

	AF 2
	GND
	MIC
	GND
	HANG
	PTT
1	AF 1

J16

HANG	1
GND	2



FROM CONNECT
BOARD J1

J7

8	UA4
	HAIL(–)
	HAIL(+)
	CALL 2
	GND
	CALL 1
	INCOM(–)
1	INCOM(+)

A.GND		
VOL.2		
VOL.1	22	

J10

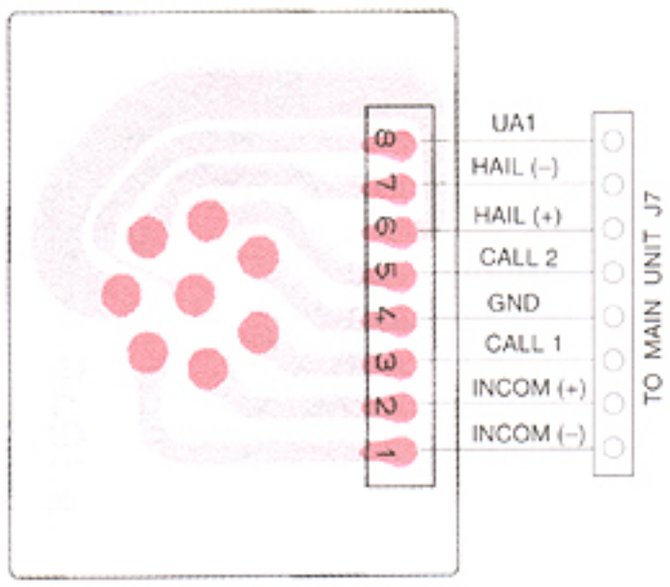
1	BEEP 1	OXE.STB	OXE.OE	BEEP 2	SQL V	CALL1/CL12	SQL I	IEX.P/S	SMET	DATA M	TXDET	DATA S	ANT	GND	GND	5V	5V		HVS	HVS	HV	HV 22

FROM LOGIC UNIT J1

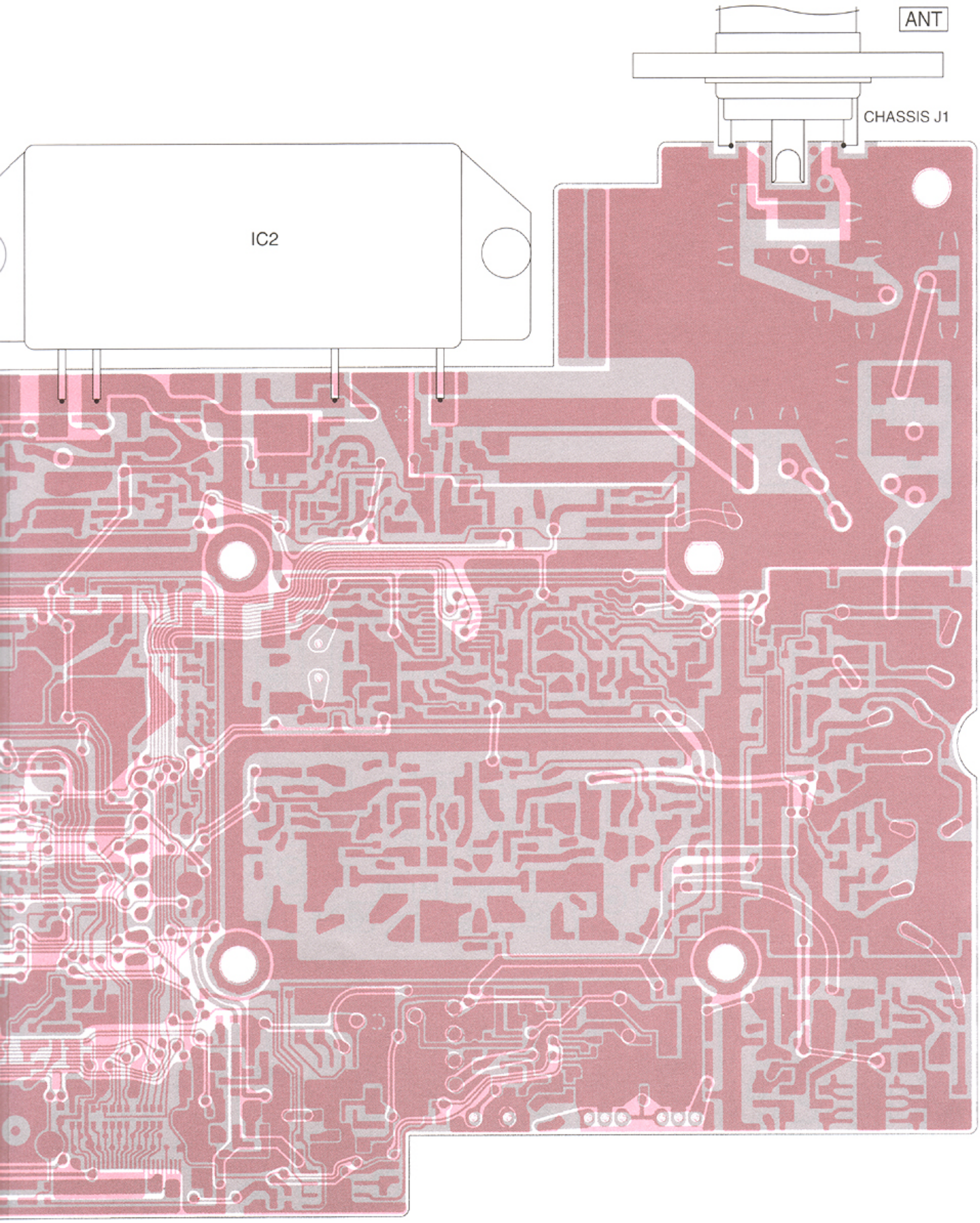
J14

2	SP–
1	SP+

• CONNECT BOARD



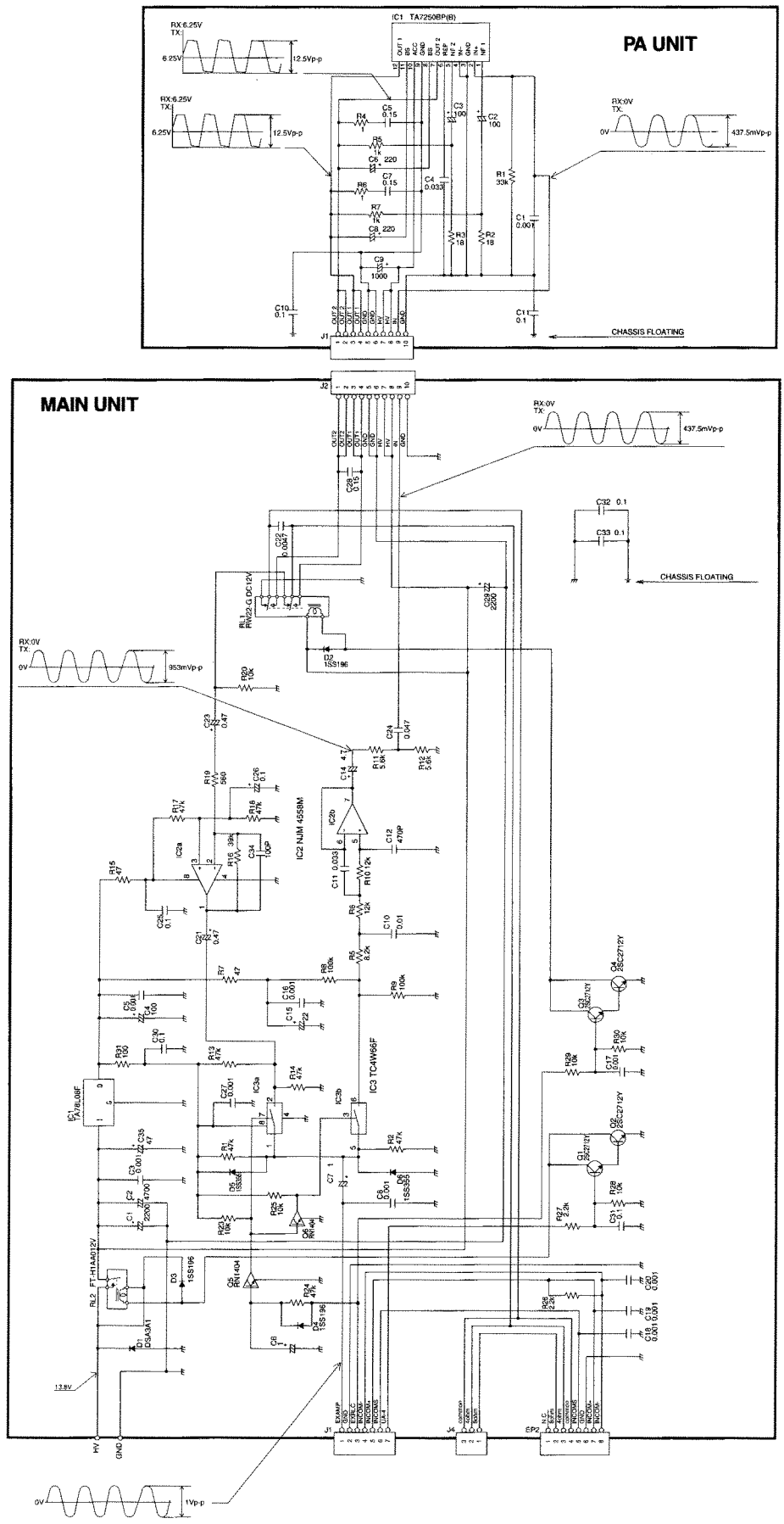
• MAIN UNIT (BOTTOM VIEW)


ANT
CHASSIS J1
IC2

SECTION 9 OPTIONAL UNITS

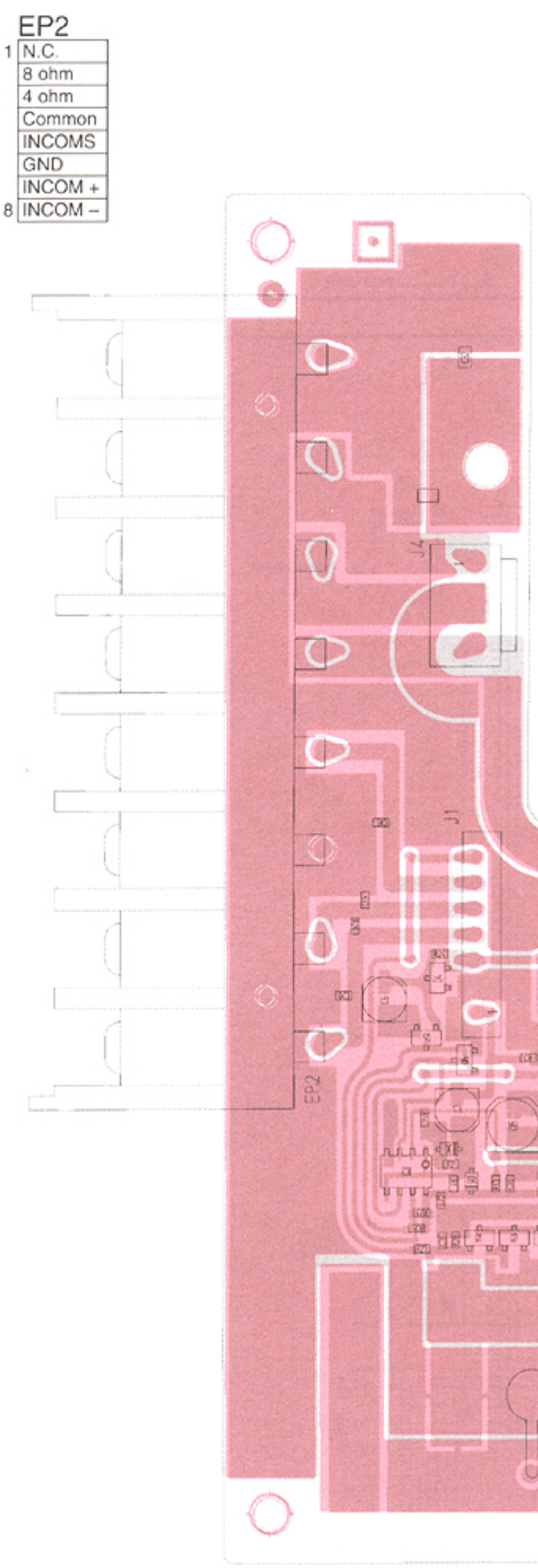
9-1 UA-4 AUDIO AMPLIFIER

VOLTAGE DIAGRAM



BOARD LAYOUT

● MAIN UNIT



EP2

1	N.C.
	8 ohm
	4 ohm
	Common
	INCOMS
	GND
	INCOM +
8	INCOM –

J4

1	8 ohm
	4 ohm
3	Common

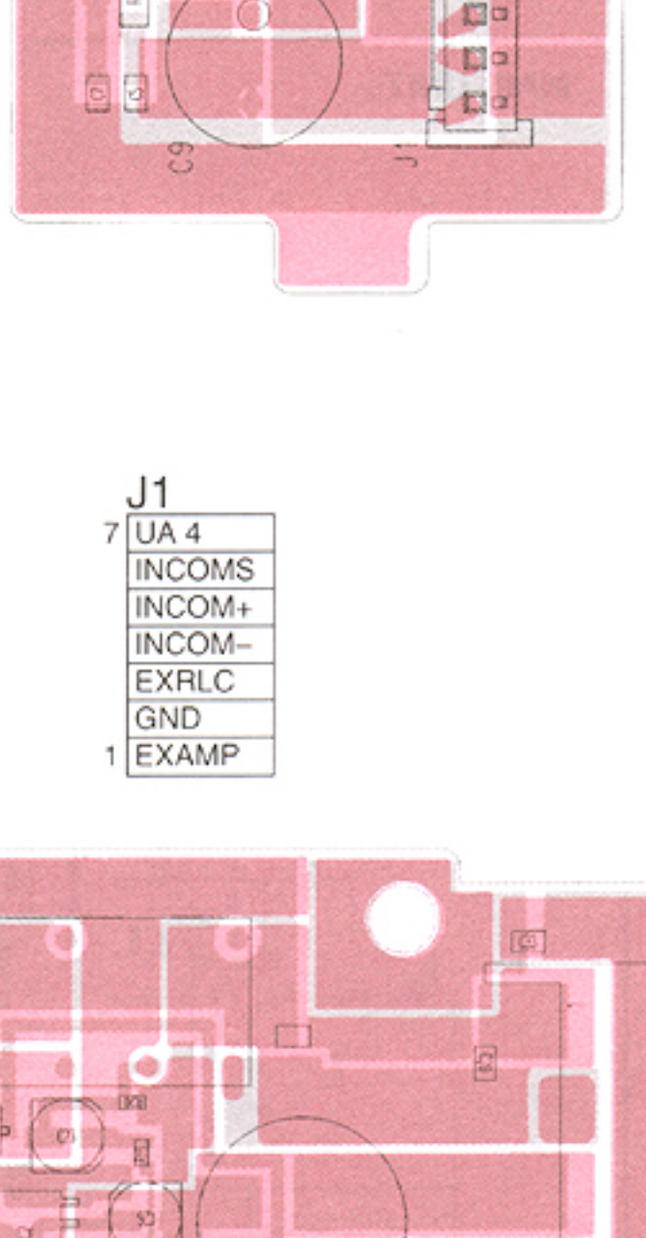
J1

7	UA 4
	INCOMS
	INCOM+
	INCOM–
	EXRLC
	GND
1	EXAMP

J2

1	OUT 2
	OUT 2
	OUT 1
	OUT 1
	GND
	GND
	HV
	HV
	IN
10	GND

● PA UNIT

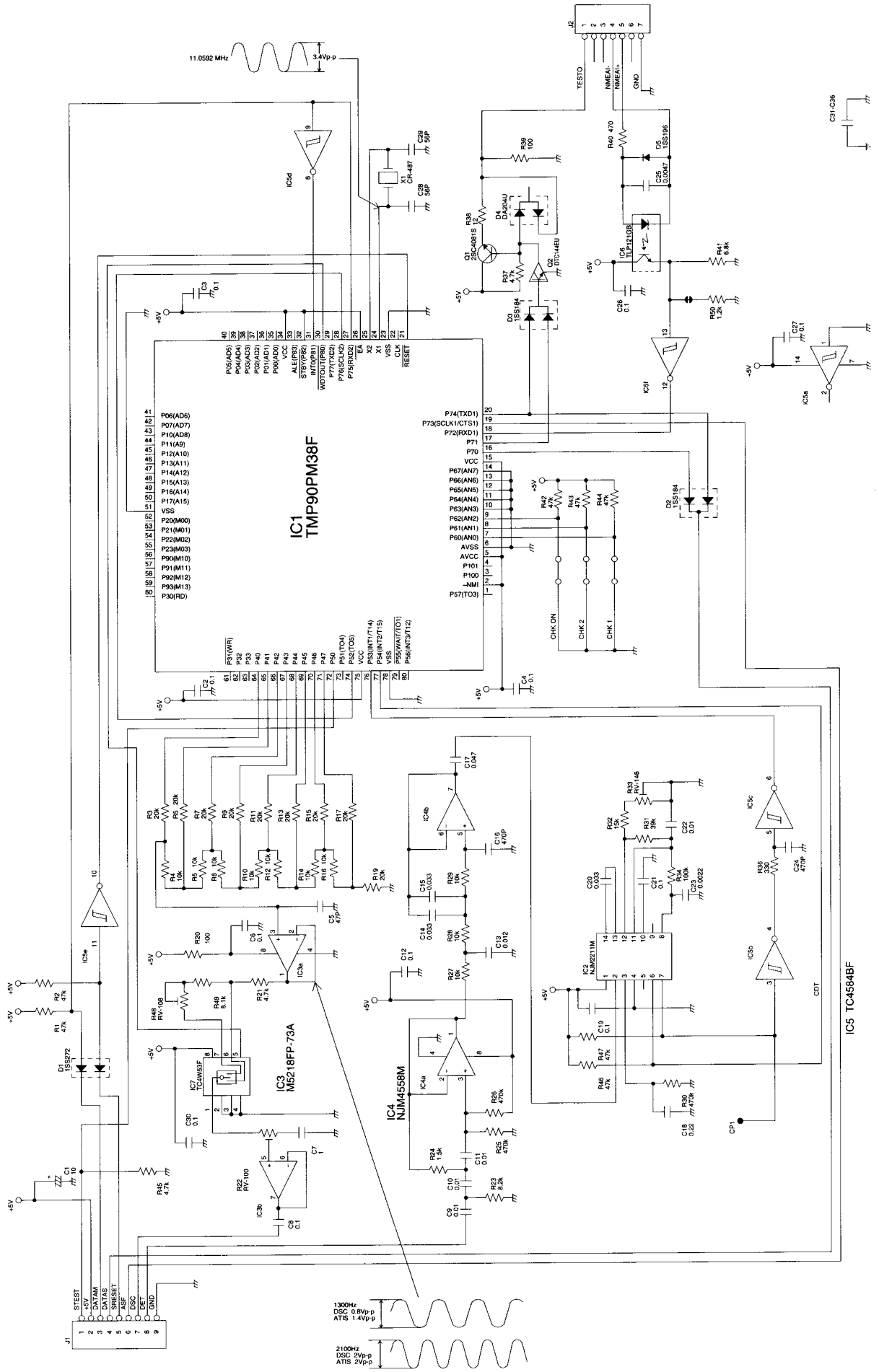


J1

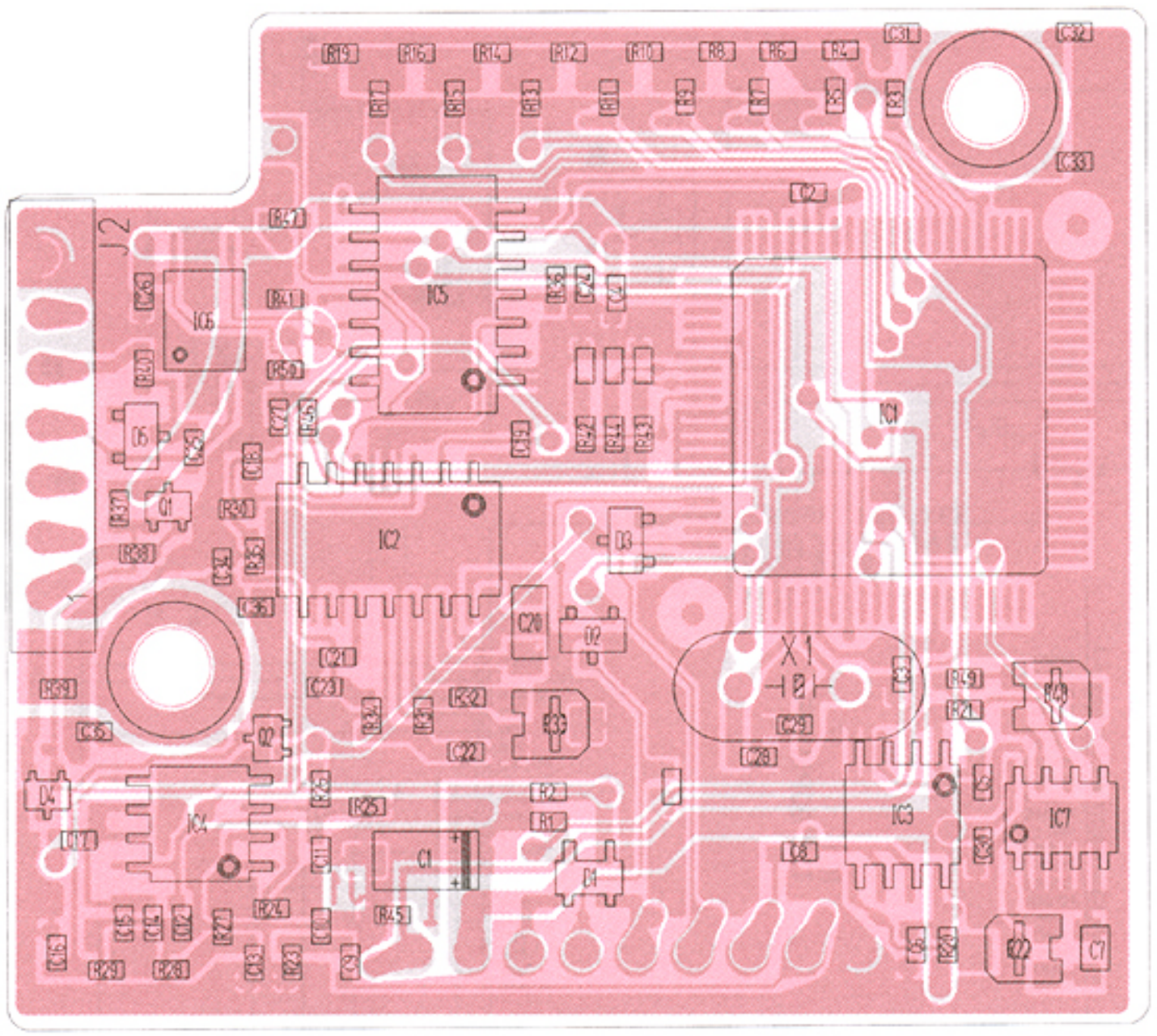
10	GND
	IN
	HV
	HV
	GND
	GND
	OUT 1
	OUT 1
	OUT 2
1	OUT 2

9-2 UX-130 DSC MODEM UNIT

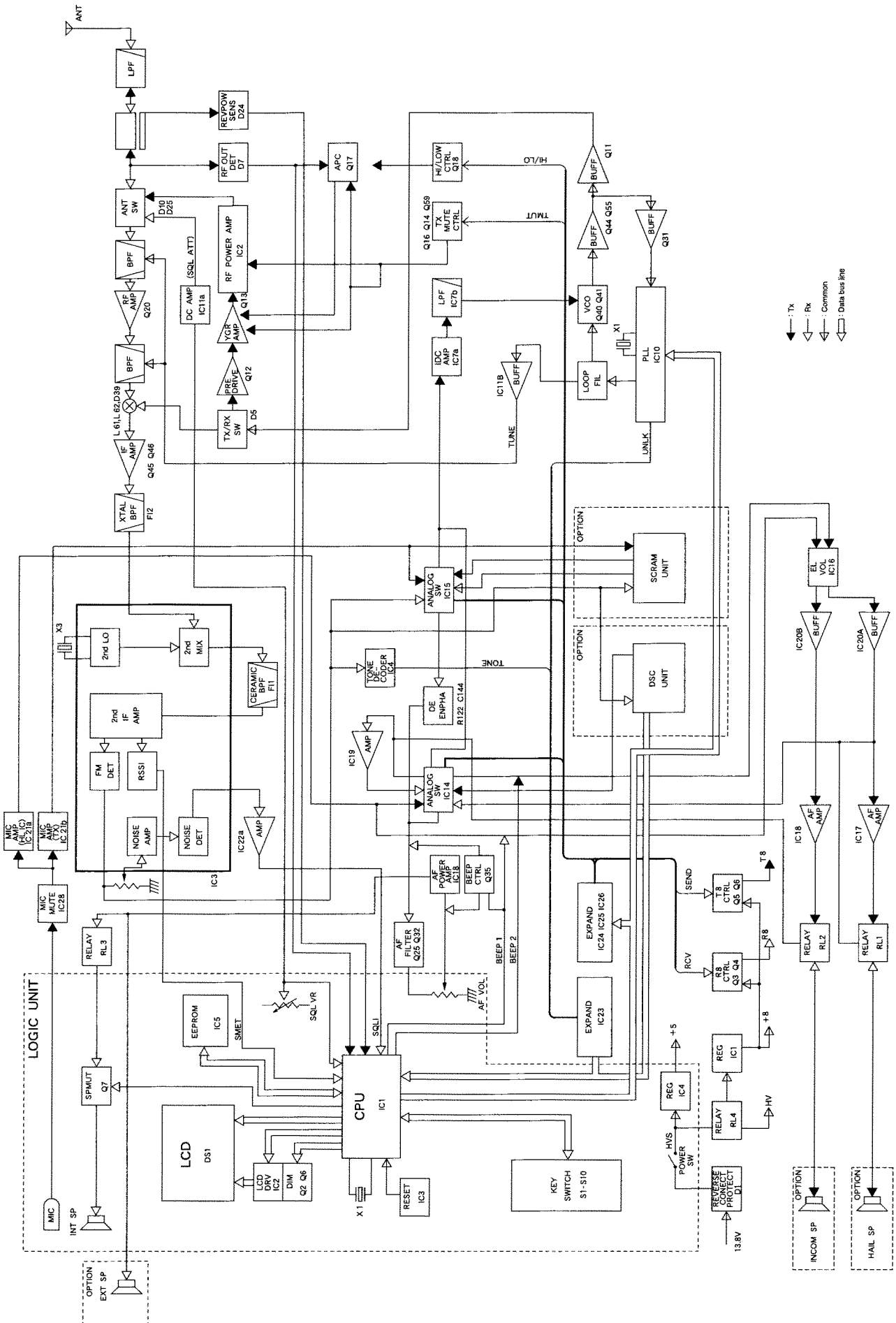
VOLTAGE DIAGRAM



BOARD LAYOUT

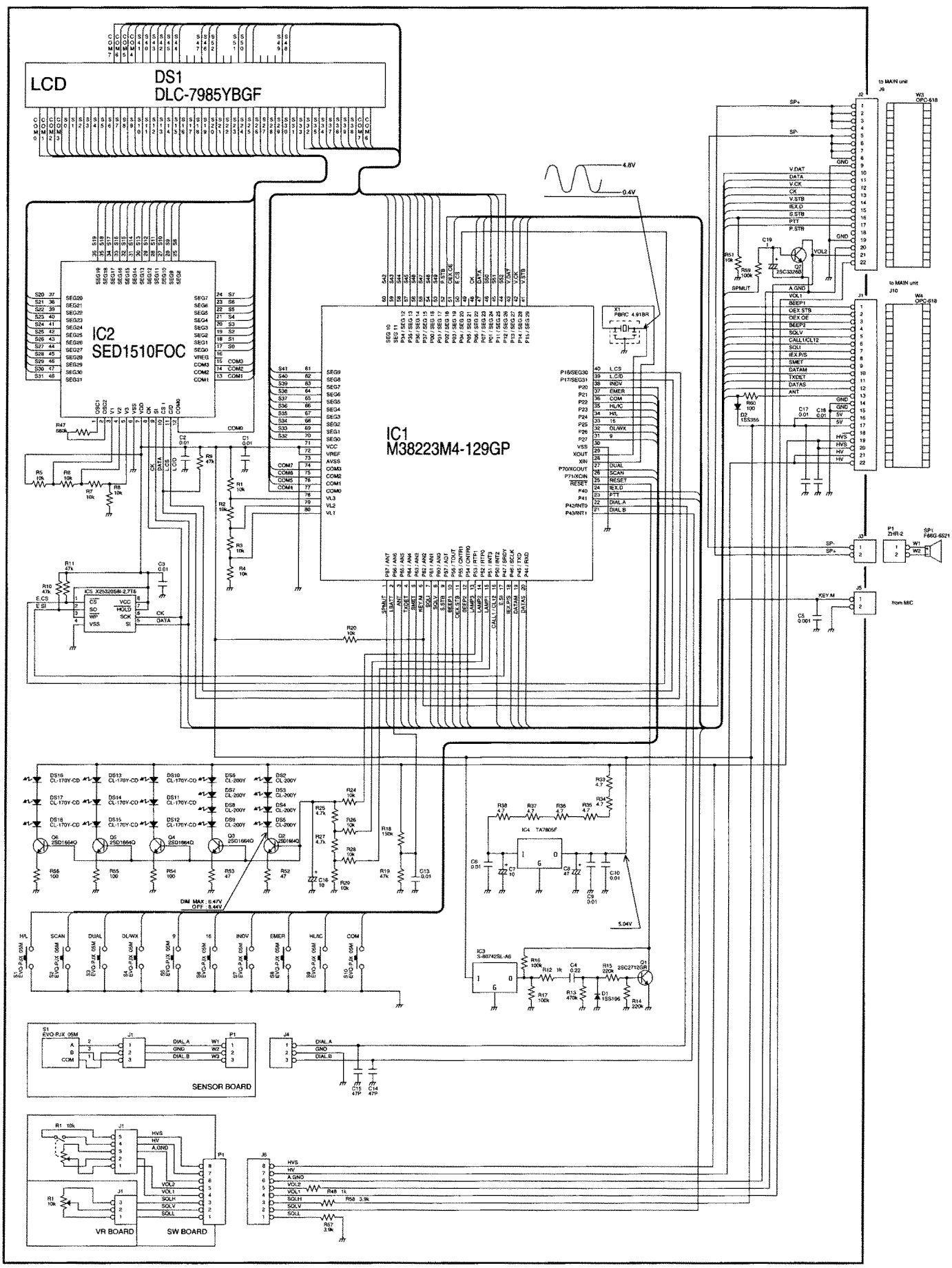


SECTION 10 BLOCK DIAGRAM

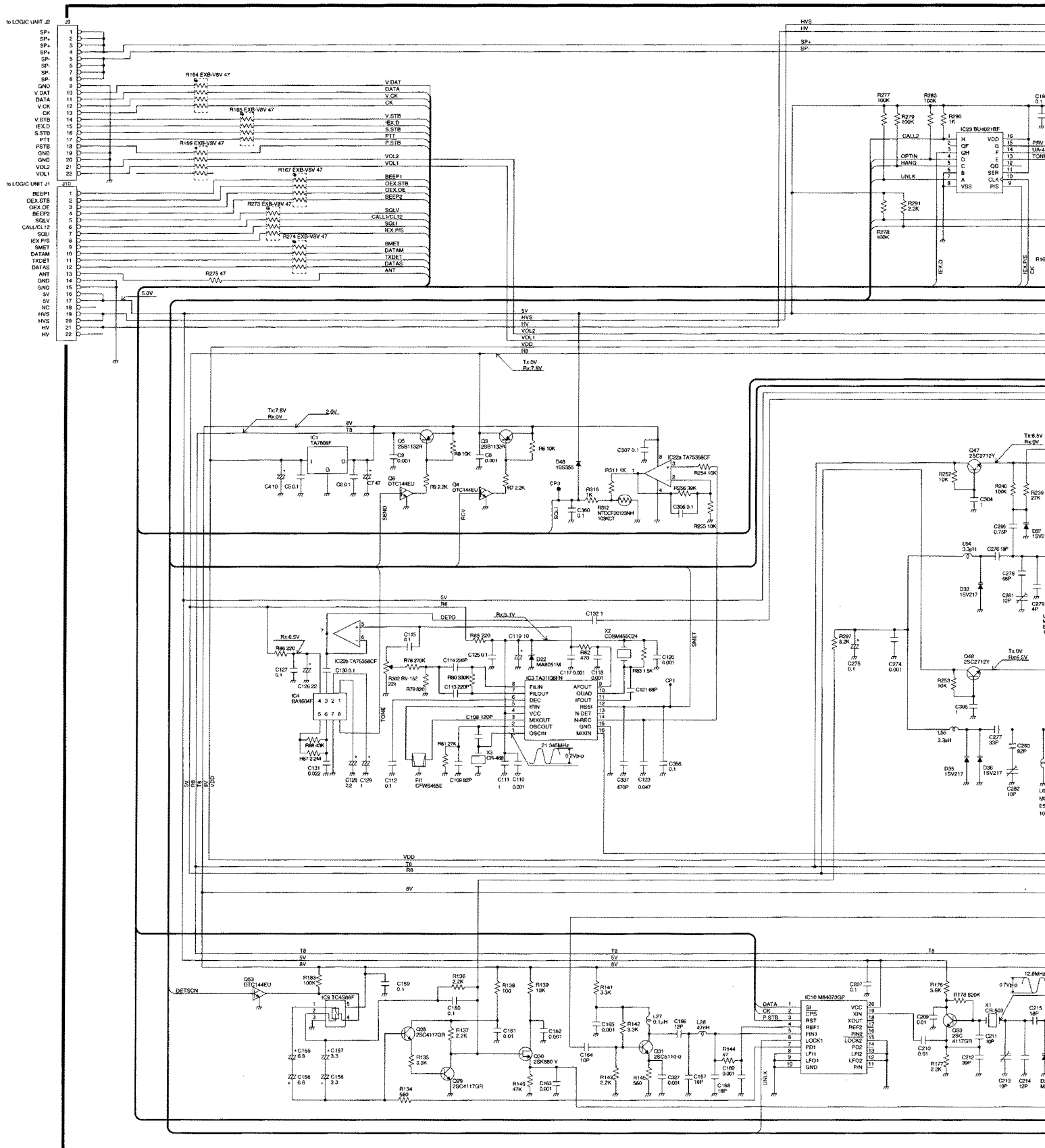


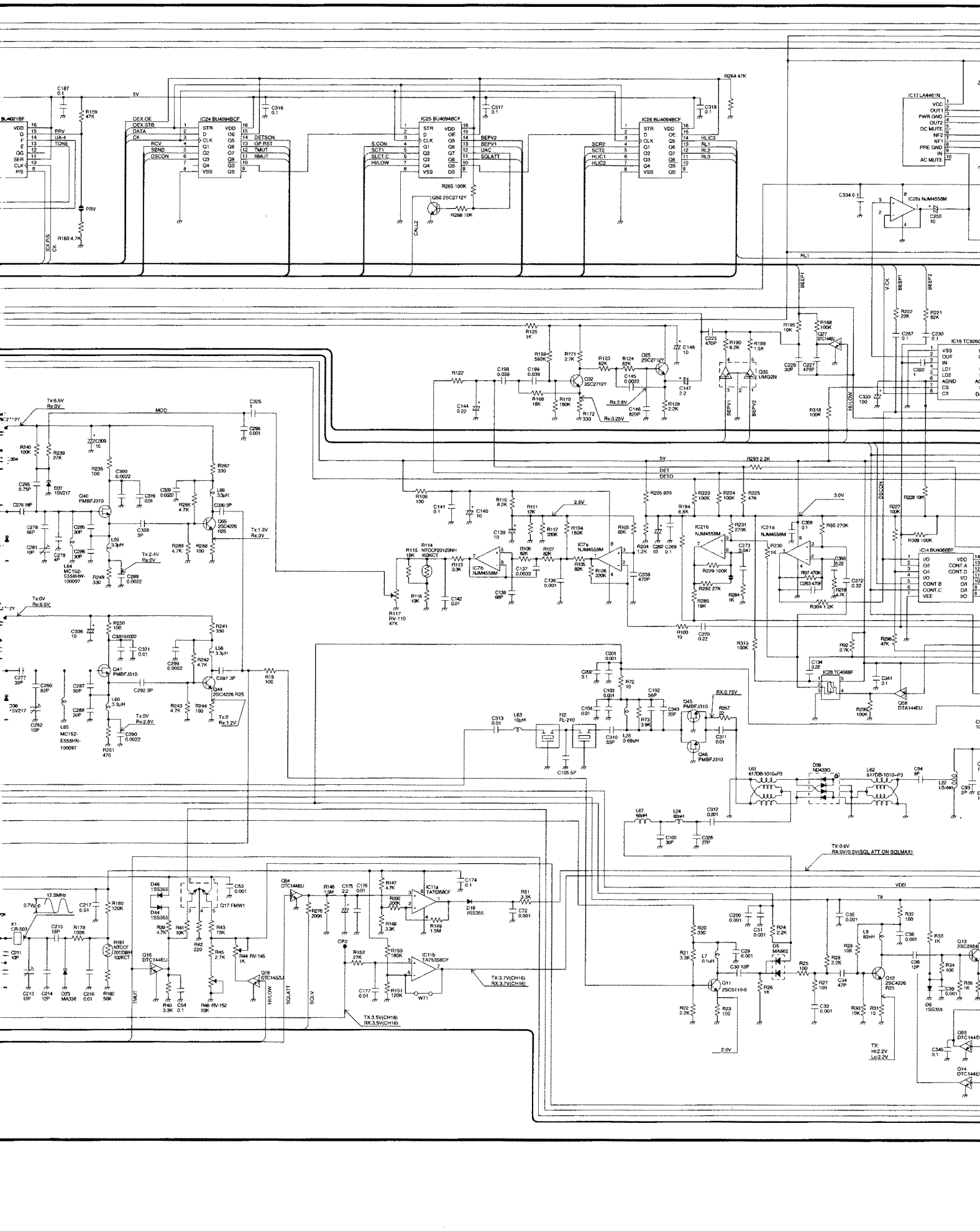
SECTION 11 VOLTAGE DIAGRAM

• LOGIC UNIT

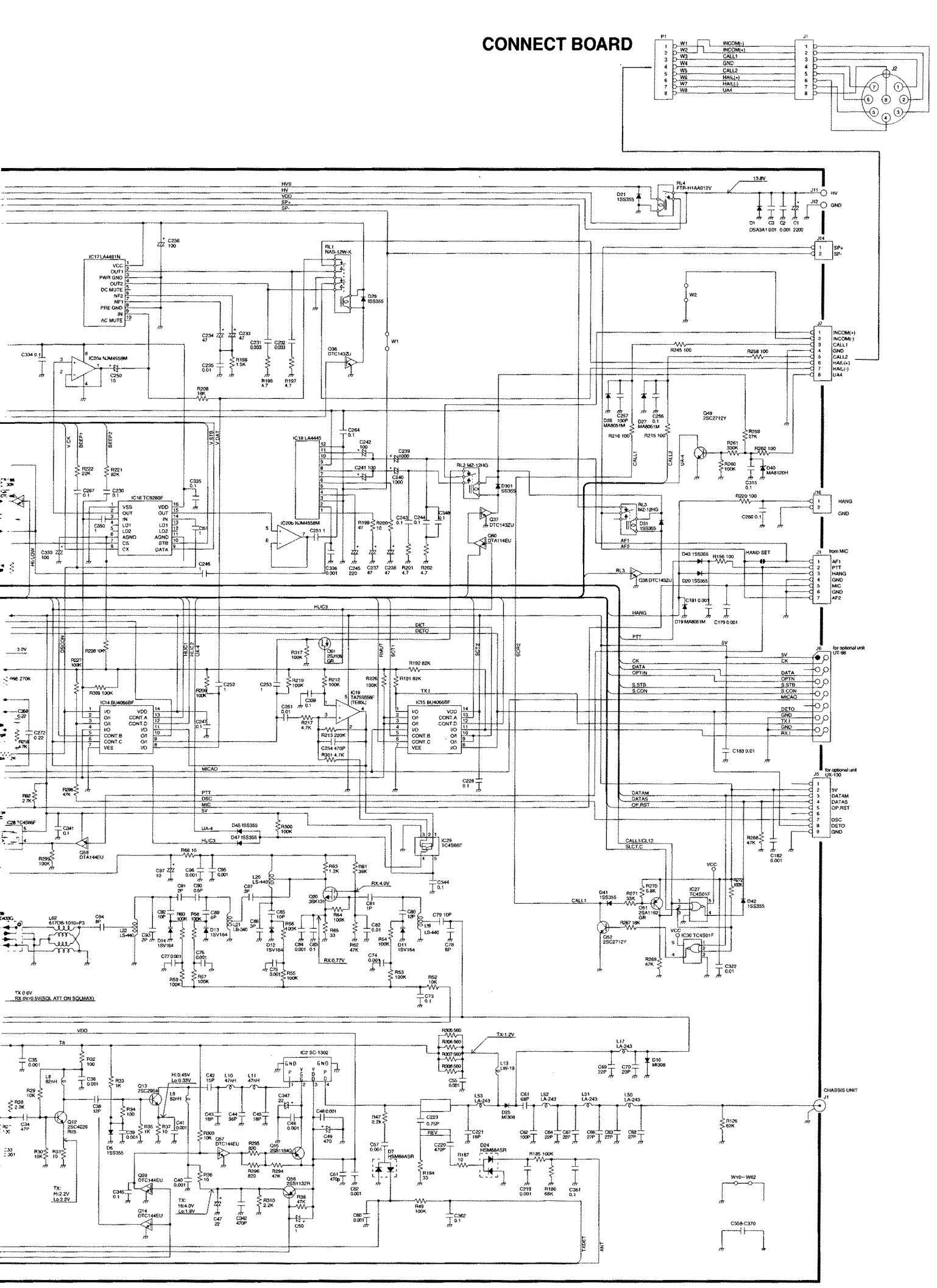


MAIN UNIT




IC24 BU4094BCF
IC25 BU4094BCF
IC26 BU4094BCF
IC17 LA4461N
IC20a NJM4558M
IC18 TC22600
IC21b NJM4558M
IC21a NJM4558M
IC7a NJM4558M
IC7b NJM4558M
IC11a TA7358CF
IC11b TA7358CF
IC14 BU4066BF
IC28 TC4066F
Q50 2SC2712Y
Q32 2SC2712Y
Q25 2SC2712Y
Q35 UMG2N
Q27 DTC144EU
Q40 PMBFJ310
Q41 PMBFJ310
Q44 2SC4226 R25
Q45 PMBFJ310
Q46 PMBFJ310
Q54 DTC144EU
Q16 DTC144EU
Q18 DTC143ZU
Q11 2SC5110-O
Q12 2SC4226 R25
Q58 DTC144EU
Q14 DTC144EU
Q28 DTA144EU
D38 MA3330
D5 MA862
D18 1SS355
D6 1SS355
D44 1SS355
D46 1SS355
D37 1SV217
D36 1SV217
D23 MA368
Q17 FMW1
W71
CP2
CALL2
RL1
5V
VDD
PRV
MCO
OEX.OE
OEX.STB
DATA
CK
RCV
SEND
DSCON
S.CON
SCT1
SLCT.C
HILOW
DET
DETO
BEEP1
BEEP2
V.CK
TMUT
SQLATT
SQLV
HILOW
Tx:6.5V Rx:0V
Tx:9V Rx:8.5V
Tx:2.4V Rx:0V
Tx:1.2V Rx:0V
Tx:0V Rx:2.8V
Tx:0 Rx:1.2V
Rx:2.6V
Rx:0.25V
Rx:0.75V
TX:0.6V RX:0V(0.5V)(SQL ATT ON SQLMAX)
TX:3.7V(CH16) RX:3.7V(CH16)
TX:3.5V(CH16) RX:3.5V(CH16)
TX: Hi:2.2V Lo:2.2V
2.6V
3.0V
2.0V
12.8MHz
0.7Vp-p
MC152-E558HW-100097
MC152-E558HN-100097
NTCCP201253NH 103KCT
NTCCP201253NH 102KCT
CR-503
FL-210
617DB-1010-P3
617DB-1010-P4
MA3330
MA368
MA862
MA738
1SS355
1SV217
FMW1
2SC4226 R25
2SC5110-O
DTC144EU
DTC143ZU
DTA144EU
TA7358CF
NJM4558M
UMG2N
TC4066F
TC22600
LA4461N
BU4094BCF
BU4066BF
PMBFJ310
RV-145
RV-152
RV-110
RV-111

CONNECT BOARD



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