ICOM

SERVICE MANUAL

VHF MARINE TRANSCEIVER

IC-M32

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-M32** VHF MARINE TRANSCEIVER at the time of publication.

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

Model	Version	Symbol	AC adapter	TX high power
IC-M32	U.S.A.	[USA]	BC-147A	5W
	S.E. Asia	[SEA]	BC-147E	
	Australia	[AUS]	BM-95V	

DANGER

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

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

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

DO NOT apply an RF signal of more than 20 dBm (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**>

1110003200 S.IC	TA31136FN	IC-M32	MAIN UNIT	1 piece
8930060730	2691 keyboard	IC-M32	Chassis	5 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 turning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 40 dB to 50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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SECTION 1 SPECIFICATIONS

■ GENERAL

• Frequency coverage	: 156.025–157.425 MHz 156.050–163.275 MHz		
• Type of emission	: 16K0G3E		
• Antenna impedance	: 50 Ω		
• MIC impedance	: 2 kΩ		
• Audio impedance	: 8 Ω		
• Power supply requirement	: 7.5 V DC (negative ground; supplied battery pack)		
• Current drain (approx.)	: Transmit	at High (5.0 W)	1.5 A
		at Low (1.0 W)	0.7 A
	Receive	max audio	200 mA
• Frequency stability	: ±10 ppm		
• Usable temperature range	: –20˚C to +60˚C; –4˚F to +140˚F		
• Dimensions (projections not included)	: 61(W) × 135(H) × 41(D) mm; 2 13/32(W) × 5 5/16(H) × 1 5/8(D) in.		
• Weight (approx.)	: 360 g; 12.7 oz. (with BP-224)		

■ TRANSMITTER

• RF output power (with supplied battery pack)	: 5 W / 1 W (High / Low)
• Modulation system	: Variable reactance frequency modulation
• Maximum frequency deviation	: ±5.0 kHz
• Spurious emissions	: 68 dB
• Adjacent channel power	: 70 dB
• Transmitter audio distortion	: Less than 10 % at 1 kHz, 60% deviation
• Residual modulation	: 40 dB
• Audio frequency response	: +1 dB to –3 dB of 6 dB octave from 300 Hz to 3000 Hz

■ RECEIVER

• Receive system	: Double conversion superheterodyne system	
• Intermediate frequencies	: 1st	21.7 MHz
	2nd	450 kHz
• Sensitivity	: 0.25 µV at 12 dB SINAD (typical)	
• Squelch sensitivity	: 0.35 µV at threshold	
• Adjacent channel selectivity	: 70 dB (typical)	
• Spurious response rejection	: 70 dB (typical)	
• Intermodulation rejection ratio	: 70 dB (typical)	
• Hum and noise	: 40 dB	
• Audio output power	: 350 mW typical at 10% distortion with an 8 Ω load	
• Audio frequency response	: +1 dB to –3 dB of –6 dB octave from 300 Hz to 3000 Hz	

Specifications are measured in accordance with EIA/TIA-603.

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	CAN	Transmit	Receive	USA	INT	CAN	Transmit	Receive	USA	INT	CAN	Transmit	Receive
	01	01	156.050	160.650	21A		21A	157.050	157.050	73	73	73	156.675	156.675
01A			156.050	156.050		22		157.100	161.700	74	74	74	156.725	156.725
	02	02	156.100	160.700	22A		22A	157.100	157.100	77*	77	77*	156.875	156.875
	03	03	156.150	160.750		23	23	157.150	161.750		78		156.925	161.525
03A			156.150	156.150	23A			157.150	157.150	78A		78A	156.925	156.925
	04		156.200	160.800	24	24	24	157.200	161.800		79		156.975	161.575
		04A	156.200	156.200	25	25	25	157.250	161.850	79A		79A	156.975	156.975
	05		156.250	160.850	26	26	26	157.300	161.900		80		157.025	161.625
05A		05A	156.250	156.250	27	27	27	157.350	161.950	80A		80A	157.025	157.025
06	06	06	156.300	156.300	28	28	28	157.400	162.000		81		157.075	161.675
	07		156.350	160.950		60	60	156.025	160.625	81A		81A	157.075	157.075
07A		07A	156.350	156.350		61		156.075	160.675		82		157.125	161.725
08	08	08	156.400	156.400	61A		61A	156.075	156.075	82A		82A	157.125	157.125
09	09	09	156.450	156.450		62		156.125	160.725		83	83	157.175	161.775
10	10	10	156.500	156.500			62A	156.125	156.125	83A		83A	157.175	157.175
11	11	11	156.550	156.550		63		156.175	160.775	84	84	84	157.225	161.825
12	12	12	156.600	156.600	63A			156.175	156.175	84A			157.225	157.225
13*	13	13*	156.650	156.650		64	64	156.225	160.825	85	85	85	157.275	161.875
14	14	14	156.700	156.700	64A		64A	156.225	156.225	85A			157.275	157.275
15*	15*	15*	156.750	156.750		65		156.275	160.875	86	86	86	157.325	161.925
16*	16	16	156.800	156.800	65A	65A	65A	156.275	156.275	86A			157.325	157.325
17*	17	17*	156.850	156.850		66		156.325	160.925	87	87	87	157.375	161.975
	18		156.900	161.500	66A	66A	66A*	156.325	156.325	87A			157.375	157.375
18A		18A	156.900	156.900	67*	67	67	156.375	156.375	88	88	88	157.425	162.025
	19		156.950	161.550	68	68	68	156.425	156.425	88A			157.425	157.425
19A		19A	156.950	156.950	69	69	69	156.475	156.475					
20	20	20*	157.000	161.600	70	70	70	Rx only	156.525					
20A			157.000	157.000	71	71	71	156.575	156.575					
	21	21	157.050	161.650	72	72	72	156.625	156.625					

* Low power only

NOTE: Channels 3, 21, 23, 61, 64, 81, 82 and 83 **CANNOT** be used by the general public in USA waters.

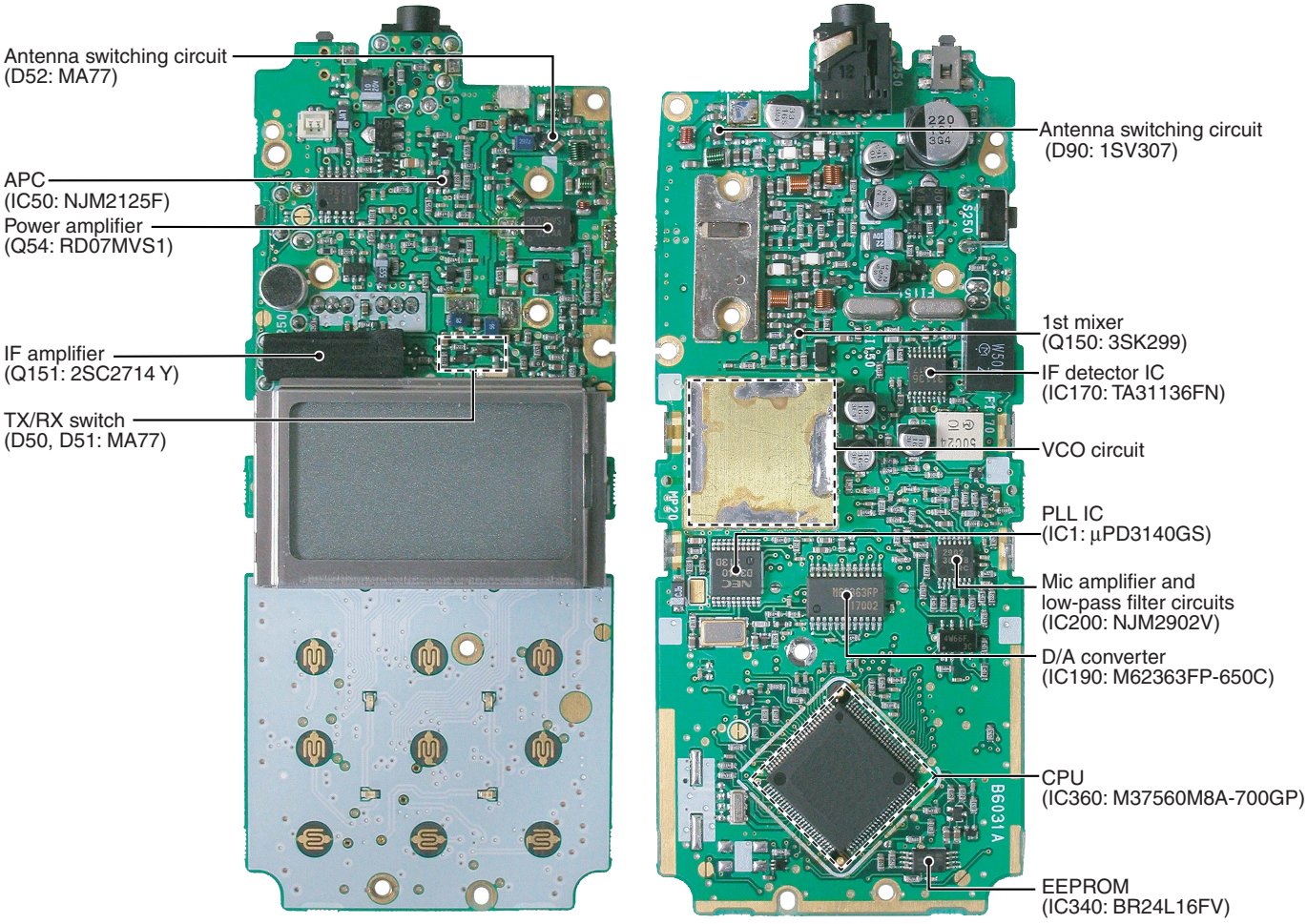
■ WX CHANNEL LIST

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

SECTION 2 INSIDE VIEWS

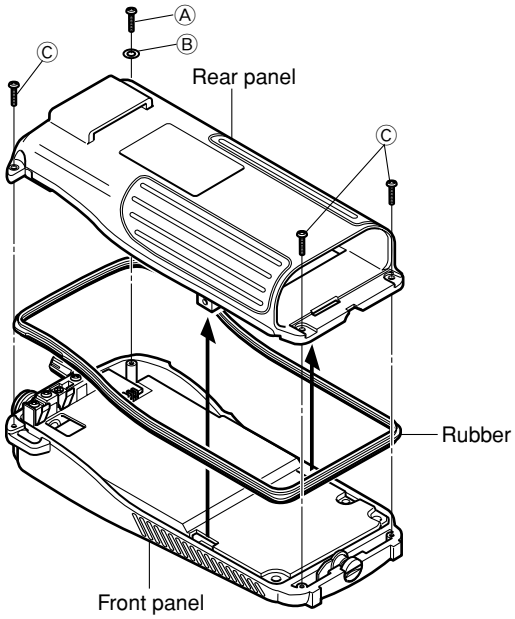
• MAIN UNIT

TOP VIEW **BOTTOM VIEW**



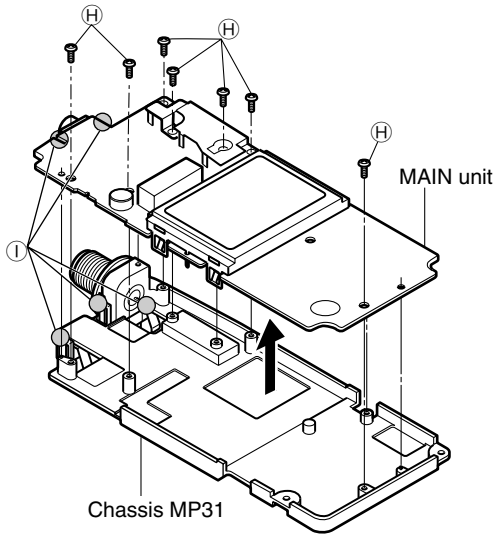
SECTION 3 DISASSEMBLY INSTRUCTIONS

● Removing the Rear panel



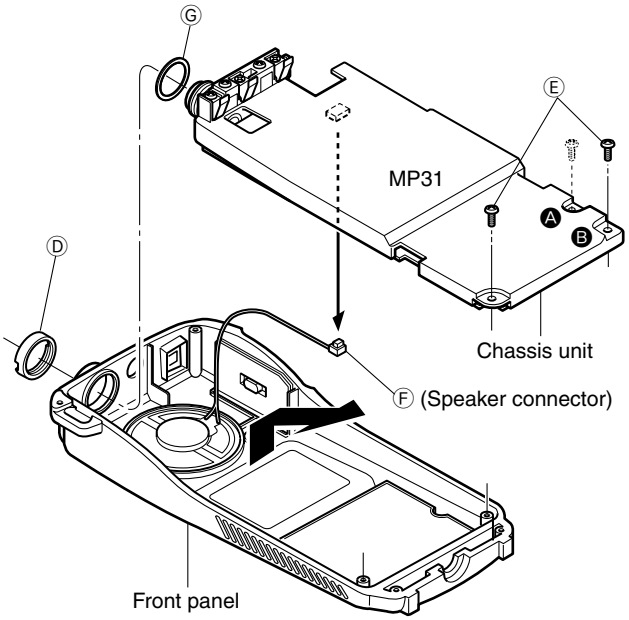
① Unscrew 1 screw, Ⓐ (2 × 10 mm), and remove 1 washer, Ⓑ.
② Unscrew 3 screws, Ⓒ (2 × 8 mm).
③ Remove the rear panel and rubber from the front panel.

● Removing the MAIN unit



① Unscrew 7 screws, Ⓗ (2 × 4 mm).
② Unsolder 3 points, Ⓘ, and remove earth plate.
③ Separate the MAIN unit and the chassis.

● Removing the Chassis unit



① Unscrew 1 nut, Ⓓ.
② Unscrew 2 screws, Ⓔ (2 × 6 mm).
③ Take off the chassis unit in the direction of the arrow.
④ Unplug, Ⓕ, to separate the front panel, J251, and the chassis unit.
⑤ Remove 1 washer, Ⓖ.

NOTE:
Ⓐ : For IC-M2A only.
Ⓑ : For IC-M32 only.

NOTE: The chassis panel MP31 is a common parts for IC-M2A and IC-M32. Need to screw the MP42 (C) to the Ⓑ location for IC-M32.

SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

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 from the antenna connector pass through the low-pass filter (L81, L82, C83–C86, C89) and antenna switching circuit (D52, D90). The filtered signals are then applied to the RF amplifier circuit (Q90).

4-1-2 RF AND 1ST MIXER CIRCUITS (MAIN UNIT)

The 1st mixer circuit converts the received signals to a fixed frequency of the 1st IF signal with a PLL output frequency. By changing the PLL frequency, only the desired frequency will be passed through a pair of crystal filters at the next stage of the 1st mixer.

The signals from the antenna switching circuit are passed through the tunable bandpass filter (D92) and amplified at the RF amplifier (Q90). The amplified signals are passed through another tunable bandpass filter (D130), and then applied to the 1st mixer circuit (Q150).

The filtered signals are mixed at the 1st mixer (Q150) with a 1st LO signal coming from the PLL circuit to produce a 21.7 MHz 1st IF signal. The 1st IF signal is passed through two crystal filters (FI150, FI151) and is then amplified at the IF amplifier (Q151).

4-1-3 2ND IF AND DEMODULATOR CIRCUITS (MAIN UNIT)

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

The 1st IF signal is applied to a 2nd mixer section of the FM IF IC (IC170, pin 16). The signal is then mixed with a 2nd LO signal for conversion into a 450 kHz 2nd IF signal.

IC170 contains the 2nd mixer, limiter amplifier, quadrature detector and active filter circuits. A 21.25 MHz 2nd LO signal is produced at the PLL circuit using the reference frequency.

The 2nd IF signal from the 2nd mixer (IC170, pin 3) passes through ceramic filters (FI170) to remove unwanted heterodyne frequencies. It is then amplified at the limiter amplifier section (IC170, pin 5) and applied to the quadrature detector section (IC170, pins 10 and 11) to demodulate the 2nd IF signal into AF signals.

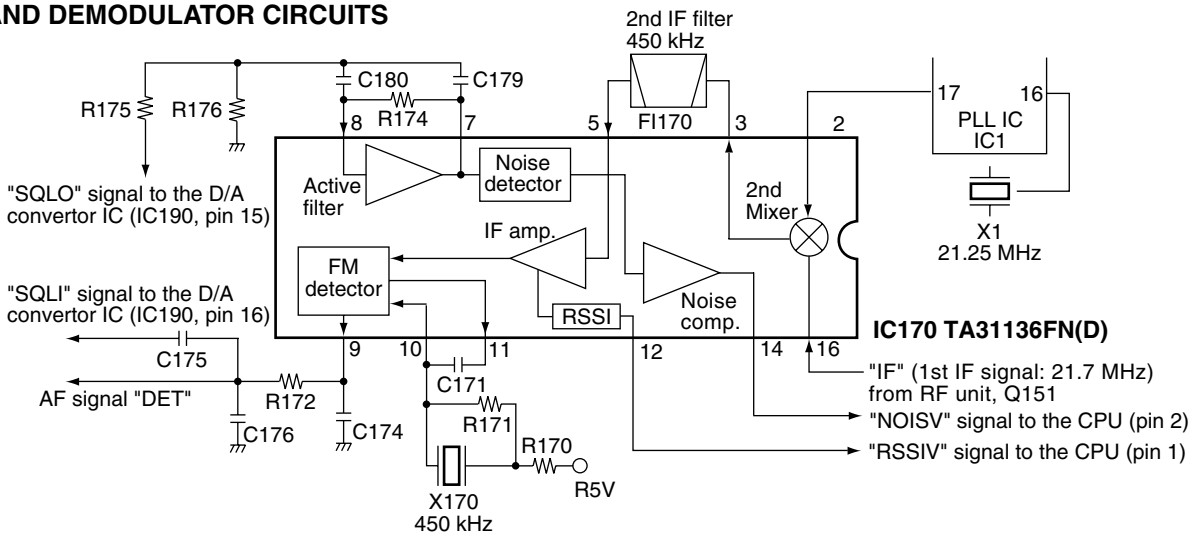
4-1-4 AF CIRCUIT (MAIN UNIT)

AF signals from the FM IF IC (IC170, pin 9) are fed to the analog switch (IC260).

The AF signals (detected signals) are passed through the analog switch (IC260, pins 2 and 1) and are then applied to the active low-pass filter (IC200c, pin 9).

The filtered AF signals are applied to and adjusted audio level at the D/A convertor (IC190, pin 24) to adjust amplitude. The level controlled signals are passed through the AF mute switch (Q280) which is controlled by “AFMS” signal from the CPU (IC360, pin 47). The passed signals are applied to the AF power amplifier (IC280, pin 4), and then output to the internal speaker or [EXT SP] jack after being passed through the de-emphasis circuit (R286, C285) to obtain the –6 dB/octave frequency characteristics.

• 2ND IF AND DEMODULATOR CIRCUITS



4-1-5 SQUELCH CIRCUIT (MAIN UNIT)

The noise squelch circuit cuts out AF signals when no RF signals are received. By detecting noise components in the AF signals, the squelch circuit switches the AF mute switch.

A portion of the AF signals divided by C175 from the FM IF IC (IC170, pin 9) are applied to the D/A convertor (IC190, pin 16) to adjust amplitude. The signals from the D/A convertor (IC190, pin 15) are applied to the active filter section (IC170, pin 8). The active filter section amplifies and filters noise components. The filtered signals are applied to the noise detector section and output from IC170 (pin 14) as the "NOISV" signal.

The "NOISV" signal from IC170 (pin 14) is applied to the CPU (IC360, pin 2). The CPU compares the set squelch level voltage and "NOISV" signal voltage to control the squelch output.

4-2 TRANSMITTER CIRCUITS

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

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

The AF signals from the microphone are passed through the pre-emphasis circuit (R253, C254) and are then applied to the microphone amplifier (IC200b). The amplified AF signals are applied to analog switch (IC260, pin 5).

The AF signals are amplified again at the limiter-amplifier (IC200a) and then passed through the low-pass filter (IC200d, pins 12 and 13). The filtered audio is applied to the RF unit as the "MOD" signal.

4-2-2 MODULATION CIRCUIT (MAIN UNIT)

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

The audio signals "MOD" change the reactance of D20 to modulate an oscillated signal at the VCO circuit (Q21, Q22, D22, D23). The oscillated signal is amplified at the buffer-amplifiers (Q23, Q24).

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

The signal from the VCO circuit passes through the transmit/receive switching circuit (D50, D51) and is applied to the buffer-amplifier (Q50). The amplified signal is amplified by the pre-driver (Q53) and the power amplifier (Q54) to obtain 5 W of RF power (at 7.2 V). The amplified signal passes through the antenna switching circuit (D52), and low-pass filter (L81, L82, C83–C86, C89) and is then applied to the antenna connector.

The bias current of the pre-driver (Q53) and the power amplifier (Q54) is controlled by the APC circuit to stabilize the output power.

4-2-4 APC CIRCUIT (MAIN UNIT)

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

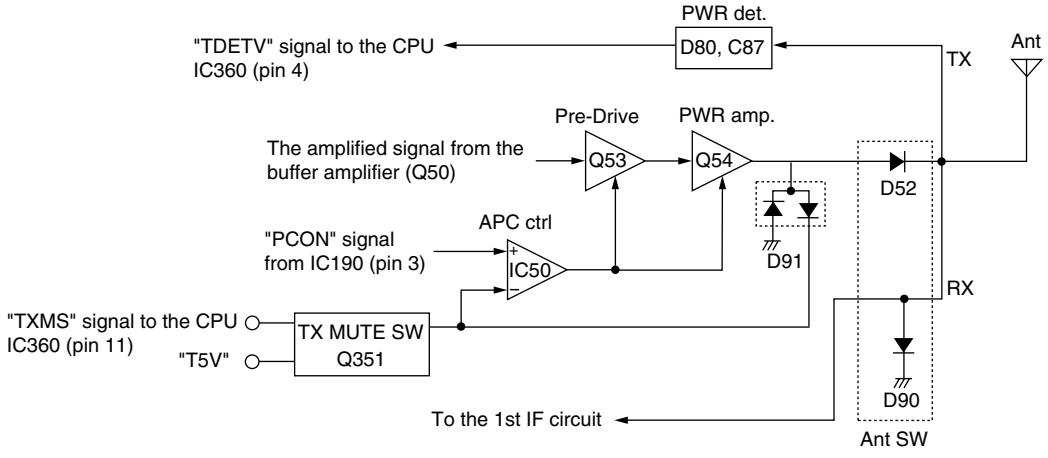
• POWER DETECTOR CIRCUIT (MAIN UNIT)

The power detector circuit (D80, C87) detects the transmit output power level and converts it to DC voltage as the "TDETV" signal. The detected signal is applied to the TX control circuit.

• APC CONTROL CIRCUIT (MAIN UNIT)

The detected signal from the power detector circuit (D91, R280) is applied to the CPU (IC360, pin 4) to control the input voltage of the pre-driver (Q53) and the power amplifier (Q54). When the output power changes, the CPU (IC360) outputs APC control signal to the D/A converter (IC190). And then "PCON" signal from the D/A converter controls the APC controller (IC50) to provide stable output power.

• APC CIRCUIT



4-3 PLL CIRCUIT (MAIN UNIT)

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

The PLL circuit contains a VCO (Q21, Q22, D22, D23). The oscillated signal is amplified at the buffer-amplifiers (Q23, Q25) and then applied to the PLL IC (IC1, pin 19).

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

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

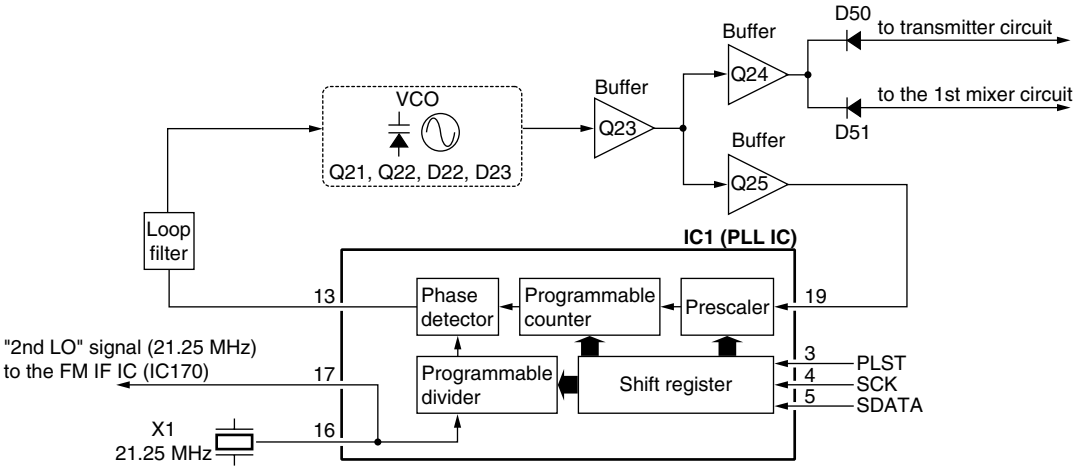
A portion of the VCO signal is amplified at buffer-amplifiers (Q23, Q24) and is then applied to the receive 1st mixer (Q150) or transmit driver via the TX/RX switching diode (D50, D51).

4-4 POWER SUPPLY CIRCUITS

VOLTAGE LINES

LINE	DESCRIPTION
VCC	The voltage from the attached battery pack.
CPU5V	Common 5 V converted from the VCC line by the CPU5V regulator circuit (IC220). The output voltage is applied to the CPU (IC360), REG5V regulator, etc.
5V	Common 5V converted from the VCC line by the 5V regulator circuit (Q223–Q225). The output voltage is applied to the D/A converter (IC190) and PLL IC (IC1), etc.
R5V	Receive 5V converted from the 5V line by the R5 regulator circuit (Q221). The regulated voltage is applied to the MOD MUTE circuit (Q20, D20, D21) and receiver circuit.
V5V	Common 5V converted from the 5V line by the V5 regulator circuit (Q220). The regulated voltage is applied to the VCO circuit
T5V	Transmit 5V converted from the 5V line by the T5 regulator circuit (Q222). The regulated voltage is applied to the transmitter circuit.

• PLL CIRCUIT



4-5 PORT ALLOCATIONS

4-5-1 CPU (IC360)

Pin number	Port name	Description
1	RSSIV	Input port for the RSSI signal to control S-meter from the FM IF IC (IC170 pin 12).
2	NOISV	Input port for the NOIS signal to control squelch circuit from the FM IF IC (IC170 pin 14).
3	BATTV	Input port for the battery voltage detection.
4	TDETV	Input port for the TX power detection.
5	TEMPV	Input port for transceiver's internal temperature detection.
6	SCK	Outputs serial clock.
7	SDATA	Outputs serial data.
10	LEDS	Outputs key pad and LCD back light control signal. High : While lights ON.
12	BEEP	Outputs beep audio signals.
13	PLST	Outputs strobe signals to the PLL IC (IC1, pin 3).
14	DAST	Outputs strobe signals to the D/A convertor IC (IC190, pin 6).
15	5VS	Outputs the M5V regulator control signal.
16	LCDS	Outputs LCD contrast signal.
18	ESCK	Outputs serial clock signal for the EEPROM (IC340, pin 6).
19	CLOUT	Outputs the cloning data.
20	CLIN	Input port for the cloning data.
22	PWSW	Input port for the power switch control signal.
23	UNLK	Input port for the PLL unlock signal. High : PLL is unlocked.
24	ESDA	I/O port for the serial data signals to the EEPROM (IC340, pin 5).
27	TDEC	Outputs the decode monitor signal. High : While muting.
30	PTT	Input port for the [PTT] switch. High : While the [PTT] switch is pushed.
31	WET	Input port for transceiver's internal inundation detection.
39	SCAN	Input port for the [SCN] key. Low : While the [SCN] key is pushed.
40	H/L	Input port for the [H/L] key. Low : While the [H/L] key is pushed.
41	VOL DOW	Input port for the volume control signal.
42	SQL	Input port for the [SQL] key. Low : While the [SQL] key is pushed.
43	CH/WX	Input port for the [CH/WX] key. Low : While [CH/WX] key is pushed.
44	UP	Input port for the [▲] key. Low : While the [▲] key is pushed.
45	DOWN	Input port for the [▼] key. Low : While the [▼] key is pushed.
46	16	Input port for the [16] key. Low : While the [16] key is pushed.
47	AFMS	Output the speaker mute switch control signal. High : While the AF output is muted.
48	BPFS	Outputs RF bandpass filters control signal. High : While receiving below 159.990 MHz. Low : While receiving above 160.000 MHz.
49	V5VS	Outputs the 5V regulator control signal.
50	T5VS	Outputs the T5V regulator control signal.
51	R5VS	Outputs the R5V regulator control signal.
52	AFVS	Outputs the AF regulator control signal.
53	MICM	Outputs the MIC mute switch control signal.
54	DETM	Outputs the detector mute control signal. Low : While muting.
55	VOL UP	Input port for the volume control signal.

4-5-2 D/A converter IC (IC190)

Pin number	Port name	Description
2	FCON	Outputs the reference frequency adjusting signal.
3	PCON	Outputs the TX power adjusting signal.
10	MCON	Outputs the transmit modulation adjusting signal.
11	BEPO	Outputs the beep tone level adjusting signal while "AUTO" is selected in set mode.
14	BEPST	Outputs the beep tone level adjusting signal while 1–10 level is selected in set mode.
15	SQLO	Outputs the squelch level adjusting signal.

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

When adjusting IC-M32, the optional CS-M32 CLONING SOFTWARE (Rev. 1.0 or later), OPC-478 CLONING CABLE are required.

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 7.5 V DC Current capacity : 3 A or more	FM deviation meter	Frequency range : 30–300 MHz Measuring range : 0 to ±10 kHz
RF power meter (terminated type)	Measuring range : 0.1–10 W Frequency range : 100–300 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
Frequency counter	Frequency range : 0.1–300 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Standard signal generator (SSG)	Frequency range : 100–300 MHz Output level : 0.1 µV–32 mV (–127 to –17 dBm)
Digital multimeter	Input impedance : 10 MΩ/DC or better	Attenuator	Power attenuation : 40 dB or more Capacity : 10 W or more

■ BEFORE ENTERING THE ADJUSTMENT MODE

• Cloning the adjustment frequency 156.800 MHz on the programmable CH.
(No select POC function POC ON on the adjustment frequency.)

■ ENTERING THE ADJUSTMENT MODE

• Push and hold the [H/L] key and [PTT] switch, and then turn power ON.

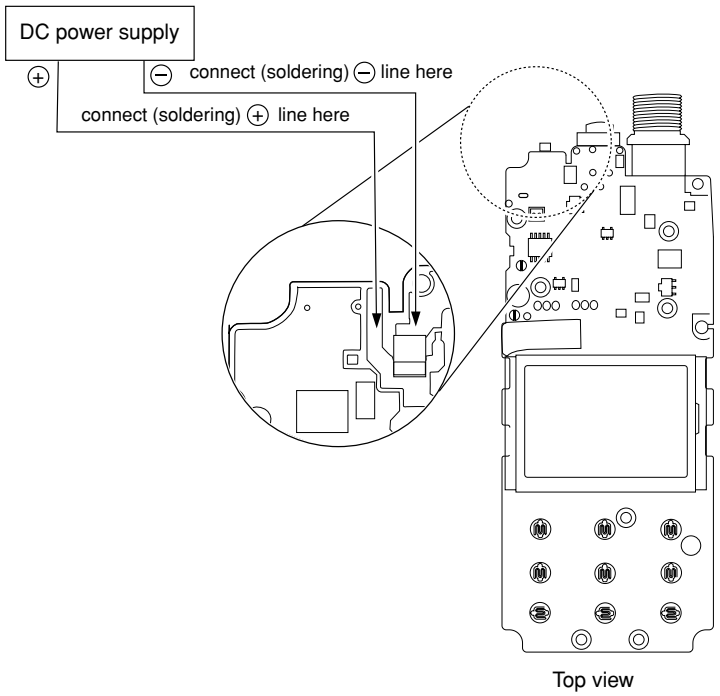
■ OPERATING IN THE ADJUSTMENT MODE

• Change adjustment items: [16] key
• Change adjustment values: [▲] and [▼] keys

■ EXITING THE ADJUSTMENT MODE

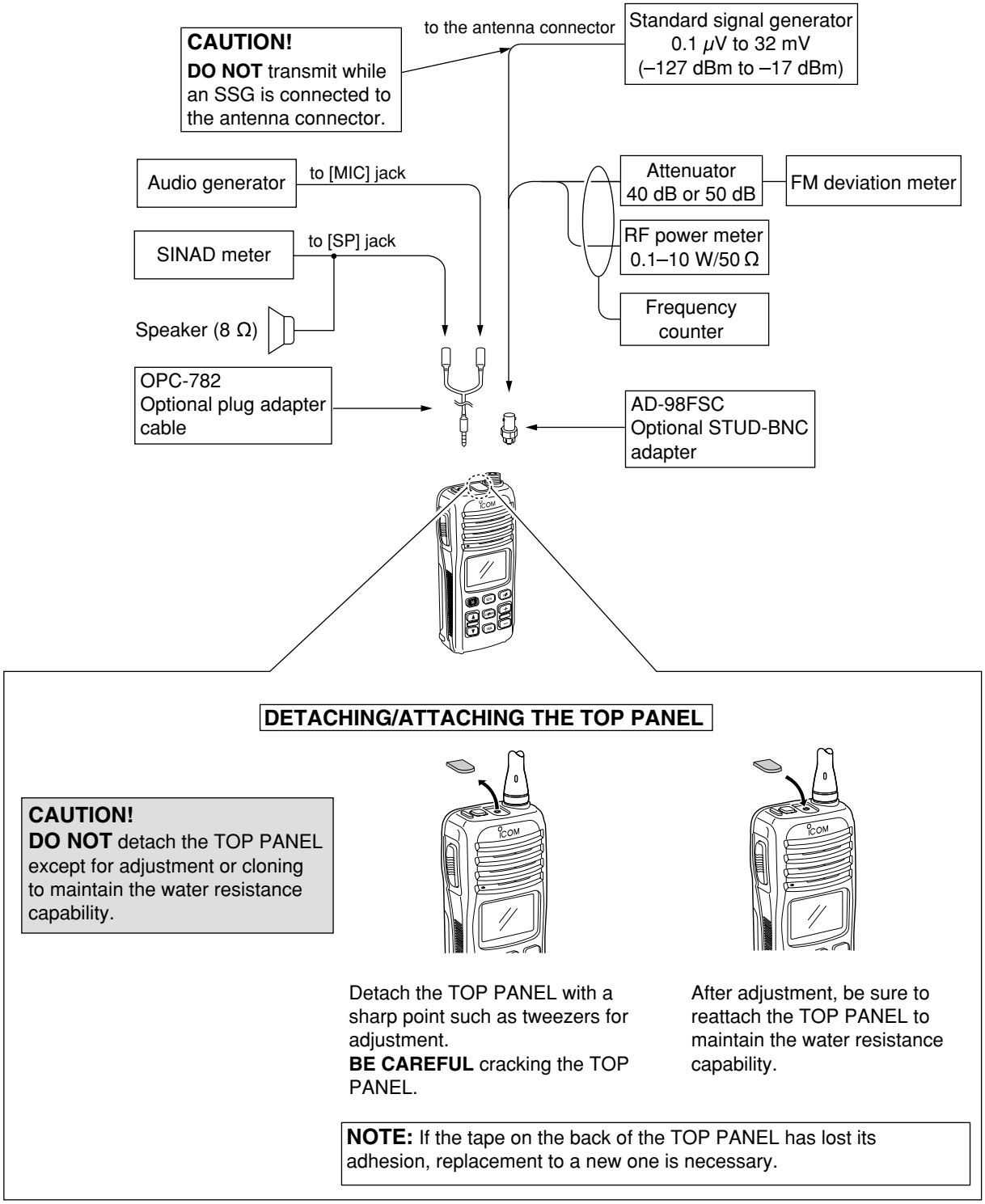
When adjustment is finished, need to do follow operation to cancel the adjustment mode. Otherwise, the transceiver does not work properly.
• Turn power OFF.
• Push and hold the [H/L] key and [PTT] switch, and then turn power ON.

• DC POWER CABLE CONNECTION



Top view

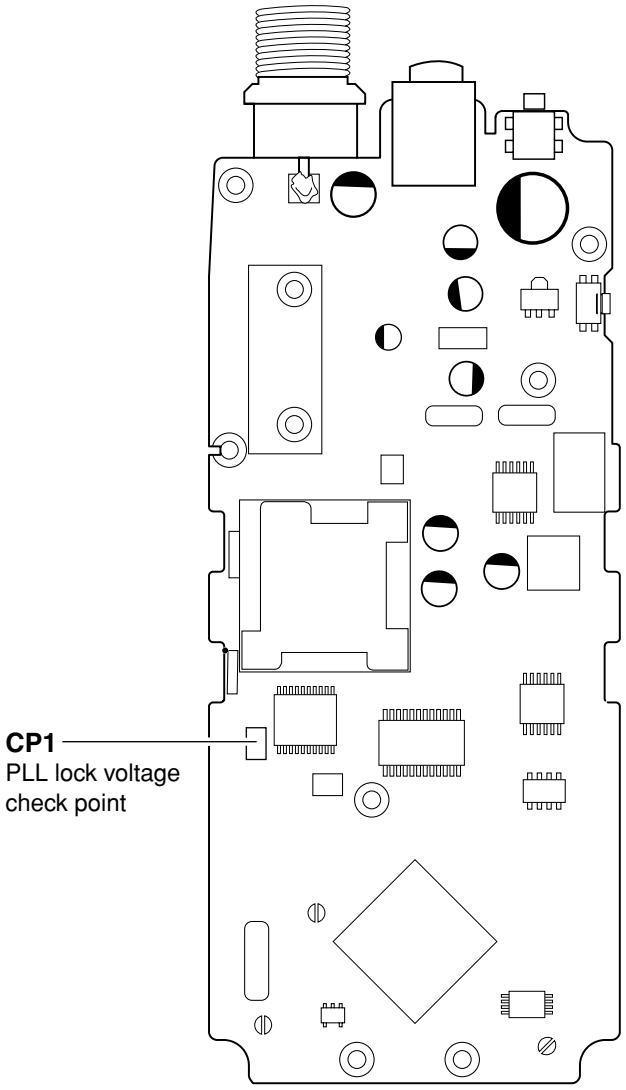
• CONNECTION


CAUTION!
DO NOT transmit while an SSG is connected to the antenna connector.
to the antenna connector
Standard signal generator
0.1 μV to 32 mV
(–127 dBm to –17 dBm)
Audio generator
to [MIC] jack
Attenuator
40 dB or 50 dB
FM deviation meter
SINAD meter
to [SP] jack
RF power meter
0.1–10 W/50 Ω
Speaker (8 Ω)
Frequency counter
OPC-782
Optional plug adapter cable
AD-98FSC
Optional STUD-BNC adapter
DETACHING/ATTACHING THE TOP PANEL
CAUTION!
DO NOT detach the TOP PANEL except for adjustment or cloning to maintain the water resistance capability.
Detach the TOP PANEL with a sharp point such as tweezers for adjustment.
BE CAREFUL cracking the TOP PANEL.
After adjustment, be sure to reattach the TOP PANEL to maintain the water resistance capability.
NOTE: If the tape on the back of the TOP PANEL has lost its adhesion, replacement to a new one is necessary.

5-2 PLL AND RX SENSITIVITY ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
LOCK VOLTAGE	1	• Operating frq. : 156.800 MHz • Receiving	MAIN	Connect a digital multi-meter or oscilloscope to the check point CP1.	1.8 V		Verify
	2	• Operating frq. : 156.800 MHz • Output power : Low • Transmitting			1.7 V		
RX SENSITIVITY	1	• Operating frq. : 156.800 MHz • Set an SSG as: Frequency : 156.800 MHz Level : 3.2 µV* (–97 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	Top Panel	Connect an SSG to the antenna connector and a SINAD meter with 8 Ω load to the [SP] jack.	0.35 µV (–116 dBm)		Verify

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



5-3 ADJUSTMENT MODE ADJUSTMENTS

Select an operation using [16] key, then set specified value using [▲] / [▼] keys on the front panel of IC-M32.

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE
			UNIT	LOCATION	
REFERENCE FREQUENCY [Fr]	1	• Operating frq. :156.800 MHz • Output power : Low • Connect an RF power meter or a 50 Ω dummy load to the antenna connector. • Transmitting	Top Panel	Loosely couple the frequency counter to the antenna connector.	156.8000 MHz
OUTPUT POWER [Po H] (Hi)	1	• Operating frq. : 156.800 MHz • Output power : Hi • Transmitting	Top panel	Connect an RF power meter to the antenna connector.	5.0 W
[Po L] (Low)	2	• Output power : Low • Transmitting			0.8 W
[Po ML] (Extra-Low)	3	• Output power : Extra-Low • Transmitting			0.45 W
FM DEVIATION [dE]	1	• Operating frq. : 156.800 MHz • Output power : Low • Connect an audio generator to the [MIC] jack and set as: 1 kHz/25 mV • Set an FM deviation meter as: HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P–P)/2 • Transmitting	Top panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.3 kHz
SQUELCH LEVEL [nL]	1	• Operating frq. : 156.800 MHz • Set an SSG as: Frequency : 156.800 MHz Level : 0.63 µV* (–111 dBm) Modulation : 1 kHz Deviation : ±3.5 kHz • Receiving	Top panel	Connect an SSG to the antenna connector and a SINAD meter with 8 Ω load to the [SP] jack.	More than 12 dB SINAD
	2	• Receiving			• Push [▼] key to set squelch level to “01” at the sub channel readout. • Then, push [▲] key to set squelch level to “00” at the sub channel readout.

*The output level of the standard signal generator (SSG) is indicated as the SSG’s open circuit.
TX power Hi/Low is selectable on all adjustment items.

SECTION 6 PARTS LIST

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
IC1	1130007610	S.IC	µPD3140GS-E1 (DS8)	B
IC50	1120002830	S.IC	NJM2125F-TE1	T
IC170	1110003200	S.IC	TA31136FN (EL)	B
IC190	1190000350	S.IC	M62363FP-650C	B
IC200	1110003780	S.IC	NJM2902V-TE1	B
IC220	1110005350	S.IC	NJM2870F05-TE1	T
IC260	1140003830	S.IC	TC4W66F (TE12L)	B
IC280	1110001810	S.IC	TA7368F (ER)	T
IC340	1130011540	S.IC	BR24L16FV-WE2	B
IC341	1110006210	S.IC	BD5242FVE-TR	B
IC360	1140011630	S.IC	M37560M8A-700GP (FX-2691A)	B
Q20	1590000430	S.TRANSISTOR	DTC144EUA T106	B
Q21	1530002920	S.TRANSISTOR	2SC4226-T1 R25	B
Q22	1530002920	S.TRANSISTOR	2SC4226-T1 R25	B
Q23	1530002380	S.TRANSISTOR	2SC4215-Y (TE85R)	B
Q24	1530002380	S.TRANSISTOR	2SC4215-Y (TE85R)	B
Q25	1530002380	S.TRANSISTOR	2SC4215-Y (TE85R)	B
Q50	1530002920	S.TRANSISTOR	2SC4226-T1 R25	T
Q53	1560001240	S.FET	RD01MUS1	T
Q54	1560001230	S.FET	RD07MVS1	T
Q90	1530002920	S.TRANSISTOR	2SC4226-T1 R25	B
Q150	1580000760	S.FET	3SK299-T1 U73	B
Q151	1530002360	S.TRANSISTOR	2SC2714-Y (TE85R)	T
Q220	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	T
Q221	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	T
Q222	1510000670	S.TRANSISTOR	2SA1588-GR (TE85R)	T
Q223	1590000430	S.TRANSISTOR	DTC144EUA T106	B
Q224	1590001190	S.TRANSISTOR	XP6501-(TX) .AB	B
Q225	1520000450	S.TRANSISTOR	2SB1132 T100 Q	B
Q230	1520000450	S.TRANSISTOR	2SB1132 T100 Q	T
Q231	1590001190	S.TRANSISTOR	XP6501-(TX) .AB	T
Q240	1590000430	S.TRANSISTOR	DTC144EUA T106	B
Q250	1590002530	S.TRANSISTOR	UN911H (TX)	B
Q280	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)	T
Q350	1590000660	S.TRANSISTOR	DTC144TU T106	B
Q351	1590000720	S.TRANSISTOR	DTA144EUA T106	T
D1	1750000770	S.VARICAP	HVC376BTRF	B
D20	1790001260	S.DIODE	MA2S077-(TX)	B
D21	1790000620	S.DIODE	MA77 (TX)	B
D22	1720000780	S.VARICAP	HVU350B TRF	B
D23	1720000780	S.VARICAP	HVU350B TRF	B
D50	1790000620	S.DIODE	MA77 (TX)	T
D51	1790000620	S.DIODE	MA77 (TX)	T
D52	1750000580	S.DIODE	1SV307 (TPH3)	T
D80	1790001670	S.DIODE	RB706F-40T106	T
D90	1750000580	S.DIODE	1SV307 (TPH3)	B
D91	1790001670	S.DIODE	RB706F-40T106	T
D92	1790000620	S.DIODE	MA77 (TX)	B
D93	1790000660	S.DIODE	MA728 (TX)	B
D130	1790000620	S.DIODE	MA77 (TX)	B
D350	1750000370	S.DIODE	DA221 TL	B
D353	1790000660	S.DIODE	MA728 (TX)	B
FI150	2030000350	MONOLITH	21R15AB (FL-368)	B
FI151	2030000270	MONOLITH	FL-363 (21.7 MHz)	B
FI170	2020001270	CERAMIC	CFWLB450KE2A-B0	B
X1	6050011740	S.XTAL	CR-766 (21.250 MHz)	B
X170	6070000190	S.DISCRIMINATOR	CDBCB450KCAY24-R0	B
X360	6060010290	S.XTAL	CR-610 (7.9872 MHz)	B
L1	6200008070	S.COIL	MLF1608E 6R8K 6.8U	B
L20	6200007000	S.COIL	ELJRE 82NG-F	B
L21	6200003090	S.COIL	NL 322522T-2R7J-3	B
L22	6200008190	S.COIL	0.25-1.9-8TL 80N	B
L23	6200006980	S.COIL	ELJRE R10G-F	B
L24	6200006980	S.COIL	ELJRE R10G-F	B
L25	6200006980	S.COIL	ELJRE R10G-F	B
L50	6200006980	S.COIL	ELJRE R10G-F	T
L51	6200007000	S.COIL	ELJRE 82NG-F	T
L53	6200007690	S.COIL	LQW2BHN18NJ01L	T
L55	6200009240	S.COIL	0.20-1.0-7TL 31N	T
L56	6200010640	S.COIL	0.26-1.0-3TL 8.5N	T
L57	6200008230	S.COIL	0.30-1.3-5TL 22N	T

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
L58	6200003710	S.COIL	NL 252018T-2R7J	T
L80	6200008280	S.COIL	0.30-1.7-7TL 50N	T
L81	6200009800	S.COIL	0.26-1.1-7TR 30N	B
L82	6200008580	S.COIL	0.30-1.4-6TL 32N	T
L90	6200008280	S.COIL	0.30-1.7-7TL 50N	B
L91	6200007760	S.COIL	LQW2BHN82NJ01L	B
L92	6200007760	S.COIL	LQW2BHN82NJ01L	B
L93	6200008190	S.COIL	0.25-1.9-8TL 80N	B
L94	6200008190	S.COIL	0.25-1.9-8TL 80N	B
L95	6200006980	S.COIL	ELJRE R10G-F	B
L120	6200002430	S.COIL	NL 252018T-082J	T
L121	6200002410	S.COIL	NL 252018T-056J	T
L122	6200003550	S.COIL	MLF1608A 4R7K-T	B
L130	6200007760	S.COIL	LQW2BHN82NJ01L	B
L131	6200007760	S.COIL	LQW2BHN82NJ01L	B
L132	6200008190	S.COIL	0.25-1.9-8TL 80N	B
L133	6200008190	S.COIL	0.25-1.9-8TL 80N	B
L150	6200003680	S.COIL	LQH31MNR82M01L	B
R1	7510001660	S.THRMISTOR	NTCG16 4LH 473KT	B
R2	7030003940	S.RESISTOR	ERJ3GEYF 104 V (100 kΩ)	B
R3	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R4	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R5	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)	B
R6	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R7	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R8	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R9	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)	B
R10	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	B
R20	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	B
R22	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)	B
R23	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R24	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R25	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R26	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)	B
R27	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)	B
R28	7030003350	S.RESISTOR	ERJ3GEYJ 181 V (180 Ω)	B
R29	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)	B
R30	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	B
R31	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)	B
R32	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)	B
R33	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)	B
R34	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	B
R35	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	B
R36	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R50	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R52	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	T
R53	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	T
R54	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)	T
R55	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)	T
R56	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)	T
R57	7030003310	S.RESISTOR	ERJ3GEYJ 820 V (82 Ω)	T
R65	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)	T
R66	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	T
R67	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	T
R68	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	T
R69	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	T
R70	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	T
R71	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	T
R72	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)	T
R73	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R74	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R75	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	T
R76	7030000280	S.RESISTOR	MCR10EZHJ 150 Ω (151)	T
R80	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)	B
R81	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)	T
R82	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R90	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R91	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R93	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R94	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	B
R95	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	B
R96	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)	B
R100	7030003860	S.RESISTOR	ERJ3GE JPW V	T
R120	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	T
R121	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R130	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R131	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R132	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R133	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
R134	7030003330	S.RESISTOR	ERJ3GEYJ 121 V (120 Ω)	B
R150	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	B
R151	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)	B
R152	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)	B
R153	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)	T
R154	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	T
R155	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)	T
R156	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	T
R170	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)	T
R171	7030003450	S.RESISTOR	ERJ3GEYJ 122 V (1.2 kΩ)	B
R172	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	B
R173	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)	B
R174	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)	B
R175	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R176	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)	B
R192	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)	B
R193	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	B
R194	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R201	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	B
R202	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R203	7030003810	S.RESISTOR	ERJ3GEYJ 125 V (1.2 MΩ)	B
R204	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	B
R205	7030003550	S.RESISTOR	ERJ3GEYJ 822 V (8.2 kΩ)	B
R206	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)	B
R207	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)	B
R212	7030003460	S.RESISTOR	ERJ3GEYJ 152 V (1.5 kΩ)	B
R213	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)	B
R214	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	B
R220	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R221	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	T
R222	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R223	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	T
R224	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R225	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	T
R226	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	B
R227	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R228	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)	B
R230	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)	T
R231	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)	T
R232	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R233	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	T
R234	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)	T
R235	7030005930	S.RESISTOR	ERJ3GEYF 334 V (330 kΩ)	T
R236	7030008090	S.RESISTOR	ERJ3EKF 1503 V (150 kΩ)	T
R240	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)	B
R241	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)	B
R242	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)	B
R245	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R250	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R251	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)	B
R252	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	B
R253	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	B
R255	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)	B
R256	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)	B
R257	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	B
R258	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)	B
R260	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)	B
R261	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)	B
R262	7030003470	S.RESISTOR	ERJ3GEYJ 182 V (1.8 kΩ)	B
R263	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R264	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R265	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R271	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	B
R272	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)	B
R273	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)	B
R274	7030003750	S.RESISTOR	ERJ3GEYJ 394 V (390 kΩ)	B
R275	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R276	7030003710	S.RESISTOR	ERJ3GEYJ 184 V (180 kΩ)	B
R277	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R278	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R279	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)	B
R281	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	T
R282	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R283	7030003260	S.RESISTOR	ERJ3GEYJ 330 V (33 Ω)	T
R284	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)	B
R286	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R288	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)	T
R289	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)	T
R290	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)	B
R300	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)	B
R304	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R305	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R340	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R341	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R343	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R345	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)	B
R346	7030003200	S.RESISTOR	ERJ3GEYJ 100 V (10 Ω)	T
R350	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)	B

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
R351	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R352	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	B
R353	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R360	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R361	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R362	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R363	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R364	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	B
R366	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R367	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)	B
R371	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R372	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R373	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	B
R374	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)	B
R375	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)	B
R376	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)	B
R377	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)	B
R378	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)	B
R379	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)	B
R380	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)	T
R381	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
R382	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)	T
R383	7030003570	S.RESISTOR	ERJ3GEYJ 123 V (12 kΩ)	T
R384	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)	T
R385	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)	T
R386	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)	T
C1	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C2	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C3	4030007170	S.CERAMIC	C1608 CH 1H 221J-T	B
C4	4030007040	S.CERAMIC	C1608 CH 1H 180J-T	B
C5	4030007030	S.CERAMIC	C1608 CH 1H 150J-T	B
C6	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C7	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C8	4030009520	S.CERAMIC	C1608 CH 1H 020B-T	B
C9	4030009520	S.CERAMIC	C1608 CH 1H 020B-T	B
C10	4030008920	S.CERAMIC	C1608 JB 1H 473K-T	B
C11	4550006560	S.TANTALUM	ECST1CY225R	B
C12	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C20	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C21	4030007000	S.CERAMIC	C1608 CH 1H 090D-T	B
C22	4030007000	S.CERAMIC	C1608 CH 1H 090D-T	B
C24	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C25	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C26	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C27	4030007080	S.CERAMIC	C1608 CH 1H 390J-T	B
C28	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C29	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C30	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C31	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C32	4030009540	S.CERAMIC	C1608 CH 1H 1R5B-T	B
C33	4030007170	S.CERAMIC	C1608 CH 1H 221J-T	B
C34	4030009540	S.CERAMIC	C1608 CH 1H 1R5B-T	B
C35	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C36	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C37	4030009570	S.CERAMIC	C1608 CH 1H 0R3B-T	B
C38	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C39	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C40	4030007030	S.CERAMIC	C1608 CH 1H 150J-T	B
C41	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C42	4030009920	S.CERAMIC	C1608 CH 1H 050B-T	B
C43	4030007050	S.CERAMIC	C1608 CH 1H 220J-T	B
C44	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C50	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C51	4030007050	S.CERAMIC	C1608 CH 1H 220J-T	T
C52	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C53	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C54	4030007030	S.CERAMIC	C1608 CH 1H 150J-T	T
C55	4030009650	S.CERAMIC	C1608 CH 1H 240J-T	T
C56	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C57	4030016930	S.CERAMIC	ECJ0EB1A104K	T
C58	4030016930	S.CERAMIC	ECJ0EB1A104K	T
C59	4030017730	S.CERAMIC	ECJ0EB1E471K	T
C60	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C61	4510006970	S.ELECTROLYTIC	ECEV1CA330WR	B
C62	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C63	4030017730	S.CERAMIC	ECJ0EB1E471K	T
C64	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C65	4030007130	S.CERAMIC	C1608 CH 1H 101J-T	T
C66	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C67	4030017730	S.CERAMIC	ECJ0EB1E471K	T
C68	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	T
C70	4030018020	S.CERAMIC	C1608 CH 1H 910J-T	T
C71	4030008560	S.CERAMIC	C1608 CH 1H 300J-T	T
C72	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T
C73	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T
C74	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
C75	4030007050	S.CERAMIC	C1608 CH 1H 220J-T	T
C80	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T
C81	4030007040	S.CERAMIC	C1608 CH 1H 180J-T	T
C82	4030007040	S.CERAMIC	C1608 CH 1H 180J-T	T
C83	4030007050	S.CERAMIC	C1608 CH 1H 220J-T	T
C84	4030011530	S.CERAMIC	C1608 CH 1H 110J-T	T
C85	4030009650	S.CERAMIC	C1608 CH 1H 240J-T	T
C86	4030007000	S.CERAMIC	C1608 CH 1H 090D-T	T
C87	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T	T
C88	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C89	4030006980	S.CERAMIC	C1608 CH 1H 070D-T	B
C90	4030007000	S.CERAMIC	C1608 CH 1H 090D-T	B
C91	4030007010	S.CERAMIC	C1608 CH 1H 100D-T	B
C92	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C93	4030009910	S.CERAMIC	C1608 CH 1H 040B-T	B
C94	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C95	4030007070	S.CERAMIC	C1608 CH 1H 330J-T	B
C96	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C97	4030009510	S.CERAMIC	C1608 CH 1H 010B-T	B
C98	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C99	4030009910	S.CERAMIC	C1608 CH 1H 040B-T	B
C100	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C101	4030007070	S.CERAMIC	C1608 CH 1H 330J-T	B
C102	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C103	4030009920	S.CERAMIC	C1608 CH 1H 050B-T	B
C104	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C105	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C106	4030017730	S.CERAMIC	ECJ0EB1E471K	B
C107	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C108	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C109	4030017730	S.CERAMIC	ECJ0EB1E471K	B
C110	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C120	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C121	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T
C122	4030007030	S.CERAMIC	C1608 CH 1H 150J-T	T
C123	4030007010	S.CERAMIC	C1608 CH 1H 100D-T	T
C130	4030009920	S.CERAMIC	C1608 CH 1H 050B-T	B
C131	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C132	4030007070	S.CERAMIC	C1608 CH 1H 330J-T	B
C133	4030017990	S.CERAMIC	MCH185A130JK	B
C134	4030009510	S.CERAMIC	C1608 CH 1H 010B-T	B
C135	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C136	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C137	4030009530	S.CERAMIC	C1608 CH 1H 1R5B-T	B
C138	4030017990	S.CERAMIC	MCH185A130JK	B
C139	4030007070	S.CERAMIC	C1608 CH 1H 330J-T	B
C140	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C141	4030009920	S.CERAMIC	C1608 CH 1H 050B-T	B
C142	4030007020	S.CERAMIC	C1608 CH 1H 120J-T	B
C143	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C150	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C151	4030007100	S.CERAMIC	C1608 CH 1H 560J-T	B
C152	4030016970	S.CERAMIC	ECJ0EB1C223K	B
C153	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C154	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	B
C155	4030011770	S.CERAMIC	C1608 CH 1H 060B-T	T
C156	4030006860	S.CERAMIC	C1608 JB 1H 102K-T	T
C157	4030016970	S.CERAMIC	ECJ0EB1C223K	T
C158	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C159	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C160	4030018240	S.CERAMIC	ECJ0EB1E562K	T
C170	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C171	4030007120	S.CERAMIC	C1608 CH 1H 820J-T	B
C174	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C175	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C176	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C177	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C178	4030011810	S.CERAMIC	C1608 JB 1A 224K-T	B
C179	4030007140	S.CERAMIC	C1608 CH 1H 121J-T	B
C180	4030007140	S.CERAMIC	C1608 CH 1H 121J-T	B
C181	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C191	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C192	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	B
C193	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C194	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C200	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C202	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C205	4030016960	S.CERAMIC	ECJ0EB1C183K	B
C206	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C207	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C220	4510005430	S.ELECTROLYTIC	ECEV0JA220SR	B
C221	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C222	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C223	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C224	4510005430	S.ELECTROLYTIC	ECEV0JA220SR	B
C225	4030011810	S.CERAMIC	C1608 JB 1A 224K-T	B
C226	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C227	4550006710	S.TANTALUM	ECST1AX226R	B

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
C228	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C229	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C230	4550006820	S.TANTALUM	ECST1DX106R	T
C231	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T	T
C232	4030016930	S.CERAMIC	ECJ0EB1A104K	T
C233	4030016790	S.CERAMIC	ECJ0EB1C103K	T
C240	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C250	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C251	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	B
C252	4030017460	S.CERAMIC	ECJ0EB1E102K	B
C254	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C257	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C260	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	B
C261	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C262	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C263	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C264	4030017780	S.CERAMIC	ECJ0EB1E472K	B
C265	4030007150	S.CERAMIC	C1608 CH 1H 151J-T	B
C266	4030017030	S.CERAMIC	ECJ0EB1A273K	B
C267	4030011810	S.CERAMIC	C1608 JB 1A 224K-T	B
C268	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C280	4030017480	S.CERAMIC	C1608 JB 1A 474K-T	T
C281	4550006140	S.TANTALUM	ECST1EY474R	T
C282	4510004630	S.ELECTROLYTIC	ECEV1CA100SR	B
C283	4030016930	S.CERAMIC	ECJ0EB1A104K	T
C284	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C285	4030016930	S.CERAMIC	ECJ0EB1A104K	T
C286	4550006200	S.TANTALUM	ECST0JY106R	T
C287	4030007150	S.CERAMIC	C1608 CH 1H 151J-T	T
C288	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C289	4510005370	S.ELECTROLYTIC	ECEV1AA221P	B
C300	4030017770	S.CERAMIC	ECJ0EB1E332K	B
C340	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C341	4030017030	S.CERAMIC	ECJ0EB1A273K	B
C350	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C351	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C352	4030007090	S.CERAMIC	C1608 CH 1H 470J-T	B
C360	4030016790	S.CERAMIC	ECJ0EB1C103K	B
C361	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C363	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C364	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C365	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C366	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C367	4030017040	S.CERAMIC	ECJ0EB1A333K	B
C368	4030016950	S.CERAMIC	ECJ0EB1A473K	B
C370	4030007040	S.CERAMIC	C1608 CH 1H 180J-T	B
C371	4030007050	S.CERAMIC	C1608 CH 1H 220J-T	B
C372	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C373	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C374	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C375	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C376	4030016930	S.CERAMIC	ECJ0EB1A104K	B
C377	4030009490	S.CERAMIC	C1608 JB 1H 821K-T	B
C378	4030017780	S.CERAMIC	ECJ0EB1E472K	B
C379	4030007100	S.CERAMIC	C1608 CH 1H 560J-T	B
C380	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C381	4030017460	S.CERAMIC	ECJ0EB1E102K	T
C382	4030017460	S.CERAMIC	ECJ0EB1E102K	B
J250	6450001910	CONNECTOR	HSJ1594-010150	B
J251	6510021900	S.CONNECTOR	BM02B-ASRS-TF	T
DS240	5040002660	S.LED	FY1101F-TR (LED)	T
DS241	5040002660	S.LED	FY1101F-TR (LED)	T
DS242	5040002310	S.LED	SML-311YTT86	T
DS243	5040002310	S.LED	SML-311YTT86	T
DS244	5040002310	S.LED	SML-311YTT86	T
DS245	5040002310	S.LED	SML-311YTT86	T
DS246	5030002600	LCD	L3-0018TAY-1	T
MC250	7700002480	MICROPHONE	SKB-2746 LPC	T
S250	2260001900	SWITCH	SW-149 (SKHLLD)	B
S328	2260002710	S.SWITCH	SKQLLCE012	B
EP1	0910056712	PCB	B 6031B	
EP2	6910014690	S.BEAD	MPZ1608S221A-T	T
EP3	6910014690	S.BEAD	MPZ1608S221A-T	T
EP360	8930057100	LCD CONTACT	SRCN-2497-SP-N-W	T

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)

S.=Surface mount

[CHASSIS UNIT]

REF NO.	ORDER NO.	DESCRIPTION		M.
J31	6910014190	CONNECTOR	2497 ANT CONNECTOR	
SP1	2510001092	SPEAKER	036D0801B <FG>	
W1	8900010960	CABLE	OPC-1129	

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)
S.=Surface mount

SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

[CHASSIS PARTS]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
J 31	6910014190	2497 ANT connector	1
SP 1	2510001092	Speaker 036D0801B <FG>	1
W 1	8900010960	Cable OPC-1129	1
MP 1	8210020090	2691 front panel assembly	1
MP 2	8310059690	2691 front panel (incl. MP1)	1
MP 4	8930039000	1757 sheet	1
MP 5	8930060730	2691 keyboard	1
MP 6	8930058020	2497 PTT button	1
MP 7	8930056960	2497 PTT holder	1
MP 8	8610011151	Knob 2497 BATT lock-1	1
MP 9	8930056941	2497 lock plate-1 Y609A	1
MP 14	8850001950	Shieling washer (Y)	1
MP 15	8830001250	ANT connector-101 nut	1
MP 16	8210018500	2497 top panel	1
MP 17	8930057260	2497 top sheet	1
MP 21	8210018482	2497 rear panel-2	1
MP 22	8930056950	2497 main seal	1
MP 23	8810010120	Screw PH B0 M2x8 SUS ZK	3
MP 24	8810010150	Screw PH B0 2 x 10 SUS ZK	1
MP 25	8850001880	Shieling washer (W)	1
MP 31	8010019320	2691 chassis	1
MP 32	8930056980	2497 terminal holder	1
MP 33	8810009560	Screw PH BT M2x6 ZK	2
MP 34	8930060770	2691 A-terminal Y678	1
MP 35	8930056900	2497 B-terminal Y607	1
MP 36	8810008640	Screw FH BT No.0 M2x4 NI-ZU	2
MP 37	8930056910	2497 C-terminal Y608	1
MP 38	8810009510	Screw PH BT M2x4 NI-ZU	1
MP 39	8810009510	Screw PH BT M2x4 NI-ZU	7
MP 40	8510015970	2691 grounding plate	1
MP 42	8810009560	Screw PH BT M2x6 ZK	2
MP 43	8510015980	2691 main shield	1
MP 44	8930024961	891terminal rubber (A)-1	3
MP 46	8930060780	2691 PW button	1
MP 47	8930060790	2691 PW holder	1

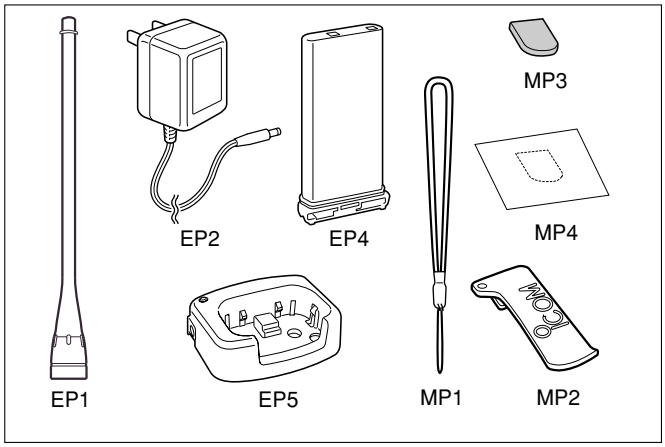
[MAIN UNIT]

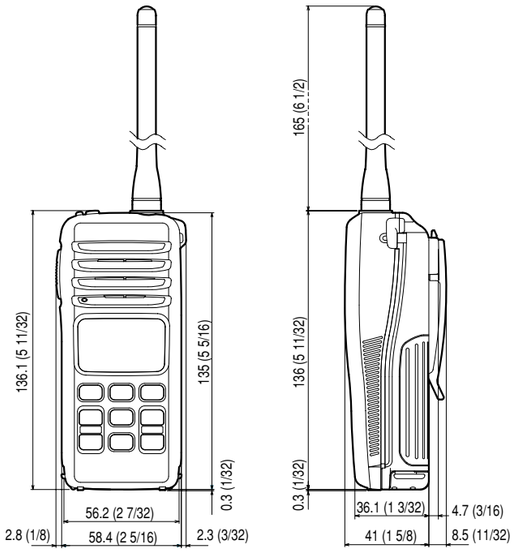
REF NO.	ORDER NO.	DESCRIPTION	QTY.
J 250	6450001910	Connector HSJ1594-010150	1
J 251	6510021900	S. connector BM02B-ASRS-TF	1
S 250	2260001900	switch SW-149 (SKHLLD)	1
S 328	2260002710	S. switch SKQLLCE012	1
DS 246	5030002600	LCD L3-0018TAY-1	1
EP 360	8930057100	LCD contact SRCN-2497-SP-N-W	1
MC 250	7700002480	Microphone SKB-2746 LPC	1
MP 20	8510014330	2497 VCO case tip	1
MP 21	8510011101	1922 VCO cover-1 Y340A	1
MP 50	8410002370	2337 PA heatsink (tip) Y539	1
MP 360	8210019970	2691 reflector panel	1
MP 361	8930060800	2691 LCD holder	1
MP 362	8930061580	Sponge (HK)	1

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

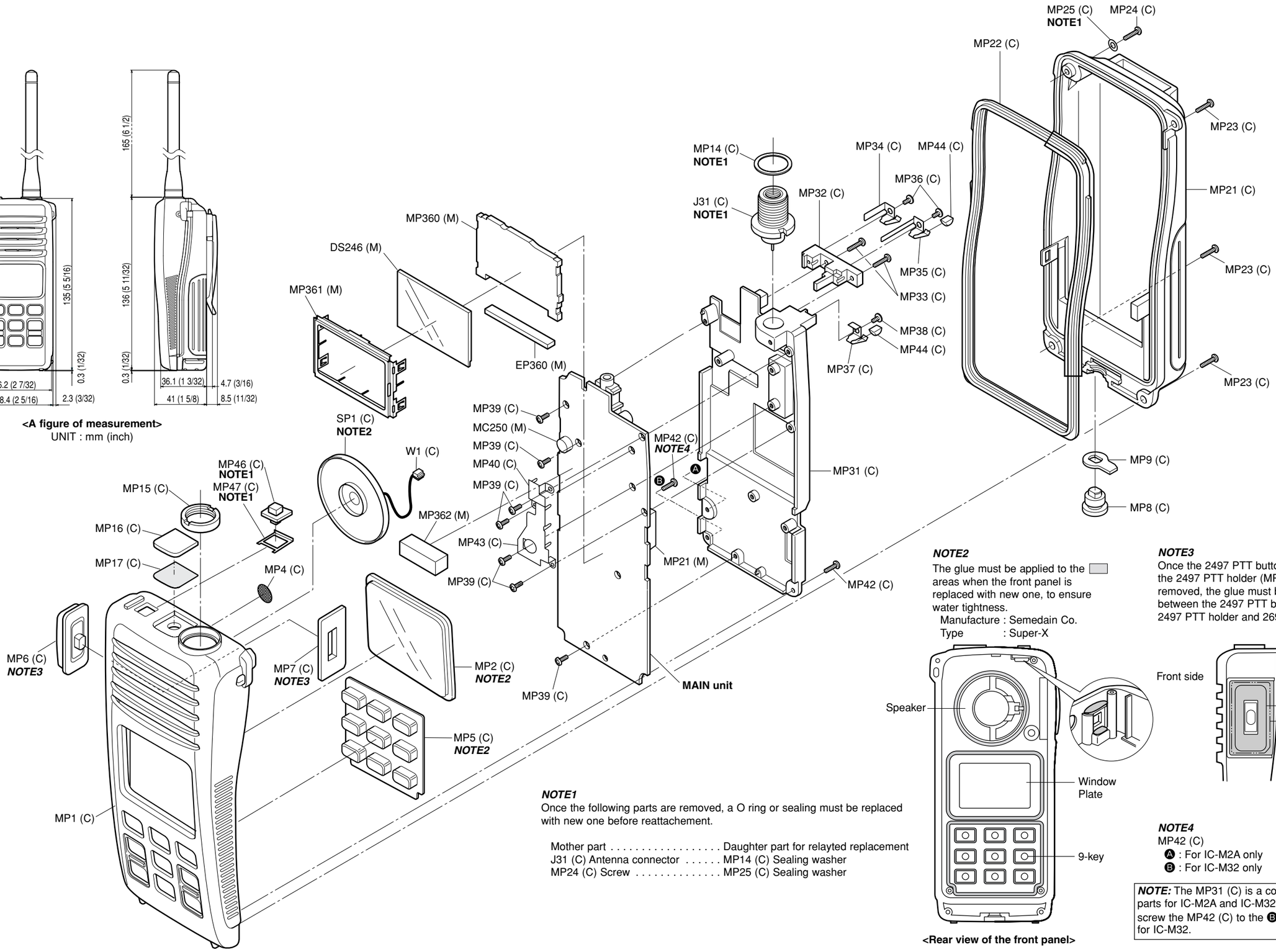
[ACCESSORIES]

REF NO.	ORDER NO.	DESCRIPTION		QTY.
EP1	3310002321	Antenna FA-SC55V-1		1
EP2	Optional products	Charger BM-95V	[AUS]	1
	Optional products	Charger BC-147A	[USA]	1
	Optional products	Charger BC-147E	[SEA]	1
EP4	Optional products	Battery BP-224 ACC (750MAH)		1
EP5	Optional products	Charger BC-150		1
MP1	8010018080	Hand strap HK-009		1
MP2	8930042041	1922 belt crip-1		1
MP3	8210028500	2497 top panel	[AUS]	1
MP4	8930057260	2497 top sheet	[AUS]	1





<A figure of measurement>
UNIT : mm (inch)



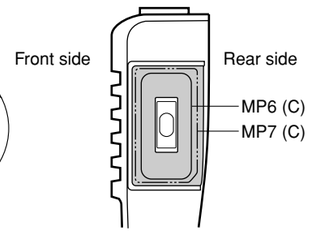
NOTE1
Once the following parts are removed, a O ring or sealing must be replaced with new one before reattachement.

Mother part . . . . . Daughter part for relayted replacement
J31 (C) Antenna connector . . . . . MP14 (C) Sealing washer
MP24 (C) Screw . . . . . MP25 (C) Sealing washer

NOTE2
The glue must be applied to the areas when the front panel is replaced with new one, to ensure water tightness.
Manufacture : Semedain Co.
Type : Super-X

<Rear view of the front panel>

NOTE3
Once the 2497 PTT button (MP6 (C)) or the 2497 PTT holder (MP7 (C)) is removed, the glue must be applied between the 2497 PTT button or the 2497 PTT holder and 2691 front panel.



NOTE4
MP42 (C)
Ⓐ : For IC-M2A only
Ⓑ : For IC-M32 only

NOTE: The MP31 (C) is a common parts for IC-M2A and IC-M32. Need to screw the MP42 (C) to the Ⓑ location for IC-M32.

UNIT abbreviations (C): CHASSIS PARTS, (M): MAIN UNIT

❑ BC-150 CHARGER PARTS LIST

● ELECTRICAL PARTS

[CHARGE UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
R1	7070001130	RESISTOR 120 ERG2SJ
R2	7070001140	RESISTOR 150 ERG2SJ
R3	7010007100	RESISTOR 1K PSD1/4V
J1	6510023070	CONNECTOR HEC2305-01-250
DS1	5040003020	LED SEL2410G
EP1	0910054642	PCB B-5787B

● MECHANICAL PARTS

[CHASSIS]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8510014350	2523 Case	1
MP2	8110007680	2523 Cover	1
MP3	8810008660	Screw B0 3 x 8 NI-ZU (BT)	2
MP4	8930047830	Leg cushion (C)	2

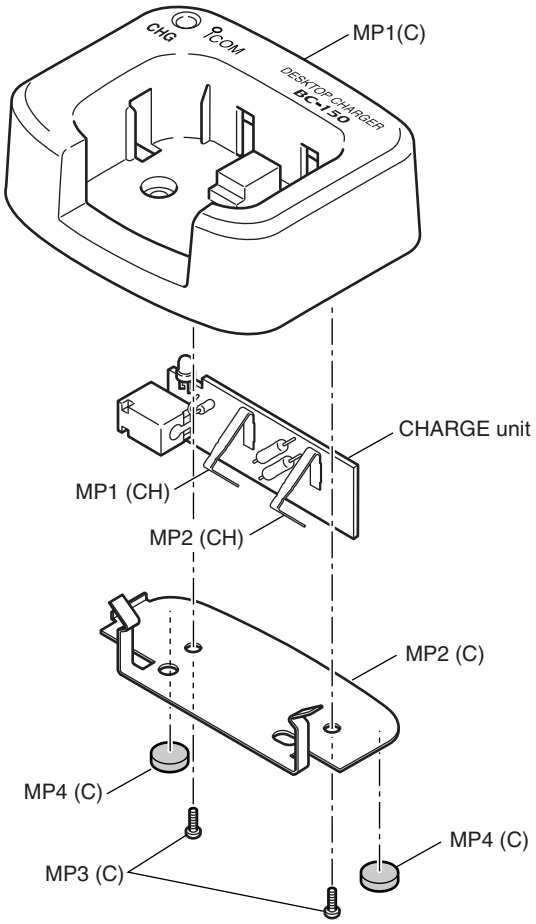
[CHARGE UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8930057120	2523 Terminal	1
MP2	8930057120	2523 Terminal	1

[ACCESSORIES]

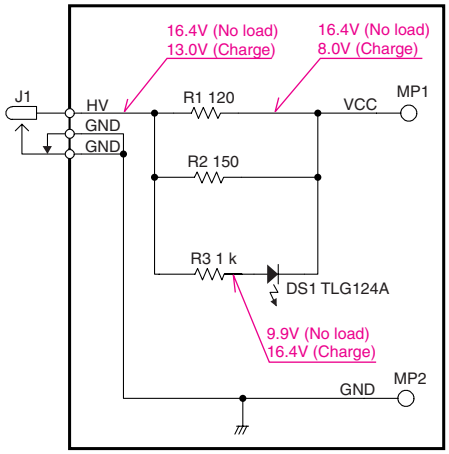
REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8810001460	Screw A0 3.5 x 20 SUS	2

Screw abbreviations A0, B0, BT: Self-tapping
NI-ZU: Nickel-zinc
SUS: Stainless



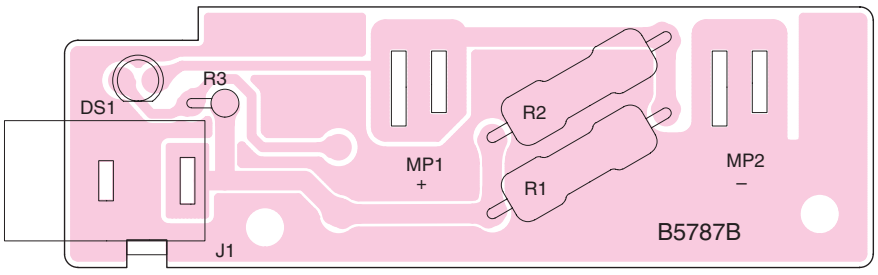
NOTE: (C): CHASSIS (CH): CHARGE UNIT

❑ BC-150 VOLTAGE DIAGRAM

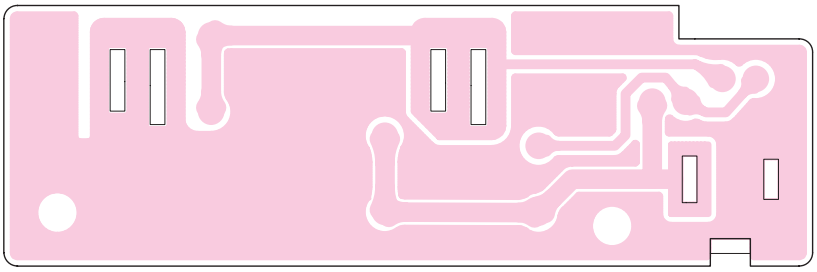


❑ BC-150 BOARD LAYOUT

● TOP VIEW

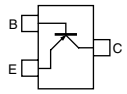
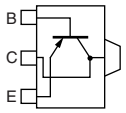
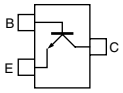
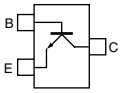
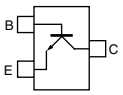
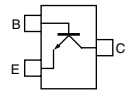
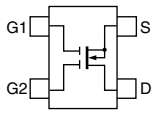
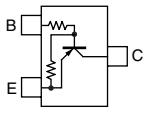
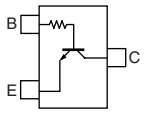
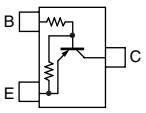
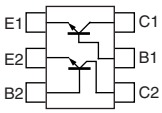
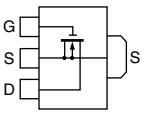
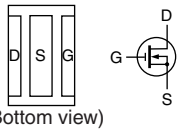


● BOTTOM VIEW

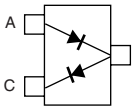
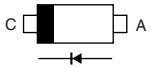
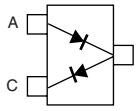
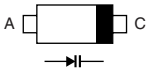
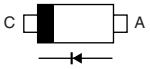
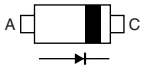
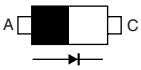
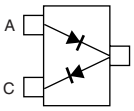


SECTION 8 SEMI-CONDUCTOR INFORMATION

● TRANSISTOR AND FET'S

2SA1588 GR (Symbol: ZG) 	**2SB1132 Q** (Symbol: BAQ) 	**2SC2714 Y** (Symbol: QY) 	**2SC4213 B** (Symbol: AB) 	**2SC4215 O** (Symbol: QO) 
2SC4226 R25 (Symbol: R25) 	**3SK299 U73** (Symbol: U73) 	**DTA144 EUA** (Symbol: 16) 	**DTC144 TU** (Symbol: 06) 	**UN911 H** (Symbol: 6P) 
XP6501 AB (Symbol: 5N) 	**RD01MUS1** (Symbol: K2) 	**RD07MVS1** (Symbol: RD07MVS1)  (Bottom view)		

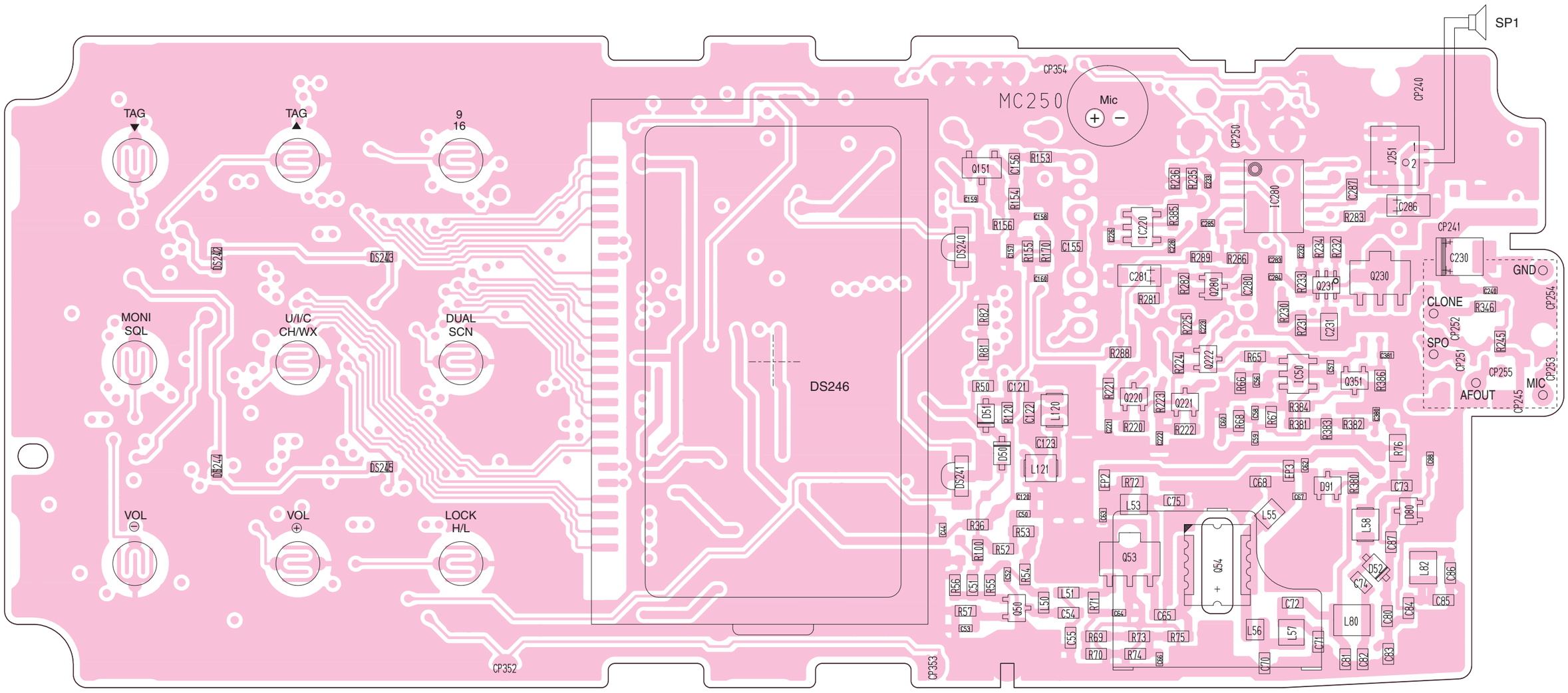
● DIODES

1SS375 (Symbol: FH) 	**1SV307** (Symbol: TX) 	**DA221 TL** (Symbol: K) 	**HVC376B TRF** (Symbol: B9) 	**HVU350 B** (Symbol: B0) 
MA2S077 (Symbol: S) 	**MA728** (Symbol: 2A) 	**MA77** (Symbol: 4B) 	**RB706F-40 T106** (Symbol: 3J) 	

SECTION 9 BOARD LAYOUTS

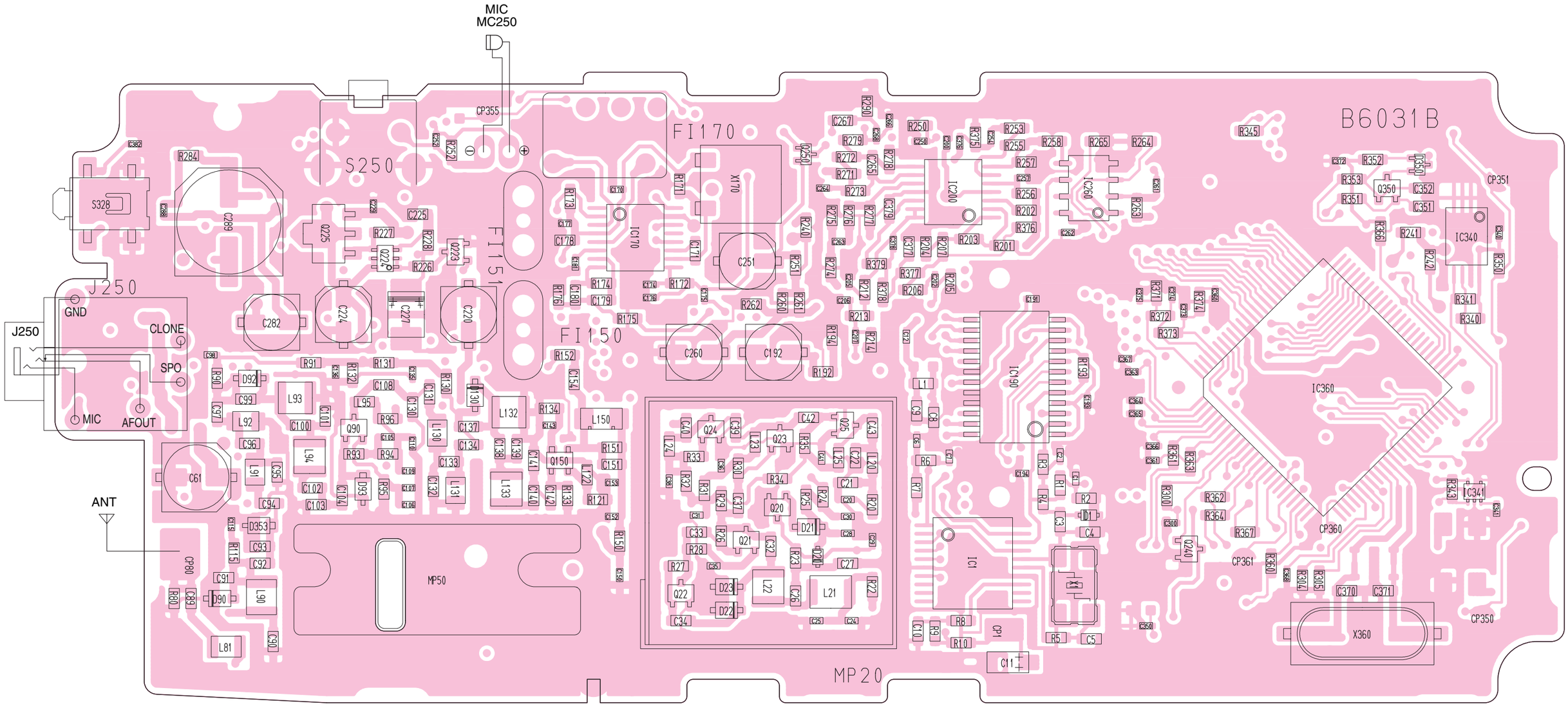
MAIN UNIT
• **TOP VIEW**

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

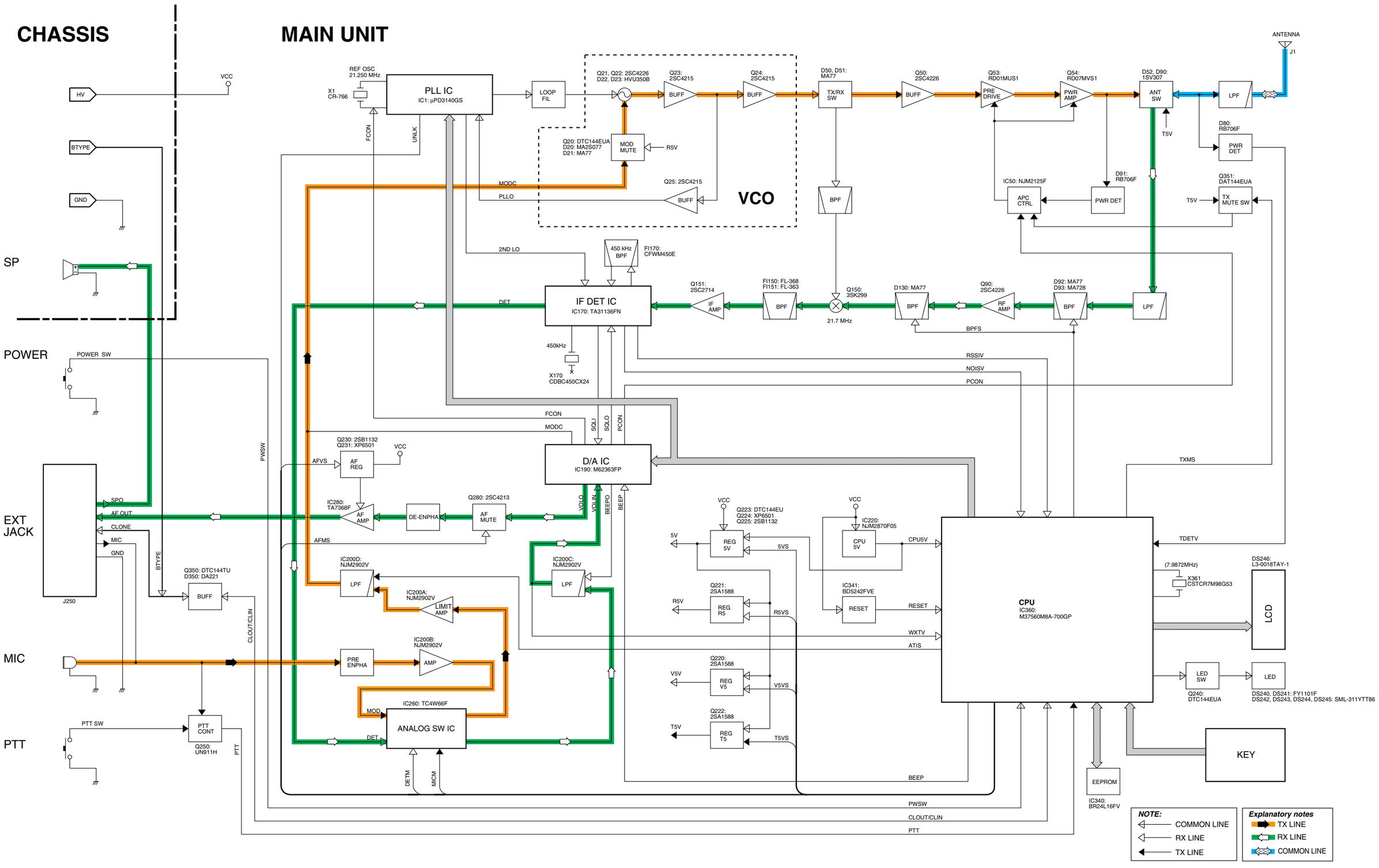


• **BOTTOM VIEW**

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

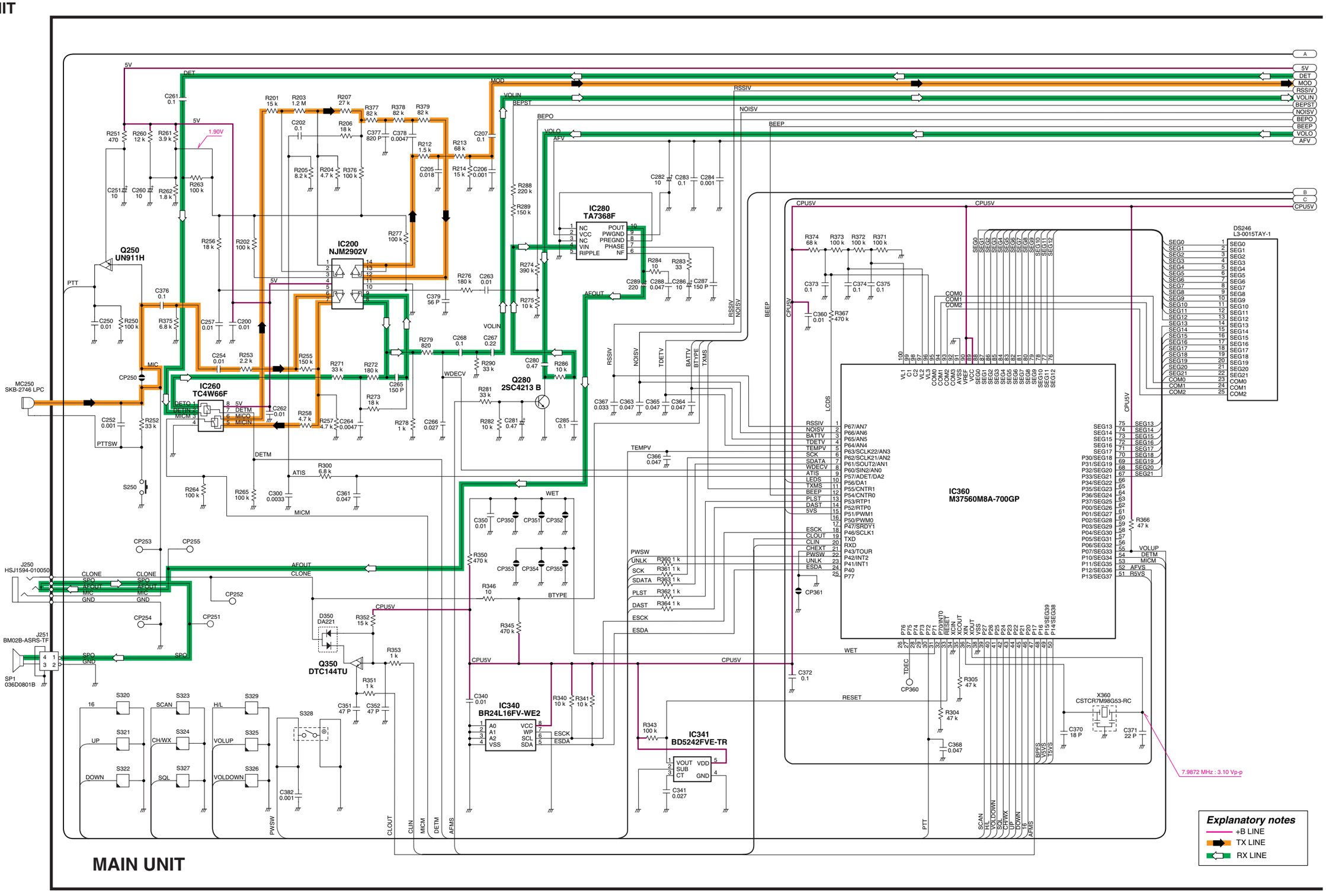


SECTION 10 BLOCK DIAGRAM



SECTION 11 VOLTAGE DIAGRAM

MAIN UNIT



MAIN UNIT

VCO CIRCUIT

IC1 µPD3140GS

IC170 TA31136FN

IC190 M62363FP-650C

IC50 NJM2125F

IC220 NJM2870F05

Q20 DTC144EUA

Q21 2SC4226 R25

Q22 2SC4226 R25

Q23 2SC4215 Y

Q24 2SC4215 Y

Q25 2SC4215 Y

Q50 2SC4226 R25

Q351 DTA144EUA

Q53 RD01MUS1

Q54 RD07MVS1

Q90 2SC4226 R25

Q150 3SK299

Q151 2SC2714 Y

Q220 2SA1588 GR

Q221 2SA1588 GR

Q222 2SA1588 GR

Q223 DTC144EU

Q224 XP6501 AB

Q225 2SB1132 Q

Q230 2SB1132 Q

Q231 XP6501 AB

Q240 DTC144EUA

CH16 RX : 4.96V
CH88 RX : 0.00V

5W TX : 3.02V
1W TX : 2.33V

5W TX : 2.29V
1W TX : 0.65V

Power Save OFF : 5.00V

Power Save OFF : 4.96V

AF Mute OFF : 7.48V

Back-Light ON : 3.91V

Back-Light ON : 3.82V

RX : 3.57V

RX : 4.20V

RX : 0.91V

RX : 1.45V

RX 3.21V

RX : 0.79V

TX : 4.93V

RX : 4.96V

Explanatory notes

- +B LINE
- TX LINE
- RX LINE
- COMMON LINE

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E-mail : info@icomuk.co.uk

Icom France S.a

Zac de la Plaine, 1, Rue Brindejonc des Moulinais
BP 5804, 31505 Toulouse Cedex, France
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E-mail : icom@icom-france.com

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