



# SERVICE MANUAL

AIS RECEIVER

# MXA-5000

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S-14521XZ-C1  
Jan. 2009

Icom Inc.

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## INTRODUCTION

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This service manual describes the latest technical information for the **MXA-5000** AIS RECEIVER at the time of publication.

MODEL	VERSION	UNIT ABBREVIATIONS: C=CHASSIS M=MAIN UNIT
MXA-5000	[USA]	
	[EUR]	
	[EXP]	

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

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## CAUTION

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**NEVER** connect the receiver to an AC outlet or to a DC power supply that uses more than specified. This will ruin the receiver.

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

**DO NOT** reverse the polarities of the power supply when connecting the receiver.

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



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## ORDERING PARTS

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

1. 10-digit Icom parts numbers
2. Component name
3. Equipment model name and unit name
4. Quantity required

**<ORDER EXAMPLE>**

1190002850 S.IC CMX7032L9/TR IC12 MAIN UNIT 1 piece  
8110009660 Cover 2197 COVER (C) MP1 CHASSIS 3 piece

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

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## REPAIR NOTES

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1. Make sure that the problem is internal before disassembling the receiver.
2. **DO NOT** open the receiver until the receiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the receiver is defective.
6. **READ** the instructions of test equipment thoroughly before connecting a test equipment to the receiver.

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## ◇ General

- Frequency coverage : 161.975 MHz, 162.025 MHz
- Type of emission : 16K0F1D (GMSK)
- Antenna impedance : 50 Ω nominal
- Operating temp. range : -20°C to +60°C; -4°F to +140°F
- Power supply requirement : 12 V DC nominal (10.8 V to 15.6 V)  
(negative ground)
- Current drain : 0.25 A
- Dimensions (Projections not included)
  - Without Angle : 132(W) × 34(H) × 155(D) mm  
5 <sup>3</sup>/<sub>16</sub>(W) × 1 <sup>11</sup>/<sub>32</sub>(H) × 6 <sup>3</sup>/<sub>32</sub>(D) in
  - Angle attached : 158(W) × 39(H) × 155(D) mm  
6 <sup>7</sup>/<sub>32</sub>(W) × 1 <sup>17</sup>/<sub>32</sub>(H) × 6 <sup>3</sup>/<sub>32</sub>(D) in
- Weight (Approx.)
  - Without Angle : 400 g (14.1 oz)
  - Angle attached : 460 g (16.2 oz)
- DATA input interface : IEC61162-1: 2000 (4,800 bps)
  - Sentence formatters : RMC, GGA, GNS, and GLL
  - Input level : Less than 2 mA  
(When 2 V is applied)
- DATA output interface :
  - To navigation equipment : IEC61162-2 (38,400 bps)
    - Sentence formatter : VDM
    - Output level : 5 V, 40 mA max  
RS-422 ballanced type
  - To PC : Baud rate 38,400 bps
    - Sentence formatter : VDM
    - Output level : ±5 V, ±35 mA typical  
RS-232C unballanced type

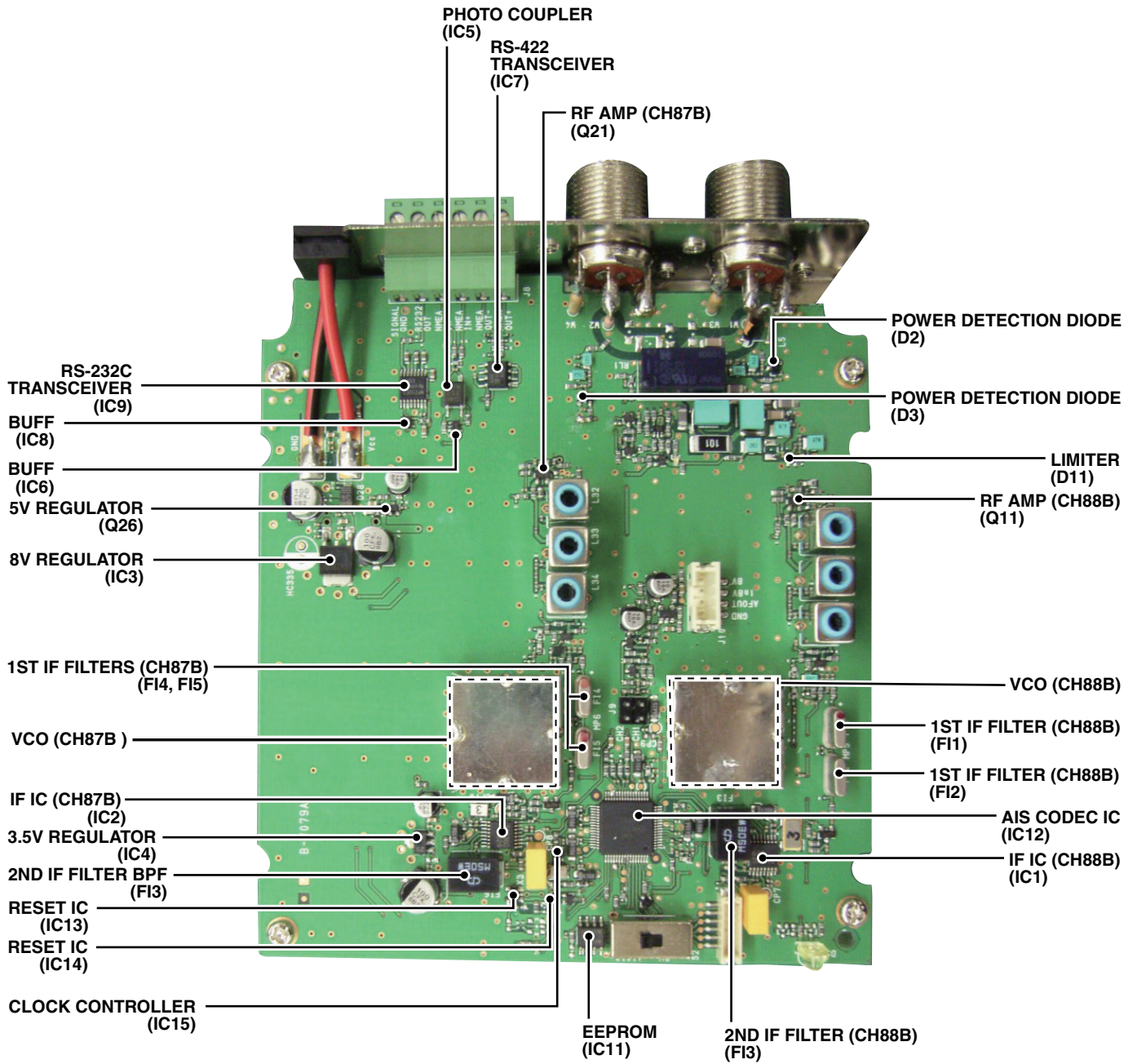
## ◇ Receiver

- Sensitivity : 0.35 μV (typical)
- Adjacent channel selectivity : More than 70 dB
- Spurious response : More than 70 dB
- Intermodulation : More than 65 dB
- Hum and noise : More than 40 dB
- Conducted spurious emission : Less than -57 dBm

# SECTION 2

# INSIDE VIEW

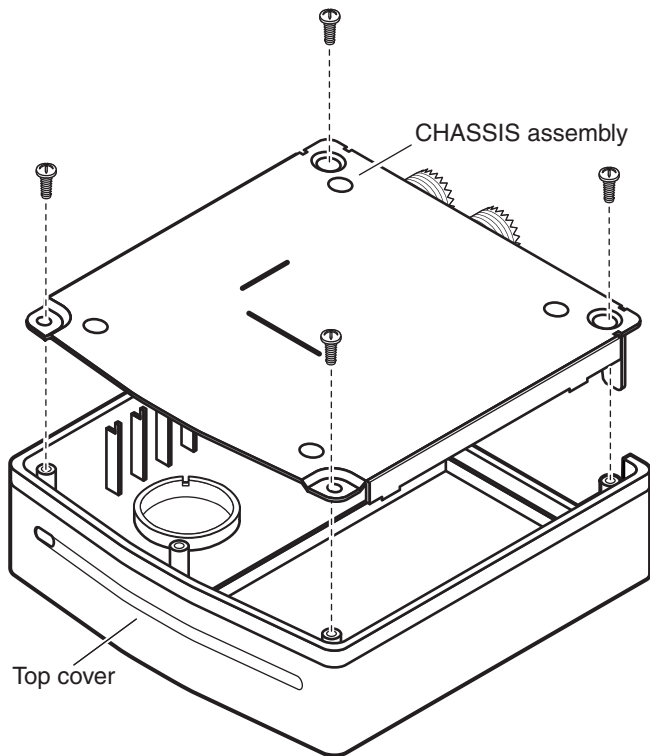
## • MAIN UNIT



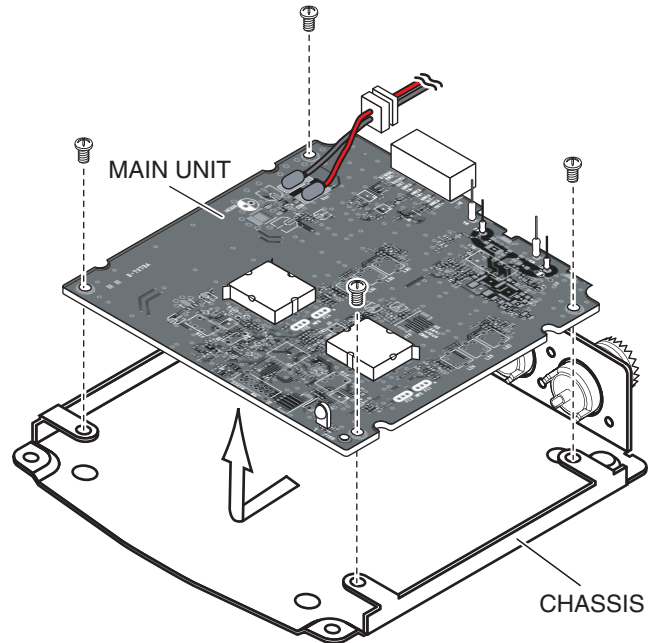
## SECTION 3 DISASSEMBLY INSTRUCTION

### • Removing the MAIN UNIT

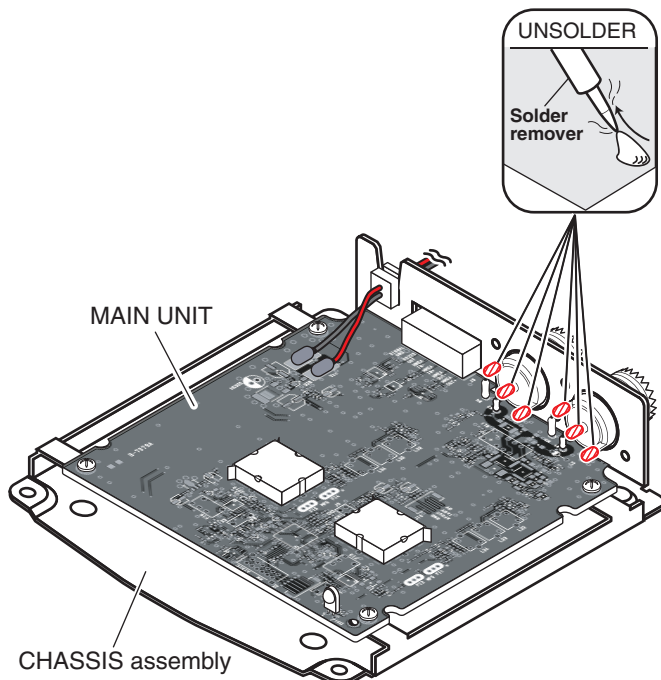
1) Unscrew 4 screws from the bottom.



3) Unscrew 4 screws from the MAIN UNIT, and remove the MAIN UNIT from the CHASSIS.



2) Unsolder total of 6 points at the antenna connector.



## 4-1 RECEIVE CIRCUITS

### RF BYPASS CIRCUIT

MXA-5000 equips two antenna connectors; one is connected to the antenna, another one is connected to the transceiver, thus no AIS-dedicated antenna is necessary.

When MXA-5000 is turned OFF or the connected transceiver is in transmitting, the [RADIO] and [ANTENNA] connectors are connected directly (bypassed) by the RF bypass circuit (RL1).

RF signals from [ANTENNA] are passed through the coupling capacitor (C21) and RL1, and applied to the divider (L2, 3, C10, 16, 17, R8).

The divided RF signals are applied to both of the connected transceiver via [RADIO] connector and the RF amplifier for AIS receive circuit via the protector (D5, L6, 7, C11, 13).

### RF POWER DETECTION CIRCUIT

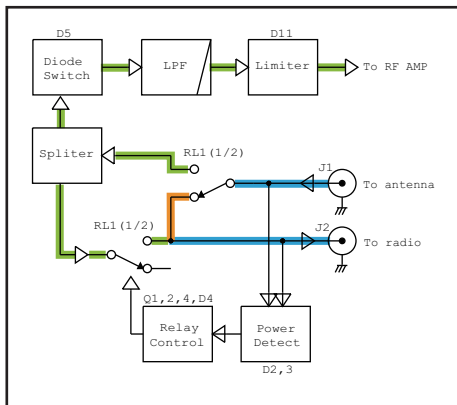
The RF detection circuit detects the transmission signal from the connected transceiver, and the detected signal controls the RF bypass circuit.

When connected transceiver starts transmitting, a portion of RF signals from the transceiver is passed through the attenuator (R19, 20) and the BPF (L8, 9, C22–25, 30, R24), then rectified by D3. The RF signals are also passed through the bypass relay (RL1), attenuator (R21, 22) and BPF (C26–29, 31, L10, 11, R23), then rectified by D2 too.

These rectified voltages are the reference voltage to switch RL1 (using Q1, 2, 4), thus the TX signal from the transceiver is fed to the antenna via RL1.

At the same time, Q5 and D5 are turned ON to prevent TX signals from the transceiver to enter into the RX circuit, until the RL1 is activated completely.

### • RF BAYPASS AND DETECTION CIRCUITS

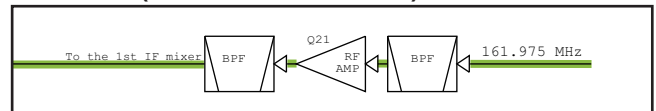


### AIS CHANNELS

Two channels, CH87B (161.975 MHz) and CH88B (162.025 MHz), are assigned for use of AIS operation due to the international regulation. The MXA-5000 has capability of receiving both of channels; CH87B and CH88B simultaneously.

RF signals from the protector are passed through the limiter (D11) and then separated into each channel, CH87B (161.975 MHz) and CH88B (162.025 MHz) at the matching section (L21, C49, 50). The separated RF signal is applied to appropriate RF AMP.

### • RF AMP (CH87B: 161.975 MHz)



### RF AMP (CH87B: 161.975 MHz)

The CH87B signal from the matching section is amplified by Q21, and passed through the BPF (L32–34), then down-converted into the 30.875 MHz of 1st IF signal by the 1st mixer (Q22).

### IF AND DEMODULATOR CIRCUITS (CH87B: 161.975 MHz)

The 1st IF signal from the 1st mixer (Q22) are filtered by FI4 and FI5 to remove out-of-band signals. The filtered 1st IF signal is amplified by Q23, then applied to the pin 16 of IC2.

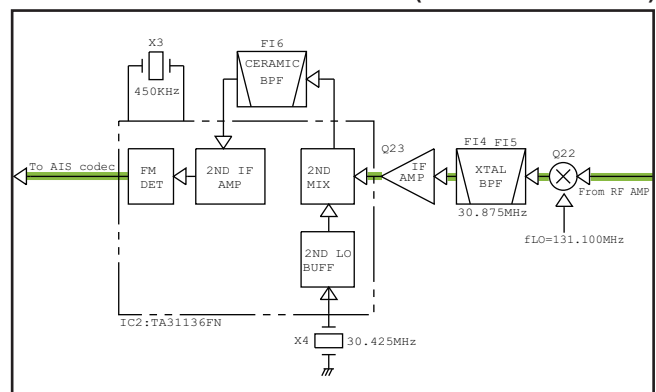
IC2 contains 2nd Local oscillator, 2nd Mixer, Limiter and Quadrature detector in its package.

The 30.425 MHz 2nd LO signal generated by the crystal oscillator X4 is applied to the pin 2 of IC2. The 2nd LO signal is mixed with the 1st IF signal, then produced 450 kHz 2nd IF signal is output from pin 3. The 2nd IF signal is filtered by the ceramic filter (FI6) to extract 450 kHz signal only, then applied to the pin 5 of IC2 again.

The 2nd IF signal is detected by Quadrature detector, then output to the AIS processor IC as demodulated GMSK signal.

The quadrature detector uses X3 and R172 as the phase delayer, for adjustment-free detect circuit.

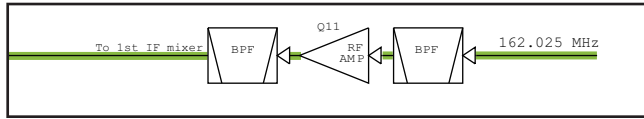
### • IF AND DEMODULATOR CIRCUITS (CH87B: 161.975 MHz)



**RF AMP (CH88B: 162.025 MHz)**

The CH88B signal from the matching section is amplified by Q11, and passed through the BPF (L22, 23, 24), and down-converted into the 21.7 MHz of 1st IF signal by Q12.

**• RF AMP (CH88B: 162.025 MHz)**



**IF AND DEMODULATOR CIRCUITS (CH88B: 162.025 MHz)**

The 1st IF signal from the 1st mixer (Q12) is filtered by FI1 and FI2 to remove out-of-band signals, then amplified by Q13, then applied to the pin 16 of IC1.

IC1 contains 2nd Oscillator, 2nd Mixer, Limiter, Quadrature Detector in its package.

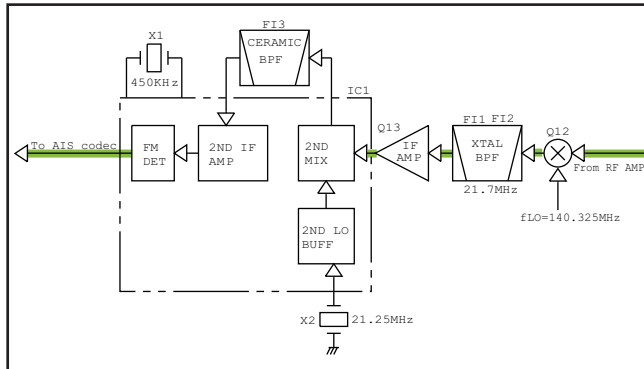
The 21.25 MHz 2nd LO signal generated by the crystal oscillator X2 is applied to the pin 2 of IC1. The 2nd LO signal is mixed with the 1st IF signal, then produced 450 kHz 2nd IF signal is output from pin 3.

The 2nd IF signal is filtered by the ceramic filter FI3 to extract 450 kHz signal only, then applied to the pin 5 of IC1.

The 2nd IF signal is detected by Quadrature Detector, then output to the AIS processor IC (IC12) as demodulated GMSK signal.

The quadrature detector uses X1 and R102 as the phase delayer, for adjustment-free detect circuit.

**• IF AND DEMODULATOR CIRCUITS (CH88B: 162.025 MHz)**



**AIS DECODING**

The demodulated GMSK signal from the demodulator circuits is applied to the AIS processor IC (IC12), and decoded into NMEA data format.

The decoded NMEA signal is output from pin 50, and level-converted into 5 V (from 3.5 V) by the buffer (IC8), then applied to IC7 and IC9.

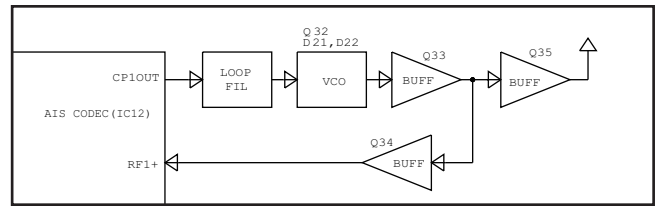
The NMEA signals are converted into RS-422 format by IC7, then output from (J8, pins 1, 2), or RS-232 format by IC9, then output from (J8, pin 5).

**4-2 FREQUENCY SYNTHESIZER**

**VCO (CH87B: 161.975 MHz)**

The 1st LO signal for the CH87B is generated by Q47, and the generated 1st LO signal is buffer amplified by Q43 and Q45. The buffer amplified 1st LO signal is then applied to the 1st mixer (Q22). Q44 is the buffer amplifier for the PLL (contained in IC12) feedback.

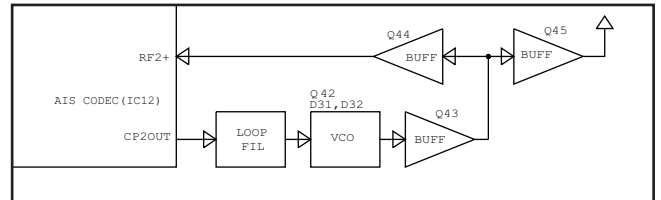
**• VCO (CH87B: 161.975 MHz)**



**VCO (CH88B: 162.025 MHz)**

The 1st LO signal for the CH88B is generated by Q32, and the generated 1st LO signal is buffer amplified by Q33 and Q35. The buffer amplified 1st LO signal is then applied to the 1st mixer (Q12). Q34 is the buffer for PLL (contained in IC12) feedback.

**• VCO (CH88B: 162.025 MHz)**



**PLL**

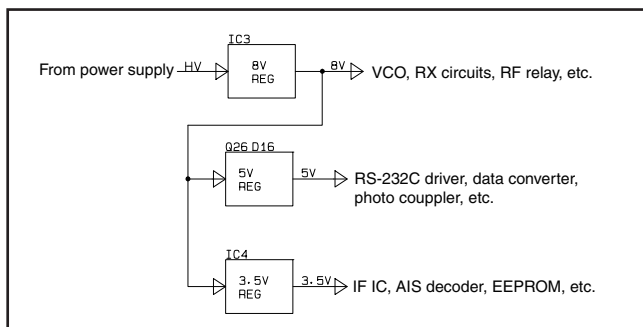
The AIS processor IC (IC12) contains dual PLL synthesizer for two AIS channels. TCXO (X5) generates 19.2 MHz signal and is used for both of system clock for AIS codec and PLL reference frequency.



### 4-3 AIS processor IC (IC12) PORT ALLOCATION

Pin No.	Pin name	Description
3	RF I/P 1	VCO oscillation signal input for CH88B PLL.
5	Out CP1	Charge pump output for CH88B PLL.
9	RF I/P 2	VCO oscillation signal input for CH87B PLL.
11	Out CP2	Charge pump output for CH87B PLL.
24	RX1in	Demodulated AF signals input for CH88B.
26	RX2in	Demodulated AF signals input for CH87B.
49	RxData	NMEA+/NMEA- input.
50	TxDatA	AIS data output.
58	EPSI	Serial data input from EEPROM.
59	EPSClk	Serial clock output to EEPROM.
60	EPSO	Serial data output to EEPROM.

### 4-4 VOLTAGE DIAGRAMS



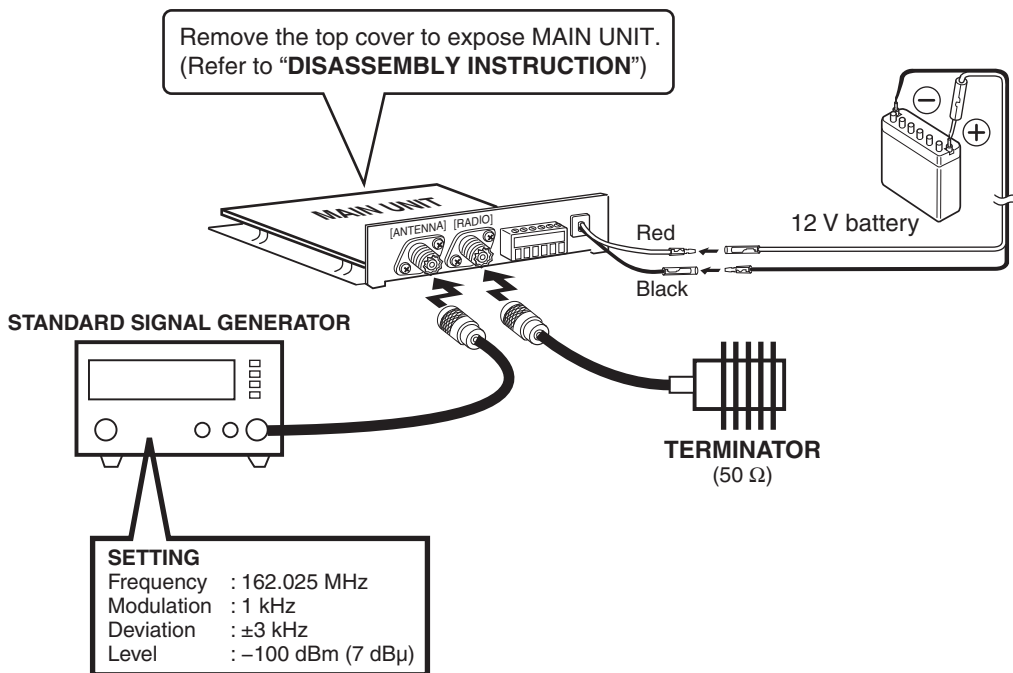
# SECTION 5 ADJUSTMENT PROCEDURE

## REQUIRED EQUIPMENTS

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Voltage : 12.0 V DC Current : More than 1 A	Digital voltmeter	Measuring range : 0–10 V Input impedance : More than 50 kΩ
Standard signal generator (SSG)	Frequency range : 150–170 MHz Output level : 0.1 mV to 32 mV (–127 to –17 dBm)	Terminator	Impedance : 50 Ω

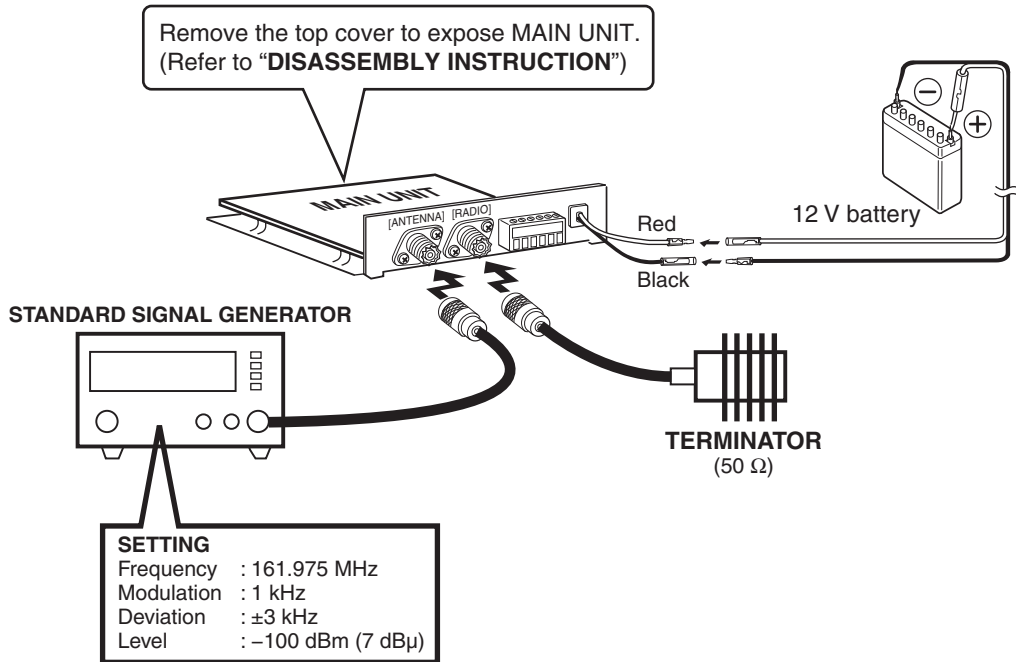
## ADJUSTMENTS

ADJUSTMENT	OPERATION	ADJUSTMENT POINT	VALUE
<b>RECEIVE SENSITIVITY (CH88B)</b> <b>-PREPARATION-</b>	1) Connect a 50 Ω Terminator to [RADIO] terminal. 2) Connect an SG to [ANTENNA] terminal. 3) Connect a Voltage Meter to <b>CP7</b> on the P.C. board (refer to page 5-3 for the location.).	–	–
<b>-ADJUSTMENT-</b>	2) • Adjust the voltage of <b>CP7</b> with coils on the P.C. board (Refer to page 5-3 for the location).	L22→L23→L24 (In sequence, repeatedly)	Max. voltage

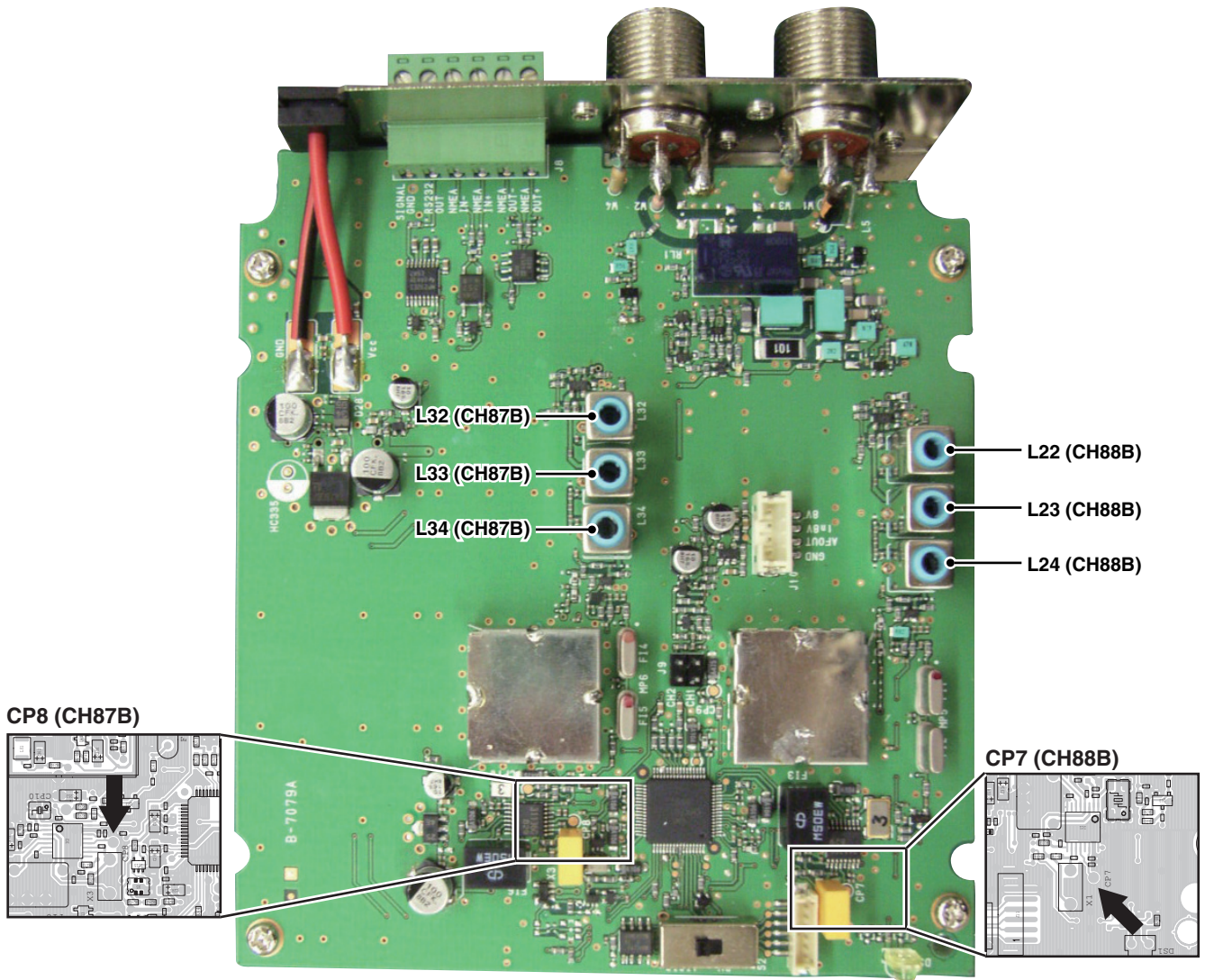


■ ADJUSTMENTS (continued)

ADJUSTMENT	OPERATION	ADJUSTMENT POINT	VALUE
RECEIVE SENSITIVITY (CH87B) -PREPARATION-	1) Connect a 50 Ω Terminator to [RADIO] terminal. 2) Connect an SG to [ANTENNA] terminal. 3) Connect a Voltage Meter to CP8 on the P.C. board (refer to page 5-3 for the location).	-	-
-ADJUSTMENT-	• Adjust the voltage of CP8 with coils on the P.C. board (Refer to page 5-3 for the location).	L32→L33→L34 (In sequence, repeatedly)	Max. voltage



• ADJUSTMENT AND CHAECK POINTS



## SECTION 6

## PARTS LIST

## [MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
IC1	1110003201	S.IC TA31136FNG(EL)	T	20.4/20.6
IC2	1110003201	S.IC TA31136FNG(EL)	T	24/68.2
IC3	1180001251	S.IC TA7808F(TE16L,Q)	T	74.5/98.7
IC4	1180002560	S.REG XC6202P352PR	T	22.4/83.1
IC5	1170000352	S.IC PC357N6J000F	T	104.8/77.2
IC6	1130007431	S.IC TC7S14FU(TE85R,F)	T	99/77
IC7	1120003060	S.IC ADM4853ARZ-REEL7	T	108.5/69.1
IC8	1130009301	S.IC TC7SET08FU(T5L,JF)	T	99.9/85.8
IC9	1120003070	S.IC MAX3232EIPWR	T	106.3/84.9
IC11	1130014210	S.IC AT25FS010N-SH27-T	T	5.5/51.9
IC12	1190002850	S.IC CMX7032L9/TR (FI-2.0)	T	25.5/45.5
IC13	1130014980	S.IC BU4331G-TR	T	13/65.9
IC14	1130013770	S.IC TC7S00FU(TE85L,F)	T	12/58.5
IC15	1130007021	S.IC TC7S66FU(TE85L,F)	T	20.5/57.8
IC16	1120002830	S.IC NJM2125F-TE1-#FZZB	T	64.3/38.3
Q1	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	100.2/45.1
Q2	1590001160	S.TRA XP1401-(TX).AB	T	98.2/39.7
Q4	1510000671	S.TRA 2SA1588-GR(TE85R, F)	T	94.2/45.1
Q5	1510000671	S.TRA 2SA1588-GR(TE85R, F)	T	92.5/39.1
Q6	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	53.9/44.6
Q7	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	59/45.1
Q11	1580000701	S.FET 3SK292(TE85R,F)	T	84.9/14.6
Q12	1580000731	S.FET 3SK293(TE85L,F)	T	55.3/10.4
Q13	1530003890	S.TRA KTC3880S-Y-RTK/P	T	24.3/8.9
Q21	1580000701	S.FET 3SK292(TE85R,F)	T	89.8/60.9
Q22	1580000731	S.FET 3SK293(TE85L,F)	T	60.1/56.8
Q23	1530003890	S.TRA KTC3880S-Y-RTK/P	T	29.5/59.2
Q26	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	83.8/88.4
Q27	1590000430	S.TRA DTC144EUA T106	T	12.2/55.8
Q28	1590000660	S.TRA DTC144TU T106	T	11.6/41.7
Q31	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	41.7/32
Q32	1560000990	S.FET PMBFJ310	T	49.8/23.9
Q33	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	44.6/21.8
Q34	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	36.3/28
Q35	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	38.5/23.9
Q41	1530002691	S.TRA 2SC4116-GR(TE85R,F)	T	39/66.2
Q42	1560000990	S.FET PMBFJ310	T	47.1/74.3
Q43	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	49.2/69.1
Q44	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	43/60.8
Q45	1530002601	S.TRA 2SC4215-O(TE85R,F)	T	47.1/63
D1	1790001251	S.DIO MA2S1110GL	T	107.4/44.5
D2	1790000491	S.DIO HSM88ASTR-E	T	109.9/18
D3	1790000491	S.DIO HSM88ASTR-E	T	104.2/53.1
D4	1790001251	S.DIO MA2S1110GL	T	94.7/42.3
D5	1790001261	S.DIO MA2S077G0L	T	100.8/15.1
D11	1790001211	S.DIO 1SS375-TL-E	T	92.9/15
D16	1790000951	S.ZEN MAZ8056GML	T	83.1/92.6
D21	1720000811	S.VAR HVC358BTRF-E	T	49.8/30
D22	1720000811	S.VAR HVC358BTRF-E	T	51.1/30
D26	1790001251	S.DIO MA2S1110GL	T	110.9/76.9
D28	1790001450	S.DIO RB160L-40 TE-25	T	85.7/97
D31	1720000811	S.VAR HVC358BTRF-E	T	41/74.3
D32	1720000811	S.VAR HVC358BTRF-E	T	41/75.6
D33	1790001251	S.DIO MA2S1110GL	T	12.9/46.1
D34	1790001810	S.VAR AVR-M1005C080MTABB	T	116.2/71.3
D35	1790001810	S.VAR AVR-M1005C080MTABB	T	116.2/67.1
F11	2030000350	MON 21R15AB (FL-368)		
F12	2030000481	MON 21R15AB (FL-399A)		
F13	2020002490	CER LTM4450EW <JJE>		
F14	2030000640	MON FL-413 (MCF UM-5-3P) 30.875 MHz		
F15	2030000640	MON FL-413 (MCF UM-5-3P) 30.875 MHz		
F16	2020002490	CER LTM4450EW <JJE>		
X1	6070000290	DIS JTB450C24 <JJE>		
X2	6050012121	S.XTA CR-804A SX-2112 21.250 MHz	T	24.4/15.4
X3	6070000290	DIS JTB450C24 <JJE>		
X4	6050012570	S.XTA CR-845 DSX321G 30.425 MHz	T	28.5/72.3
X5	6050012790	S.XTA CR-869 DSA321SC 19.2 MHz	T	17.3/57.8
L2	6200010600	S.COI C6342A-67NG-A	T	100.6/23.2
L3	6200010600	S.COI C6342A-67NG-A	T	100.8/30.4
L5	6170000400	COI LW-38		
L6	6200011800	S.COI C2520C-47NG-A	T	98.1/17.2
L7	6200010810	S.COI C2520C-2R2G-A	T	95.1/22.5
L8	6200011220	S.COI C2012C-R47J-A	T	111.2/52.7
L9	6200011090	S.COI C2012C-R56J-A	T	108.3/54.4
L10	6200011220	S.COI C2012C-R47J-A	T	109/24.9
L11	6200011090	S.COI C2012C-R56J-A	T	110.7/22.1
L12	6200009610	S.COI MLG1608B 39NJ-T	T	88.3/11.7
L21	6200011800	S.COI C2520C-47NG-A	T	95.7/11
L22	6150003821	COI LS-440-LF		
L23	6150003821	COI LS-440-LF		
L24	6150003821	COI LS-440-LF		
L25	6200011200	S.COI C2012C-R82J-A	T	52.6/12.1
L26	6200010840	S.COI MLG1608B 56NJ-T	T	54/15.1
L27	6200010840	S.COI MLG1608B 56NJ-T	T	50.1/15.1
L32	6150003821	COI LS-440-LF		
L33	6150003821	COI LS-440-LF		

## [MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
L34	6150003821	COI LS-440-LF		
L35	6200007360	S.COI ELJND R47J	T	57.7/58.1
L36	6200010840	S.COI MLG1608B 56NJ-T	T	60.7/61.4
L37	6200010840	S.COI MLG1608B 56NJ-T	T	58.1/61.4
L41	6200003101	S.COI NLV32T-3R9J	T	50.4/33.5
L42	6200013420	S.COI 0.30-1.6-7TR 41.8N <COMO>	T	47.6/29.5
L43	6200003101	S.COI NLV32T-3R9J	T	48.2/20.6
L44	6200009560	S.COI MLG1608B R10J-T	T	43.8/23.7
L45	6200009560	S.COI MLG1608B R10J-T	T	36.3/30.2
L46	6200009560	S.COI MLG1608B R10J-T	T	37.1/21.7
L47	6200010840	S.COI MLG1608B 56NJ-T	T	19.7/34.6
L51	6200003101	S.COI NLV32T-3R9J	T	37.6/74.9
L52	6200012470	S.COI 0.30-1.7-TTL 45.3N <COMO>	T	41.5/72.1
L53	6200003101	S.COI NLV32T-3R9J	T	50.4/72.7
L54	6200009560	S.COI MLG1608B R10J-T	T	47.3/68.3
L55	6200009560	S.COI MLG1608B R10J-T	T	40.8/60.7
L56	6200009560	S.COI MLG1608B R10J-T	T	49.3/61.6
L57	6200010840	S.COI MLG1608B 56NJ-T	T	36/41.7
R7	7030003290	S.RES ERJ3GEYJ 560 V (56)	T	104.8/44.5
R8	7030010520	S.RES ERJ1TYJ 101U (100)	T	95.6/29.9
R9	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	93.2/47
R10	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	96.5/45
R11	7030003540	S.RES ERJ3GEYJ 682 V (6.8K)	T	97.9/45
R12	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	95.2/36.5
R13	7030003290	S.RES ERJ3GEYJ 560 V (56)	T	108.3/46.4
R14	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	93/26.3
R15	7030003600	S.RES ERJ3GEYJ 223 V (22K)	T	91.1/35.2
R16	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	92.5/41.3
R17	7030003600	S.RES ERJ3GEYJ 223 V (22K)	T	92.6/43.2
R18	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	95.4/40.4
R19	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	114.5/49.1
R20	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	113.5/51.6
R21	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	112.1/30.3
R22	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	110.9/26.8
R23	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	111.9/20.3
R24	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	106.4/55.5
R25	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	101.2/52.1
R26	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	101/41.7
R27	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	98.2/41.7
R28	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	98.8/43.1
R29	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	101/40.4
R30	7030003660	S.RES ERJ3GEYJ 683 V (68K)	T	95.4/39.1
R31	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	98.1/37.8
R32	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	95.4/37.8
R33	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	100.9/37.8
R34	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	107.5/19.4
R36	7030003590	S.RES ERJ3GEYJ 183 V (18K)	T	50.2/45.3
R37	7030003760	S.RES ERJ3GEYJ 474 V (470K)	T	51.8/45.3
R38	7030003710	S.RES ERJ3GEYJ 184 V (180K)	T	51.7/41.8
R39	7030003580	S.RES ERJ3GEYJ 153 V (15K)	T	53.8/42.5
R40	7030003390	S.RES ERJ3GEYJ 391 V (390)	T	53.8/41.2
R41	7030003490	S.RES ERJ3GEYJ 272 V (2.7K)	T	55.8/45.3
R42	7030003620	S.RES ERJ3GEYJ 333 V (33K)	T	55.8/42.7
R43	7030003620	S.RES ERJ3GEYJ 333 V (33K)	T	57.1/44.8
R44	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	59.4/41.2
R45	7030003360	S.RES ERJ3GEYJ 221 V (220)	T	66.5/42.7
R50	7030010040	S.RES ERJ2GEJ-JPW	T	93.6/12.6
R51	7030003620	S.RES ERJ3GEYJ 333 V (33K)	T	87.2/14.3
R52	7030003600	S.RES ERJ3GEYJ 223 V (22K)	T	86.8/10.6
R53	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	85.3/17.7
R54	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	86.6/17.7
R56	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	85.1/8
R57	7030004050	S.RES ERJ3GEYJ 1R0 V (1)	T	81.6/16.2
R58	7030003410	S.RES ERJ3GEYJ 561 V (560)	T	81.6/14.9
R59	7030003320	S.RES ERJ3GEYJ 101 V (100)	T	80/17.9
R71	7030003760	S.RES ERJ3GEYJ 474 V (470K)	T	57.5/11.4
R72	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	56.3/7.8
R73	7030003700	S.RES ERJ3GEYJ 154 V (150K)	T	56.7/13.7
R74	7030003630	S.RES ERJ3GEYJ 393 V (39K)	T	55.3/12.4
R75	7030003500	S.RES ERJ3GEYJ 332 V (3.3K)	T	50.1/11.4
R76	7030003200	S.RES ERJ3GEYJ 100 V (10)	T	50.1/10.1
R77	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	50.1/7.8
R78	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	28.9/8
R79	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	22.6/11.1
R80	7030003380	S.RES ERJ3GEYJ 331 V (330)	T	21.3/11.1
R81	7030003500	S.RES ERJ3GEYJ 332 V (3.3K)	T	24.7/12.3
R91	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	64.4/41.6
R92	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	60.7/40.9
R93	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	62/40.9
R94	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	62.1/35.9
R95	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	64.7/35.9
R96	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	70.2/36.9
R97	7030003360	S.RES ERJ3GEYJ 221 V (220)	T	67.5/36.9
R98	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	68.9/43.1
R99	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	71.4/35.6
R101	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	16.1/27.1
R102	7030003460	S.RES ERJ3GEYJ 152 V (1.5K)	T	16.1/24.5
R103	7030003400	S.RES ERJ3GEYJ 471 V (470)	T	18.1/26.3
R121	7030003620	S.RES ERJ3GEYJ 333 V (33K)	T	92.2/60.6
R122	7030003600	S.RES ERJ3GEYJ 223 V (22K)	T	91.6/57
R123	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	90.2/64
R124	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	91.5/64
R126	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	90/54.2
R127	7030004050	S.RES ERJ3GEYJ 1R0 V (1)	T	86.5/62.6
R128	7030003410	S.RES ERJ3GEYJ 561 V (560)	T	85.5/61.3
R129	7030003320	S.RES ERJ3GEYJ 101 V (100)	T	86.9/64.8

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

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
R141	7030003760	S.RES ERJ3GEYJ 474 V (470K)	T	62.5/58
R142	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	61.2/54.2
R143	7030003700	S.RES ERJ3GEYJ 154 V (150K)	T	61.7/60.1
R144	7030003630	S.RES ERJ3GEYJ 393 V (39K)	T	60.1/58.8
R145	7030003500	S.RES ERJ3GEYJ 332 V (3.3K)	T	55.5/57.4
R146	7030003200	S.RES ERJ3GEYJ 100 V (10)	T	55.5/56
R147	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	55.6/53.6
R148	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	35/55.6
R149	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	29.9/62.3
R150	7030003380	S.RES ERJ3GEYJ 331 V (330)	T	28.6/62.3
R151	7030003500	S.RES ERJ3GEYJ 332 V (3.3K)	T	28/64.3
R171	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	22.3/78.5
R172	7030003460	S.RES ERJ3GEYJ 152 V (1.5K)	T	18.4/64.8
R173	7030003400	S.RES ERJ3GEYJ 471 V (470)	T	20.5/65.4
R174	7030003560	S.RES ERJ3GEYJ 103 V (10K)	T	25.6/75.1
R181	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	83.6/90.3
R182	7030003500	S.RES ERJ3GEYJ 332 V (3.3K)	T	85.9/90.3
R186	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	33/83
R188	7030003860	S.RES ERJ3GE JPW V	T	10.6/61.9
R189	7030003760	S.RES ERJ3GEYJ 474 V (470K)	T	10.1/67.1
R191	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	40.4/39.5
R192	7030003460	S.RES ERJ3GEYJ 152 V (1.5K)	T	42.1/41.4
R196	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	42.3/34.6
R197	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	41.1/34.6
R198	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	40.9/30.1
R199	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	46.8/26.1
R201	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	45.6/35.9
R202	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	51/20.7
R203	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	44.5/25
R204	7030005070	S.RES ERJ2GEJ 683 X (68K)	T	43.6/20
R205	7030003400	S.RES ERJ3GEYJ 471 V (470)	T	38.3/30
R206	7030005070	S.RES ERJ2GEJ 683 X (68K)	T	39.2/27.8
R207	7030003360	S.RES ERJ3GEYJ 221 V (220)	T	40.4/21.2
R208	7030003610	S.RES ERJ3GEYJ 273 V (27K)	T	40.4/24
R209	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	41.7/22.9
R211	7030005570	S.RES ERJ2GEJ 820 X (82)	T	36.9/32.4
R212	7030003320	S.RES ERJ3GEYJ 101 V (100)	T	35.5/33.1
R213	7030005570	S.RES ERJ2GEJ 820 X (82)	T	36.9/33.4
R221	7030003400	S.RES ERJ3GEYJ 471 V (470)	T	113.2/75.9
R222	7030003200	S.RES ERJ3GEYJ 100 V (10)	T	113.2/77.3
R223	7030003540	S.RES ERJ3GEYJ 682 V (6.8K)	T	98.9/79.1
R224	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	100.4/74.7
R225	7030003490	S.RES ERJ3GEYJ 272 V (2.7K)	T	3.9/63.6
R226	7030003530	S.RES ERJ3GEYJ 562 V (5.6K)	T	3.2/61.7
R231	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	112.5/69.1
R232	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	114.5/69.9
R233	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	114.5/68.5
R234	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	104.1/71.1
R235	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	100.1/82.7
R236	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	115.4/86.2
R241	7030010300	S.RES ERJ3GEYF 203 V (20K)	T	15/58.6
R242	7030003580	S.RES ERJ3GEYJ 153 V (15K)	T	15/56
R243	7030004010	S.RES ERJ3GEYJ 2R2 V (2.2)	T	15.1/53.3
R244	7030003640	S.RES ERJ3GEYJ 473 V (47K)	T	13.6/49
R245	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	23.3/58.3
R251	7030003440	S.RES ERJ3GEYJ 102 V (1K)	T	14.4/41.7
R252	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	5.3/55.3
R254	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	18.7/37.1
R255	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	11.7/47.3
R261	7030003720	S.RES ERJ3GEYJ 224 V (220K)	T	35.9/49.3
R262	7030003860	S.RES ERJ3GE JPW V	T	35.9/48
R263	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	38.6/49.3
R264	7030003860	S.RES ERJ3GE JPW V	T	35.9/45.4
R265	7030003720	S.RES ERJ3GEYJ 224 V (220K)	T	35.9/46.7
R266	7030003680	S.RES ERJ3GEYJ 104 V (100K)	T	38.6/45.5
R267	7030003410	S.RES ERJ3GEYJ 561 V (560)	T	6.7/13.5
R268	7030003860	S.RES ERJ3GE JPW V	T	6.7/9.7
R271	7030007300	S.RES ERJ2GEJ 332 X (3.3K)	T	22.8/35.6
R272	7030007300	S.RES ERJ2GEJ 332 X (3.3K)	T	28.3/36.9
R273	7030004040	S.RES ERJ3GEYJ 4R7 V (4.7)	T	29.3/33.8
R276	7030005580	S.RES ERJ2GEJ 560 X (56)	T	21.2/35.4
R281	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	27.7/66.2
R282	7030003460	S.RES ERJ3GEYJ 152 V (1.5K)	T	29/66.2
R286	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	36.4/66.8
R287	7030003480	S.RES ERJ3GEYJ 222 V (2.2K)	T	36.4/65.5
R288	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	40.9/65.4
R289	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	44.9/71.3
R291	7030003520	S.RES ERJ3GEYJ 472 V (4.7K)	T	35.1/70.1
R292	7030003450	S.RES ERJ3GEYJ 122 V (1.2K)	T	50.2/75.5
R293	7030003420	S.RES ERJ3GEYJ 681 V (680)	T	46/69
R294	7030005070	S.RES ERJ2GEJ 683 X (68K)	T	50.9/68.1
R295	7030003400	S.RES ERJ3GEYJ 471 V (470)	T	41/62.8
R296	7030005070	S.RES ERJ2GEJ 683 X (68K)	T	43.2/63.7
R297	7030003280	S.RES ERJ3GEYJ 470 V (47)	T	48.1/66.2
R298	7030003360	S.RES ERJ3GEYJ 221 V (220)	T	49.8/64.9
R299	7030003610	S.RES ERJ3GEYJ 273 V (27K)	T	47/64.9
R306	7030005570	S.RES ERJ2GEJ 820 X (82)	T	38.6/61.4
R307	7030003320	S.RES ERJ3GEYJ 101 V (100)	T	37.8/60
R308	7030005570	S.RES ERJ2GEJ 820 X (82)	T	37.6/61.4
R309	7030005580	S.RES ERJ2GEJ 560 X (56)	T	34.9/40.3
C9	4030017200	S.CER GRM31BR32J102KY01L (GHM1030 R)	T	100.8/18.3
C10	4030011140	S.CER GRM31M2C2H120JV01L (GRM42-6 CH)	T	104.5/19.7
C11	4030017390	S.CER ECJ0EC1H180J	T	99.1/14.3
C13	4030011170	S.CER GRM31M2C2H180JV01L (GRM42-6 CH)	T	103/16
C14	4030017460	S.CER ECJ0EB1E102K	T	92.8/24.4
C15	4030017760	S.CER ECJ0EB1H222K	T	93.6/16.8
C16	4030011290	S.CER GRM31M2C2H240JV01L (GRM42-6 CH)	T	105.6/25.6

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C17	4030011140	S.CER GRM31M2C2H120JV01L (GRM42-6 CH)	T	100.5/35.2
C18	4030017460	S.CER ECJ0EB1E102K	T	106.8/45.6
C19	4030017460	S.CER ECJ0EB1E102K	T	104.2/45.9
C20	4030016930	S.CER ECJ0EB1A104K	T	99.3/47.1
C21	4030017200	S.CER GRM31BR32J102KY01L (GHM1030 R)	T	114.4/29.4
C22	4030017350	S.CER ECJ0EC1H020B	T	111.9/54.6
C23	4030017370	S.CER ECJ0EC1H3R5B	T	110.4/54.6
C24	4030017340	S.CER ECJ0EC1H010B	T	108.7/52.2
C25	4030017560	S.CER ECJ0EC1H2R5B	T	106.9/52.2
C26	4030017350	S.CER ECJ0EC1H020B	T	110.9/24.8
C27	4030017370	S.CER ECJ0EC1H3R5B	T	110.9/23.8
C28	4030017340	S.CER ECJ0EC1H010B	T	108.6/22.4
C29	4030017560	S.CER ECJ0EC1H2R5B	T	108.6/20.8
C30	4030017460	S.CER ECJ0EB1E102K	T	106.4/53.4
C31	4030017460	S.CER ECJ0EB1E102K	T	109.8/20.4
C32	4030017460	S.CER ECJ0EB1E102K	T	102/53.5
C33	4030017460	S.CER ECJ0EB1E102K	T	101.6/39.1
C34	4030017460	S.CER ECJ0EB1E102K	T	101/43.2
C35	4030017460	S.CER ECJ0EB1E102K	T	96.2/46.7
C36	4030017460	S.CER ECJ0EB1E102K	T	107.6/17.3
C37	4030008920	S.CER C1608 JB 1H 473K-T	T	100.4/54
C41	4030016930	S.CER ECJ0EB1A104K	T	50.2/42.1
C42	4030016970	S.CER ECJ0EB1C223K	T	50.3/43.5
C43	4030016970	S.CER ECJ0EB1C223K	T	51.9/43.5
C44	4030017760	S.CER ECJ0EB1H222K	T	57/42.5
C45	4030018820	S.CER ECJ0EB1H561K	T	58.2/41.7
C46	4030016930	S.CER ECJ0EB1A104K	T	59.5/43.1
C47	4510008540	S.ELE EEE1CA100SR	T	63.3/44.8
C49	4030017590	S.CER ECJ0EC1H070C	T	96.8/13.6
C50	4030017630	S.CER ECJ0EC1H120J	T	95.2/13.6
C51	4030017670	S.CER ECJ0EC1H390J	T	95.2/14.5
C54	4030017370	S.CER ECJ0EC1H3R5B	T	86.9/12.4
C56	4030016930	S.CER ECJ0EB1A104K	T	81.8/17.9
C57	4030017760	S.CER ECJ0EB1H222K	T	83.7/10.1
C58	4030017760	S.CER ECJ0EB1H222K	T	87.4/16
C59	4030017760	S.CER ECJ0EB1H222K	T	84.2/11.1
C61	4030017590	S.CER ECJ0EC1H070C	T	76.9/14.8
C64	4030017550	S.CER ECJ0EC1H1R5B	T	75.3/15.8
C65	4030017590	S.CER ECJ0EC1H070C	T	68.6/14.8
C67	4030017530	S.CER ECJ0EC1HOR5B	T	68/15.8
C68	4030017530	S.CER ECJ0EC1HOR5B	T	64.7/15.8
C70	4030017590	S.CER ECJ0EC1H070C	T	64.1/14.8
C72	4030017380	S.CER ECJ0EC1H050B	T	57.6/9.2
C73	4030017760	S.CER ECJ0EB1H222K	T	59.2/14.7
C74	4030017530	S.CER ECJ0EC1HOR5B	T	66.3/15.8
C75	4030017640	S.CER ECJ0EC1H150J	T	52.1/15.6
C77	4030016970	S.CER ECJ0EB1C103K	T	48.2/11.3
C78	4030017500	S.CER ECJ0EC1H560J	T	50.9/12.9
C79	4030017590	S.CER ECJ0EC1H070C	T	49.9/12.9
C80	4030016930	S.CER ECJ0EB1A104K	T	53/7.9
C81	4030017460	S.CER ECJ0EB1E102K	T	53/8.9
C82	4030017400	S.CER ECJ0EC1H220J	T	53/9.9
C83	4030017460	S.CER ECJ0EB1E102K	T	50.6/8.9
C85	4030017580	S.CER ECJ0EC1H060C	T	40/10.2
C88	4030017460	S.CER ECJ0EB1E102K	T	26.8/8
C90	4030016970	S.CER ECJ0EB1C103K	T	24.2/11.2
C91	4030017640	S.CER ECJ0EC1H150J	T	26.4/11.3
C92	4030016970	S.CER ECJ0EB1C103K	T	21.8/8.9
C93	4030017460	S.CER ECJ0EB1E102K	T	46.8/15
C95	4030017490	S.CER C1608 JB 1A 105K-T	T	61.6/37.8
C96	4030017490	S.CER C1608 JB 1A 105K-T	T	68.8/35.6
C97	4030016970	S.CER ECJ0EB1C103K	T	65/40.5
C98	4510008540	S.ELE EEE1CA100SR	T	69.3/40
C101	4550006250	S.TAN TEESVA 1A 106M8R	T	28.9/20.4
C102	4030016970	S.CER ECJ0EB1C103K	T	19.3/25.9
C103	4030017430	S.CER ECJ0EC1H101J	T	15.9/21.9
C104	4030016930	S.CER ECJ0EB1A104K	T	15.8/19.3
C105	4030016930	S.CER ECJ0EB1A104K	T	14.9/19.3
C106	4030017460	S.CER ECJ0EB1E102K	T	18/23.9
C107	4030017460	S.CER ECJ0EB1E102K	T	19.2/27.5
C108	4030017640	S.CER ECJ0EC1H150J	T	25/18.7
C109	4030017640	S.CER ECJ0EC1H150J	T	26/18.7
C110	4030017460	S.CER ECJ0EB1E102K	T	27.3/21.3
C111	4030016930	S.CER ECJ0EB1A104K	T	25.3/20
C112	4030016930	S.CER ECJ0EB1A104K	T	25/22.5
C124	4030017370	S.CER ECJ0EC1H3R5B	T	92.1/58.8
C126	4030016930	S.CER ECJ0EB1A104K	T	87.1/64.3
C127	4030017760	S.CER ECJ0EB1H222K	T	88.6/56.4
C128	4030017760	S.CER ECJ0EB1H222K	T	92.3/62.3
C129	4030017760	S.CER ECJ0EB1H222K	T	89/57.4
C131	4030017590	S.CER ECJ0EC1H070C	T	81.8/61.1
C134	4030017550	S.CER ECJ0EC1H1R5B	T	79.6/62.1
C135	4030017590	S.CER ECJ0EC1H070C	T	73.6/61.1
C137	4030017530	S.CER ECJ0EC1HOR5B	T	73/62.1
C138	4030017530	S.CER ECJ0EC1HOR5B	T	69.7/62.1
C140	4030017590	S.CER ECJ0EC1H070C	T	69.1/61.1
C142	4030017380	S.CER ECJ0EC1H050B	T	62.5/55.7
C143	4030017760	S.CER ECJ0EB1H222K	T	64.3/61.3
C14				

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C171	4550006250	S.TAN TEESVA 1A 106M8R	T	24.2/76.8
C172	4030016790	S.CER ECJ0EB1C103K	T	18.3/67.3
C173	4030017430	S.CER ECJ0EC1H101J	T	23.2/63.2
C174	4030016930	S.CER ECJ0EB1A104K	T	25.1/63.6
C175	4030016930	S.CER ECJ0EB1A104K	T	25.1/62.7
C176	4030017460	S.CER ECJ0EB1E102K	T	19.4/66.2
C177	4030017460	S.CER ECJ0EB1E102K	T	25.1/60
C178	4030017400	S.CER ECJ0EC1H220J	T	26/72.8
C179	4030018070	S.CER ECJ0EC1H300J	T	26/73.8
C180	4030017460	S.CER ECJ0EB1E102K	T	23.4/75.2
C181	4030016930	S.CER ECJ0EB1A104K	T	24.8/73.2
C182	4030016930	S.CER ECJ0EB1A104K	T	22/72.8
C191	4510009700	S.ELE EEEFK1C101P	T	85/105
C192	4030016790	S.CER ECJ0EB1C103K	T	80.2/98.3
C193	4030011600	S.CER C1608 JB 1E 104K-T	T	81.4/97.7
C194	4030016930	S.CER ECJ0EB1A104K	T	78.7/102.7
C195	4030016790	S.CER ECJ0EB1C103K	T	80.9/102.7
C196	4510009700	S.ELE EEEFK1C101P	T	76.5/91.5
C201	4030017490	S.CER C1608 JB 1A 105K-T	T	84.7/92.3
C202	4030017460	S.CER ECJ0EB1E102K	T	85.8/92.4
C203	4510008540	S.ELE EEE1CA100SR	T	88.5/87.4
C204	4030017730	S.CER ECJ0EB1E471K	T	83.9/86.4
C210	4510008540	S.ELE EEE1CA100SR	T	29.7/81.6
C211	4030017460	S.CER ECJ0EB1E102K	T	25.4/81.4
C212	4030017490	S.CER C1608 JB 1A 105K-T	T	26.6/81
C213	4030016930	S.CER ECJ0EB1A104K	T	18/81.4
C214	4030017760	S.CER ECJ0EB1H222K	T	17.1/81.4
C215	4510009700	S.ELE EEEFK1C101P	T	12.3/81.6
C221	4030016930	S.CER ECJ0EB1A104K	T	43.3/42.3
C222	4550005980	S.TAN TEESVA 1A 475M8R	T	47.1/40.6
C223	4030017920	S.CER ECJ0EB1A683K	T	22.8/37.2
C226	4550006250	S.TAN TEESVA 1A 106M8R	T	39.3/33.8
C227	4030017490	S.CER C1608 JB 1A 105K-T	T	40.9/28.8
C228	4030016930	S.CER ECJ0EB1A104K	T	47.4/24.3
C229	4030017460	S.CER ECJ0EB1E102K	T	47.5/23.3
C231	4030017460	S.CER ECJ0EB1E102K	T	49.6/36
C232	4550000530	S.TAN TEESVA 1V 104M8R	T	47.8/34
C233	4030017340	S.CER ECJ0EC1H010B	T	50.7/28.1
C234	4030017390	S.CER ECJ0EC1H180J	T	50.7/27.1
C235	4030017390	S.CER ECJ0EC1H180J	T	50.7/26.1
C236	4030017630	S.CER ECJ0EC1H120J	T	49/27.1
C237	4030017630	S.CER ECJ0EC1H120J	T	49/26.1
C238	4030017340	S.CER ECJ0EC1H010B	T	45.2/20
C239	4030017730	S.CER ECJ0EB1E471K	T	45.9/23.6
C240	4030017730	S.CER ECJ0EB1E471K	T	38.3/27.8
C241	4030017380	S.CER ECJ0EC1H050B	T	40.3/26.7
C242	4030017400	S.CER ECJ0EC1H220J	T	35.7/31.4
C244	4030017460	S.CER ECJ0EB1E102K	T	35/13.7
C245	4030017730	S.CER ECJ0EB1E471K	T	36.7/23.2
C246	4030017630	S.CER ECJ0EC1H120J	T	42.3/21.2
C247	4030017640	S.CER ECJ0EC1H150J	T	39.2/21.7
C253	4030017780	S.CER ECJ0EB1E472K	T	109.7/77.1
C254	4030016790	S.CER ECJ0EB1C103K	T	97.2/77.8
C255	4030017460	S.CER ECJ0EB1E102K	T	12/53.2
C263	4030016790	S.CER ECJ0EB1C103K	T	108.5/73.4
C266	4030016930	S.CER ECJ0EB1A104K	T	5.6/56.4
C271	4030008920	S.CER C1608 JB 1H 473K-T	T	108.8/81.3
C272	4030019550	S.CER C1608 JB 1E 334K-T	T	112.2/82.9
C273	4030019550	S.CER C1608 JB 1E 334K-T	T	112.2/84.3
C274	4030019550	S.CER C1608 JB 1E 334K-T	T	112.2/86.1
C275	4030016930	S.CER ECJ0EB1A104K	T	101.3/83.1
C276	4030018910	S.CER C1608 JB 0J 475K-T	T	98.2/82.8
C281	4030016790	S.CER ECJ0EB1C103K	T	13.6/54
C282	4030017460	S.CER ECJ0EB1E102K	T	18.4/53.8
C283	4550006250	S.TAN TEESVA 1A 106M8R	T	16.8/52.6
C284	4030016930	S.CER ECJ0EB1A104K	T	19.7/53.7
C285	4030016930	S.CER ECJ0EB1A104K	T	22.9/53.8
C286	4550006250	S.TAN TEESVA 1A 106M8R	T	21.7/55.4
C287	4030017460	S.CER ECJ0EB1E102K	T	22.8/57
C291	4030016930	S.CER ECJ0EB1A104K	T	25.6/53.8
C292	4550006250	S.TAN TEESVA 1A 106M8R	T	26.9/55.4
C293	4030016930	S.CER ECJ0EB1A104K	T	27.3/53.8
C294	4030016930	S.CER ECJ0EB1A104K	T	29.1/53.8
C301	4030017400	S.CER ECJ0EC1H220J	T	33.9/47.4
C303	4030017400	S.CER ECJ0EC1H220J	T	33.9/45.7
C305	4030016930	S.CER ECJ0EB1A104K	T	34/42.8
C306	4550006250	S.TAN TEESVA 1A 106M8R	T	37/43.6
C307	4030017490	S.CER C1608 JB 1A 105K-T	T	41.1/48.4
C308	4030017490	S.CER C1608 JB 1A 105K-T	T	41.2/45.5
C311	4030017460	S.CER ECJ0EB1E102K	T	21.2/37.2
C312	4030017460	S.CER ECJ0EB1E102K	T	25.3/36.7
C313	4030016930	S.CER ECJ0EB1A104K	T	29.8/36.4
C314	4550006250	S.TAN TEESVA 1A 106M8R	T	26/32.3
C315	4030016930	S.CER ECJ0EB1A104K	T	24.4/36.3
C316	4550006250	S.TAN TEESVA 1A 106M8R	T	25.4/34.4
C321	4030017460	S.CER ECJ0EB1E102K	T	20.7/36.3
C322	4030017650	S.CER ECJ0EC1H270J	T	21.2/34.4
C323	4030017650	S.CER ECJ0EC1H270J	T	21.2/33.4
C331	4030017460	S.CER ECJ0EB1E102K	T	82.7/98.8
C332	4030017430	S.CER ECJ0EC1H101J	T	83.9/99.2
C333	4030017420	S.CER ECJ0EC1H470J	T	83.9/100.1
C336	4030011600	S.CER C1608 JB 1E 104K-T	T	102.2/95.1
C337	4030017420	S.CER ECJ0EC1H470J	T	101.7/97.4
C338	4030017460	S.CER ECJ0EB1E102K	T	101.7/96.4
C339	4030017420	S.CER ECJ0EC1H470J	T	95.2/100.2
C340	4030017460	S.CER ECJ0EB1E102K	T	96.2/100.2
C341	4030011600	S.CER C1608 JB 1E 104K-T	T	97.6/100.2
C342	4030017730	S.CER ECJ0EB1E471K	T	101.7/98.4
C351	4030017920	S.CER ECJ0EB1A683K	T	27.1/36.2
C352	4030016930	S.CER ECJ0EB1A104K	T	30.2/64.4
C353	4550005980	S.TAN TEESVA 1A 475M8R	T	30.7/67.8
C356	4550006250	S.TAN TEESVA 1A 106M8R	T	37.2/63.8
C357	4030017490	S.CER C1608 JB 1A 105K-T	T	42.2/65.4
C358	4030016930	S.CER ECJ0EB1A104K	T	46.8/71.9

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C359	4030017460	S.CER ECJ0EB1E102K	T	47.7/72
C361	4030017460	S.CER ECJ0EB1E102K	T	35/74.1
C362	4550000530	S.TAN TEESVA 1V 104M8R	T	37/72.3
C363	4030017340	S.CER ECJ0EC1H010B	T	42.9/75.2
C364	4030017390	S.CER ECJ0EC1H180J	T	43.9/75.2
C365	4030017390	S.CER ECJ0EC1H180J	T	44.9/75.2
C366	4030017630	S.CER ECJ0EC1H120J	T	43.9/73.5
C367	4030017630	S.CER ECJ0EC1H120J	T	44.9/73.5
C368	4030017540	S.CER ECJ0EC1HR75B	T	50.9/69.7
C369	4030017460	S.CER ECJ0EB1E102K	T	47.4/70.4
C370	4030017460	S.CER ECJ0EB1E102K	T	43.2/62.8
C371	4030017380	S.CER ECJ0EC1H050B	T	44.3/64.8
C372	4030017400	S.CER ECJ0EC1H220J	T	39.6/60.2
C373	4030017460	S.CER ECJ0EB1E102K	T	47.8/61.2
C374	4030017630	S.CER ECJ0EC1H120J	T	49.8/66.8
C375	4030017640	S.CER ECJ0EC1H150J	T	49.3/63.7
C376	4030017460	S.CER ECJ0EB1E102K	T	54.3/61.2
C381	4030017650	S.CER ECJ0EC1H270J	T	37.7/40.6
C382	4030017650	S.CER ECJ0EC1H270J	T	26.5/37.1
C383	4030017460	S.CER ECJ0EB1E102K	T	34/41
RL1	6330001640	REL ATX209		
J8	6510027250	CON XW4A-06B1-H1		
J9	6910020810	CON IMSA-9201B-2-04Z256-PT1		
J10	6510018971	S.CON B4B-PH-SM4-TB(LF)(SN)	T	67.2/32
J11	6510021441	S.CON B6B-ZR-SM4-TF(LF)(SN)	T	7.6/31.2
DS1	5040002440	LED MPY4361F		
DS2	5040002310	S.LED SML-311YTT86	T	92.6/36.5
S2	2220000680	SWI SS-42D07-VG2		
W1	7120000470	JUM ERDS2T0		
W2	7120000470	JUM ERDS2T0		
W3	7120000490	JUM ERD25T0		
W4	7120000490	JUM ERD25T0		
MP1	8510014940	S.CAS 2601 VCO CASE Y641	T	43/28
MP3	8510014940	S.CAS 2601 VCO CASE Y641	T	43/67.5

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

# SECTION 7

# MECHANICAL PARTS

## [CHASSIS PARTS]

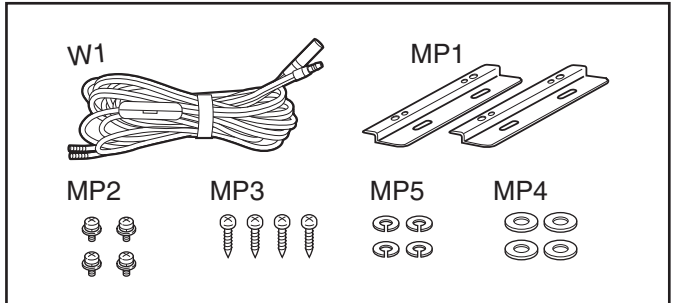
REF NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510004880	MR-DSE-01	1
J2	6510004880	MR-DSE-01	1
P1	5610000530	XW4B-06B1-H1	1
W1	8900018490	OPC-1953	1
MP1	8110009660	2197 COVER (C)	1
MP2	8010021430	3170 CHASSIS	1
MP3	8930074610	SP NET (E)	1
MP4	8930041500	1887 LENS	1
MP5	8930039620	LEG CUSHION (A)	4
MP6	8810010610	SCREW BT B0 3X8 SUS S (BT)	4
MP7	8810007410	SCREW PH M3X6 NI	4
MP8	8810002950	SCREW BiH M3X6 SUS	4

## [MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
RL1	6330001640	ATX209	1
J8	6510027250	XW4A-06B1-H1	1
J9	6910020810	IMSA-9201B-2-04Z256-PT1	1
J10*	6510018971	B4B-PH-SM4-TB (LF) (SN)	1
J11*	6510021441	B6B-ZR-SM4-TF (LF) (SN)	1
DS1	5040002440	MPY4361F	1
S2	2220000680	SS-42D07	1
W1	7120000470	ERDS2T0	1
W2	7120000470	ERDS2T0	1
W3	7120000490	ERD25T0	1
W4	7120000490	ERD25T0	1
MP1*	8510014940	2601 VCO CASE	1
MP2	8510014950	2601 VCO COVER	1
MP3*	8510014940	2601 VCO CASE	1
MP4	8510014950	2601 VCO COVER	1
MP5	8930005320	FILTER SPACER	2
MP6	8930005320	FILTER SPACER	2

## [ACCESSORIES]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
W1	8900018500	OPC-1954	1
MP1	8930077580	3170 ANGLE	2
MP2	8810006330	SETSCREW (C) 3X6 SUS	4
MP3	8810001490	SCREW BT A0 5X20 SUS	4
MP4	8850000180	FLAT WASHER M5 SUS	4
MP5	8850000500	S-WASHER M5 SUS	4

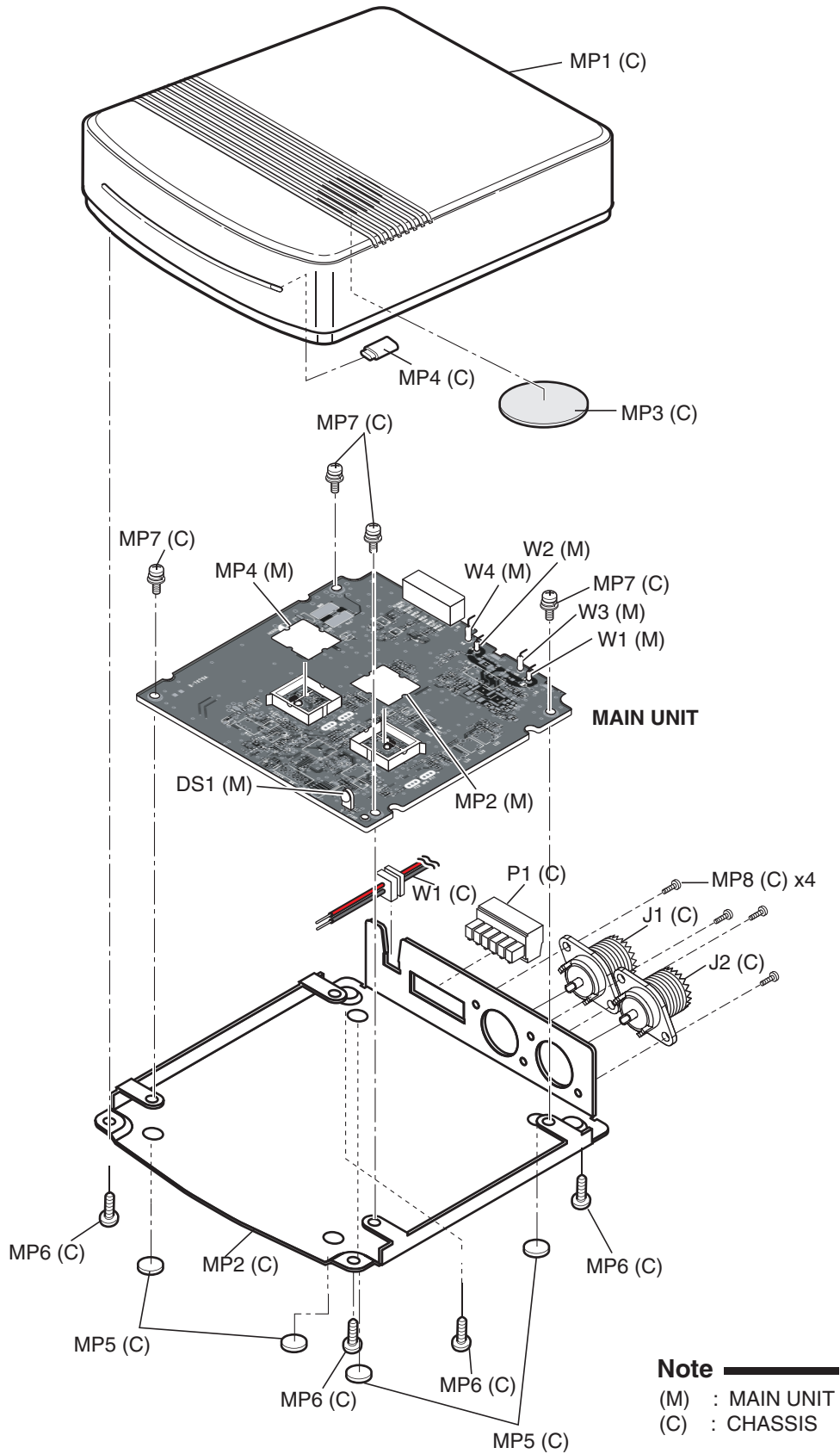


\*: Refer to "BOARD LAYOUTS" for the location.

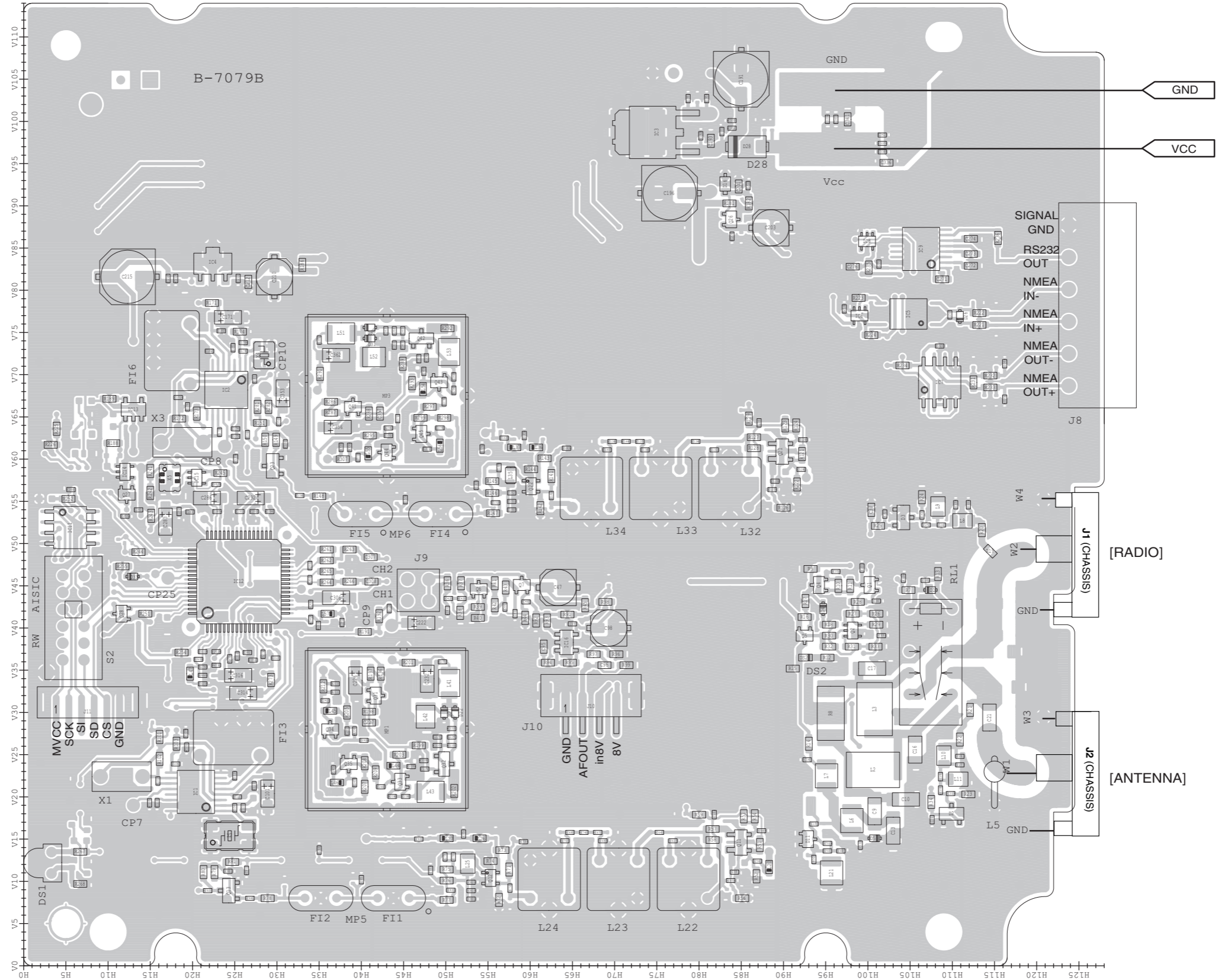
\*\* : Refer to "GENERAL WIRING" for the connection

**Screw abbreviations** A, B0, BT: Self-tapping PH: Pan head ZK: Black NI-ZU: Nickel-Zinc SUS: Stainless

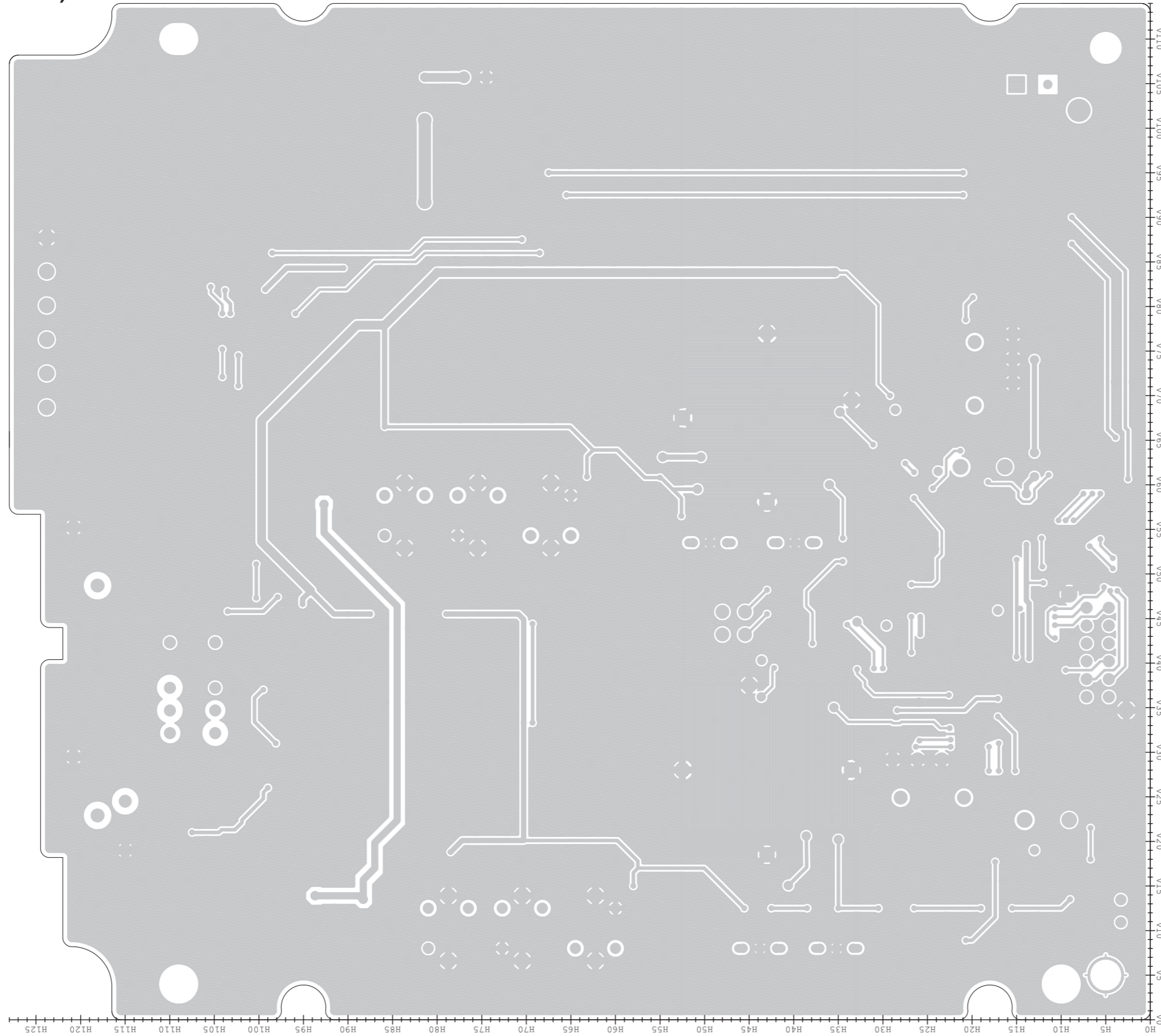




• MAIN UNIT  
(TOP VIEW)

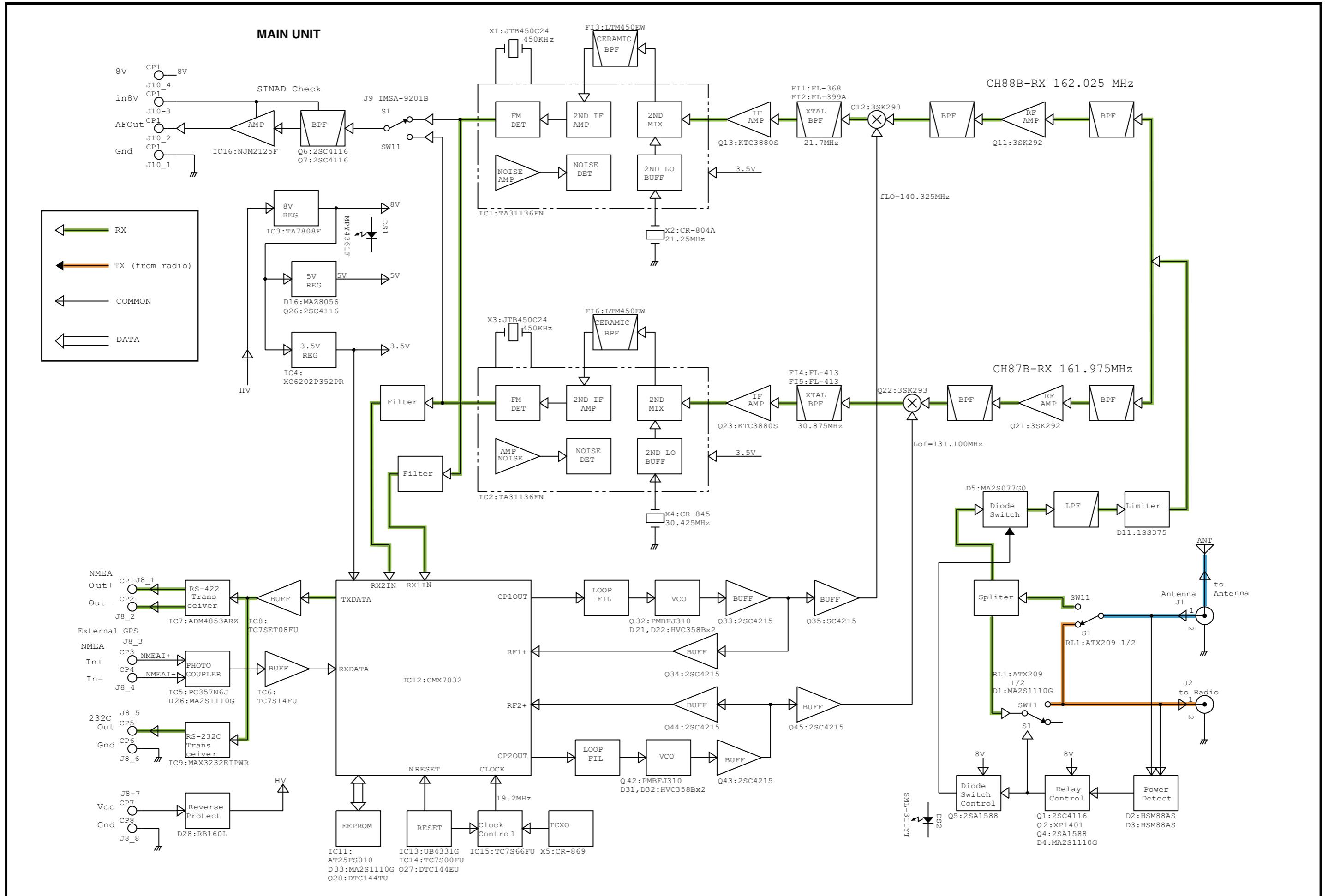


• MAIN UNIT  
(BOTTOM VIEW)

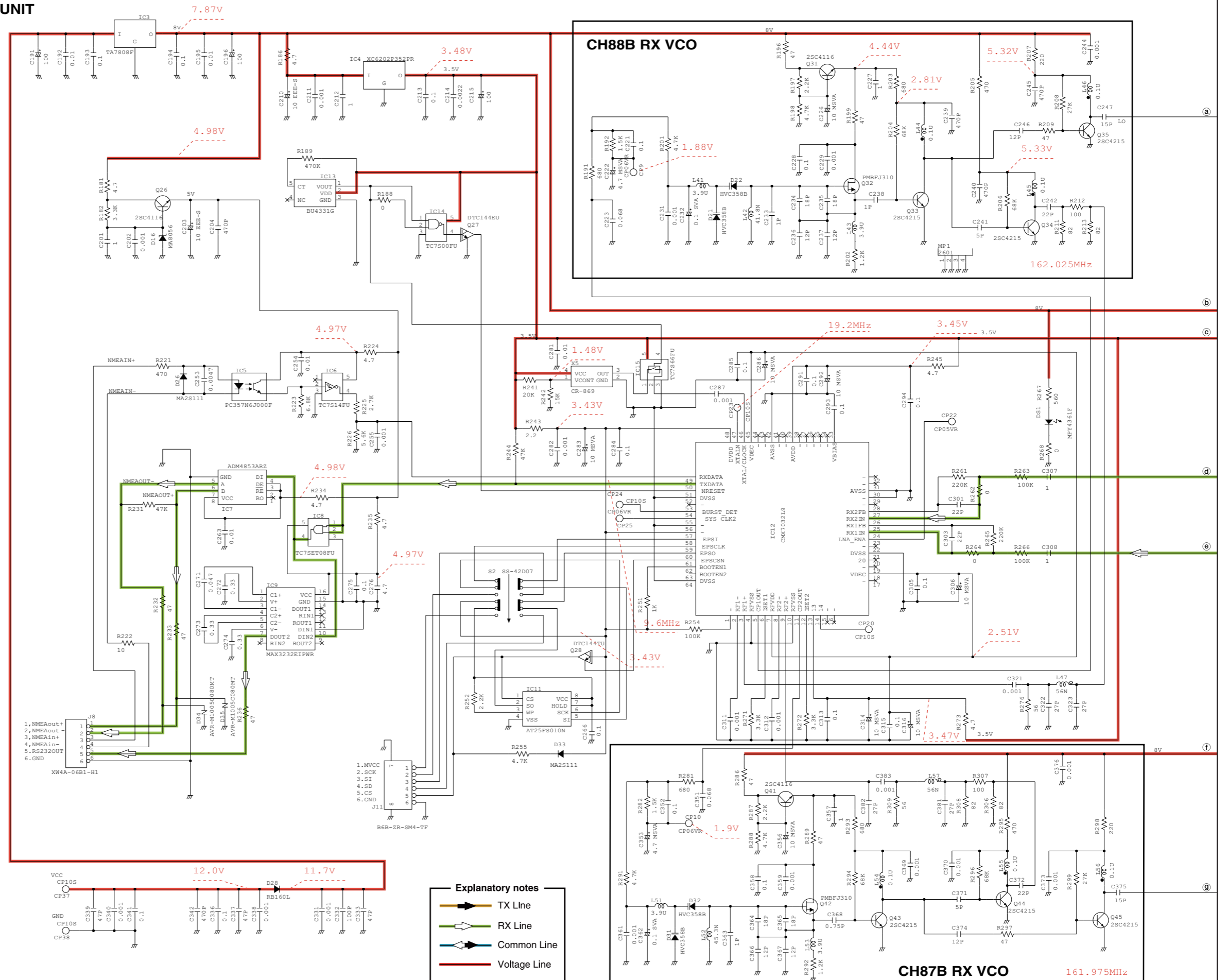


# SECTION 9

# BLOCK DIAGRAM



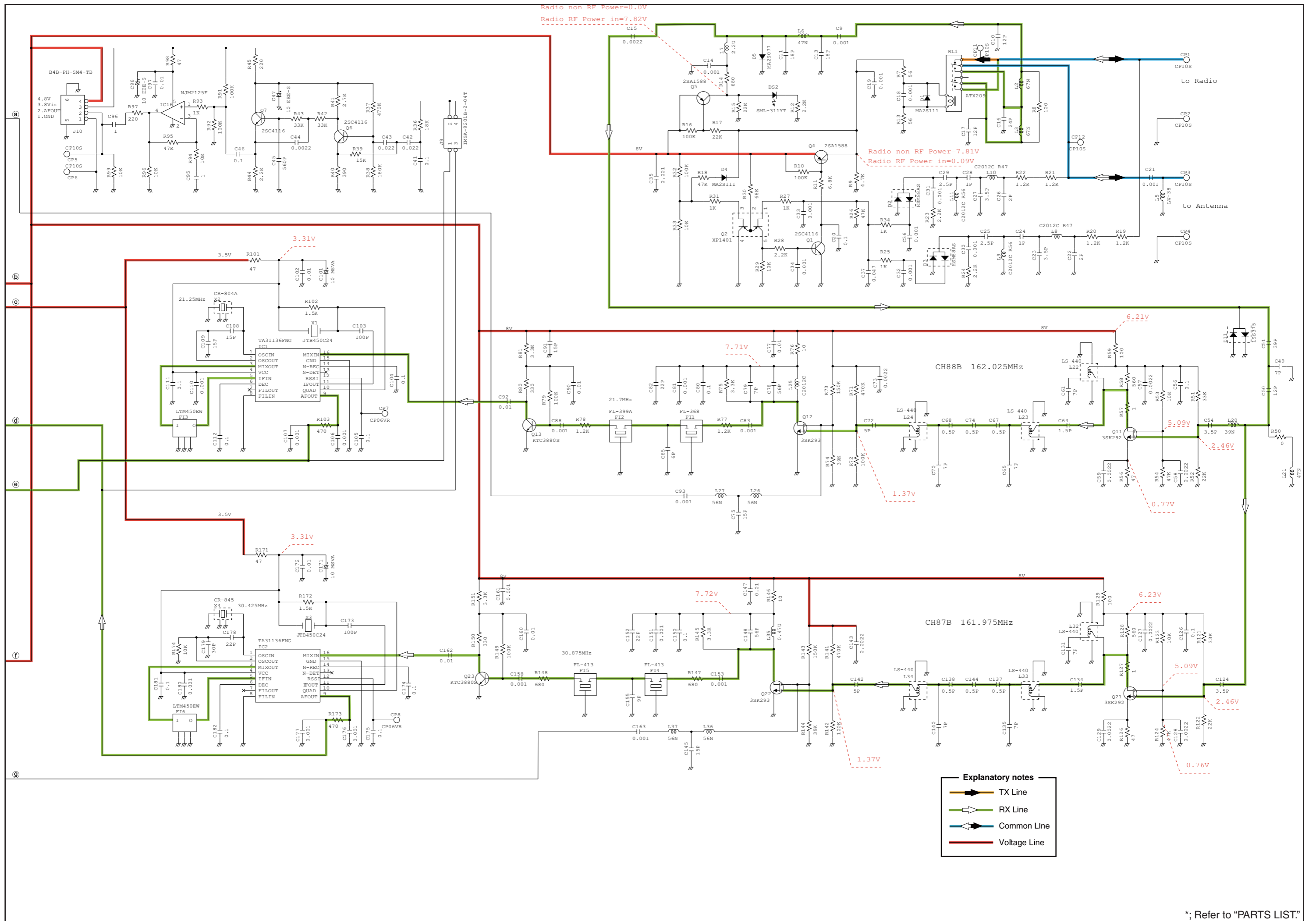
MAIN UNIT



**Explanatory notes**

- ▶ TX Line
- ▶ RX Line
- ▶ Common Line
- ▶ Voltage Line

\*; Refer to "PARTS LIST."



Radio non RF Power=0.0V  
Radio RF Power in=7.82V

Radio non RF Power=7.81V  
Radio RF Power in=0.09V

3.31V

3.31V

7.71V

CH88B 162.025MHz

6.21V

5.09V

0.77V

1.37V

7.72V

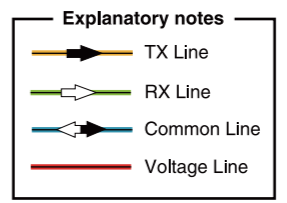
CH87B 161.975MHz

6.23V

5.09V

0.76V

1.37V



\*; Refer to "PARTS LIST."

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