



SERVICE MANUAL

COMMUNICATIONS RECEIVERS
IC-R1500
IC-R2500

S-14233MZ-C1
Jun. 2006

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-R1500 and IC-R2500 COMMUNICATIONS RECEIVERS** at the time of publication.

MODEL	VERSION	SYMBOL
IC-R1500 IC-R2500	Europe	EUR
	U.K.	UK
	U.S.A.	USA
	Canada	CAN
	France	FRA
	South East Asia	SEA
	Export	EXP
		EXP-1
IC-R2500*	U.S.A.	USA-2

*UT-122 is already installed as DIGITAL UNIT.

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

CAUTION

NEVER connect the receiver to an AC outlet or to a DC power supply that uses more than 16 V. Such a connection could cause a fire hazard and/or electric shock.

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.



(IC-R1500)

(IC-R2500)

ORDERING PARTS

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

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

<SAMPLE ORDER>

1110001811 S.IC TA7S04F IC-R2500 Main-A unit 5 pieces
8810008960 Screw FH M2.6 IC-R2500 Chassis 8 pieces

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

REPAIR NOTES

1. Make sure a problem is internal before disassembling the receiver.
2. **DO NOT** open the transceiver 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 turning 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 equipment to the receiver.

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SECTION 1 SPECIFICATIONS

GENERAL

- Frequency coverage

U.S.A.	:	0.010000–809.999999 *1, *2 851.000–866.999999 896.000–1300.000000 1300.000001–1810.999999 1852.000–1867.999999 *1 1897.000–2305.899999 *1 2357.000–2811.999999 *1 2853.000–2868.999999 *1 2898.000–3109.799999 *1, *2 3136.000–3154.799999 *1, *2 3181.000–3299.999999 *1, *2
France	:	0.010000–29.999999 *1, *2 50.200–51.200000 87.500–107.999999 144.000–146.000000 430.000–440.000000 1240.000–1300.000000
Other than above:	:	0.010–3299.999999 *1, *2

*1 : For IC-R2500. Available on Main band only.
Sub band does not cover outside of frequency range; 50 to 1300.000000 MHz.
*2 : Guaranteed: 0.495–3000.000 MHz range only
- Mode

		: FM, AM, WFM, USB*1, LSB*1, CW, DV*1,*2, P25*1,*3
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*1 : For R2500. Available on Main band only.
*2 : For R2500. Available when optional UT-118 is installed.
*3 : For R2500. Available when optional UT-122 is installed, and depending on versions.
- Number of memory channels : 2600
- Tuning steps : 1 Hz, 10 Hz, 20 Hz, 50 Hz, 100 Hz, 500 Hz, 1 kHz, 2.5 kHz, 5 kHz, 6.25 kHz, 8.33 kHz, 9 kHz, 10 kHz, 12.5 kHz, 15 kHz, 20 kHz, 25 kHz, 30 kHz, 50 kHz, 100 kHz, 125 kHz, 150 kHz, 200 kHz, 500 kHz, 1 MHz, 10 MHz, USER TS
- Operating temperature range : 0°C to +60°C; +32°F to +140°F
- Current drain (at 12.0 V DC: approx.)

[1500]	POWER ON	Standby	650 mA		
		Max. audio	Less than 1.2 A		
		*While using controller (R1500): plus 50 mA with above current value.			
[1500/2500]	POWER OFF	PC (USB VBAS-ON)	550 mA typ.		
		PC (VBAS-OFF)	15 mA typ.		
		Controller (R1500)	15 mA		
[2500]	single band operation	Standby	650 mA		
		Max. audio	Less than 1.2 A		
	Dualwatch operation	Standby	850 mA		
		Max. audio	Less than 1.5 A		
		*While using controller (R2500): plus 110 mA with above current value.			
- Frequency stability : ±3 ppm (–10°C to +60°C)
- Power supply requirement : 12 V DC ±15% (Negative ground)
- Current drain (At 12 V DC ; approx.)
- Dimensions (projections not included) : 146(W)×41(H)×206(D) mm; 5¾(W)×1⅝(H)×8⅛(D) in
111(W)×40(H)×26.5(D) mm; 4⅜(W)×1⅞(H)×8⅜(D) in
140(W)×50(H)×27.5(D) mm; 5½(W)×1⅜(H)×1⅜(D) in
- Weight (approx.)

MAIN UNIT			1.2 kg; 2 lb 10 oz (1500)		
			1.35 kg; 2 lb 15 oz (2500)		
CONTROLLER			0.2 kg; 2 lb 7⅞ oz (1500)		
			0.25 kg; 2 lb 8⅜ oz (2500)		
- Antenna connector : BNC (50 Ω)

RECEIVER

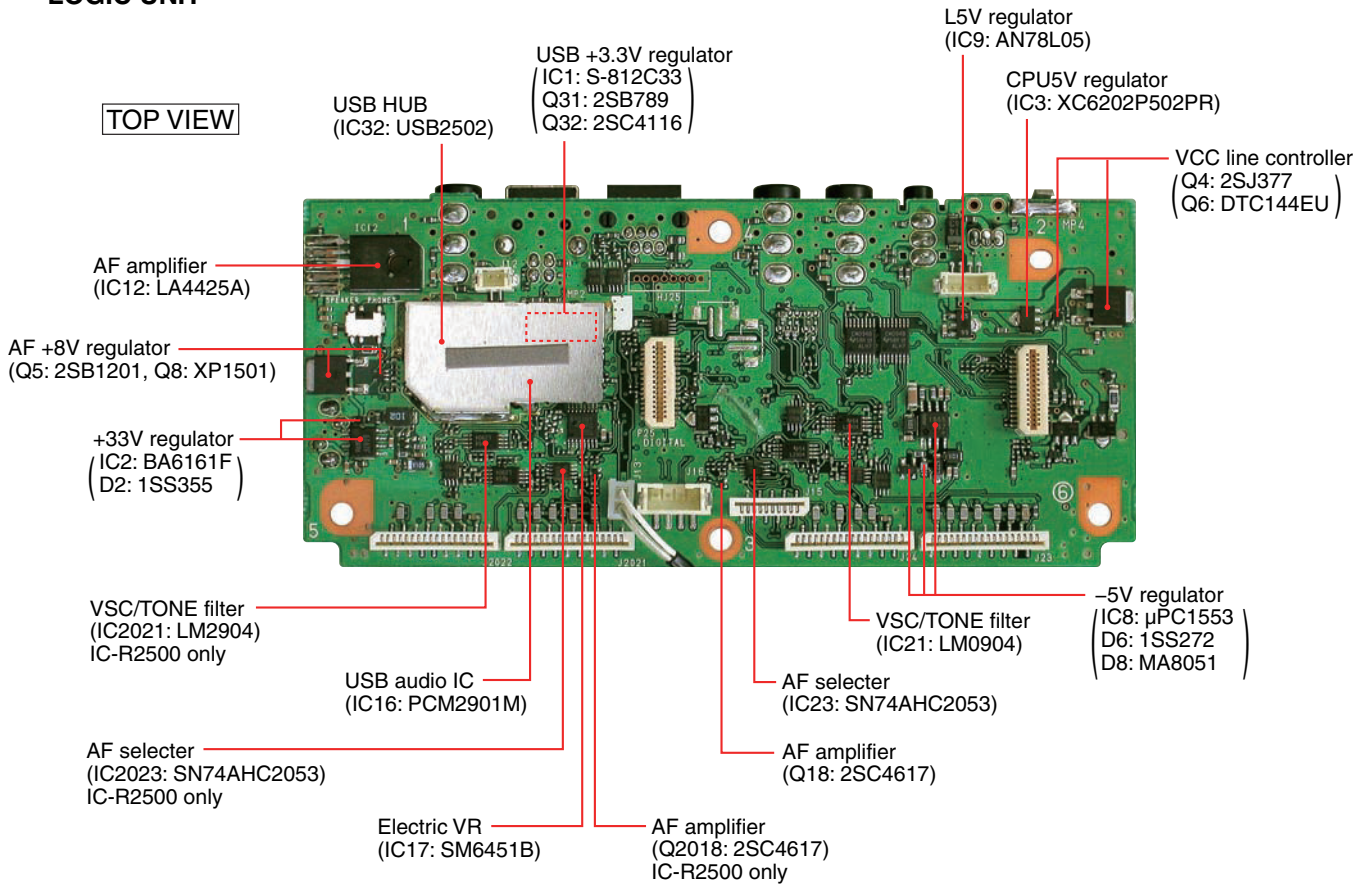
- Receive system : Triple-conversion superheterodyne and down converter
- Intermediate frequencies : 1st: 266.700 MHz, 2nd: 10.700 MHz, 3rd: 450 kHz (except for WFM mode)
- Sensitivity :
 - FM (1 kHz/3.5 kHz Dev.; 12 dB SINAD)
 - 28.000–29.999 MHz : Less than 0.63 μ V
 - 30.000–49.999 MHz : Less than 0.63 μ V
 - 50.000–239.999 MHz : Less than 0.5 μ V
 - 240.000–279.999 MHz : Less than 0.5 μ V
 - 280.000–299.999 MHz : Less than 0.5 μ V
 - 300.000–699.999 MHz : Less than 0.5 μ V
 - 700.000–1300.000 MHz : Less than 0.63 μ V
 - 1300.000001–2299.999 MHz: Less than 5.6 μ V
 - 2300.000–3000.000 MHz : Less than 18 μ V
 - WFM (1 kHz/52.5 kHz Dev.; 12 dB SINAD)
 - 50.000–699.999 MHz : Less than 1.4 μ V
 - 700.000–1300.000 MHz : Less than 1.8 μ V
 - 1300.000001–2299.999 MHz: Less than 18 μ V
 - 2300.000–3000.000 MHz : Less than 56 μ V
 - AM (1 kHz/30% MOD.; 10 dB S/N)
 - 0.495–1.799 MHz : Less than 25 μ V
 - 1.800–14.999 MHz : Less than 2.5 μ V
 - 15.000–49.999 MHz : Less than 2.5 μ V
 - 50.000–299.999 MHz : Less than 2 μ V
 - 300.000–699.999 MHz : Less than 2 μ V
 - 700.000–1300.000 MHz : Less than 2.5 μ V
 - SSB/CW (10 dB S/N)
 - 0.495–1.799 MHz : Less than 5 μ V
 - 1.800–14.999 MHz : Less than 0.5 μ V
 - 15.000–49.999 MHz : Less than 0.5 μ V
 - 50.000–699.999 MHz : Less than 0.4 μ V
 - 700.000–1300.000 MHz : Less than 0.5 μ V
- Selectivity :
 - SSB/CW/AM : More than 2.8 kHz/–6 dB (typical)
 - SSB/CW/AM/FM : More than 6.0 kHz/–6 dB (typical)
 - AM/FM : More than 15 kHz/–6 dB (typical)
 - AM/FM/WFM : More than 50 kHz/–6 dB (typical)
 - WFM : More than 230 kHz/–6 dB (typical)
- Audio output power : More than 0.5 W (at 10% distortion with an 8 Ω load)
- Ext. speaker connector : 2-conductor 3.5 (d) mm ($1/8$ ")/8 Ω
- Packet connector : 2-conductor 3.5 (d) mm ($1/8$ ")
- Data connector : 3-conductor 2.5 (d) mm ($1/10$ ")
- IF shift variable range : More than ± 1.2 kHz

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

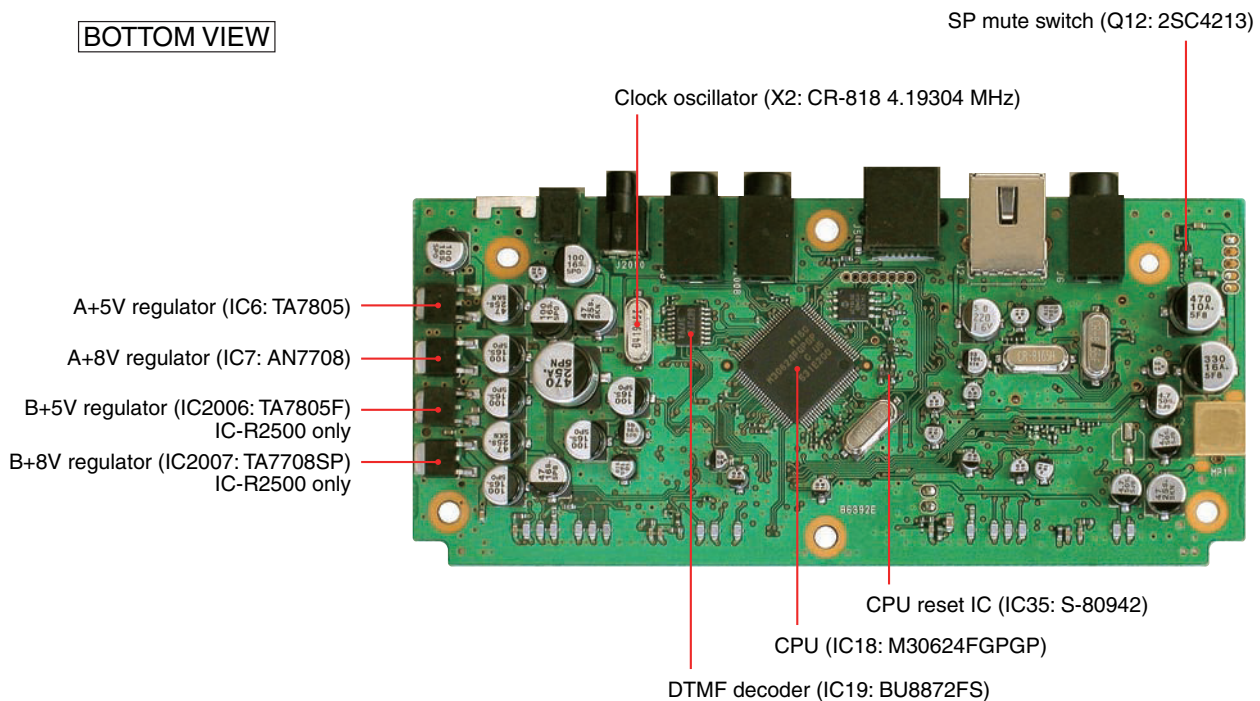
SECTION 2 INSIDE VIEWS

LOGIC UNIT

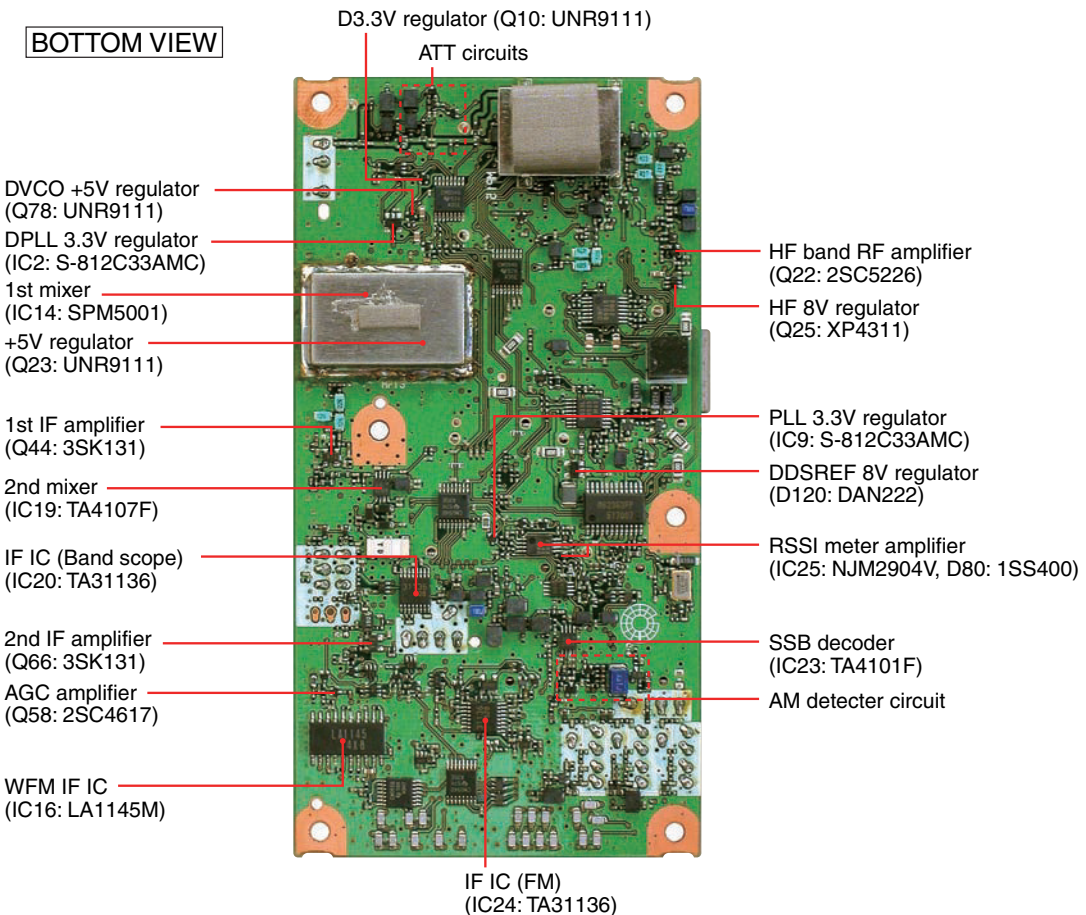
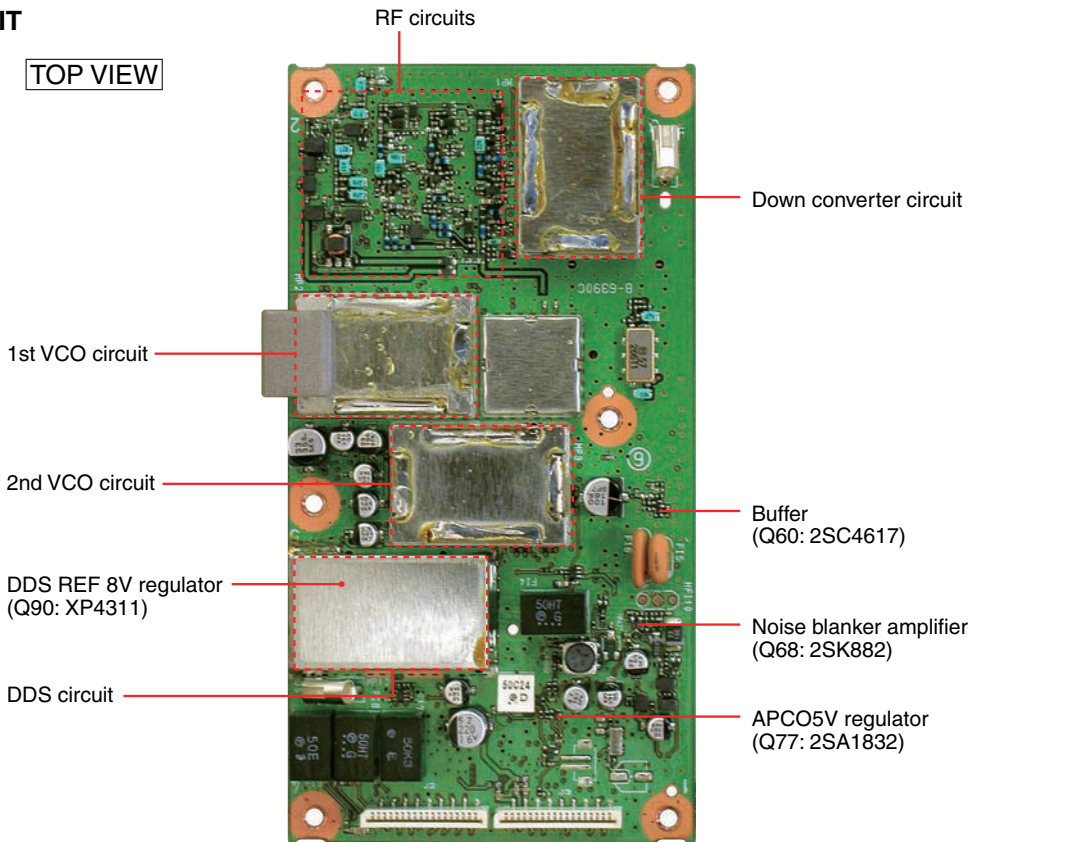
TOP VIEW



BOTTOM VIEW

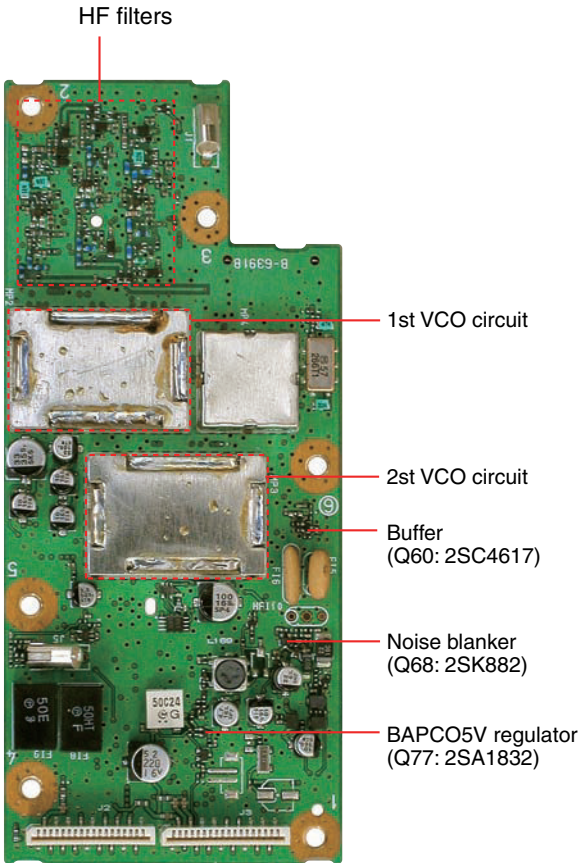


• MAIN-A UNIT

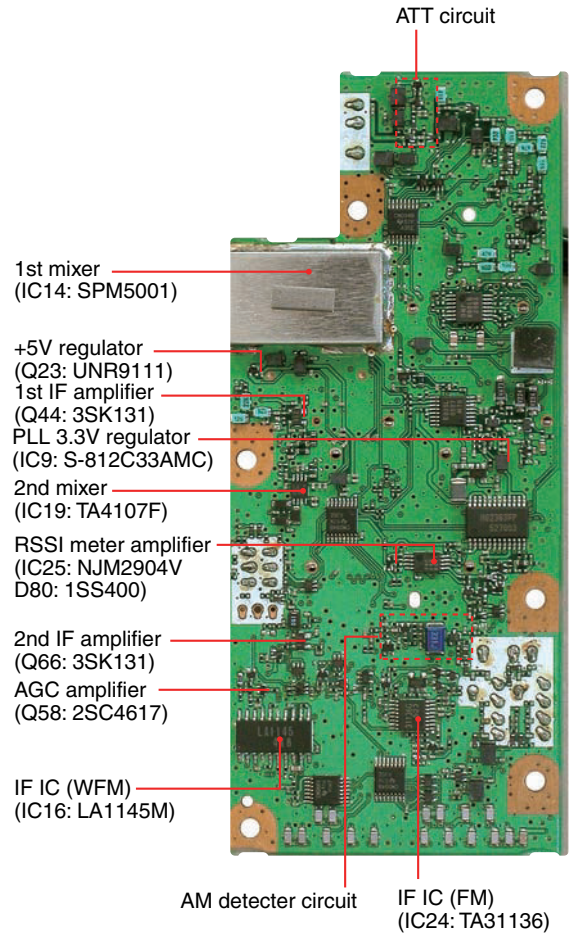


• MAIN-B UNIT (IC-R2500 only)

TOP VIEW

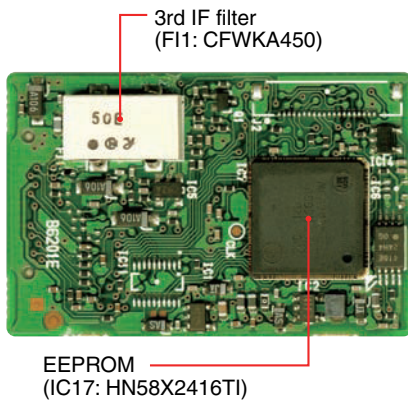


BOTTOM VIEW

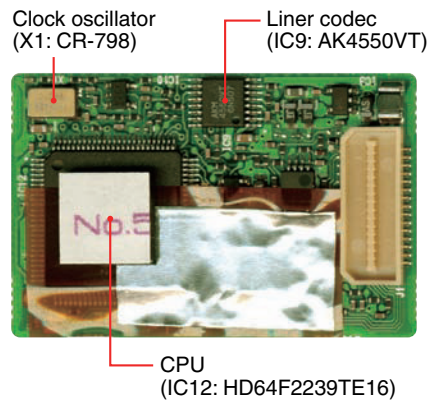


• UT-122 (Optinal product; DIGITAL UNIT for [IC-R2500: USA-2])

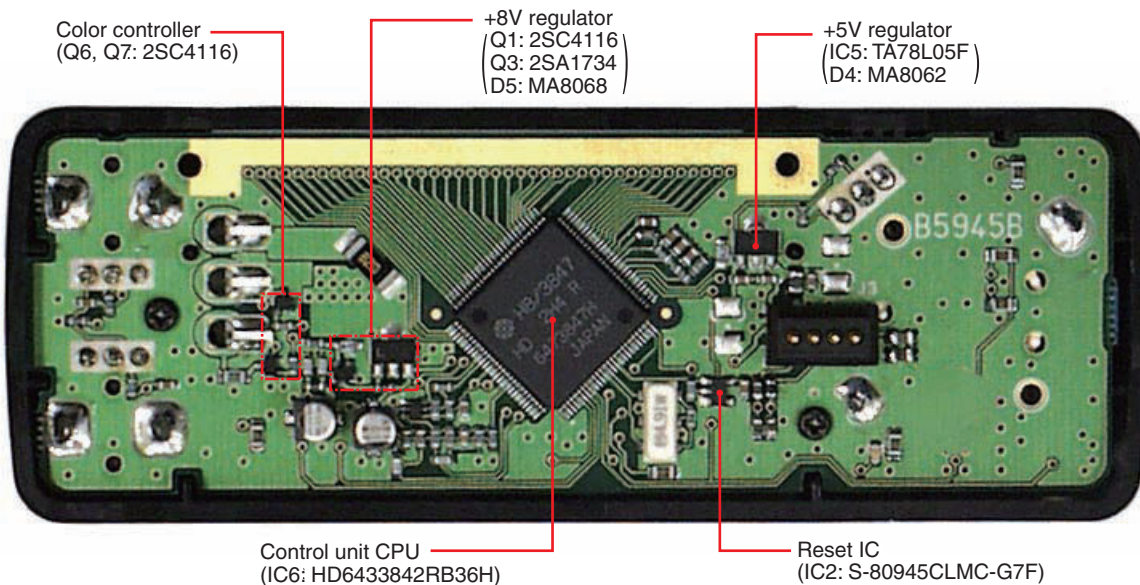
TOP VIEW



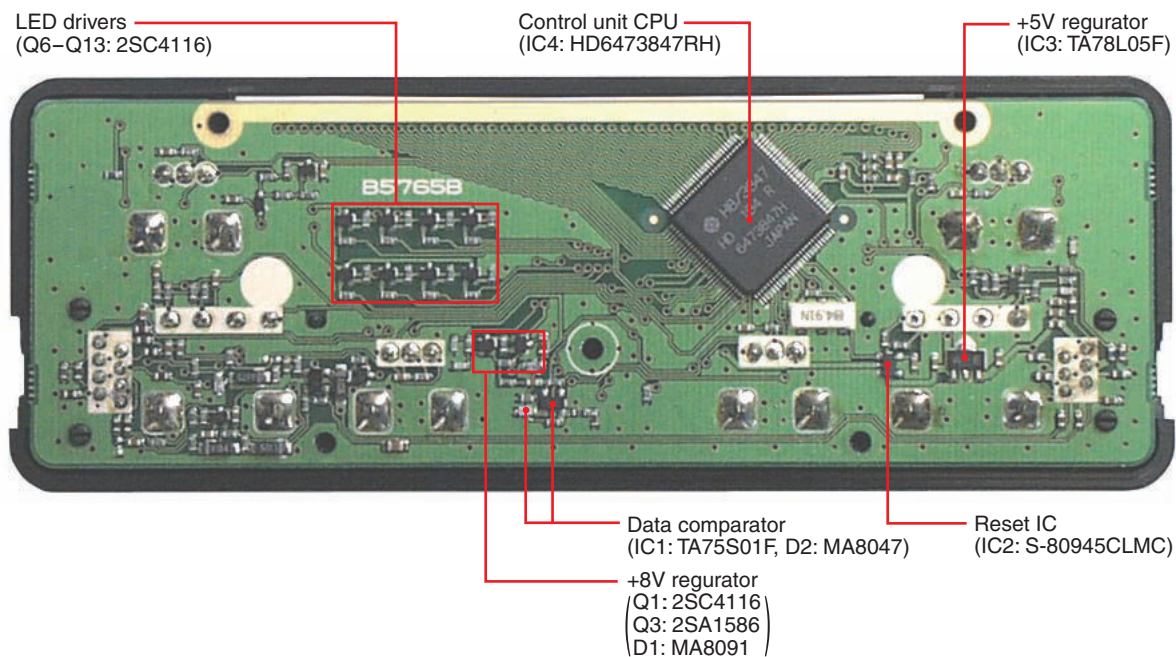
BOTTOM VIEW



• CONTROL UNIT (R1500)



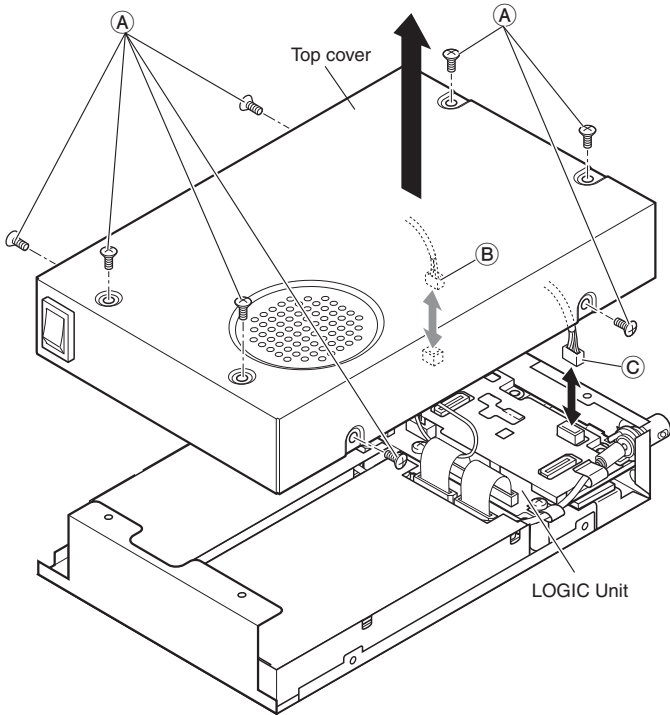
• CONTROL UNIT (R2500)



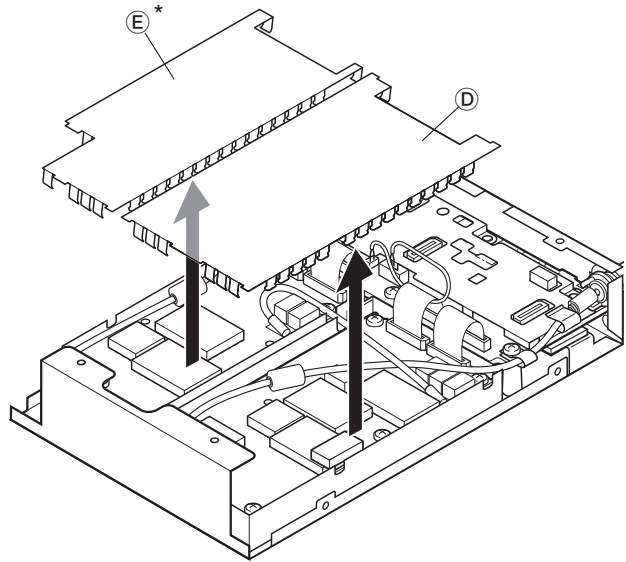
SECTION 3 DISASSEMBLY INSTRUCTIONS

• Removing the top cover and shield covers

- ① Unscrew 8 screws, (A).
- ② Unplug the connectors (B) and (C) from the LOGIC unit.
- ③ Remove the top cover in the direction of the arrow.



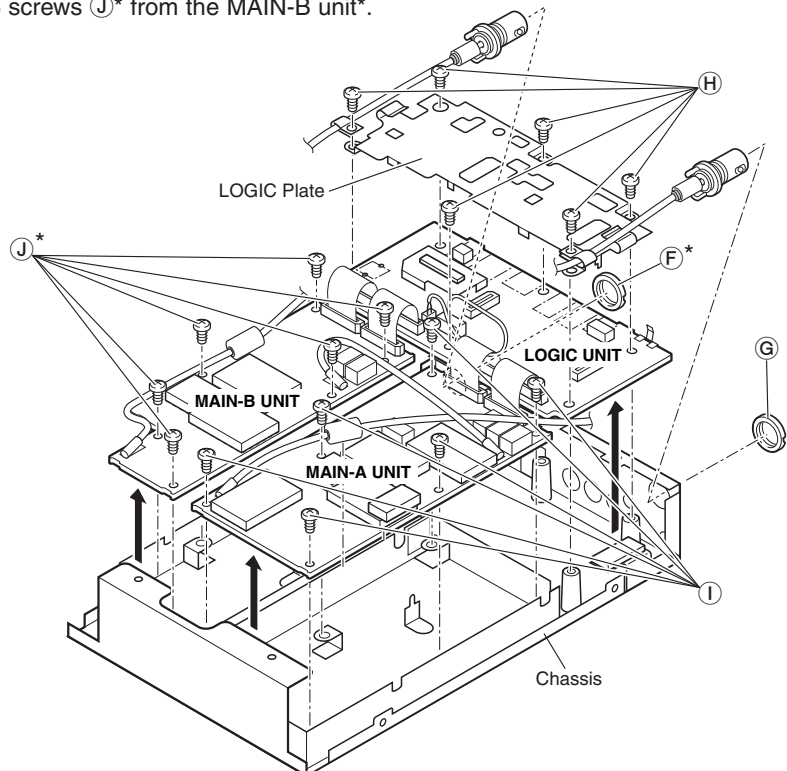
- ④ Remove the shield covers (D) and (E)* in the direction of the arrow.



* IC-R2500 only

• Removing the LOGIC unit, MAIN-A unit and MAIN-B* unit

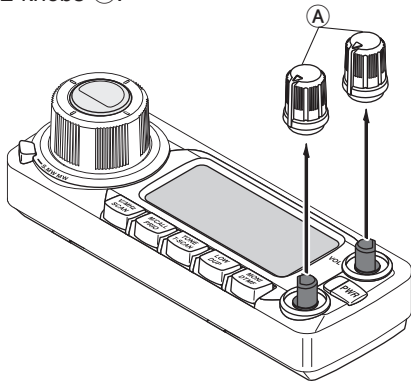
- ① Unscrew nut (F)*, (G).
- ② Unscrew 6 screws (H) from the LOGIC unit and remove the LOGIC plate.
- ③ Unscrew 6 screws (I) from the MAIN-A unit and 6 screws (J)* from the MAIN-B unit*.
- ④ Remove the units in the direction of the arrows.



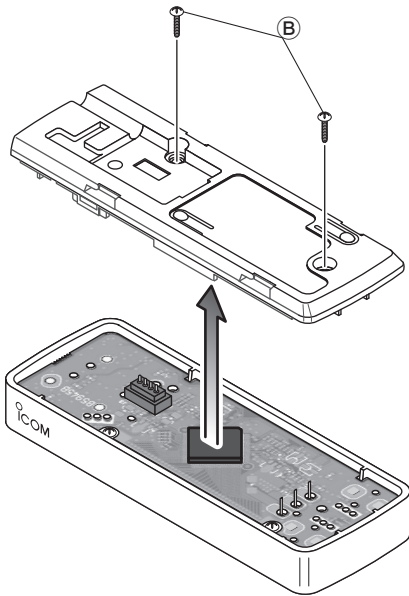
* IC-R2500 only

• **CONTROL unit disassembly (R1500)**

① Remove 2 knobs (A).

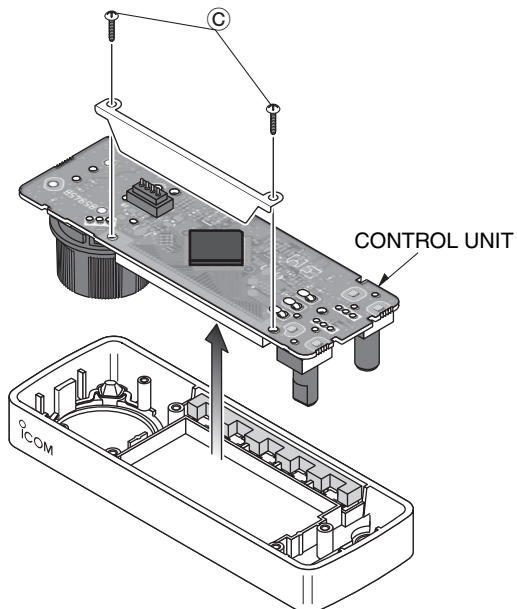


② Unscrew 2 screws (B), and remove the cover.



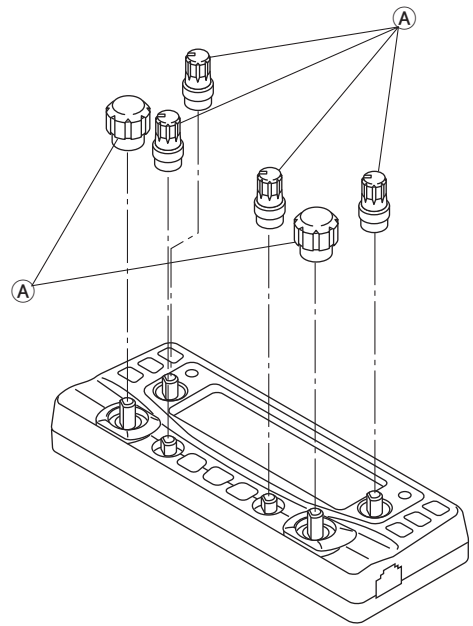
③ Unscrew 2 screws (C), and remove the LCD plate.

④ Remove the CONTROL unit.



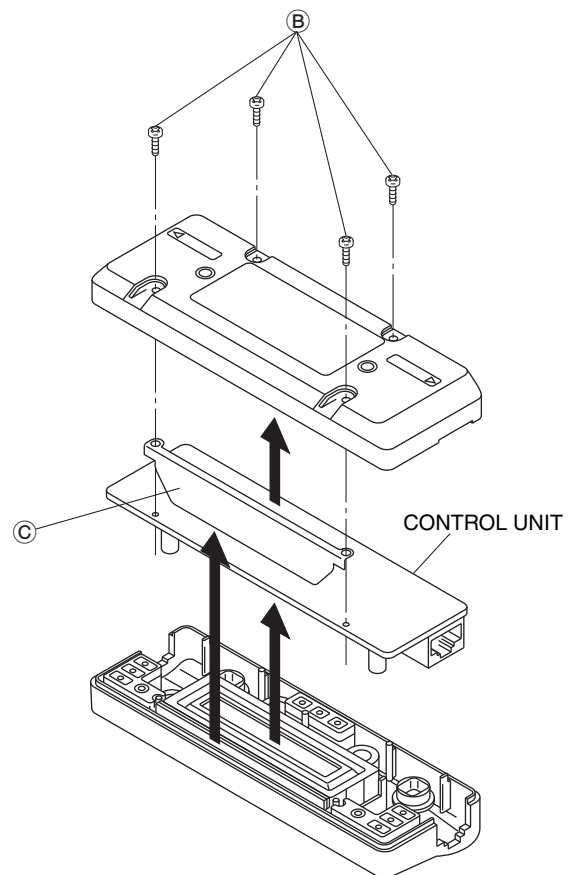
• **CONTROL unit disassembly (R2500)**

① Remove 6 knobs (A).



② Unscrew 4 screws (B), and remove the cover.

③ Remove the plate (C), and remove CONTROL unit.



SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVE CIRCUITS

4-1-1RF CIRCUITS (MAIN-A/B UNITS)

The MAIN-A UNIT has eight RF circuits and one down converter circuit to provide wide receiving range. The received signals from the antenna connector (CHASSIS; J1) are applied to RF circuits or down converter circuit according to the received frequency, and amplified within the frequency coverage.

IC-R2500 contains MAIN-B UNIT which has 4 RF circuits to provide dualwatch or diversity capability .

The 0.01–50 MHz signals from the antenna are passed through the attenuator (D1, D3), band switch (D9) and low-pass filter (LPF; L20, L26, C54, C60, C68, C72, C81, C88), then applied to one of the RF circuit.

• 0.01–1.8 MHz*

The 0.01–1.8 MHz signals are passed through the band switch (D29), LPF (L48, L52, C134, C148, C171, C173) and another band switch (D56), then applied to the 1st mixer (IC14, pins 4, 5).

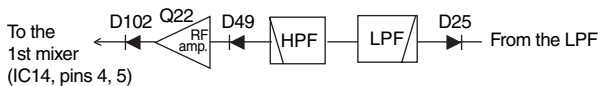
<0.01–1.8 MHz>



• 1.8–15.0 MHz*

The 1.8–15.0 MHz signals are passed through the band switch (D25), LPF (L43, L47, L50, C102, C120, C125, C131, C135, C140), high-pass filter (HPF; L57, L60, L72, C150, C161, C163, C174, C178, C618, C619) and another band switch (D49), and then applied to the RF amplifier (Q22). The amplified signals are then applied to the 1st mixer (IC14, pins 4, 5) via the band switch (D102).

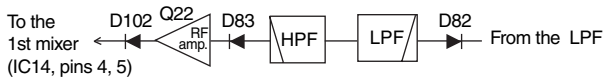
<1.8–15 MHz>



• 15.0–30 MHz*

The 15.0–30 MHz signals are passed through the band switch (D82), LPF (L46, L49, C116, C118, C124, C130, C136), HPF (L55, L58, C139, C149, C151, C162, C164) and another band switch (D83), and then applied to the RF amplifier (Q22). The amplified signals are then applied to the 1st mixer (IC14, pins 4, 5) via the band switch (D102).

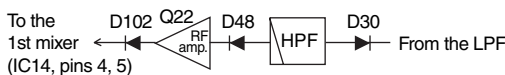
<15–30 MHz>



• 30–50 MHz*

The 30–50 MHz signals are passed through the band switch (D30), HPF (L77, L82, C201, C206, C208, C213, C216) and another band switch (D48), and then applied to the RF amplifier (Q22). The amplified signals are then applied to the 1st mixer (IC14, pins 4, 5) via the band switch (D102).

<30–50 MHz>

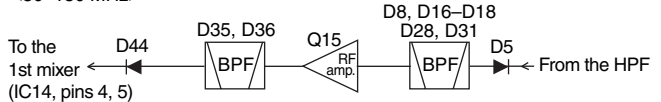


The 50–1300 MHz signals from the antenna are passed through the attenuator (D1, D3), band switch (D7) and LPF (L5, C33, C34), then applied to one of the RF circuit.

• 50–150 MHz

The received signals 50–150 MHz are passed through the band switch (D5) and the tunable bandpass filter (BPF; D8, D16–D18, D28, D31, L9, L21, L25, L31, L33, C39, C41, C44, C49, C70), and then applied to the RF amplifier (Q15). The amplified signals are passed through another tunable BPF (D35, D36, L53, L62, L69, L73, C142, C154, C199) and another band switch (D44), and then applied to the 1st mixer (IC14, pins 4, 5).

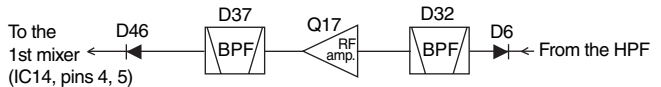
<50–150 MHz>



• 150–350 MHz

The received signals 150–350 MHz are passed through the band switch (D6) and BPF (D32, L10, L12, L34, L37, L39, C40, C42, C45, C50, C82, C114, C117), and applied to the RF amplifier (Q17). The amplified signals are passed through another BPF (D37, L56, L67, L71, C155, C167, C183, C195) and another band switch (D46), and then applied to the 1st mixer (IC14, pins 4, 5).

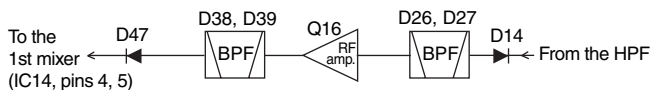
<150–350 MHz>



• 350–700 MHz

The received signals 350–700 MHz are passed through the band switch (D14) and BPF (D26, D27, L24, L32, L40, C65, C71, C81, C106), then applied to the RF amplifier (Q16). The amplified signals are passed through another BPF (D38, D39, L54, L64, L74, L78, C144, C172, C211) and another band switch (D47), and then applied to the 1st mixer (IC14, pins 4, 5).

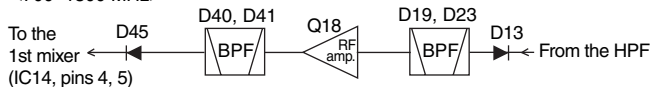
<350–700 MHz>



• 700–1300 MHz

The received signals 700–1300 MHz are passed through the band switch (D13) and BPF (D19, D23, D33, D34, L22, L27, L36, L36, L41, L44, C66, C77, C119), then applied to the RF amplifier (Q18). The amplified signals are passed through another BPF (D40, D41, L51, L59, L68, L72, C168, C176, C205) and the band switch (D45), and then applied to the 1st mixer (IC14, pins 4, 5).

<700–1300 MHz>

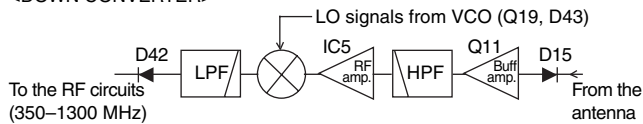


*MAIN-A UNIT only

• **1300–3300 MHz***

The 1300–3300 MHz signals from the antenna are applied to the down converter circuit where those signals are converted into the lower frequencies.

<DOWN CONVERTER>



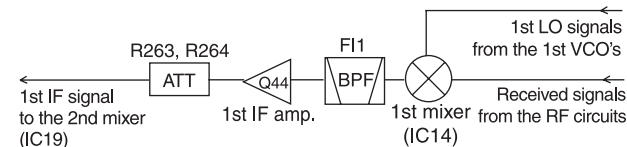
The received signals are applied to the buffer amplifier (Q11) via the band switch (D15). The buffer-amplified signals are applied to the RF amplifier (IC5, pin 1) via HPF (L35, L38, C89, C92, C93, C100, C103). The amplified signals are output from pin 4, and applied to the mixer (IC6, pin 1) and down-converted. The down converted signals are output from pin 6, then applied to the RF circuits via LPF (L66, C190, C193) and band switch (D42). The LO frequencies and converted frequencies are shown as below.

RX frequency	LO frequency	Converted frequency
1300–1700 MHz	1001 MHz	350–700 MHz
1700–2300 MHz	1001 MHz	700–1300 MHz
2300–2700 MHz	2002 MHz	350–700 MHz
2700–3300 MHz	2002 MHz	700–1300 MHz

4-1-2 1st IF CIRCUITS

The 1st IF circuits contain a 1st mixer, 1st IF amplifier and 1st IF filter. The 1st IF mixer converts the received signals into a fixed frequency of the 1st Intermediate Frequency (IF) signal. The converted 1st IF signal is filtered at the 1st IF filters, then amplified at the 1st IF amplifier.

<1st IF CIRCUITS>



The converted signals from the RF circuits are applied to the 1st IF mixer (IC14, pins 4, 5) and converted into the 266.7 MHz 1st IF signal by being mixed with the 1st LO (Local Oscillator) signals from the 1st-VCO's.

The converted IF signal is passed through the 1st IF filter (FI1) to filter out the unwanted signals, then applied to the 1st IF amplifier (Q44). The amplified 1st IF signal is then applied to the 2nd mixer (IC19, pin 4) via attenuator (R263, R264).

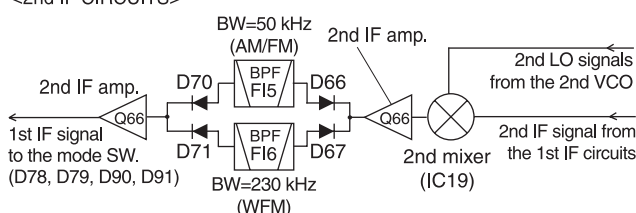
4-1-3 2nd IF CIRCUITS (MAIN UNIT)

The 2nd IF circuits contain the 2nd mixer, 2nd IF amplifier and the 2nd IF filters.

The 1st IF signal from the 1st IF circuits is converted into the 10.7 MHz 2nd IF signal by being mixed with the 2nd LO signals from the 2nd-VCO.

The converted 2nd IF signal is applied to the 2nd IF amplifier (Q60). The amplified 2nd IF signal is passed through the 2nd IF filter to filter out the unwanted signals.

<2nd IF CIRCUITS>



In FM or AM mode, the 2nd IF signal is passed through the FI5 (band width=50 kHz) via mode switches (D66, D70),

In WFM mode, the 2nd IF signal is passed through the FI6 (band width=230 kHz) via mode switches (D67, D71).

The filtered 2nd IF signal is applied to the 2nd IF amplifier (Q66). The amplified 2nd IF signals are then applied to the 3rd IF and demodulation circuits.

4-1-4 NOISE BLANKER CIRCUIT

The noise blanker (NB) circuit reduces pulse type noises in the received signals. When the received signals contain pulse type noise components, the NB circuit reduces the noisy AF signals by cutting off the 2nd IF line.

In AM, SSB or CW mode and the NB function is activated, a portion of the 2nd IF signal from the band switch (D70, D71) is amplified at NB amplifier (Q68) and applied to the IF IC (IC16, pin 2).

When the 2nd IF signal contains a pulse noise, the RSSI signal corresponding to the pulse noise level is output from pin 17. The output RSSI signal turns Q49 ON and Q65 turns OFF, thus the Q66 is inactivated and the 2nd IF signal is cut off.

4-1-5 3rd IF AND DEMODULATOR CIRCUITS (MAIN-A/B UNIT)

The 2nd IF signal is converted into the 3rd IF signal (except WFM mode) and demodulated in the IF IC. The IF IC contains a 3rd mixer, limiter amplifier, quadrature detector, etc. in its package.

In FM mode, the 2nd IF signal from the 2nd IF amplifier (Q66) is applied to the IF IC (IC24, pin 16) via mode switch (D78) and IF gain control circuit (D97).

The applied 2nd IF signal is converted into the 3rd IF signal by being mixed with 3rd LO signal from the TCXO (X1), at the 3rd mixer in the IF IC (IC24). The converted 3rd IF signal is output from pin 3 and applied to the 3rd IF amplifier (Q62). The amplified 3rd IF signal is passed through one of the 3rd IF filter according to the receiving mode.

The filtered 3rd IF signal is applied to the limiter amplifier (IC24, pin 5), then applied to the demodulator circuit (pin 10, X2) and FM-demodulated. The FM-demodulated AF signals are output from pin 9, then applied to the AF circuits.

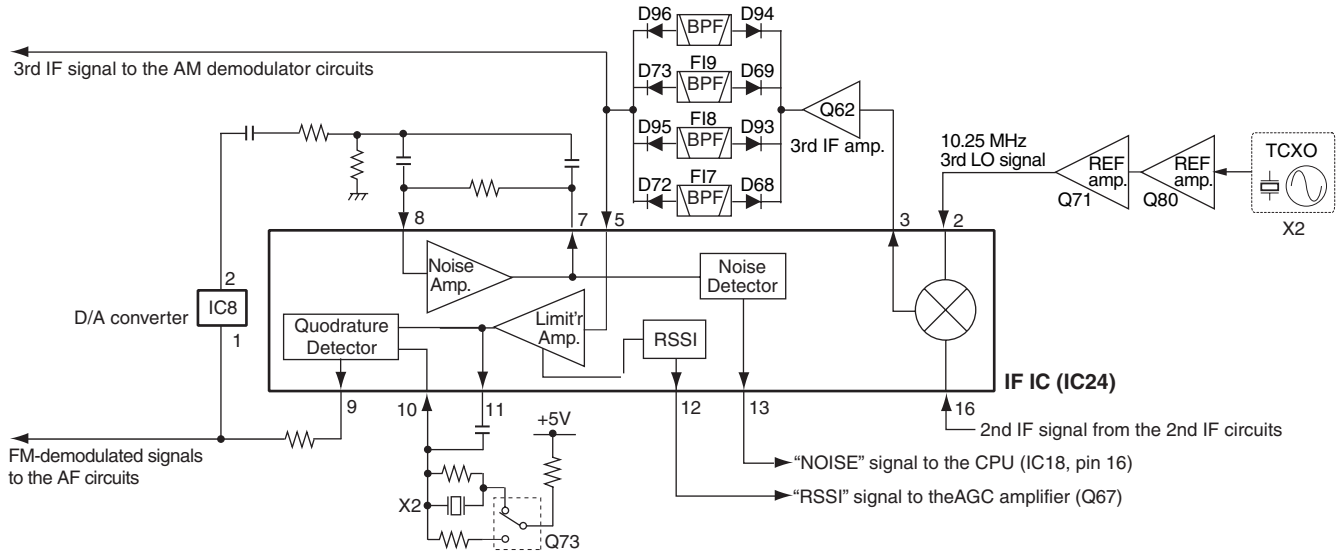
In AM and CW mode, the 3rd IF signal from the 3rd IF filter is applied to the 3rd IF amplifier (Q61). The amplified 3rd IF is applied to the AM demodulator circuit (D75) via the buffer amplifier (Q63). The AM-demodulated AF signals are applied to AF circuits via the AF selector (IC27, pins 3, 4).

In SSB mode, the 3rd IF signal from the buffer amplifier (Q63) are applied to the AF mixer (IC23, pin 6) and converted into the AF signal by being mixed with the 447.3–452.7 kHz BFO signal from the DDS circuits. The converted audio signals are applied to the AF selector (IC27, pin 1) after being filtered at the HPF (IC31, pins 1, 4).

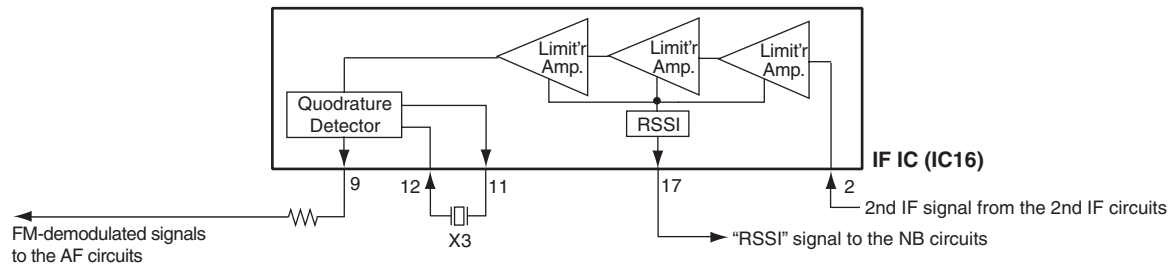
In WFM mode, the 2nd IF signal is applied to the IF IC (IC16, pin 2) via the 2nd IF amplifier (Q66) and mode switch (D90, D91). The 2nd IF signal is amplified at the limiter amplifier, then applied to the demodulator circuit (pins 11, 12, X2) and FM-demodulated. The FM-demodulated AF signals are output from pin 8, then applied to the AF circuits via the AF selector (IC27, pins 8, 9).

*MAIN-A UNIT only

<3rd IF AND DEMODULATOR CIRCUITS (FM)>



<2nd IF AND DEMODULATOR CIRCUITS (WFM)>



4-1-6 AF CIRCUITS (LOGIC UNIT)

The demodulated AF signals from the demodulator circuits are amplified and filtered in the AF circuits.

In FM mode, the demodulated AF signals from the demodulator circuits are passed through the AF select switch (IC4, pins 1, 7) and BPF (IC27, pins 1, 3 and 5, 7), then applied to the AF amplifier (Q18).

In other than FM mode, the demodulated AF signals from the demodulator circuits are passed through the AF select switch (MAIN-A/B; UNIT ;IC27, pins 8, 9; WFM, pins 3, 4; AM, pins 1, 2; SSB), then applied to the AF amplifier (Q18).

The amplified AF signal are applied to the electric volume (IC17, pins 6, 7) for level adjustment. The level adjusted AF signals are passed through the speaker mute switch (Q12, D8) and applied to the AF power amplifier (IC12, pin 1). The power-amplified AF signals are applied to the internal speaker via J1 (J6) or an external speaker/ear phone via the phone switch (S1), attenuator (R19, R20) and J1 (J6).

In the USB (Universal Serial Bus) audio output mode, the AF signals from the AF amplifier (Q18) are applied to another AF amplifier (Q15). The amplified AF signals are passed through the USB audio selector (IC2038, pins 1, 3), then applied to the USB audio IC (IC16, pin 12) then converted into the USB audio data. The converted audio data is applied to the connected PC via the USB HUB (IC32, pins 5, 6 and 2, 3).

4-1-7 SQUELCH CIRCUIT

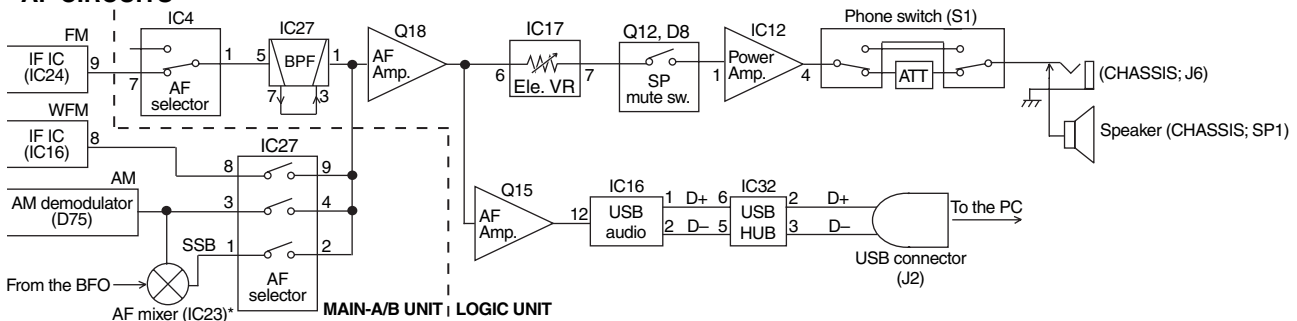
• **NOISE SQUELCH (MAIN-A/B UNITS)**

The noise squelch mutes the AF output signals when no RF signals are received. By detecting noise components in the demodulated AF signals, the squelch circuit toggles the AF power amplifier ON and OFF.

A portion of the demodulated signals from the IF IC (IC24, pin 9) are applied to the D/A converter (IC8, pin 1) for level adjustment. The level-adjusted AF signals are output from pin 2, and passed through the noise filter (R421, R417, C520, C523). The filtered noise signals are then applied to the noise amplifier (IC24, pins 7, 8) to be amplified noise components only.

The amplified noise components are converted into the

• **AF CIRCUITS**



*MAIN-A UNIT only

pulse-type signal at the noise detector section, and output from pin 13 as the “NOIS” signal. The “NOIS” signal is applied to the CPU (IC18, pin 16). And the CPU outputs control signals “LSTB,” “VDAT,” “VCK” from pins 61, 57, 58, to the expander (IC34) according to the “NOIS” signal level. Then the expander outputs “SPPWR” signal from pin 7 to toggle the AF+8V regulator (Q5, Q8) ON and OFF.

The expander also outputs “SPMUTE” signal to the speaker switch (Q12, D28) at the same time, to disconnect the AF line.

• TONE SQUELCH (LOGIC UNIT)

The tone squelch detects the tone (CTCSS/DTCS) signal in the demodulated AF signals, and opens the squelch only when the matched sub-audible tone frequency is detected in the received signal.

While the tone squelch is in use, and the received signal contains no sub-audible tone or mismatched tone frequency, the tone squelch mutes the AF signals even if the noise squelch is open.

A portion of the demodulated AF signals from the IF IC (MAIN-A/B; IC24, pin 9) are passed through the tone filter (IC21/IC2021, pins 5, 7) to suppress unwanted voice signals. The filtered tone signals are applied to the CPU (IC18, pin 93/85).

The CPU decodes the CTCSS/DTCS signal, and outputs control signals “LSTB,” “VDAT,” “VCK” from pins 61, 57, 58, to the expander (IC34) according to the applied CTCSS/DTCS signal. Then the expander outputs “SPPWR” signal from pin 7 to toggle the AF+8V regulator (Q5, Q8) ON and OFF.

The expander also outputs “SPMUTE” signal to the speaker switch (Q12, D28) at the same time, to disconnect the AF line.

4-1-8 BANDSCOPE CIRCUITS* (MAIN-A UNIT)

A portion of the 2nd IF signal from the 2nd mixer (IC19, pin 5) is applied to the IF IC (IC20, pin 16) via the 2nd IF filter (FI2). The 2nd IF signal is converted into the 3rd IF signal by being mixed with 3rd LO signal from the DDS circuits, at the 3rd mixer in the IF IC (IC20). The converted 3rd IF signal is output from pin 3 and passed through the 3rd IF filter FI4. The filtered signal is amplified at the limiter amplifier in the IC to produce the RSSI signal which corresponding to the received signal level.

The RSSI signal “SCAD” is output from pin 12, and applied to the CPU (IC18, pin 89). The CPU converts the RSSI signal into the digital signal, and outputs to connected PC via USB HUB (IC32, pins 19, 20 and 2, 3) to indicate the received signal level for bandscope function on the PC screen.

4-2 PLL CIRCUITS

4-2-1 VCO CIRCUITS (MAIN-A/B UNITS)

DOWN CONVERTER VCO*

The down converter VCO (Q19, D43) generates the 1001 MHz LO signals for down conversion.

The VCO output signals are buffer amplified by Q13, and applied to the mixer (IC6, pin 3) for frequency down-conversion, via the band switches (D11, D12, D21, D22).

When the receiving 2000 MHz and above, the VCO outputs are doubled by being passed through the HPF (L23, C61, C69, C75), and applied to the mixer (IC6, pin 3) as the 2002 MHz LO signals via the band switches (D12, D22).

• 1st VCO's

The 1st VCO is composed by two VCO's; as the 1st LO signal generator for 0.01–483.29 MHz and 483.3–3300 MHz reception range.

[When receiving 0.01–265.6999 MHz signals]

-1st VCO 1 (Q28, D53)-

Generates 532.4–749.95 MHz LO signals. The VCO output signal is buffer-amplified by Q27. The buffer amplified signals are passed through the LO switch (D58) and buffer amplifier (IC15, pins 1, 4).

-1st VCO 2 (Q30, D54)-

Generates 750–1066.65 MHz LO signals. The VCO output signal is buffer-amplified by Q29. The buffer amplified signals are passed through the LO switch (D59) and buffer amplifier (IC15, pins 1, 4).

The buffer amplified VCO output signals from pin 4 of IC15 are passed through the attenuator (R137, R138, R152), LO switch (D57) and another attenuator (R153, R154, R156), and applied to the 1/2 frequency divider (IC11, pin 2). The divided LO signals are buffer-amplified by Q34, and then passed through the HPF (L113, C316, C321), LPF (L115, L118, C326, C322), LO switch (D85) and attenuator (R214, R217, R226), before being applied to the 1st mixer (IC14, pins 1, 6).

[When receiving 266.7–33000 MHz signals]

-1st VCO 1 (Q28, D53)-

Generates 532.4–749.95 MHz LO signals. The VCO output signal is buffer-amplified by Q27. The buffer amplified signals are passed through the LO switch (D58) and buffer amplifier (IC15, pins 1, 4).

-1st VCO 2 (Q30, D54)-

Generates 750–1066.65 MHz LO signals. The VCO output signal is buffer-amplified by Q29. The buffer amplified signals are passed through the LO switch (D59) and buffer amplifier (IC15, pins 1, 4).

The buffer amplified VCO output signals from pin 4 of IC15 are passed through the attenuator (R137, R138, R152) and LO switches (D60, D84) and BPF (L107, L108, C276, C278, C288, C292, C298), before being applied to the 1st mixer (IC14, pins 1, 6).

• 2nd VCO

The 2nd VCO (Q47, D62, D63) generates the LO signals for producing 2nd IF signal. The oscillated signals are buffer amplified by Q50, and applied to the 2nd mixer (IC19, pin 1) via LPF (L158, C456, C459, C462) and attenuator (R276).

4-2-2 PLL CIRCUITS (MAIN-A/B UNIT)

The PLL circuits provide stable oscillation of the receive LO frequencies. The PLL circuit compares the phase of the divided VCO frequency with the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) from the CPU.

• DOWN CONVERTER PLL*

A portion of the VCO output signals are amplified at the buffer amplifier (Q14) and then applied to the PLL IC (IC4, pin 8). The applied signals are divided at the prescaler and programmable counter according to the N-data “DAT1” from the expander (IC3, pin 2) controlled by the CPU (LOGIC UNIT; IC18). The divided signal is phase compared with the reference frequency from the reference amplifier (Q5) at the phase comparator.

The phase difference is output from pin 5 as a pulse type signal after being passed through the internal charge pump. The output signal is applied to the VCO (Q19, D43) after being converted into the DC voltage (lock voltage) at the loop filter (R84, R102, R106, C180, C188, C202, C645, C646).

• **1st PLL**

-1st VCO 1 (Q28, D53)-

A portion of the VCO output signals from the buffer amplifier (IC12, pin 4) are applied to the PLL IC (IC10, pin 8) via the buffer amplifier (Q39). The applied signals are divided at the prescaler and programmable counter according to the N-data "DAT1" from the expnader (IC7, pin 2) controlled by the CPU (IC18). The divided signal is phase compared with the reference frequency at the phase comparator.

The phase difference is output from pin 5 as a pulse type signal after being passed through the internal charge pump. The output signal is applied to the VCO (Q27, Q28, D52, D53) after being converted into the DC voltage (lock voltage) at the loop filter (Q35, Q36).

-1st VCO 2 (Q30, D54)-

A portion of the VCO output signals from the buffer amplifier (IC12, pin 4) are applied to the PLL IC (IC10, pin 8) via the buffer amplifier (Q39). The applied signals are divided at the prescaler and programmable counter according to the N-data "DAT1" from the expnader (IC7, pin 2) controlled by the CPU (IC18). The divided signal is phase compared with the reference frequency at the phase comparator.

The phase difference is output from pin 5 as a pulse type signal after being passed through the internal charge pump. The output signal is applied to the VCO (Q27, Q28, D52, D53) after being converted into the DC voltage (lock voltage) at the loop filter (Q35, Q36).

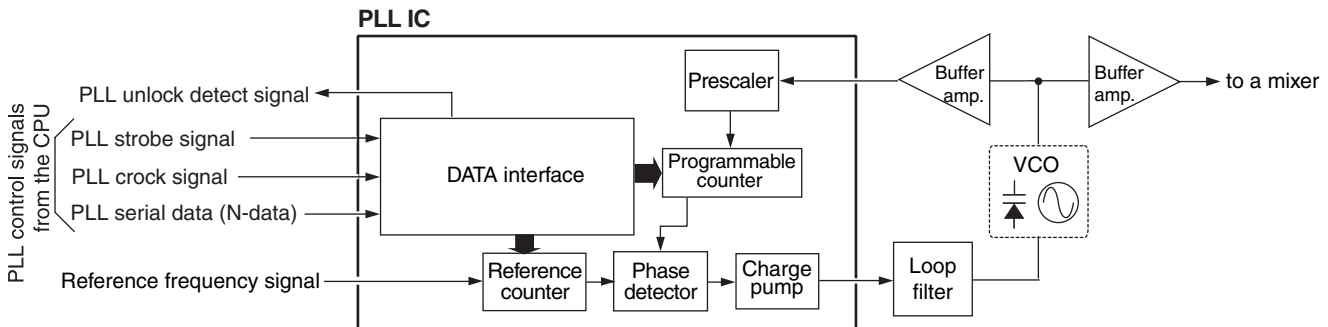
• **2nd PLL**

A portion of the VCO (Q47, D62, D63) output signals from the buffer (Q50) are applied to the PLL IC (IC13, pin 11) via the buffer (Q41). The applied signals are divided at the prescaler and programmable counter according to the N-data "DAT1" from the expnader (IC3, pin 2) controlled by the CPU (IC18). The divided signal is phase compared with the reference frequency from the reference amplifier (Q31) at the phase comparator.

The phase difference is output from pin 5 as a pulse type signal after being passed through the internal charge pump. The output signal is applied to the VCO (Q47, D62, D63) after being converted into the DC voltage (lock voltage) at the loop filter (R235, R238, C354, C355, C362).

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

<THE CONCEPT OF PLL CIRCUITS>



4-3 DIGITAL MODE OPERATION WITH UT-122†

A portion of the 450 kHz 3rd IF signal from IF IC (MAIN-A UNIT; IC24, pin 13) is applied to the LOGIC UNIT via the IF amplifier (MAIN-A UNIT; Q76, Q77). The applied 3rd IF signal is passed through the IF switch (LOGIC UNIT; IC2028, pins 1, 7) and buffer amplifier (LOGIC UNIT; Q2023), then applied to the attached UT-122 via J2017 (pin 11).

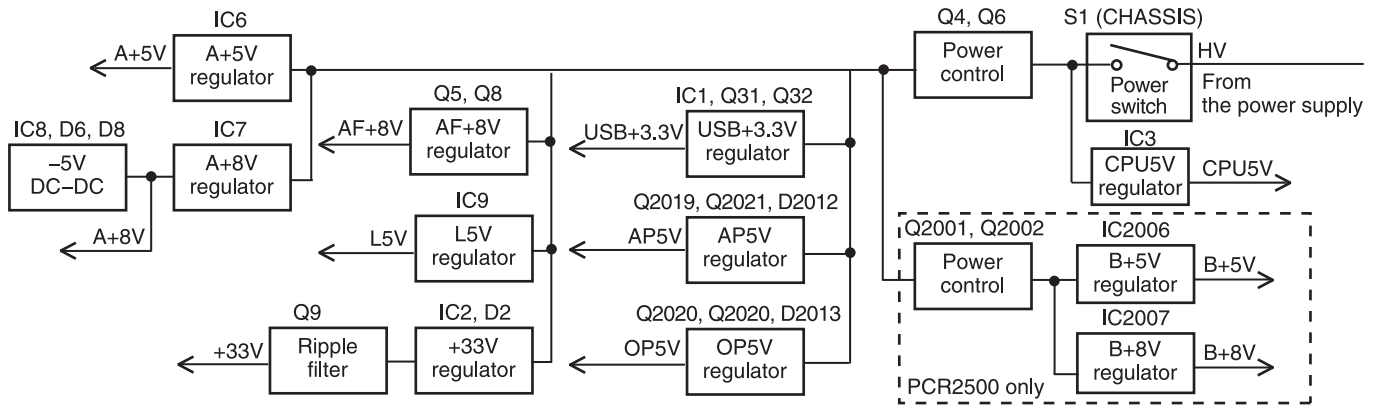
The applied 3rd IF signal is passed through the IF filter (UT-122; FI1) to remove unwanted signals, and applied to the A/D converter (UT-122; IC8, pin 3) to be converted into the digital signal via BPF. The converted digital signal is then applied to the DSP (Digital Signal Processor; IC7) and demodulated. The demodulated signal is then applied to the liner codec (UT-122; IC9) to be converted in to the analog audio signals.

The converted audio signals are applied to the same AF circuits as analog receiving from the AF switch (IC23, pin 7).

†Optional product (DIGITAL UNIT for R2500; [USA-2])

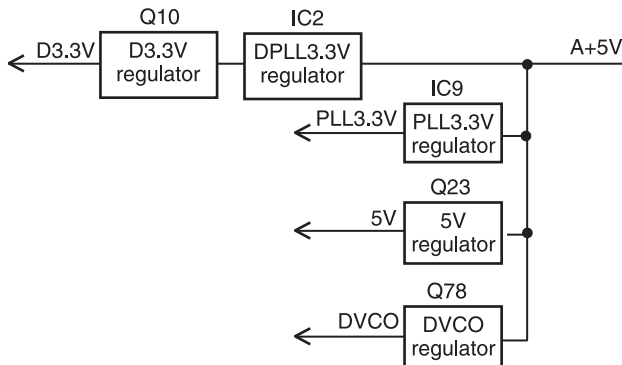
4-4 POWER SUPPLY CIRCUITS

<LOGIC UNIT>



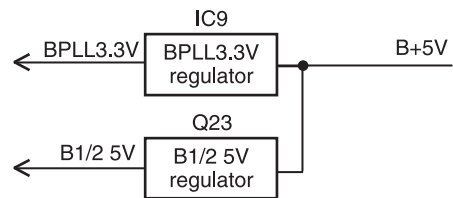
VOLTAGE LINE	DESTINATION	VOLTAGE LINE	DESTINATION
HV	Same voltage as the connected power supply.	AP5V	Optional UT-122.
AF+8V	AF power amplifier (IC12).	OP5V	Optional UT-108/UT-118.
L5V	Electric volume (IC17), tone filter (IC21), AF switch (IC4, IC23), etc.	A+5V	MAIN-A UNIT.
+33V	Loop filter (MAIN-A/B UNITS; Q35, Q36).	A+8V	
USB3.3V	USB HUB (IC20, IC32), USB audio IC (IC16).	-5V	AGC amplifier (MAIN UNIT; IC25).

<MAIN-A UNIT>



VOLTAGE LINE	DESTINATION
DPLL3.3V	Down converter circuit; PLL IC (IC4).
D3.3V	Down converter circuit; mixer (IC6), RF amplifier (IC15), etc.
PLL3.3V	1st and 2nd PLL circuits; PLL IC (IC10, IC13).
5V	Divider (IC11), reference oscillator (X1), etc.
DVCO5V	Down converter circuit; VCO (Q19, D43), buffer (Q14), etc.

<MAIN-B UNIT*>



VOLTAGE LINE	DESTINATION
BPLL3.3V	1st and 2nd PLL circuits; PLL IC (IC10, IC13).
B1/2 5V	Divider (IC11).

*R2500 only

4-5 CPU PORT ALLOCATION

4-5-1 CPU (LOGIC UNIT; IC18)

Pin No.	PORT NAME	DESCRIPTION
4	BMST2	Outputs strobe signal to the expander (MAIN-B UNIT; IC18, pin1).
5	BCK	Outputs clock signal to the expander (MAIN-B UNIT; IC17, pin 3).
8	BMST1	Outputs strobe signal to the expander (MAIN-B UNIT; IC3, pin1).
9	CSHIFT	Outputs clock frequency shift signal to the clock shift circuit (D6).
16	NOIS	Input port for "NOIS" signal from the IF IC (MAIN-A UNIT; IC24, pin 13).
17	BNOIS	Input port for "BNOISE" signal from the IF IC (MAIN-B UNIT; IC24, pin 13).
18	PWRSW	Input port for power witch (CHASSIS; S1). "Low"=While the power switch is turned.
19	BMST3*	Outputs strobe signal to the expander (MAIN-B UNIT; IC17, pin 1).
20	CCS	Outputs optional unit select signal to the attached optional unit via the pin 20 of J2018. "High"=While the optional unit is attached.
21	BP1STB*	Outputs PLL strobe signla to the 1st PLL IC (MAIN-B UNIT; IC10, pin 11).
22	BP2STB*	Outputs PLL strobe signla to the 2nd PLL IC (MAIN-B UNIT; IC13, pin 13).
23	BDSTB*	Outputs strobe signal to the D/A converter (MAIN-B; IC8, pin 6).
27	PDIN	Input port for USB data.
28	PDOUT	Outputs USB data.
31	SCL	Outputs clock signal to the EEPROM (IC14, pin 5).
33	OPSO	Output serial data to the attached optional unit via the pin 18 of J2018.
34	OPSI	Input port for serial data from the attached optional unit via the pin17 of J2018.
35	OPSCK	Outputs clock signal to the Attached optional unit via the pin 16 of J2018.
36	AIRQ	Input port for data request signal from the attached UT-122 via the pin 19 of the J2017.
37	ASTB	Outputs strobe signal to the attached UT-122 via the pin 20 of the J2017.
38	ASI	Input port for serial data from the attached UT-122 via the pin 17 of the J2017.
39	ASO	Outputs serial data to the attached UT-122 via the pin 18 of the J2017.
40	ACK	Outputs clock signal to the attached UT-122 via the pin 16 of the J2017.
41	DSPS	Outputs DSP select signal to the attached DSP unit via pin 7 of J15.
42	IMST	Outputs DSP strobe signal to the attached DSP unit via pin 3 of J15.
43	BUSY	Outputs busy signal to the attached optional unit via pin 7 of J7.
44	SDL	I/O port for EEPROM (IC14, pin 6).
45	OPAFSEL	Outputs control signal to the AF switch (IC23, pin 5). "High"=While the optional unit is activated.
46	OPAFINH	Outputs control signal to the AF switch (IC23, pin 2). "High"=The AF line for the optional unit is disconnected.
47	BOPAFSEL*	Outputs control signal to the AF switch (IC2031, pin 5). "High"=While the optional unit is activated.
48	BOPAFINH*	Outputs control signal to the AF switch (IC2031, pin 2). "High"=The AF line for the optional unit is disconnected.

Pin No.	PORT NAME	DESCRIPTION
49	RXMUTE	Input port for mute signal from the attached optional unit via the pin 24 of J2018. "High"=While the audio output is muted.
53	APAFSEL	Outputs control signal to the AF switch (IC4, pin 5). "High"=While the UT-122 is in use.
54	APAFINH	Outputs control signal to the AF switch (IC4, pin 2). "High"=While the attached UT-122 is inactivated.
57	VDAT	Outputs serial data to the electric volume (IC17, pin 16).
58	VCK	Outputs clock signal to the electric volume (IC17, pin 15).
59	VSTB	Outputs strobe signal to the electric volume (IC17, pin 14).
61	LSTB	Outputs strobe signal to the expander (IC34, pin 1).
64	PWR	Outputs control signal to the power controller (Q4, Q6). "High"=While the receivers power is ON.
65	DTMSTD	Input port for detecting signal from the DTMF decoder (IC19, pin 14). "High"=When the DTMF signal is detected.
66	DTMSD	Input port for DTMF signal from the DTMF decoder (IC19, pin 9).
67	DTMCK	Outputs clock signal from the DTMF decoder (IC19, pin 11).
70	PDSTB	Outputs strobe signal to the DDS IC (MAIN-A UNIT; IC22, pin 41).
73	VBUS	Input port for USB connection detecting signal from the VBUS line. "High"=While a PC is connected through [USB] connector on the receiver's main unit.
75	DSTB	Outputs strobe signal to the D/A converter (MAIN-A; IC8, pin 6).
76	P2STB	Outputs strobe signal to the 2nd PLL IC (MAIN-A UNIT; IC13, pin 13).
77	P1STB	Outputs strobe signal to the 1st PLL IC (MAIN-A UNIT; IC12, pin 11).
78	DPSTB	Outputs strobe signal to the down converter PLL IC (MAIN-A UNIT; IC4, pin 11).
79	MST0	Outputs strobe signal to the expander (MAIN-A; IC3, pin 1).
80	MST1	Outputs strobe signal to the expander (MAIN-A; IC18, pin 1).
81	MST2	Outputs strobe signal to the expander (MAIN-A; IC3, pin 1).
82	BCMAD*	Input port for RSSI signal from the RSSI signal selector (MAIN-A; IC30, pin 1).
83	BVSCAF*	Input port for VSC signal from the tone filter (IC2021, pin 7).
85	BRTONE*	Input port for CTCSS signals from the tone filter (MAIN-B UNIT; IC21, pin 1).
86	BSMAD*	Inputport for RSSI signal from the IF IC (MAIN-A/B UNITS; IC16, pin 13).
88	TEMP	Input port for internal temperature detection.
89	SCAD	Input port for RSSI signal from the IF IC (MAIN-A/B UNITS; IC20, pin 5) for band scope function.
90	CMAD	Input port for RSSI signal from the IF IC (MAIN-A UNIT; IC30, pin 1) for AFC function.
91	VSCAF	Input port for VSC signal from the tone filter (IC21, pin 1).
93	RTONE	Input port for CTCSS signals from the tone filter (MAIN-A UNIT; IC21, pin 7).
98	USBPOW	Outputs voltage line control signal to the 3.3V regulator (IC1, Q31, Q32, Q33). "High"=During in the USB audio mode.

*R2500 only

SECTION 5 ADJUSTMENT PROCEDURES

5-1 PREPARATION

When adjusting IC-R1500/R2500, controller for the R1500/R2500 and JIG cable (see the illust below) are required.

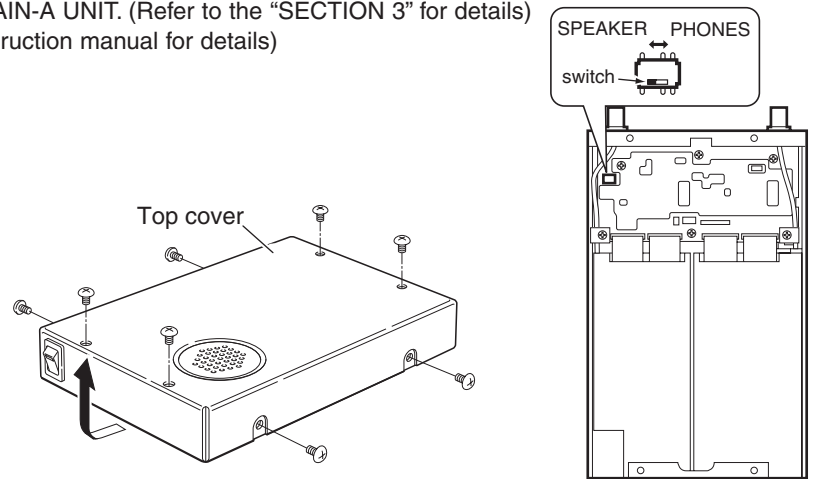
REQUIRED TEST EQUIPMENTS

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
Standard signal generator (SSG)	Frequency range : 0.1–3300 MHz Output level : 0.1 μ V to 32 mV (–127 to –17 dBm)	AC milliwattmeter	Measuring range : 10 μ W to 100 mW
Frequency counter	Frequency range : 0.1–30 MHz Frequency accuracy: \pm 1 ppm or better Sensitivity : 100 mV or better	External speaker	Input impedance : 8 Ω Capacity : More than 5 W

CAUTION!: BACK UP the originally programmed memory data in the receiver before starting the adjustment.
There is possibility of losing original memory data when the adjustment is finished.

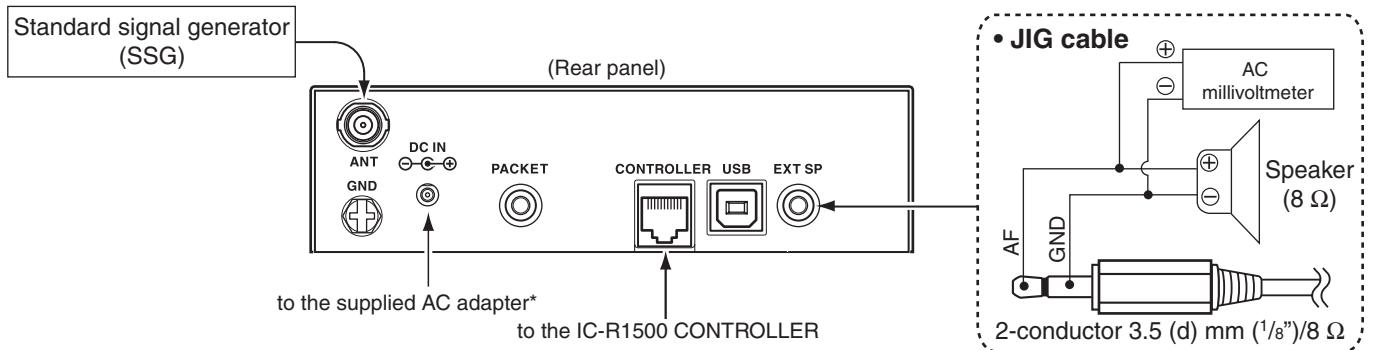
Before starting adjustment:

- Remove the top cover and shield cover on the MAIN-A UNIT. (Refer to the “SECTION 3” for details)
- Set the AF switch to “PHONES.” (Refer to the instruction manual for details)

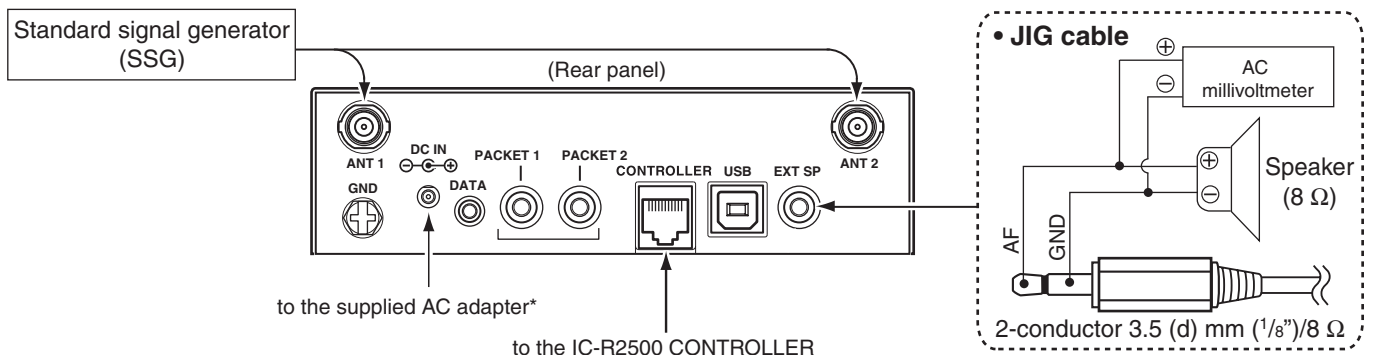


• CONNECTION

<FOR IC-R1500 ADJUSTMENT>



<FOR IC-R2500 ADJUSTMENT>



*; Optional product for [UK].

<FOR IC-R1500 ADJUSTMENT>

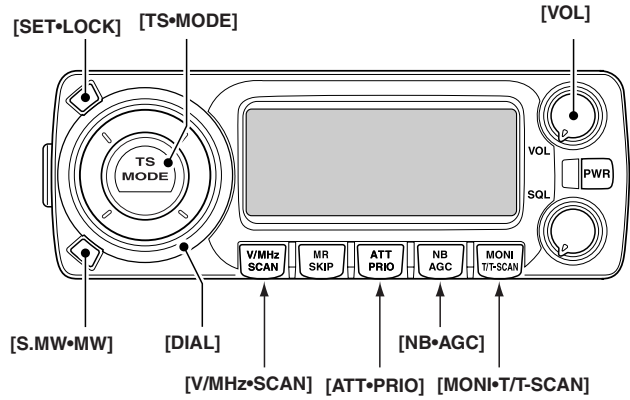
■ ENTERING ADJUSTMENT MODE

- ① Set the direction of the [VOL] to 12 o'clock (11–1 o'clock).
- ② Push and hold [TS•MODE]+[ATT•PRIO]+[NB•AGC] +[MONI•T/T-SCAN] key, and turn the power switch (MAIN UNIT) ON.

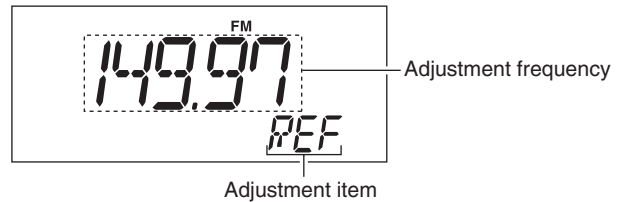
■ KEY ASSIGNMENTS FOR THE ADJUSTMENT MODE

- [SET•LOCK] : Selects the next adjustment item.
- [S.MW•MW] : Selects the previous adjustment item.
- [DIAL] : Adjusts the value for the item manually.
- [TS•MODE] : Adjusts the value for the item automatically. Stores the set value.
- [V/MHz•SCAN] : Verify the adjustment value for the item.
- [VOL] : Adjust the audio output level.

• CONTROLLER



• DISPLAY EXAMPLE



<FOR IC-R2500 ADJUSTMENT>

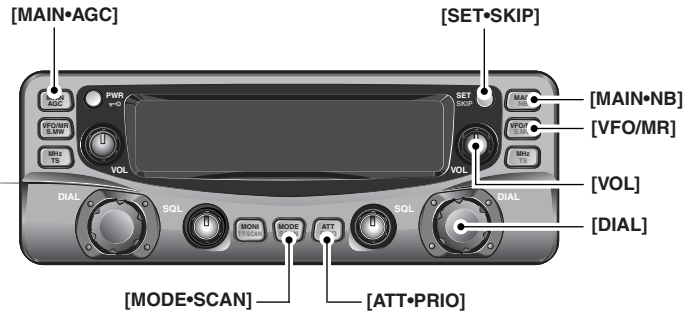
■ ENTERING ADJUSTMENT MODE

- ① Set the direction of the [VOL] (Right) to 12 o'clock (11–1 o'clock).
- ② Push and hold [MAIN•NB]+[MAIN•AGC]+[ATT•PRIO] +[MODE•SCAN] key, and turn the power switch (MAIN UNIT) ON.

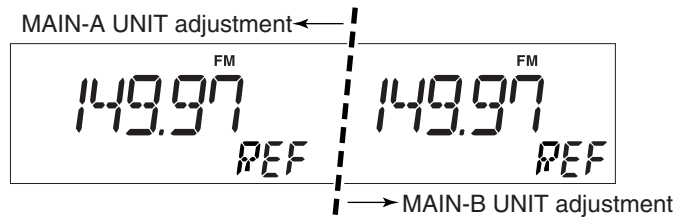
■ KEY ASSIGNMENTS FOR THE ADJUSTMENT MODE

- [MAIN•NB] : Selects the next adjustment item.
- [VFO/MR•S.MW] (Right band) : Selects the previous adjustment item.
- [DIAL] (Right band) : Adjusts the value for the item manually.
- [SET•SKIP] : Adjusts the value for the item automatically. Stores the set value.
- [ATT•PRIO] : Verify the adjustment value for the item.
- [VOL] (Right band) : Adjust the audio output level.

• CONTROLLER



• DISPLAY EXAMPLE



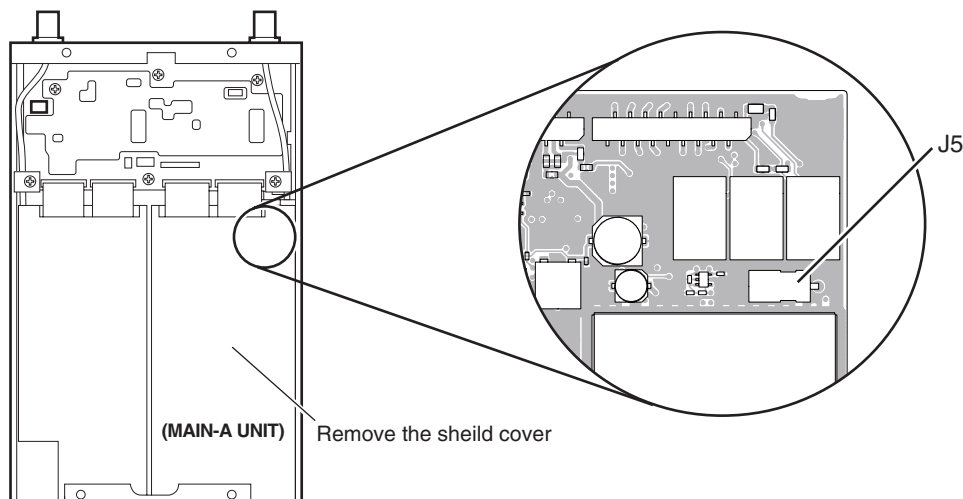
5-2 MAIN-A UNIT ADJUSTMENT

ADJUSTMENT	OPERATION	VALUE
REFERENCE FREQUENCY [REF] <i>REF</i>	1 • Connect a frequency counter to the J5 connector on the MAIN-A UNIT (see the illust below).	10.25000 MHz
	2 • Push [TS•MODE]/[SET•SKIP] to store the set value.	
BPF [LT1]–[HTF] <i>LT1-HTF</i>	1 • Preset the adjustment items as below before the “BPF” adjustment. [AGA] : “8A” [IFA] : “25”	Automatic adjustment
	2 • Connect an SSG to the antenna connector “ANT1” and set as; Frequency : Specified frequency* Modulation : none Level : Specified level†	
	3 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	4 • Repeat 2–3 for each specified frequency and level for [LT1] to [HTF].	
AGC GAIN (FM) [AGF] <i>AGF</i>	1 • Connect an SSG to the antenna connector and set as; Frequency : Specified frequency* Mode : FM Modulation : 1 kHz Deviation : 3.5 kHz Level : +34 dBμ (–73 dBm)‡	50 mW
	2 • Connect a speaker and milliwatt meter then set the audio output level to 50 mW with [VOL].	
	3 • Push [SET•LOCK]/[MAIN•NB] to select next adjustment item.	
(AM) [AGA] <i>AGA</i>	4 • Set the SSG as; Frequency : Specified frequency* Mode : AM Modulation : 1 kHz Deviation : 70% Level : +34 dBμ (–73 dBm)‡	50 mW
	5 • Set the audio output level to 50 mW with [DIAL]. • Verify that the demodulated audio signals are not distorted badly.	
	6 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
IF GAIN (FM) [IFF] <i>IFF</i>	1 • Set the SSG as; Level : OFF	50 mW
	2 • Connect a speaker and milliwatt meter then set the audio output level to 50 mW with [VOL].	
	3 • Push [SET•LOCK]/[MAIN•NB] to select next adjustment item.	
(AM) [IFA] <i>IFA</i>	4 • Set the audio output level to 80 μW with [DIAL].	80 μW
	5 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	

†Refer to the “ADJUSTMENT ITEM LIST” on page 5-7.

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

*Displayed on the controller's display.



5-2 MAIN-A UNIT ADJUSTMENT (continued)

ADJUSTMENT	OPERATION	VALUE
S-METER [NS0]–[WS6] <i>n50 - w56</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [NS0] to [WS6].	
S-METER FLATNESS [L1]–[LEH] <i>L1 - LEH</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	3 • Repeat 1-2 for each specified frequency and value for [L1] to [LEH].	
BAND SCOPE [SC0]–[SC6] <i>SC0 - SC6</i>	1 • Set the SSG as; Frequency : Specified frequency * Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [SC0] to [SC6].	
CENTER METER [CML] (LOW) <i>CnL</i>	1 • Set the SSG as; Frequency : 3 kHz lower than specified frequency* Modulation : None Level : +34 dB μ (–73 dBm) [‡]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
[CMH] (HIGH) <i>CnH</i>	1 • Set the SSG as; Frequency : 3 kHz higher than specified frequency* Modulation : None Level : +34 dB μ (–73 dBm) [‡]	
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
SQUELCH [SQL] <i>SQL</i>	1 • Set the SSG as; Frequency : Specified frequency* Mode : FM Modulation : 1 kHz Deviation : 3.5 kHz Level : –13 dB μ (–120 dBm) [‡]	Automatic adjustment
	2 • Set the [SQL] value to close the squelch with [DIAL]. Then set the [SQL] value at the point where the audio signals just appear.	
	3 • Turn the SSG output OFF, and verify that the squelch is closed.	
	4 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
RSSI [RS0]–[RS6] <i>RS0 - RS6</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [RS0] to [RS6].	
RSSI FLATNESS [R5L]–[R8H] <i>RSL - R8H</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [R5L] to [R8H].	

[†]Refer to the “ADJUSTMENT ITEM LIST” on page 5-7.

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

*Displayed on the controller's display.

5-3 MAIN-B UNIT ADJUSTMENT (R2500 only)

ADJUSTMENT	OPERATION	VALUE
BPF [LT1]–[HTF] <i>LT1-HTF</i>	1 • Set the adjustment items as below before the “BPF” adjustment. [AGA] : “8A” [IFA] : “25”	Automatic adjustment
	2 • Connect an SSG to the antenna connector “ANT1” and set as; Frequency : Specified frequency* Modulation : none Level : Specified level†	
	3 • Push [SET•SKIP] to store the set value.	
	4 • Repeat 2–3 for each specified frequency then level for [LT1] to [HTF].	
AGC GAIN (FM) [AGF] <i>AGF</i>	1 • Connect an SSG to the antenna connector and set as; Frequency : Specified frequency* Mode : FM Deviation : 3.5 kHz Level : +34 dBμ (–73 dBm)‡ Modulation : 1 kHz	50 mW
	2 • Connect a speaker and milliwatt meter and set the audio output level to 50 mW with [VOL] .	
	3 • Push [MAIN•NB] to select next adjustment item.	
(AM) [AGA] <i>AGA</i>	4 • Set the SSG as; Frequency : Specified frequency* Mode : AM Deviation : 70% Level : +34 dBμ (–73 dBm)‡ Modulation : 1 kHz	50 mW
	5 • Set the audio output level to 50 mW with [DIAL] . • Verify that the demodulated audio signals are not distorted badly.	
	6 • Push [SET•SKIP] to store the adjustment value.	
IF GAIN (FM) [IFF] <i>IFF</i>	1 • Set the SSG as; Level : OFF	50 mW
	2 • Connect a speaker and milliwatt meter then set the audio output level to 50 mW with [VOL] .	
	3 • Push [SET•LOCK]/[MAIN•NB] to select next adjustment item.	
(AM) [IFA] <i>IFA</i>	4 • Set the audio output level to 80 μW with [DIAL] .	80 μW
	5 • Push [TS•MODE]/[SET•SKIP] to store the adjustment value.	

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

*Displayed on the controller's display.

5-3 MAIN-B UNIT ADJUSTMENT (R2500 only; continued)

ADJUSTMENT	OPERATION	VALUE
S-METER [NS0]–[WS6] <i>n50-w56</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [NS0] to [WS6].	
S-METER FLATNESS [L5L]–[L8H] <i>L5L-L8H</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
	3 • Repeat 1-2 for each specified frequency and value for [L5L] to [L8H].	
CENTER METER [CML] (LOW) <i>CnL</i>	1 Set the SSG as; Frequency : 3 kHz lower than specified frequency* Modulation : None Level : +34 dBμ (–73 dBm) [‡]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
[CMH] (HIGH) <i>CnH</i>	1 • Set the SSG as; Frequency : 3 kHz higher than specified frequency* Modulation : None Level : +34 dBμ (–73 dBm) [‡]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
SQUELCH [SQL] <i>SQL</i>	1 • Set the SSG as; Frequency : Specified frequency* Mode : FM Modulation : 1 kHz Deviation : 3.5 kHz Level : –13 dBμ (–120 dBm) [‡]	Automatic adjustment
	2 • Set the [SQL] value to close the squelch with [DIAL]. Then set the [SQL] value at the point where the audio signals just appear.	
	3 • Turn the SSG output OFF, and verify that the squelch is closed.	
	4 • Push [SET•SKIP] to store the adjustment value.	
RSSI [RS0]–[RS6] <i>R50-R56</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [RS0] to [RS6].	
RSSI FLATNESS [R5L]–[R8H] <i>R5L-R8H</i>	1 • Set the SSG as; Frequency : Specified frequency* Modulation : None Level : Specified level [†]	Automatic adjustment
	2 • Push [SET•SKIP] to store the adjustment value.	
	3 • Repeat 1–2 for each specified frequency and value for [R5L] to [R8H].	

[†]Refer to the “ADJUSTMENT ITEM LIST” on page 5-7.

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

*Displayed on the controller's display.

• ADJUSTMENT ITEM LIST

ADJUSTMENT ITEM	Disp.	RF Level† (dBμ/dBm)	ADJUSTMENT ITEM	Disp.	RF Level† (dBμ/dBm)	ADJUSTMENT ITEM	Disp.	RF Level† (dBμ/dBm)	ADJUSTMENT ITEM	Disp.	RF Level† (dBμ/dBm)
REFERENCE FREQUENCY	REF*	-		NS3	11/-96		LA2*	34/-73		RS4	25/-82
				NS5	18/-89		LA3*	34/-73		RS6	35/-72
	LT1	35/-72		NS7	26/-81		LA4*	34/-73		R5L	20/-87
	MT1	35/-72		NS9	34/-73		LA5*	34/-73		R51	20/-87
	HT1	35/-72		NS2	45/-62		LA6*	34/-73		R52	20/-87
	LT2	35/-72		NS4	55/-52		LA7*	34/-73		R53	20/-87
	MT2	35/-72		NS6	65/-42		LA8*	34/-73		R54	20/-87
	HT2	35/-72	S-METER	WS0	9/-98		LAH*	34/-73		R55	20/-87
	LT3	35/-72		WS3	16/-91		LB1*	34/-73		R56	20/-87
	MT3	35/-72		WS5	22/-85		LB2*	34/-73		R57	20/-87
	HT3	35/-72		WS7	28/-79		LB3*	34/-73		R5H	20/-87
	LT4	35/-72		WS9	34/-73		LB4*	34/-73		R6L	20/-87
	MT4	35/-72		WS2	45/-62		LB5*	34/-73		R61	20/-87
	HT4	35/-72		WS4	55/-52		LB6*	34/-73		R62	20/-87
	LT5	35/-72		WS6	65/-42		LB7*	34/-73		R63	20/-87
	MT5	35/-72		L1.*	34/-73		LB8*	34/-73		R64	20/-87
	HT5	35/-72		L2.*	34/-73		LB9*	34/-73		R65	20/-87
	LT6	35/-72		L3.*	34/-73		LBA*	34/-73		R66	20/-87
	MT6	35/-72		L4.*	34/-73		LBH*	34/-73		R6H	20/-87
	HT6	35/-72		L5L	34/-73		LCL*	34/-73		R7L	20/-87
	LT7	35/-72		L51	34/-73		LCH*	34/-73		R71	20/-87
	MT7	35/-72		L52	34/-73	S-METER FLATNESS	LDL*	39/-68		R72	20/-87
	HT7	35/-72		L53	34/-73		LD1*	39/-68	RSSI FLATNESS	R73	20/-87
	LT8	35/-72		L54	34/-73		LD2*	39/-68		R74	20/-87
	MT8	35/-72		L55	34/-73		LD3*	39/-68		R75	20/-87
	HT8	35/-72		L56	34/-73		LD4*	39/-68		R76	20/-87
	LT9	35/-72		L57	34/-73		LD5*	39/-68		R77	20/-87
	MT9	35/-72		L5H	34/-73		LD6*	39/-68		R78	20/-87
	HT9	35/-72		L6L	34/-73		LD7*	39/-68		R7H	20/-87
	LTA	35/-72		L61	34/-73		LD8*	39/-68		R8L	20/-87
	HTA	35/-72		L62	34/-73		LDH*	39/-68		R81	20/-87
	LTB	40/-67		L63	34/-73		LEL*	39/-68		R82	20/-87
	MTB	40/-67		L64	34/-73		LE1*	39/-68		R83	20/-87
	HTB	40/-67		L65	34/-73		LE2*	39/-68		R84	20/-87
	LTC	40/-67		L66	34/-73		LE3*	39/-68		R85	20/-87
	HTC	40/-67		L6H	34/-73		LE4*	39/-68		R86	20/-87
	LTD	40/-67		L7L	34/-73		LE5*	39/-68		R87	20/-87
	HTD	40/-67		L71	34/-73		LE6*	39/-68		R88	20/-87
	LTE	40/-67		L72	34/-73		LE7*	39/-68		R89	20/-87
	THE	40/-67	S-METER FLATNESS	L73	34/-73		LE8*	39/-68		R8A	20/-87
	LTF	40/-67		L74	34/-73		LE9*	39/-68		R8H	20/-87
	MTF	40/-67		L75	34/-73		LEA*	40/-67			
	HTF	40/-67		L76	34/-73		LEH*	42/-65			
AGC gain	AGF	34/-73		L77	34/-73		SC0*	0/-107			
	AGA	34/-73		L78	34/-73		SC3*	10/-97			
IF gain	IFF	off		L7H	34/-73		SC5*	20/-87			
	IFA	off		L8L	34/-73	BAND SCOPE	SC7*	30/-77			
				L81	34/-73		SC9*	40/-67			
	NS0	0/-107		L82	34/-73		SC2*	50/-57			
	NS3	7/-100		L83	34/-73		SC4*	60/-47			
	NS5	14/-93		L84	34/-73		SC6*	70/-37			
	NS7	24/-83		L85	34/-73		CML	34/-73			
	NS9	34/-73		L86	34/-73	CENTER METER	CMH	34/-73			
	NS2	49/-58		L87	34/-73		SQL	-13/-120			
	NS4	64/-43		L88	34/-73	SQUELCH	RS0	-5/-112			
	NS6	79/-28		L89	34/-73		RS3	0/-107			
S-METER	WS0	0/-107		L8A	34/-73		RS5	5/-102			
	WS3	7/-100		L8H	34/-73		RS7	10/-97			
	WS5	14/-93		L9L*	34/-73	RSSI	RS9	15/-92			
	WS7	24/-83		L9H*	34/-73		RS2	20/-87			
	WS9	34/-73		LAL*	34/-73						
	WS2	49/-58		LA1*	34/-73						
	WS4	64/-43									
	WS6	79/-28									
	NS0	4/-103									

*: Not necessary for MAIN-B adjustment.

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

SECTION 6 PARTS LIST

• IC-R1500 IC-R2500

[REPLACEMENT UNITS]

ORDER NO.	UNIT NAME
0328800101	U R1500 CONTROL
0328790101	U R2500 CONTROL

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
IC1	1180002391	S.REG S-812C33AMC-C2N-G	T	47.3/40.1
IC2	1110002350	S.IC BA6161F	T	10.3/20.8
IC3	1110006090	S.IC XC6202P502PR	T	119.7/41.1
IC4	1130011781	S.IC SN74AHC2G53HDCT3	T	91.2/15.5
IC6	1180001071	S.IC TA7805F (TE16L Q)	B	132.5/43.4
IC7	1180002910	S.REG AN7708SP-E1	B	131.3/34.5
IC8	1110001401	S.IC μPC1555G2-E1-A	T	104/23.7
IC9	1180000970	S.IC AN78L05M-(E1)	T	109.1/40.1
IC12	1110003091	IC LA4425A-E	T	
IC14	1140012950	S.IC 24LC512T-I/SM	B	64.6/43
IC15	1130011990	S.IC SN74LVC1G08DCKR	T	31.9/33.6
IC16	1190002240	S.IC PCM2901E/2K	T	38.7/33.4
IC17	1130011860	S.IC SM6451BT-G-E2	T	46.3/23.6
IC18	1140013082	S.IC M30624FGPGP (RX2879A2)		
		[EUR], [UK], [CAN], [EXP-1]	B	73.9/33.1
	1140013083	S.IC M30624FGPGP RX2879A-3		
		[SEA]	B	73.9/33.1
	1140013085	S.IC M30624FGPGP (RX2879A-5)		
		[FRA], [EXP]	B	73.9/33.1
	1140013090	S.IC M30624FGPGP (RX-2879B)		
		[USA], [USA-2]	B	73.9/33.1
IC19	1130012960	S.IC BU8872FS-E2	B	91.7/39.6
IC20	1190002231	S.IC CP2101-GM	T	27.4/29.1
IC21	1110006380	S.IC LM2904PWR	T	90.1/23.9
IC23	1130011781	S.IC SN74AHC2G53HDCT3	T	74.6/16.6
IC27	1110006380	S.IC LM2904PWR	T	81.3/19.4
IC32	1190002261	S.IC USB2502-AEZG	T	24.1/37.3
IC34	1130011760	S.IC CD4094BPWR	T	92/37.5
IC35	1110005771	S.IC S-80942CNMC-G9CT2G	B	59.1/31.7
IC36	1130011760	S.IC CD4094BPWR	T	97.6/37.5
IC37	1130011990	S.IC SN74LVC1G08DCKR	B	58.5/35.7
IC40	1130011781	S.IC SN74AHC2G53HDCT3	T	51.8/48
IC41	1130011781	S.IC SN74AHC2G53HDCT3	T	48.4/48
IC2006*	1180001071	S.IC TA7805F (TE16L Q)	B	132.5/26.3
IC2007*	1180002910	S.REG AN7708SP-E1	B	131.3/17.8
IC2021*	1110006380	S.IC LM2904PWR	T	30.3/21
IC2023*	1130011781	S.IC SN74AHC2G53HDCT3	T	42.9/16.1
IC2027*	1110006380	S.IC LM2904PWR	T	33.7/15.3
IC2028*	1130011781	S.IC SN74AHC2G53HDCT3	T	59.2/39.8
IC2029*	1130011781	S.IC SN74AHC2G53HDCT3	T	95.5/14.7
IC2031*	1130011781	S.IC SN74AHC2G53HDCT3	T	24.7/16.2
IC2038*	1130011801	S.IC SN74AHC1G66HDBV3	T	48.2/35.8
IC2039*	1130011781	S.IC SN74AHC2G53HDCT3	T	81.1/25.3
Q4	1550000100	S.FET 2SJ377 (TE16L1 NQ)	T	131.5/43.1
Q5	1520000651	S.TR 2SB1201S-TL-E	T	6.5/31.8
Q6	1590000430	S.TR DTC144EUA T106	T	124.6/41.5
Q8	1590001170	S.TR XP1501-(TX) AB	T	13/31.8
Q9	1530003630	S.TR 2SC4617 TLS	T	16.7/20.6
Q12	1530003091	S.TR 2SC4213-B (TE85R F)	B	10/52.4
Q15	1510001100	S.TR 2SA1832-GR (TE85R)	T	45.1/33.4
Q18	1530003630	S.TR 2SC4617 TLS	T	69.1/14.1
Q25	1590003240	S.TR UNR9114J-(TX)	T	32.5/38.1
Q26	1590003450	S.TR UNR9214J-(TX)	T	32.3/36
Q31	1520000201	S.TR 2SB798-T2-AZ DK	T	38.8/40.8
Q32	1530002691	S.TR 2SC4116-GR (TE85R F)	T	43.3/39.3
Q33	1590003450	S.TR UNR9214J-(TX)	T	44.1/42.8
Q2001*	1590000430	S.TR DTC144EUA T106	T	133/31.8
Q2002*	1520000561	S.TR 2SB1123 T-TD-E	T	132/23
Q2015*	1510001100	S.TR 2SA1832-GR (TE85R)	T	48.9/31.2
Q2018*	1530003630	S.TR 2SC4617 TLS	T	48.4/15.9
Q2019*	1520000201	S.TR 2SB798-T2-AZ DK	T	66.1/24.7
Q2020*	1520000201	S.TR 2SB798-T2-AZ DK	T	125.9/23
Q2021*	1530002851	S.TR 2SC4116-BL (TE85R F)	T	69.2/21.6
Q2022*	1530002851	S.TR 2SC4116-BL (TE85R F)	T	123.8/18.9
Q2023*	1510001100	S.TR 2SA1832-GR (TE85R)	T	53.6/36.2
Q2024*	1510001100	S.TR 2SA1832-GR (TE85R)	T	119.6/18.4
Q2039*	1590003450	S.TR UNR9214J-(TX)	T	64.8/29.6
D1	1710000840	S.DIO 1SR154-400 TE25	T	107.5/55.5

*IC-R2500 only

[LOGIC UNIT]

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
D2	1750000550	S.DIO 1SS355 TE-17	T	9.8/24.5
D6	1750000111	S.DIO 1SS272 (TE85R F)	T	99.8/16.4
D8	1730002320	S.ZEN MA8051-M (TX)	T	102.5/16.8
D14	1790001250	S.DIO MA2S111-(TX)		
		Except [EUR], [UK], [USA], [USA-2] only	T	84.6/41.3
D15	1790001250	S.DIO MA2S111-(TX)		
		[USA], [FRA], [CAN] only	T	83.4/41.3
D16	1790001250	S.DIO MA2S111-(TX)		
		[UK], [USA], [CAN] only	T	81.6/41.3
		[EUR], [FRA] only	T	80.4/41.3
D17	1790001250	S.DIO MA2S111-(TX)		
		[EUR], [FRA] only	T	79.2/41.3
D18	1790001250	S.DIO MA2S111-(TX)		
D20	1790001250	S.DIO MA2S111-(TX)		
		[EUR], [FRA] only	T	84.2/38.7
D21	1790001250	S.DIO MA2S111-(TX)		
D23	1790001250	S.DIO MA2S111-(TX)		
D24	1790001250	S.DIO MA2S111-(TX)		
		[EUR], [FRA] only	T	83/38.7
		[EUR], [FRA] only	T	80/38.8
		[EUR], [FRA] only	T	78.8/38.8
D26	1750000771	S.VCP HVC376BTRF-E	B	68.6/22.2
D27	1790001250	S.DIO MA2S111-(TX)	T	43.5/41.2
D28	1750000940	S.DIO ISS400 TE61	T	89.4/30.8
D30	1750000940	S.DIO ISS400 TE61	T	50.8/52.5
D31	1750000940	S.DIO ISS400 TE61	T	51.6/51.3
D32	1750000940	S.DIO ISS400 TE61	T	48.9/53.7
D33	1750000940	S.DIO ISS400 TE61	T	48.3/51.3
D34	1750000940	S.DIO ISS400 TE61	T	79.4/43.3
D35	1790001240	S.DIO MA2S728-(TX)	T	112.1/34.5
D36	1790001240	S.DIO MA2S728-(TX)	B	57.9/41.8
D37	1790001240	S.DIO MA2S728-(TX)	B	59.2/40
D2012*	1790001250	S.DIO MA2S111-(TX)	T	67.3/21.1
D2013*	1790001250	S.DIO MA2S111-(TX)	T	125.7/18.8
D2029*	1750000940	S.DIO ISS400 TE61	T	63.7/27.6
X1	6050012260	S.XTL CR-815 (24.000 MHz)	B	24.8/36.4
X2	6050012320	S.XTL CR-818 (4.194304 MHz)	B	100.1/38.9
X3	6050012270	S.XTL CR-816 (12.000 MHz)	B	34.6/34.2
X4	6050012270	S.XTL CR-816 (12.000 MHz)	B	61.7/23
L2	6180002651	COL RCR875DNP-472K		
L5	6200007420	S.COL ELJFC 101K-F	T	99.9/23.9
L6	6200003520	S.COL ELJFB 102K-F	T	16.3/24.9
L7	6200007420	S.COL ELJFC 101K-F	T	107.2/18.6
R1	7030003500	S.RES ERJ3GEYJ 332 V (3.3 k)	T	102.2/29
R2	7030003620	S.RES ERJ3GEYJ 333 V (33 k)	T	104/29
R4	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	126.4/41.3
R5	7030010040	S.RES ERJ2GEJ-JPW	T	37.2/46.4
R6	7030010040	S.RES ERJ2GEJ-JPW	T	36.6/48.8
R7	7030005000	S.RES ERJ2GEJ 471 X (470)	T	126/42.9
R8	7030005290	S.RES ERJ2GEJ 682 X (6.8 k)	T	15.3/33
R11	7030008410	S.RES ERJ2GEJ 392 X (3.9 k)	T	13.7/34
R13	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	86.8/46.4
R14	7030005010	S.RES ERJ2GEJ 681 X (680)	T	15.3/32.1
R15	7030003450	S.RES ERJ3GEYJ 122 V (1.2 k)	T	12.6/24.8
R18	7030005691	S.RES ERA3YED 123V (12 k)	T	19.3/34.5
R19	7030005120	S.RES ERJ2GEJ 102 X (1 k)	T	13.6/36.2
R20	7030000500	S.RES MCR10EZJH 10 k	T	10.9/36
R22	7030003380	S.RES ERJ3GEYJ 331 V (330)	T	115.5/39.2
R23	7030003220	S.RES ERJ3GEYJ 150 V (15)	T	101.6/19
R25	7030005160	S.RES ERJ2GEJ 105 X (1 M)	B	21/38.2
R28	7030003680	S.RES ERJ3GEYJ 104 V (100 k)	T	19.3/20.1
R29	7030000100	S.RES MCR10EZJH 4.7 (4R7)	B	8/49.3
R30	7030003200	S.RES ERJ3GEYJ 100 V (10)	T	107.7/16.1
R31	7030003630	S.RES ERJ3GEYJ 393 V (39 k)	T	16.7/18.8
R32	7030005000	S.RES ERJ2GEJ 471 X (470)	T	28.4/42.2
R33	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	23.8/41.8
R40	7030005050	S.RES ERJ2GEJ 103 X (10 k)	B	10.3/49.6
R41	7030005060	S.RES ERJ2GEJ 333 X (33 k)	B	10.7/48.4
R44	7030005240	S.RES ERJ2GEJ 473 X (47 k)	T	38.3/24.8
R46	7030005220	S.RES ERJ2GEJ 223 X (22 k)	B	30.2/22.6
R47	7030005030	S.RES ERJ2GEJ 152 X (1.5 k)	T	30/33.6
R48	7030007250	S.RES ERJ2GEJ 220 X (22)	T	32.6/31.6
R50	7030005600	S.RES ERJ2GEJ 273 X (27 k)	T	46.1/35.4
R52	7030007340	S.RES ERJ2GEJ 153 X (15 k)	B	61.2/39.6
R53	7030007250	S.RES ERJ2GEJ 220 X (22)	T	31.1/31.6
R54	7030005160	S.RES ERJ2GEJ 105 X (1 M)	T	40.3/28.4
R56	7030005090	S.RES ERJ2GEJ 104 X (100 k)	B	59.5/42.6
R58	7030004980	S.RES ERJ2GEJ 101 X (100)	T	47/33.6
R60	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	47.2/29.6
R64	7030007340	S.RES ERJ2GEJ 153 X (15 k)	B	94.9/44.2
R65	7030008410	S.RES ERJ2GEJ 392 X (3.9 k)	B	94.9/43.3
R68	7030008300	S.RES ERJ2GEJ 184 X (180 k)	B	84.9/24.7

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

[MAIN-A UNIT]

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Contains parts like LMV321DCKR, UNR9213J-TX, 2SC4617 TLS, etc.

[MAIN-A UNIT]

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Contains parts like S.DIO 1SV308 (TPL3 F), S.VCP 1SV290 (TPH3 F), etc.

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

[MAIN-A UNIT]

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Contains parts list for MAIN-A UNIT including components like ECJ0EB1E102K, CNR TMP-S01X-B1, and S.BEA MMZ1608Y 102BT.

[MAIN-B UNIT] (IC-R2500 only)

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Contains parts list for MAIN-B UNIT (IC-R2500 only) including components like CD4094BPWR, S.IC LA1145M-TLM-E, and S.VCP 1SV282 (TPH2 F).

[MAIN-B UNIT] (IC-R2500 only)

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Contains parts list for MAIN-B UNIT (IC-R2500 only) including components like 2SC4117-BL (TE85R F), S.VCP 1SV290 (TPH3 F), and S.DIO 1SV308 (TPL3 F).

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

[MAIN-B UNIT] (IC-R2500 only)

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Rows include part numbers like C82-C258 with descriptions such as S.CER ECJ0EB1E102K and locations like T 13.2/4.9.

[MAIN-B UNIT] (IC-R2500 only)

Table with columns: REF NO., ORDER NO., DESCRIPTION, M., H/V LOCATION. Rows include part numbers like C259-C363 with descriptions such as S.CER C1608 CH 1H 050B-T and locations like T 47.4/14.2.

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

[MAIN-B UNIT] (IC-R2500 only)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
C696	4030017460	S.CER ECJ0EB1E102K	B	49.9/41.1
C697	4030017460	S.CER ECJ0EB1E102K	B	54.2/13.6
C703	4030017460	S.CER ECJ0EB1E102K	B	18.9/27.7
C704	4030017460	S.CER ECJ0EB1E102K	B	7.4/29
C705	4030017460	S.CER ECJ0EB1E102K	T	7.1/28.5
C706	4030017460	S.CER ECJ0EB1E102K	B	15.7/20.7
C707	4030017460	S.CER ECJ0EB1E102K	B	17.2/18
C708	4030017460	S.CER ECJ0EB1E102K	B	51.2/4.9
C710	4030018860	S.CER ECJ0EBOJ105K	T	24.4/28.2
C724	4030017520	S.CER ECJ0EC1H0R3B	T	18.8/23.7
C725	4030017440	S.CER ECJ0EC1H221J	B	34.5/9.7
C726	4030017440	S.CER ECJ0EC1H221J	B	34.5/8.7
C727	4030017440	S.CER ECJ0EC1H221J	B	35.1/7
C728	4030017460	S.CER ECJ0EB1E102K	B	35.5/16.2
C729	4030017460	S.CER ECJ0EB1E102K	B	35.4/13.2
J1	6510018450	CNR TMP-S01X-B1		
J2	6510020531	S.CNR 52808-1871	T	124.9/14.2
J3	6510020531	S.CNR 52808-1871	T	124.9/36.2
J5	6510018450	CNR TMP-S01X-B1		
EP1	6910012350	S.BEA MMZ1608Y 102BT	B	65.3/16.9
EP2	6910012350	S.BEA MMZ1608Y 102BT	B	63.5/16.1
EP3	6910012350	S.BEA MMZ1608Y 102BT	T	73.3/29
EP4	6910012350	S.BEA MMZ1608Y 102BT	T	66.9/28.7
EP5	6910014690	S.BEA MPZ1608S221A-T	T	118.9/26.3
EP6	6910014690	S.BEA MPZ1608S221A-T	T	125/2
EP7	6910014690	S.BEA MPZ1608S221A-T	T	119.8/22.7
EP8	6910014690	S.BEA MPZ1608S221A-T	T	118.1/9.7

[CONTROL UNIT] (R1500)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
IC2	1110005991	S.IC S-80945CNMC-G9F-T2G	B	41/5.8
IC5	1180000421	S.IC TA78L05F (TE12R F)	B	35.7/28.1
IC7	1140013072	S.IC µPD78F0338GC-9EB-A	B	59.8/17.5
Q1	1530002691	S.TR 2SC4116-GR (TE85R F)	B	81.2/8.9
Q3	1510000691	S.TR 2SA1734 (TE12R F)	B	76.9/14.6
Q6	1530002691	S.TR 2SC4116-GR (TE85R F)	B	80.8/18.7
Q7	1530002691	S.TR 2SC4116-GR (TE85R F)	B	90/10.3
D4	1790001000	S.ZEN MA8062-L (TX)	B	42.2/27.1
D5	1790001170	S.ZEN MA8068-M (TX)	B	80.5/12.1
D6	1750000940	S.DIO ISS400 TE61	B	51.2/7
D7	1750000940	S.DIO ISS400 TE61	B	50.5/5.6
D8	1750000940	S.DIO ISS400 TE61	B	73.3/11.2
D9	1750000940	S.DIO ISS400 TE61	B	75.8/8.7
D10	1750000940	S.DIO ISS400 TE61	B	72/9.4
D11	1750000940	S.DIO ISS400 TE61	B	66.5/5.8
X1	6060000610	S.CER EFOS4914E3	B	46/7.7
R1	7210002920	VAR EVU-F2AF20B55 (560K)		
R2	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	97.1/18.2
R5	7210002920	VAR EVU-F2AF20B55 (560K)		
R6	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	95.5/10.5
R13	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	85.6/8.5
R21	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	82.8/11.2
R22	7030003760	S.RES ERJ3GEYJ 474 V (470 k)	B	79.5/6.9
R24	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	68.6/5.8
R25	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	70.5/8.7
R41	7030003800	S.RES ERJ3GEYJ 105 V (1 M)	B	49/12.3
R42	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	81.2/15.8
R43	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	87.7/10.5
R44	7030001120	S.RES MCR50JZHJ 820 (82)	B	74.4/22.1
R58	7030003840	S.RES ERJ3GEYJ 225 V (2.2 M)	B	45.4/21.9
R62	7030003840	S.RES ERJ3GEYJ 225 V (2.2 M)	B	47.2/19.7
R65	7030000410	S.RES MCR10EZJHJ 1.8 k	B	83.7/5.5
R74	7030000410	S.RES MCR10EZJHJ 1.8 k	B	9.4/31.1
R75	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	46.4/12.6
R76	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	45.4/17.9
R77	7030003570	S.RES ERJ3GEYJ 123 V (12 k)	B	46.2/15.9
R79	7030000380	S.RES MCR10EZJHJ 1 k	B	11.5/22.3
R80	7030000380	S.RES MCR10EZJHJ 1 k	B	9.7/22.8
R81	7030000410	S.RES MCR10EZJHJ 1.8 k	B	40.7/2.4
R82	7030000410	S.RES MCR10EZJHJ 1.8 k	B	35.5/3.6
R83	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	50.4/10.6
R84	7030003860	S.RES ERJ3GE JPW V	B	53/6.7
R86	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	54.3/6.6
R87	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)	B	14.7/11.3

[CONTROL UNIT] (R1500)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
R89	7030003860	S.RES ERJ3GE JPW V	B	92.1/11.4
R91	7030003840	S.RES ERJ3GEYJ 225 V (2.2 M)	B	83.3/7.9
C1	4030006900	S.CER C1608 JB 1H 103K-T	B	99.7/18.1
C3	4030006900	S.CER C1608 JB 1H 103K-T	B	93.7/10.9
C5	4030007130	S.CER C1608 CH 1H 101J-T	B	86.3/10.4
C7	4030007130	S.CER C1608 CH 1H 101J-T	B	68.6/4.5
C8	4030007130	S.CER C1608 CH 1H 101J-T	B	84.8/10.4
C10	4030007130	S.CER C1608 CH 1H 101J-T	B	64.7/5.6
C25	4030006860	S.CER C1608 JB 1H 102K-T	B	39.9/27.8
C26	4030006900	S.CER C1608 JB 1H 103K-T	B	38.6/5.4
C27	4030006860	S.CER C1608 JB 1H 102K-T	B	29.9/27.8
C29	4030006860	S.CER C1608 JB 1H 102K-T	B	33/9.8
C30	4030007090	S.CER C1608 CH 1H 470J-T	B	18.3/8.2
C31	4030007090	S.CER C1608 CH 1H 470J-T	B	15.5/8.2
C36	4030017480	S.CER C1608 JB 1A 474K-T	B	48.9/22.5
C37	4030011600	S.CER C1608 JB 1E 104K-T	B	46.8/24.1
C38	4030011600	S.CER C1608 JB 1E 104K-T	B	46.4/14
C39	4030011600	S.CER C1608 JB 1E 104K-T	B	71.8/14.8
C46	4510007310	S.ELE 16 CE 10 BS	B	72.1/3.3
C50	4030006860	S.CER C1608 JB 1H 102K-T	B	46.8/17.8
C51	4510009280	S.ELE EEE1EA4R7SR	B	77.8/3.1
C52	4030017480	S.CER C1608 JB 1A 474K-T	B	48.9/21
C53	4030017480	S.CER C1608 JB 1A 474K-T	B	45/25.7
C54	4030017480	S.CER C1608 JB 1A 474K-T	B	49.2/23.8
J2	6510021411	S.CNR S6B-ZR-SM4A-TF (LF) (SN)	B	39.6/17.5
DS13	5040003060	S.LED SML-512WWT86	T	60.1/6.7
DS14	5040003060	S.LED SML-512WWT86	T	48.7/6.7
DS15	5040003060	S.LED SML-512WWT86	T	71.5/6.7
DS16	5040003060	S.LED SML-512WWT86	T	82.9/6.7
DS17	5040003060	S.LED SML-512WWT86	T	37/6.7
DS18	5040003060	S.LED SML-512WWT86	T	9.1/2.6
DS20	5040003060	S.LED SML-512WWT86	T	9.1/32.3
DS21	5040002910	S.LED SML-020MYT	T	14.7/20.5
DS22	5040002920	LED CV1074	T	
DS23	5040003060	S.LED SML-512WWT86	B	33.4/3.8
DS24	5030002900	LCD A01B005X LCD 2880		
S1	2240000150	SW JRS0000-1401	T	102.2/17.5
S3	2260001890	S.SW SKQDPA	T	14.7/15.5
S4	2260001890	S.SW SKQDPA	T	37.3/3.2
S5	2260001890	S.SW SKQDPA	T	48.7/3.2
S6	2260001890	S.SW SKQDPA	T	60.1/3.2
S7	2260001890	S.SW SKQDPA	T	71.5/3.2
S8	2260001890	S.SW SKQDPA	T	82.9/3.2
S9	2260001890	S.SW SKQDPA	T	4.2/4.2
S10	2260001890	S.SW SKQDPA	T	4.2/30.8
S11	2260001890	S.SW SKQDPA	T	
EP9	6910015120	S.BEA MMZ2012D 301BT	B	36.9/8.1
EP10	6910012350	S.BEA MMZ1608Y 102BT	B	18.9/10.1
EP11	6910012350	S.BEA MMZ1608Y 102BT	B	17.5/10.1
EP12	6910015120	S.BEA MMZ2012D 301BT	B	15/9.7
EP13	6910012350	S.BEA MMZ1608Y 102BT	B	16.4/13.1
EP20	8930060040	LCT SRCN-2633-SP-N-W		

[CONTROL UNIT] (R2500)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
IC2	1110005991	S.IC S-80945CNMC-G9F-T2G	B	32.2/10.8
IC3	1180000421	S.IC TA78L05F (TE12R F)	B	22.2/9.2
IC4	1140013510	S.IC µPD780336GC-512-9EB-A	B	57.2/20.7
IC5	1130012990	S.IC LC75874W-E	B	80.5/30.5
Q1	1530002691	S.TR 2SC4116-GR (TE85R F)	B	79.8/7.3
Q3	1510000771	S.TR 2SA1586-GR (TE85R F)	B	76.3/9.6
Q6	1530002691	S.TR 2SC4116-GR (TE85R F)	B	101/29.6
Q7	1530002691	S.TR 2SC4116-GR (TE85R F)	B	98.2/26.9
Q8	1530002691	S.TR 2SC4116-GR (TE85R F)	B	101.2/32.5
Q9	1530002691	S.TR 2SC4116-GR (TE85R F)	B	95.8/24.5
Q10	1530002691	S.TR 2SC4116-GR (TE85R F)	B	103.3/34.2
Q11	1530002691	S.TR 2SC4116-GR (TE85R F)	B	94.5/20.4
Q12	1530002691	S.TR 2SC4116-GR (TE85R F)	B	104.7/31.6
Q13	1530002691	S.TR 2SC4116-GR (TE85R F)	B	96.9/20.5
Q14	1530002691	S.TR 2SC4116-GR (TE85R F)	B	80.2/10.6
Q15	1510000771	S.TR 2SA1586-GR (TE85R F)	B	76.9/13.4

[CONTROL UNIT] (R2500)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
D4	1790001000	S.ZEN MA8062-L (TX)	B	40.3/16.5
D5	1750000940	S.DIO ISS400 TE61	B	80.1/12.8
D8	1750000940	S.DIO ISS400 TE61	B	18.7/21.7
D9	1750000940	S.DIO ISS400 TE61	B	14/20.9
D10	1750000940	S.DIO ISS400 TE61	B	20/21.7
D11	1750000940	S.DIO ISS400 TE61	B	16.1/23.3
X1	6060000610	S.CER EFOS4914E3	B	38.9/28.3
R1	7210002920	VAR EVU-F2AF20B55 (560K)		
R2	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	20.4/32.5
R3	7210002920	VAR EVU-F2AF20B55 (560K)		
R4	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	116/37.5
R5	7210002920	VAR EVU-F2AF20B55 (560K)		
R6	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	43.6/17.4
R7	7210002920	VAR EVU-F2AF20B55 (560K)		
R8	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	87.4/9.8
R9	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	29.7/13.6
R10	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	117.4/22.6
R11	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	28.5/13.6
R12	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	114.6/22.6
R13	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	75.4/5.3
R19	7030003480	S.RES ERJ3GEYJ 222 V (2.2 k)	B	8.9/5.6
R20	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	76.8/7.6
R21	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	76.7/5.5
R22	7030003760	S.RES ERJ3GEYJ 474 V (470 k)	B	78.2/9.5
R24	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	10.4/22.1
R25	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	10.4/23.4
R41	7030003800	S.RES ERJ3GEYJ 105 V (1 M)	B	42/28.2
R42	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	102.8/28.2
R43	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	100.4/26.1
R44	7030000320	S.RES MCR10EZJH 331 (330)	B	98.7/29.8
R45	7030003390	S.RES ERJ3GEYJ 391 V (390)	B	99.8/20.5
R46	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	102.9/30.8
R47	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	98.3/24.9
R48	7030003380	S.RES ERJ3GEYJ 331 V (330)	B	99.4/32.8
R49	7030003390	S.RES ERJ3GEYJ 391 V (390)	B	92.6/19.4
R50	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	106/34
R51	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	95.8/22.5
R52	7030003380	S.RES ERJ3GEYJ 331 V (330)	B	103.2/36.1
R53	7030003390	S.RES ERJ3GEYJ 391 V (390)	B	94.1/17.6
R54	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	104.3/28.8
R55	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	98.7/22.3
R56	7030003380	S.RES ERJ3GEYJ 331 V (330)	B	106.5/29.6
R57	7030003390	S.RES ERJ3GEYJ 391 V (390)	B	96.2/17.6
R58	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	86.8/18.1
R59	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	83.1/17.6
R60	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	84.3/17.6
R65	7030003500	S.RES ERJ3GEYJ 332 V (3.3 k)	B	9.8/35.6
R66	7030003460	S.RES ERJ3GEYJ 152 V (1.5 k)	B	60.9/8.6
R67	7030003500	S.RES ERJ3GEYJ 332 V (3.3 k)	B	125/39.5
R72	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	T	52.1/14.3
R73	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	T	52/15.6
R74	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	118.7/22.6
R75	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	113.4/22.6
R76	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	82.7/11.3
R77	7030003760	S.RES ERJ3GEYJ 474 V (470 k)	B	77.7/11.6
R79	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	80.7/17.4
R80	7030003550	S.RES ERJ3GEYJ 822 V (8.2 k)	B	88.9/18.9
R83	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	32.8/13.2
R100	7030003610	S.RES ERJ3GEYJ 273 V (27 k)	B	77.1/17.5
R101	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	78.3/17.8
R102	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	42/19.4
R110	7030003330	S.RES ERJ3GEYJ 121 V (120)	T	35.3/28.1
R111	7030003340	S.RES ERJ3GEYJ 151 V (150)	T	35.3/32.4
R112	7030003330	S.RES ERJ3GEYJ 121 V (120)	T	50.3/29.7
R113	7030003340	S.RES ERJ3GEYJ 151 V (150)	T	50.3/30.9
R114	7030003330	S.RES ERJ3GEYJ 121 V (120)	T	67.9/29.6
R115	7030003340	S.RES ERJ3GEYJ 151 V (150)	T	67.9/30.8
R116	7030003330	S.RES ERJ3GEYJ 121 V (120)	T	85.5/29.7
R117	7030003340	S.RES ERJ3GEYJ 151 V (150)	T	85.5/30.9
R120	7030003640	S.RES ERJ3GEYJ 473 V (47 k)	B	102.5/39.3
R121	7030003680	S.RES ERJ3GEYJ 104 V (100 k)	B	104.9/39.3
C1	4030006880	S.CER C1608 JB 1H 472K-T	B	19.4/31.2
C2	4030006880	S.CER C1608 JB 1H 472K-T	B	117.1/39
C3	4030006880	S.CER C1608 JB 1H 472K-T	B	41/18.2
C4	4030006880	S.CER C1608 JB 1H 472K-T	B	90/9.8
C5	4030007130	S.CER C1608 CH 1H 101J-T	B	74.1/7.7
C7	4030007130	S.CER C1608 CH 1H 101J-T	B	10.4/20.8
C8	4030007130	S.CER C1608 CH 1H 101J-T	B	77.9/5
C10	4030007130	S.CER C1608 CH 1H 101J-T	B	9.6/26
C16	4030006900	S.CER C1608 JB 1H 103K-T	B	69.1/18.2
C24	4510008540	S.ELE EEE1CA100SR	T	57.6/14.2
C25	4030006860	S.CER C1608 JB 1H 102K-T	B	25.6/10.7
C26	4030006900	S.CER C1608 JB 1H 103K-T	B	28.1/11.6
C27	4030006860	S.CER C1608 JB 1H 102K-T	B	15.3/10.5
C28	4510008800	S.ELE EEE1EA100SR	T	35/9.9

[CONTROL UNIT] (R2500)

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
C29	4030006860	S.CER C1608 JB 1H 102K-T	B	11.7/18.2
C30	4030007090	S.CER C1608 CH 1H 470J-T	B	11.7/19.5
C31	4030007090	S.CER C1608 CH 1H 470J-T	B	3.8/13.3
C34	4030006900	S.CER C1608 JB 1H 103K-T	B	47.4/26.2
C35	4030011600	S.CER C1608 JB 1E 104K-T	B	88.9/17.4
C36	4030011600	S.CER C1608 JB 1E 104K-T	B	85.5/17.6
C37	4030011600	S.CER C1608 JB 1E 104K-T	B	81.9/17.6
C42	4030006860	S.CER C1608 JB 1H 102K-T	B	119.9/22.6
C43	4030006860	S.CER C1608 JB 1H 102K-T	B	112.2/22.6
C44	4030006860	S.CER C1608 JB 1H 102K-T	T	52.1/13
C45	4030006860	S.CER C1608 JB 1H 102K-T	T	52.9/16.8
C46	4030006860	S.CER C1608 JB 1H 102K-T	B	30.9/13.7
C47	4030006860	S.CER C1608 JB 1H 102K-T	B	115.8/24.1
C48	4030011600	S.CER C1608 JB 1E 104K-T	B	89.4/20.2
C49	4030009980	S.CER C1608 JB 1H 152K-T	B	79.5/17.4
C50	4030006900	S.CER C1608 JB 1H 103K-T	B	38.6/19.4
C51	4030006900	S.CER C1608 JB 1H 103K-T	B	37.4/11.2
C52	4030006900	S.CER C1608 JB 1H 103K-T	B	82.6/12.5
C53	4030006900	S.CER C1608 JB 1H 103K-T	B	111.1/33
J1	6510023110	CNR 3008L-8P8C <KIN>		
J2	6510023170	CNR 3008L-6P6C <KIN>		
DS1	5040001760	S.LED SEC 2422C	T	36.2/30.3
DS2	5040001760	S.LED SEC 2422C	T	45/30.3
DS4	5040001760	S.LED SEC 2422C	T	53.8/30.3
DS5	5040001760	S.LED SEC 2422C	T	62.6/30.3
DS7	5040001760	S.LED SEC 2422C	T	71.4/30.3
DS8	5040001760	S.LED SEC 2422C	T	80.2/30.3
DS10	5040001760	S.LED SEC 2422C	T	89/30.3
DS11	5040001760	S.LED SEC 2422C	T	97.8/30.3
DS13	5040003060	S.LED SML-512WWT86	T	11.2/28.5
DS14	5040003060	S.LED SML-512WWT86	T	11.9/41
DS15	5040003060	S.LED SML-512WWT86	T	72.3/9.3
DS16	5040003060	S.LED SML-512WWT86	T	122.7/28.5
DS17	5040003060	S.LED SML-512WWT86	T	122.1/41
DS18	5040003060	S.LED SML-512WWT86	T	61.7/9.3
DS20	5030002890	LCD A01B006X LCD 2879		
S1	2250000460	ECR EVQ-VENF0224B		
S2	2250000460	ECR EVQ-VENF0224B		
EP9	6910012350	S.BEA MMZ1608Y 102BT	B	11.7/16.9
EP10	6910012350	S.BEA MMZ1608Y 102BT	B	9.6/18.9
EP11	6910012350	S.BEA MMZ1608Y 102BT	B	5.1/13.3
EP12	6910012350	S.BEA MMZ1608Y 102BT	B	4.1/10.9
EP20	8930070390	LCT SRCN-2879-SP-N-W		

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.	H/V LOCATION
C64	4030017460	S.CER ECJ0EB1E102K	T	23/14
C65	4030016930	S.CER ECJ0EB1A104K	T	18.9/17.6
C66	4550007030	S.TAN TEESVP 0J 106M8R	T	22.4/12.6
C67	4030017490	S.CER C1608 JB 1A 105K-T	T	20/17.2
C68	4030017460	S.CER ECJ0EB1E102K	T	1.2/26.5
C69	4030017460	S.CER ECJ0EB1E102K	T	1.6/38.1
C70	4030017490	S.CER C1608 JB 1A 105K-T	T	20.9/37.9
C71	4030017460	S.CER ECJ0EB1E102K	T	19.2/37.5
C72	4030016930	S.CER ECJ0EB1A104K	B	24.4/19.1
C73	4030016930	S.CER ECJ0EB1A104K	T	25.7/38.9
C74	4030017620	S.CER ECJ0EC1H100C	T	23.6/32.2
C75	4030016930	S.CER ECJ0EB1A104K	T	24.8/32.7
C76	4030017460	S.CER ECJ0EB1E102K	B	4.9/18.8
C77	4030017460	S.CER ECJ0EB1E102K	T	24.8/27.2
C78	4030017460	S.CER ECJ0EB1E102K	B	10.3/21.3
C79	4030017460	S.CER ECJ0EB1E102K	T	18.9/38.7
C80	4030017460	S.CER ECJ0EB1E102K	T	9.3/21.3
C81	4030017460	S.CER ECJ0EB1E102K	T	10.3/13.3
C82	4550007070	S.TAN TEESVP 1A 475M8R	T	2.8/21.9
C83	4030016790	S.CER ECJ0EB1C103K	B	17.4/39.7
C84	4030016930	S.CER ECJ0EB1A104K	T	4.9/21.5
C86	4030017460	S.CER ECJ0EB1E102K	B	1.2/37.9
C88	4030017730	S.CER ECJ0EB1E471K	B	1.4/23.1
C89	4030017490	S.CER C1608 JB 1A 105K-T	B	2.9/21.9
C90	4030017730	S.CER ECJ0EB1E471K	B	1.5/24.8
C91	4030017730	S.CER ECJ0EB1E471K	B	4.8/4.9
C92	4030016930	S.CER ECJ0EB1A104K	T	22/31.6
C93	4030017380	S.CER ECJ0EC1H050B	T	21.1/29.9
C94	4030016930	S.CER ECJ0EB1A104K	T	23.9/27.2
J1	6510018440	S.CNR AXN430C330P	T	13.2/4.3

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.
J1	6510015550	Connector BNC-R117	1
J2	6510015550	Connector BNC-R117 [R2500 only]	1
S1	2260002400	Switch DS850K-S-LG	1
SP1	2510001160	Speaker 057P0802	1
W5	9020320050	Wire 51/99/290/B09A/W19A	1
W7	8900007640	Cable OPC-740	1
W8	8900007640	Cable OPC-740 [R2500 only]	1
W10	8900014760	Cable OPC-1563	1
W12	8900014760	Cable OPC-1563 [R2500 only]	1
W13	8900007640	Cable OPC-740	1
W14	8900007640	Cable OPC-740 [R2500 only]	1
MP1	8510017270	2879 Case	1
MP2	8510017280	2879 A-shield case	1
MP3	8510017300	2879 A-shield cover	1
MP4	8510017290	2879 B-shield case [R2500 only]	1
MP5	8510017310	2879 B-shield cover [R2500 only]	1
MP9	8510017390	2879 LOGIC plate	1
MP10	8930055551	Thermally sheet (W)-1	1
MP11	8930015640	Cord holder (SX-713)	2
MP20	8810008631	Screw B0 3x6 NI-ZC3 (BT)	6
MP21	8810008631	Screw B0 3x6 NI-ZC3 (BT) [R2500 only]	6
MP22	8810007231	Screw (H) 3x8 ZC3	6
MP23	8810009021	Screw M2.6x5 ZK3	8
MP25	8820000530	Screw M4x8 NI	1
MP26	8850001561	Toothed washer (A) M4 ZC3	1
MP27	8850000140	Washer M4 BS NI	1
MP30	8930069080	2879 A-sponge	1
MP31	8930064990	Sponge (ID)	4
MP32	8930068060	2879 SP net	1
MP33	8930068800	Sponge (IU)	2
MP34	8930068770	Rubber sheet (BS)	1

[MAIN-A UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510018450	Connector TMP-S01X-B1	1
J5	6510018450	S.connector TMP-S01X-B1	1
MP5	8510014460	2509 VCO cover	1
MP6	8510014460	2509 VCO cover	1
MP7	8510014460	2509 VCO cover	1
MP8	8510016460	2775 VCO cover	1
MP11	8930058840	Shield sponge (T)	1
MP12	8510017360	2879 DDS case	1
MP13	8510017370	2879 DBM case	1
MP14	8930061120	Shield sponge (AA)	1
MP15	8510005350	VCO plate shield prate (A) (FX-637)	1
MP16	8930058840	Shield sponge (T)	1
MP17	8930069060	Rubber sheet (BT)	1

[MAIN-B UNIT] (IC-R2500 only)

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510018450	Connector TMP-S01X-B1	1
J5	6510018450	Connector TMP-S01X-B1	1
MP6	8510014460	2509 VCO cover	1
MP7	8510014460	2509 VCO cover	1
MP8	8510016460	2775 VCO cover	1
MP9	8510017370	2879 DBM case	1
MP10	8930061120	Shield sponge (AA)	1
MP11	8930069060	Rubber sheet (BT)	1

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
W8	9016910300	WIRE51/99/130/B11A/D33A	1
MP1	8510017380	2879 coil cover	1
MP2	8510017400	2879 A-LOGIC plate	1
MP3	8930058990	Shield sponge (V)	1
MP4	8930062740	2590 M-spring	1

[DIGITAL UNIT] (IC-R2500: [USA-2] only)

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
—	Optional product	UT-122 (incl. MP1)	1

[CONTROL UNIT] (IC-R1500)

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R1	7210002920	Variable resistor EVU-F2AF20B55	1
R5	7210002920	Variable resistor EVU-F2AF20B55	1
DS22	5040002920	LED CV1074	1
DS24	5030002900	LCD A01B005X	1
S1	2240000150	Switch JRS0000-1401	1
EP20	8930060040	LCD contact SRCN-2633-SP-N-W	1
MP1	8210022230	2633 Front panel (F)	1
MP2	8210022350	2880 Rear panel	1
MP3	8930067440	2633 Key-top (B)	1
MP4	8610012790	Knob K-229 (E)	1
MP5	8610012800	Knob K-229 (F)	1
MP6	8610012810	Knob K-229 (G)	1
MP7	8610012820	Knob K-229 (H)	1
MP8	8610012830	Knob K-229 (I)	1
MP10	8610011290	Knob N-297	1
MP11	8610011300	Knob N-298	1
MP12	8610011280	Knob N-299	1
MP13	8210019550	2633 D-Reflector panel	1
MP14	8930059740	2633 Power button	1
MP15	8930059730	2633 2-key	1
MP16	8310057020	2633 Window plate	1
MP17	8930060050	2633 Window sheet	1
MP18	8930060060	2633 D-Filter screen	1
MP19	8930060071	2633 Jog sheet-1	1
MP20	8930060080	2633 A-SHEET	1
MP22	8930059780	2633 LCD plate	1
MP23	8930064440	Spring (F)	1
MP25	8810009221	Screw B0 2x8 NI-ZK3 (BT)	2
MP26	8810008991	Screw B0 2x10 NI-ZK3 (BT)	2

[CONTROL UNIT] (IC-R2500)

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R1	7210002920	Variable resistor EVU-F2AF20B55	1
R3	7210002920	Variable resistor EVU-F2AF20B55	1
R5	7210002920	Variable resistor EVU-F2AF20B55B	1
R7	7210002920	Variable resistor EVU-F2AF20B55	1
J1	6510023110	Connector 3008L-8P8C	1
DS20	5030002890	LCD A01B006X	1
S1	2250000460	Encoder EVQ-VENF02 24B	1
S2	2250000460	Encoder EVQ-VENF02 24B	1
EP20	8930070390	LCD contact SRCN-2879-SP-N-W	1
MP1	8210022220	2493 front panel (B)	1
MP2	8930067410	2493 3-key (A)	1
MP3	8930067390	2493 L-key (A)	1
MP4	8930067400	2493 R-key (A)	1
MP6	8210018550	2493 Rear panel	1
MP8	8210018560	2493 Reflector panel	1
MP9	8930057740	2493 LCD filter	1
MP10	8930057080	2493 LCD plate	1
MP11	8930059030	Sheet (O)	1
MP12	8610011160	Knob N-289	2
MP13	8610011170	Knob N-290	4
MP17	8810009221	Screw B0 2x8 NI-ZK3 (BT)	4

[ACCESSORIES]

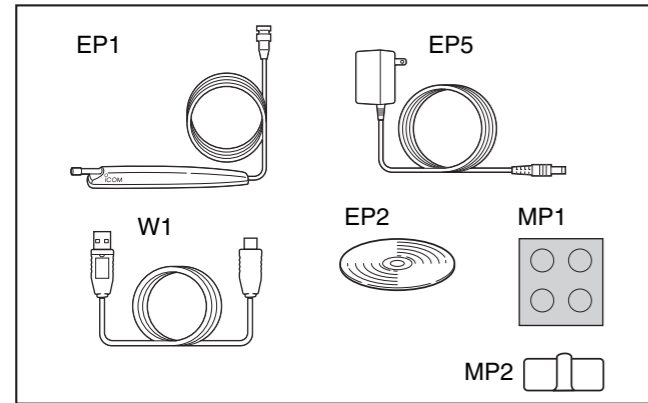
REF. NO.	ORDER NO.	DESCRIPTION	QTY.
W1	Optional product	Cable OPC-1045	1
EP1	3310001920	2032 antenna	1
EP2	7800000330	Data CD-R74	1
EP5	Optional product	Adapter AD-113E ACC [EUR], [FRA], [EXP]	1
	Optional product	Adapter AD-113A ACC [USA], [USA-2], [CAN], [EXP-1]	1
MP1	8930055180	Leg cushion (G)	1
MP2	8950004610	S-5	1

Screw abbreviations

B0, BT: Self-tapping PH: Pan head

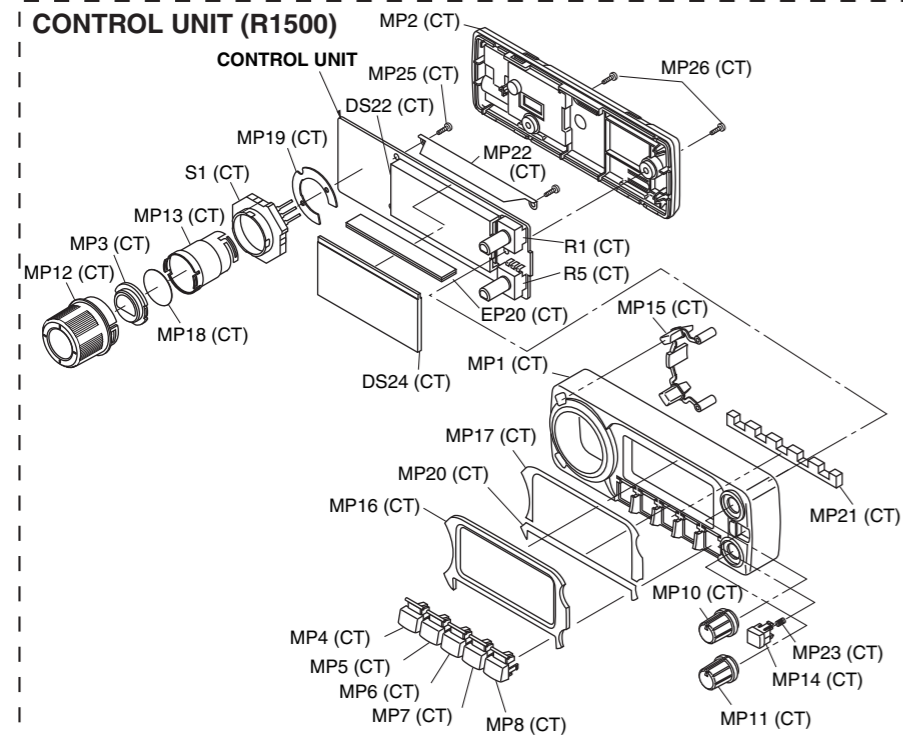
NI-ZU: Nickel-Zinc ZK: Black

[ACCESSORIES]

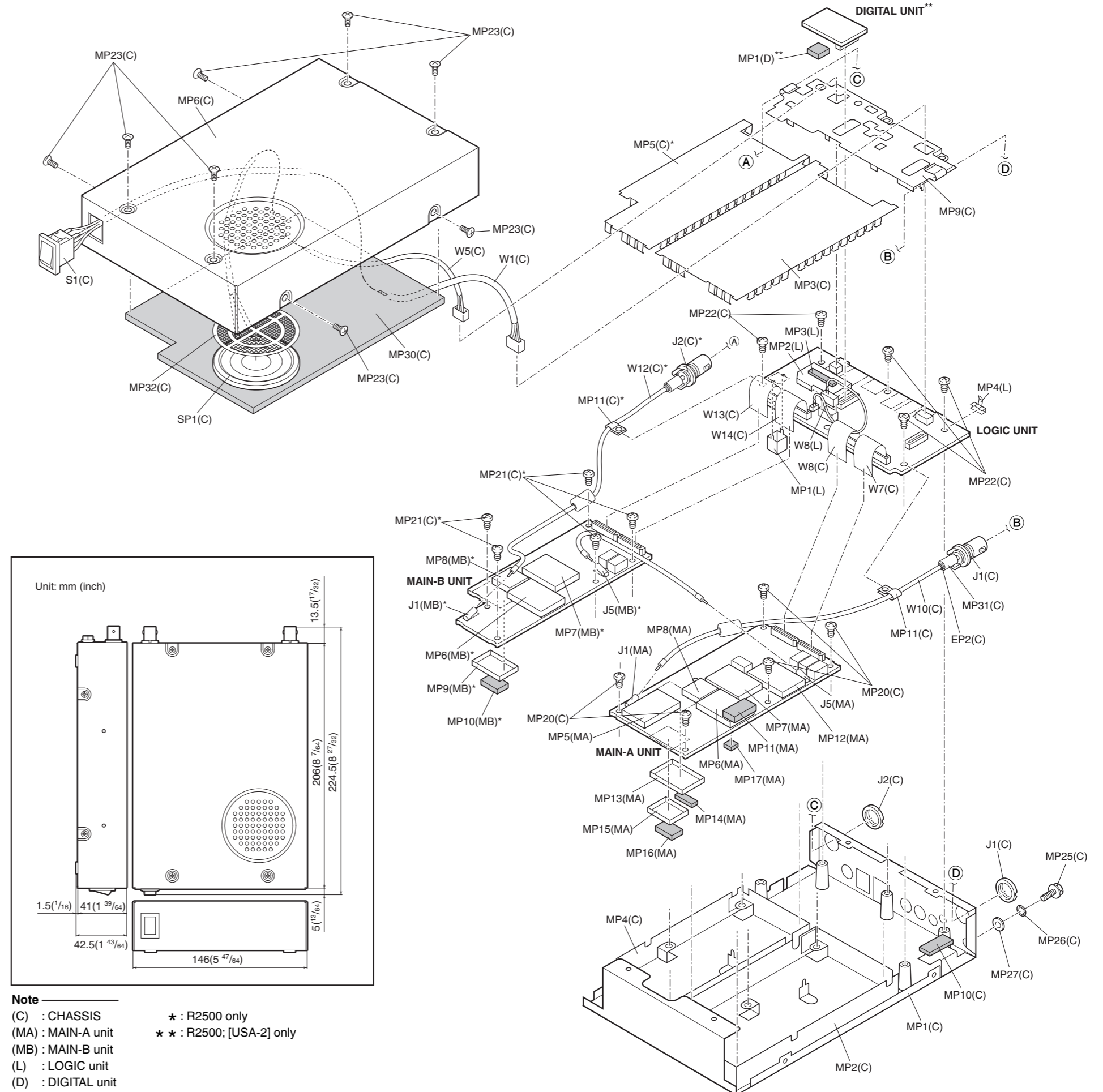
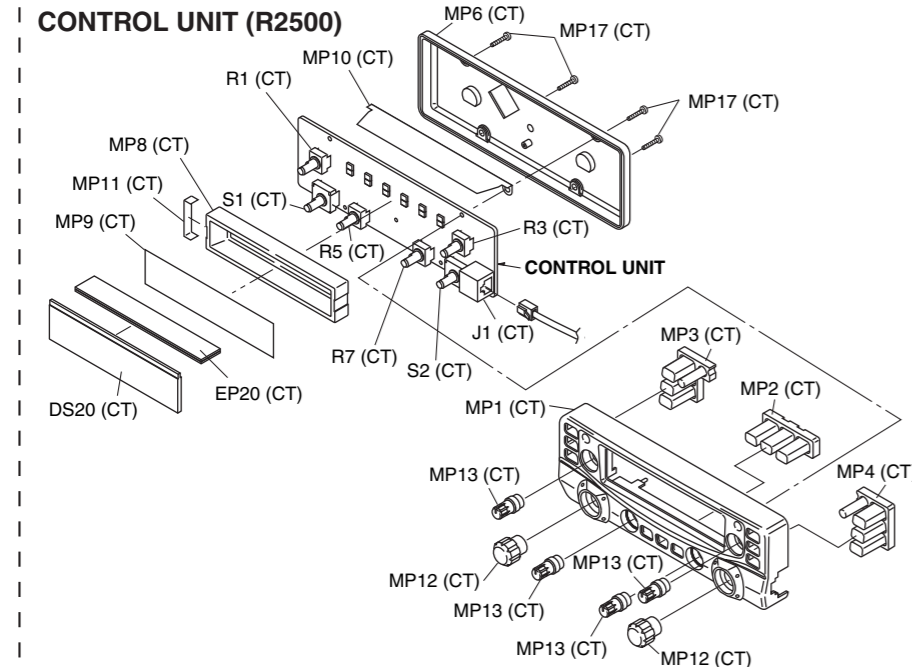


* Design is depended on versions.

CONTROL UNIT (R1500)



CONTROL UNIT (R2500)



Note
 (C) : CHASSIS
 (MA) : MAIN-A unit
 (MB) : MAIN-B unit
 (L) : LOGIC unit
 (D) : DIGITAL unit
 (CT) : CONTROL unit
 * : R2500 only
 ** : R2500; [USA-2] only

SECTION 8 SEMICONDUCTOR INFORMATION

• TRANSISTORS AND FET'S

NAME	SYMBOL	INSIDE VIEW
2SA1832 GR	SG	
2SB1123 T-TD	BF	
2SB1201 S-TL XP1113 XP1114	B1201 7L 7Q	
2SB798	DK	
2SC4116 BL 2SC4116 GR 2SC4117 BL 2SC4213 B 2SC4215 O 2SC4617 S 2SC4835 R 2SC5006 2SC5193 2SC5226 4 2SC5277 D2	LL LG CL AB QO BR 3M 24 T88 LN4 D2	
2SC5624	VH-	
2SJ377	4L	

NAME	SYMBOL	INSIDE VIEW
2SK880 Y	XY	
2SK882 GR	TGR	
3SK131 L 3SK318	V12 YB-	
3SK324	UG	
DTC144EU UNR9113J UNR9211J UNR9213J UNR9214J	26 8C 8A 8C 8A	
UNR9111J UNR9114J	6A 6D	
XP1213	9L	
XP1501 AB	5R	

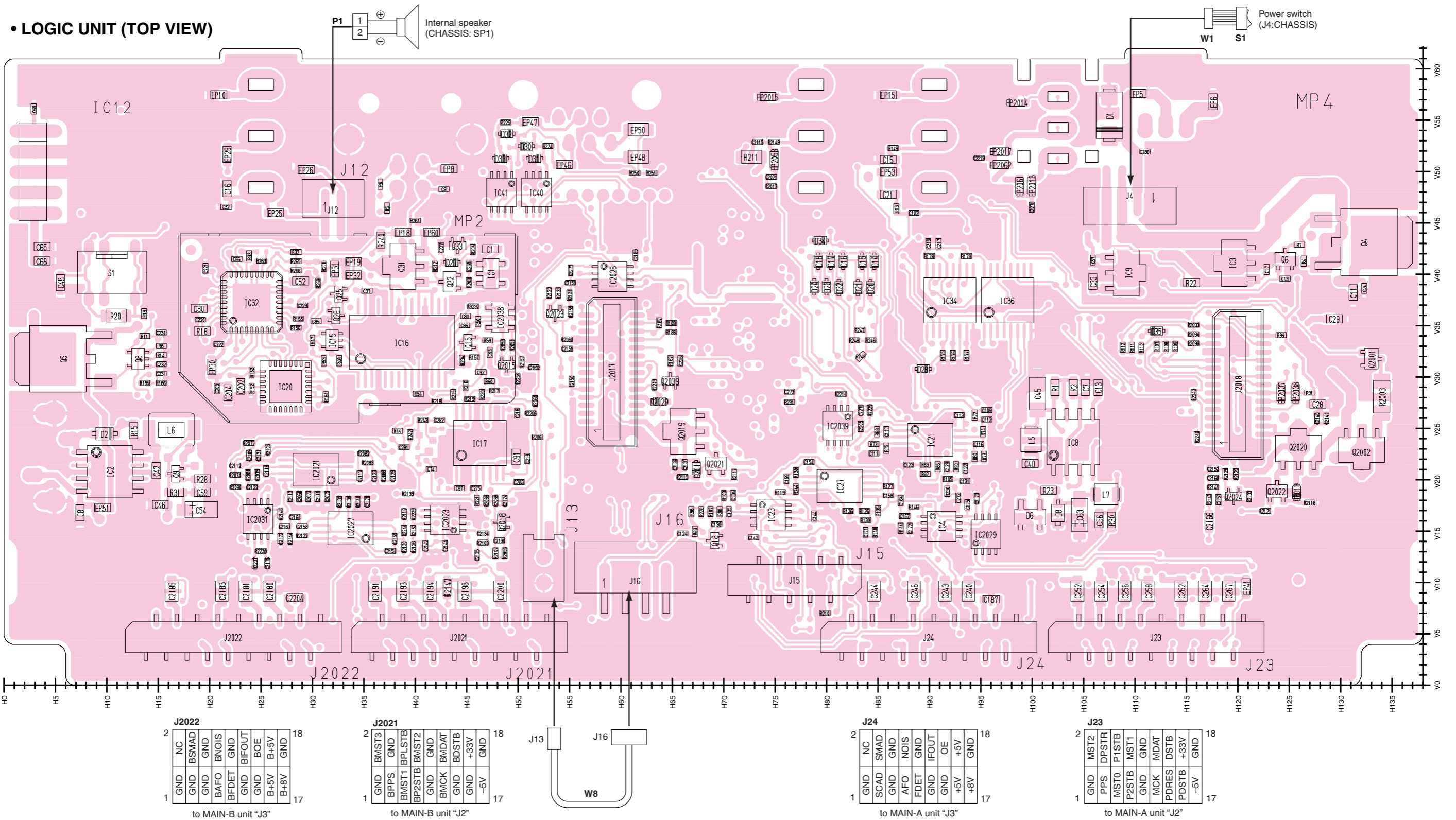
NAME	SYMBOL	INSIDE VIEW
XP4311	3X	
XP4601	5C	

• DIODES

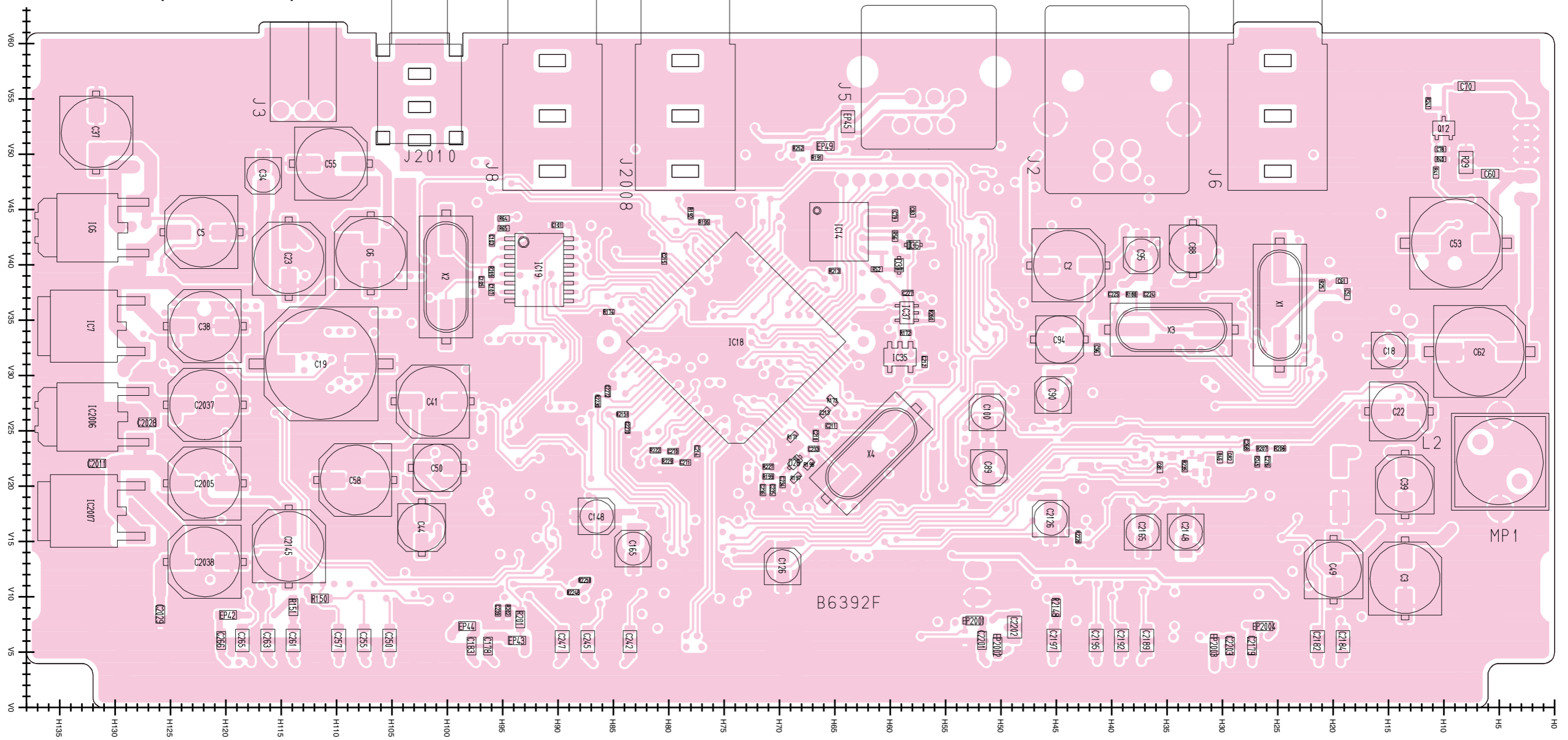
NAME	SYMBOL	INSIDE VIEW
1SR154-400 1SS400 1SV284 1SV286 1SV308 MA2S077 MA2S111 MA2S728	14 A TL T7 TX S A B	
1SS355 1SV307	A TX	
1SV282 MA8051 M	TD 5-1	
1SS272	A1	
1SV245 HVC376B 1SV290	T3 B9 TJ	
DA221 RB706F-40	K 3J	
DAN222	N	

SECTION 9 BOARD LAYOUTS

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

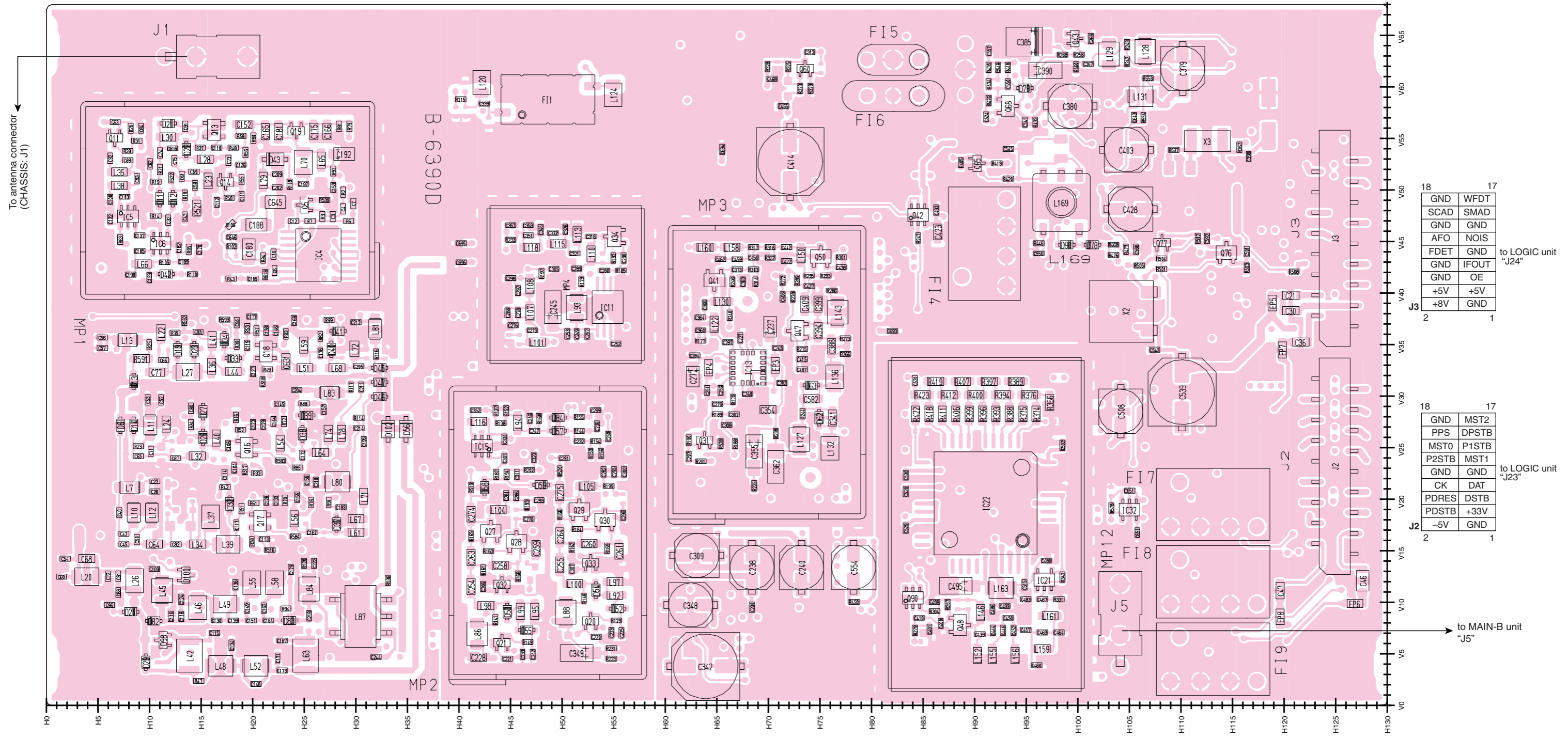


• LOGIC UNIT (BOTTOM VIEW)



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

• MAIN-A UNIT (TOP VIEW)



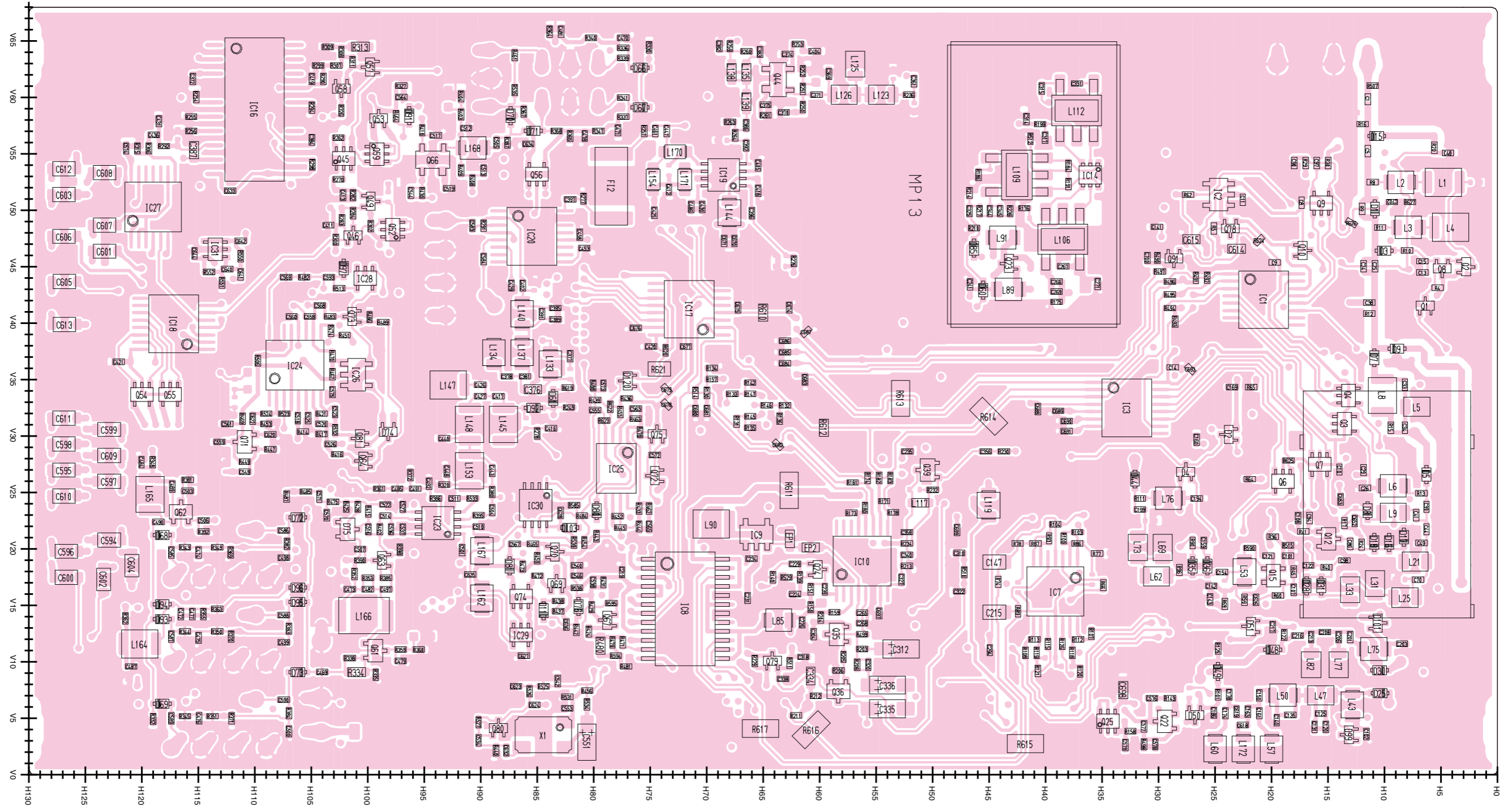
to LOGIC unit "J24"

18	GND	WFDT	17
	SCAD	SMAD	
	GND	GND	
	AFO	NOIS	
	FDET	GND	
	GND	IFOUT	
	GND	OE	
	+5V	+5V	
	+8V	GND	
2			1

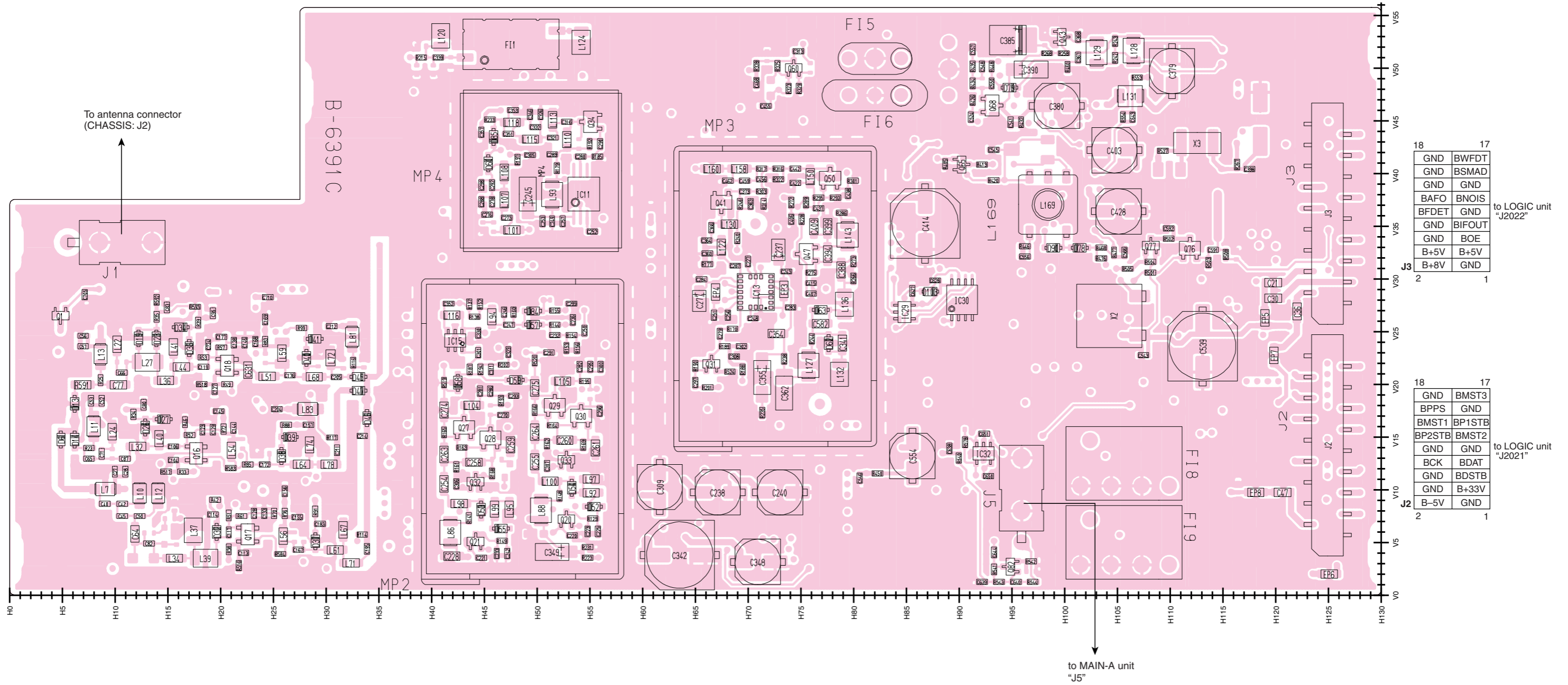
to LOGIC unit "J23"

18	GND	MST2	17
	PPS	DPSTB	
	MST0	P1STB	
	P2STB	MST1	
	GND	GND	
	CK	DAT	
	PDRES	DSTB	
	PDSTB	+33V	
	-5V	GND	
2			1

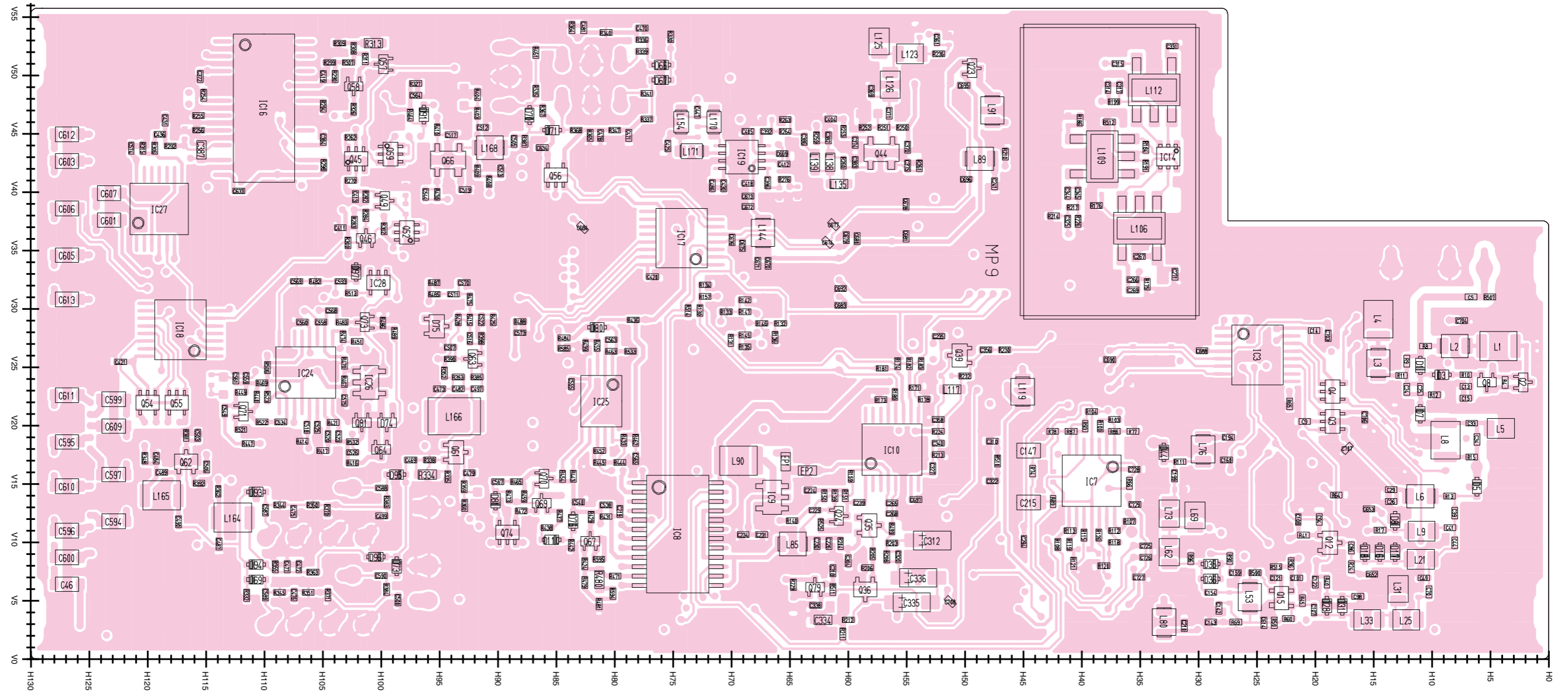
• MAIN-A UNIT (BOTTOM VIEW)



• MAIN-B UNIT (TOP VIEW; R2500 only)

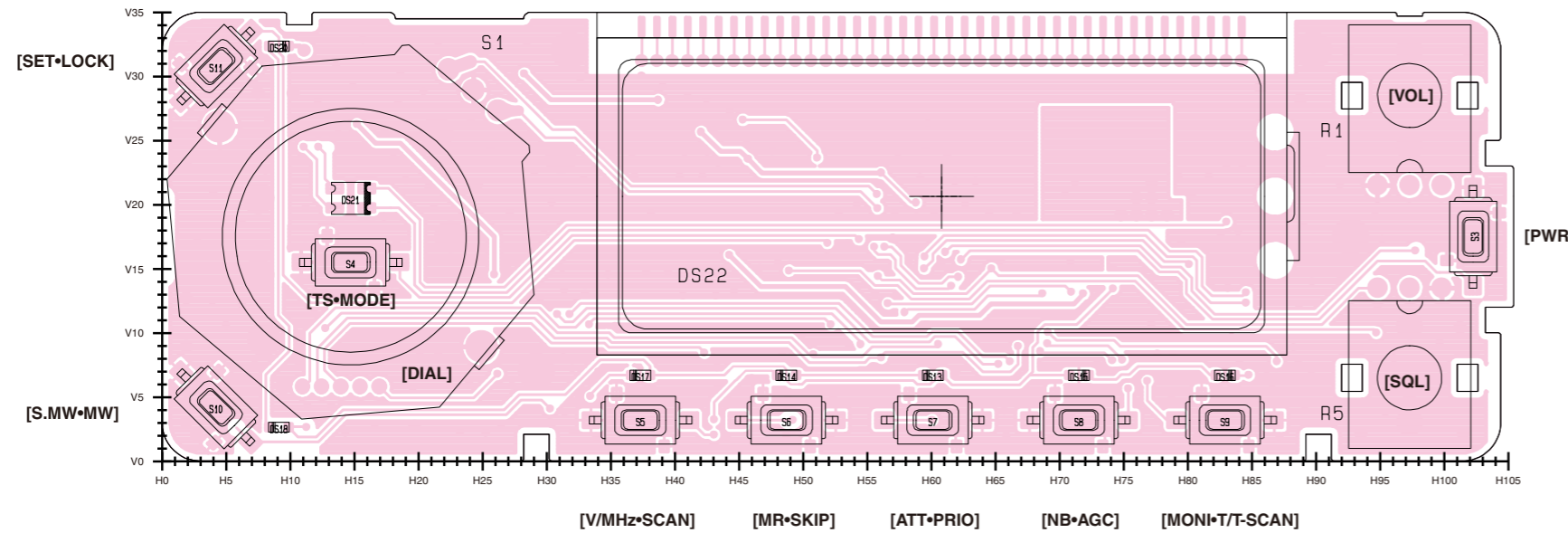


• MAIN-B UNIT (BOTTOM VIEW; R2500 only)

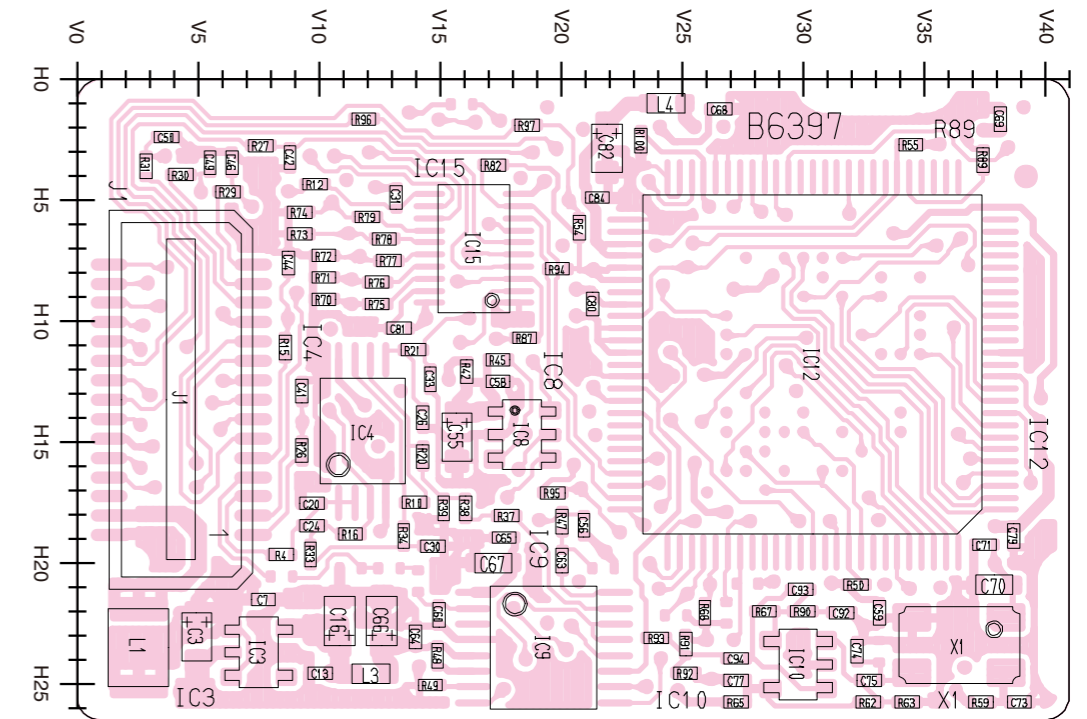


The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.

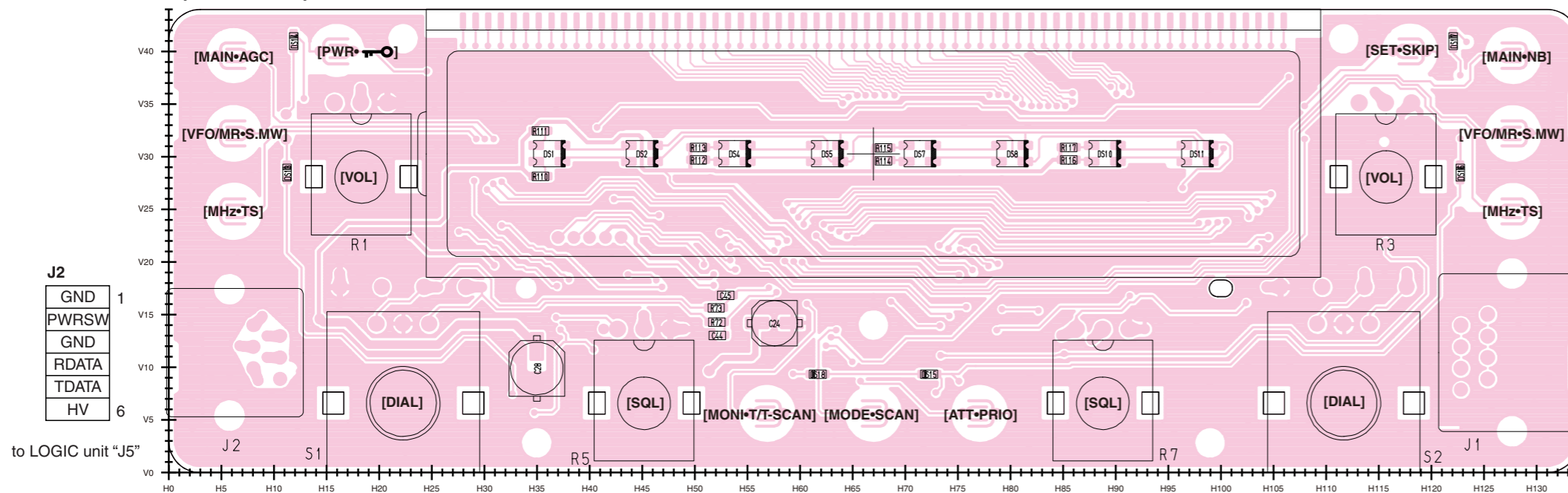
• CONTROL UNIT [IC-R1500]
(TOP VIEW)



• UT-122 (Optinal product: DIGITAL UNIT for [IC-R2500: USA-2])
(TOP VIEW)



• CONTROL UNIT [IC-R2500]
(TOP VIEW)

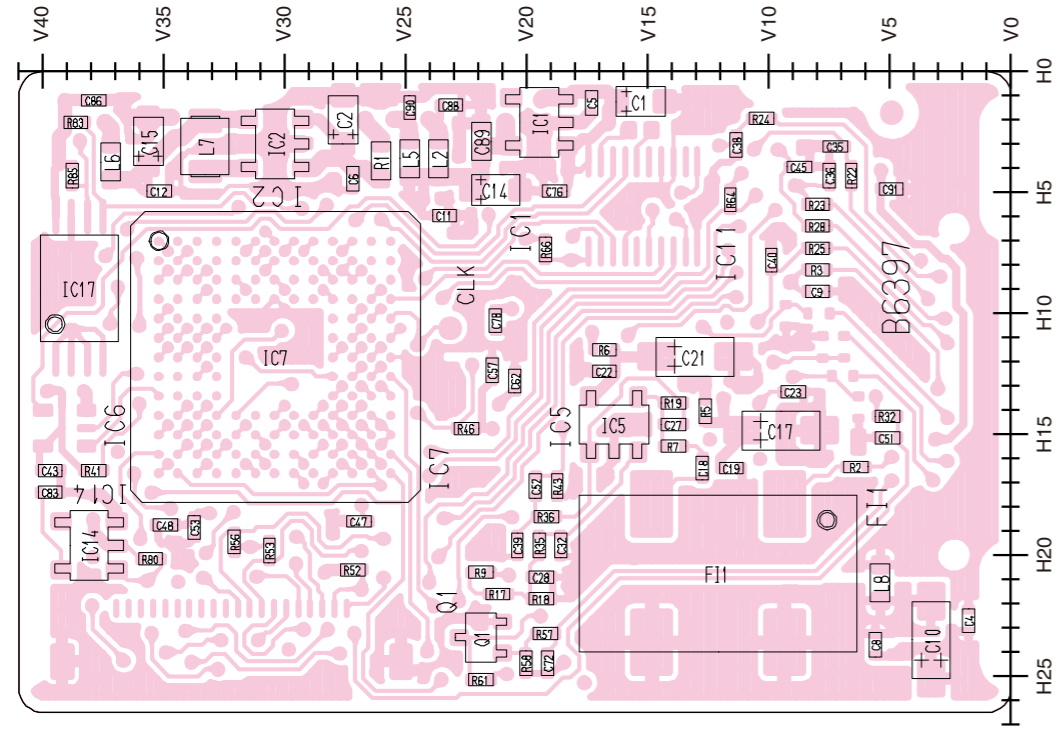


J1

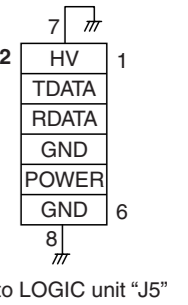
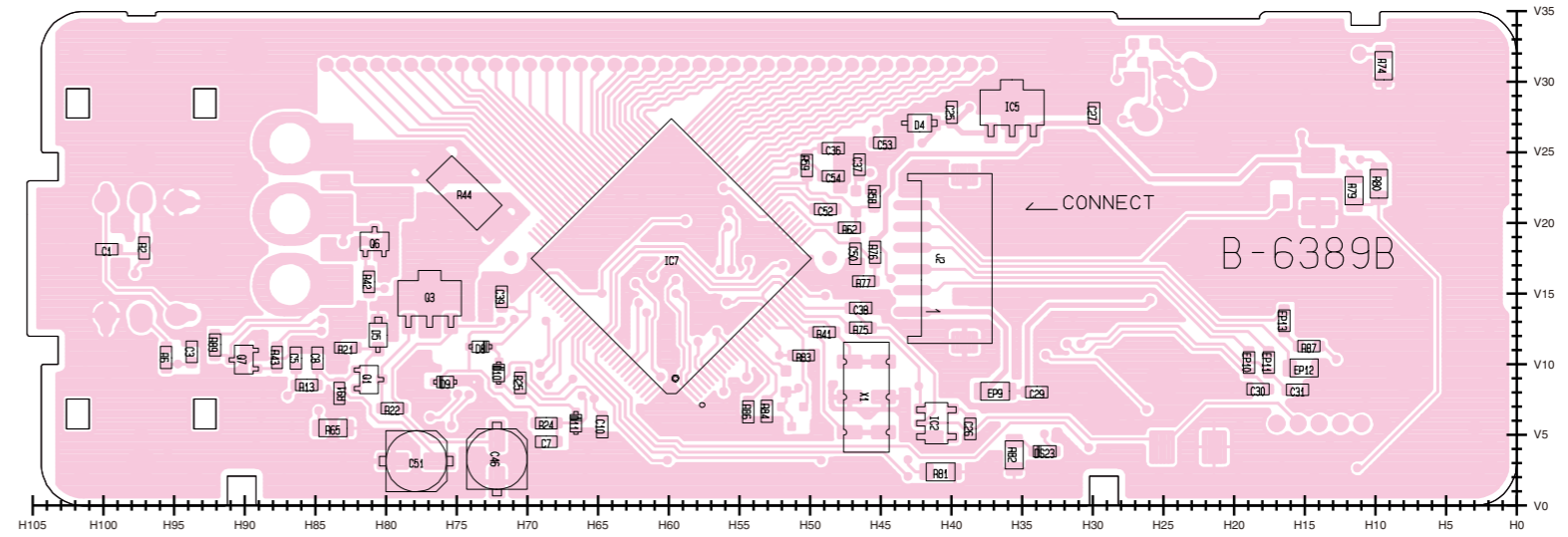
16	SCK	RXD	15
	SI	TXD	
	SO	RTS	
	CIRQ	GND	
	CCS	D IF	
	FLASH RXD	MD	
	AFOUT	CPU RES	
	FLASH TXD	CTS	
	RMUT	TEMP	
	+3.3V	BUSY	
	AFON	RSSI	
	MMUT	MIC	
	VCC	BASE OUT	
	+5V	PTTO	
30	GND	PTTI	1

to LOGIC unit "J2017"

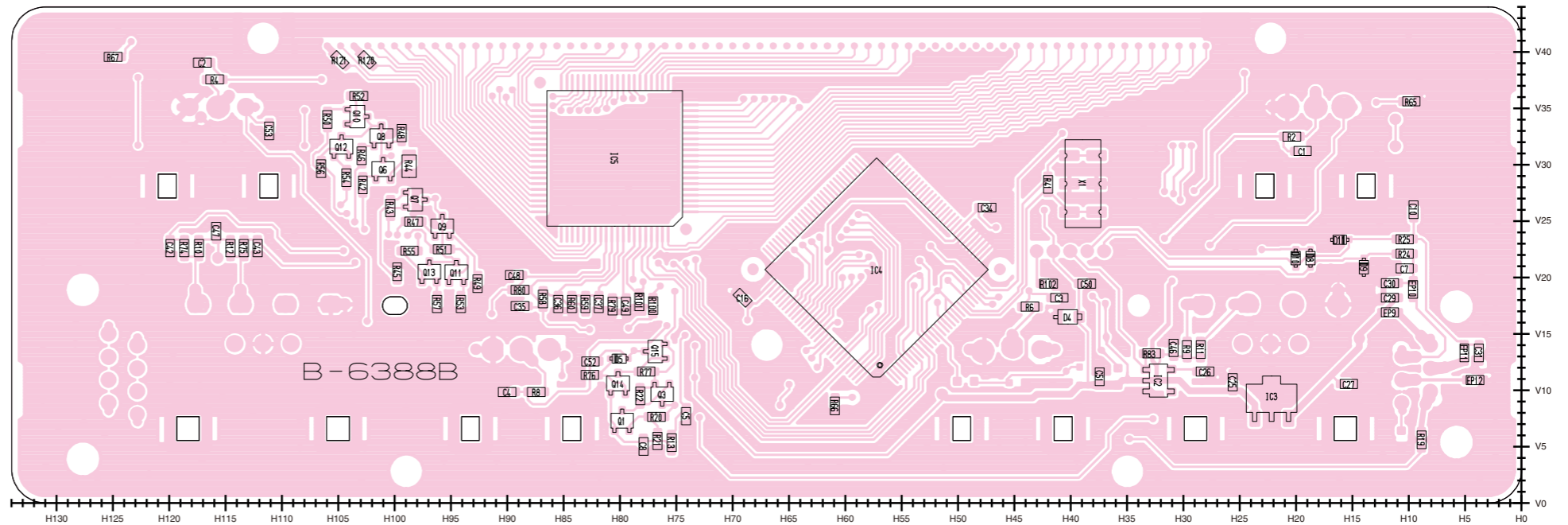
• UT-122 (Optonal product: DIGTAL UNIT for [IC-R2500: USA-2])
(BOTTOM VIEW)



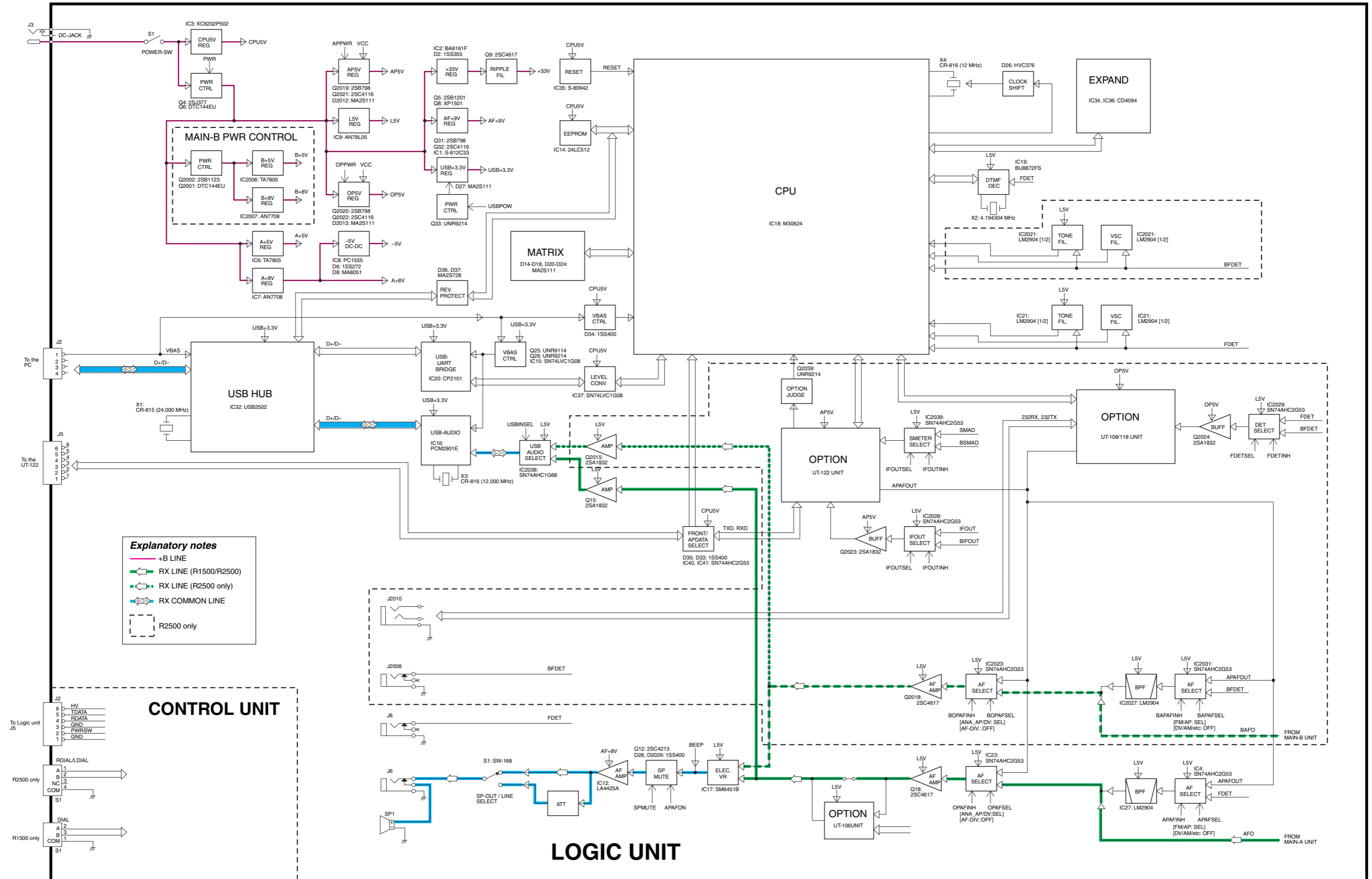
• CONTROL UNIT [IC-R1500]
(BOTTOM VIEW)

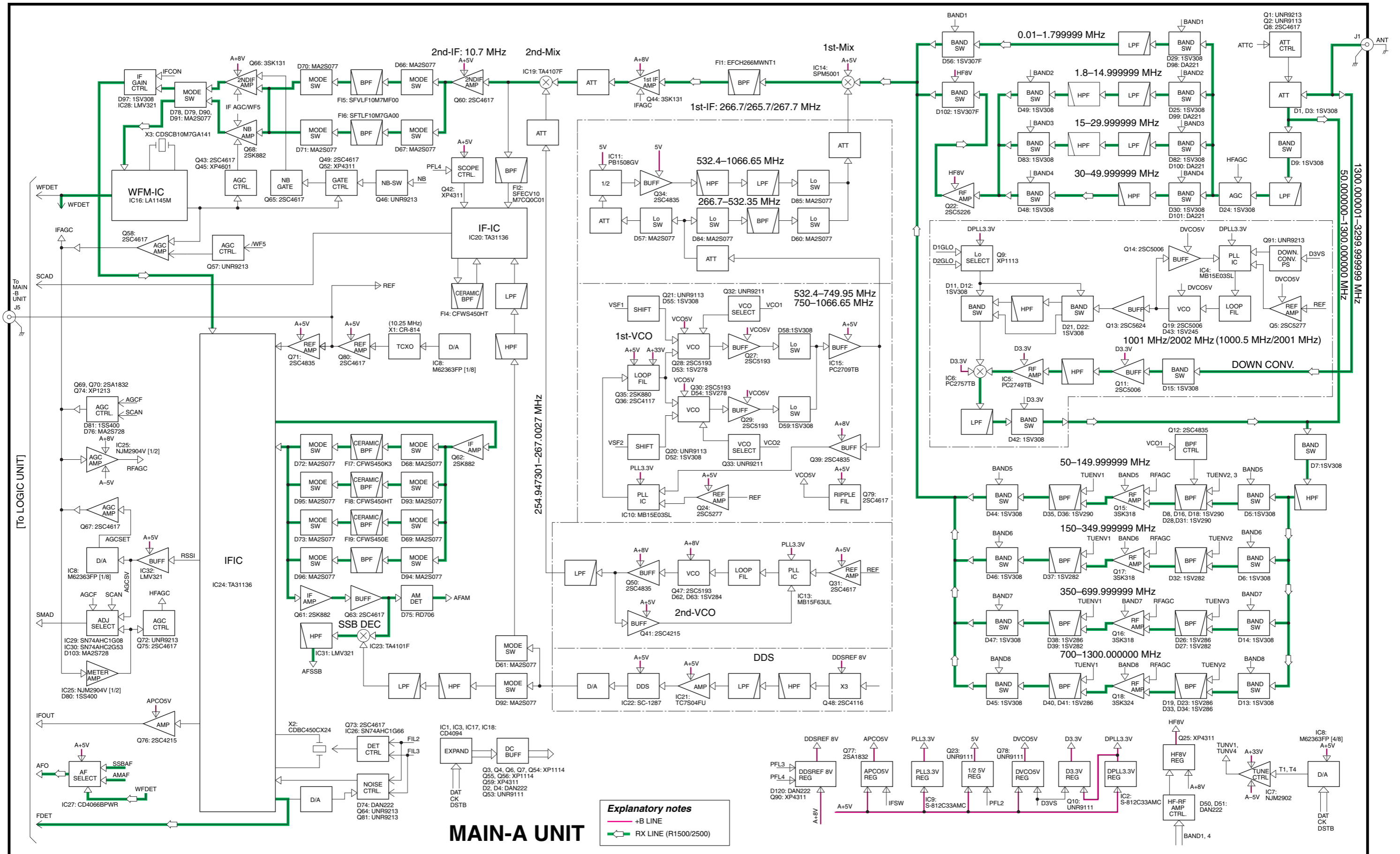


• CONTROL UNIT [IC-R2500]
(BOTTOM VIEW)



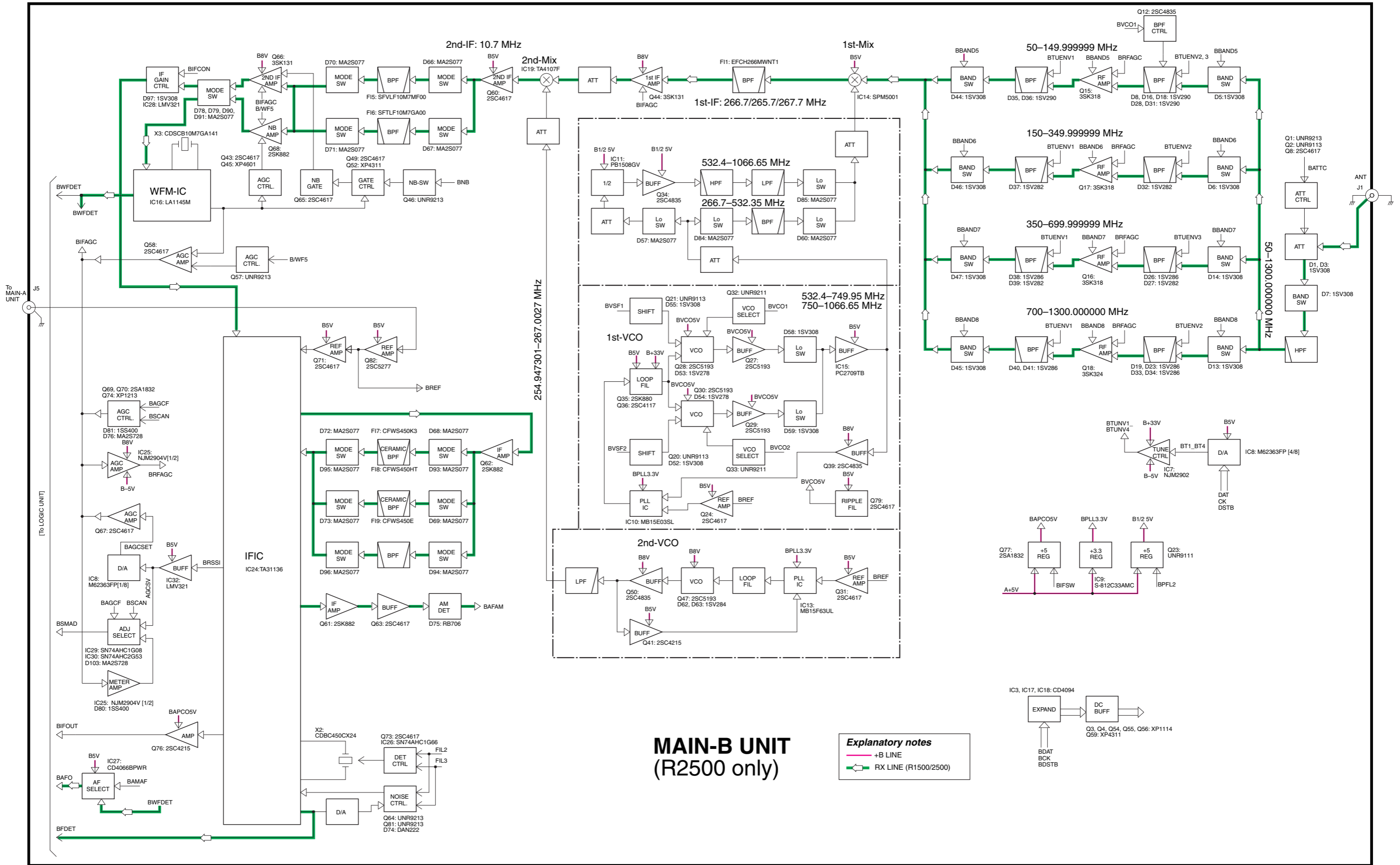
SECTION 10 BLOCK DIAGRAM





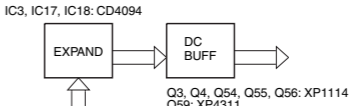
MAIN-A UNIT

Explanatory notes
 — +B LINE
 — RX LINE (R1500/2500)

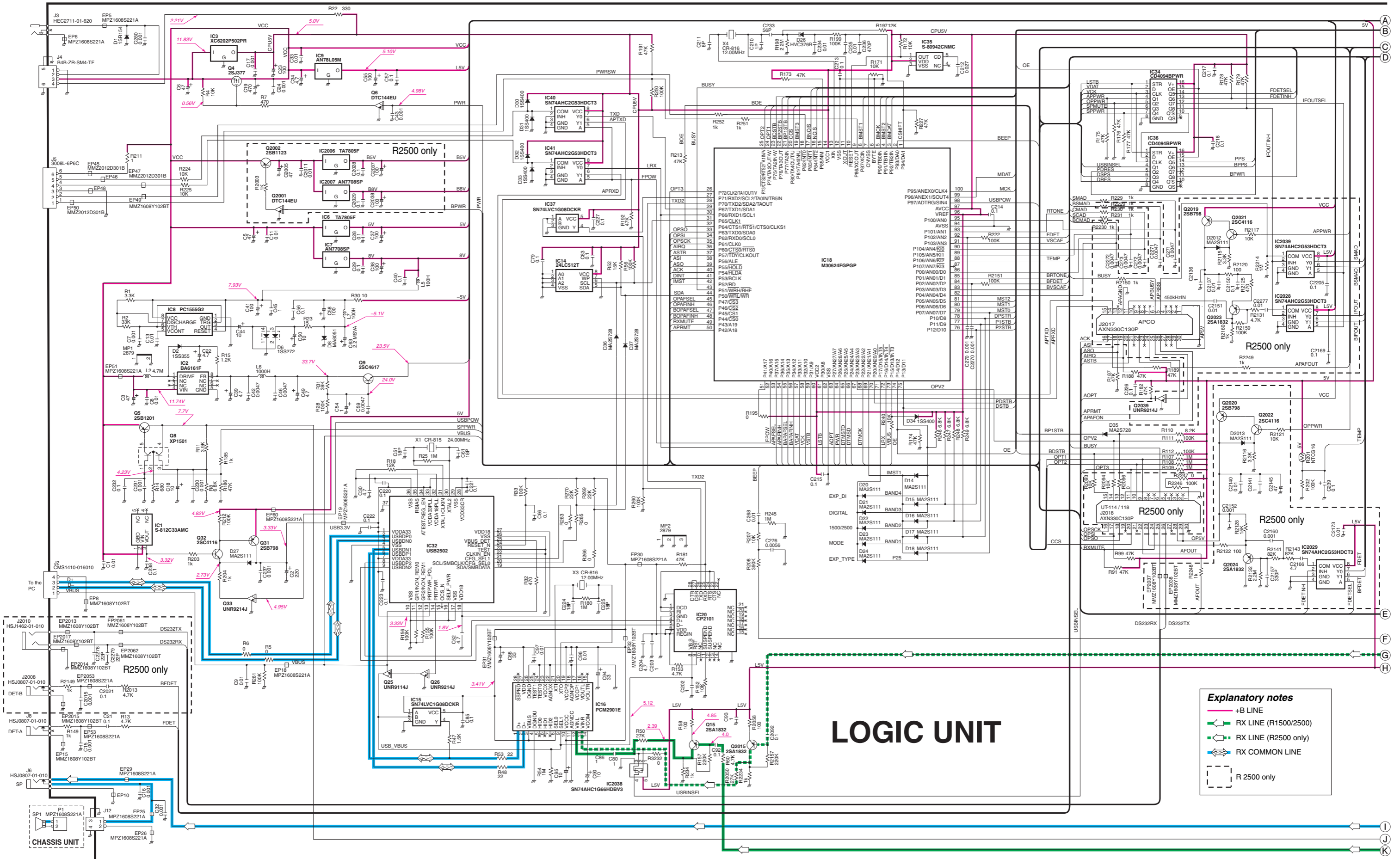


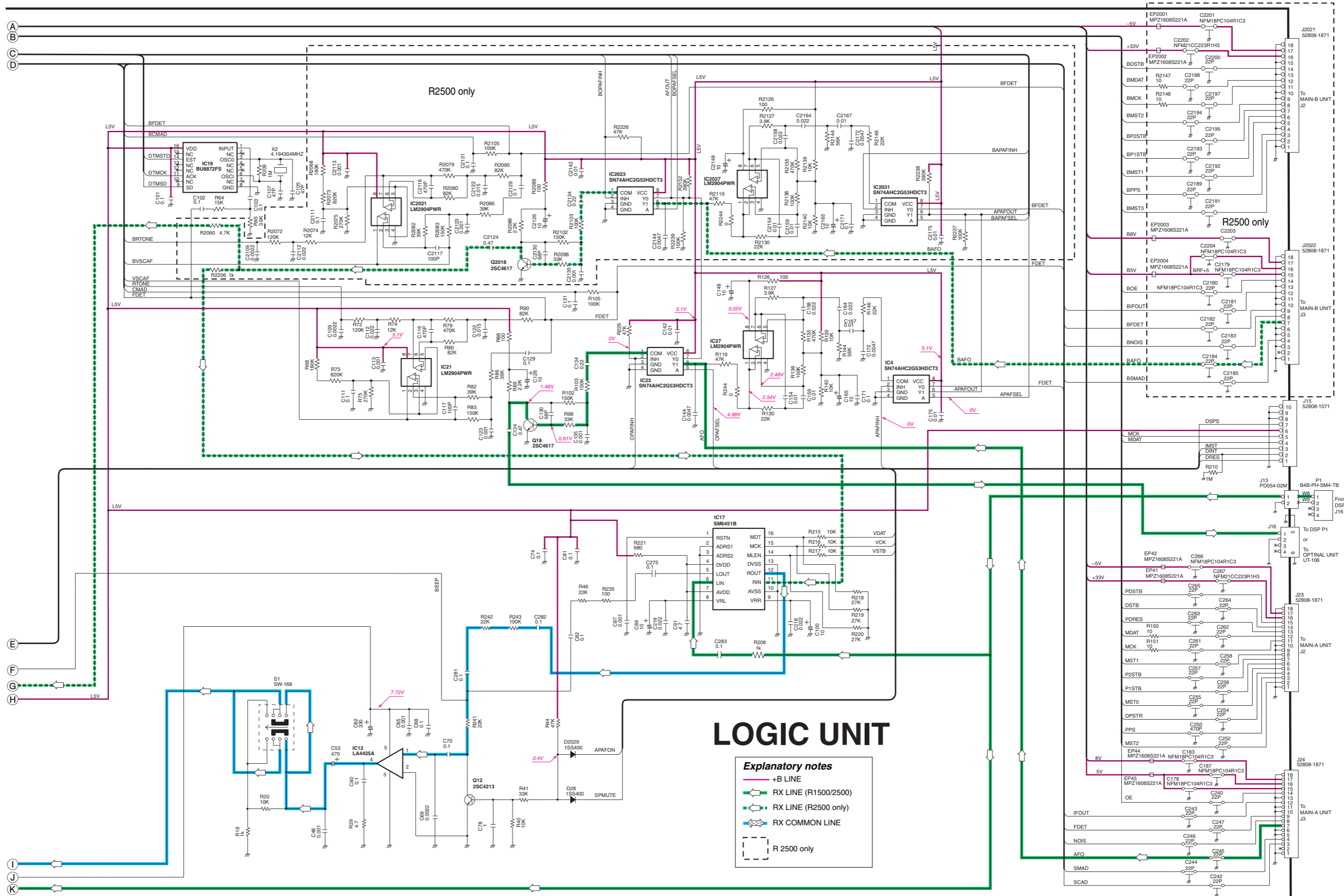
**MAIN-B UNIT
(R2500 only)**

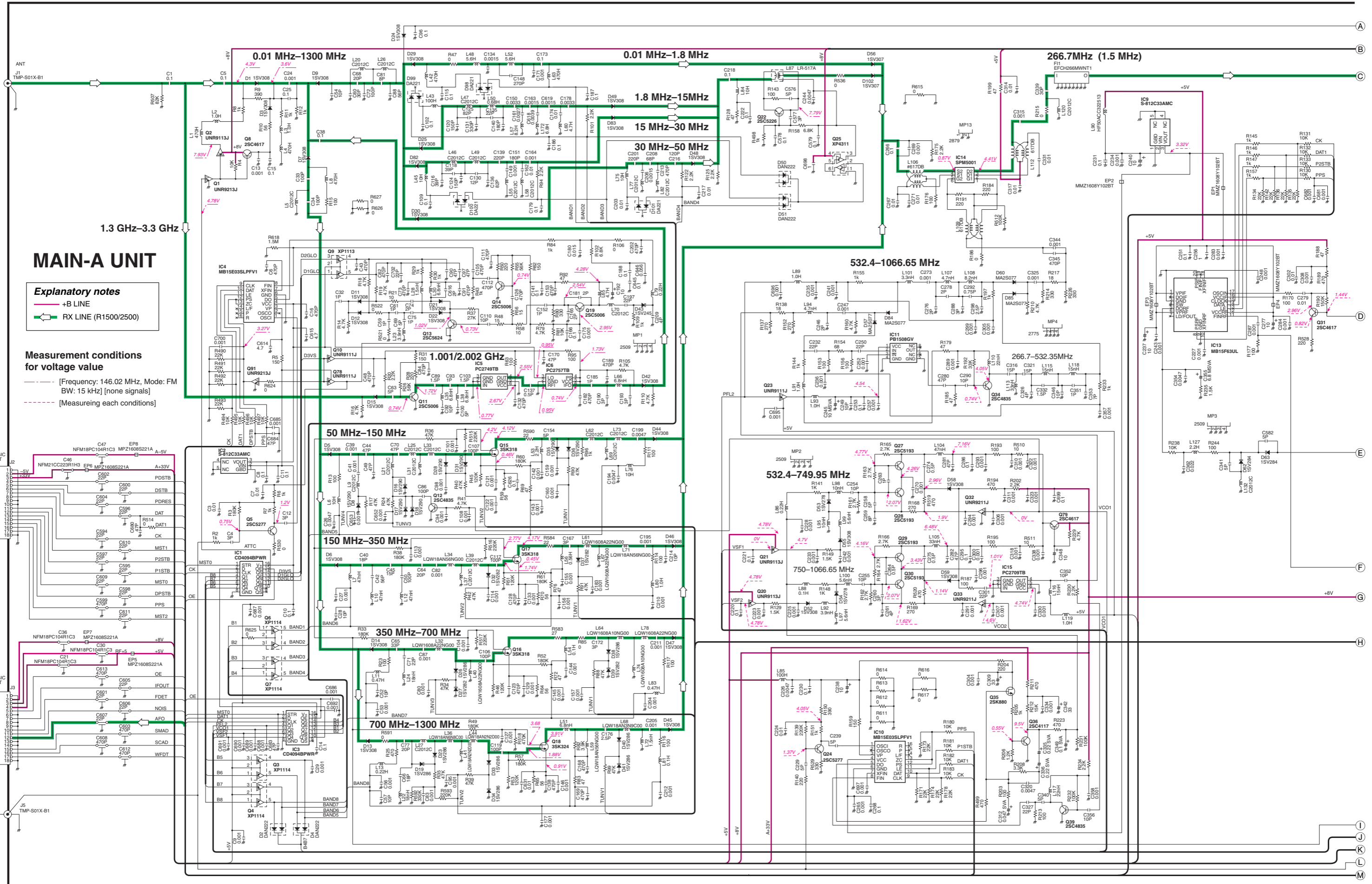
Explanatory notes
 — +B LINE
 — RX LINE (R1500/2500)

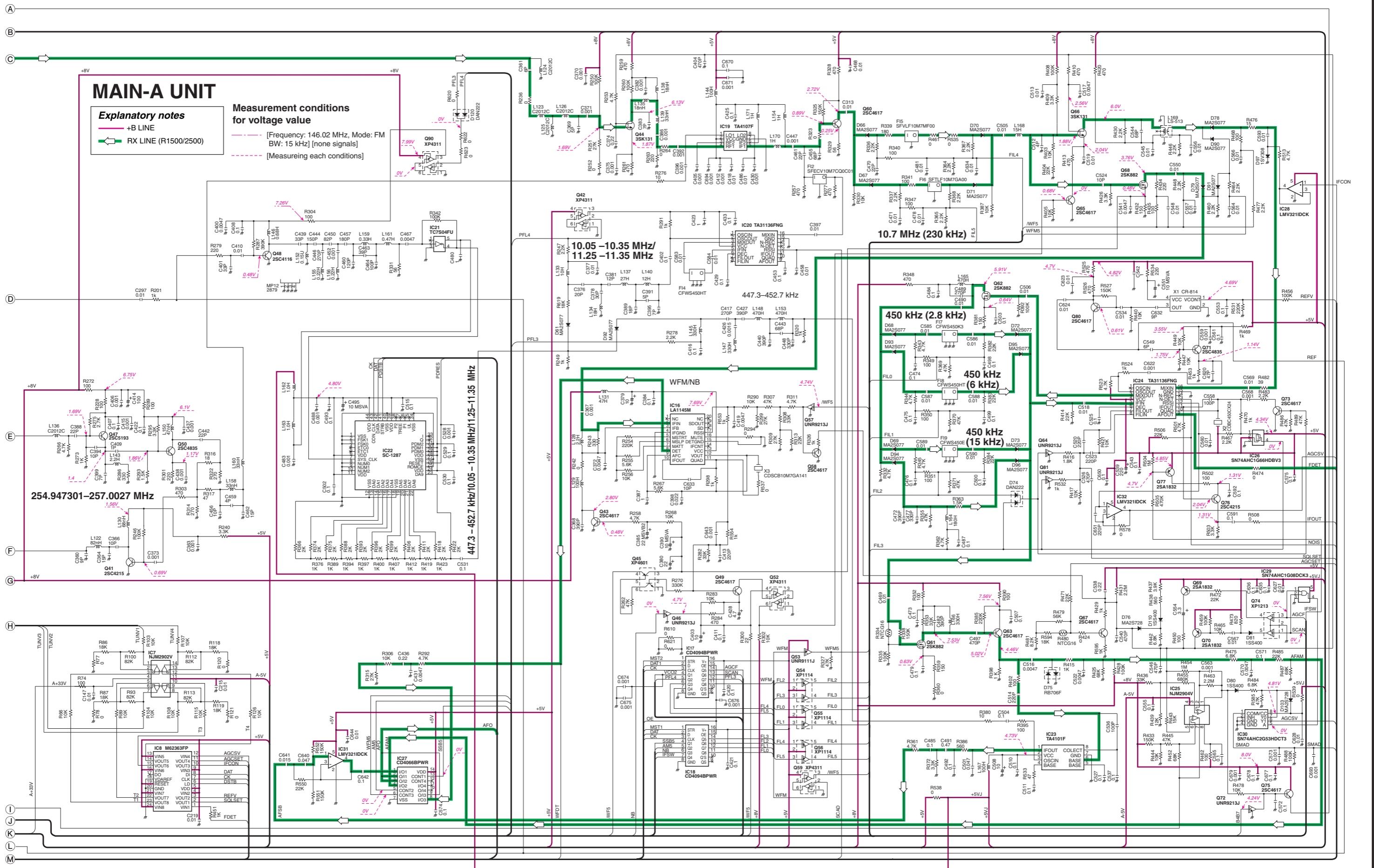


SECTION 11 VOLTAGE DIAGRAM





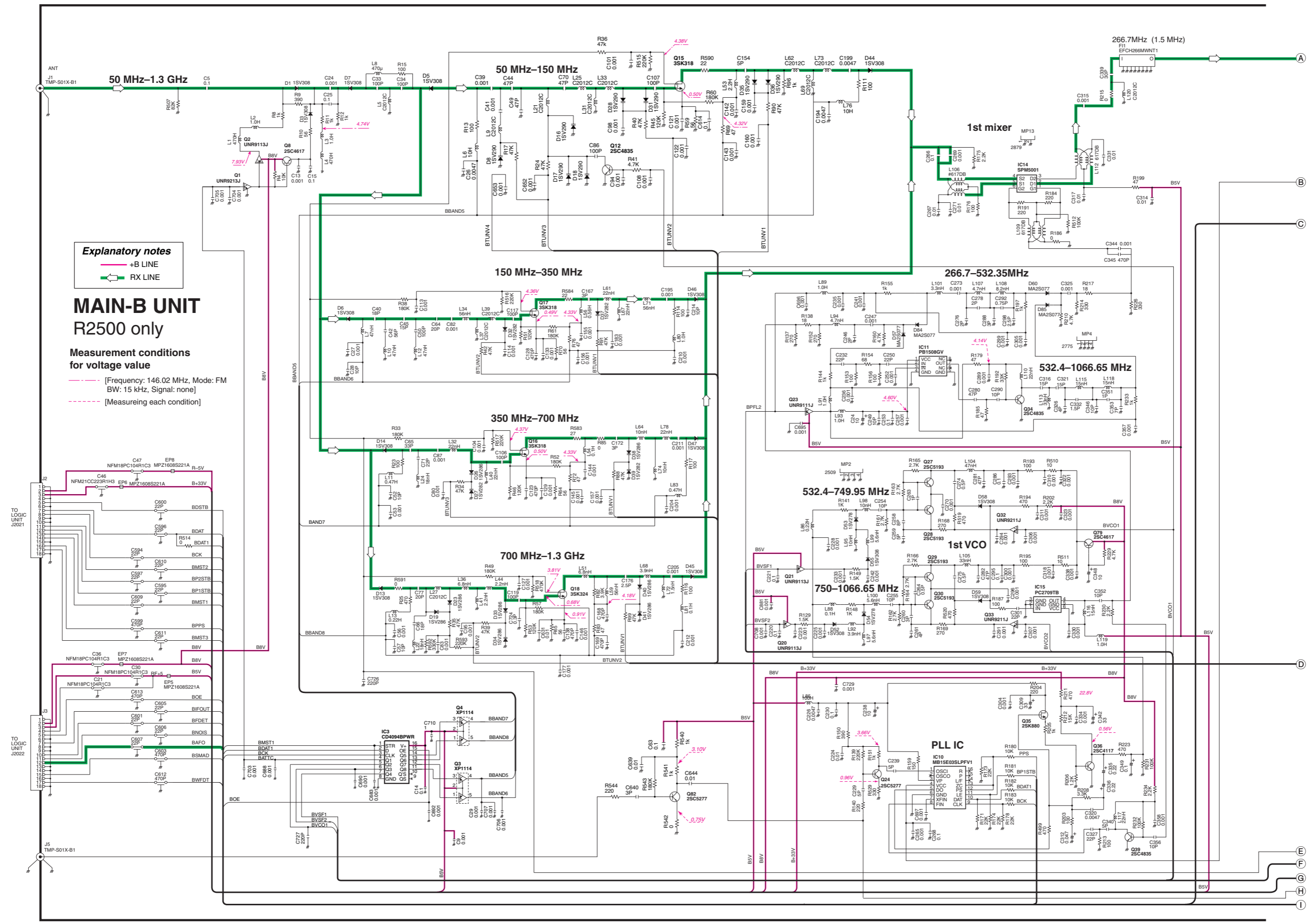




MAIN-A UNIT

Explanatory notes
 — +B LINE
 — RX LINE (R1500/2500)

Measurement conditions for voltage value
 [Frequency: 146.02 MHz, Mode: FM
 BW: 15 kHz] [none signals]
 [Measuring each conditions]



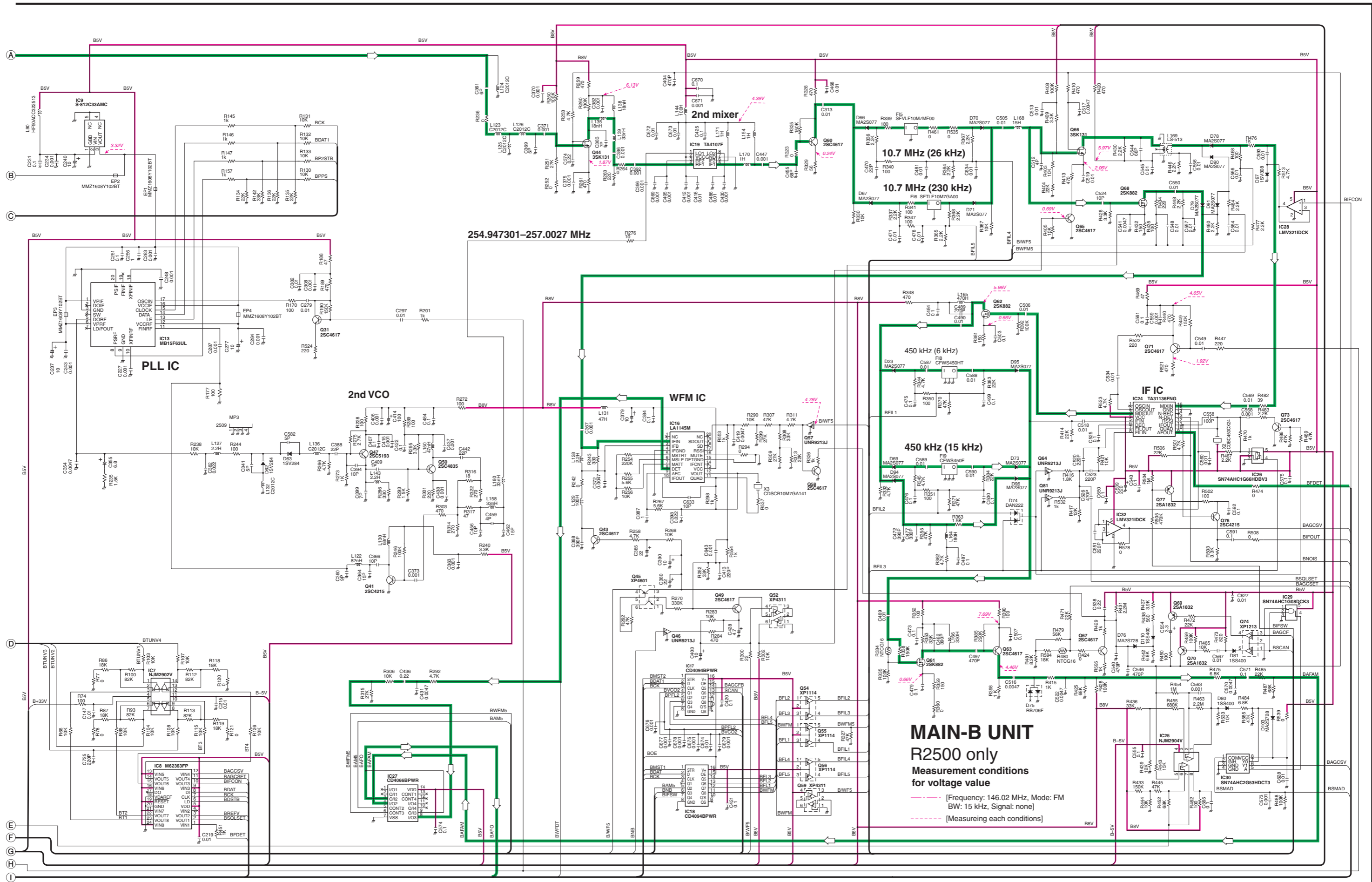
Explanatory notes

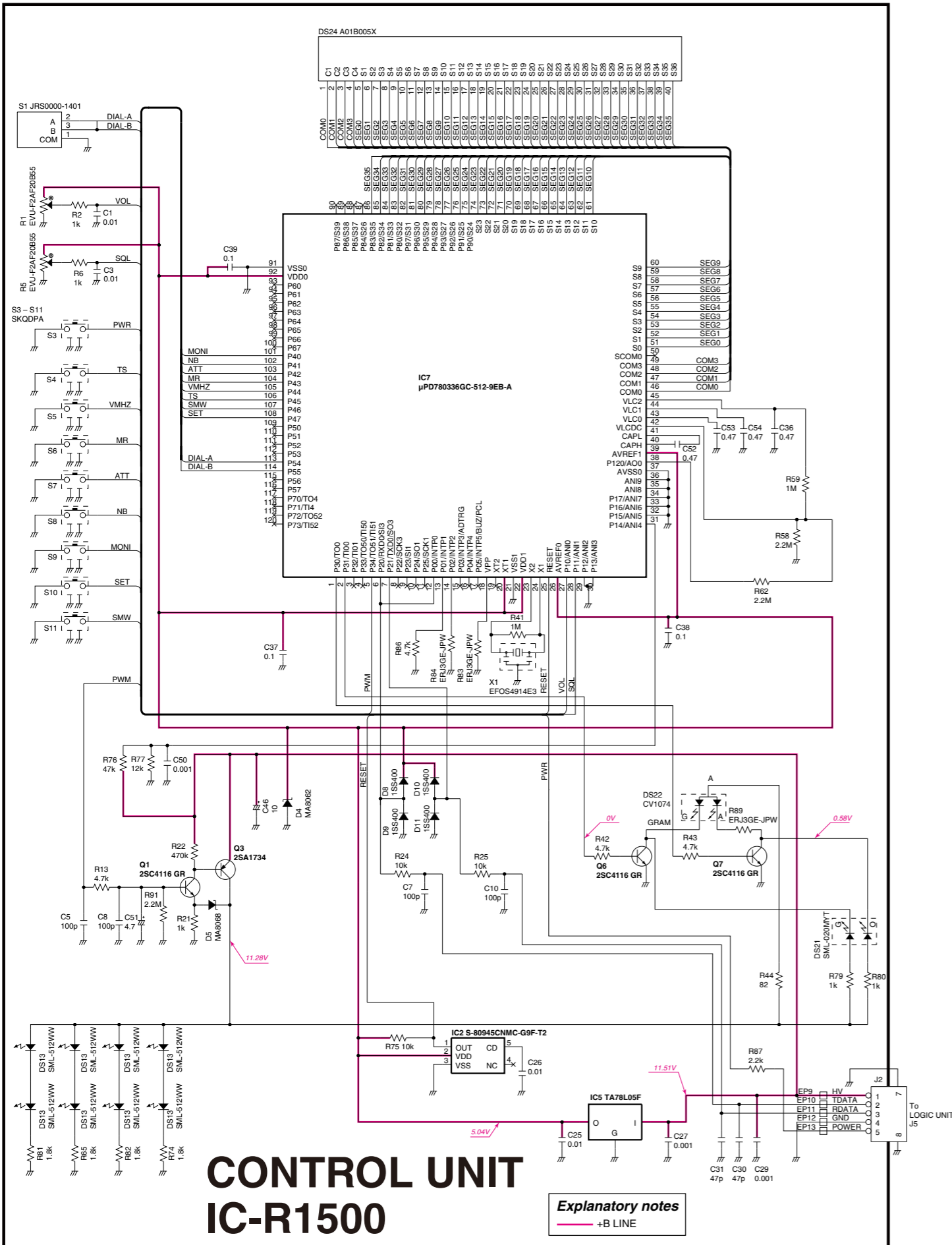
- +B LINE
- RX LINE

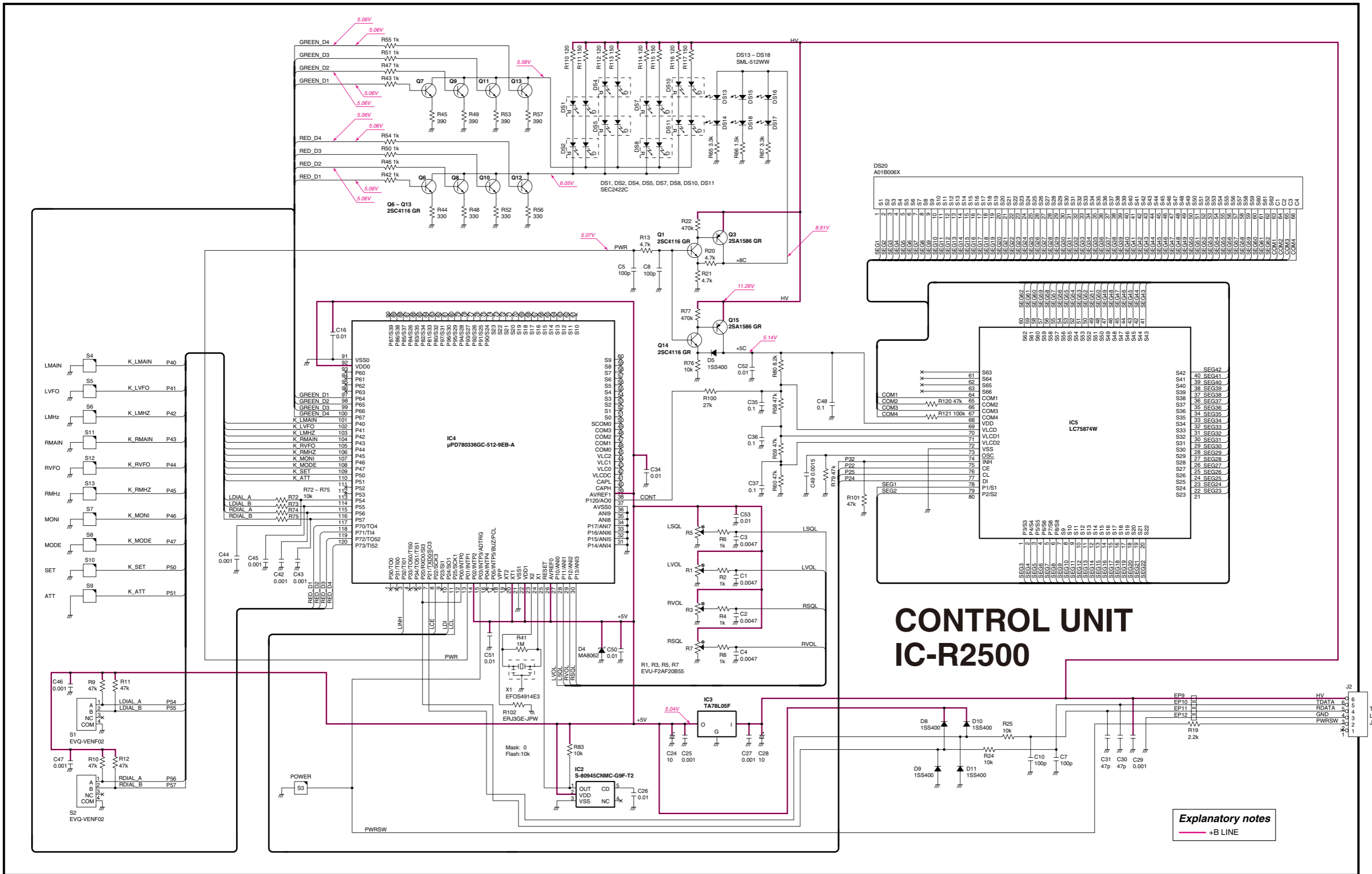
MAIN-B UNIT R2500 only

Measurement conditions
for voltage value

- [Frequency: 146.02 MHz, Mode: FM, BW: 15 kHz, Signal: none]
- [Measuring each condition]

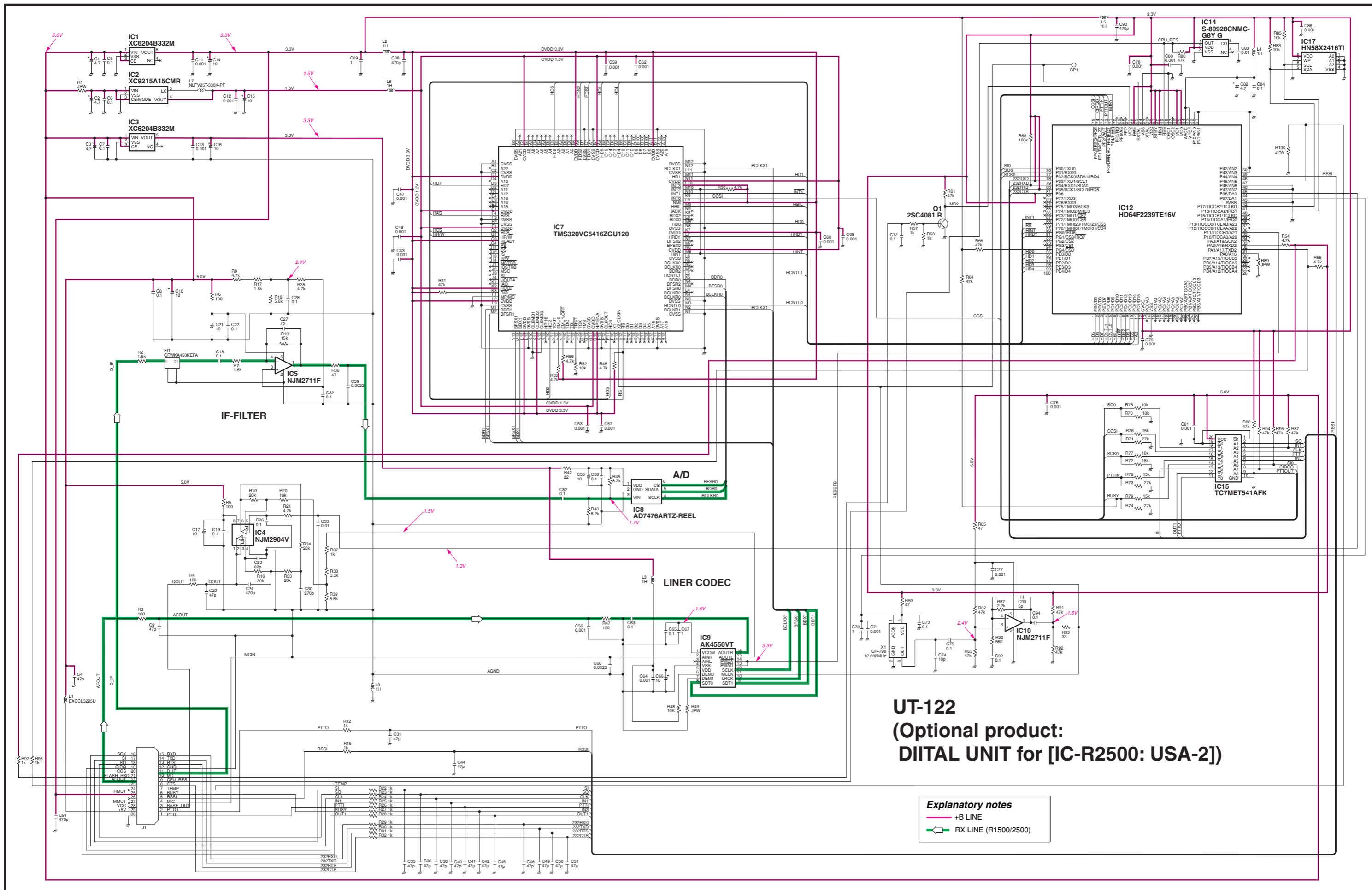






CONTROL UNIT IC-R2500

Explanatory notes
— +B LINE



UT-122
(Optional product:
DIITAL UNIT for [IC-R2500: USA-2])

Explanatory notes
 — +B LINE
 — RX LINE (R1500/2500)

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