



# SERVICE MANUAL

HF/50MHz ALL MODE TRANSCEIVER

## IC-756PRO

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## INTRODUCTION

This service manual describes the latest service information for the **IC-756PRO** HF/50MHz ALL MODE TRANSCEIVER.

MODEL	VERSION	SYMBOL
IC-756PRO	U.S.A.	USA
	Europe	EUR
	France	FRA

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

## DANGER

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

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

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

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



## ORDERING PARTS

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

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

### <SAMPLE ORDER>

1110000960 S.IC NJM4558M IC-756PRO MAIN UNIT 5 pieces  
8810005770 Screw BiH M3x8 ZK IC-756PRO Top cover 10 pieces  
Addresses are provided on the inside back cover for your convenience.

## REPAIR NOTES

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 50 dB to 60 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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## TABLE OF CONTENTS

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<b>SECTION 1</b>	<b>SPECIFICATIONS</b>	
<b>SECTION 2</b>	<b>INSIDE VIEWS</b>	
<b>SECTION 3</b>	<b>CIRCUIT DESCRIPTION</b>	
3 - 1	RECEIVER CIRCUITS .....	3 - 1
3 - 2	TRANSMITTER CIRCUITS .....	3 - 4
3 - 3	PLL CIRCUITS .....	3 - 6
3 - 4	ANTENNA TUNER CIRCUITS .....	3 - 7
3 - 5	SCOPE CIRCUIT .....	3 - 8
3 - 6	POWER SUPPLY CIRCUITS .....	3 - 9
3 - 7	LOGIC CIRCUITS .....	3 - 10
<b>SECTION 4</b>	<b>ADJUSTMENT PROCEDURES</b>	
4 - 1	PREPARATION BEFORE SERVICING .....	4 - 1
4 - 2	PLL ADJUSTMENTS .....	4 - 2
4 - 3	RECEIVER ADJUSTMENTS .....	4 - 4
4 - 4	TRANSMITTER ADJUSTMENTS .....	4 - 8
4 - 5	TUNER ADJUSTMENT .....	4 - 10
<b>SECTION 5</b>	<b>PARTS LIST</b>	
<b>SECTION 6</b>	<b>MECHANICAL PARTS</b>	
<b>SECTION 7</b>	<b>SEMI-CONDUCTOR INFORMATION</b>	
<b>SECTION 8</b>	<b>BOARD LAYOUTS</b>	
8 - 1	PBT, RIT AND MIC BOARDS .....	8 - 1
8 - 2	DISPLAY BOARD .....	8 - 2
8 - 3	MODE, PHONE, KEY AND TEN-KEY BOARDS .....	8 - 4
8 - 4	RF UNIT .....	8 - 6
8 - 5	PLL UNIT .....	8 - 8
8 - 6	MAIN UNIT .....	8 - 10
8 - 7	DSP BOARD .....	8 - 12
8 - 8	MEMORY BOARD .....	8 - 13
8 - 9	PA UNIT .....	8 - 14
8 - 10	FILTER UNIT .....	8 - 15
8 - 11	TUNER BOARD .....	8 - 16
8 - 12	CTRL UNIT .....	8 - 17
<b>SECTION 9</b>	<b>BLOCK DIAGRAM</b>	
<b>SECTION 10</b>	<b>VOLTAGE DIAGRAM</b>	
10 - 1	FRONT UNIT .....	10 - 1
10 - 2	DSP BOARD .....	10 - 2
10 - 3	TUNER, MEMORY BOARDS AND CTRL UNIT .....	10 - 3
10 - 4	MAIN UNIT (1) .....	10 - 4
10 - 5	MAIN UNIT (2) .....	10 - 5
10 - 6	PLL UNIT .....	10 - 6
10 - 7	PA AND FILTER UNITS .....	10 - 7
10 - 8	RF UNIT .....	10 - 8

# SECTION 1 SPECIFICATIONS

## ■ GENERAL

- Frequency coverage:
  - Receive 0.030–60.000 MHz\*<sup>1</sup>, \*<sup>2</sup>
  - Transmit 1.800–1.999 MHz\*<sup>2</sup> 3.500–3.999 MHz\*<sup>2</sup>
  - 7.000–7.300 MHz\*<sup>2</sup> 10.100–10.150 MHz\*<sup>2</sup>
  - 14.000–14.350 MHz\*<sup>2</sup> 18.068–18.168 MHz\*<sup>2</sup>
  - 21.000–21.450 MHz\*<sup>2</sup> 24.890–24.990 MHz\*<sup>2</sup>
  - 28.000–29.700 MHz\*<sup>2</sup> 50.000–54.000 MHz\*<sup>2</sup>
- \*<sup>1</sup> Some frequency bands are not guaranteed.
- \*<sup>2</sup> Depending on version.
- Mode : USB, LSB, CW, RTTY, AM, FM
- Number of memory channels : 101 (99 regular, 2 scan edges)
- Antenna connector : SO-239 x 2 and phono [(RCA)]; 50 Ω]
- Usable temp. range: –10°C to +50°C (14°F to 122°F)
- Frequency stability : Less than ±0.5 ppm from 1 min. after power ON.
- Freq. resolution : 1 Hz
- Power supply : 13.8 V DC ±15 % (negative ground) requirement
- Current consumption:
  - Transmit max. power 23 A
  - Receive stand-by 3.0 A (typical)
  - max. audio 3.3 A (typical)
- Dimensions : 340 (W) x 111(H) x 285(D) mm  
13<sup>3</sup>/<sub>8</sub>(W) x 4<sup>3</sup>/<sub>8</sub>(H) x 11<sup>7</sup>/<sub>32</sub>(D) in
- Weight : 9.6 kg (21 lb 1 oz)
- ACC 1 connector : 8-pin DIN connector
- ACC 2 connector : 7-pin DIN connector
- CI-V connector : 2-conductor 3.5(d) mm (1/8")
- Display : 5-inch (diagonal) TFT color LCD

## ■ TRANSMITTER

- Output power :
  - SSB/CW/RTTY/FM 5–100 W
  - AM 5–40 W
- Modulation system :
  - SSB PSN modulation
  - AM Low power modulation
  - FM Phase modulation
- Spurious emission : Less than –50 dB (HF bands)  
Less than –60 dB (50 MHz band)
- Carrier suppression: More than 40 dB
- Unwanted sideband suppression: More than 55 dB
- ΔTX variable range : ±9.999 kHz
- Mic. connector : 8-pin connector (600 Ω)
- ELE-KEY connector: 3-conductor 6.35(d) mm (1/4")
- KEY connector : 3-conductor 6.35(d) mm (1/4")
- SEND connector : Phono (RCA)
- ALC connector : Phono (RCA)

## ■ RECEIVER

- Receive system : Triple-conversion superheterodyne
- Intermediate frequencies:
  - 1st IF frequency 64.455 MHz
  - 2nd IF frequency 455 kHz
  - 3rd IF frequency 36 kHz
- Sensitivity :
  - SSB, CW, RTTY (at 2.4 kHz bandwidth)
    - 1.8–29.99 MHz\*<sup>1</sup> 0.16 μV (10 dB S/N)
    - 50.0–54.0 MHz\*<sup>2</sup> 0.13 μV (10 dB S/N)
  - AM (at 6.0 kHz bandwidth)
    - 0.5–1.799 MHz 13 μV (10 dB S/N)
    - 1.8–29.99 MHz\*<sup>1</sup> 2.0 μV (10 dB S/N)
    - 50.0–54.0 MHz\*<sup>2</sup> 1.0 μV (10 dB S/N)
  - FM (at 15 kHz bandwidth)
    - 28.0–29.99 MHz\*<sup>1</sup> 0.5 μV (12 dB SINAD)
    - 50.0–54.0 MHz\*<sup>2</sup> 0.32 μV (12 dB SINAD)
- \*<sup>1</sup> Pre-amp 1 ON \*<sup>2</sup> Pre-amp 2 ON
- Squelch sensitivity : (Pre-amp OFF)
  - SSB/CW/RTTY Less than 5.6 μV
  - FM Less than 1.0 μV
- Selectivity :
  - SSB/RTTY (at 2.4 kHz bandwidth)
    - More than 2.4 kHz/–6 dB
    - Less than 2.8 kHz/–60 dB
  - CW (at 500 Hz bandwidth)
    - More than 500 Hz/–6 dB
    - Less than 700 Hz/–60 dB
  - AM (at 6 kHz bandwidth)
    - More than 6.0 kHz/–6 dB
    - Less than 15.0 kHz/–60 dB
  - FM (at 15 kHz bandwidth)
    - More than 12 kHz/–6 dB
    - Less than 20 kHz/–60 dB
- Spurious and image: More than 70 dB rejection ratio (except IF through in 50 MHz band)
- RIT variable range : ±9.999 kHz
- Audio output power : More than 2.0 W at 10 % distortion (at 13.8 V DC) with an 8 Ω load
- PHONES connector: 3-conductor 6.35 (d) mm (1/4")
- EXT SP connector : 2-conductor 3.5 (d) mm (1/8") 8 Ω

## ■ ANTENNA TUNER

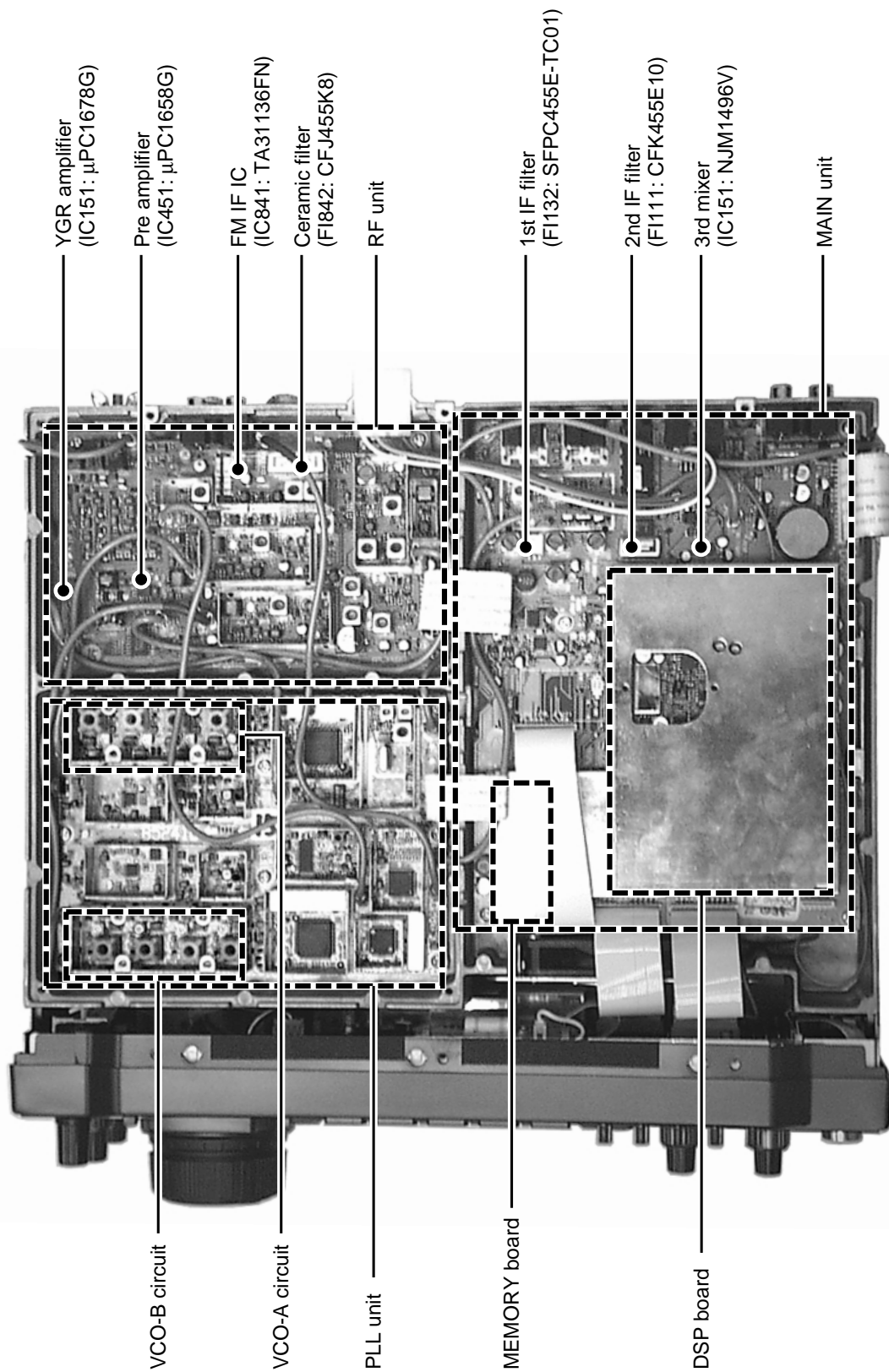
- Matching impedance range:
  - HF bands 16.7 to 150 Ω unbalanced\*<sup>1</sup>
  - 50 MHz band 20 to 125 Ω unbalanced\*<sup>2</sup>
- \*<sup>1</sup> Less than VSWR 3:1; \*<sup>2</sup> Less than VSWR 2.5:1
- Minimum operating input power:
  - HF bands : 8 W
  - 50 MHz band : 15 W
- Tuning accuracy : VSWR 1.5:1 or less
- Insertion loss : Less than 1.0 dB (after tuning)

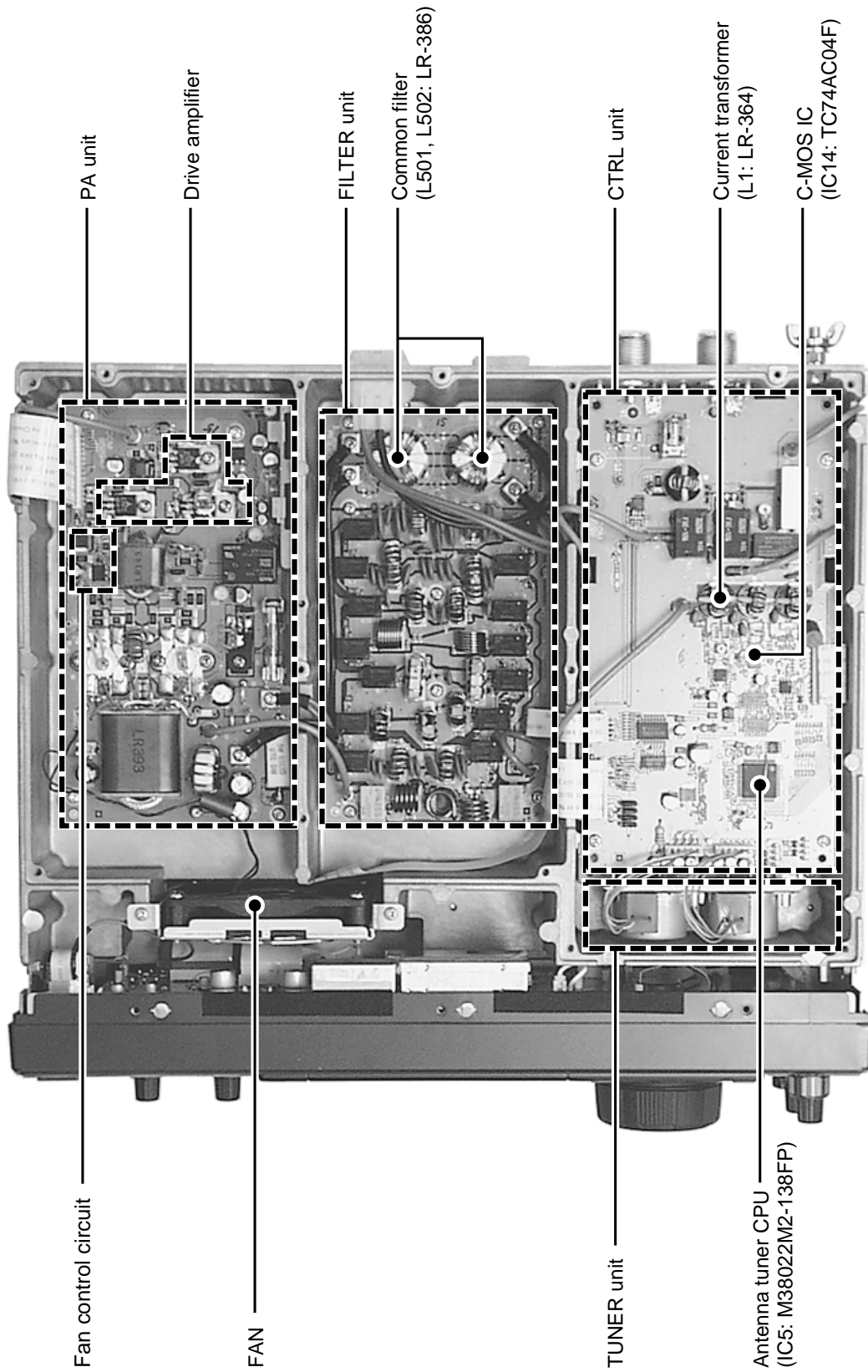
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## SECTION 2 INSIDE VIEWS

### • BOTTOM VIEW





# SECTION 3 CIRCUIT DESCRIPTION

## 3-1 RECEIVER CIRCUITS

### 3-1-1 RF SWITCHING CIRCUIT (CTRL AND RF UNITS)

The RF switching circuit leads receive signals to bandpass filters from an antenna connector while receiving. However, the circuit leads the signal from the RF power amplifier to the antenna connector while transmitting.

RF signals from [ANT 1] or [ANT 2] pass through the antenna selector (RL3), transmit/receive switching relays (RL1, RL2, RL4), and low-pass filter (L27, L28, C63–C66, C105), and are then applied to the RF unit via J2.

The signals from the CTRL unit either bypass or pass through the 6 dB (RF unit, RL121, R121) and/or 12 dB (RF unit, RL122, R123) attenuators via the antenna selector (RL101). By selecting the attenuators, 0 (bypass), 6, 12 and 18 dB attenuations are obtained. The signals are then applied to the RF filters.

When the [RX ANT] is selected, the RF signals are passed through the low-pass filter (RF unit, L112, L111, C111–C116), then applied to the antenna selector (RF unit, RL101).

### 3-1-2 RF BANDPASS FILTER CIRCUIT (RF UNIT)

RF bandpass filters pass only the desired band signals and suppress any undesired band signals. The RF circuit has 11 bandpass filters and 1 low-pass filter.

#### (1) 0.03–1.6 MHz

The signals pass through the low-pass filter (L181–L183, C181–C185), attenuator (R181–R183), and are then applied to the RF amplifiers (Q501, Q601).

#### (2) 1.6–60 MHz

The signals pass through the high-pass filter (L171–L174, C171–C174) to suppress excessively strong signals below 1.6 MHz. The filtered signals are applied to one of 11 bandpass filters as below, and then applied to or bypassed the pre-amplifier circuit.

#### • Used RF filter

Band	Control signal	Input diode	Band	Control signal	Input diode
0.03–1.6 MHz	B0	N/A	11–15 MHz	B7	D311
1.6–2 MHz	B1	D191	15–22 MHz	B8	D231
2–3 MHz	B2	D211	22–30 MHz	B9	D291½
3–4 MHz	B3	D231½	30–50 MHz	B10W	D391
4–6 MHz	B4	D231½	50–54 MHz	B10	D371
6–8 MHz	B5	D271	54–60 MHz	B10W	D391
8–11 MHz	B6	D291½			

### 3-1-3 PRE-AMPLIFIER CIRCUITS (RF UNIT)

The IC-756PRO has 2 gain levels of pre-amplifier circuits. One has 10 dB gain over a wide band frequency range and the other one has 16 dB gain for the 21–28 MHz bands.

When the [PREAMP] switch is set to [PRE1] or [PRE2], the signals are applied to the pre-amplifier 1 (Q441, Q442) or pre-amplifier 2 (IC451) circuit, respectively. Pre-amplified or bypassed signals are applied to the RF amplifier circuits (Q501, Q601).

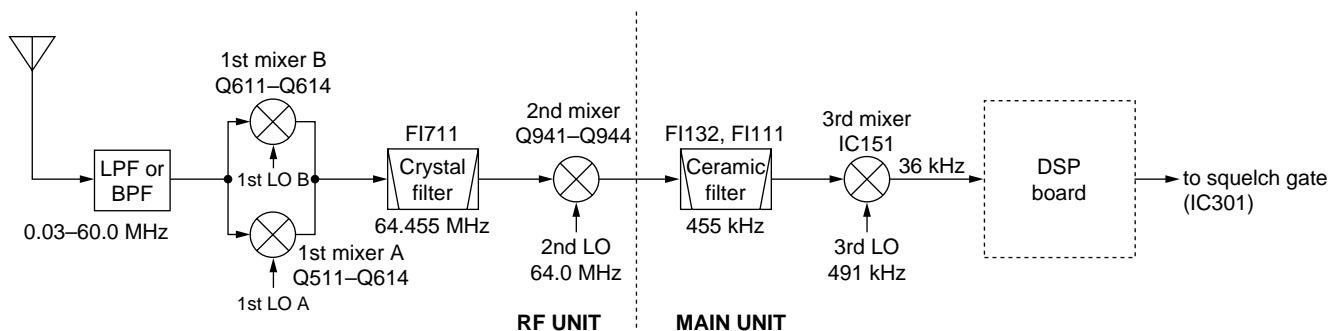
### 3-1-4 RF AMPLIFIER AND 1ST MIXER CIRCUITS (RF UNIT)

The 1st mixer circuit mixes the receive signals with the 1st LO signal to convert the receive signal frequencies into a 64.455 MHz 1st IF signal. The IC-756PRO has two 1st mixer circuits for the dualwatch function.

The signals from the pre-amplifier circuit, or signals which bypass the pre-amplifiers, are divided at L491. Each signal is applied to a 60 MHz cut-off low-pass filter, RF amplifier (Q501, Q601) and then to a 1st mixer (Q511–Q514 or Q611–Q614).

Each 1st LO signal (64.4850–124.4550 MHz) enters the RF unit from the PLL unit via J561 or J661. The LO signals are amplified at the LO amplifier (Q561 or Q661), filtered by a low-pass filter, and then applied to each 1st mixer.

#### • Receiver construction



### 3-1-5 1ST IF CIRCUIT (RF UNIT)

The 1st IF circuit filters and amplifies the 1st IF signal. The 1st IF signal combined at L653 is applied to an MCF (Monolithic Crystal Filter; FI711a/b) to suppress out-of-band signals.

The converted 1st IF signal level is adjusted at PIN attenuators (D531–D533, D535 or D631–D632, D635) controlled by the [BAL] controller for the dualwatch function. The signal is applied to the 1st IF amplifier (Q551 or Q651) and then combined at L653.

The combined signal passes through the MCFs (FI711a/b) and PIN attenuator (D781, D783). The signal is amplified at the 1st IF amplifier (Q721). The amplified signal is then applied to the 2nd mixer circuit.

### 3-1-6 2ND MIXER CIRCUIT (RF UNIT)

The 2nd mixer circuit mixes the amplified 1st IF signal and 2nd LO signal (64.00 MHz) for conversion into the 2nd IF signal.

The 1st IF signal from the 1st IF amplifier (Q721) is converted into a 455 kHz 2nd IF signal at the 2nd mixer circuit (Q941–Q944).

The 2nd IF signal is applied to the ceramic filter (MAIN unit, FI131) to suppress un-desired signals, and then applied to the noise blanker gate.

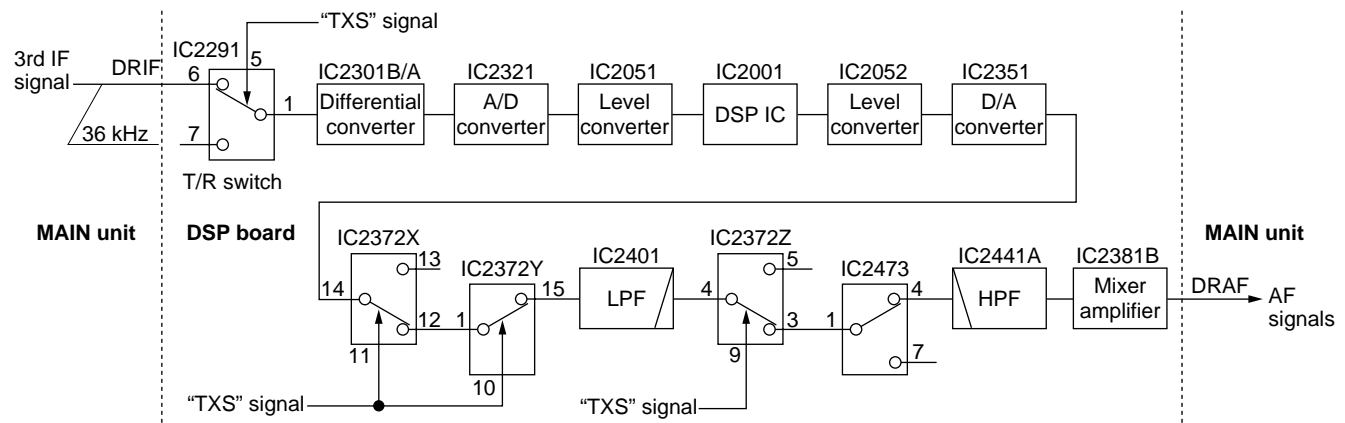
### 3-1-7 NOISE BLANKER CIRCUIT (MAIN UNIT)

The noise blanker circuit detects pulse-type noise, and turns OFF the signal line when the noise appears.

The 2nd IF signal from the ceramic filter (FI132) is applied to the noise blanker gate (D112, D116). A portion of the signal from FI132 is amplified at the noise amplifiers (Q271–Q273), and is then detected at the noise detector (D271) to convert the noise components to DC voltages.

The signal is then applied to the noise blanker switch (Q276, Q278). At the moment the detected voltage exceeds Q276's threshold level, Q278 outputs a blanking signal to close the noise blanker gate (D112, D116). The PLL unlock signal are also applied to Q278, to control the noise blanker gate.

### • DSP receiver circuit



Some DC voltage from the noise detector circuit is fed back to the noise amplifiers (Q271–Q273) via the DC amplifiers (Q274, Q275). The DC amplifiers function as an AGC circuit to reduce average noise. Therefore, the noise blanker function shuts off pulse-type noise only.

### 3-1-8 2ND IF CIRCUIT (MAIN UNIT)

The 2nd IF circuit filters and applies the 2nd IF signal to the 3rd mixer circuit.

The 2nd IF signal from the noise blanker gate (D112, D116) is passed through the another ceramic filter (FI111). The filtered signal is applied to the 3rd mixer circuit.

### 3-1-9 3RD MIXER AND 3RD IF CIRCUITS (MAIN UNIT)

The 3rd mixer circuit mixes the 2nd IF signal and the 3rd LO signal to obtain the 3rd IF (36 kHz) signal.

The 2nd IF signal from the ceramic filter (FI111) is applied to the 3rd mixer circuit (IC151, pin 1). The 3rd LO signal from the PLL unit is applied to the 3rd mixer (IC151, pin 10). The mixed signal is output from pin 6.

The 3rd IF signal is amplified at the 3rd IF amplifier (IC201b), and is passed through the low-pass filter (IC201a). The filtered signal is then applied to the DSP board via DRIF line.

### 3-1-10 DSP RECEIVER CIRCUIT (DSP BOARD)

The DSP (Digital Signal Processor) board enables digital IF filter, digital noise reduction, digital PSN (Phase Shift Network)/Low Power/Phase demodulation, digital automatic notch, and etc.

The 36 kHz 3rd IF signal from the low-pass filter (MAIN unit, IC201a) is amplified at the differential amplifiers (IC2301a/b) after being passed through the T/R switch (IC2291), and is then applied to the A/D converter (IC2321). The converted signal is level shifted 5V to 3.3 V at the level converter (IC2051).



The level shifted signal is applied to the DSP IC (IC2001) for 36 kHz digital IF filter, demodulation, automatic notch and noise reduction, etc. The output signal is level shifted 3.3 V to 5V at the level converter (IC2052), and is applied to the D/A converter (IC2351) to convert into the analog audio signals.

The converted audio signals are passed through the active filter (IC2371a), AF amplifier (IC2371b), analog switches (IC2372, pins 14, 13 and pins 1, 15) then applied to the low-pass filter (IC2401). The filtered signals are passed through the analog switches (IC2372, pins 4, 3 and IC2473), high-pass filter (IC2441A) and mixer amplifier (IC2471A), and then applied to the MAIN unit via J2001 (pin 13) as the DTAF signal.

### 3-1-11 TWIN PBT CIRCUIT (DSP BOARD)

General PBT (Passband Tuning) circuit shifts the center frequency of IF signal to electronically narrow the passband width. The IC-756PRO uses the DSP circuit for the digital PBT function and actually shifts the both lower and higher passbands of 3rd IF filter within  $\pm 1.8$  kHz.

The twin PBT circuit in DSP IC (IC2001) controlled by the [TWIN PBT] controller adjusts the 3rd IF passband width and rejects interference.

### 3-1-12 AGC CIRCUIT (DSP BOARD)

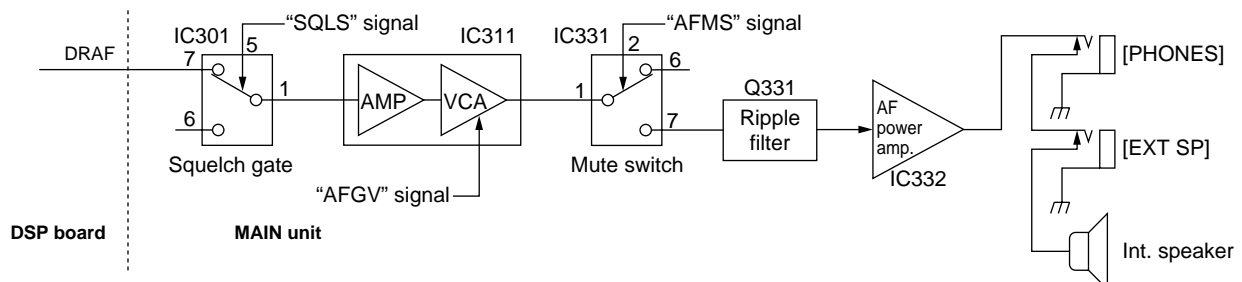
The AGC (Automatic Gain Control) circuit reduces IF amplifier gain and attenuates IF signal to keep the audio output at a constant level.

The receiver gain is determined by the voltage on the AGC line (IC2461, pin 4). The D/A converter for AGC (IC2461) supplies control voltage to the AGC line and sets the receiver gain with the [RF/SQ] control.

The 3rd IF signal from the level converter (IC2051) is detected at the AGC detector section in DSP IC (IC2001), and is applied to the D/A converter for AGC via the level converter (IC2052). The AGC voltage is amplified at the buffer amplifier (IC2471b) and is applied to the MAIN unit to control the AGC line.

When receiving strong signals, the detected voltage increases and the AGC voltage decreases via the buffer amplifier (IC2471b). As the AGC voltage is used for the bias voltage of the IF amplifier (RF unit; Q721), IF amplifier gain is decreased. And also AGC voltage is amplified at the AGC amplifier (RF unit; IC871c) and applied to the ATT driver (Q781, D784) to drive the PIN attenuator (D781, D783).

### • AF amplifier circuit



### 3-1-13 S-METER CIRCUIT (MAIN UNIT)

The S-meter circuit indicates the relative received signal strength while receiving by utilizing the AGC voltage which changes depending on the received signal strength.

A portion of the AGC bias voltage from the DSP board is applied to the differential amplifier (IC101a, pin 2) where the difference between the AGC and reference voltage is detected.

The detected voltage is passed through the analog switch (IC3631, pins 12, 14) as the SML signal and applied to the main CPU (IC3501, pin 108) to activate the S/Rf meter via the sub CPU (IC401) on the DISPLAY board.

### 3-1-14 SQUELCH CIRCUIT (MAIN UNIT)

The squelch circuit mutes audio output when the S-meter signal is lower than the [RF/SQ] setting level.

The S-meter signal is applied to the main CPU (IC3501, pin 108) and is compared with the threshold level set by the [RF/SQ] control. The [RF/SQ] setting signal is applied to the main CPU via the sub CPU (DISPLAY board; IC401, pin 91). The main CPU analyzes the compared signal and outputs control signal to the squelch gate (IC301, pin 5) via the interface IC (IC3653, pin 19) to open or close the squelch as the SQLS signal.

### 3-1-15 AF AMPLIFIER CIRCUIT (MAIN UNIT)

The AF amplifier amplifies the audio signals to a suitable driving level for the speaker.

The AF signals (DRAF) from the DSP board are passed through the squelch gate (IC301) and amplified at the AF amplifier section of IC311 (pins 2, 4) and volume is controlled by the AFGV signal at the VCA section (pins 7-9). The volume controlled AF signals are passed through the AF mute gate (IC331, pins 1, 7), then applied to the AF power amplifier (IC332, pin 1) via the ripple filter (Q331).

The amplified audio signals are passed through the [PHONES] and [EXT SP] jacks then applied to the internal speaker when no plug is connected to the jacks. The AF mute gate is controlled by the [AF] control via the sub and main CPUs.

## 3-2 TRANSMITTER CIRCUITS

### 3-2-1 MICROPHONE AMPLIFIER CIRCUIT (MAIN UNIT)

The microphone amplifier circuit amplifies microphone audio signals to a level needed for the DSP.

Audio signals from the [MIC] connector (MIC board; J1, pin 1) are amplified at the audio amplifier section in IC451 (pins 21–23) via the analog switch (IC3002, pins 12, 14), then applied to the buffer amplifier section (IC451, pin 5) and VCA section. The gain controlled signals are output from (IC451, pin 9) and passed through the analog switch (IC3005, pins 14, 12) and then applied to the DSP circuit as the DTAF signal.

The VCA section in IC451 (pins 7–9) controls microphone input gain according to the [MIC GAIN] control level using the MIGV signal coming from the main CPU via the I/O expander (IC3751, pin 4).

### 3-2-2 VOX CIRCUIT (MAIN UNIT)

The VOX (Voice-Operated Transmission) circuit sets transmitting conditions according to voice input.

A portion of the amplified audio signals from the AF amplifier section in IC451 are again amplified at the VOX amplifier section IC451 (pin 9), also gain controlled signals at the VCA section (pin 9) are amplified at the AF amplifier (IC3004b, pins 6, 7), and then applied to the main CPU (IC3501, pin 106) after passing through the analog switch (IC362, pins 6, 1) as the VOXL signal.

The VOGV signal is applied to the VCA section in IC3003 (pin 7–9) from the main CPU via the I/O expander (IC3751, pin 9) to adjust VOX actionable sensitivity. This is controlled by the VOX gain set in the VOX SET mode.

### 3-2-3 DSP TRANSMITTER CIRCUIT (DSP BOARD)

The microphone audio signals from the MAIN unit via the DTAF line are passed through the analog switch (IC2201, pins 4 and 3 or 5) and applied to the each modulation circuits.

#### (1) When SSB mode

The audio signals from the analog switch (IC2201, pin 5) are amplified at the limiter amplifier (IC2281b) and applied to the low-pass filter (IC2281d/c) to limit the transmit passband width.

The filtered signals are then applied to the differential amplifiers (IC2301a/b) via the analog switch (IC2201) and T/R switch (IC2291).

#### (2) When FM/AM modes

The audio signals from the analog switch (IC2201, pin 3) are applied to the deviation adjustment pots (R2227: FM mode, R2229: AM mode) via the limiter amplifier, pre-emphasis circuit (only FM mode) and splatter filter consist of IC2211.

The level adjusted signals are applied to the differential amplifiers (IC2301a/b) after being passed through the analog switch (IC2201) and T/R switch (IC2291). When AM mode the pre-emphasis circuit is cancelled by Q2201, Q2202, Q2211.

The amplified signals at the differential amplifiers (IC2301a/b) are applied to the A/D converter (IC2321). The converted signals are level shifted 5V to 3.3 V at the level converter (IC2051).

The level shifted signal is applied to the DSP IC (IC2001) and modulated at the DSP IC to produce the 36 kHz transmit IF signal. The modulated IF signal from the DSP IC is level shifted 3.3 V to 5V at the level converter (IC2052), and is applied to the D/A converter (IC2351) to convert into the analog IF signal.

The converted IF signal is passed through the active filter (IC2371a), buffer amplifier (IC2371b), analog switch (IC2372, pins 14, 12) then applied to the low-pass filter (IC2381c/d). The filtered signal is applied to the MAIN unit via J2001 (pin 28) as the DTIF signal.

A portion of the filtered signal from the low-pass filter (IC2381c/d) is amplified at the IF amplifier (IC2381b) and applied to the transmit monitor circuit for the monitor function.

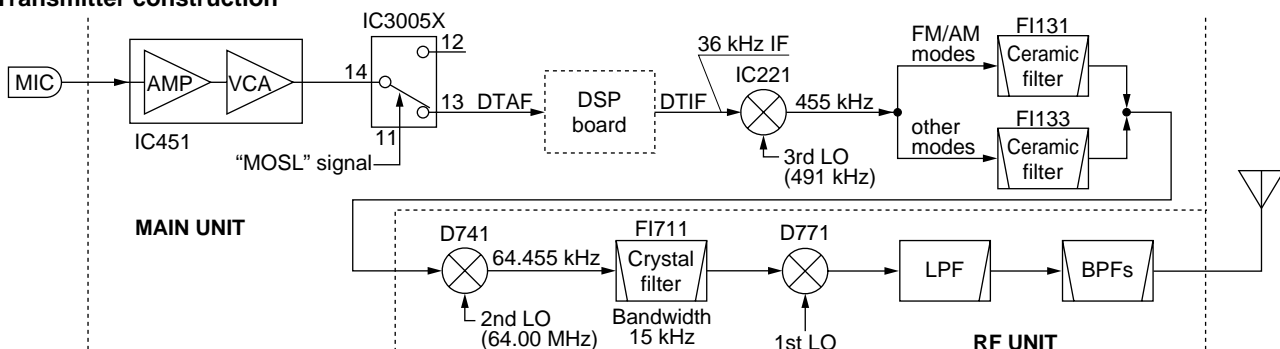
### 3-2-4 SPEECH COMPRESSOR CIRCUIT (DSP BOARD)

The speech compressor compresses the transmitter audio input signals to increase the average output level (average talk power).

When the [COMP] switch is ON, the level shifted signal from the level converter (IC2051) is applied to the DSP IC (IC2001) and compressed at the DSP IC to obtain an average audio level.

At the same time, the compressed signals are modulated at the DSP IC and applied to the level converter (IC2052).

#### • Transmitter construction



### 3-2-5 IF AMPLIFIER AND MIXER CIRCUITS (MAIN AND RF UNITS)

The modulated 3rd IF signal from the DSP board (DTIF: 36 kHz) is applied to the 3rd mixer circuit (MAIN unit; IC221). The applied 3rd IF signal is mixed with the 3rd LO signal from the DDS circuit (PLL unit; IC701) to produce a 455 kHz 2nd IF signal.

The 2nd IF signal is output from pin 6 and amplified at the IF amplifier (MAIN unit; Q241). The amplified signal is passed through the ceramic bandpass filter (MAIN unit; F1131: FM/AM modes, F1133: other modes) for unwanted signals are suppressed. The filtered 2nd IF signal is amplified at IF amplifier (MAIN unit; Q261) and applied to the 2nd mixer circuit on the RF unit via J101.

The 2nd IF signal is mixed with the 64 MHz 2nd LO signal, coming from the PLL unit, at the 2nd mixer circuit (RF unit; D741) to obtain a 64.455 MHz 1st IF signal. The 1st IF signal is passed through the MCF (RF unit; F1711) to cut-off the undesired signals then amplified at the IF amplifier (RF unit; Q751) via the T/R switch (RF unit; D711). The amplified 1st IF signal is applied to the 1st IF mixer circuit (RF unit; D771).

The operating (transmitting) frequency is produced at the 1st IF mixer circuit (RF unit; D771) by mixing the 1st IF and 1st LO signals. The mixed signal is then applied to the RF circuit.

### 3-2-6 RF CIRCUIT (RF AND PA UNITS)

The RF circuit amplifies operating (transmitting) frequency to obtain 100 W of RF output.

The signal from the 1st IF mixer is passed through the low-pass filter (RF unit; L961, L962, C961–C966) and amplified at the RF amplifier (RF unit; IC961). The amplified signal is again amplified at the wide-band YGR amplifier (RF unit; IC151) after passing through one of 11 bandpass (Refer to page 3-1 for bandpass filters used) and high-pass filters, and is then applied to the PA unit via J151.

The signal applied from the RF unit is amplified at the pre-drive (Q1), drive (Q2, Q3) and power amplifiers (Q4, Q5) in sequence to obtain a stable 100 W of RF output power. The

amplified signal is applied to one of 8 low-pass filters in the FILTER unit.

### 3-2-7 LOW-PASS FILTER CIRCUIT (FILTER UNIT)

The low-pass filter circuit contains 8 Chebyshev low-pass filters to suppress the higher harmonic components.

The signal from the power amplifiers in the PA unit is applied to one of the low-pass filters, which is selected by the I/O expander (IC11) in the CTRL unit via the buffer-amplifier (CTRL unit; IC12).

The filtered signal is then applied to one of 2 antenna connectors via the CTRL only/and TUNER unit/s.

### 3-2-8 ALC CIRCUIT (MAIN UNIT)

The ALC (Automatic Level Control) circuit controls the gain of IF amplifiers in order for the transceiver to output a constant RF power set by the [RF POWER] control even when the supplied voltage shifts, etc.

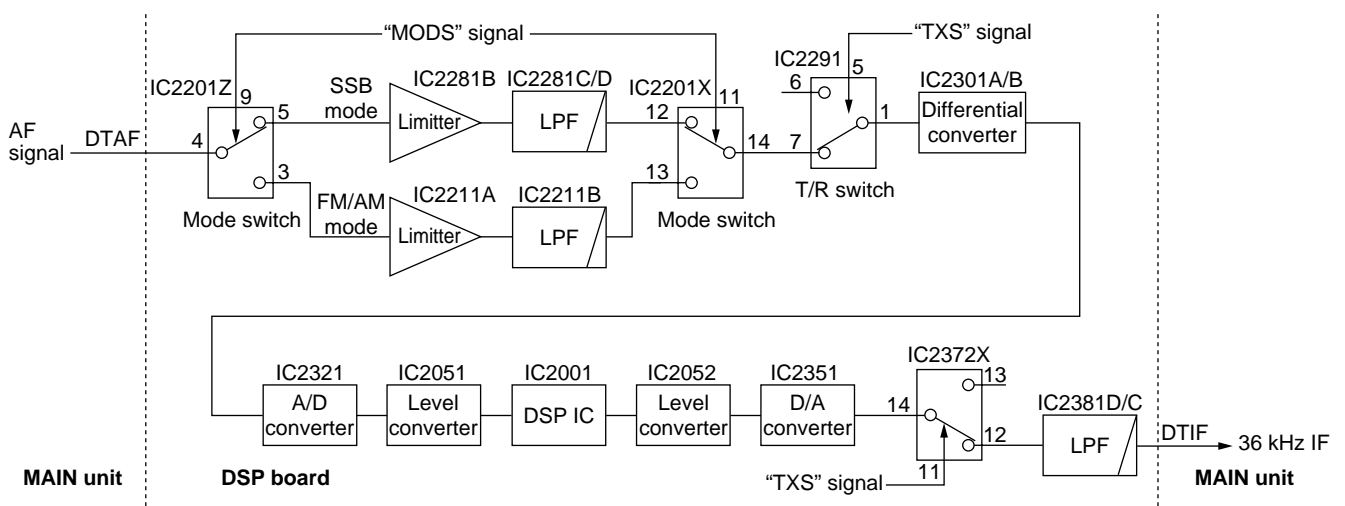
The RF power level is detected at one of the APC detector circuits (CTRL unit; D2) to be converted into DC voltage and applied to the MAIN unit as the FORV signal.

The FORV signal from the CTRL unit is applied to the comparator (IC551b, pin 6). The POCV signal, controlled by the [RF POWER] control via the I/O expander (IC3751, pin 5), is also applied to the other input (pin 5) for reference. The compared signal is output from pin 7 and applied to the IF amplifiers in the MAIN (Q261) and RF (Q751) units to control amplifying gain.

When the FORV signal exceeds the POCV voltage, ALC bias voltage from the comparator controls the IF amplifiers. This adjusts the output power to a specified level from the [RF POWER] control until the FORV and POCV voltages are equalized.

In AM mode, the comparator operates as an averaging ALC amplifier. Q502 turns ON and the POCV voltage is shifted for 40 W AM output power (maximum) through R510.

### • DSP Transmitter circuit



The ALC bias voltage is also applied to the ALC meter amplifier (IC551a, pin 2) to obtain an ALC meter signal (ALCL). The amplified signal is passed through the analog switch (IC3631, pins 13, 14) and applied to the main CPU (IC3501, pin 108) to drive the S/RF meter via the sub CPU (IC401) on the DISPLAY board.

An external ALC input from the [ALC] jack or [ACC] sockets is applied to the buffer amplifier (Q521). External ALC operation is identical to that of the internal ALC.

The FORV signal is also applied to the power meter amplifier (IC571a, pin 3). The amplified signal is passed through the analog switch (IC3631, pins 1, 15) as an FORL signal and applied to the main CPU (IC3501, pin 109) to drive the S/RF meter when the power meter is selected.

### 3-2-9 APC CIRCUIT (MAIN UNIT)

The APC (Automatic Power Control) circuit protects the power amplifiers on the PA unit from high SWR and excessive current.

The reflected wave signal appears and increases when the connected antenna is mismatched to 50  $\Omega$ . The APC detector circuit (CTRL unit; D1 and L1) detects the reflected signal, and applies it to the APC circuit (IC551c, pin 9) as a REFV signal.

When the REFV signal level increases, the APC circuit decreases the ALC voltage to activate the APC.

For the current APC, the power transistor current is obtained by detecting the voltages (ICH and ICL) which appear at both terminals of the current detector (PA unit, R28). The detected voltages are applied to the differential amplifier (IC551d, pins 12, 13). When the current of transistors is increased, the amplifier controls the ALC line to prevent excessive current flow.

A portion of the REFV signal is applied to the SWR meter amplifier (IC571b, pin 5). The amplified signal is passed through the analog switch (IC3631, pins 3, 4) as an REFL signal and applied to the main CPU (IC3501, pin 110) to drive the S/RF meter when the SWR meter is selected.

### 3-2-10 TEMPERATURE PROTECTION CIRCUIT (PA UNIT)

The cooling fan (MF1) is activated while transmitting or when the temperature of the power amplifier exceeds the preset value. The temperature protection circuit consists of Q10–Q13 and R50.

While transmitting, Q10 and Q12 are turned ON, and provide a voltage to the cooling fan to rotate at medium speed. The thermistor detects the temperature of Q5, and activates Q11 and Q13 to accelerate the cooling fan when the detected temperature exceeds 70°C (158°F). The cooling fan rotates at high speed at 80°C (176°F) or more.

The thermistor keeps the cooling fan rotating even while receiving until the Q5 temperature drops to 60°C (140°F) or below.

## 3-2-11 MONITOR CIRCUIT (DSP BOARD AND MAIN UNIT)

The microphone audio signals can be monitored to check voice characteristics.

### (1) When FM/AM modes (MAIN UNIT)

A portion of the microphone audio signals from the VCA section in IC451 are applied to the analog switch (IC361). The selected audio signals are applied to IC371 (pin 2), and the output signals from pin 9 are applied to the AF amplifier circuit (IC311, pin 7).

### (2) When SSB/RTTY modes (DSP BOARD)

A portion of the transmit IF signal from the low-pass filter (IC2381c/d) is amplified at the IF (IC2381b) and buffer (IC2381a) amplifiers and applied to the digital mixer circuit (IC2302). The applied signal is mixed with a 36 kHz LO signal from IC2347 to demodulate into the AF signals. The demodulated signals are passed through the buffer amplifier (IC2381a), low-pass filter (IC2441b/c) and AF amplifier (IC2441d), and then applied to the MAIN unit as the DMAF signal.

The DMAF signal from the DSP board is amplified at ALC amplifier (MAIN unit; IC372) and applied to the VCA section of IC371 (MAIN unit). The volume controlled AF signals is applied to the AF amplifier circuit (MAIN unit; IC311, pin 7).

## 3-3 PLL CIRCUITS

### 3-3-1 GENERAL

The PLL unit generates a pair of 1st LO frequencies (64.485–124.455 MHz) for dualwatch and spectrum scope functions; a 2nd LO frequency (64 MHz), 3rd LO frequency (491 kHz) and sweep LO frequency for the spectrum scope function.

The 1st LO PLLs adopt a mixer-less dual loop PLL system and has 4 VCO circuits. The LOs, except the 2nd, use DDSs while the 2nd LO uses the fixed frequency of the crystal oscillator.

### 3-3-2 1ST LO PLL CIRCUIT

The 1st LO PLLs contain a main and reference loop as a dual loop system. Both PLLs have equivalent circuits— this manual describes only the 1st LO PLL A circuit.

The reference loop generates a 10.747 to 10.865 MHz frequency using a DDS circuit, and the main loop generates a 64.485 to 124.455 MHz frequency using the reference loop frequency.

### (1) REFERENCE LOOP PLL

The oscillated signal at the reference VCO (Q151, D151) is amplified at the amplifiers (Q152, Q102) and is then applied to the DDS IC (IC101, pin 46). The signal is then divided and detected on phase with the DDS generated frequency.

The detected signal output from the DDS IC (pin 56) is converted into DC voltage (lock voltage) at the loop filter (R135–R137, C121, C151) and then fed back to the reference VCO circuit (Q151, D151).

## (2) MAIN LOOP PLL

The oscillated signal at one of the main loop VCOs (Q201, D201, D202), (Q221, D221, D222), (Q251, D251–D254) and (Q271, D271–D274) is amplified at the buffer amplifiers (Q301, IC320) and is then applied to the PLL IC (IC381, pin 6). The signal is then divided and detected on phase with the reference loop output frequency.

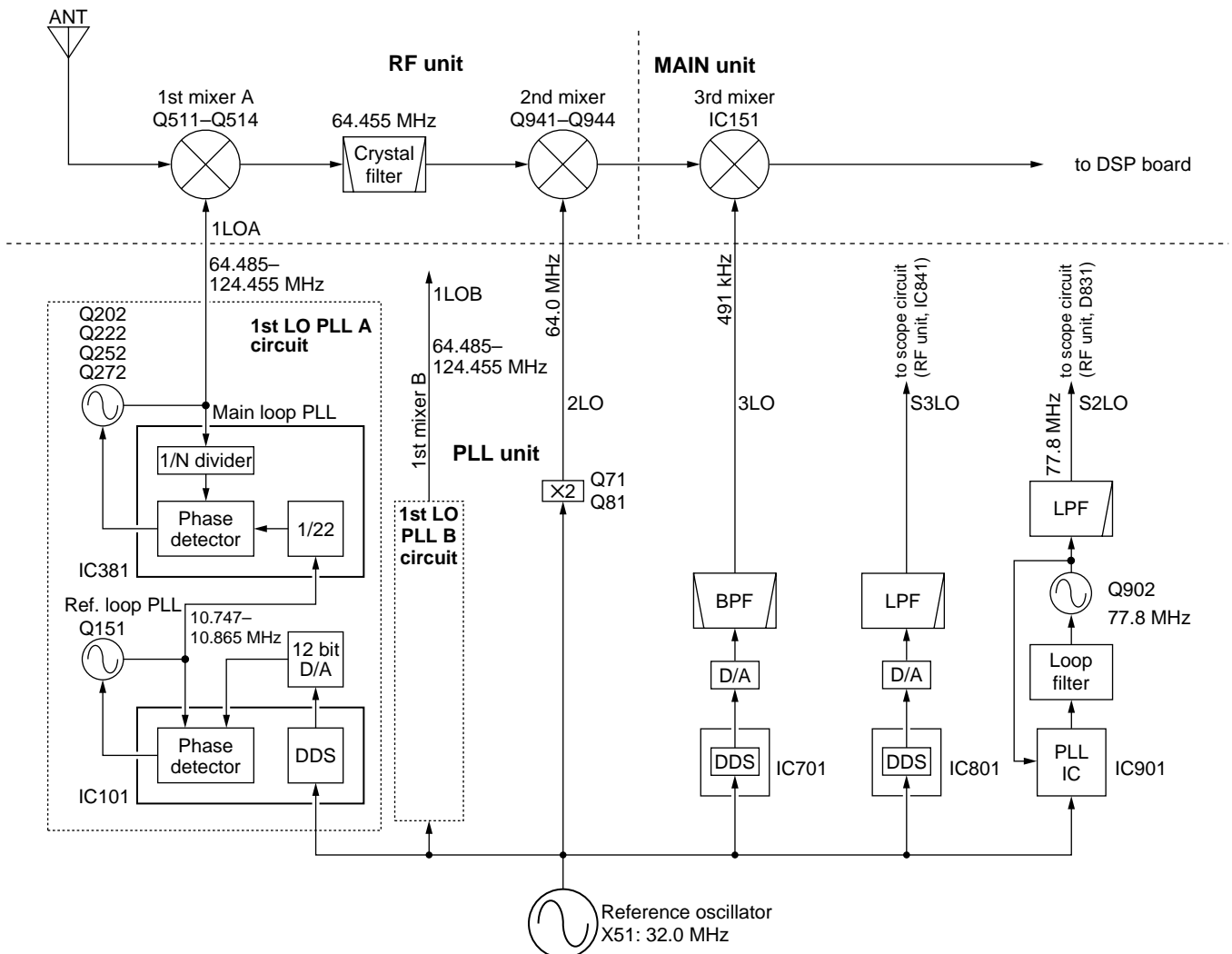
The detected signal output from the PLL IC (pin 2) is converted into a DC voltage (lock voltage) at the loop filter and then fed back to one of the VCO circuits (Q201, D201, D202), (Q221, D221, D222), (Q251, D251–D254) and (Q271, D271–D274).

The oscillated signal is amplified at the buffer amplifiers (Q301, IC320) and then applied to the RF unit as a 1st LO A signal after being passed through the bandpass filter (L303, L351–L354, C304–C307, C351–C356, C358–C360).

## 3-3-3 2ND LO AND REFERENCE OSCILLATOR CIRCUITS

The reference oscillator (X52, Q51) generates a 32.00056 MHz frequency for the 4 DDS circuits as a system clock and for the LO output. The oscillated signal is doubled at the doubler circuit (Q71, Q81) and the 64.0 MHz frequency is picked up at the double tuned filter (L81, L82). The 64.0 MHz signal is applied to the RF unit as a 2nd LO signal.

### • PLL CIRCUIT



## 3-3-4 3RD LO CIRCUIT

The DDS IC (IC701) generates a 10-bit digital signal using the 32 MHz system clock. The digital signal is converted into an analog wave signal at the D/A converter (R701–R720). The converted analog wave is passed through the bandpass filter (L702, L703, C709–C713) and then applied to the MAIN unit as the 3rd LO signal.

## 3-3-5 MARKER CIRCUIT

The divided signal at the DDS circuit (IC101) is used for the marker signals with the IC-756PRO.

The reference signal for the DDS circuit (32.0 MHz) is divided to produce an acceptable frequency signal, 16 MHz, with the programmable divider then divided again by 160 to obtain 100 kHz cycle square-wave signals.

The generated marker signals are output from pin 66 of the DDS IC (IC101), and are then applied to the RF unit via the mute switch (IC192) and J851 as the MKR signal.

### 3-4 ANTENNA TUNER CIRCUITS

#### 3-4-1 MATCHING CIRCUIT (TUNER UNIT)

The matching circuit is a T-network. Using 2 tuning motors, the matching circuit obtains rapid overall tuning speed.

Using relays (RL1–RL15), the relay control signals from the antenna tuner CPU (CTRL unit; IC5) via the buffer-amplifier (IC1, IC2) ground one of the taps of L3–L12 and add capacitors (C27–C43). After selecting the coils and capacitors, 2 motors (CTRL unit; MF1, MF2) adjust C44 and C45 using the antenna tuner CPU (CTRL unit; IC5) and the motor controller (CTRL unit; Q211–Q218, D211–D217) to obtain a low SWR (Standing Wave Ratio).

#### 3-4-2 DETECTOR CIRCUIT (CTRL UNIT)

##### (1) SWR detector

Forward and reflected power are picked up by a current transformer (L1), detected by D2 and D1, and then amplified at IC1a and IC1b, respectively. The amplified voltages are applied to the antenna tuner CPU (IC5, pins 2, 3). The tuner CPU detects the SWR.

##### (2) Reactance components detector

Reactance components are picked up by comparing the phases of the RF current and RF voltage. The RF current is detected by L4 and R16 and buffer-amplified at IC14e and IC2a and then applied to the phase comparator (IC3a). RF voltages are detected by C12–C14 and then applied to the phase comparator (IC3b) after being amplified at the buffer-amplifiers (IC14c, IC2b). The output signal from the phase comparator (IC3a, pin 6 for RF current, IC3b pin 7 for RF voltage) is rectified at D7 and D6 for conversion into DC voltage. The rectified voltage signals are combined, then amplified at the inverter amplifier (IC4b), then applied to the antenna tuner CPU (IC5, pin 64).

A C-MOS IC is used for the buffer-amplifier (IC14) to improve functional sensitivity; the inverter amplifier (IC4) is very responsive even with a low signal level input. Together, these ensure quick and stable signal detection even at low RF signal level input.

##### (3) Resistance components detector

Resistance components are picked up by L8, and detected by D8, D9 and Q5. The detected resistance components are amplified at the inverter amplifier (IC4a), and then applied to the antenna tuner CPU (IC5, pin 1).

#### 3-4-3 MOTOR CONTROL CIRCUIT (CTRL AND TUNER UNITS)

The control circuit of the internal antenna tuner consists of the CPU, EEPROM\*, tuning motors and tuning relays.

\*Electronically-Erasable Programmable Read Only Memory

##### (1) CPU and EEPROM (CTRL unit)

The antenna tuner CPU (IC5) controls the tuning motors via the motor controller (Q211–Q218, D211–D217) and tuning relays, and memorizes the best preset position in 100 kHz steps. The memory contents are stored in the EEPROM (IC6) without a backup battery.

##### (2) Tuning motors (CTRL and TUNER units)

A motor controller (Q211–Q218, D211–D217) rotates the tuning motors (TUNER unit; MF1, MF2) to obtain a low SWR.

##### (3) Tuning relays (TUNER unit)

According to the operating frequency band and antenna condition, tuning relays select the capacitors and coils.

#### 3-4-4 ANTENNA TUNER CPU PORT ALLOCATION (CTRL unit; IC5)

Pin number	Port name	Description
1	R	Input port for the resistance components detection voltage.
2	REF	Input port for the reflected RF power voltage.
3	FOR	Input port for the forward RF power voltage.
4	PWRS	Input port for the transceiver power OFF.
6	STDU	Inputs low level signal when operating the antenna tuner in 50 MHz band.
7	SETI	Input port for reference voltage setting.
13	KEY	Outputs tuner data signal.
15	START	Input port for the serial signal.
17	THRU	Input port for the [TUNER] ON/OFF signal.
21	SEND	Input port for the TX/RX switching signal.
22, 23	CL1, CL2	Input port for the antenna tuner CPU system clock.
26	DUAL	Outputs the coil selection signal. High : While 46–60 MHz band is displayed.
27–32	L24M, L18M, L14M, L10M, L7M, L3.5M	Output the coil selection signal.
34–40	CO3, CO2, CO1, C13, C12, C11	Output the capacitor selection signal.
41–48	PZ, PY, PX, PW, RZ, RY, RX, RW	Output pulse-type control signals for the tuning motors (M1, M2).
64	P	Input port for the reactance components detection voltage.

### 3-5 SCOPE CIRCUITS

#### 3-5-1 SCOPE RECEIVER CIRCUIT (RF UNIT)

A portion of the 64.455 MHz 1st IF signal from the 1st mixer circuit (Q511–Q514: while receiving) or IF amplifier (Q751: while transmitting) is amplified at the IF amplifiers (Q811, Q812), then mixed with the 77.8 MHz scope 2nd LO signal at the mixer circuit (D831) to produce the 13.345 MHz IF signal. The mixed IF signal is passed through the ceramic bandpass filters (F1843, F1841) to suppress unwanted signals. The filtered IF signal is applied to the FM IF IC (IC841, pin 16).

The applied 13 MHz IF signal is mixed with the sweep LO signals from the PLL unit at the FM IF IC (IC841), which includes the RSSI terminal. The mixed IF signals are filtered at the ceramic bandpass filter (F1842) then applied to the limiter amplifier section in the FM IF IC (IC841, pin 5). The applied IF signals are converted into DC voltages according to the applied IF signal strength at the RSSI section in the IC.

The converted voltages are amplified at IC871b then applied to the MAIN unit as the SCPL signal.

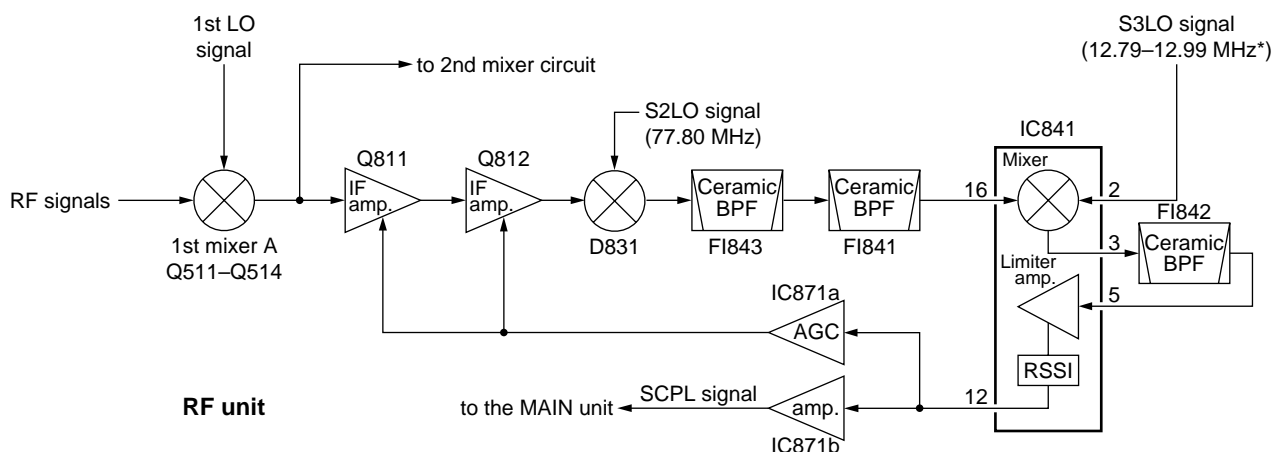
Some of the DC voltages from the FM IF IC are amplified at IC871a to produce AGC voltages for the IF amplifiers (Q811, Q812), producing wider dynamic range.

By sweeping LO signals (S3LO) are applied to the mixer section in the FM IF IC, the spectrum scope function is activated.

#### 3-5-2 SWEEP LO CIRCUIT (PLL UNIT)

The sweep LO signals (S3LO) are generated by the DDS IC (IC801) using the 32 MHz system clock. A 10-bit digital signal is converted into analog wave signals at the D/A converter (R801–R820). The converted analog wave is passed through the bandpass filter (L802, L803, C809–C813) then applied to the RF unit after being amplified at the buffer amplifier (Q802).

#### • SCOPE CIRCUIT DIAGRAM



\*depending on sweeping passband width

### 3-6 POWER SUPPLY CIRCUITS

#### 3-6-1 PA UNIT

LINE	DESCRIPTION
PHV	The voltage from an external power supply via the common filter circuit (FILTER unit, L501, L502).
HV	The same voltage as the PHV line passed through a fuse (F1).
14 V	The same voltage as the HV line passed through the switching relay (RL1).
14 VA	The same voltage as the 14 V line is applied to the AF power amplifier (MAIN unit, IC332).
8 V	Common 8 V converted from the 14 V line and regulated by the +8 regulator circuit (IC3).
5 V	Common 5 V converted from the 14 V line and regulated by the +5 regulator circuit (IC2).
H5V	Common 5 V converted from the 14 V line and regulated by the H5V regulator circuit (IC1).

#### 3-6-2 FRONT UNIT

LINE	DESCRIPTION
5V	Common 5 V converted from the 14 V line and regulated by the +5 regulator circuit (IC861).
-15V	Common -15 V converted from the 14 V line and converted by the -15 DC-DC converter circuit (IC841, Q841, D841). The voltage is applied to the -7 V, -8 V regulator circuits and etc.
-7V	Common -7 V converted from the 14 V line and regulated by the -7 regulator circuit (IC501).
-8V	Common -8 V converted from the 14 V line and regulated by the -8V regulator circuit (IC881).
+18V	Common 18 V converted from the 14 V line and converted by the 18 V DC-DC converter circuit (IC821, Q821, D822).

### 3-6-3 MAIN UNIT

LINE	DESCRIPTION
R8V	Receive 8 V converted from the 14 V line and regulated by the R8V regulator circuit (Q601, Q602, D601).
T8V	Transmit 8 V converted from the 14 V line and regulated by the T8V regulator circuit (Q611, Q612, D611).

### 3-6-4 CTRL AND PLL UNITS

LINE	DESCRIPTION
5V	Common 5 V for the antenna tuner CPU (CTRL unit; IC5) and the EEPROM (CTRL unit; IC6), converted from the 14 V line and regulated by the +5 regulator circuit (CTRL unit; IC13).
5V	Common 5 V for each of the PLL-A and PLL-B circuits regulated from the 8 V line and regulated by the +5 regulator circuit (PLL unit; IC382: PLL-A, IC682: PLL-B).

## 3-7 LOGIC CIRCUITS

### 3-7-1 BAND SELECTION DATA (RF, CTRL AND PLL UNITS)

To select the correct bandpass, low-pass filters and VCOs on the RF, FILTER and PLL units, the main CPU (MAIN unit, IC3501) outputs the following band selection data via the I/O expander (RF unit, IC901, IC902, CTRL unit, IC11) or DDS IC (PLL unit, IC101, IC401) depending on the displayed frequency.

Frequency [MHz]	IC901, IC902 (RF unit)	IC11 (CTRL)	IC101 (PLL)	IC401 (PLL)
	BPF	LPF	VCO-A	VCO-B
0.003–1.599999	B0	L1S	VA1S	VB1S
1.6–1.999999	B1			
2.0–2.999999	B2	L2S		
3.0–3.999999	B3			
4.0–5.999999	B4			
6.0–7.999999	B5	L3S		
8.0–10.999999	B6	L4S	VA2S	VB2S
11.0–14.999999	B7			
15.0–19.999999	B8	L5S		
20.0–21.999999				
22.0–29.999999	B9	L6S	VA3S	VB3S
30.0–44.999999	B10W	L7	VA4S	VB4S
45.0–49.999999				
50.0–54.000000	B10			
54.000001– 60.000000	B10W			

The D/A convertor (MAIN unit, IC3751) output signal from pin 7 is amplified at IC101b (pins 5–7) to obtain the band voltage for external equipment via the [ACC 2] connector pin 4.



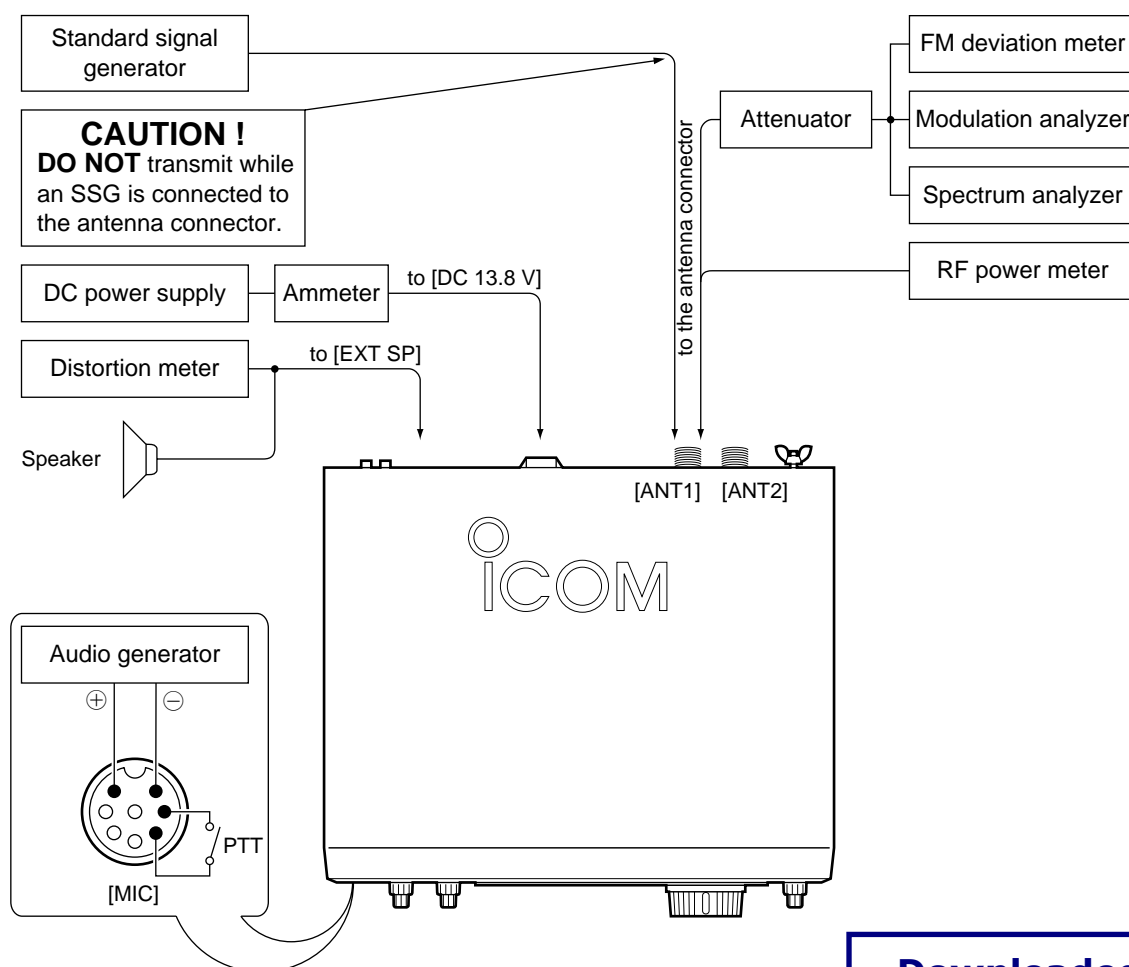
# SECTION 4 ADJUSTMENT PROCEDURES

## 4-1 PREPARATION BEFORE SARVICING

### ■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GREDE AND RANGE	EQUIPMENT	GREDE AND RENGE
DC power supply	Output voltage : 13.8 V DC Current capacity : 30 A or more	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 10–200 W Frequency range : 1.8–100 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–100 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–100 MHz Frequency accuracy : ±0.5 ppm or better Sensitivity : 100 mV or better	Digital multimeter	Imput impedance : 10 MΩ/DC or beter
RF voltmeter	Frequency range : 0.1–100 MHz Measuring range : 0.01–10 V	AC millivoltmeter	Measuring range : 10 mV–10 V
FM deviation meter	Frequency range : DC–500 MHz Measuring range : 0 to ±5 kHz	DC voltmeter	Input impedance : 50 kΩ/V DC or better
Modulation analyzer	Frequency range : At least 90 MHz Measuring range : 0–100 %	DC ammeter	Measurement capability: 1 A/30 A
Distortion meter	Frequency range : 1 kHz ±10 % Measuring range : 1–100 %	Spectram analyzer	Frequency range : At least 90 MHz Spectraum bandwidth : 100 kHz or more
Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V	Attenuator	Power attenuation : 50 or 60 dB Capacity : 150 W or more
		External speaker	Input impedance : 8 Ω Capacity : 5 W or more
		Terminator	Resistance : 50 and 150 Ω Capacity : 150 W or more

### ■ CONNECTIONS



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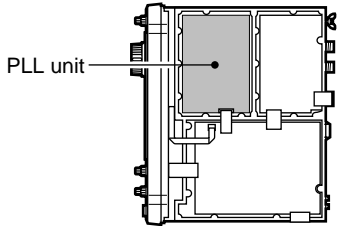
## 4-2 PLL ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
REFERENCE FREQUENCY	1	<ul style="list-style-type: none"> <li>• Display frequency: Any</li> <li>• Turn L52 on the PLL unit to 4 rotation downside for presetting.</li> </ul>	PLL	Connect a frequency counter to check point P81.	64.000000 MHz	PLL	L52 (R33 for critical adjustment)
	2						<ul style="list-style-type: none"> <li>• Receiving</li> </ul>
LPL-A LOCK VOLTAGE	1	<ul style="list-style-type: none"> <li>• Display frequency: 0.030000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect a digital multimeter or oscilloscope to check point LPA.	2.0 V	PLL	C154
VCO-A LOCK VOLTAGE	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect a digital multimeter or oscilloscope to check point LVA.	4.3 V	PLL	C278
	2	<ul style="list-style-type: none"> <li>• Display frequency: 19.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C258
	3	<ul style="list-style-type: none"> <li>• Display frequency: 44.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C228
	4	<ul style="list-style-type: none"> <li>• Display frequency: 60.000000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C208
1LO-A OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Display frequency: 0.030000 MHz, 7.999999 MHz, 8.000000 MHz, 19.999999 MHz, 20.000000 MHz, 44.999999 MHz, 45.000000 MHz, 60.000000 MHz</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P351.	0 dBm or more		Verify
LPL-B LOCK VOLTAGE	1	<ul style="list-style-type: none"> <li>• Sub display freq. : 0.030000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect a digital multimeter or oscilloscope to check point LPB.	2.0 V	PLL	C454
VCO-B LOCK VOLTAGE	1	<ul style="list-style-type: none"> <li>• Sub display freq. : 7.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	PLL	Connect a digital multimeter or oscilloscope to check point LVB.	4.3 V	PLL	C578
	2	<ul style="list-style-type: none"> <li>• Sub display freq. : 19.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C558
	3	<ul style="list-style-type: none"> <li>• Display frequency: 44.999999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C528
	4	<ul style="list-style-type: none"> <li>• Display frequency: 60.000000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			4.3 V		C508
1LO-B OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Sub display freq. : 0.030000 MHz, 7.999999 MHz, 8.000000 MHz, 19.999999 MHz, 20.000000 MHz, 44.999999 MHz, 45.000000 MHz, 60.000000 MHz</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P651.	0 dBm or more		Verify
3LO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Display frequency: Any</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P701.	-16 dBm or more		Verify
S3LO OUTPUT LEVEL	1	<ul style="list-style-type: none"> <li>• Display frequency: Any</li> <li>• Receiving</li> </ul>	PLL	Connect an RF voltmeter to check point P801.	-7 dBm or more		Verify

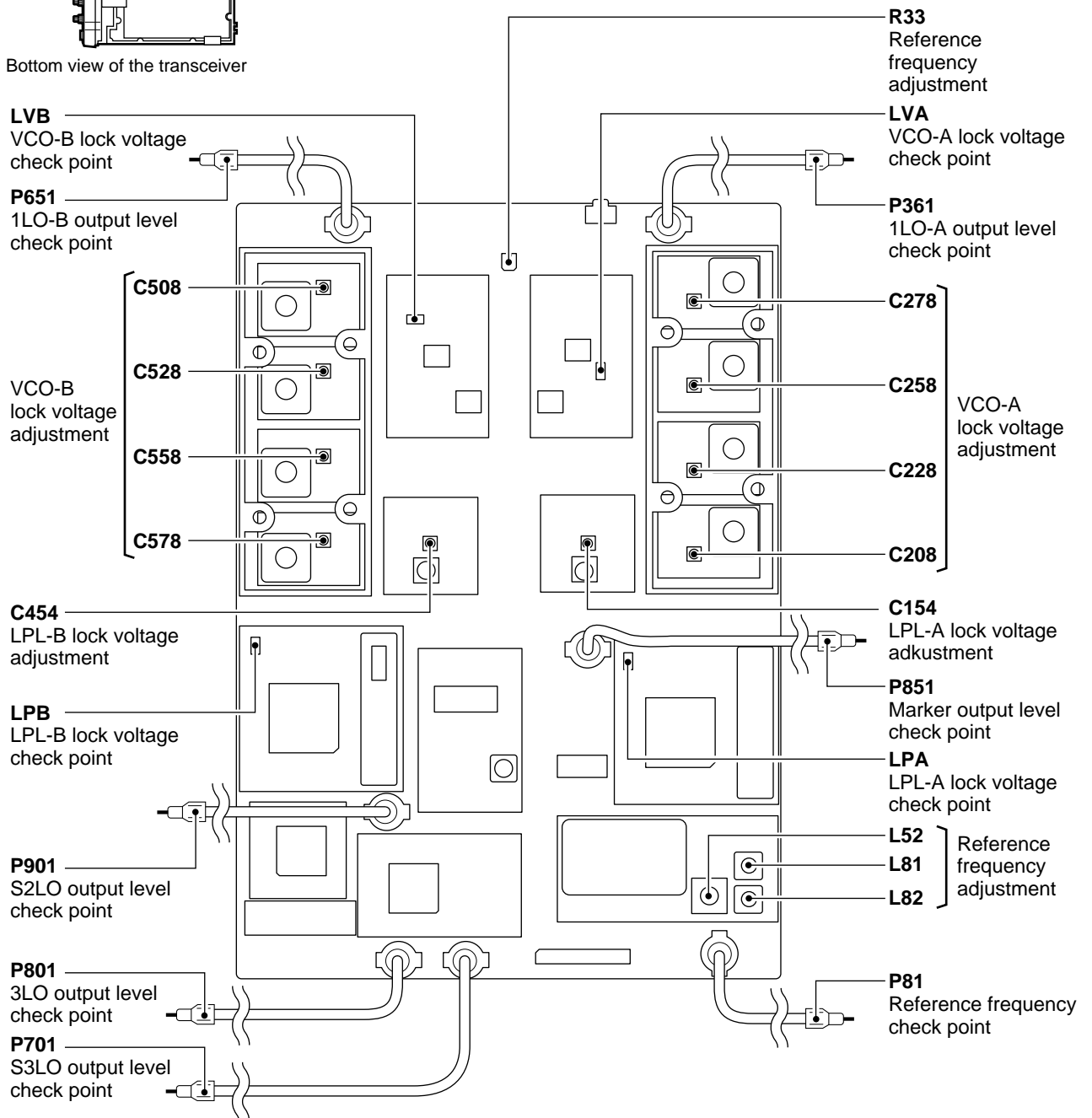
## PLL ADJUSTMENTS—continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
S2LO OUTPUT LEVEL	1 • Display frequency: Any • Receiving	PLL	Connect an RF voltmeter to check point P901.	0 dBm or more		Verify
MARKER OUTPUT LEVEL	1 • Display frequency: Any • Receiving	PLL	Connect an oscilloscope to check point P851.	4 Vp-p or more		Verify

### • PLL unit



Bottom view of the transceiver

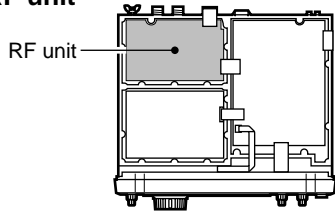


## 4-3 RECEIVER ADJUSTMENTS

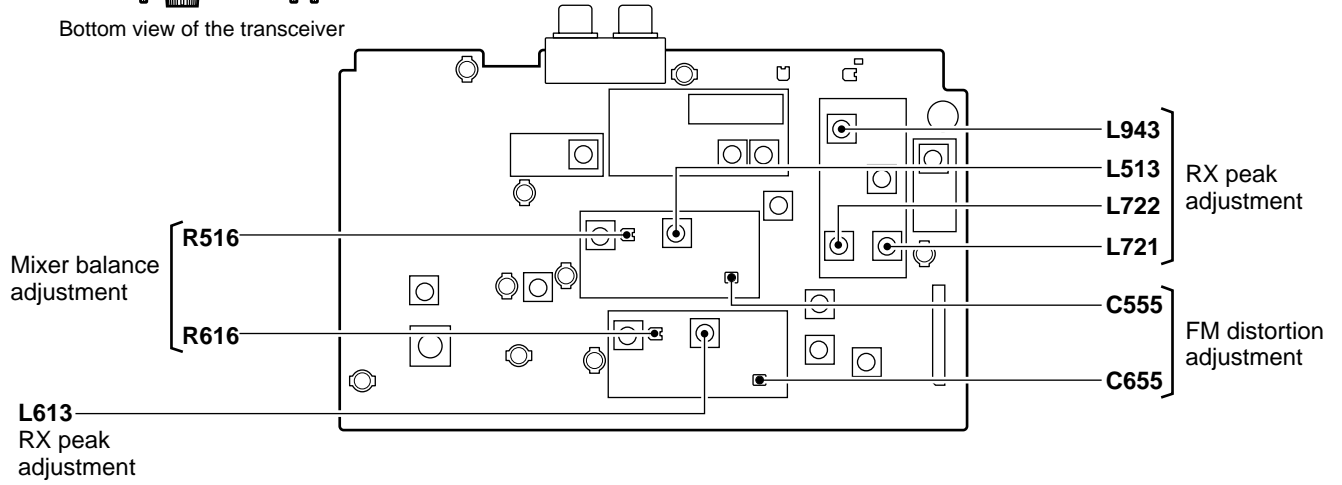
ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
RX PEAK	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• Filter : 2.4 kHz</li> <li>• [P.AMP] : P.AMP1</li> <li>• [ATT] : OFF</li> <li>• Connect an SSG to [ANT1] connector and set as :                Frequency : 14.101500 MHz                Level : 10 <math>\mu</math>V* (-87 dBm)                Modulation: 1 kHz/<math>\pm</math>7.5 kHz dev.</li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to [EXT SP] connector with an 8 $\Omega$ load.	Maximum audio output level	RF	L513, L721, L722, L943
	2	<ul style="list-style-type: none"> <li>• [DUAL WATCH] : ON</li> <li>• Sub display freq. : 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [BAL] : Max. CW</li> <li>• Set an SSG as :                Level : 10 <math>\mu</math>V* (-87 dBm)</li> <li>• Receiving</li> </ul>					L613
	3	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [DUAL WATCH] : OFF</li> <li>• Set following selections, controls and functions as :                Filter : 2.4 kHz, [ATT] : OFF                [AGC]: MID , [BAL] : Center                PBT1 : Center , PBT2 : Center                [NB] : OFF , [RIT] : OFF                [P.AMP] : P.AMP1                [RF/SQ] : Center                [AUTO NOTCH]: OFF                [NOTCH] : Center                [NR] switch : OFF                [NR] level : Max. CCW                [MONITOR] : OFF</li> <li>• Connect an SSG to [ANT1] connector and set as :                Frequency : 14.101500 MHz                Level : 1 <math>\mu</math>V* (-107 dBm)                Modulation: OFF</li> <li>• Receiving</li> </ul>				MAIN	L111, L112, L113
MIXER BALANCE	1	<ul style="list-style-type: none"> <li>• Display frequency: 0.030000 MHz</li> <li>• Sub display freq. : 0.030000 MHz</li> <li>• Mode : USB</li> <li>• [BAL] : Max. CCW</li> <li>• Apply no no RF signal to [ANT1] connector.</li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to [EXT SP] connector with an 8 $\Omega$ load.	Minimum noise output level	RF	R516
	2	<ul style="list-style-type: none"> <li>• [BAL] : Max. CW</li> <li>• Receiving</li> </ul>					R616
FM DISTORTION	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Sub display freq. : 14.100000 MHz</li> <li>• Mode : FM</li> <li>• [BAL] : Max. CCW</li> <li>• Connect an SSG to [ANT1] connector and set as :                Frequency : 14.100000 MHz                Level : 500 <math>\mu</math>V* (-53 dBm)                Modulation: 1 kHz/<math>\pm</math>7.5 kHz Dev.</li> <li>• Receiving</li> </ul>	Rear panel	Connect an distortion meter to [EXT SP] connector with an 8 $\Omega$ load.	Minimum distortion level	RF	C555
	2	<ul style="list-style-type: none"> <li>• [BAL] : Max. CW</li> <li>• Receiving</li> </ul>					C655

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

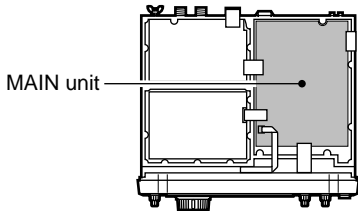
• **RF unit**



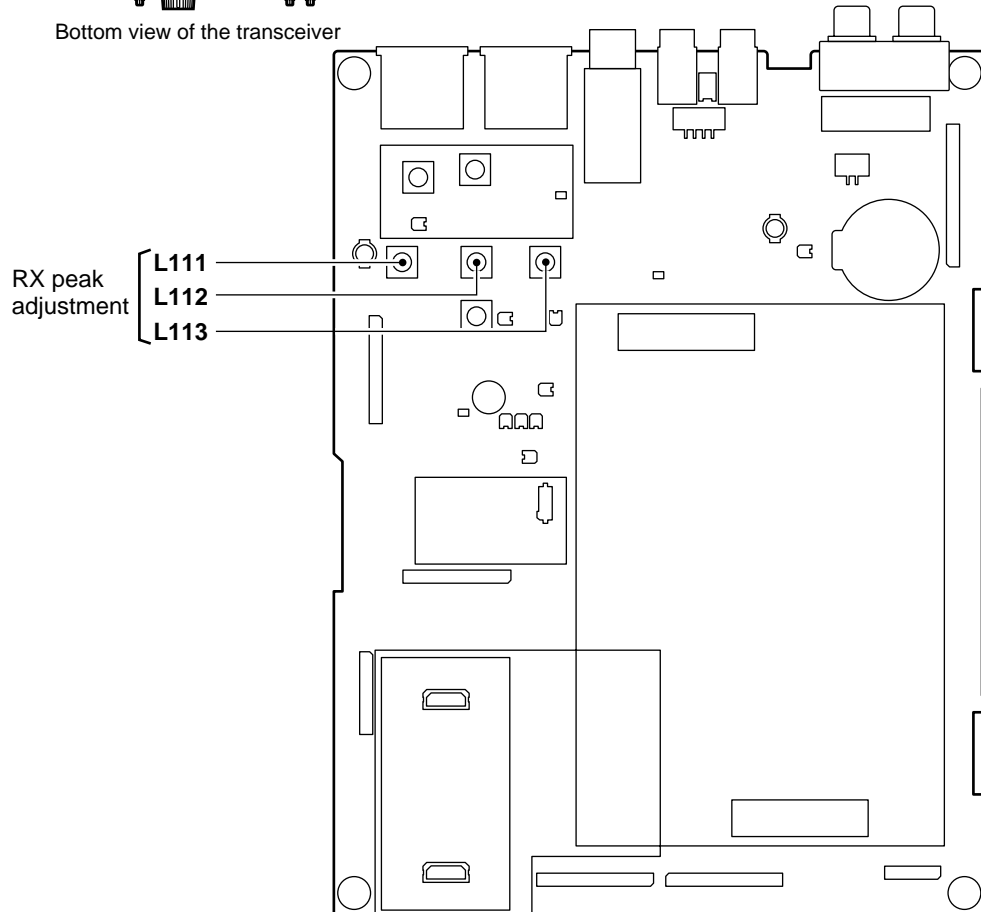
Bottom view of the transceiver



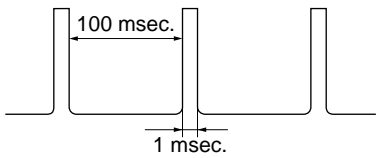
• **MAIN unit**



Bottom view of the transceiver

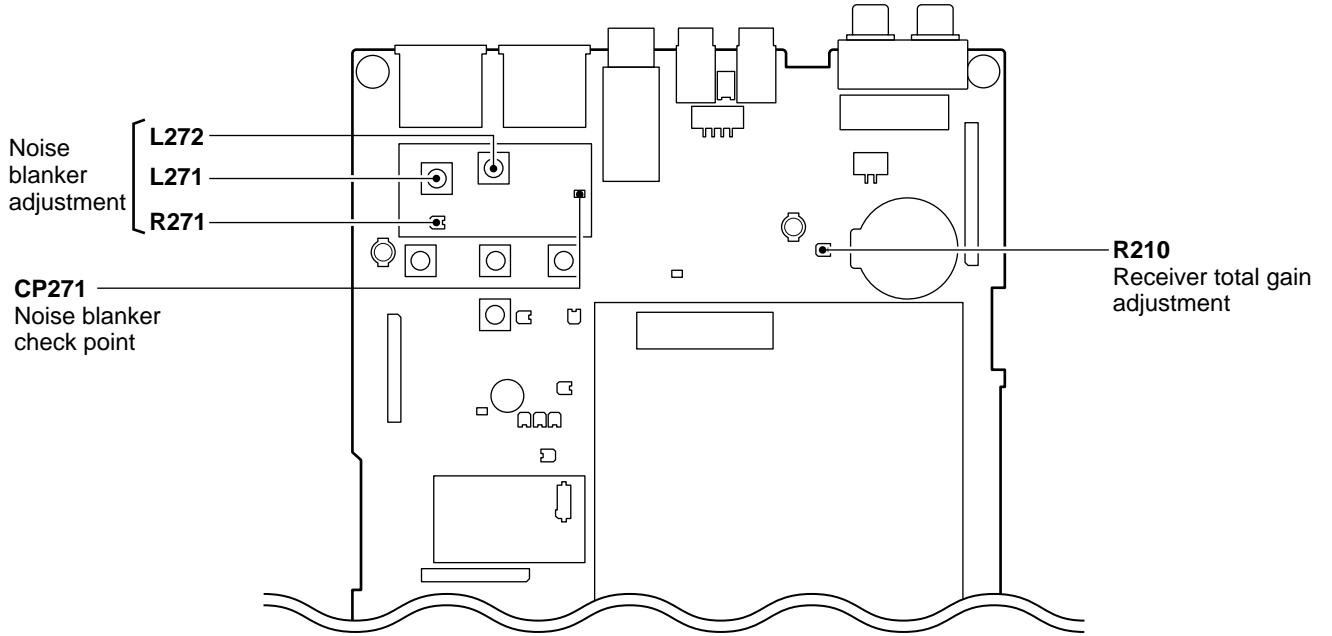
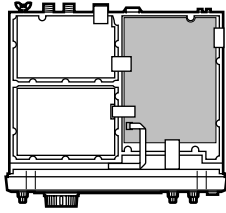


## RECEIVER ADJUSTMENTS—continued

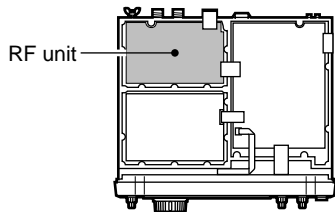
ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT			
		UNIT	LOCATION		UNIT	ADJUST		
RECEIVER TOTAL GAIN	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• Filter : 2.4 kHz</li> <li>• [P.AMP] : OFF</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 14.101500 MHz</li> <li>Level : 500 <math>\mu</math>V* (-53 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to [EXT SP] connector with an 8 $\Omega$ load.	1.0 V (0 dB)	Front unit	[AF] control		
	2 <ul style="list-style-type: none"> <li>• Set an SSG output level to OFF.</li> <li>• Receiving</li> </ul>						32 mV (-30 dB)	MAIN
NOISE BLANKER	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [P.AMP] : P.AMP1</li> <li>• [NB] : OFF</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 14.101500 MHz</li> <li>Level : 10 <math>\mu</math>V* (-87 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>and apply following signal to [ANT1] connector.</li> </ul>  <ul style="list-style-type: none"> <li>• Preset R271 on the MAIN unit to the 12 o'clock position.</li> <li>• Receiving</li> </ul>	MAIN	Connect an oscilloscope to check point CP271.	Maximum noise level	MAIN	L271, L272		
	2 <ul style="list-style-type: none"> <li>• [NB] : ON</li> <li>• Receiving</li> </ul>						At the point where the voltage just reduces.	R271
SPECTRUM SCOPE	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [DUAL WATCH] : OFF</li> <li>• [P.AMP] : OFF</li> <li>• [SCOPE] : ON</li> <li>• [SCOPE ATT] : OFF</li> <li>• Verify the connection of J841 on the RF unit and P801 (S3LO: 12.89000 MHz/-7 dBm) from the PLL unit.</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 14.101500 MHz</li> <li>Level : 1 <math>\mu</math>V* (-107 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	RF	Connect a digital multimeter or oscilloscope to check point CP871.	Maximum voltage	RF	L812, L813, L833		
	2 <ul style="list-style-type: none"> <li>• Set an SSG output level to OFF.</li> <li>• Receiving</li> </ul>						0.05 V-0.15 V	R872
	3 <ul style="list-style-type: none"> <li>• Set an SSG output level as: <ul style="list-style-type: none"> <li>Level : 50 mV* (-13 dBm)</li> </ul> </li> <li>• Receiving</li> </ul>						4.35 V- 4.45 V	R863

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

• MAIN unit

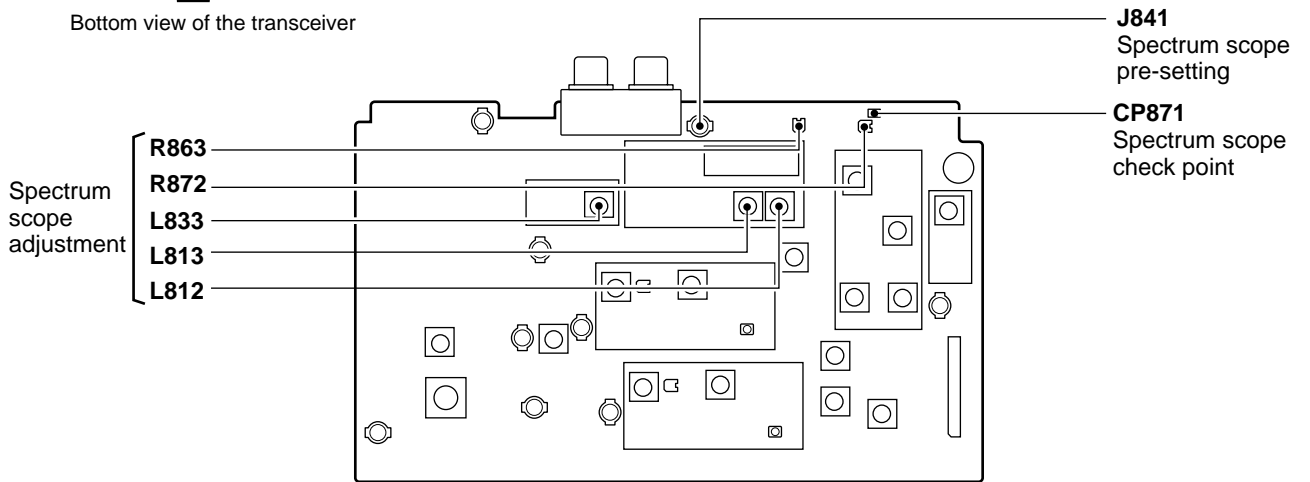


• RF unit



RF unit

Bottom view of the transceiver

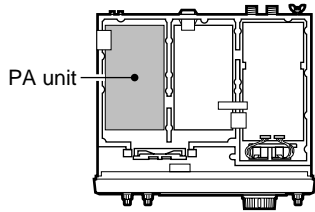


## 4-4 TRANSMITTER ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
IDLING CURRENT (for driver)	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : CW (key up)</li> <li>• Preset R11, R18 on the PA unit to max. CCW.</li> <li>• [RF POWER] : Max. CW</li> <li>• [TUNER] : OFF</li> <li>• Transmitting (without key)</li> </ul>	PA	Unsolder W29. Connect an ammeter to the unsoldering points of W29.	100 mA	PA	R11
	After adjustment, re-solder the lead wire (W29) on the PA board.						
(for final amplifier)	2	<ul style="list-style-type: none"> <li>• Transmitting (without key)</li> </ul>	PA	Unsolder R28 (L8 side). Connect an ammeter to the unsoldering points of R28.	500 mA	PA	R18
	After adjustment, re-solder the resistor (R28) on the PA board.						
TX PEAK	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [RF POWER] : Max. CW</li> <li>• Apply no audio signals to [MIC] connector.</li> <li>• Transmitting</li> </ul>	MAIN	Connect a digital multimeter or oscilloscope to check point CP243.	0.13 V	MAIN	R247
	2	<ul style="list-style-type: none"> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT1] connector.	50 W	Front panel	[MIC GAIN] control
	3	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>			Maximum output power	MAIN	L261
	4	<ul style="list-style-type: none"> <li>• Transmitting</li> </ul>	RF	Connect an RF voltmeter to check point J151.	Maximum level	RF	L752
TRANSMITTER TOTAL GAIN	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : USB</li> <li>• [MIC GAIN] : Center</li> <li>• Connect an audio generator to [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mVrms</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT1] connector.	50 W	MAIN	R263
Ic APC	1	<ul style="list-style-type: none"> <li>• Display frequency: 3.550000 MHz</li> <li>• Mode : RTTY</li> <li>• Connect CP501 to GND.</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an ammeter between power supply and the IC-756PRO.	23 A	MAIN	R545
HF BANDS OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Display frequency: 14.100000 MHz</li> <li>• Mode : RTTY</li> <li>• [RF POWER] : Max. CW</li> <li>• [TUNER] : OFF</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT1] connector.	100 W	MAIN	R507
50 MHz BAND OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Display frequency: 51.000000 MHz</li> <li>• Mode : RTTY</li> <li>• [RF POWER] : Max. CW</li> <li>• [TUNER] : OFF</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT1] connector.	100 W	MAIN	R509
AM CARRIER	1	<ul style="list-style-type: none"> <li>• Display frequency: 29.600000 MHz</li> <li>• Mode : AM</li> <li>• [RF POWER] : Max. CW</li> <li>• [MIC GAIN] : Center</li> <li>• Apply no audio signals to [MIC] connector.</li> <li>• Transmitting</li> </ul>	MAIN	Connect an RF power meter to [ANT1] connector.	40 W	MAIN	R510

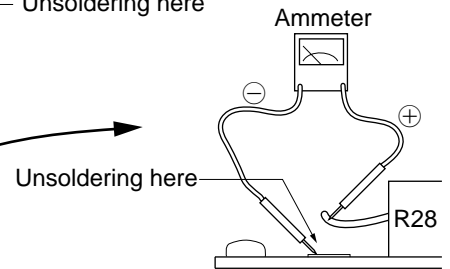
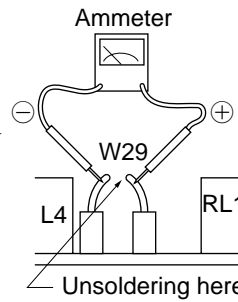
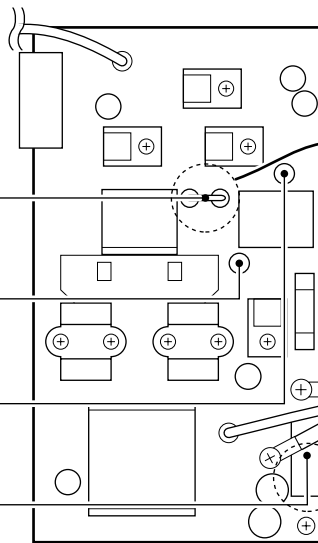


• PA unit

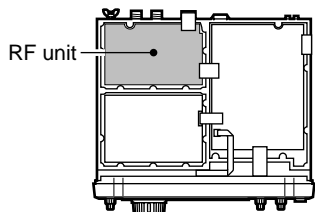


Top view of the transceiver

- W29**  
Idling current check point  
for drivers
- R18**  
Idling current adjustment  
for finals
- R11**  
Idling current adjustment  
for drivers
- R28**  
Idling current check point  
for finals

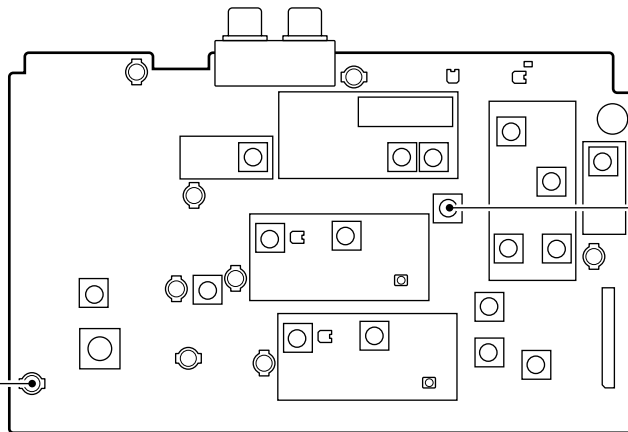


• RF unit



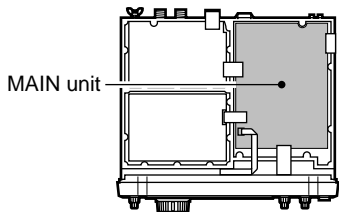
Bottom view of the transceiver

- J151**  
TX peak check point



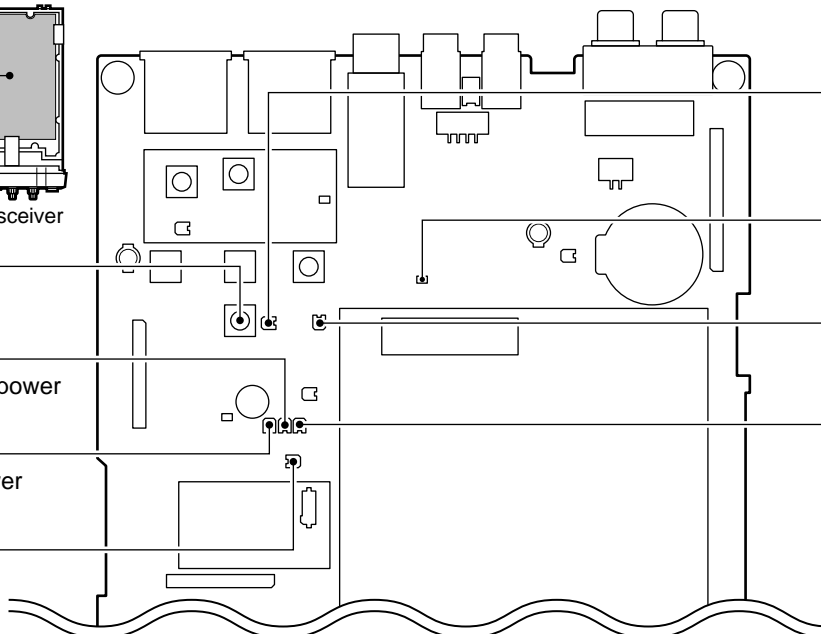
- L307**  
TX peak  
adjustment

• MAIN unit



Bottom view of the transceiver

- L261**  
TX peak  
adjustment
- R509**  
50 MHz band output power  
adjustment
- R507**  
HF bands output power  
adjustment
- R545**  
Ic APC adjustment



- R263**  
Transmitter  
total gain  
adjustment
- CP243**  
TX peak  
check point
- R247**  
TX peak  
adjustment
- R510**  
AM carrier  
adjustment

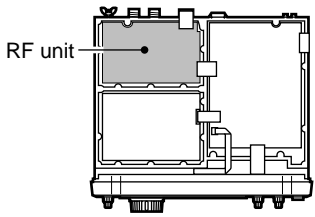
## TRANSMITTER ADJUSTMENTS—continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
RESIDUAL AM	1 <ul style="list-style-type: none"> <li>• Display frequency: 29.60000 MHz</li> <li>• Mode : FM</li> <li>• Filter : 15 kHz</li> <li>• [RF POWER] : Max. CW</li> <li>• [MIC GAIN] : Max. CW and CCW</li> <li>• [MONI] : OFF</li> <li>• Connect CP503 on the MAIN unit to GND.</li> <li>• Connect an audio generator to [MIC] connector and set as: <ul style="list-style-type: none"> <li>Frequency : 1 kHz</li> <li>Level : 10 mVrms</li> </ul> </li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to [ANT1] connector.	Minimum power difference with minimum MIC GAIN and maximum MIC GAIN.	RF	L713, L712, L711
FM DEVIATION	1 <ul style="list-style-type: none"> <li>• Displayed freq. : 29.60000 MHz</li> <li>• Mode : FM</li> <li>• Filter : 15 kHz</li> <li>• [RF POWER] : Max. CW</li> <li>• [MIC GAIN] : Center</li> <li>• Connect an audio generator to [MIC] connector and set as: <ul style="list-style-type: none"> <li>Frequency : 1 kHz</li> <li>Level : 10 mVrms</li> </ul> </li> <li>• Transmitting</li> </ul>	Rear panel	Connect an FM deviation meter to [ANT1] connector through an attenuator.	±4.5 kHz	DSP	R2227
AM MODULATION	1 <ul style="list-style-type: none"> <li>• Display frequency: 14.10000 MHz</li> <li>• Mode : AM</li> <li>• [MIC GAIN] : Center</li> <li>• [RF POWER] : Max. CCW</li> <li>• Connect an audio generator to [MIC] connector and set as: <ul style="list-style-type: none"> <li>Frequency : 1 kHz</li> <li>Level : 10 mVrms</li> </ul> </li> <li>• Transmitting</li> </ul>	Rear panel	Connect a modulation analyzer to [ANT1] connector through an attenuator.	90%	DSP	R2229

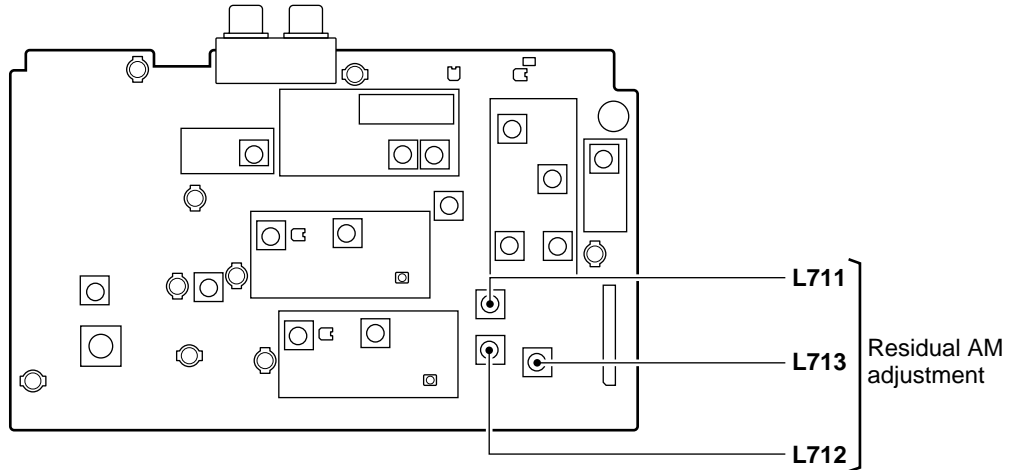
## 4-5 TUNER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
SWR DETECTOR	1 <ul style="list-style-type: none"> <li>• Display frequency: 29.70000 MHz</li> <li>• Mode : FM</li> <li>• [RF POWER] : Max. CW</li> <li>• [TUNER] : Through</li> <li>• Connect J12 on the CTRL unit to GND.</li> <li>• Connect a 50 Ω terminator to [ANT1] connector.</li> <li>• Transmitting</li> </ul>	CTRL	Connect a digital multimeter or oscilloscope to J14.	Minimum voltage	CTRL	C3
	2 <ul style="list-style-type: none"> <li>• Terminate [REMOTE] jack with a 3.5(d) mm mini-plug.</li> </ul>			<ul style="list-style-type: none"> <li>• While pushing [FILTER] and [EXIT], turn power ON.</li> <li>• Verify the display shows “START”.</li> </ul>		
	3			<ul style="list-style-type: none"> <li>• Push [F-5 (START)].</li> <li>• Verify the display shows “ADJUSTING NOW”.</li> </ul>		
	4			<ul style="list-style-type: none"> <li>• Verify the display shows “OK”.</li> </ul>		
After adjustment, disconnect J12 on the CTRL unit from GND.						

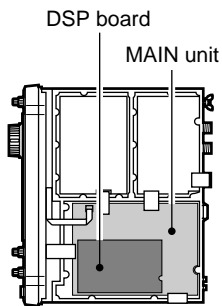
• RF unit



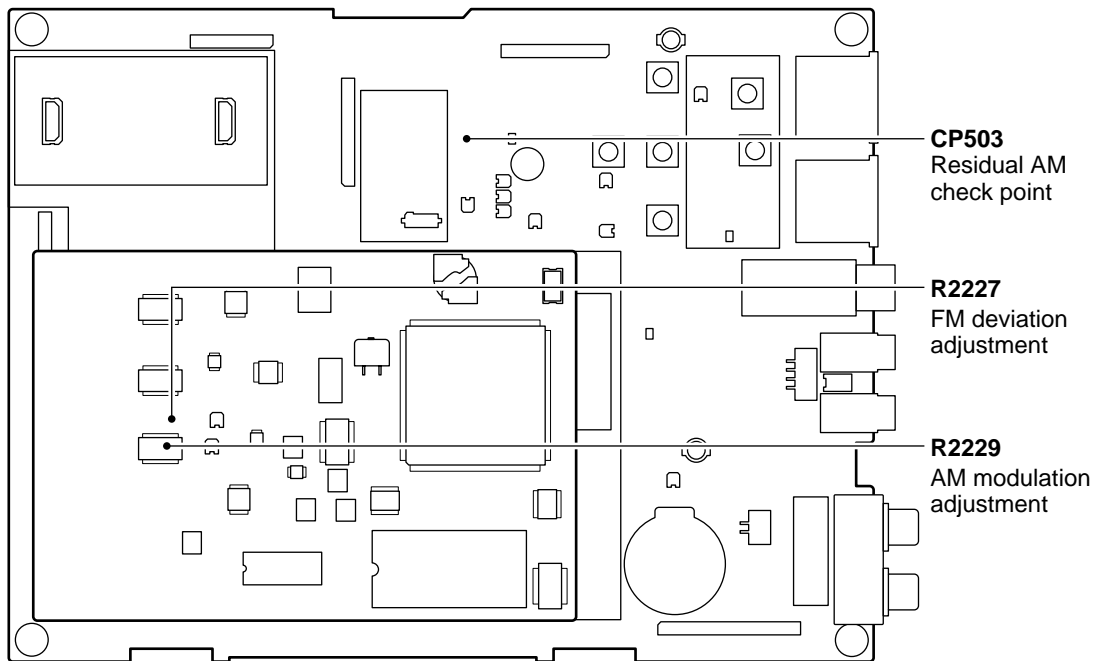
Bottom view of the transceiver



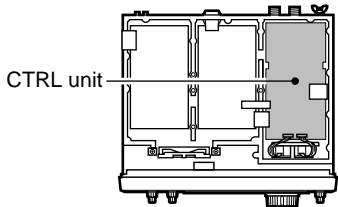
• MAIN unit and DSP board



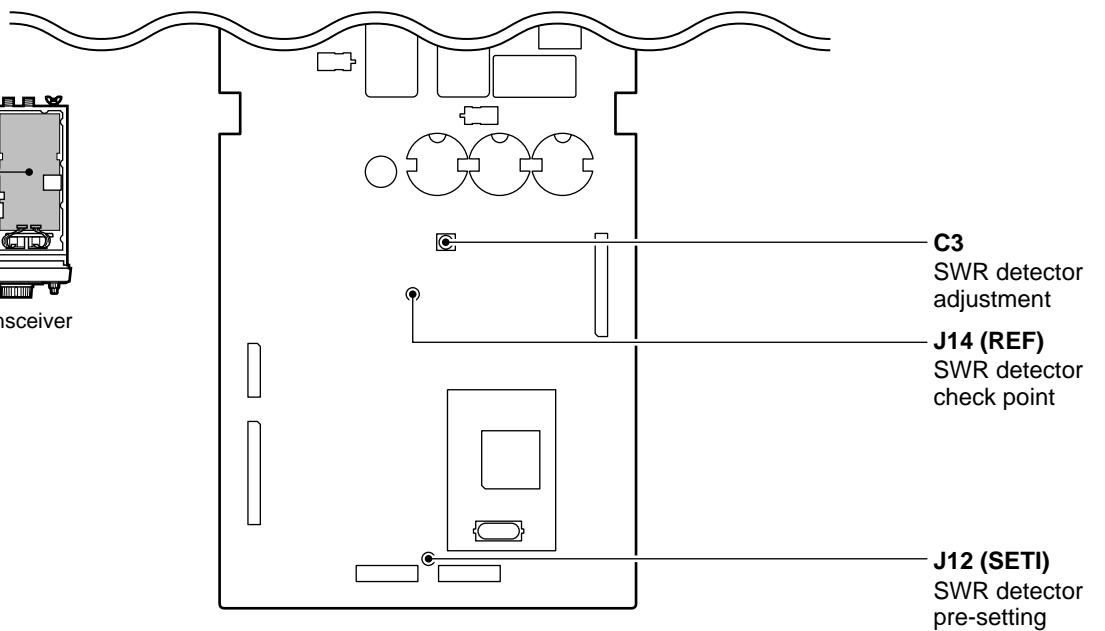
Bottom view of the transceiver



• CTRL unit



Top view of the transceiver



# SECTION 5 PARTS LIST

## [FRONT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
DS1	5080000450	LAMP	SLU2LC1EX5B-TH
ME1	5510000480	METER	ME-40 (KL-293S-10)
W1	8900009230	CABLE	OPC-908
W2	8900009660	CABLE	OPC-964
W3	8900009230	CABLE	OPC-908
W4	8900009240	CABLE	OPC-909
W5	8900009240	CABLE	OPC-909
W6	8900009260	CABLE	OPC-911
W7	8900009260	CABLE	OPC-911
W8	8900009400	CABLE	OPC-926
EP1	6910011090	SENSOR UNIT	RMS20-250-201-P
EP2	6450001230	E.OTHER	HLJ0999-01-480
EP3	6450001230	E.OTHER	HLJ0999-01-480
EP4	6910012500	UNIT BOARD	TFD50W40-A

## [DISPLAY BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
IC101	1130002660	S.IC	μPD4030BG-T1
IC102	1130008650	S.IC	MC14071BF-EL
IC401	1140003670	S.IC	HD6473834H (Z-TAT)
IC411	1130009640	S.IC	BU4051BCFV-E2
IC431	1130009490	S.IC	TC74HC4050AF (EL)
IC490	1130009110	S.IC	S-80942ANMP-DD6-T2
IC492	1130003760	S.IC	TC4S81F (TE85R)
IC501	1180001920	S.IC	TA79L08F (TE12L)
IC511	1110003780	S.IC	NJM2902V-TE1
IC542	1120002740	S.IC	TK16105MTL
IC821	1110002350	S.IC	BA6161F
IC841	1110004200	S.IC	NJM2360M-TE3
IC861	1180001070	S.IC	TA7805F (TE16L)
IC881	1180001920	S.IC	TA79L08F (TE12L)
IC1401	1120002580	S.IC	M52338FP
IC1521	1110003750	S.IC	M5218AFP 600C
Q321	1590002310	S.TRANSISTOR	DTC114EE TL
Q511	1590002310	S.TRANSISTOR	DTC114EE TL
Q512	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q513	1590002310	S.TRANSISTOR	DTC114EE TL
Q514	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q515	1590002310	S.TRANSISTOR	DTC114EE TL
Q622	1590002310	S.TRANSISTOR	DTC114EE TL
Q623	1590002310	S.TRANSISTOR	DTC114EE TL
Q624	1590002310	S.TRANSISTOR	DTC114EE TL
Q625	1590002310	S.TRANSISTOR	DTC114EE TL
Q701	1590002310	S.TRANSISTOR	DTC114EE TL
Q801	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q802	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q803	1530003300	S.TRANSISTOR	2SC3647S-TD
Q804	1530003300	S.TRANSISTOR	2SC3647S-TD
Q805	1590002310	S.TRANSISTOR	DTC114EE TL
Q821	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q841	1520000580	S.TRANSISTOR	2SB1124S-TD
Q901	1590002310	S.TRANSISTOR	DTC114EE TL
Q902	1590002310	S.TRANSISTOR	DTC114EE TL
Q903	1590002310	S.TRANSISTOR	DTC114EE TL
Q904	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q905	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q1201	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1211	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1221	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1301	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1551	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q1552	1510000510	S.TRANSISTOR	2SA1576A T106R

## [DISPLAY BOARD]

REF NO.	ORDER NO.	DESCRIPTION	
Q1553	1510000510	S.TRANSISTOR	2SA1576A T106R
Q1554	1530002060	S.TRANSISTOR	2SC4081 T107 R
D421	1750000520	S.DIODE	DAN222TL
D422	1750000520	S.DIODE	DAN222TL
D423	1750000520	S.DIODE	DAN222TL
D424	1750000520	S.DIODE	DAN222TL
D425	1750000520	S.DIODE	DAN222TL
D431	1750000520	S.DIODE	DAN222TL
D432	1750000520	S.DIODE	DAN222TL
D501	1750000190	S.DIODE	1SS322 (TE85R)
D509	1750000190	S.DIODE	1SS322 (TE85R)
D511	1730002260	S.ZENER	MA8030-H (TX)
D512	1730000410	S.ZENER	RD5.1M-T2B2
D531	1730002260	S.ZENER	MA8030-H (TX)
D701	1750000520	S.DIODE	DAN222TL
D801	1730002260	S.ZENER	MA8030-H (TX)
D821	1750000190	S.DIODE	1SS322 (TE85R)
D822	1730001050	S.ZENER	RD20M-T2B1
D841	1750000560	S.DIODE	RB050L-40 TE-25
D901	1730000410	S.ZENER	RD5.1M-T2B2
D1201	1730002260	S.ZENER	MA8030-H (TX)
D1211	1730002260	S.ZENER	MA8030-H (TX)
D1221	1730002260	S.ZENER	MA8030-H (TX)
X401	6050009870	S.XTAL	CR-567 (9.8304 MHz)
L321	6200003950	S.COIL	HF50ACC 322513-T
L322	6200003950	S.COIL	HF50ACC 322513-T
L323	6200003950	S.COIL	HF50ACC 322513-T
L401	6200003950	S.COIL	HF50ACC 322513-T
L801	6180000990	COIL	LAL 04NA 101K
L802	6190001190	S.COIL	D10F-A814AY-101K=P3
L803	6190001180	S.COIL	BLC13H-D818HN-1107
L821	6200003950	S.COIL	HF50ACC 322513-T
L822	6200009190	S.COIL	NLFC565050T-472K
L823	6200003520	S.COIL	ELJFB 102K-F
L841	6190001190	S.COIL	D10F-A814AY-101K=P3
L842	6180003250	S.COIL	SLF12565T-680M2R0
L843	6190001190	S.COIL	D10F-A814AY-101K=P3
R101	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R102	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R103	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R104	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R105	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R106	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R107	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R121	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R122	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R123	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R124	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R125	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R126	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R127	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R128	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R201	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R202	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R203	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R204	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R205	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R206	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R207	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R208	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R209	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R210	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R211	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R212	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R213	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R214	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R215	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R221	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)

S.=Surface mount





**[DISPLAY BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
DS621	5040002110	S.LED	CL-200HR-C-TU
DS622	5040002080	S.LED	CL-200YG-C-TU
DS623	5040002080	S.LED	CL-200YG-C-TU
DS624	5040002080	S.LED	CL-200YG-C-TU
DS625	5040002080	S.LED	CL-200YG-C-TU
DS901	5040002080	S.LED	CL-200YG-C-TU
DS902	5040002080	S.LED	CL-200YG-C-TU
DS903	5040002080	S.LED	CL-200YG-C-TU
DS904	5040002080	S.LED	CL-200YG-C-TU
S621	2260001890	S.SWITCH	SKQDPA
S622	2260001890	S.SWITCH	SKQDPA
S623	2260001890	S.SWITCH	SKQDPA
S624	2260001890	S.SWITCH	SKQDPA
S625	2260001890	S.SWITCH	SKQDPA
S626	2260001890	S.SWITCH	SKQDPA
W502	7030003860	S.JUMPER	ERJ3GE JPW V
W504	7030003860	S.JUMPER	ERJ3GE JPW V
W506	7030003860	S.JUMPER	ERJ3GE JPW V
W512	7030003860	S.JUMPER	ERJ3GE JPW V
W801	7030008240	S.JUMPER	ERJ12YJ0R00H
EP1	0910051843	PCB	B 5328C

**[PHONE BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
L1	6200003950	S.COIL	HF50ACC 322513-T
L2	6200003950	S.COIL	HF50ACC 322513-T
R1	7030008180	S.RESISTOR	ERJ12YJ331H (330 Ω)
R2	7030008180	S.RESISTOR	ERJ12YJ331H (330 Ω)
C1	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C3	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
J1	6510019970	S.CONNECTOR	52808-1090
J2	6450001980	CONNECTOR	HLJ5815-01-030
EP1	0910052281	PCB	B 5331A

**[MIC BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
L1	6200003260	S.COIL	NL 322522T-101J
L3	6200003260	S.COIL	NL 322522T-101J
L4	6200003260	S.COIL	NL 322522T-101J
L6	6200003950	S.COIL	HF50ACC 322513-T
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C3	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C4	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C5	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C6	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C7	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
J1	6510000190	CONNECTOR	FM214-8SS (P)
J2	6510019970	S.CONNECTOR	52808-1090
EP1	0910052322	PCB	B 5407B

**[MODE BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
R1	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R2	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R3	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R4	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R5	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R6	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R7	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
C1	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C2	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
J1	6510019980	S.CONNECTOR	52808-1690
S1	2260001890	S.SWITCH	SKQDPA
S2	2260001890	S.SWITCH	SKQDPA
S3	2260001890	S.SWITCH	SKQDPA
S4	2260001890	S.SWITCH	SKQDPA
S5	2260001890	S.SWITCH	SKQDPA
S6	2260001890	S.SWITCH	SKQDPA
S7	2260001890	S.SWITCH	SKQDPA
S8	2260001890	S.SWITCH	SKQDPA
S9	2260001890	S.SWITCH	SKQDPA
S10	2260001890	S.SWITCH	SKQDPA
S11	2260001890	S.SWITCH	SKQDPA
S12	2260001890	S.SWITCH	SKQDPA
S13	2260001890	S.SWITCH	SKQDPA
S14	2260001890	S.SWITCH	SKQDPA
S15	2260001890	S.SWITCH	SKQDPA
S16	2260001890	S.SWITCH	SKQDPA
S17	2260001890	S.SWITCH	SKQDPA
S18	2260001890	S.SWITCH	SKQDPA
EP1	0910052292	PCB	B 5404B

**[KEY BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
C1	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
J1	6510019970	S.CONNECTOR	52808-1090
J2	6450001790	CONNECTOR	HLJ7000-01-3010
EP1	0910052310	PCB	B 5406

**[PBT BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
R1	7210002970	VARIABLE	RV-314
R3	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R4	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
C1	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
J1	6510019970	S.CONNECTOR	52808-1090
S1	2250000410	ENCODER	TP90D96E20-30F-2178-1
EP1	0910051851	PCB	B 5330A

S.=Surface mount

**[TEN-KEY BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
Q1	1590002310	S.TRANSISTOR	DTC114EE TL
Q2	1590002310	S.TRANSISTOR	DTC114EE TL
Q3	1590002310	S.TRANSISTOR	DTC114EE TL
Q4	1590002310	S.TRANSISTOR	DTC114EE TL
Q5	1590002310	S.TRANSISTOR	DTC114EE TL
R1	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R2	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R3	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R4	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R5	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R6	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R7	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R8	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R9	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R10	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R11	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R12	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
C1	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C2	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
J1	6510019980	S.CONNECTOR	52808-1690
J2	6510021560	S.CONNECTOR	52808-2490
DS1	5040002110	S.LED	CL-200HR-C-TU
DS2	5040002110	S.LED	CL-200HR-C-TU
DS3	5040002220	S.LED	CL-220YG-C-TU
DS4	5040002220	S.LED	CL-220YG-C-TU
DS5	5040002220	S.LED	CL-220YG-C-TU
S1	2260001890	S.SWITCH	SKQDPA
S2	2260001890	S.SWITCH	SKQDPA
S3	2260001890	S.SWITCH	SKQDPA
S4	2260001890	S.SWITCH	SKQDPA
S5	2260001890	S.SWITCH	SKQDPA
S6	2260001890	S.SWITCH	SKQDPA
S7	2260001890	S.SWITCH	SKQDPA
S8	2260001890	S.SWITCH	SKQDPA
S9	2260001890	S.SWITCH	SKQDPA
S10	2260001890	S.SWITCH	SKQDPA
S11	2260001890	S.SWITCH	SKQDPA
S12	2260001890	S.SWITCH	SKQDPA
S13	2260001890	S.SWITCH	SKQDPA
S14	2260001890	S.SWITCH	SKQDPA
S15	2260001890	S.SWITCH	SKQDPA
S16	2260001890	S.SWITCH	SKQDPA
S17	2260001890	S.SWITCH	SKQDPA
S18	2260001890	S.SWITCH	SKQDPA
S19	2260001890	S.SWITCH	SKQDPA
S20	2260001890	S.SWITCH	SKQDPA
S21	2260001890	S.SWITCH	SKQDPA
S22	2260001890	S.SWITCH	SKQDPA
S23	2260001890	S.SWITCH	SKQDPA
S24	2260001890	S.SWITCH	SKQDPA
S25	2260001890	S.SWITCH	SKQDPA
S26	2260001890	S.SWITCH	SKQDPA
S27	2260001890	S.SWITCH	SKQDPA
S28	2260001890	S.SWITCH	SKQDPA
S29	2260001890	S.SWITCH	SKQDPA
S30	2260001890	S.SWITCH	SKQDPA
S31	2260001890	S.SWITCH	SKQDPA
EP1	0910052272	PCB	B 5403B

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**[RIT BOARD]**

REF NO.	ORDER NO.	DESCRIPTION	
J1	6510019970	S.CONNECTOR	52808-1090
S1	2250000340	ENCODER	EVQ-VCJF0324B
EP1	0910052300	PCB	B 5405

**[RF UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
IC151	1110001890	S.IC	μPC1678G-E2
IC451	1110003970	S.IC	μPC1658G-E1
IC841	1110003490	S.IC	TA31136FN (D,EL)
IC871	1110003870	S.IC	NJM2058M-T1
IC901	1130007700	S.IC	BU4094BCF-T1
IC902	1130007570	S.IC	BU4094BCFV-E2
IC903	1160000130	S.IC	TD62783AF (TP1)
IC904	1160000130	S.IC	TD62783AF (TP1)
IC961	1110004130	S.IC	μPC2708T-E3
Q131	1590002310	S.TRANSISTOR	DTC114EE TL
Q132	1590002310	S.TRANSISTOR	DTC114EE TL
Q141	1590002710	S.TRANSISTOR	UMH11NTN
Q143	1590002310	S.TRANSISTOR	DTC114EE TL
Q151	1590002710	S.TRANSISTOR	UMH11NTN
Q152	1510000510	S.TRANSISTOR	2SA1576A T106R
Q153	1590002310	S.TRANSISTOR	DTC114EE TL
Q441	1560000720	S.FET	2SK2171-4-TD
Q442	1560000720	S.FET	2SK2171-4-TD
Q501	1560000720	S.FET	2SK2171-4-TD
Q511	1560000640	S.FET	2SK1740-TA
Q512	1560000640	S.FET	2SK1740-TA
Q513	1560000640	S.FET	2SK1740-TA
Q514	1560000640	S.FET	2SK1740-TA
Q531	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q532	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q551	1560000640	S.FET	2SK1740-TA
Q561	1530003150	S.TRANSISTOR	2SC4673D-TD
Q601	1560000720	S.FET	2SK2171-4-TD
Q611	1560000640	S.FET	2SK1740-TA
Q612	1560000640	S.FET	2SK1740-TA
Q613	1560000640	S.FET	2SK1740-TA
Q614	1560000640	S.FET	2SK1740-TA
Q631	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q632	1540000550	S.TRANSISTOR	2SD1664 T100Q
Q651	1560000640	S.FET	2SK1740-TA
Q661	1530003150	S.TRANSISTOR	2SC4673D-TD
Q701	1560000560	S.FET	2SK882-GR (TE85L)
Q721	1580000620	S.FET	3SK131-T2 MAS
Q722	1590002480	S.TRANSISTOR	UMC3N TR
Q751	1560000560	S.FET	2SK882-GR (TE85L)
Q781	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q801	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q811	1560000560	S.FET	2SK882-GR (TE85L)
Q812	1560000560	S.FET	2SK882-GR (TE85L)
Q831	1560000560	S.FET	2SK882-GR (TE85L)
Q901	1590002710	S.TRANSISTOR	UMH11NTN
Q902	1590002710	S.TRANSISTOR	UMH11NTN
Q903	1590002480	S.TRANSISTOR	UMC3N TR
Q904	1590002480	S.TRANSISTOR	UMC3N TR
Q905	1590002480	S.TRANSISTOR	UMC3N TR
Q941	1560000640	S.FET	2SK1740-TA
Q942	1560000640	S.FET	2SK1740-TA
Q943	1560000640	S.FET	2SK1740-TA
Q944	1560000640	S.FET	2SK1740-TA
Q945	1540000550	S.TRANSISTOR	2SD1664 T100Q
D101	1750000300	S.DIODE	1SS302 (TE85R)
D102	1750000300	S.DIODE	1SS302 (TE85R)
D131	1750000450	S.DIODE	1SV265-TL
D141	1750000450	S.DIODE	1SV265-TL
D142	1790000620	S.DIODE	MA77 (TX)
D151	1790001250	S.DIODE	MA2S111-(TX)
D152	1790001250	S.DIODE	MA2S111-(TX)

S.=Surface mount



## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
D191	1750000440	S.DIODE	1SV263-TL
D192	1790000620	S.DIODE	MA77 (TX)
D211	1750000440	S.DIODE	1SV263-TL
D212	1790000620	S.DIODE	MA77 (TX)
D231	1750000450	S.DIODE	1SV265-TL
D232	1790000450	S.DIODE	MA862 (TX)
D271	1750000440	S.DIODE	1SV263-TL
D272	1790000620	S.DIODE	MA77 (TX)
D291	1750000450	S.DIODE	1SV265-TL
D292	1790000450	S.DIODE	MA862 (TX)
D311	1750000440	S.DIODE	1SV263-TL
D312	1790000620	S.DIODE	MA77 (TX)
D331	1750000440	S.DIODE	1SV263-TL
D332	1790000620	S.DIODE	MA77 (TX)
D371	1750000440	S.DIODE	1SV263-TL
D372	1790000620	S.DIODE	MA77 (TX)
D391	1750000440	S.DIODE	1SV263-TL
D392	1790000620	S.DIODE	MA77 (TX)
D421	1790000620	S.DIODE	MA77 (TX)
D431	1790000620	S.DIODE	MA77 (TX)
D432	1790000620	S.DIODE	MA77 (TX)
D441	1790000450	S.DIODE	MA862 (TX)
D442	1790000450	S.DIODE	MA862 (TX)
D481	1790000620	S.DIODE	MA77 (TX)
D531	1750000450	S.DIODE	1SV265-TL
D532	1750000450	S.DIODE	1SV265-TL
D533	1750000440	S.DIODE	1SV263-TL
D534	1790000620	S.DIODE	MA77 (TX)
D535	1790000620	S.DIODE	MA77 (TX)
D536	1790001250	S.DIODE	MA2S111-(TX)
D561	1790000450	S.DIODE	MA862 (TX)
D631	1750000450	S.DIODE	1SV265-TL
D632	1750000450	S.DIODE	1SV265-TL
D633	1750000440	S.DIODE	1SV263-TL
D635	1790000620	S.DIODE	MA77 (TX)
D636	1790001250	S.DIODE	MA2S111-(TX)
D701	1790000450	S.DIODE	MA862 (TX)
D711	1790000450	S.DIODE	MA862 (TX)
D721	1790000450	S.DIODE	MA862 (TX)
D741	1750000430	S.DIODE	HSB88WSTR
D742	1790001620	S.DIODE	1SV308 (TPL3)
D743	1790001620	S.DIODE	1SV308 (TPL3)
D751	1790000620	S.DIODE	MA77 (TX)
D771	1750000430	S.DIODE	HSB88WSTR
D772	1790000620	S.DIODE	MA77 (TX)
D781	1750000450	S.DIODE	1SV265-TL
D782	1750000440	S.DIODE	1SV263-TL
D783	1750000450	S.DIODE	1SV265-TL
D784	1790000950	S.ZENER	MA8056-M (TX)
D801	1750000440	S.DIODE	1SV263-TL
D831	1750000430	S.DIODE	HSB88WSTR
D861	1790001250	S.DIODE	MA2S111-(TX)
D871	1790001560	S.DIODE	1SS372 (TE85R)
D901	1750000520	S.DIODE	DAN222TL
D902	1750000520	S.DIODE	DAN222TL
FI711	2010002470	XTAL	FL-315 (64.45500 MHz)
FI841	2020001500	S.CERAMIC	SFECV13.35MA
FI842	2020001320	CERAMIC	CFJ455K8
FI843	2020001500	S.CERAMIC	SFECV13.35MA
L111	6200003450	S.COIL	NL 322522T-082J
L112	6200001470	S.COIL	NL 322522T-R12J-3
L131	6200005490	S.COIL	NL 322522T-331J
L132	6200002960	S.COIL	NL 322522T-4R7J-3
L141	6200005490	S.COIL	NL 322522T-331J
L151	6200001710	S.COIL	NL 322522T-220J
L152	6200001470	S.COIL	NL 322522T-R12J-3
L171	6200005490	S.COIL	NL 322522T-331J
L172	6200008790	S.COIL	ACL3225S-4R7K
L173	6200008800	S.COIL	ACL3225S-5R6K
L174	6200002960	S.COIL	NL 322522T-4R7J-3
L181	6200005490	S.COIL	NL 322522T-331J
L182	6200002960	S.COIL	NL 322522T-4R7J-3
L183	6200003110	S.COIL	NL 322522T-6R8J
L191	6200005490	S.COIL	NL 322522T-331J
L192	6200003090	S.COIL	NL 322522T-2R7J-3
L193	6200003100	S.COIL	NL 322522T-3R9J-3
L194	6200005490	S.COIL	NL 322522T-331J
L211	6200005490	S.COIL	NL 322522T-331J

## [RF UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
L212	6200002990	S.COIL	NL 322522T-2R2J-3
L213	6200003090	S.COIL	NL 322522T-2R7J-3
L214	6200008780	S.COIL	ACL3225S-3R9K
L215	6200008790	S.COIL	ACL3225S-4R7K
L231	6200005490	S.COIL	NL 322522T-331J
L232	6200003070	S.COIL	NL 322522T-1R5J-3
L233	6200002990	S.COIL	NL 322522T-2R2J-3
L234	6200003090	S.COIL	NL 322522T-2R7J-3
L235	6200003100	S.COIL	NL 322522T-3R9J-3
L251	6200003260	S.COIL	NL 322522T-101J
L252	6200003060	S.COIL	NL 322522T-1R2J-3
L253	6200003070	S.COIL	NL 322522T-1R5J-3
L254	6200003070	S.COIL	NL 322522T-1R5J-3
L255	6200003070	S.COIL	NL 322522T-1R5J-3
L271	6200003260	S.COIL	NL 322522T-101J
L272	6200003330	S.COIL	NL 322522T-1R0J-3
L273	6200003060	S.COIL	NL 322522T-1R2J-3
L274	6200003060	S.COIL	NL 322522T-1R2J-3
L275	6200003070	S.COIL	NL 322522T-1R5J-3
L291	6200003260	S.COIL	NL 322522T-101J
L292	6200003060	S.COIL	NL 322522T-1R2J-3
L293	6200003330	S.COIL	NL 322522T-1R0J-3
L294	6200003330	S.COIL	NL 322522T-1R0J-3
L295	6200003080	S.COIL	NL 322522T-1R8J-3
L311	6200003260	S.COIL	NL 322522T-101J
L312	6200003250	S.COIL	NL 322522T-R39J-3
L313	6200002980	S.COIL	NL 322522T-R56J-3
L314	6200003040	S.COIL	NL 322522T-R68J-3
L315	6200003330	S.COIL	NL 322522T-1R0J-3
L331	6200003260	S.COIL	NL 322522T-101J
L332	6200003020	S.COIL	NL 322522T-R33J-3
L333	6200003250	S.COIL	NL 322522T-R39J-3
L334	6200003030	S.COIL	NL 322522T-R47J-3
L335	6200003030	S.COIL	NL 322522T-R47J-3
L351	6200003260	S.COIL	NL 322522T-101J
L352	6200003020	S.COIL	NL 322522T-R33J-3
L353	6200003010	S.COIL	NL 322522T-R27J-3
L354	6200003020	S.COIL	NL 322522T-R33J-3
L355	6200003250	S.COIL	NL 322522T-R39J-3
L371	6200001830	S.COIL	NL 322522T-100J
L372	6200008100	S.COIL	LQN1H R14J04
L373	6200008100	S.COIL	LQN1H R14J04
L374	6200008100	S.COIL	LQN1H R14J04
L375	6200008100	S.COIL	LQN1H R14J04
L376	6200008100	S.COIL	LQN1H R14J04
L391	6200001830	S.COIL	NL 322522T-100J
L393	6200003420	S.COIL	NL 322522T-R15J-3
L394	6200003020	S.COIL	NL 322522T-R33J-3
L395	6200001830	S.COIL	NL 322522T-100J
L411	6200005490	S.COIL	NL 322522T-331J
L412	6200005490	S.COIL	NL 322522T-331J
L413	6200002960	S.COIL	NL 322522T-4R7J-3
L431	6200003220	S.COIL	NL 322522T-151J
L441	6140000640	COIL	LR-86
L442	6200003090	S.COIL	NL 322522T-2R7J-3
L443	6140003550	COIL	LR-397
L444	6200003260	S.COIL	NL 322522T-101J
L445	6200003220	S.COIL	NL 322522T-151J
L451	6200003260	S.COIL	NL 322522T-101J
L452	6200003260	S.COIL	NL 322522T-101J
L453	6200002960	S.COIL	NL 322522T-4R7J-3
L471	6200005490	S.COIL	NL 322522T-331J
L491	6140003530	COIL	LR-395
L501	6200001470	S.COIL	NL 322522T-R12J-3
L502	6200003010	S.COIL	NL 322522T-R27J-3
L503	6200003020	S.COIL	NL 322522T-R33J-3
L504	6200005490	S.COIL	NL 322522T-331J
L505	6200003040	S.COIL	NL 322522T-R68J-3
L506	6180002970	S.COIL	NL 322522T-068J
L511	6140003250	COIL	LR-362
L512	6200003260	S.COIL	NL 322522T-101J
L513	6150002980	COIL	LS-309
L521	6200004940	S.COIL	MLF1608D R27K-T
L522	6200004940	S.COIL	MLF1608D R27K-T
L530	6200003640	S.COIL	MLF1608K 100K-T
L531	6200001830	S.COIL	NL 322522T-100J
L532	6200001830	S.COIL	NL 322522T-100J
L533	6200001830	S.COIL	NL 322522T-100J
L534	6200002970	S.COIL	NL 322522T-121J
L535	6200003640	S.COIL	MLF1608K 100K-T
L551	6200001830	S.COIL	NL 322522T-100J
L552	6200004940	S.COIL	MLF1608D R27K-T

S.=Surface mount









**[RF UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
J831	6510007020	CONNECTOR	TMP-J01X-V6
J841	6510007020	CONNECTOR	TMP-J01X-V6
J901	6510007020	CONNECTOR	TMP-J01X-V6
J951	6510019990	S.CONNECTOR	52808-2290
P741	6510003240	CONNECTOR	TMP-P01X-A1
DS111	5080000370	LAMP	HRS-4160A
W392	7030003860	S.JUMPER	ERJ3GE JPW V
W562	7030003860	S.JUMPER	ERJ3GE JPW V
W662	7030003860	S.JUMPER	ERJ3GE JPW V
W941	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910051154	PCB	B 5238D

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
IC101	1110000960	S.IC	NJM4558M-T1
IC151	1110004840	S.IC	NJM1496V-TE1
IC201	1110001900	S.IC	μPC4570G2-T1
IC215	1180000990	S.IC	AN78L08M-(E1)
IC221	1110004840	S.IC	NJM1496V-TE1
IC301	1130006220	S.IC	TC4W53FU (TE12L)
IC311	1110003300	S.IC	M5282FP 70CD
IC321	1110000960	S.IC	NJM4558M-T1
IC331	1130006220	S.IC	TC4W53FU (TE12L)
IC332	1110003090	IC	LA4425A
IC361	1130006220	S.IC	TC4W53FU (TE12L)
IC362	1130006220	S.IC	TC4W53FU (TE12L)
IC371	1110003300	S.IC	M5282FP 70CD
IC372	1110003670	S.IC	BA3308F-T1
IC451	1140005280	S.IC	μPC5023GS-077-E1
IC551	1110003870	S.IC	NJM2058M-T1
IC571	1110000960	S.IC	NJM4558M-T1
IC801	1180002000	REG	BA033T
IC802	1180001070	S.IC	TA7805F (TE16L)
IC803	1180001070	S.IC	TA7805F (TE16L)
IC805	1180000720	S.IC	AN79L05M-(E1)
IC3001	1190001000	S.IC	ISD33120S
IC3002	1130008230	S.IC	BU4053BCFV-E2
IC3003	1110003300	S.IC	M5282FP 70CD
IC3004	1110000960	S.IC	NJM4558M-T1
IC3005	1130008230	S.IC	BU4053BCFV-E2
IC3501	1140008590	S.IC	HD64F2357F20
IC3502	1130009110	S.IC	S-80942ANMP-DD6-T2
IC3503	1140005880	S.IC	X25320S8I-2.7T6
IC3504	1130007450	S.IC	RTC-4553A
IC3551	1190000950	S.IC	SED1354F0A (QFP15-128PIN)
IC3552	1130007180	S.IC	TC7WU04FU (TE12L)
IC3553	1130009360	S.IC	LH61665AS-60A
IC3631	1130008230	S.IC	BU4053BCFV-E2
IC3651	1120002770	S.IC	TC74AC244FT (EL)
IC3652	1120002780	S.IC	TC74AC245FT (EL)
IC3653	1120002790	S.IC	TC74AC574FT (EL)
IC3654	1120002790	S.IC	TC74AC574FT (EL)
IC3655	1120002440	S.IC	TC74AC08FS (EL)
IC3656	1120002760	S.IC	TC74AC32FT (EL)
IC3751	1110004310	S.IC	M62352GP 75EC
IC3752	1130007510	S.IC	BU4094BCFV-E1
IC3753	1130007510	S.IC	BU4094BCFV-E1
IC3771	1130007110	S.IC	TC7W04FU (TE12L)
Q141	1590002710	S.TRANSISTOR	UMH11NTN
Q142	1590002310	S.TRANSISTOR	DTC114EE TL
Q241	1560000560	S.FET	2SK882-GR (TE85L)
Q261	1560000560	S.FET	2SK882-GR (TE85L)
Q271	1560000560	S.FET	2SK882-GR (TE85L)
Q272	1560000560	S.FET	2SK882-GR (TE85L)
Q273	1560000560	S.FET	2SK882-GR (TE85L)
Q274	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q275	1510000510	S.TRANSISTOR	2SA1576A T106R

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
Q276	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q277	1590002710	S.TRANSISTOR	UMH11NTN
Q278	1590002530	S.TRANSISTOR	UN911H (TX)
Q331	1540000470	S.TRANSISTOR	2SD1801S-TL
Q333	1590002770	S.FET	CPH3404-TL
Q334	1590002310	S.TRANSISTOR	DTC114EE TL
Q351	1590002310	S.TRANSISTOR	DTC114EE TL
Q471	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q501	1590002710	S.TRANSISTOR	UMH11NTN
Q502	1590002710	S.TRANSISTOR	UMH11NTN
Q503	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q504	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q505	1510000510	S.TRANSISTOR	2SA1576A T106R
Q506	1590002310	S.TRANSISTOR	DTC114EE TL
Q507	1590001870	S.TRANSISTOR	DTA114EE TL
Q521	1510000510	S.TRANSISTOR	2SA1576A T106R
Q601	1540000440	S.TRANSISTOR	2SD1619-T-TD
Q602	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q611	1540000440	S.TRANSISTOR	2SD1619-T-TD
Q612	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q621	1510000920	S.TRANSISTOR	2SA1577 T107 Q
Q622	1590002710	S.TRANSISTOR	UMH11NTN
Q631	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q632	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q651	1590001870	S.TRANSISTOR	DTA114EE TL
Q652	1540000440	S.TRANSISTOR	2SD1619-T-TD
Q653	1590002310	S.TRANSISTOR	DTC114EE TL
Q691	1590002310	S.TRANSISTOR	DTC114EE TL
Q801	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q803	1590002430	S.TRANSISTOR	DTA144EE TL
Q804	1540000470	S.TRANSISTOR	2SD1801S-TL
Q805	1520000510	TRANSISTOR	2SB1133 R
Q3002	1590001870	S.TRANSISTOR	DTA114EE TL
Q3504	1510000500	S.TRANSISTOR	2SA1162-GR (TE85R)
Q3505	1590001940	S.TRANSISTOR	DTC144EE TL
Q3551	1590001870	S.TRANSISTOR	DTA114EE TL
Q3701	1590002310	S.TRANSISTOR	DTC114EE TL
Q3771	1510000510	S.TRANSISTOR	2SA1576A T106R
Q3772	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q3773	1590002310	S.TRANSISTOR	DTC114EE TL
D111	1790001620	S.DIODE	1SV308 (TPL3)
D112	1790001620	S.DIODE	1SV308 (TPL3)
D113	1790000450	S.DIODE	MA862 (TX)
D114	1790000450	S.DIODE	MA862 (TX)
D115	1790001620	S.DIODE	1SV308 (TPL3)
D116	1790001620	S.DIODE	1SV308 (TPL3)
D215	1790001250	S.DIODE	MA2S111-(TX)
D216	1790001250	S.DIODE	MA2S111-(TX)
D251	1750000520	S.DIODE	DAN222TL
D252	1750000520	S.DIODE	DAN222TL
D271	1790001210	S.DIODE	1SS375-TL
D273	1790001250	S.DIODE	MA2S111-(TX)
D351	1750000520	S.DIODE	DAN222TL
D501	1790001040	S.ZENER	MA8033-L (TX)
D502	1790001250	S.DIODE	MA2S111-(TX)
D504	1790001240	S.DIODE	MA2S728-(TX)
D505	1790001040	S.ZENER	MA8033-L (TX)
D531	1790001250	S.DIODE	MA2S111-(TX)
D532	1790001250	S.DIODE	MA2S111-(TX)
D533	1790001250	S.DIODE	MA2S111-(TX)
D541	1790001250	S.DIODE	MA2S111-(TX)
D542	1790001250	S.DIODE	MA2S111-(TX)
D561	1790001250	S.DIODE	MA2S111-(TX)
D571	1790001250	S.DIODE	MA2S111-(TX)
D601	1750000370	S.DIODE	DA221 TL
D611	1750000370	S.DIODE	DA221 TL
D631	1790001250	S.DIODE	MA2S111-(TX)
D632	1790001250	S.DIODE	MA2S111-(TX)
D691	1750000520	S.DIODE	DAN222TL
D801	1790001250	S.DIODE	MA2S111-(TX)
D3001	1750000370	S.DIODE	DA221 TL
D3504	1790001250	S.DIODE	MA2S111-(TX)
D3505	1790001250	S.DIODE	MA2S111-(TX)
D3506	1790001250	S.DIODE	MA2S111-(TX)
D3507	1750000370	S.DIODE	DA221 TL
D3508	1790001560	S.DIODE	1SS372 (TE85R)
D3509	1790001560	S.DIODE	1SS372 (TE85R)
D3601	1790001250	S.DIODE	MA2S111-(TX)
D3602	1790001560	S.DIODE	1SS372 (TE85R)
D3701	1750000520	S.DIODE	DAN222TL

S.=Surface mount













[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C3507	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3508	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3509	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3510	4510004630	S.ELECTROLYTIC ECEV1CA100SR
C3511	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3512	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3513	4510005940	ELECTROL 10 MV 470 HC
C3552	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3553	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3554	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3555	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3556	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3557	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3558	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C3560	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3561	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3562	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C3601	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3602	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C3603	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3604	4510006670	S.ELECTROLYTIC ECEV1CA471P
C3605	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3606	4030007170	S.CERAMIC C1608 CH 1H 221J-T-A
C3607	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C3608	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3609	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3610	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3611	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3612	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3614	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3615	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3624	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3625	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3626	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3631	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3632	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3633	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3634	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3635	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3636	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3637	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3638	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3641	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3642	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3643	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3651	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3652	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3653	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3654	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3655	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C3656	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3657	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3702	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3704	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3706	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3707	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3708	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3709	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3711	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3712	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C3721	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3722	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3723	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3724	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3725	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3751	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3752	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3753	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3754	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3755	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3756	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3757	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3758	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3761	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3762	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3763	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3764	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3765	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3766	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3767	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3768	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3769	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
C3770	4030006880	S.CERAMIC C1608 JB 1H 472K-T-A
C3771	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3772	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3773	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3774	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C3775	4510006670	S.ELECTROLYTIC ECEV1CA471P
C3801	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C3802	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C3803	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
RL351	6330001320	RELAY AHY103
RL691	6330000540	RELAY OMR-109F
CP271	6910009670	S.CHECK P HK3-S-T
CP501	6910009670	S.CHECK P HK3-S-T
J101	6510007020	CONNECTOR TMP-J01X-V6
J201	6910012460	CONNECTOR IMSA-9180S-30A
J202	6910012460	CONNECTOR IMSA-9180S-30A
J203	6510018960	S.CONNECTOR B2B-PH-SM3-TB
J211	6510007020	CONNECTOR TMP-J01X-V6
J351	6450000140	CONNECTOR HSJ0807-01-010
J352	6510009870	CONNECTOR PD054-02M
J641	6510018970	S.CONNECTOR B4B-PH-SM3-TB
J661	6450000170	CONNECTOR TCS4480-01-1111
J662	6450000160	CONNECTOR TCS4470-01-1111
J681	6450001490	CONNECTOR HLJ7001-01-3010
J691	6450001130	CONNECTOR JJP2042-01-110
J701	6450000140	CONNECTOR HSJ0807-01-010
J741	6510019990	S.CONNECTOR 52808-2290
J771	6510020000	S.CONNECTOR 52808-3090
J811	6510019990	S.CONNECTOR 52808-2290
J841	6510019980	S.CONNECTOR 52808-1690
J861	6510021560	S.CONNECTOR 52808-2490
J891	6510021560	S.CONNECTOR 52808-2490
J1702	6510019970	S.CONNECTOR 52808-1090
J3501	6510021860	CONNECTOR BH-800.8
J3502	6510019190	S.CONNECTOR 52365-0891
J3503	6510022060	S.CONNECTOR AXK5S30235P
J3504	6510022060	S.CONNECTOR AXK5S30235P
P352	6510003640	CONNECTOR EHR04
BT3501	3020000110	LITHIUM CR2032
W201	7030003860	S.JUMPER ERJ3GE JPW V
W308	7030003860	S.JUMPER ERJ3GE JPW V
W311	7030003860	S.JUMPER ERJ3GE JPW V
W354	7030003860	S.JUMPER ERJ3GE JPW V
W355	7030003860	S.JUMPER ERJ3GE JPW V
W451	7030003860	S.JUMPER ERJ3GE JPW V
W452	7030008240	S.JUMPER ERJ12YJ0R00H
W501	7030003860	S.JUMPER ERJ3GE JPW V
W503	7030003860	S.JUMPER ERJ3GE JPW V
W561	7030003860	S.JUMPER ERJ3GE JPW V
W562	7030003860	S.JUMPER ERJ3GE JPW V
W571	7030003860	S.JUMPER ERJ3GE JPW V
W572	7030003860	S.JUMPER ERJ3GE JPW V
W701	7030003860	S.JUMPER ERJ3GE JPW V
W1001	7030009300	S.JUMPER ERJ1WY0R00H
W3001	7030003860	S.JUMPER ERJ3GE JPW V
W3010	7030003860	S.JUMPER ERJ3GE JPW V
W3014	7030003860	S.JUMPER ERJ3GE JPW V
W3504	7030003860	S.JUMPER ERJ3GE JPW V
W3551	7030003860	S.JUMPER ERJ3GE JPW V
W3601	7030003860	S.JUMPER ERJ3GE JPW V
EP1	0910051105	PCB B 5239E

S.=Surface mount























[FILTER UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C136	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C137	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C141	4010008290	CERAMIC	HM95TJ SL 271J 500V
C142	4030011230	S.CERAMIC	GRM42-6 CH 390J 500PT
C143	4010008280	CERAMIC	HM95TJ SL 221J 500V
C144	4010008280	CERAMIC	HM95TJ SL 221J 500V
C145	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C146	4030014460	S.CERAMIC	GRM42-6 CH 820J 500PT
C151	4010008200	CERAMIC	HM11TJ SL 331J 500V
C152	4010005390	CERAMIC	HM15SJ SL 621J 500V
C153	4010008200	CERAMIC	HM11TJ SL 331J 500V
C155	4030011210	S.CERAMIC	GRM42-6 CH 330J 500PT
C156	4030011550	S.CERAMIC	GRM42-6 CH 680J 500PT
C157	4030011210	S.CERAMIC	GRM42-6 CH 330J 500PT
C158	4030011210	S.CERAMIC	GRM42-6 CH 330J 500PT
C501	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C502	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C503	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C504	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C507	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C508	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C513	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C514	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C515	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C516	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C521	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C522	4030004740	S.CERAMIC	C2012 JB 1H 472K-T-A
C523	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C524	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
RL1	6330001510	RELAY	TB1-160
RL2	6330001510	RELAY	TB1-160
RL3	6330001510	RELAY	TB1-160
RL4	6330001510	RELAY	TB1-160
RL5	6330001510	RELAY	TB1-160
RL6	6330001510	RELAY	TB1-160
RL7	6330001510	RELAY	TB1-160
RL8	6330001510	RELAY	TB1-160
RL9	6330001510	RELAY	TB1-160
RL10	6330001510	RELAY	TB1-160
RL11	6330001510	RELAY	TB1-160
RL12	6330001510	RELAY	TB1-160
RL13	6330001330	RELAY	AG 201344
RL14	6330001330	RELAY	AG 201344
RL15	6330001510	RELAY	TB1-160
RL16	6330001510	RELAY	TB1-160
J1	6510007020	CONNECTOR	TMP-J01X-V6
J2	6510007020	CONNECTOR	TMP-J01X-V6
J3	6510019970	S.CONNECTOR	52808-1090
W1	7030003860	S.JUMPER	ERJ3GE JPW V
W2	7030003860	S.JUMPER	ERJ3GE JPW V
W3	7030003860	S.JUMPER	ERJ3GE JPW V
W4	7030003860	S.JUMPER	ERJ3GE JPW V
W5	7030003860	S.JUMPER	ERJ3GE JPW V
W6	7030003860	S.JUMPER	ERJ3GE JPW V
W7	7030003860	S.JUMPER	ERJ3GE JPW V
W8	7030003860	S.JUMPER	ERJ3GE JPW V
W9	8900009620	CABLE	OPC-931
W10	8900009630	CABLE	OPC-962
EP1	0910051803	PCB	B 5287C
EP501	6510018330	TERMINAL	F4053A
EP502	6510018330	TERMINAL	F4053A

[TUNER UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1120000970	IC	M54562P
IC2	1120000970	IC	M54562P
L1	2040000490	COIL	EXC-ELDR25C
L2	2040000490	COIL	EXC-ELDR25C
L3	6110003010	COIL	LA-488
L4	6110003030	COIL	LA-490
L5	6110003020	COIL	LA-489
L6	6110003030	COIL	LA-490
L7	6110003020	COIL	LA-489
L8	6110003030	COIL	LA-490
L9	6140003260	COIL	LR-363
L10	6140003260	COIL	LR-363
L11	6140002700	COIL	LR-307
L12	6140002700	COIL	LR-307
R17	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R18	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R19	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R20	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R21	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R22	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R23	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R24	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R25	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R26	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R27	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R28	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R29	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R30	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R31	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R32	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
C1	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C2	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C3	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C4	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C5	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C6	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C7	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C8	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C9	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C10	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C11	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C12	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C13	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C14	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C15	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C16	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C17	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C18	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C23	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C24	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C25	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C26	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C27	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C28	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C29	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C30	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C31	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C32	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C33	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C34	4010005070	CERAMIC	DE0707 SL 390J 3KV
C35	4010005070	CERAMIC	DE0707 SL 390J 3KV
C36	4010004260	CERAMIC	DE0907 SL 820J 3KV
C37	4010004250	CERAMIC	DE1007 SL 101J 3KV
C38	4010004280	CERAMIC	DE1207 SL 151J 3KV
C39	4010004280	CERAMIC	DE1207 SL 151J 3KV
C40	4010004250	CERAMIC	DE1007 SL 101J 3KV
C41	4010004250	CERAMIC	DE1007 SL 101J 3KV
C42	4010004250	CERAMIC	DE1007 SL 101J 3KV
C43	4010004250	CERAMIC	DE1007 SL 101J 3KV
C44	4620000140	VARIABLE	UV35A 150P
C45	4620000140	VARIABLE	UV35A 150P
C46	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C47	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C48	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C49	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C50	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A

S.=Surface mount

**[TUNER UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
C51	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C52	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C53	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C54	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C55	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C56	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C57	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C58	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C59	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C60	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C61	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
RL1	6330001110	RELAY	NY-12W-K
RL2	6330001110	RELAY	NY-12W-K
RL3	6330001110	RELAY	NY-12W-K
RL4	6330001110	RELAY	NY-12W-K
RL5	6330001110	RELAY	NY-12W-K
RL6	6330001110	RELAY	NY-12W-K
RL7	6330001110	RELAY	NY-12W-K
RL8	6330001110	RELAY	NY-12W-K
RL9	6330001110	RELAY	NY-12W-K
RL10	6330001110	RELAY	NY-12W-K
RL11	6330001110	RELAY	NY-12W-K
RL12	6330001110	RELAY	NY-12W-K
RL13	6330001110	RELAY	NY-12W-K
RL14	6330001110	RELAY	NY-12W-K
RL15	6330001110	RELAY	NY-12W-K
J1	6510003100	CONNECTOR	RT01T-1.3B
J2	6510003100	CONNECTOR	RT01T-1.3B
J3	6510007900	CONNECTOR	TBP-P01X-A1 (B1)
J4	6510007900	CONNECTOR	TBP-P01X-A1 (B1)
J5	6510019990	S.CONNECTOR	52808-2290
P3	6510003240	CONNECTOR	TMP-P01X-A1
P4	6510003240	CONNECTOR	TMP-P01X-A1
MF1	2710000460	MOTOR	MP28GA STEPPING MOTOR
MF2	2710000460	MOTOR	MP28GA STEPPING MOTOR
EP1	0910052331	PCB	B 5408A

**[CTRL UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
Q27	1590001330	S.TRANSISTOR	DTA114EUA T106
Q211	1590000680	S.TRANSISTOR	DTC114EUA T106
Q212	1590000680	S.TRANSISTOR	DTC114EUA T106
Q213	1590000680	S.TRANSISTOR	DTC114EUA T106
Q214	1590000680	S.TRANSISTOR	DTC114EUA T106
Q215	1590000680	S.TRANSISTOR	DTC114EUA T106
Q216	1590000680	S.TRANSISTOR	DTC114EUA T106
Q217	1590000680	S.TRANSISTOR	DTC114EUA T106
Q218	1590000680	S.TRANSISTOR	DTC114EUA T106
D1	1790000490	S.DIODE	HSM88AS-TR
D2	1790000490	S.DIODE	HSM88AS-TR
D3	1750000200	S.DIODE	1SS319 (TE85R)
D4	1750000120	S.DIODE	DWA010-TE
D5	1790000690	S.DIODE	HSM88ASR-TR
D6	1790000490	S.DIODE	HSM88AS-TR
D7	1790000490	S.DIODE	HSM88AS-TR
D8	1790000490	S.DIODE	HSM88AS-TR
D9	1790000490	S.DIODE	HSM88AS-TR
D10	1750000120	S.DIODE	DWA010-TE
D11	1730000410	S.ZENER	RD5.1M-T2B2
D12	1730000030	S.ZENER	RD5.6M-T2B2
D13	1710000780	S.DIODE	MA114 (TX)
D15	1790000490	S.DIODE	HSM88AS-TR
D16	1750000270	S.DIODE	1SS301 (TE85R)
D17	1750000270	S.DIODE	1SS301 (TE85R)
D18	1750000270	S.DIODE	1SS301 (TE85R)
D20	1750000270	S.DIODE	1SS301 (TE85R)
D22	1790000620	S.DIODE	MA77 (TX)
D211	1750000200	S.DIODE	1SS319 (TE85R)
D213	1750000200	S.DIODE	1SS319 (TE85R)
D215	1750000200	S.DIODE	1SS319 (TE85R)
D217	1750000200	S.DIODE	1SS319 (TE85R)
X1	6050009890	S.XTAL	CR-569 (6.144 MHz)
L1	6140003270	COIL	LR-364
L2	6200001830	S.COIL	NL 322522T-100J
L3	6200003260	S.COIL	NL 322522T-101J
L4	6140003270	COIL	LR-364
L5	6180001220	COIL	LAL 04NA 100K
L8	6140003270	COIL	LR-364
L9	6180000450	COIL	RFC L6 222K
L10	6200003260	S.COIL	NL 322522T-101J
L11	6200003260	S.COIL	NL 322522T-101J
L13	6180000990	COIL	LAL 04NA 101K
L22	6140003270	COIL	LR-364
L25	6200003260	S.COIL	NL 322522T-101J
L27	6110001630	COIL	LA-246
L28	6110001560	COIL	LA-236
L29	2040000490	COIL	EXC-ELDR25C
L30	2040000490	COIL	EXC-ELDR25C
L31	2040000490	COIL	EXC-ELDR25C
L32	2040000490	COIL	EXC-ELDR25C
L33	6200003260	S.COIL	NL 322522T-101J
L34	6200003260	S.COIL	NL 322522T-101J
L35	6200003950	S.COIL	HF50ACC 322513-T
L36	6200003950	S.COIL	HF50ACC 322513-T
R1	7030007130	S.RESISTOR	ERJ1WYJ150H (15 Ω)
R2	7030007130	S.RESISTOR	ERJ1WYJ150H (15 Ω)
R3	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R6	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R7	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R8	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R9	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R10	7030003790	S.RESISTOR	ERJ3GEYJ 824 V (820 kΩ)
R13	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R14	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R15	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R16	7030006540	S.RESISTOR	ERJ1WYJ330H (33 Ω)
R17	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R26	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R27	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R28	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R29	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)

**[CTRL UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	S.IC	NJM4558M-T1
IC2	1120002250	S.IC	TC74ACT32F
IC3	1120002240	S.IC	TC74AC112F
IC4	1110000960	S.IC	NJM4558M-T1
IC5	1140004120	S.IC	M38022M2-138FP
IC6	1140003610	S.IC	X24C04S8-2.7T6
IC9	1110002690	S.IC	NJM2903M-T1
IC10	1130003920	S.IC	TC4S69F (TE85R)
IC11	1130007700	S.IC	BU4094BCF-T1
IC12	1160000130	S.IC	TD62783AF (TP1)
IC13	1180001070	S.IC	TA7805F (TE16L)
IC14	1120002300	S.IC	TC74AC04F
Q5	1560000870	S.FET	2SK515-T1B (X33)
Q12	1590000680	S.TRANSISTOR	DTC114EUA T106
Q13	1590001330	S.TRANSISTOR	DTA114EUA T106
Q14	1590000680	S.TRANSISTOR	DTC114EUA T106
Q15	1590001330	S.TRANSISTOR	DTA114EUA T106
Q16	1590000680	S.TRANSISTOR	DTC114EUA T106
Q17	1590001330	S.TRANSISTOR	DTA114EUA T106
Q21	1590000680	S.TRANSISTOR	DTC114EUA T106
Q22	1590001330	S.TRANSISTOR	DTA114EUA T106
Q23	1590000680	S.TRANSISTOR	DTC114EUA T106
Q24	1590001330	S.TRANSISTOR	DTA114EUA T106
Q25	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q26	1590000680	S.TRANSISTOR	DTC114EUA T106

S.=Surface mount





[CTRL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
C57	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C58	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C59	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C60	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C62	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C63	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C64	4030007030	S.CERAMIC	C1608 CH 1H 150J-T-A
C65	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A
C66	4030007070	S.CERAMIC	C1608 CH 1H 330J-T-A
C69	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C70	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C71	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C72	4510006260	S.ELECTROLYTIC	ECEV1AA471UP
C73	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C74	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C75	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C76	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C77	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C78	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C79	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C80	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C81	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C82	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C83	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C84	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C85	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C86	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C87	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C88	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C89	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C90	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C91	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C92	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C93	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C94	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C95	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C96	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C97	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C98	4510006220	S.ELECTROLYTIC	ECEV1CA101UP
C100	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C101	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C102	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C105	4030011540	S.CERAMIC	C1608 CH 1H 750J-T-A
C107	4010005580	CERAMIC	HM60SJ SL 070D 500V
C108	4010005560	CERAMIC	HM60SJ SL 050C 500V
C109	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C200	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C201	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C202	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C209	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C210	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C211	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C212	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C213	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C214	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C215	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C216	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C217	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C218	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C220	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C221	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C222	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C223	4030007090	S.CERAMIC	C1608 CH 1H 470J-T-A
C224	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C225	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C226	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
C227	4030006880	S.CERAMIC	C1608 JB 1H 472K-T-A
RL1	6330001450	RELAY	FXE-12G
RL2	6330001450	RELAY	FXE-12G
RL3	6330000800	RELAY	G5A-237P DC12V
RL4	6330000470	RELAY	NR-HD (12V) AE5343
J1	6510007900	CONNECTOR	TBP-P01X-A1 (B1)
J2	6510007900	CONNECTOR	TBP-P01X-A1 (B1)
J3	6510017150	CONNECTOR	TMP-S01X-C1
J4	6510017150	CONNECTOR	TMP-S01X-C1
J7	6510019990	S.CONNECTOR	52808-2290
J8	6510019990	S.CONNECTOR	52808-2290
J10	6510003410	CONNECTOR	B05B-EH-S

[CTRL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
J11	6510003410	CONNECTOR	B05B-EH-S
J12	6910001040	CONNECTOR	IPS-1136
J13	6510019970	S.CONNECTOR	52808-1090
J14	6910001040	CONNECTOR	IPS-1136
P1	6510003240	CONNECTOR	TMP-P01X-A1
P2	6510003240	CONNECTOR	TMP-P01X-A1
W1	7120000490	JUMPER	ERD25T0
W2	7120000490	JUMPER	ERD25T0
W3	7120000490	JUMPER	ERD25T0
W4	7030003860	S.JUMPER	ERJ3GE JPW V
EP1	0910051822	PCB	B 5300B

[PA UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1180001070	S.IC	TA7805F (TE16L)
IC2	1110002020	IC	TA7805S
IC3	1180001980	IC	MC78T08CT
Q1	1530000790	TRANSISTOR	2SC1971
Q2	1530000800	TRANSISTOR	2SC1972
Q3	1530000800	TRANSISTOR	2SC1972
Q4	1530003740	TRANSISTOR	2SC5125
Q5	1530003740	TRANSISTOR	2SC5125
Q8	1540000500	TRANSISTOR	2SD1585K
Q9	1590001150	S.TRANSISTOR	UN9211 (TX)
Q10	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q11	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q12	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q13	1520000650	S.TRANSISTOR	2SB1201-S-TL
D1	1790000710	VARISTOR	MA29B
D2	1790000710	VARISTOR	MA29B
D3	1790000710	VARISTOR	MA29B
D4	1790000700	DIODE	DSA3A1
D5	1790000700	DIODE	DSA3A1
D7	1160000140	S.DIODE	DAP222 TL
D8	1790000700	DIODE	DSA3A1
D9	1160000140	S.DIODE	DAP222 TL
D10	1710000970	DIODE	MA185
L1	6140003240	S.COIL	LR-361
L2	2040000490	COIL	EXC-ELDR25C
L3	2040000490	COIL	EXC-ELDR25C
L4	6140001180	COIL	LR-143
L5	2040000490	COIL	EXC-ELDR25C
L6	6140003510	COIL	LR-393
L7	6140000610	COIL	LR-83
L8	6140002030	COIL	LR-230
L9	2040000490	COIL	EXC-ELDR25C
L10	2040000490	COIL	EXC-ELDR25C
L12	2040000490	COIL	EXC-ELDR25C
L14	6140003230	S.COIL	LR-360
L21	6110001730	COIL	LA-262
L22	2040000490	COIL	EXC-ELDR25C
R1	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R2	7030003230	S.RESISTOR	ERJ3GEYJ 180 V (18 Ω)
R3	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R4	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R5	7030003390	S.RESISTOR	ERJ3GEYJ 391 V (390 Ω)
R6	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R7	7030006210	S.RESISTOR	ERJ12YJ4R7H (4.7 Ω)
R8	7030008230	S.RESISTOR	ERJ1WYJ1R0H (1 Ω)
R9	7030008230	S.RESISTOR	ERJ1WYJ1R0H (1 Ω)
R10	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R11	7310003750	TRIMMER	EVN-2ACA00 B52 (501)

S.=Surface mount



# SECTION 6 MECHANICAL PARTS

## [FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
DS1	5080000450	SLU2LC1EX5B-TH	1
ME1	5510000480	Meter ME-40	1
EP1	6910011090	Sensor unit RMS20-250-201-P	1
EP2	6450001230	Plate HLJ0999-01-480	1
EP3	6450001230	Plate HLJ0999-01-480	1
EP4	6910012500	Unit board TFD50W40	1
MP1	8210016720	1876 front panel (B)-1	1
MP2	8010016722	1876 sub chassis-2	1
MP3	8930041380	1876 window plate	1
MP4	8930041270	1876 power button	1
MP5	8930050370	1876 4-key (A)	1
MP6	8930050310	1876 key board (A)	1
MP7	8930050290	1876 7-key (A)	1
MP8	8930050380	1876 5-key (A)	1
MP9	8930050300	1876 10-key (A)	1
MP10	8930041280	1876 2-key	1
MP11	8610010720	Knob N273	3
MP12	8610010260	Knob N252	3
MP13	8610010270	Knob N253	1
MP14	8610010630	Knob N268 base	1
MP15	8930041390	1876 D-rubber	1
MP16	8930041230	1876 A-lens	1
MP17	8930041240	1876 B-lens	4
MP18	8930041250	1876 C-lens	2
MP19	8310046860	2178 name plate	1
MP20	8930041060	1876 brake plate	1
MP21	8930027470	1296 brake pad	1
MP23	8810008660	Screw PH BT M3 × 8 NI-ZU	6
MP24	8810008760	Screw PH BT M2 × 8 NI-ZU	1
MP25	8810008760	Screw PH BT M2 × 8 NI-ZU	2
MP26	8810009560	Screw PH BT M2 × 6 ZK	6
MP27	8810009560	Screw PH BT M2 × 6 ZK	6
MP29	8820000770	1296 screw	1
MP30	8810009390	Screw PH BT M3 × 18 NI-ZU	1
MP36	8610007420	Knob spring No.6601	4
MP37	8610007420	Knob spring No.6601	1
MP40	8810008760	Screw PH BT M2 × 8 NI-ZU	2
MP41	8810008760	Screw PH BT M2 × 8 NI-ZU	2
MP46	8930037111	1691 brake sheet-1	1
MP47	8930032340	1424 N-spring	1
MP48	8610010040	Knob N239 finger rest	1
MP49	8810008200	Screw PH BT M2.6 × 6 NI-ZU	1
MP50	8810007300	Screw PH B0 M2.6 × 14 ZK	2
MP51	8610010740	Knob N-273 (A)	1
MP52	8610010730	Knob N-252 (A)	1
MP53	8850001250	Flat washer M2.6 (2.6 × 5 × 0.5)	1
MP54	8930051520	Sheet No.631S #25 L=230	1

## [DISPLAY BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R701	7210002890	Variable register RV-308	1
R702	7210002890	Variable register RV-308	1
MP1	8510012630	2178 shield case	1
MP3	8510010760	1876 DDS case	1
MP4	8510010770	1876 DDS cover	1
MP5	8510001080	Shield case (A)	1
MP6	8510001101	Shield cover (A)-1	1
MP7	8210013980	1876 reflector	1

## [PBT BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
R1	7210002970	Variable register RV-314	1
S1	2250000410	Encoder TP90D96E20-30F-2178-1	1

## [DSP BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8510012571	2178 DSP case-1	1

## [RIT BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
S1	2250000340	Encoder EVQ-VCJF0324B	1

## [PHONE BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J2	6450001980	Connector HLJ5815-01-030	1

## [KEY BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J2	6450001790	Connector HLJ70000-01-3010	1

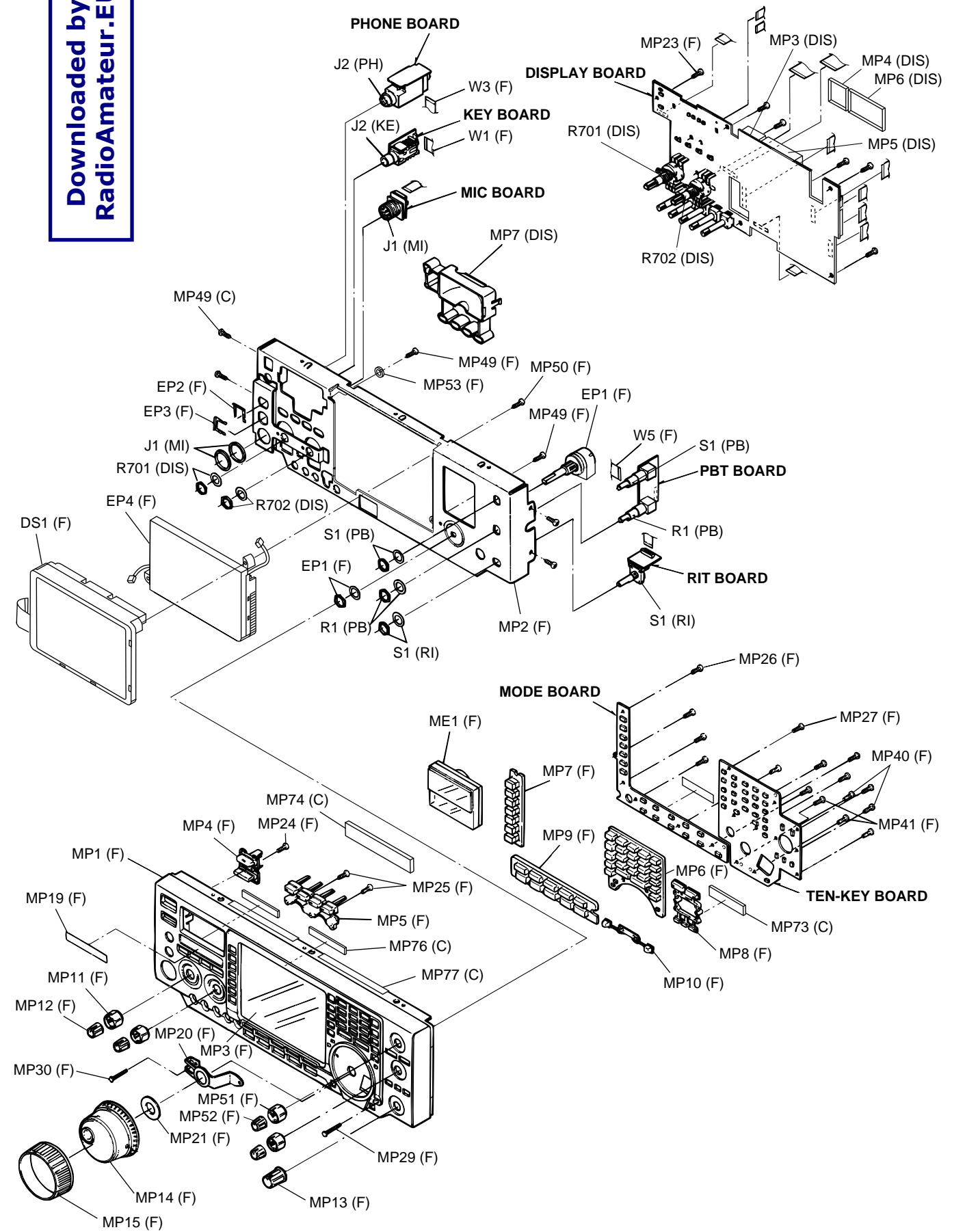
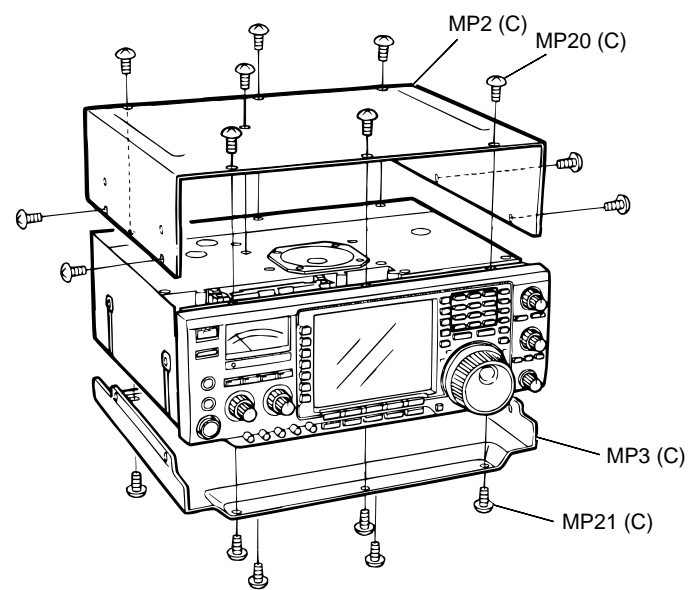
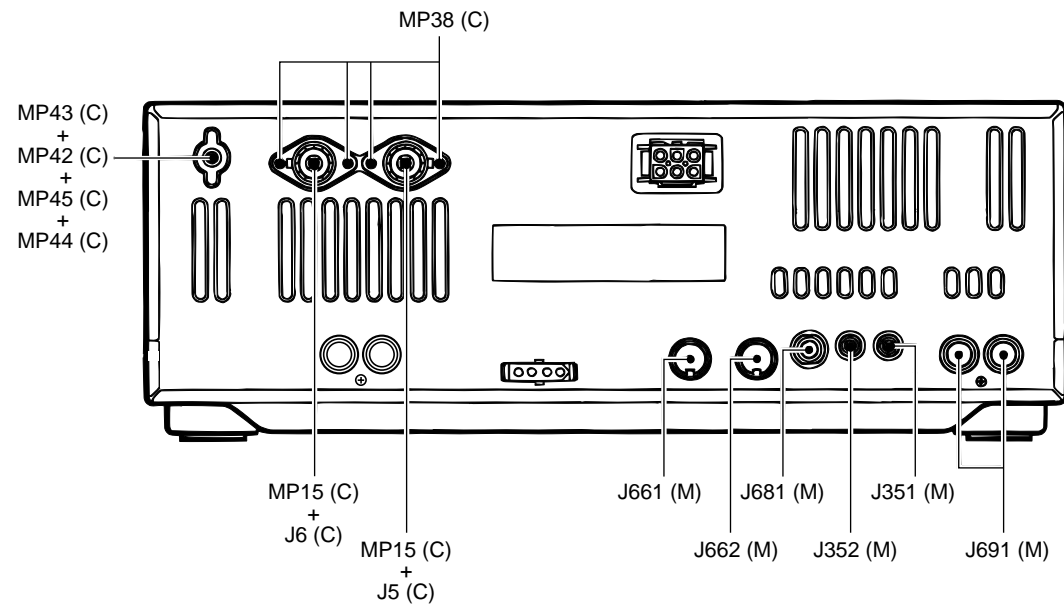
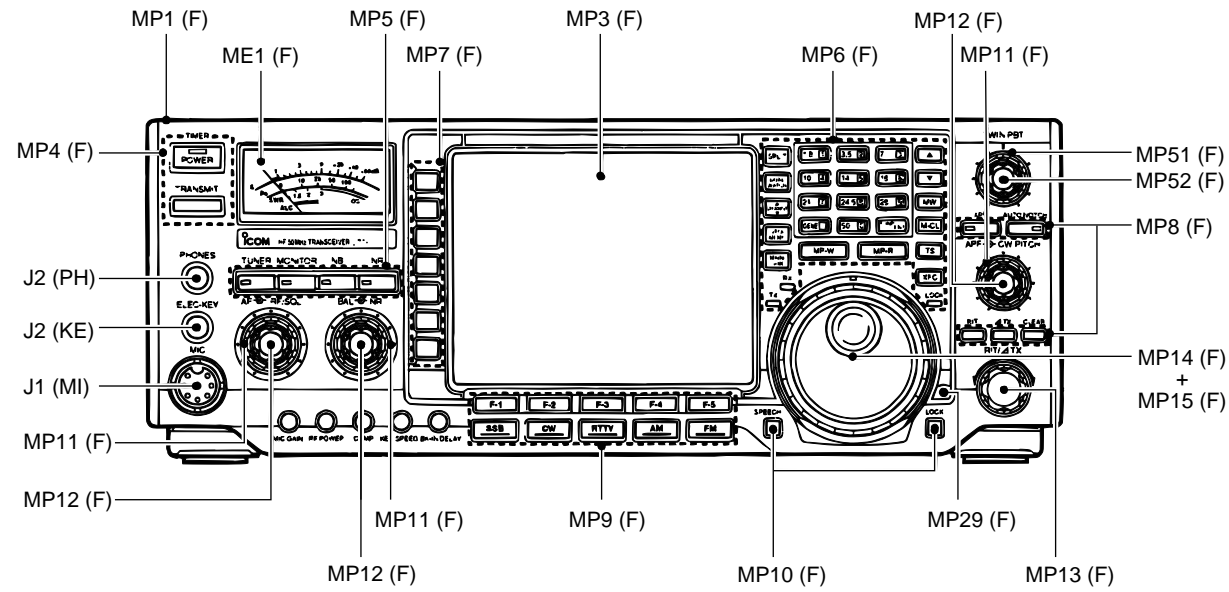
## [MIC BOARD]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6510000190	Connector FM214-8SS (P)	1

## [CHASSIS PARTS]

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J5	6510000370	Connector MR-DS	1
J6	6510000370	Connector MR-DS	1
SP1	2510000760	SM-77KY0208	1
MF1	2710000630	Fan FBA08T12HC	1
EP1	6910000340	Insulation sheet P101 (KD)	1
EP2	6910000310	Insulation washer B312D	1
MP1	8410002322	1876 heatsink (A)-2	1
MP2	8110005931	1876 T-cover-1	1
MP3	8110005922	1876 L-cover-2	1
MP4	8510012530	2178 A-plate	1
MP5	8510010730	1876 B-plate	1
MP6	8510010740	1876 C-plate	1
MP7	8510010751	1876 D-plate-1	1
MP8	8930041350	1876 main stand	2
MP9	8930041340	1876 sub stand	2
MP11	8930002910	Rubber foot (B)	2
MP12	8930002910	Rubber foot (B)	2
MP13	8930029730	1413 fan holder	1
MP15	8930037001	1691 earth plate-1	2
MP16	8930018520	TR crip (A)	1
MP17	8930035240	1546 TR-B crip	1
MP19	8930036070	1528 SP net	1
MP20	8810005770	Screw BiH M3 × 8 ZK	11
MP21	8810005770	Screw BiH M3 × 8 ZK	6
MP22	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP23	8810008660	Screw PH BT M3 × 8 NI-ZU	11
MP24	8810008660	Screw PH BT M3 × 8 NI-ZU	3
MP25	8810008660	Screw PH BT M3 × 8 NI-ZU	6
MP26	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP27	8810008660	Screw PH BT M3 × 8 NI-ZU	2

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Unit abbreviations (F) : FRONT UNIT (C) : CHASSIS PARTS (PB) : PBT BOARD  
 (RI) : RIT BOARD (DIS) : DISPLAY BOARD (MI) : MIC BOARD  
 (KE) : KEY BOARD (PH) : PHONE BOARD



**[CHASSIS PARTS]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP28	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP29	8810001650	Screw PH FT M3 × 6	2
MP30	8810001650	Screw PH FT M3 × 6	2
MP31	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP32	8810008660	Screw PH BT M3 × 8 NI-ZU	7
MP33	8810008660	Screw PH BT M3 × 8 NI-ZU	5
MP34	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP35	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP36	8810008660	Screw PH BT M3 × 8 NI-ZU	8
MP37	8810008660	Screw PH BT M3 × 8 NI-ZU	7
MP38	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP39	8810008660	Screw PH BT M3 × 8 NI-ZU	1
MP40	8810008660	Screw PH BT M3 × 8 NI-ZU	1
MP41	8810008160	Hex volt M5 × 18 NI (+)	1
MP42	8830000210	Nut M5 NI BS	1
MP43	8830000360	Wing nut M5 NI	1
MP44	8850000150	Flat washer M5 NI BS	3
MP45	8850000440	Spring washer M5 NI	1
MP46	8810003170	Setscrew A M3 × 8	4
MP47	8810003170	Setscrew A M3 × 8	4
MP48	8810000420	Screw PH M4 × 18	4
MP49	8810009310	Screw FH BT M3 × 6 NI-ZU	4
MP50	8930043340	Non-woven sheet (BP)	2
MP51	8930042690	Rubber foot (L)	2
MP53	8010018060	Carrying handle (A)	1
MP57	8930027900	Sponge (DD)	2
MP58	8930038820	Alumi sheet (V)	1
MP61	8810003160	Setscrew A M3 × 6	2
MP63	8810003160	Setscrew A M3 × 6	2
MP65	8930043281	Sponge (EW)-1	1
MP66	8930043800	Tape (S)	1
MP67	8930029050	Non-woven sheet (AL)	1
MP68	8930032130	Non-woven sheet (AQ)	2
MP69	8930029050	Non-woven sheet (AL)	1
MP70	8930008670	Sponge (AQ)	2
MP71	8930043490	Sponge (FB)	1
MP72	8930007840	Non-woven sheet (K)	2
MP73	8930043600	Sponge (FE)	1
MP74	8930043480	Sponge (FA)	1
MP75	8930041160	Non-woven sheet (BO)	1
MP76	8930037830	Sponge (ED)	2
MP77	8930007840	Non-woven sheet (K)	4
MP79	8930035240	1546 TR-B crip	1
MP80	8930027940	1126 TR-B crip	1
MP81	8930017260	758 module earth spring	1
MP83	8930043090	Sponge (EV)	1
MP84	8930011900	SP net (A)	1

**[MAIN UNIT]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
BT3501	3020000110	Lithium battery CR2030	1
MP1	8930014140	Earth spring (D)	1
MP2	8510012770	2178 A-shield cover	1
MP3	8510012780	2178 A-shield case	1
MP4	8930051480	2178 earth plate	1

**[TUNER UNIT]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MF1	2710000460	Motor MP28GA	1
MF2	2710000460	Motor MP28GA	1
MP1	8930041090	1876 A-angle	1
MP2	8810008660	Screw PH BT M3 × 8 NI-ZU	1
MP3	8810009060	Screw FH M3 × 6 ZK	4
MP4	8930041110	1876 B-angle	1
MP5	8810009060	Screw FH M3 × 6 ZK	2
MP6	8820000880	1528 screw	4
MP7	8930030111	1414 plate-1	2
MP8	8950003200	UJ6-5 (universal couplings)	2

**[RF UNIT]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
J111	6450001130	Connector JPJ2042-01-110	1
MP501	8510000230	220 shield case	1
MP502	8510000241	220 shield cover-1	1
MP601	8510000230	220 shield case	1
MP602	8510000241	220 shield cover-1	1
MP711	8930028380	Enbos tape (C)	1
MP712	8930014140	Earth spring (D)	1
MP721	8510000230	220 shield case	1
MP722	8510000241	220 shield cover-1	1
MP741	8510005150	602 shield case	1
MP742	8510005160	602 shield cover	1
MP811	8510000230	220 shield case	1
MP812	8510000241	220 shield cover-1	1
MP831	8510005150	602 shield case	1
MP832	8510005160	602 shield cover	1
MP901	8510002280	VCO shield plate (A)	1
MP903	8510002280	VCO shield plate (A)	1
MP904	8510002280	VCO shield plate (A)	1
MP907	8930028380	Enbos tape (C)	1

**[PLL UNIT]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8930014140	Earth spring (D)	1
MP51	8510000230	220 shield case	1
MP101	8510010760	1876 DDS case	1
MP102	8510010770	1876 DDS cover	1
MP103	8510005330	Coil case	1
MP151	8510012550	2178 DDS case	1
MP152	8510012580	2178 VCO cover	1
MP201	8510012540	2178 VCO case	1
MP202	8510011520	2072 VCO cover	1
MP203	8510011710	2072 VCO shield plate	1
MP204	8810003960	Setscrew A M2.6 × 5	8
MP301	8510005980	724 shield case	1
MP302	8510005990	724 shield cover	1
MP401	8510010760	1876 DDS case	1
MP402	8510010770	1876 DDS cover	1
MP403	8510005330	Coil case	1
MP451	8510012550	2178 DDS case	1
MP452	8510012580	2178 DDS cover	1
MP501	8510012540	2178 VCO case	1
MP502	8510011520	2072 VCO cover	1
MP503	8510011710	2072 VCO shield plate	1
MP504	8810003960	Setscrew A M2.6 × 5	1
MP601	8510005980	724 shield case	1
MP602	8510005990	724 shield cover	1
MP701	8510005980	724 shield case	1
MP702	8510005990	724 shield cover	1
MP801	8510012550	2178 DDS case	1
MP802	8510012580	2178 DDS cover	1
MP803	8510010150	1691 D/A case	1
MP901	8510005980	724 shield case	1
MP902	8510005990	724 shield cover	1

**[CTRL UNIT]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
MP1	8510002020	MIX shield case	1

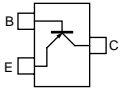
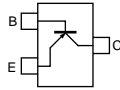
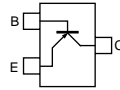
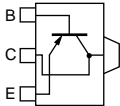
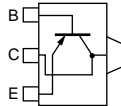
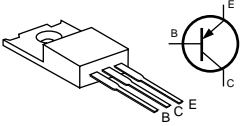
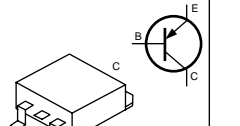
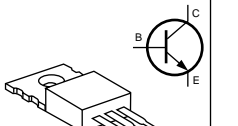
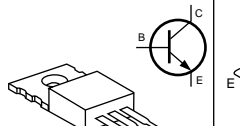
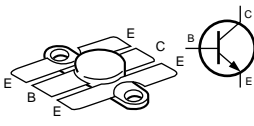
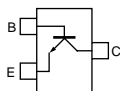
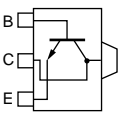
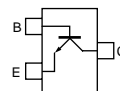
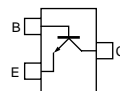
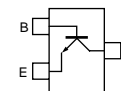
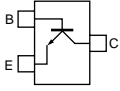
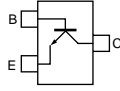
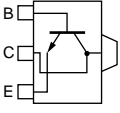
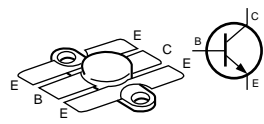
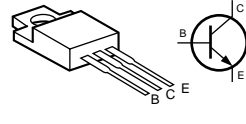
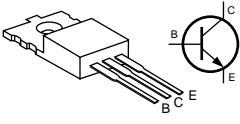
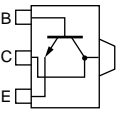
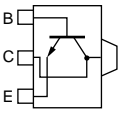
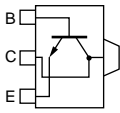
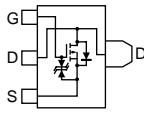
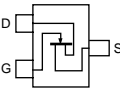
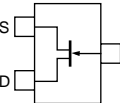
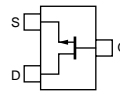
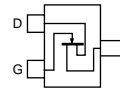
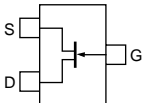
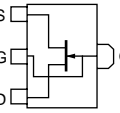
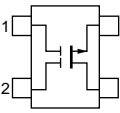
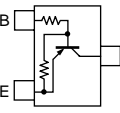
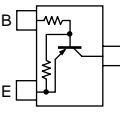
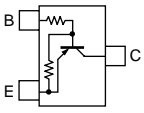
**[UNPACKING]**

REF. NO.	ORDER NO.	DESCRIPTION	QTY.
F1	5210000090	Fuse FGB 30A	2
F2	5210000060	Fuse FGB 5A	1
MC1	Optional product	Hand microphone HM-36	1
W1	Optional product	DC power cable OPC-025D	1

**Screw abbreviations** BT: Self-tapping FT: Self-tapping PH: Pan head FH: Flat head BiH: Bind head NI-ZU: Nickel-zinc NI: Nickel BS: Brass ZK:Black

# SECTION 7 SEMI-CONDUCTOR INFORMATION

## • TRANSISTOR AND FET'S

<b>2SA1162 GR</b> (Symbol: SG) 	<b>2SA1576A T106R</b> (Symbol: FR) 	<b>2SA1577</b> (Symbol: HP) 	<b>2SB1124 S TD</b> (Symbol: BG) 	<b>2SB1132 R</b> (Symbol: BARB) 
<b>2SB1133 R</b> (Symbol: None) 	<b>2SB1201 S</b> (Symbol: B1201) 	<b>2SC1971</b> (Symbol: None) 	<b>2SC1972</b> (Symbol: None) 	<b>2SC2694</b> (Symbol: None) 
<b>2SC2714 O</b> (Symbol: QO) 	<b>2SC3647 S TD</b> (Symbol: CC) 	<b>2SC4081 T107 R</b> (Symbol: BR) 	<b>2SC4117 GR</b> (Symbol: DG) 	<b>2SC4213 B</b> (Symbol: AB) 
<b>2SC4403 3 TL</b> (Symbol: LY3) 	<b>2SC4405 3 TL</b> (Symbol: OY3) 	<b>2SC4673 D TD</b> (Symbol: CO) 	<b>2SC5125</b> 	<b>2SD1406 Y</b> (Symbol: None) 
<b>2SD1585 K</b> (Symbol: None) 	<b>2SD1619 T TD</b> (Symbol: DB) 	<b>2SD1664 T100Q</b> (Symbol: DA) 	<b>2SD1801 S TL</b> (Symbol: CE) 	<b>2SJ381 TD</b> (Symbol: JI) 
<b>2SK210 GR</b> (Symbol: YG) 	<b>2SK508 K52 T2B</b> (Symbol: K52) 	<b>2SK515 T1B</b> (Symbol: X33) 	<b>2SK882 GR</b> (Symbol: TGR) 	<b>2SK1740</b> (Symbol: IJ) 
<b>2SK2171 4 TD</b> (Symbol: KM) 	<b>3SK131 T2 MAS</b> (Symbol: V11) 	<b>DTA114 EE TL</b> (Symbol: 14) 	<b>DTA114EUA T106</b> (Symbol: 14) 	<b>DTA144 EE TL</b> (Symbol: 16) 



<b>DTB123 EK T147</b> (Symbol: F12) 	<b>DTC114 EE TL</b> (Symbol: 24) 	<b>DTC114EU</b> (Symbol: 14) 	<b>DTC144 EE TL</b> (Symbol: 26) 	<b>UMC3N TR</b> (Symbol: C3) 
<b>UMD3N TL</b> (Symbol: D3) 	<b>UMH11N TN</b> (Symbol: H11) 	<b>UN9211</b> (Symbol: 8A) 		

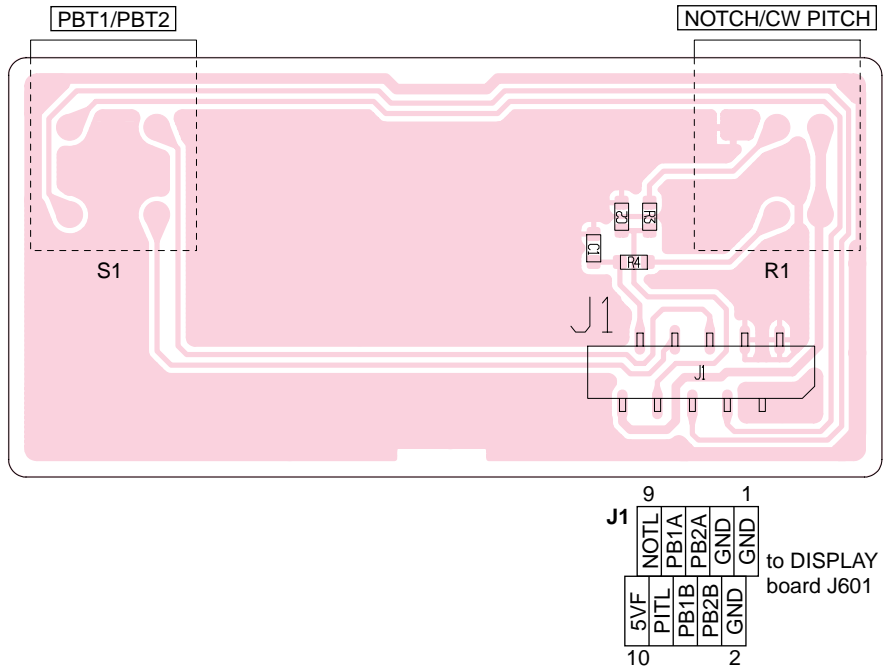
• DIODES

<b>1SS226</b> (Symbol: C3) 	<b>1SS301</b> (Symbol: B3) 	<b>1SS302</b> (Symbol: C3) 	<b>1SS319</b> (Symbol: A4) 	<b>1SS322</b> (Symbol: A9) 
<b>1SS372</b> (Symbol: N9) 	<b>1SS375-TL</b> (Symbol: FH) 	<b>1SV263 TL</b> (Symbol: JV) 	<b>1SV265 TL</b> (Symbol: LV) 	<b>DA221 TL</b> (Symbol: K) 
<b>DAP222 TL</b> (Symbol: P) 	<b>DWA010 TE</b> (Symbol: W8) 	<b>HSB88WSTR</b> (Symbol: Silver line) 	<b>HSM88ASR TR</b> (Symbol: C3) 	<b>HSM88AS TR</b> (Symbol: C1) 
<b>KV1470 TL</b> (Symbol: F7) 	<b>MA29B</b> (Symbol: Y) 	<b>RD3.0M T2B2</b> (Symbol: 302) 	<b>RD5.1M T2B2</b> (Symbol: 512) 	<b>RD5.6M T2B2</b> (Symbol: 562) 
<b>RD20M T2B1</b> (Symbol: 201) 	<b>SB10 05PCP TD</b> (Symbol: SA) 			

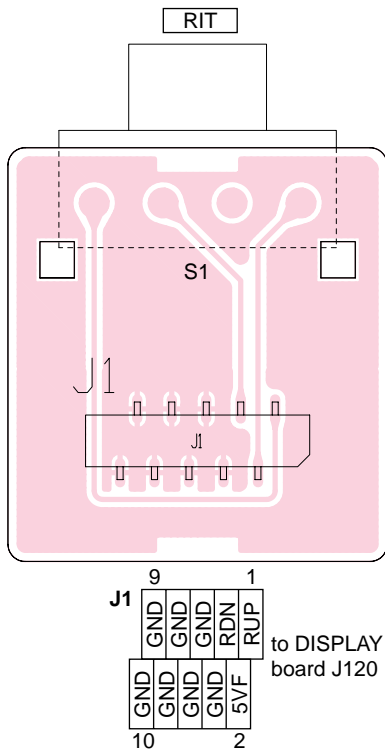
# SECTION 8 BOARD LAYOUTS

## 8-1 PBT, RIT AND MIC BOARDS

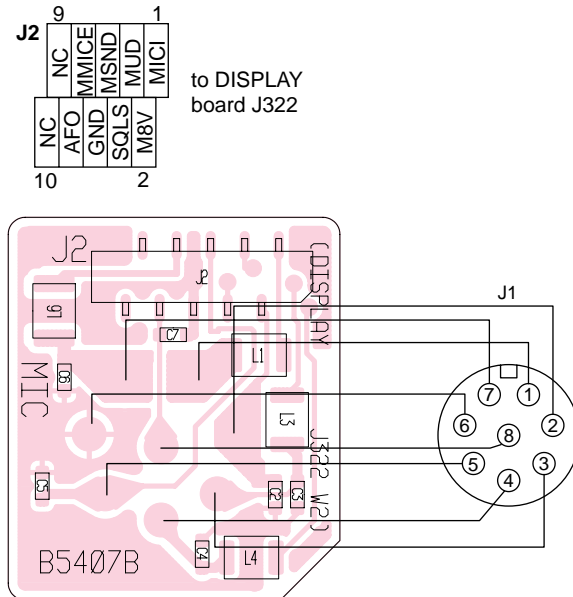
### • PBT BOARD



### • RIT BOARD

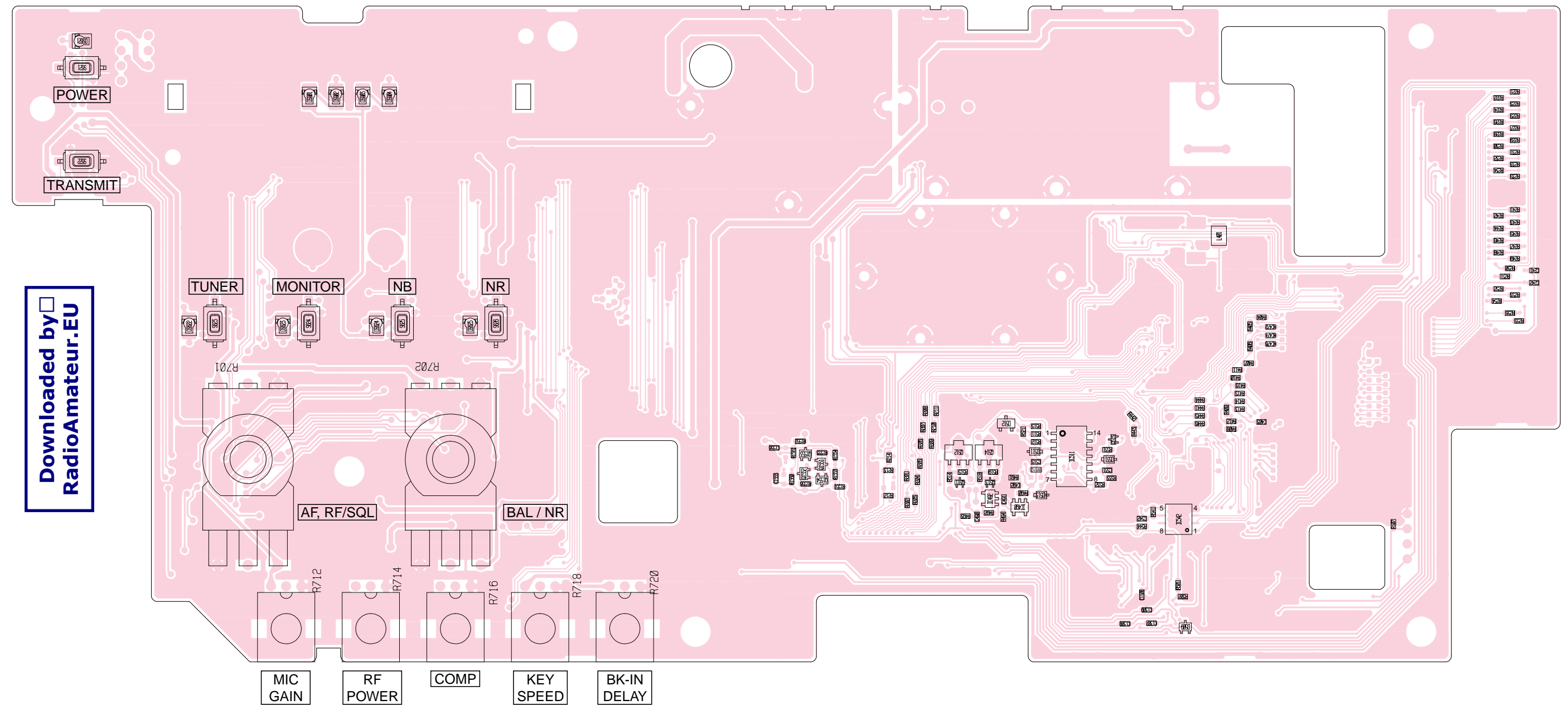


### • MIC BOARD

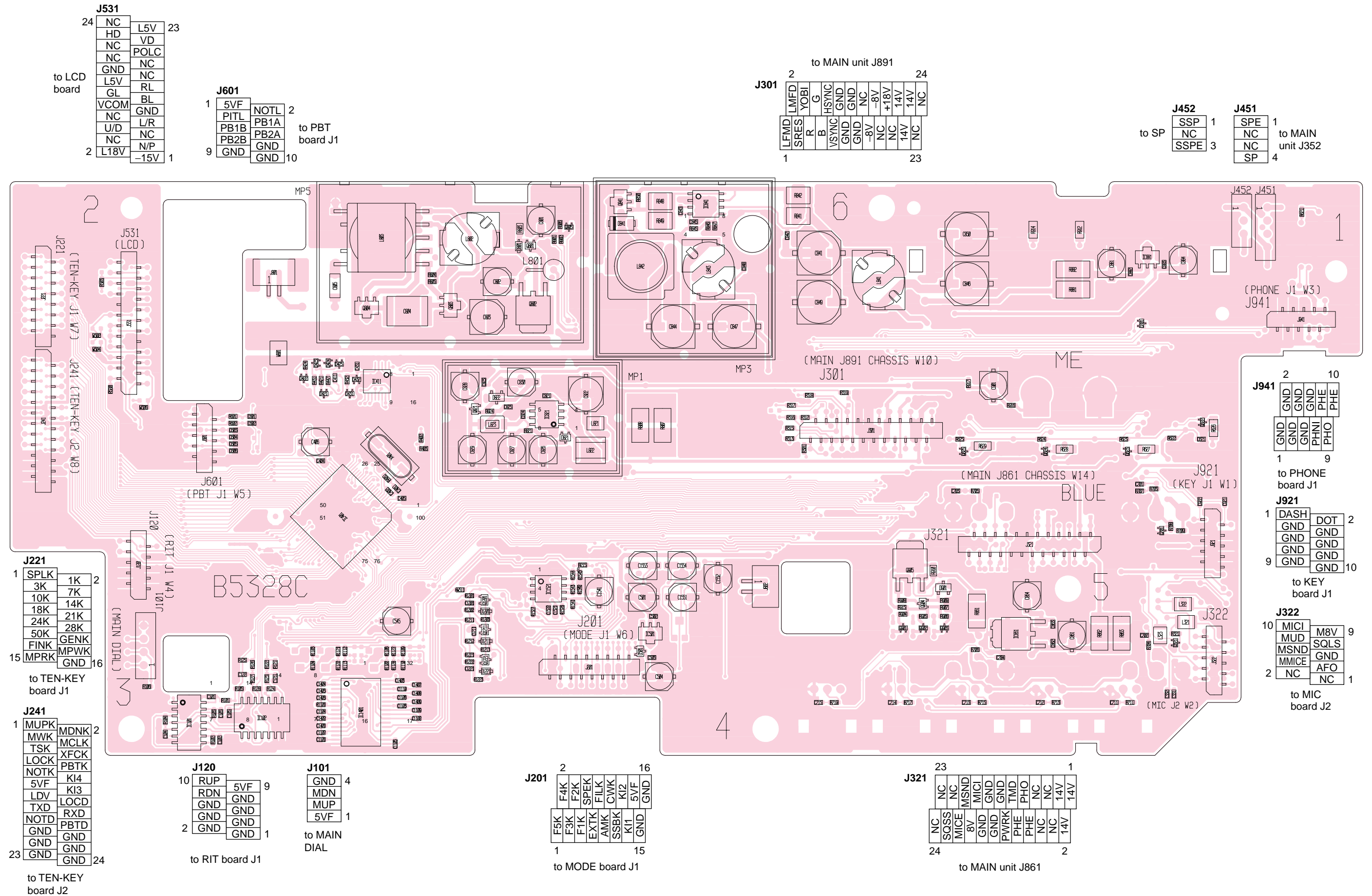


## 8-2 DISPLAY BOARD

### • DISPLAY BOARD (TOP VIEW)



• DISPLAY BOARD (BOTTOM)

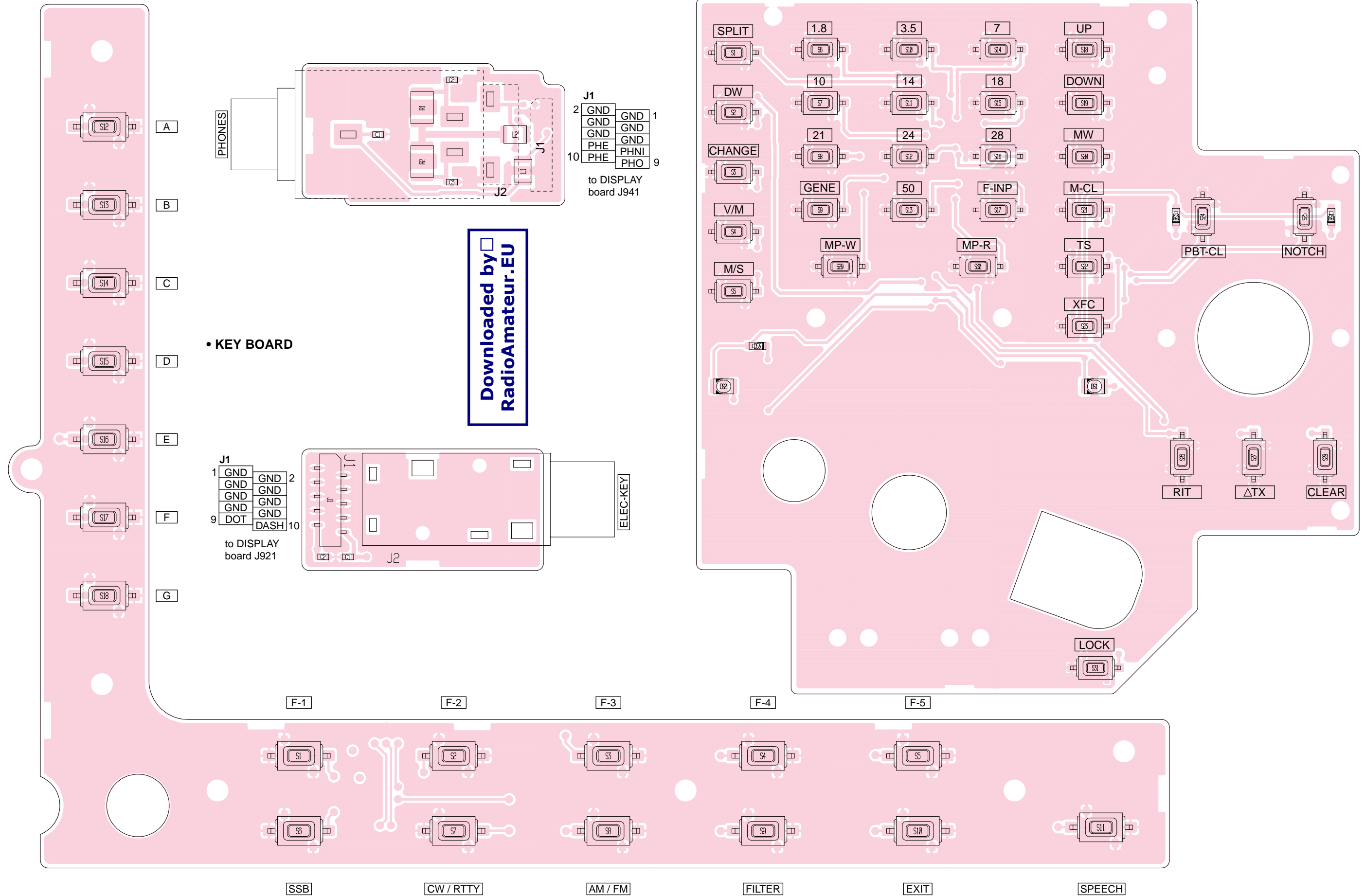


### 8-3 MODE, PHONE, KEY AND TEN-KEY BOARDS

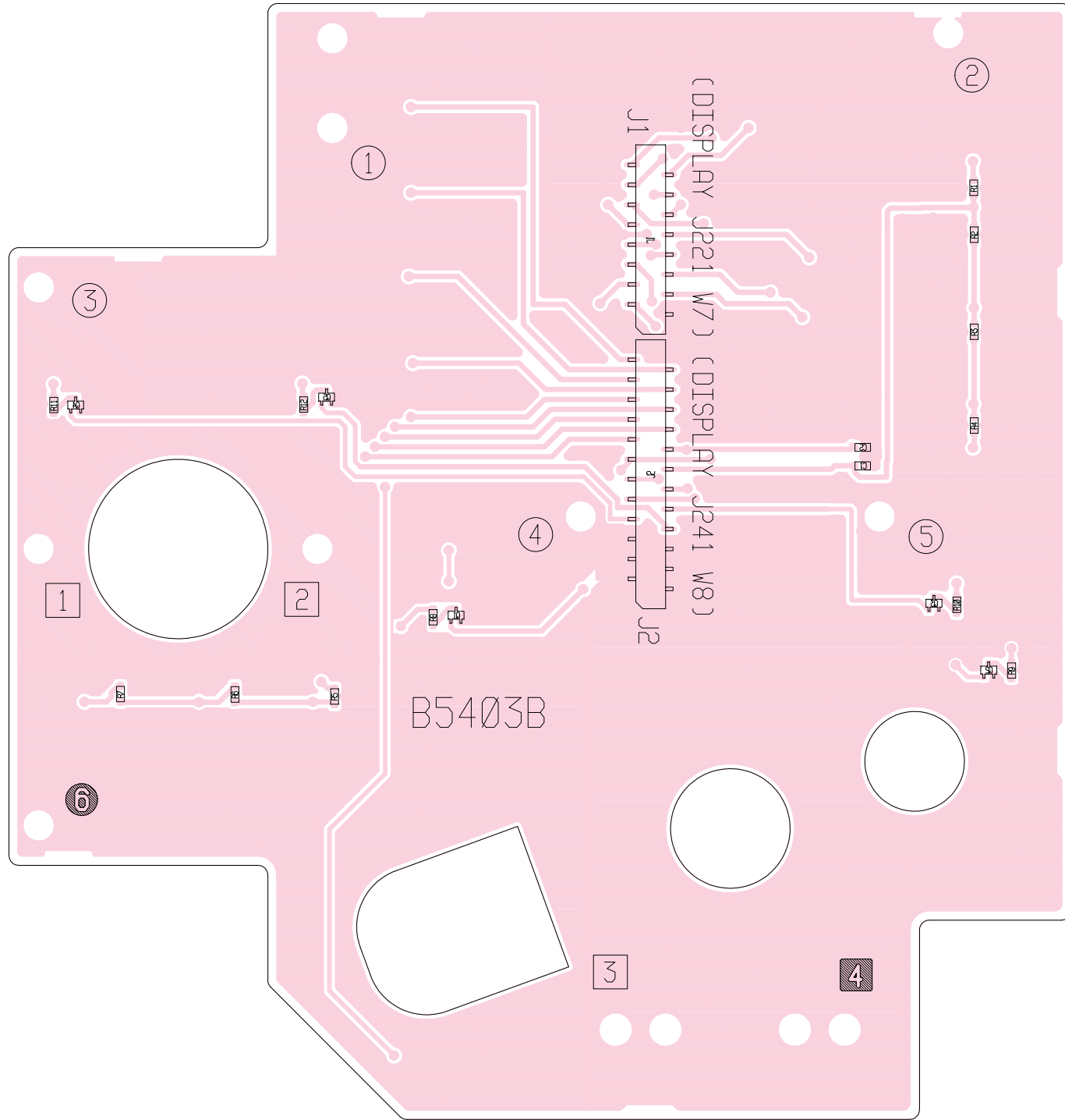
• MODE BOARD (TOP VIEW)

• PHONE BOARD

• TEN-KEY BOARD (TOP VIEW)



• TEN-KEY BOARD (BOTTOM



**J1**

16	SPLK	1K	15
	3K	7K	
	10K	14K	to DISF
	18K	21K	board J
	24K	28K	
	50K	GENK	
	FINK	MPWK	
2	MPRK	GND	1

**J2**

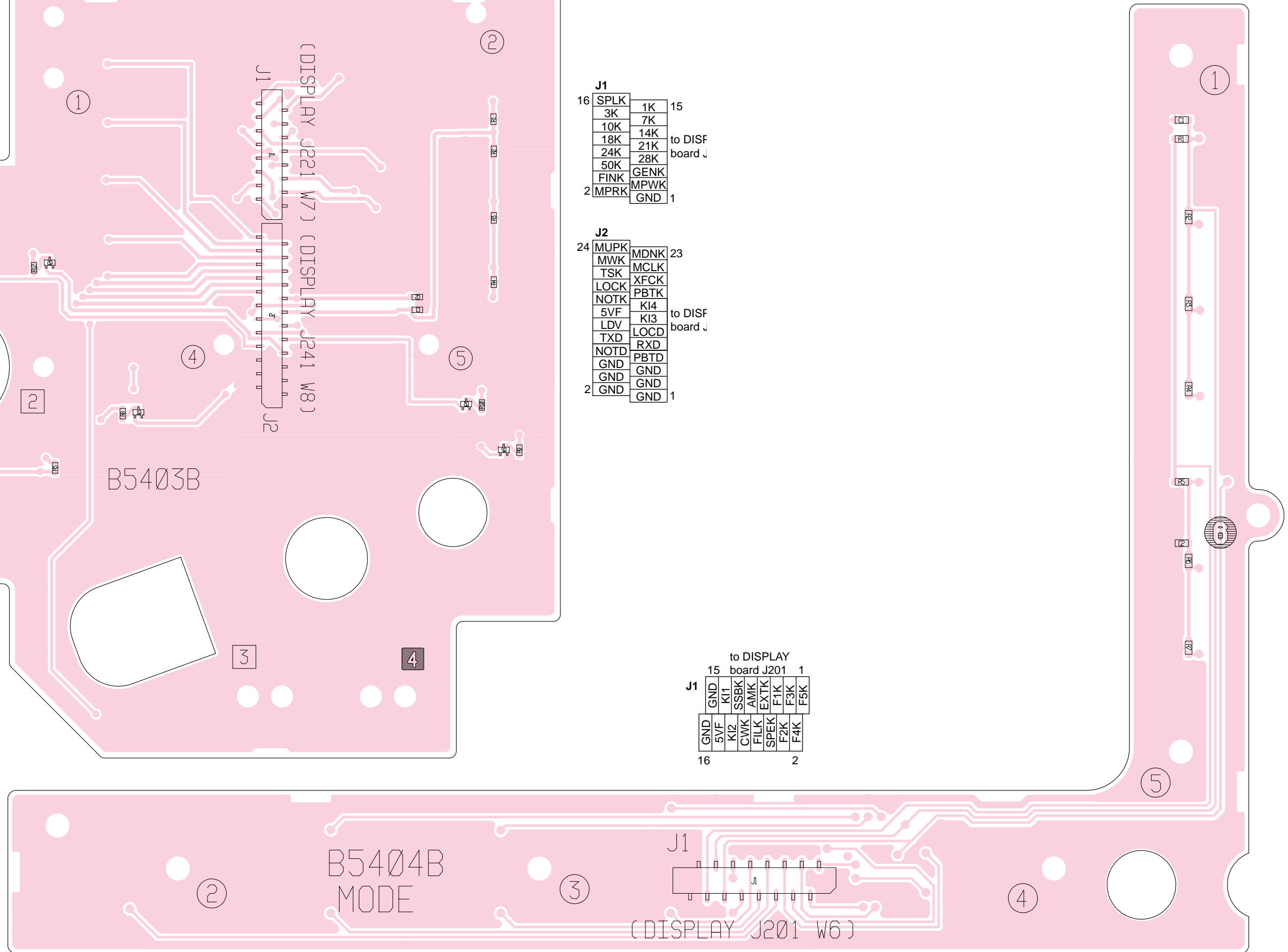
24	MUPK	MDNK	23
	MWK	MCLK	
	TSK	XFCK	
	LOCK	PBTK	
	NOTK	KI4	to DISF
	5VF	KI3	board J
	LDV	LOCD	
	TXD	RXD	
	NOTD	PBTD	
	GND	GND	
	GND	GND	
2	GND	GND	1

to DISPLAY board J201

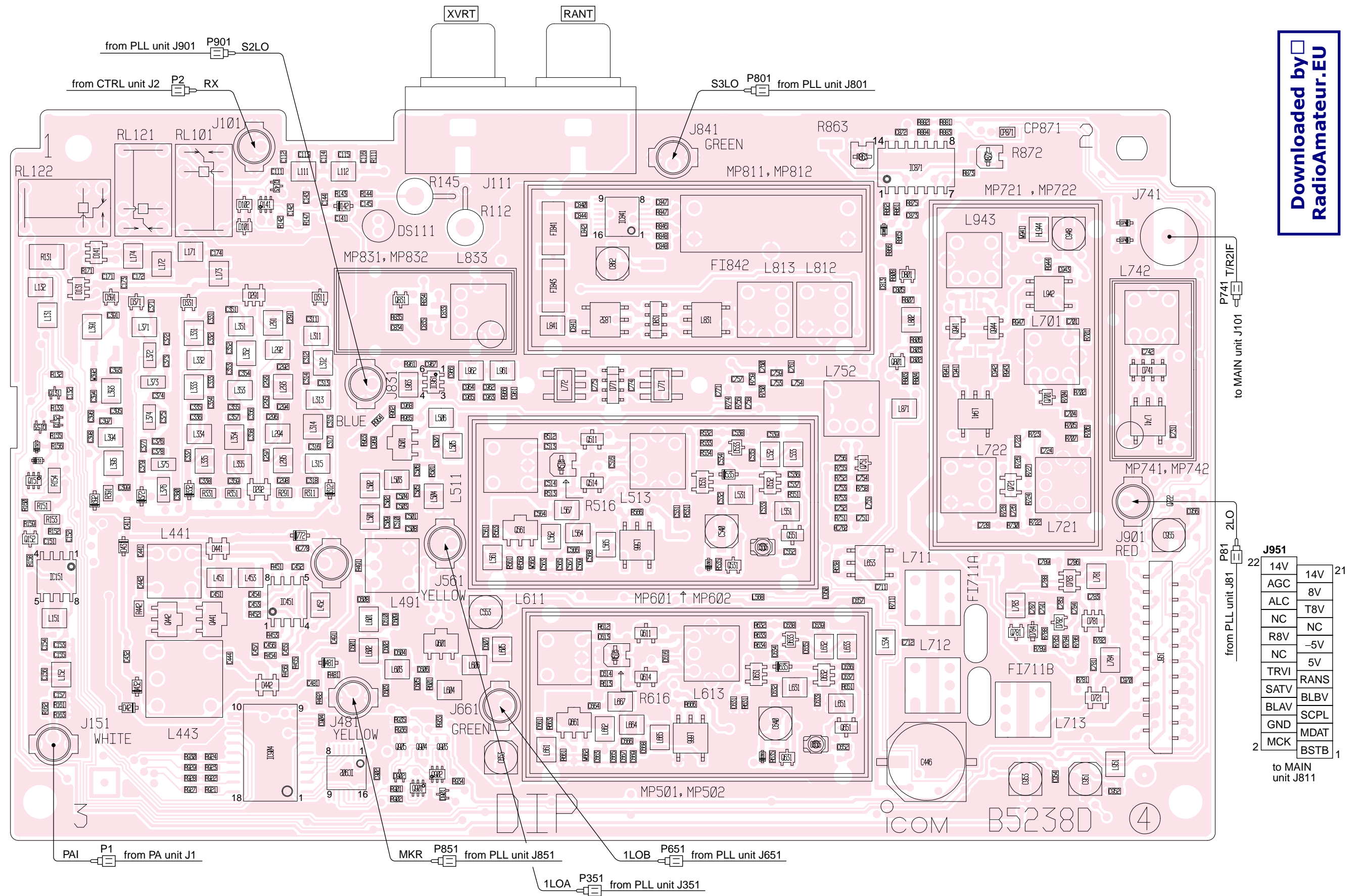
**J1**

15	GND	KI1	1
	SSBK	AMK	
	CWK	FILK	
	SPEK	F1K	
	F2K	F3K	
	F4K	F5K	
16	5VF	KI2	2

• MODE BOARD (BOTTOM VIEW)



# 8-4 RF UNIT (TOP VIEW)



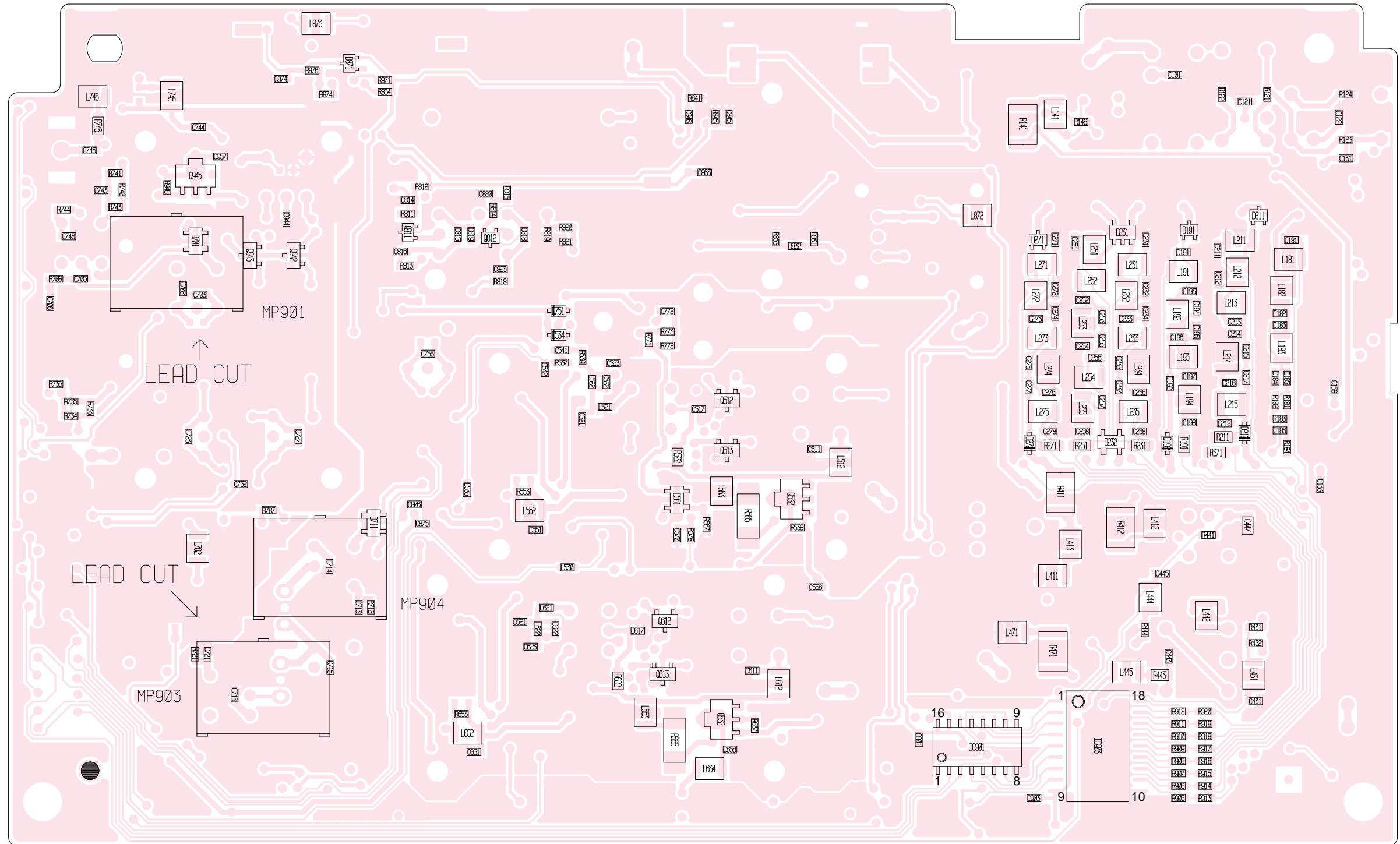
Downloaded by RadioAmateur.EU

from PLL unit J81

22	14V	14V	21
	AGC	8V	
	ALC	T8V	
	NC	NC	
	R8V	-5V	
	NC	5V	
	TRVI	RANS	
	SATV	BLBV	
	BLAV	SCPL	
	GND	MDAT	
2	MCK	BSTB	1

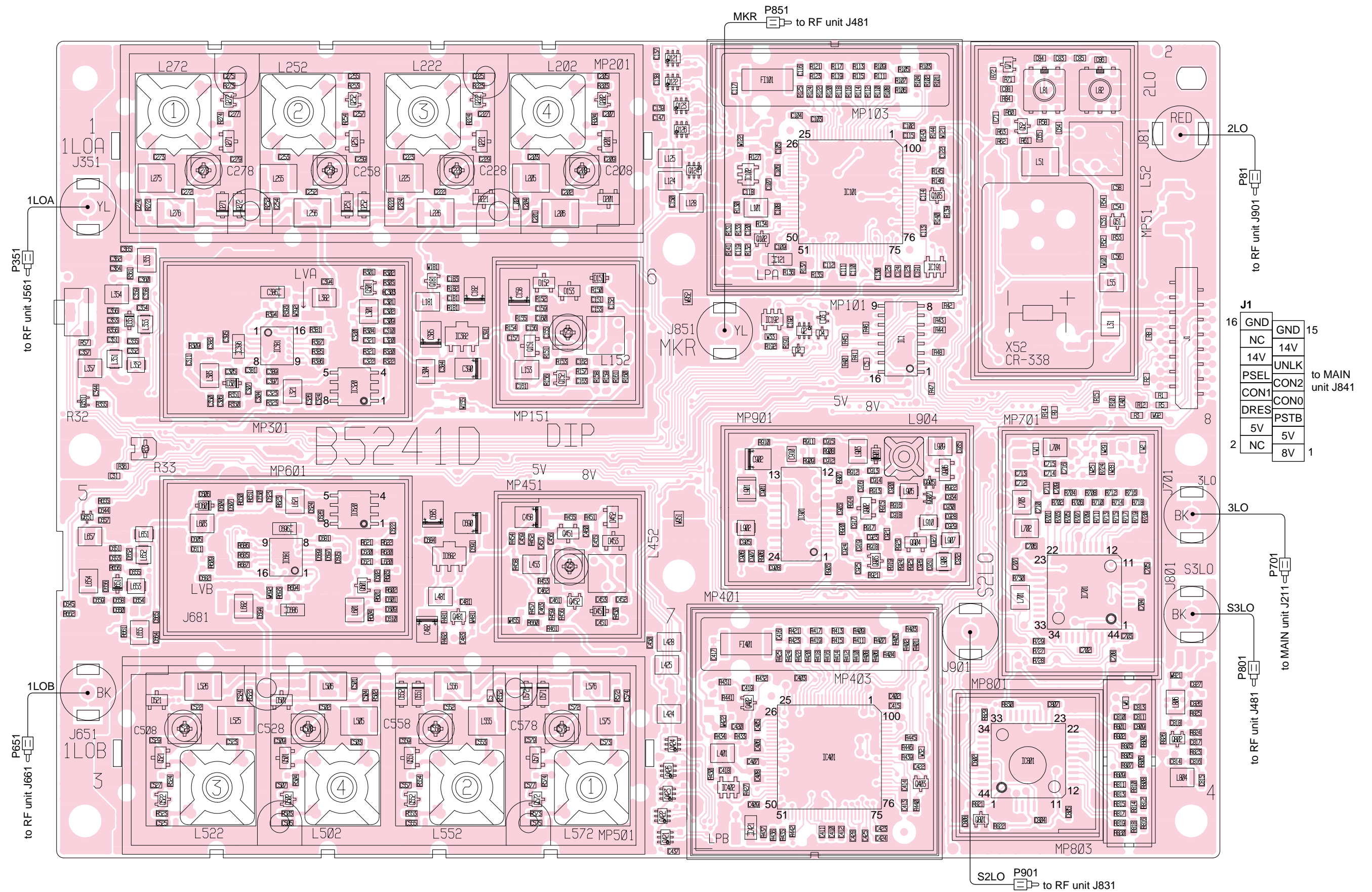
to MAIN unit J81

• RF UNIT (BOTTOM VIEW)

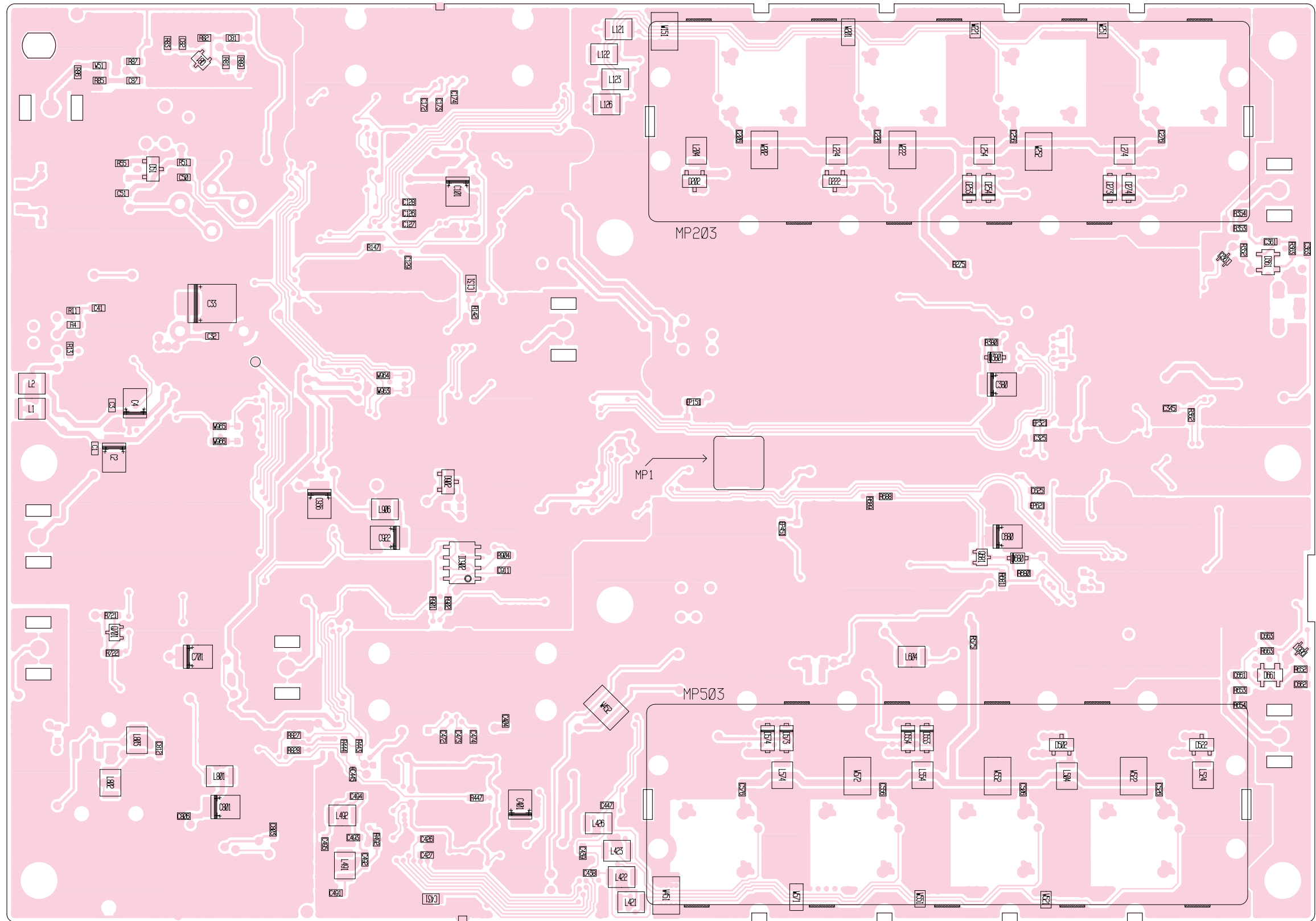




# 8-5 PLL UNIT (TOP VIEW)



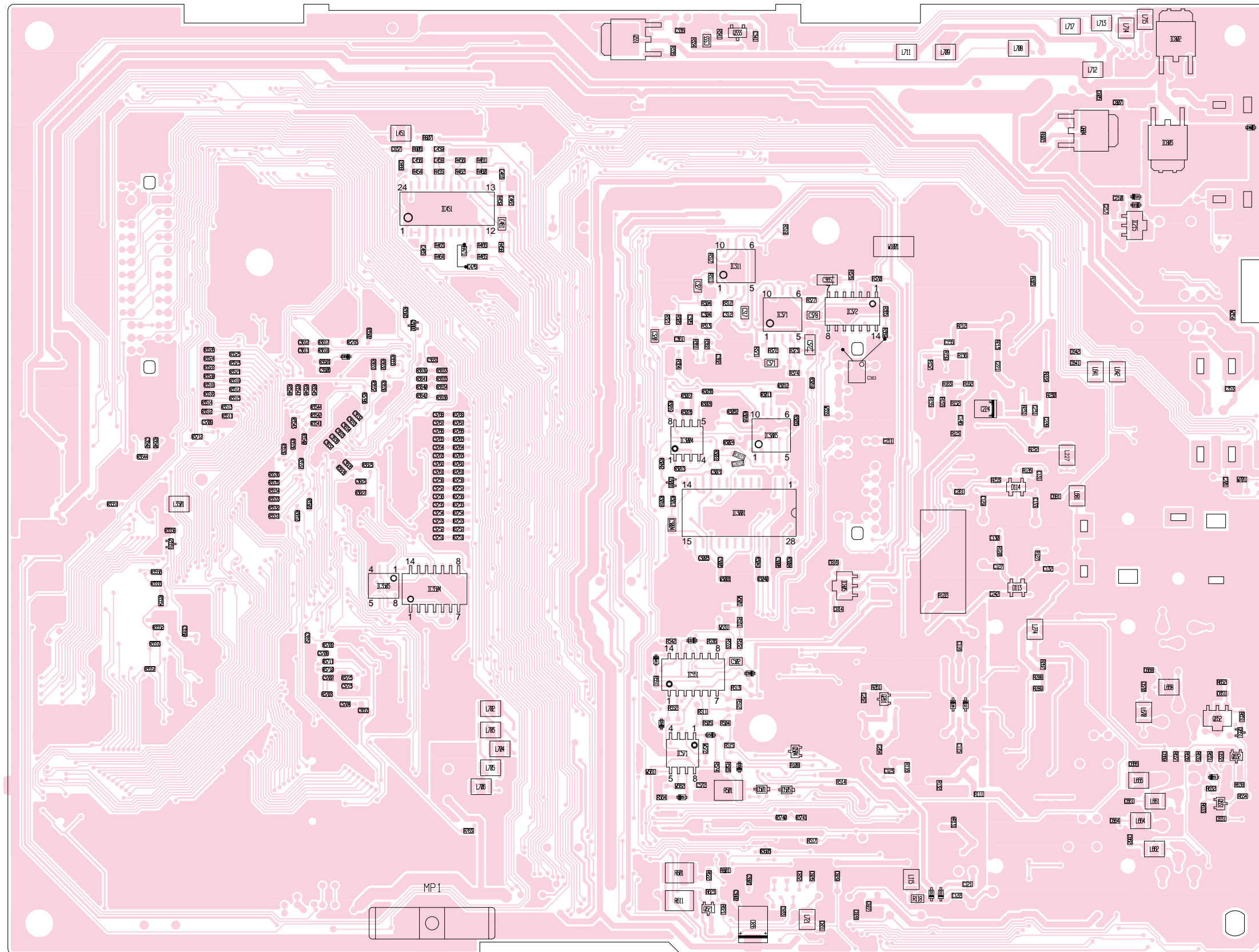
• PLL UNIT (BOTTOM VIEW)



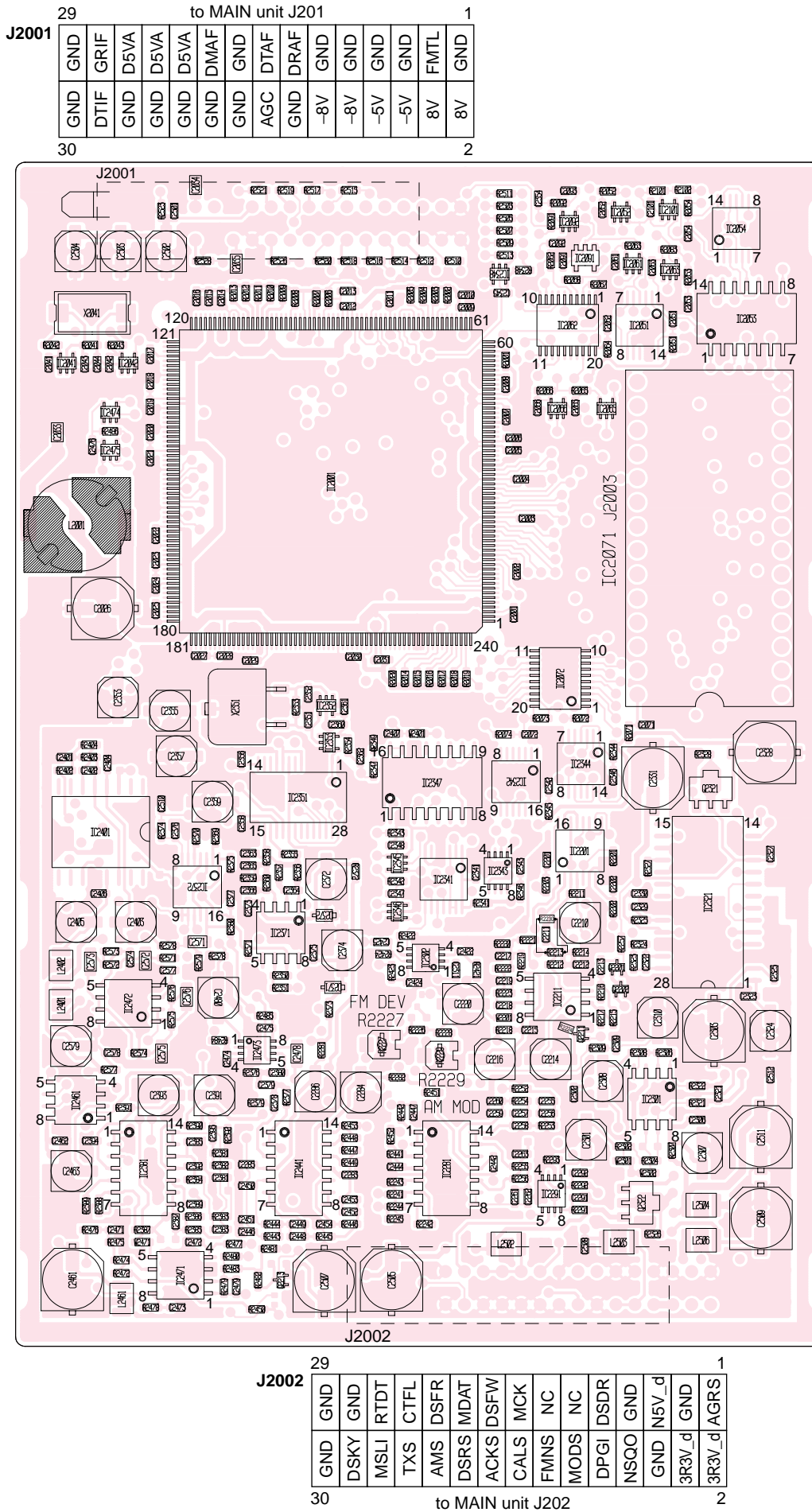


• MAIN UNIT (BOTTOM VIEW)

Downloaded by  RadioAmateur.EU



# 8-7 DSP BOARD

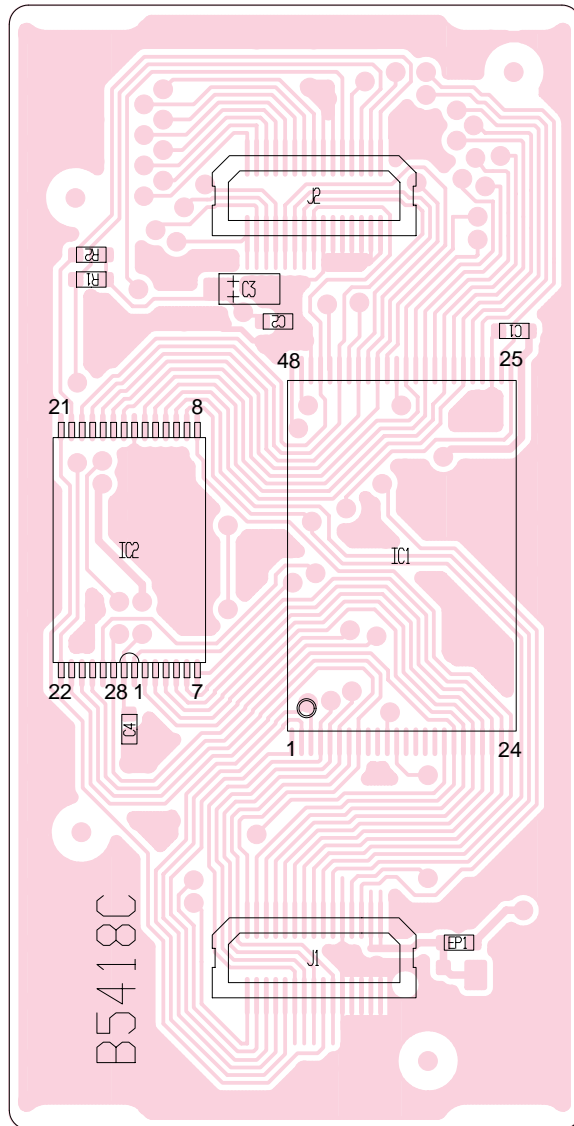


# 8-8 MEMORY BOARD

Downloaded by   
RadioAmateur.EU

to MAIN unit J3504

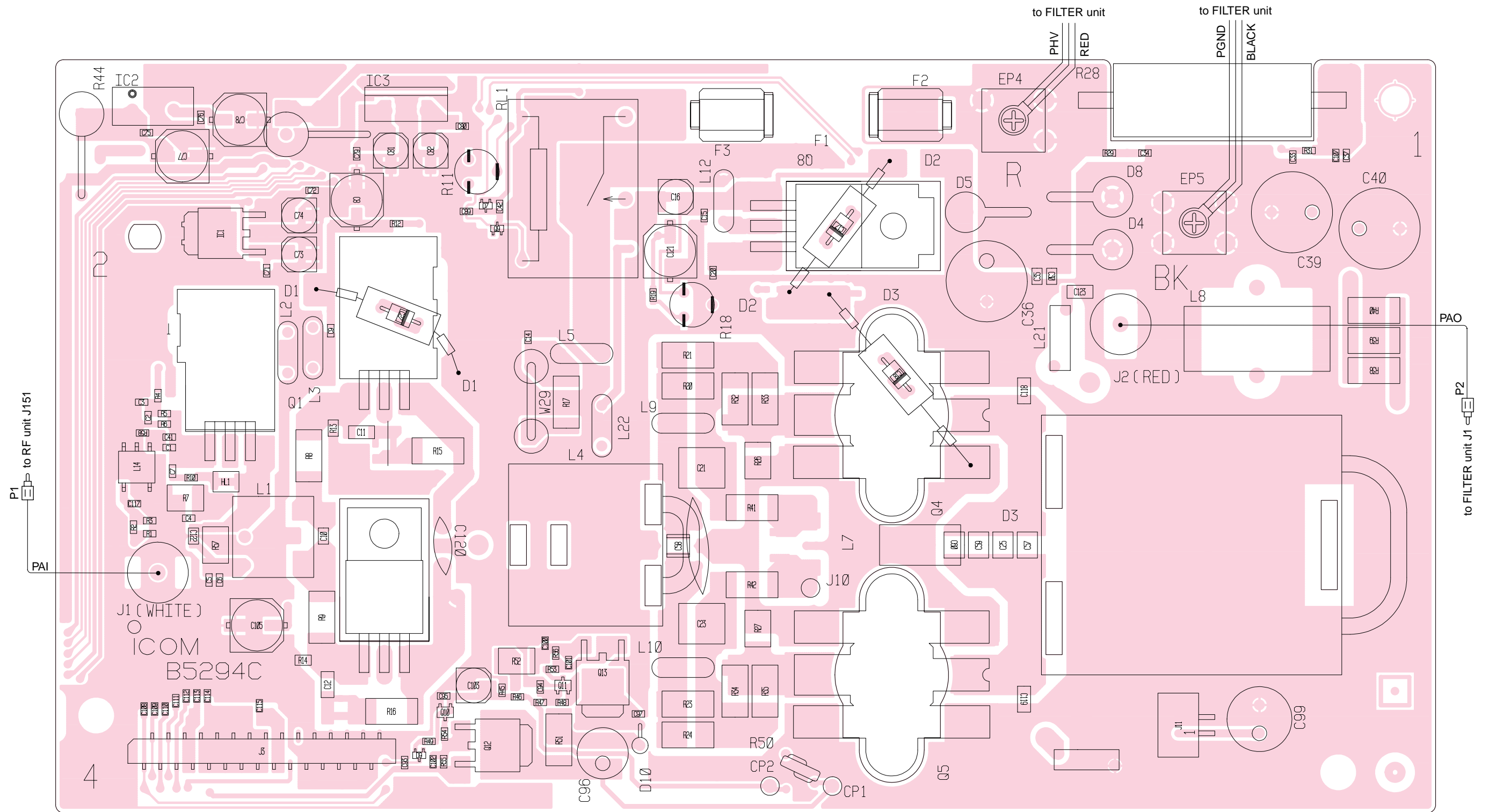
	1	D7	D6	D5	D4	D3	D2	D1	D0	GND	GND	GND	HWR	RD	RD	CS0	15	
		D8	D9	D10	D11	D12	D13	D14	D15	GND	GND	GND	GND	GND	GND	GND	GND	
	30																	16



	1	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	GND	GND	RESET	BYTE	Vcc	Vcc	15
		A18	A17	A16	A15	A14	A13	A12	A11	A10s	A10f	GND	GND	GND	GND	GND	GND	
	30																	16

to MAIN unit J3503

8-9 PA UNIT

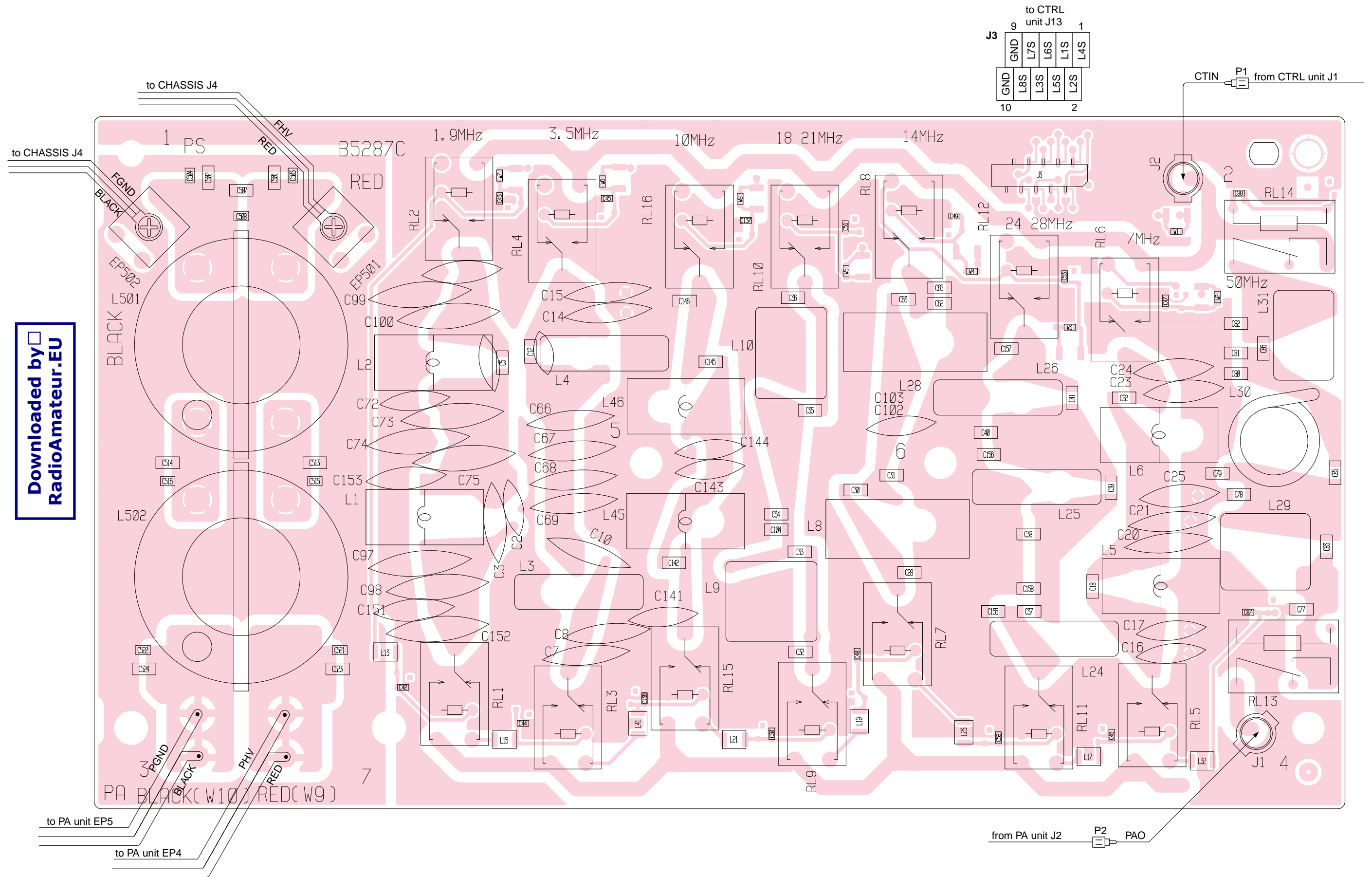


J3		2	PWRS	30
1	PAT8	1	ICL	GND
	ICL	2	H5V	GND
	H5V	3	8V	GND
	8V	4	14VA	GND
	14VA	5	14V	GND
	14V	6	14V	GND
	14V	7	14V	GND
	14V	8	5V	GND
	5V	9	HV	GND
	HV	10	NC	GND
	NC	11	GND	GND
	GND	12	GND	GND
	GND	13	GND	GND
	GND	14	GND	GND
	GND	15	GND	GND
	GND	16	GND	GND
	GND	17	GND	GND
	GND	18	GND	GND
	GND	19	GND	GND
	GND	20	GND	GND
	GND	21	GND	GND
	GND	22	GND	GND
	GND	23	GND	GND
	GND	24	GND	GND
	GND	25	GND	GND
	GND	26	GND	GND
	GND	27	GND	GND
	GND	28	GND	GND
	GND	29	GND	GND
	GND	30	GND	GND

to MAIN unit J771

J11		to CHASSIS
2	MF-	MF1
1	MF+	

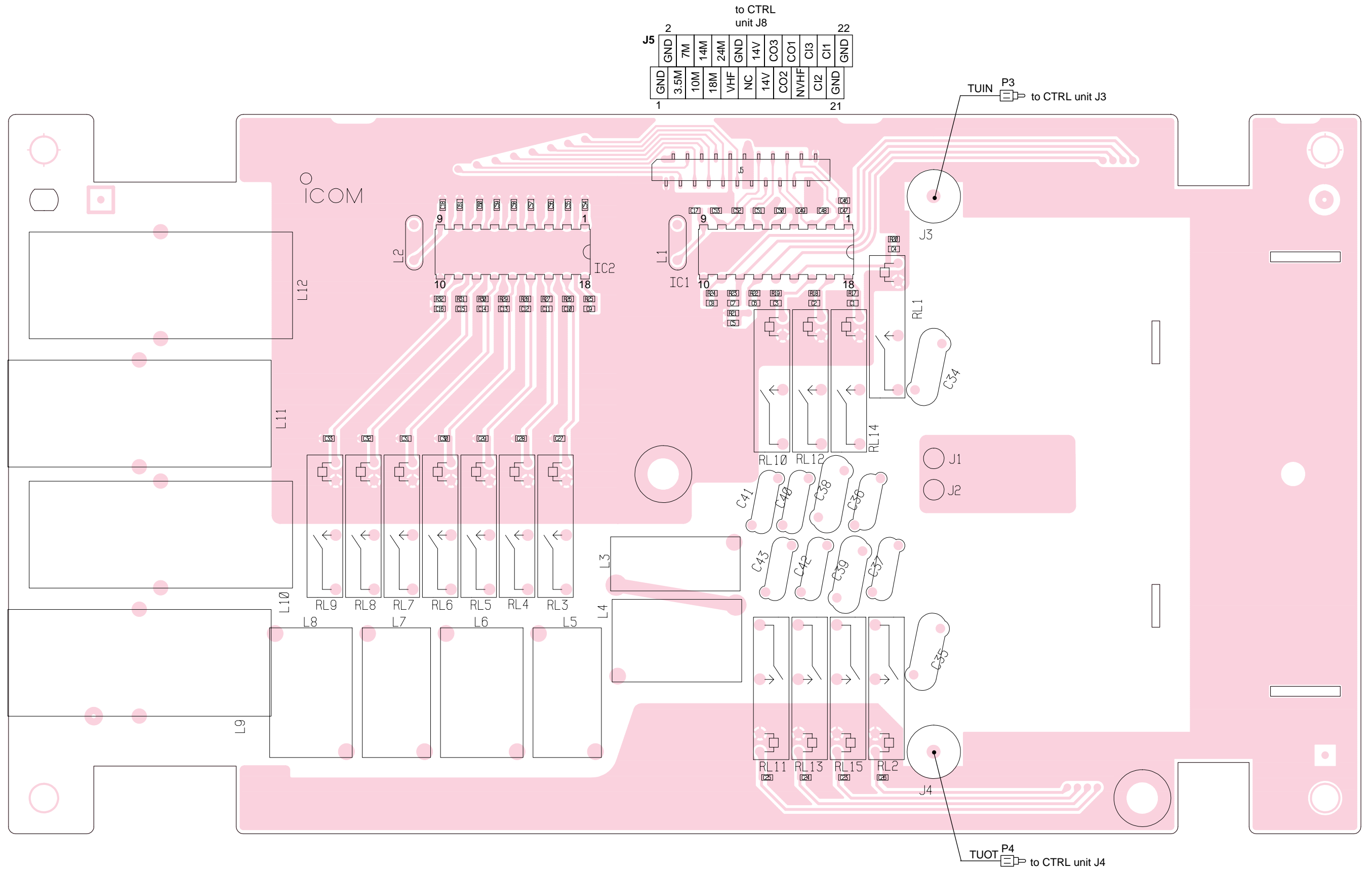
8-10 FILTER UNIT



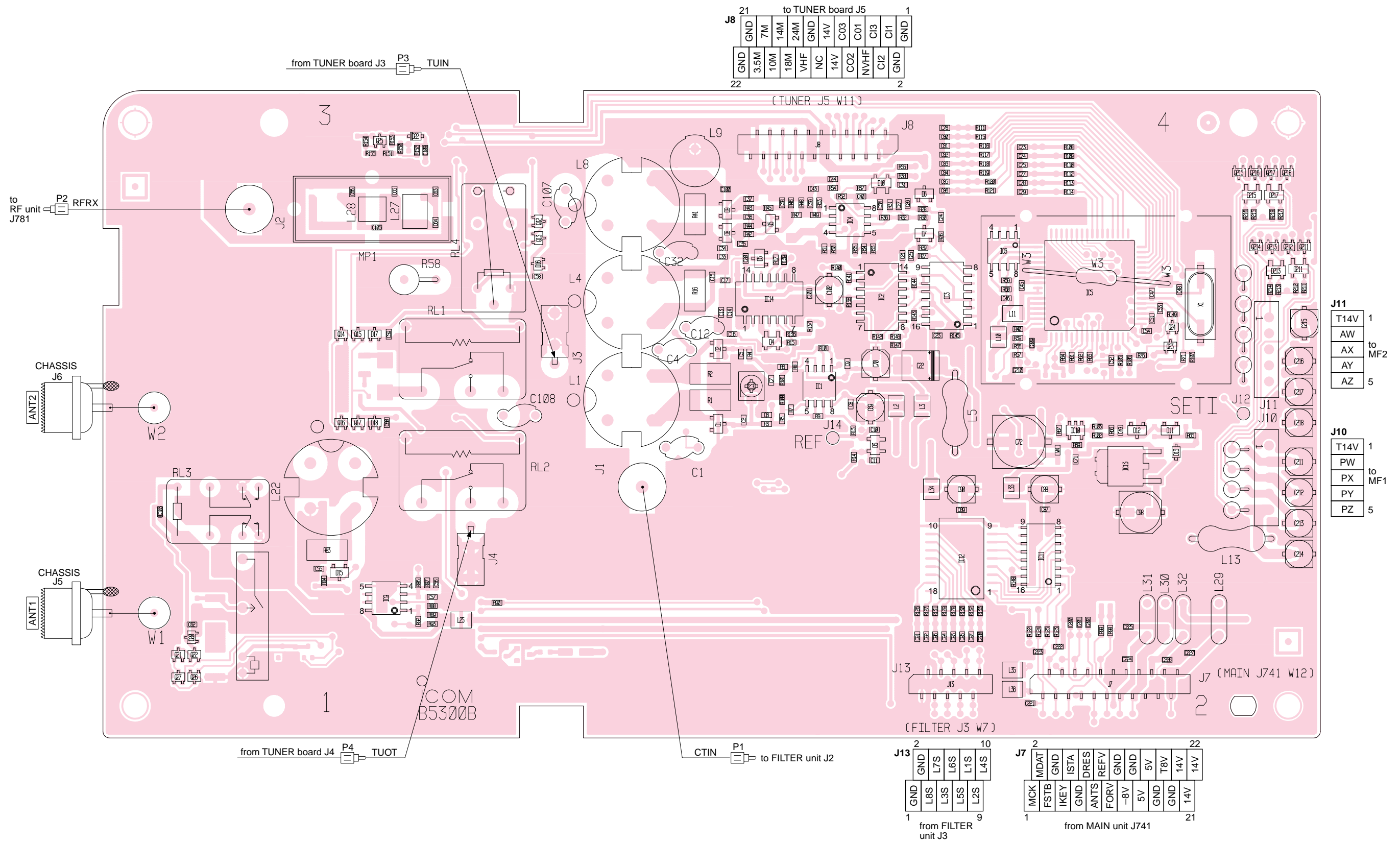
Downloaded by  
RadioAmateur.EU



# 8-11 TUNER BOARD



# 8-12 CTRL UNIT



21	to TUNER board J5										1
J8	GND	7M	14M	24M	GND	14V	CO3	CO1	CI3	CI1	GND
22	GND	3.5M	10M	18M	VHF	NC	14V	CO2	CO1	CI2	GND
											2

J11	T14V	1
	AW	to MF2
	AX	
	AY	
	AZ	5

J10	T14V	1
	PW	to MF1
	PX	
	PY	
	PZ	5

J13	2	10
GND	L7S	L4S
L8S	L3S	L1S
L6S	L5S	L2S
1		9

from FILTER unit J3

J7	2	21
MCK	MDAT	
FSTB	GND	
IKEY	ISTA	
GND	DRES	
ANTS	REFV	
GND	GND	
FORV	-8V	
GND	5V	
GND	T8V	
GND	14V	
14V	14V	
1		21

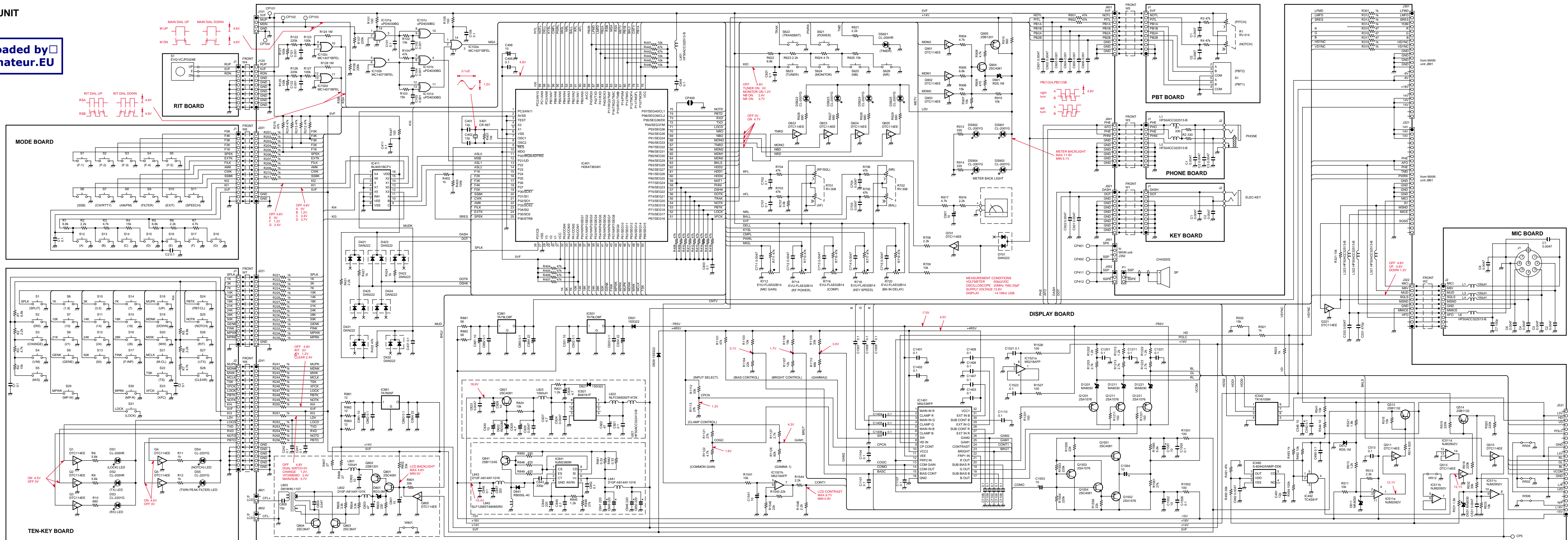
from MAIN unit J741



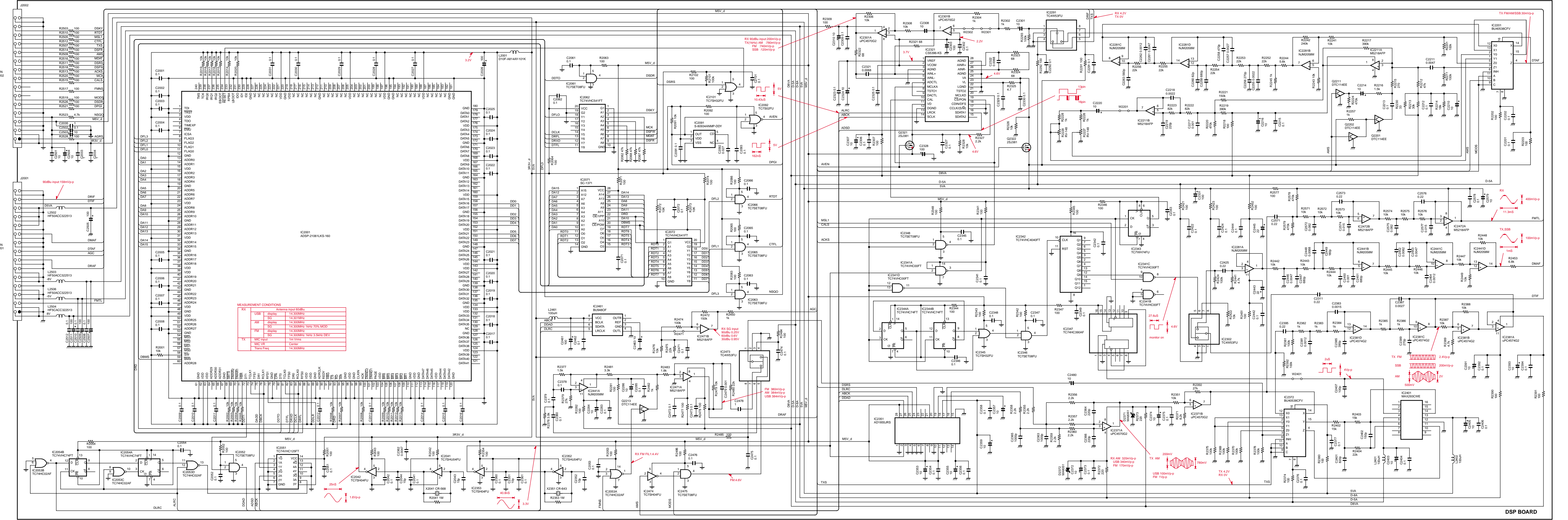
# SECTION 10 VOLTAGE DIAGRAM

## 10-1 FRONT UNIT

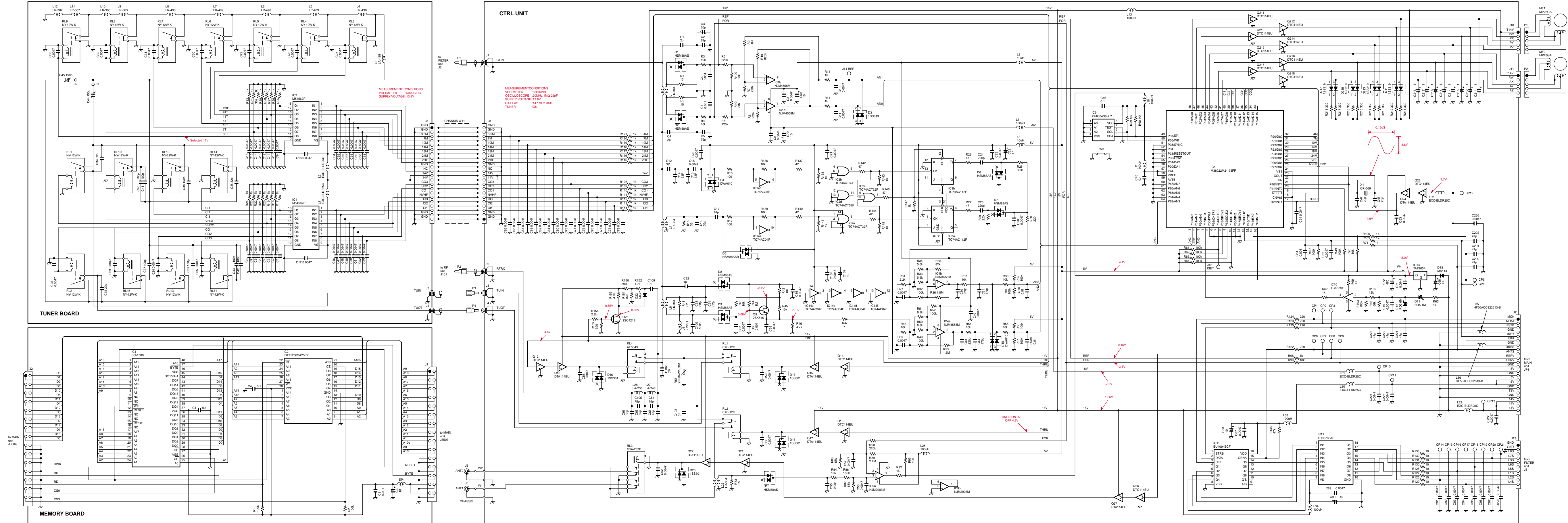
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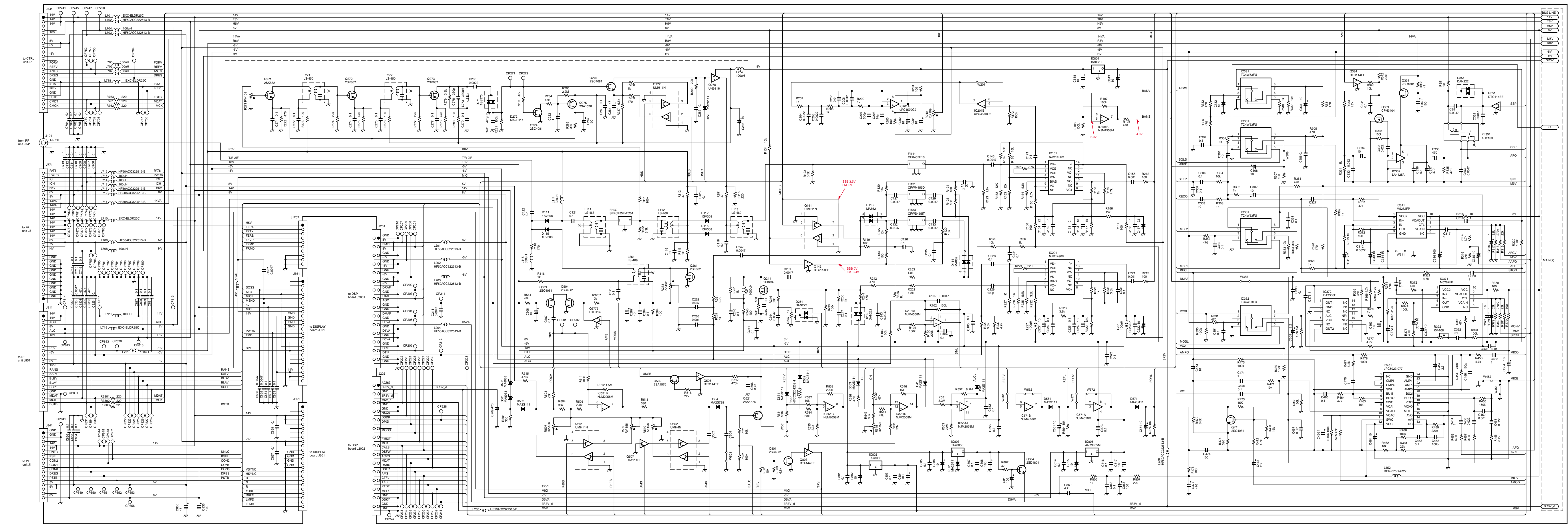
10-2 DSP BOARD



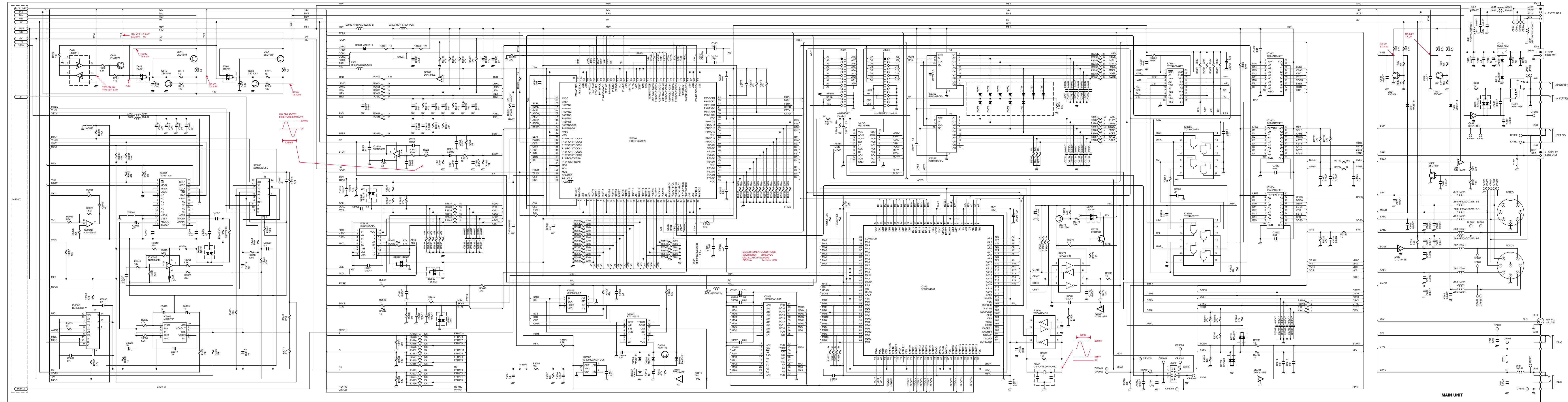
10-3 TUNER, MEMORY BOARDS AND CTRL UNIT



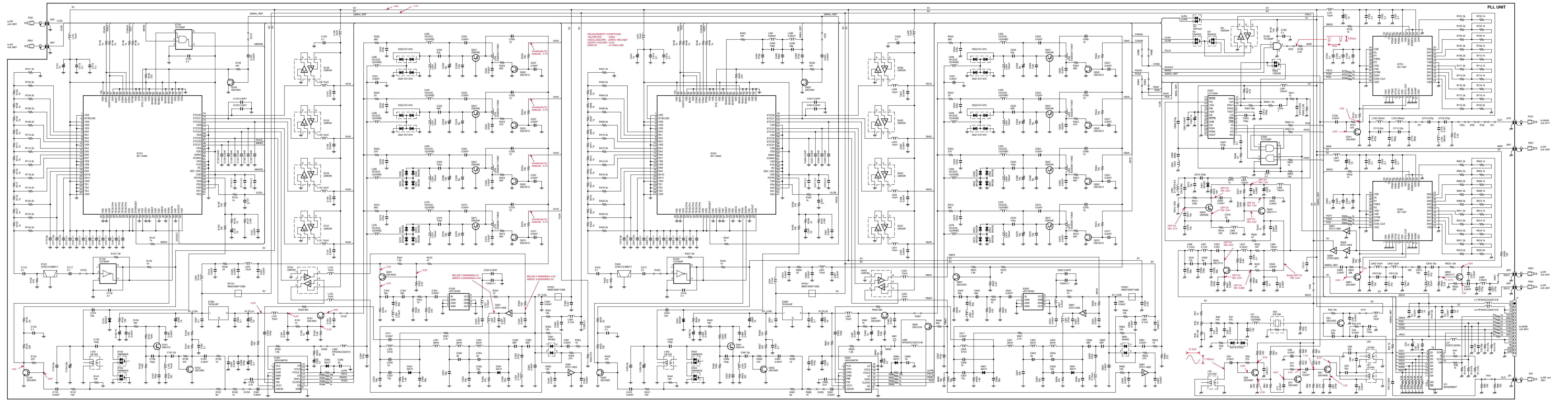
10-4 MAIN UNIT (1)



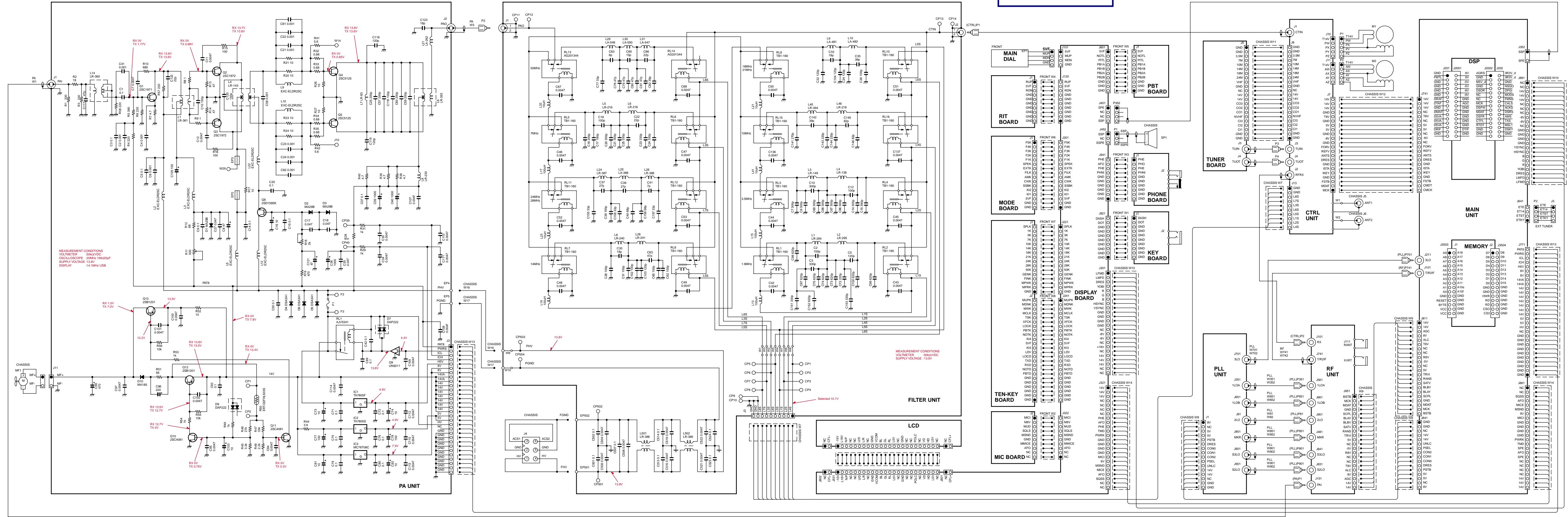
10-5 MAIN UNIT (2)

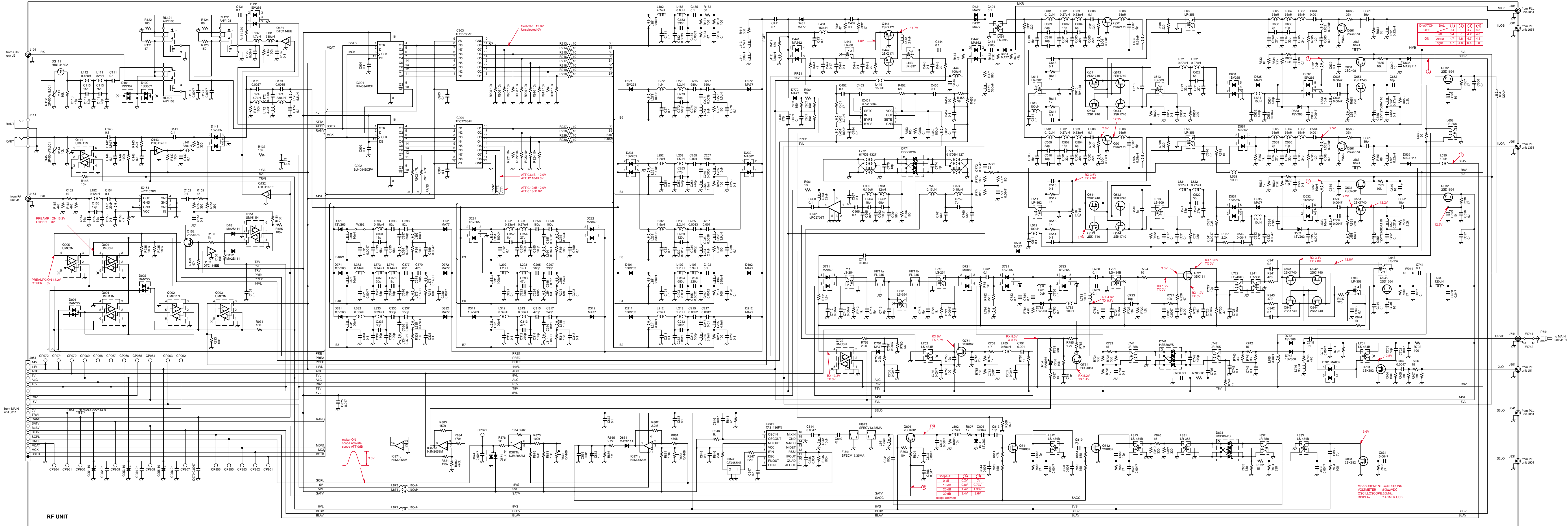






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