



# SERVICE MANUAL

DUAL BAND FM TRANSCEIVER

# IC-2800H

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## INTRODUCTION

This service manual describes the latest service information for the IC-2800H FM TRANSCEIVER at the time of publication.

MODEL	VERSION	SYMBOL
IC-2800H	Europe	EUR
	Italy	ITA
	U.S.A.	USA
	S. E. Asia	SEA
	C. S. America	CSA

To upgrade quality, all 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. Such a connection could cause a fire hazard and/or electric shock.

**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>

1110002750 S.IC TA75S01F IC-2800H MAIN UNIT 1 piece  
8810008450 Screw M4 x 8 ZK IC-2800H CHASSIS 6 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 or 60 dB attenuator between the transceiver and a deviation meter or spectrum analyser when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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# SECTION 1 SPECIFICATIONS

## GENERAL

• Frequency range	:	<table border="1"> <thead> <tr> <th>Version</th> <th>144 MHz band</th> <th>440 MHz band</th> </tr> </thead> <tbody> <tr> <td>EUR</td> <td>144.000 – 146.000</td> <td>430.000 – 440.000</td> </tr> <tr> <td>ITA</td> <td>Rx: 136.000 – 174.000*<sup>1</sup> Tx: 144.000 – 148.000</td> <td>Rx: 400.000 – 530.000*<sup>2</sup> Tx: 430.000 – 440.000</td> </tr> <tr> <td>USA</td> <td>Rx: 118.000 – 174.000*<sup>1</sup> Tx: 144.000 – 148.000</td> <td>430.000 – 450.000*<sup>3</sup></td> </tr> <tr> <td>SEA</td> <td>Rx: 136.000 – 174.000*<sup>1</sup> Tx: 144.000 – 148.000</td> <td>430.000 – 440.000</td> </tr> <tr> <td>CSA</td> <td>Rx: 118.000 – 174.000*<sup>1</sup> Tx: 144.000 – 148.000</td> <td>Rx: 400.000 – 530.000*<sup>2</sup> Tx: 430.000 – 440.000</td> </tr> </tbody> </table>	Version	144 MHz band	440 MHz band	EUR	144.000 – 146.000	430.000 – 440.000	ITA	Rx: 136.000 – 174.000* <sup>1</sup> Tx: 144.000 – 148.000	Rx: 400.000 – 530.000* <sup>2</sup> Tx: 430.000 – 440.000	USA	Rx: 118.000 – 174.000* <sup>1</sup> Tx: 144.000 – 148.000	430.000 – 450.000* <sup>3</sup>	SEA	Rx: 136.000 – 174.000* <sup>1</sup> Tx: 144.000 – 148.000	430.000 – 440.000	CSA	Rx: 118.000 – 174.000* <sup>1</sup> Tx: 144.000 – 148.000	Rx: 400.000 – 530.000* <sup>2</sup> Tx: 430.000 – 440.000
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		* <sup>1</sup> Guaranteed 144.000 – 148.000 MHz only																		
		* <sup>2</sup> Guaranteed 430.000 – 440.000 MHz only; * <sup>3</sup> Guaranteed 440.000 – 450.000 MHz only																		
• Mode	:	FM, AM (118.0 – 135.995; Rx only)																		
• Number of memory channel	:	232 (incl. 6 pairs of scan edges, 10 log, 10 repeater and 2 call channels)																		
• Usable temperature range	:	–10°C to +60°C; +14°F to +140°F																		
• Frequency resolution	:	5, 10, 12.5, 15, 20, 25, 30 and 50 kHz																		
• Frequency stability	:	±10 ppm (–10°C to +60°C; +14°F to +140°F)																		
• Power supply requirement	:	13.8 V DC ±15 % (negative ground)																		
• Current drain (at 13.8 V DC)	:	<table border="0"> <tr> <td>Receive</td> <td>Standby (squelched)</td> <td>1.2 A</td> </tr> <tr> <td></td> <td>Max. audio</td> <td>1.5 A</td> </tr> <tr> <td>Transmit</td> <td>at VHF 50 W/UHF 35 W</td> <td>12.0 A/11.0 A</td> </tr> <tr> <td></td> <td>at 25 W/25 W (TPE version)</td> <td>8.0 A</td> </tr> </table>	Receive	Standby (squelched)	1.2 A		Max. audio	1.5 A	Transmit	at VHF 50 W/UHF 35 W	12.0 A/11.0 A		at 25 W/25 W (TPE version)	8.0 A						
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Transmit	at VHF 50 W/UHF 35 W	12.0 A/11.0 A																		
	at 25 W/25 W (TPE version)	8.0 A																		
• Antenna connector	:	SO-239 (50 Ω)																		
• DATA connector	:	Mini DIN 6 pin																		
• External VIDEO input	:	PHONO [RCA (75 Ω)]																		
• Dimensions (projections not included)	:	<table border="0"> <tr> <td>Controller</td> <td>140(W)×70(H)×34(D) mm; 5½(W)×2¾(H)×1¼(D) inch</td> </tr> <tr> <td>Main unit</td> <td>140(W)×40(H)×165.8(D) mm; 5½(W)×1¾(H)×6¼(D) inch</td> </tr> </table>	Controller	140(W)×70(H)×34(D) mm; 5½(W)×2¾(H)×1¼(D) inch	Main unit	140(W)×40(H)×165.8(D) mm; 5½(W)×1¾(H)×6¼(D) inch														
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## TRANSMITTER

• Output power	:	<table border="0"> <tr> <td>High</td> <td>VHF 50 W/UHF 35 W</td> </tr> <tr> <td>Mid-H</td> <td>approx. 20 W</td> </tr> <tr> <td>Mid-L</td> <td>approx. 10 W</td> </tr> <tr> <td>Low</td> <td>approx. 5 W</td> </tr> </table>	High	VHF 50 W/UHF 35 W	Mid-H	approx. 20 W	Mid-L	approx. 10 W	Low	approx. 5 W
High	VHF 50 W/UHF 35 W									
Mid-H	approx. 20 W									
Mid-L	approx. 10 W									
Low	approx. 5 W									
• Modulation system	:	Variable reactance frequency								
• Maximum frequency deviation	:	±5.0/±2.5* kHz * [EUR] and [ITA] versions only								
• Spurious emissions	:	Less than –60 dB								
• Microphone connector	:	8-pin modular (600 Ω)								

## RECEIVER

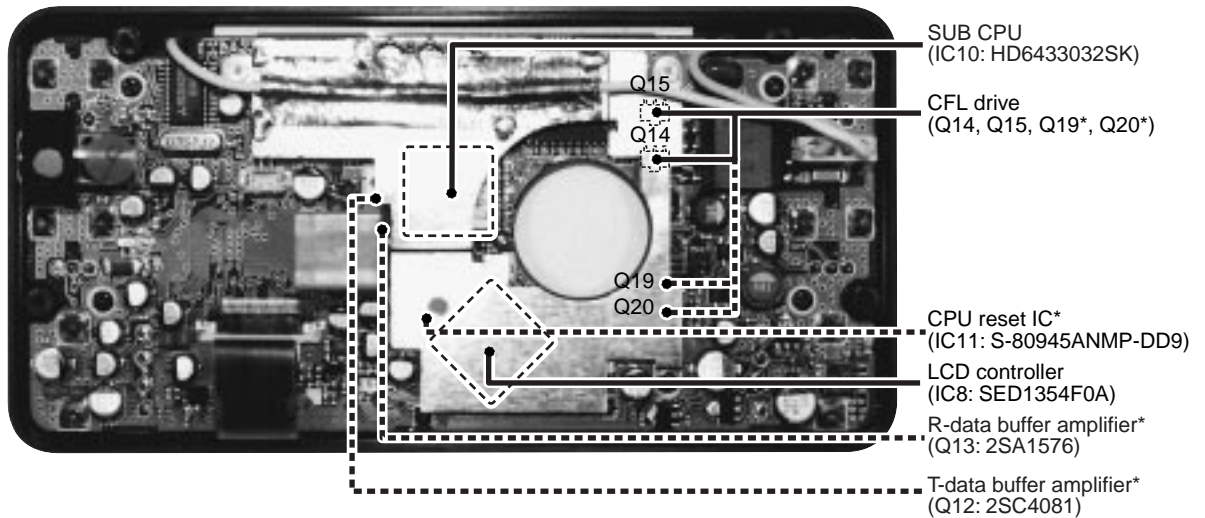
• Receive system	:	Double-conversion superheterodyne						
• Intermediate frequency	:	<table border="0"> <tr> <td>VHF</td> <td>1st IF 15.65 MHz</td> <td>2nd IF 450 kHz</td> </tr> <tr> <td>UHF</td> <td>1st IF 46.05 MHz</td> <td>2nd IF 450 kHz</td> </tr> </table>	VHF	1st IF 15.65 MHz	2nd IF 450 kHz	UHF	1st IF 46.05 MHz	2nd IF 450 kHz
VHF	1st IF 15.65 MHz	2nd IF 450 kHz						
UHF	1st IF 46.05 MHz	2nd IF 450 kHz						
• Sensitivity (at 12 dB SINAD)	:	Less than 0.18 µV						
• Squelch sensitivity (threshold)	:	Less than 0.13 µV						
• Selectivity (wide/narrow)	:	<table border="0"> <tr> <td>More than 12/6* kHz at –6 dB</td> </tr> <tr> <td>Less than 28/18* kHz at –60 dB</td> </tr> <tr> <td>* [EUR] and [ITA] versions only</td> </tr> </table>	More than 12/6* kHz at –6 dB	Less than 28/18* kHz at –60 dB	* [EUR] and [ITA] versions only			
More than 12/6* kHz at –6 dB								
Less than 28/18* kHz at –60 dB								
* [EUR] and [ITA] versions only								
• Spurious and image rejection	:	More than 60 dB						
• Intermodulation rejection ratio	:	More than 60 dB						
• Audio output power (at 13.8 V)	:	More than 2.4 W at 10% distortion with an 8Ω load						
• External SP1 connector	:	2-conductor 3.5(d) mm (¼")/8 Ω						
• External SP2 connector	:	3-conductor 3.5(d) mm (¼")/8 Ω						

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

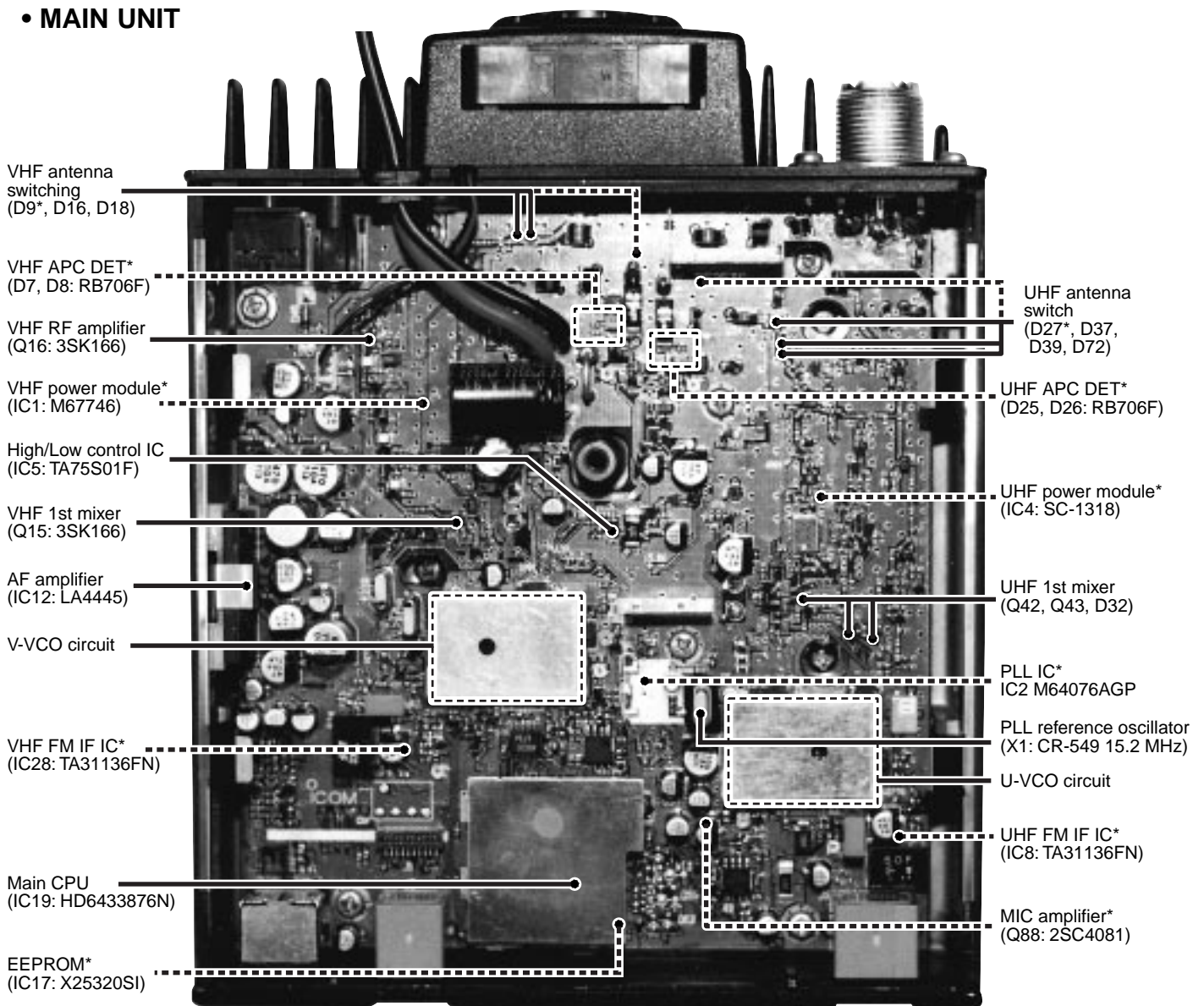
## SECTION 2 INSIDE VIEWS

### • CONTROL UNIT

\* : Located underside of this point



### • MAIN UNIT

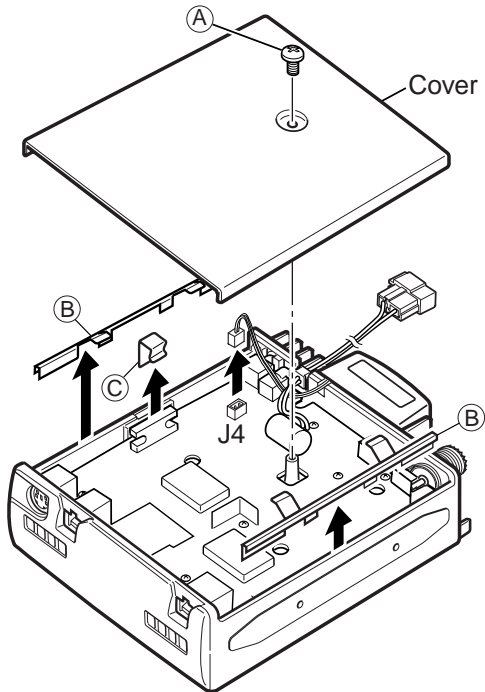


\* : Located underside of this point

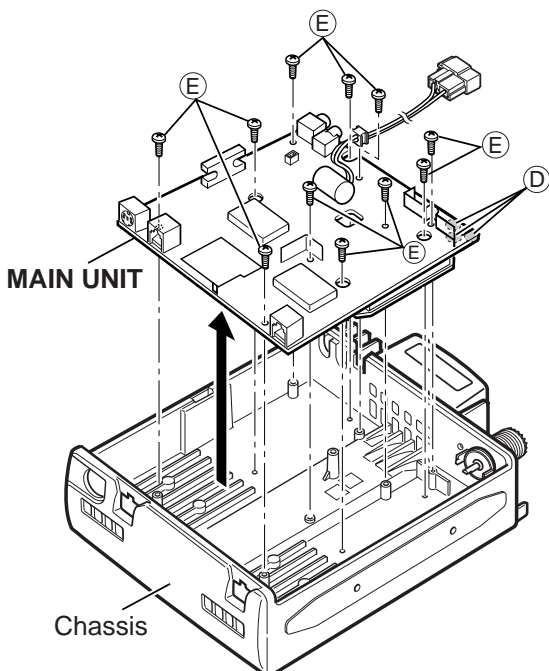
## SECTION 3 DISASSEMBLY INSTRUCTIONS

### • Removing the MAIN unit

- ① Unscrew 1 screw, (A), and remove the cover.
- ② Unplug J4 to separate the fan motor from the MAIN unit.
- ③ Remove 2 main shield, (B), and TR-A clip, (C) in the direction of the arrow.

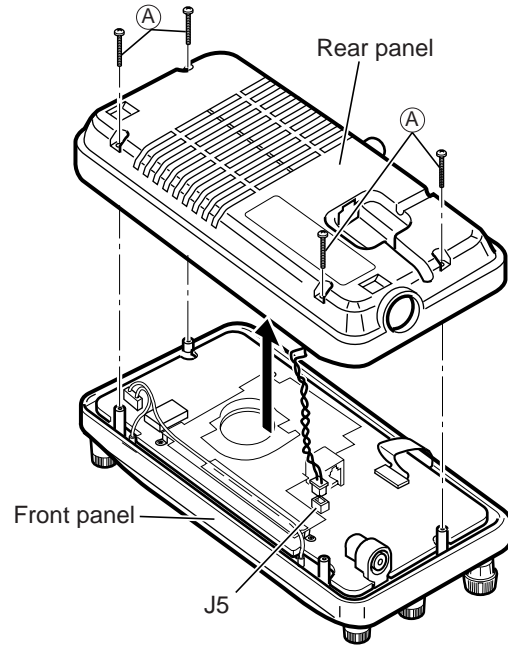


- ④ Unsolder 3 points, (D), and unscrew 11 nut, (E).
- ⑤ Remove the MAIN unit in the direction of the arrow.

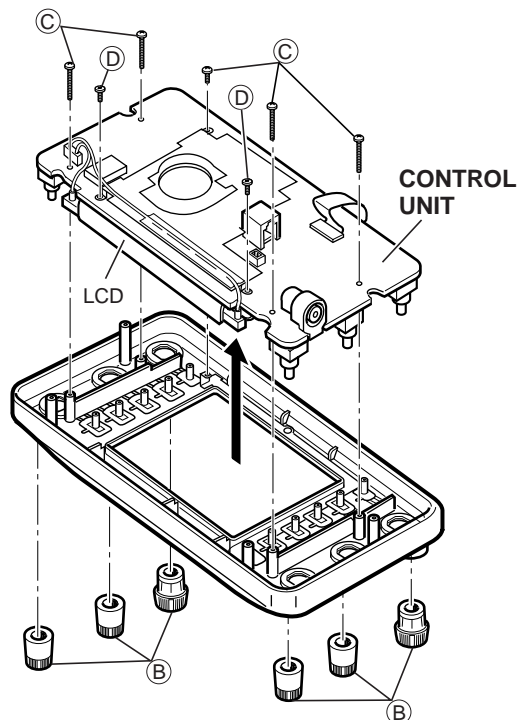


### • Removing the CONTROL unit

- ① Unscrew 4 screws, (A), and remove the cover.
- ② Unplug J5 to separate the speaker and front panel.
- ③ Remove rear panel in the direction of the arrow.



- ④ Remove 6 knobs, (B).
- ⑤ Unscrew 5 screws, (C), and remove the CONTROL unit in the direction of the arrow.
- ⑥ Unscrew 2 screws, (D), when remove the LCD.



# SECTION 4 CIRCUIT DESCRIPTION

## 4-1 RECEIVER CIRCUITS

### 4-1-1 DUPLEXER CIRCUIT

The transceiver has a duplexer (low-pass and high-pass filters) on the first stage from the antenna connector to separate the signals into VHF and UHF signals. The low-pass filter (L15, L16, L78, C70–C72) is for VHF signals and the high-pass filter (L44, L45, L82, C189, C190, C493) is for UHF signals. The separated signals are applied to each RF circuit.

### 4-1-2 VHF ANTENNA SWITCHING CIRCUIT

The antenna switching circuit functions as a low-pass filter while receiving. However, its impedance becomes very high while transmitting by turning ON diode (D18). Thus transmit signals are blocked from entering the receiver circuits. The antenna switching circuit employs a  $1/4\lambda$  type diode switching system. The passed signals are then applied to the VHF RF amplifier circuit.

### 4-1-3 VHF SQUELCH ATTENUATOR CIRCUIT

The attenuator circuit attenuates the signal strength to a maximum of 10 dB to protect the RF amplifier from distortion when excessively strong signals are received.

The current flow of the antenna switching circuit (D18) is controlled by the [SQL] control via Q33. When the [SQL] control is rotated clockwise deeper than 12 o'clock, the current of D18 is increased. In this case, D18 acts as an attenuator.

### 4-1-4 VHF RF CIRCUIT

The RF circuit amplifies signals within the range of frequency coverage and filters out-of-band signals.

The signals from the antenna switching circuit pass through the tunable bandpass filter (D15, L25, L26, C115–C117). The filtered signals are amplified at the VHF RF amplifier (Q16) and are then enter another 3-stage tunable bandpass filter (D11–D14, L20–L21, C94, C96–C105) to suppress unwanted signals, and improve the selectivity. The filtered signals are applied to the VHF 1st mixer circuit (Q15).

The tunable bandpass filters (D11–D13, D15) employ varactor diodes to tune the center frequency of the RF passband for wide bandwidth receiving and good image response rejection. The PLL lock voltage is used for control voltage of these varactor diodes. The PLL lock voltage is amplified at the DC-amplifier (Q18) and then applied to the CPU (IC19, pin 99). The CPU outputs the control signal to the varactor diodes via the D/A converter (IC3).

### 4-1-5 VHF 1ST MIXER CIRCUIT

The 1st mixer circuit converts the received signal to a fixed frequency of the 1st IF signal with a 1st LO (V-VCO output) frequency.

The signals from the VHF RF circuit are mixed with the 1st LO signal at the 1st mixer circuit (Q15) to produce a 15.65 MHz 1st IF signal.

### 4-1-6 VHF 1ST IF CIRCUIT

By changing the PLL frequency, only the desired frequency will pass through a pair of crystal filters at the next stage of the mixer.

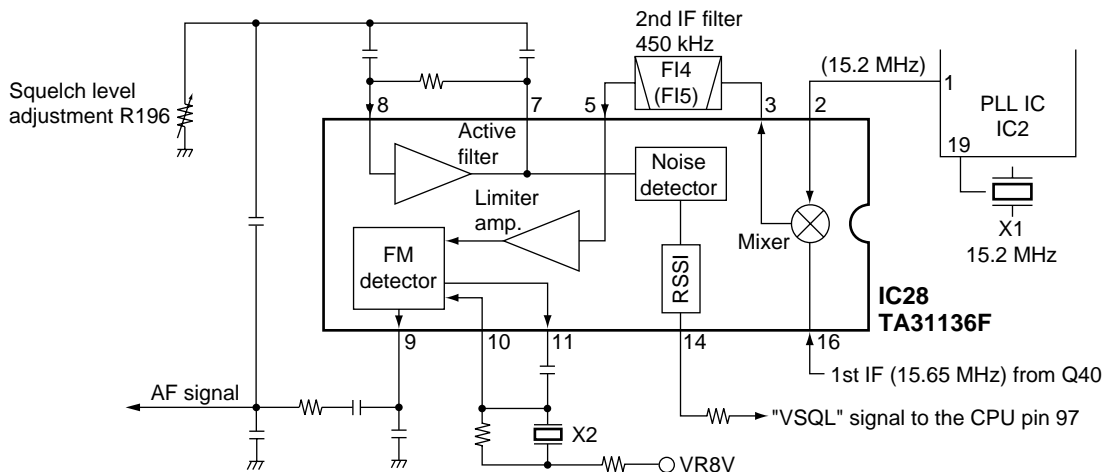
The 1st IF signal from the VHF 1st mixer circuit is applied to a pair of crystal filters (F11) to suppress out-of-band signals via a matching circuit (R61, C88). The filtered signal is amplified at the IF amplifier (Q40) and is then applied to the VHF 2nd mixer circuit (IC28).

### 4-1-7 VHF 2ND IF AND DEMODULATOR CIRCUITS

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

The FM IF IC (IC28) contains the 2nd local oscillator, 2nd mixer, limiter amplifier, quadrature detector, and noise detector circuits, etc.

#### • VHF 2nd IF AND DEMODULATOR CIRCUITS



The 1st IF signal from the 2nd IF amplifier is applied to the 2nd mixer section of IC28 (pin 16), and is mixed with a 15.2 MHz 2nd LO signal generated by the reference oscillator circuit (X1, IC2) to produce a 450 kHz VHF 2nd IF signal.

The 2nd IF signal from the 2nd mixer passes through the 2nd IF filter (FI4) (during wide channel spacing selection, or passes through FI5 during narrow channel spacing selection; [EUR], [ITA] versions only), where unwanted signals are suppressed. It is then amplified at the limiter amplifier section (IC28, pin 5) and applied to the FM detector section (X2, IC28, pins 10, 11) for demodulation the 2nd IF signal into AF signals.

The FM detector circuit employs a quadrature detection method (liner phase detection), which uses a ceramic discriminator (X2) for phase delay to obtain a non-adjusting circuit. The detected signal from IC28 (pin 9) is applied to the AF circuit.

#### 4-1-8 VHF AF AMPLIFIER CIRCUIT

The AF amplifier circuit amplifies the detected signals to drive a speaker. The AF circuit includes an AF mute circuit for the squelch.

AF signals from FM IF IC (IC28, pin 9) pass through the AF selector (IC21, pins 9, 8), and are then applied to the low-pass (Q83, R370–R373, C406–C409) and high-pass (Q84, R375–R379, C415–C418) filters. The filtered signals are level adjusted at the volume control IC (IC10), and are amplified at the AF power amplifier (IC12, pin 2) passing through the V-AF mute switch (Q70).

The output signal from IC12 (pin 11) drives the external or internal speaker.

#### 4-1-9 VHF SQUELCH CIRCUIT

##### • NOISE SQUELCH

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

Some of the noise components in the AF signals from the FM IF IC (IC28, pin 9) are passed through the active filter section (IC28, pin 8, 7), and then applied to the noise detector section (IC28). The variable resistor (R196) adjusts the input level of the active filter, and the level is used for squelch threshold reference. The detected noise signals are applied to the CPU (IC19 pin 97) via the "VSQ" line.

The [SQL] (CONTROL unit; R154) controls the input level of the sub-CPU (CONTROL unit; IC10, pin 59) in DC voltage. The sub-CPU reads the angle of the [SQL] rotation, then send the squelch data to the CPU incorporated in the RDATA line. Then the CPU controls V-AF mute switch (Q70) via the "VAMUTE" line.

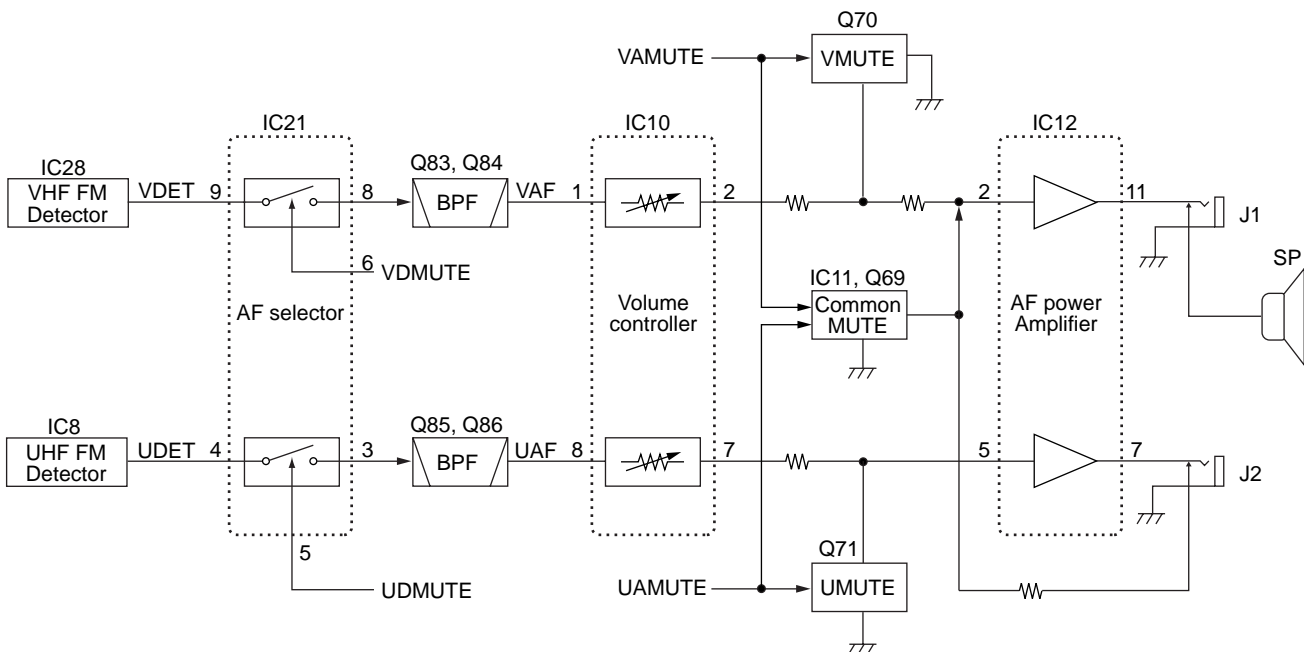
Even when the squelch is closed, the V-AF mute switch (Q70) opens at the moment of emitting beep tone.

##### • TONE SQUELCH

The tone squelch circuit detects AF signals and opens the squelch only when receiving a signal containing a matching subaudible tone (CTCSS). When tone squelch is in use, and a signal with a mismatched or no subaudible tone is received, the tone squelch circuit mutes the AF signals even when noise squelch is open.

A portion of the AF signals from the FM IF IC (IC28, pin 9) passes through the active filter (IC20) to remove AF (voice) signals via the AF selector (IC29, pins 5, 4), and is then applied to the CTCSS decoder inside the CPU (IC19, pin 1) via the "TONEIN" line to control the AF mute switch.

##### • AF amplifier circuit





#### 4-1-10 UHF RF CIRCUIT

The UHF RF signals are passed through part of a duplexer (high-pass filter; L44, L45, L82, C189, C190, C493). The signals are then passed through the low-pass filter (L42, L43, C187, C463), antenna switching circuit (D37, D39, D72), and then amplified at the RF amplifier (Q44). A bandpass filter (F13) is used at the next stage of the RF amplifier. The RF switch (D35, D33) turns on the UHF RF circuit when UHF signals are received.

#### 4-1-11 UHF 1ST MIXER AND 1ST IF CIRCUITS

The filtered signals from the bandpass filter (F13) are applied to the 1st mixer circuit (Q43). The applied signals are mixed with a 1st LO signal which comes from the U-VCO circuit (Q20, Q21) to produce a 46.05 MHz 1st IF signal.

The 1st IF signal passes through the 1st IF filter (F12) to suppress out-of-band signals via a matching circuit (R149, C226). The filtered signal is amplified at the 1st IF amplifier (Q41) and is then applied to the 2nd mixer circuit (IC8).

#### 4-1-12 UHF 2ND IF AND DEMODULATOR CIRCUITS

The 1st IF signal from the IF amplifier is applied to the 2nd mixer section of the FM IF IC (IC8, pin 16). The signal is mixed for producing a 450 kHz 2nd IF signal with a 45.6 MHz 2nd LO signal which generated by the tripler circuit (L68, L69, C208–C212) using the PLL reference frequency.

The 2nd IF signal from IC8 (pin 3) is passed through the 2nd IF filter (F16), and is then applied to the limiter amplifier section in IC8 (pin 5). The signal is applied to the FM detector section in IC8 to demodulate into AF signals.

#### 4-1-13 UHF AF AMPLIFIER CIRCUIT

AF signals from IC8 (pin 9) pass through the AF selector (IC21, pins 3, 4), low-pass filter (Q85, R381–R384, C415–C418) and high-pass filter (Q86, R386–R390, C419–C421).

The filtered signals pass through the volume control IC (IC10). And the level adjusted signals are applied to the AF power amplifier (IC12, pin 5) via the U-AF mute switch (Q71).

The output signal from IC12 (pin 7) drives the external speaker (connected at J2), or it is fed back to the input line of the AF power amplifier (IC12, pin 2: VHF AF line).

#### 4-1-14 UHF SQUELCH CIRCUIT

A portion of the AF signals from the FM IF IC (IC8, pin 9) are applied to the active filter section (IC8, pin 8, 7). The active filter section amplifies and filters noise components. The filtered signals are applied to the noise detector section. The variable resistor (R229) adjusts the input level of the active filter, and the level is used for squelch threshold reference. The detected noise signals are output from pin 14 as the "USQL" signal, and are then applied to the CPU (IC19, pin 95).

The [SQL] (CONTROL unit; R148) controls the input level of the sub-CPU (CONTROL unit; IC10, pin 61) in DC voltage. The sub-CPU reads the angle of the [SQL] rotation, then send the squelch data to the CPU incorporated in the RDATA line. Then the CPU controls U-AF mute switch (Q71) via the "UAMUTE" line.

## 4-2 TRANSMITTER CIRCUITS

### 4-2-1 MICROPHONE AMPLIFIER CIRCUIT

The microphone amplifier circuit amplifies audio signals from the microphone to a level needed at the modulation circuit. The microphone amplifier circuit is commonly used for both the VHF and UHF bands.

The AF signals from the microphone pass through the MIC sensitivity control circuit (IC25, D66) and MIC mute switch (IC26), and are then amplified at the microphone amplifier (Q88). The amplified signals are applied to the IDC limiter amplifier (IC23b, pin 6). The output signals from the IDC limiter amplifier (IC23b, pin 7) are passed through the splatter filter (IC23a, pin 3, 1) and then applied to each VCO circuit via the deviation adjustment pot.

### 4-2-2 VHF MODULATION CIRCUIT

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

The audio signals (MOD) from the splatter filter (IC23a) change the reactance of D3 to modulate the oscillated signal at the V-VCO circuit (Q4, Q5) after passing through the frequency deviation control (R2). The modulated signals are amplified at the buffer amplifiers (Q6, Q7), and are then applied to the drive amplifier circuit via the T/R switching circuit (D4).

### 4-2-3 VHF DRIVE AMPLIFIER CIRCUIT

The drive amplifier circuit amplifies the VCO oscillating signal to a level needed at the power amplifier.

The RF signals from the buffer amplifier (Q7) pass through the low-pass filter (L5, C35, C36), T/R switch (D4) and attenuator (R33–R35). The Tx signal from the attenuator is amplified at the pre-drive (Q11) and drive (Q12, D5, D6) amplifiers to obtain an approximate 400 mW signal level. The amplified signal is then applied to the RF power amplifier (IC1).

### 4-2-4 VHF POWER AMPLIFIER CIRCUIT

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

IC1 is a power module which has amplification output capabilities of about 70 W. The RF signal from the drive amplifier (Q12) is applied to IC1 (pin 1).

The amplified signals from the power amplifier (IC1, pin 4) pass through the APC detector (D7, D8), antenna switching circuit (D9) and low-pass filter (L15, L16, L78, C70–C72), and is then applied to the antenna connector.

Collector voltage for the driver (Q12) and control voltage for the power amplifier (IC1, pin 2) are controlled by the APC circuit to protect the power module from a mismatched condition as well as to stabilize the output power.

#### 4-2-5 VHF APC CIRCUIT

The APC circuit protects the power amplifier from a mismatched output load and stabilizes transmit output power.

The APC detector circuit (L12, D7, D8) detects forward signals and reflection signals at D7 and D8 respectively. The combined voltage is at a minimum level when the antenna impedance is matched at 50  $\Omega$  and is increased when it is mismatched.

The detected voltage is applied to the APC amplifier (IC5, pin 3) and compared with a reference voltage which is supplied from the CPU (IC19, pin 68–pin 75) as a D/A control signal.

When antenna impedance is mismatched, the detected voltage exceeds the reference voltage. The output voltage of the APC amplifier (IC5, pin 4) controls the bias voltage of the power module (IC1) and drive amplifier (Q12) to reduce the output power via the APC controller (Q30, Q31).

#### 4-2-6 UHF MODULATION CIRCUIT

Audio signals from the splatter filter (IC23a) pass through the frequency deviation control (R78), and are then applied to the modulation circuit (D20) to change the reactance of D20 and modulate the oscillated signal at the U-VCO circuit (Q20, Q21). The VCO output is amplified at the buffer amplifiers (Q22, Q24), and is then applied to the T/R switching circuit (D23) via the low-pass filter (L33, C153, C154).

#### 4-2-7 UHF DRIVE AMPLIFIER CIRCUIT

The VCO signals from the T/R switch (D23) are amplified at the buffer-amplifier (Q27), pre-drive amplifier (Q28) and drive (Q29, D24) amplifier to obtain an approximate 400 mW signal level. The amplified signal is then applied to the RF power amplifier (IC4).

#### 4-2-8 UHF POWER AMPLIFIER CIRCUIT

IC4 is a power module which has amplification output capabilities of about 50 W.

The RF signal from the drive amplifier (Q29) is applied to IC4 (pin 5). The amplified signal from the power amplifier (IC4, pin 1) is passed through the antenna switching circuit (D27) and is then applied to the antenna connector via a bandpass filter (L42–L45, L82, C186–C190, C467, C493).

#### 4-2-9 UHF APC CIRCUIT

The APC detector circuit (D25 and D26) detects forward signals and reflection signals respectively. The combined voltage is at a minimum level when the antenna is matched at 50  $\Omega$  and increases when it is mismatched.

The combined voltage is applied to the APC amplifier (IC5, pin 3), and the power setting voltage from the CPU (IC19, pin 68–pin 75) as a D/A control signal is applied to the other input (IC5, pin 1) for the reference.

The output voltage from IC5 (pin 4) is applied to the APC control circuit (Q30, Q31) to control the bias voltage of the PA module (IC4) and drive amplifier (Q29).

### 4-3 PLL CIRCUITS

#### 4-3-1 GENERAL

A PLL circuit provides stable oscillation of the transmit frequency and the receive local frequency. The PLL circuit compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by a crystal oscillator and the divided ratio of the programmable divider. IC2 is a dual PLL IC which controls both VCO circuits for VHF and UHF.

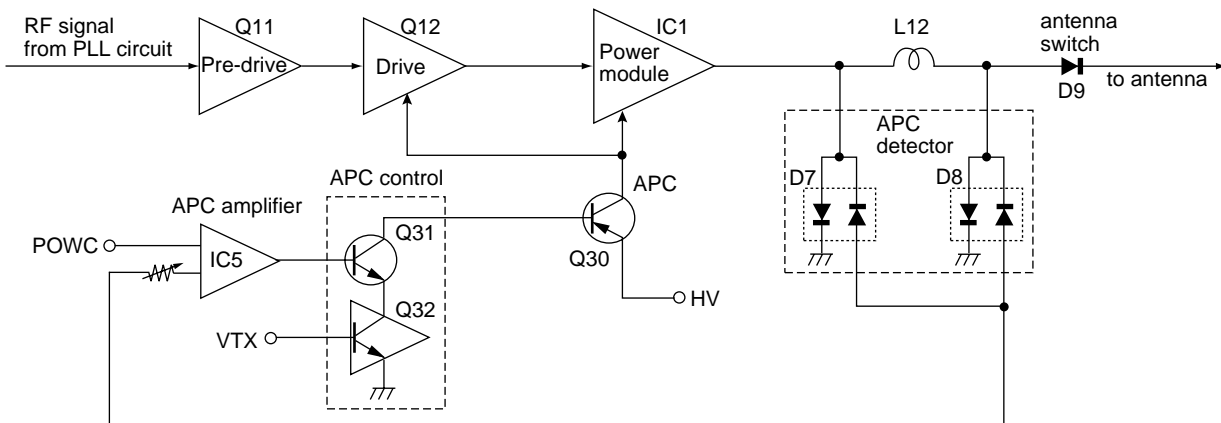
#### 4-3-2 VHF LOOP

The generated signal at the V-VCO (Q4, Q5, D3) enters the PLL IC (IC2, pin 6) via buffer-amplifiers (Q6, Q8) and is divided at the programmable divider section and is then applied to the phase detector section.

The phase detector compares the input signal with a reference frequency, and then outputs the out-of-phase signal (pulse-type signal) from pin 8.

The pulse-type signal is converted into DC voltage (lock voltage) at the loop filter (Q99, Q100, R531, C476–C478), and then applied to the V-VCO to stabilize the oscillated frequency.

#### • VHF APC circuit



### 4-3-3 UHF LOOP

The generated signal at the U-VCO (Q20, Q21, D20, D21) enters the PLL IC (IC2, pin 15) via buffer-amplifiers (Q22, Q23) and is divided at the programmable divider section and is then applied to the phase detector section.

The phase detector compares the input signal with a reference frequency, and then outputs the out-of-phase signal (pulse-type signal) from pin 13.

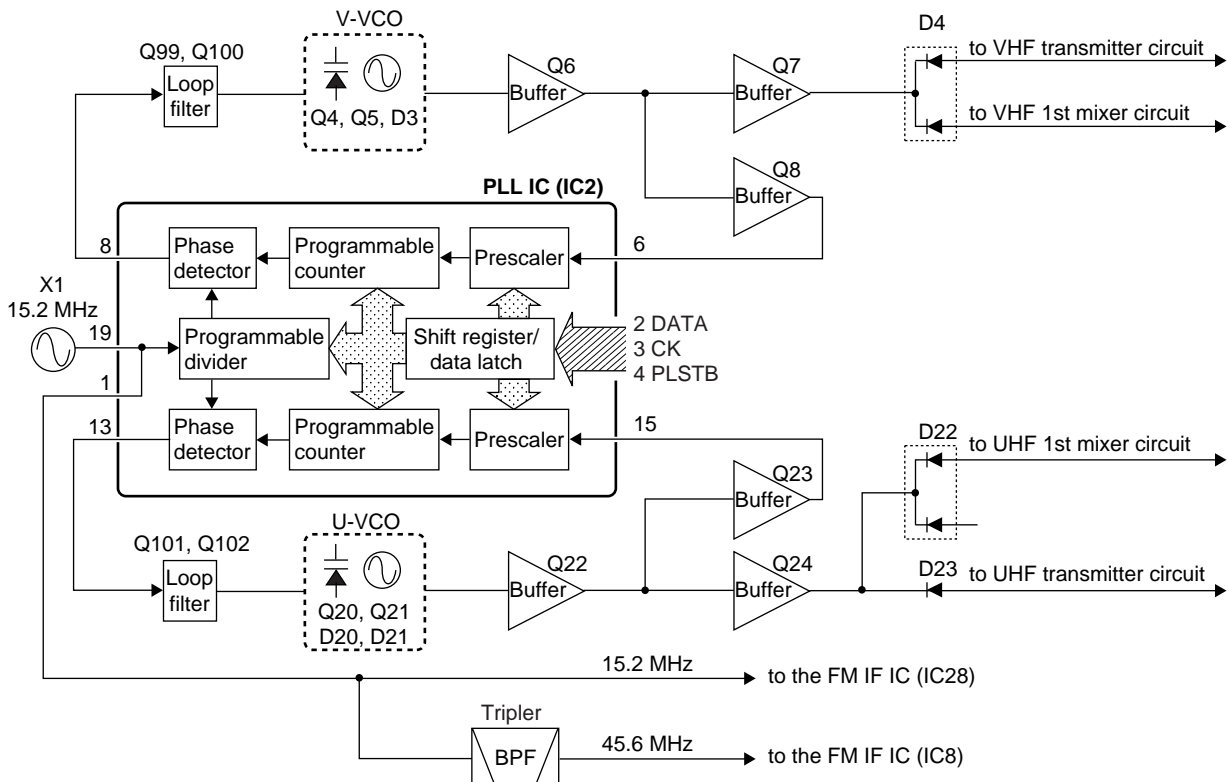
The pulse-type signal is converted into DC voltage (lock voltage) at the loop filter (Q101, Q102, R538, C481, C483), and then applied to the U-VCO to stabilize the oscillated frequency.

## 4-4 POWER SUPPLY CIRCUITS

### • VOLTAGE LINE

Line	Description
HV	The 13.8V external DC power from the power connector.
13.8V	The same voltage as the HV line which is controlled by the power switching circuit (Q74, Q75). When the [POWER] switch is pushed, the CPU outputs the "PCTRL" control signal to the power switching circuit to turn the circuit ON.
C5V	Common 5 V for the CPU converted from the HV line by the C5V regulator circuit (IC15). The circuit outputs the voltage regardless of the power ON/OFF condition.
PLL5V	Common 5 V produced from the C5V at the PLL5V regulator circuit (Q13, Q14) using control signal from 8V line.
8V	Common 8 V converted from the 13.8V line by the 8V regulator circuit (IC14).
VT8V	VHF transmit 8 V converted from the 8V line at the VT8V regulator circuit (Q9, Q10).
UT8V	UHF transmit 8V converted from the 8V line at the UT8V regulator circuit (Q25, Q26).
VR8V	Receive VR8V produced from the 8V line at the V-BIAS selector (Q34, Q35).
4R8V	Receive 4R8V produced from the 8V line at the U-BIAS selector (Q34, Q36).
UR8V	Receive UR8V produced from the 4R8V line at the UR8V switching circuit (D28, D29).

### • PLL circuit



## 4-5 PORT ALLOCATIONS

### 4-5-1 CPU (MAIN UNIT; IC19)

Pin number	Port name	Description
1	TONEIN	Input port for the decoded CTCSS signals.
7, 8	OSC1, OSC2	Input ports for the CPU system clock oscillator (X4: 10.000 MHz).
9	RES	Input port for the reset signal.
11	CLONEC	I/O port for the cloning signal.
12	PLSTB	Outputs strobe signals for the PLL IC (IC2).
13	STB	Outputs strobe signals for the D/A converter (IC3).
14	CK	Outputs serial clock signal for the PLL IC (IC2) and D/A converter (IC3).
15	DATA	Outputs serial data signals for the PLL IC (IC2) and D/A converter (IC3).
16	RXD	Input port for serial signal from the sub-CPU (CONTROL unit; IC10)
17	TXD	Output port for serial signal to the sub-CPU (CONTROL unit; IC10)
19	ESCK	Outputs clock signal for the EEPROM IC (IC17).
20	ESI	Input port for serial signal from the EEPROM IC (IC17).
21	ESO	Outputs data signal for the EEPROM IC (IC17).
22	ECS	Outputs chip select signal for the EEPROM IC (IC17).
23	MICIN	Input port for microphone serial signal via the MDATA controller (IC24).
24	EXTMIC	Input port to detect remote microphone connection. Low : HM-90/98 is connected.
25	ETONE	Outputs 1750 Hz Europe tone signal.
26	PCTRL	Outputs power switching circuit (Q74, Q75) control signal. High : While turning power ON.
34	VCK	Outputs serial clock signal for the electronic volume IC (IC10).
35	VDATA	Outputs data signal for the electronic volume IC (IC10).
44	PTTP1	Input port for packet PTT signal. High : Packet PTT switch is ON.
45	PTTM1	Input port for the PTT switch. High : While PTT switch is pushed.
46	VUNLK	PLL unlock signal input port for VHF band. High : PLL unlock on VHF band.
47	UUNLK	PLL unlock signal input port for UHF band. High : PLL unlock on UHF band.
52	1RX	Outputs control signal for the V-BIAS selector (Q34, Q35). High : While receiving on VHF band.
54	4RX	Output control signal for the U-BIAS selector (Q34, Q36). High : While receiving on UHF band.
59	W/N	Outputs Rx/Tx pass-bandwidth control signal. High : While narrow bandwidth is selected. ([EUR], [ITA] only)

Pin number	Port name	Description
60	VTX	Outputs transmit signal for VHF band. High : While transmitting on VHF band.
61	UTX	Outputs transmit signal for UHF band. High : While transmitting on UHF band.
64	MMUTE	Outputs MIC mute control signal. Low : While DTMF signals are output, etc.
68-75	POWC0-POWC7	Output ports for output power control signal.
78	FUNK	Outputs cooling fan control signal. High : While transmitting or after transmission for 2 minute.
79	UAMUTE	Outputs mute control signal for UHF AF signals. High : While UHF squelch is activate.
80	VAMUTE	Outputs mute control signal for VHF AF signals. High : While VHF squelch is activate.
81	UDMUTE	Outputs mute control signal for UHF demodulated signals. High : While UHF demodulated signals are muted.
82	VDMUTE	Outputs mute control signal for VHF demodulated signals. High : While VHF demodulated signals are muted.
83	OPD	Input port for detection signal from the DTMF unit. Low : While DTMF unit is connected.
85-85	Q1-Q4	Input ports for the decoded DTMF signal from the DTMF unit.
90	CTCSS	Outputs CTCSS signals.
91	DTMF	Outputs DTMF signals.

### 4-5-2 SUB-CPU (CONTROL UNIT; IC10)

Pin number	Port name	Description
5	LRES	Outputs reset signal for the LCD controller (IC8).
10	TXD	Input port for serial signal from the main-CPU (MAIN unit; IC19)
11	RXD	Output port for serial signal to the main-CPU (MAIN unit; IC19)
59, 60	VSQVLV, VVOLV	Squelch/volume setting level input ports for VHF band.
61, 62	USQVLV, UVOLV	Squelch/volume setting level input ports for UHF band.
73, 74	VDLA, VDLB	Input ports for the up/down signals from the VHF main dial.
75, 76	VDLA, VDLB	Input ports for the up/down signals from the VHF main dial.
77	BRITV	Outputs brightness control signal for the display backlight.
79	CONTV	Outputs control signal for the contrast of display.

# SECTION 5 ADJUSTMENT PROCEDURES

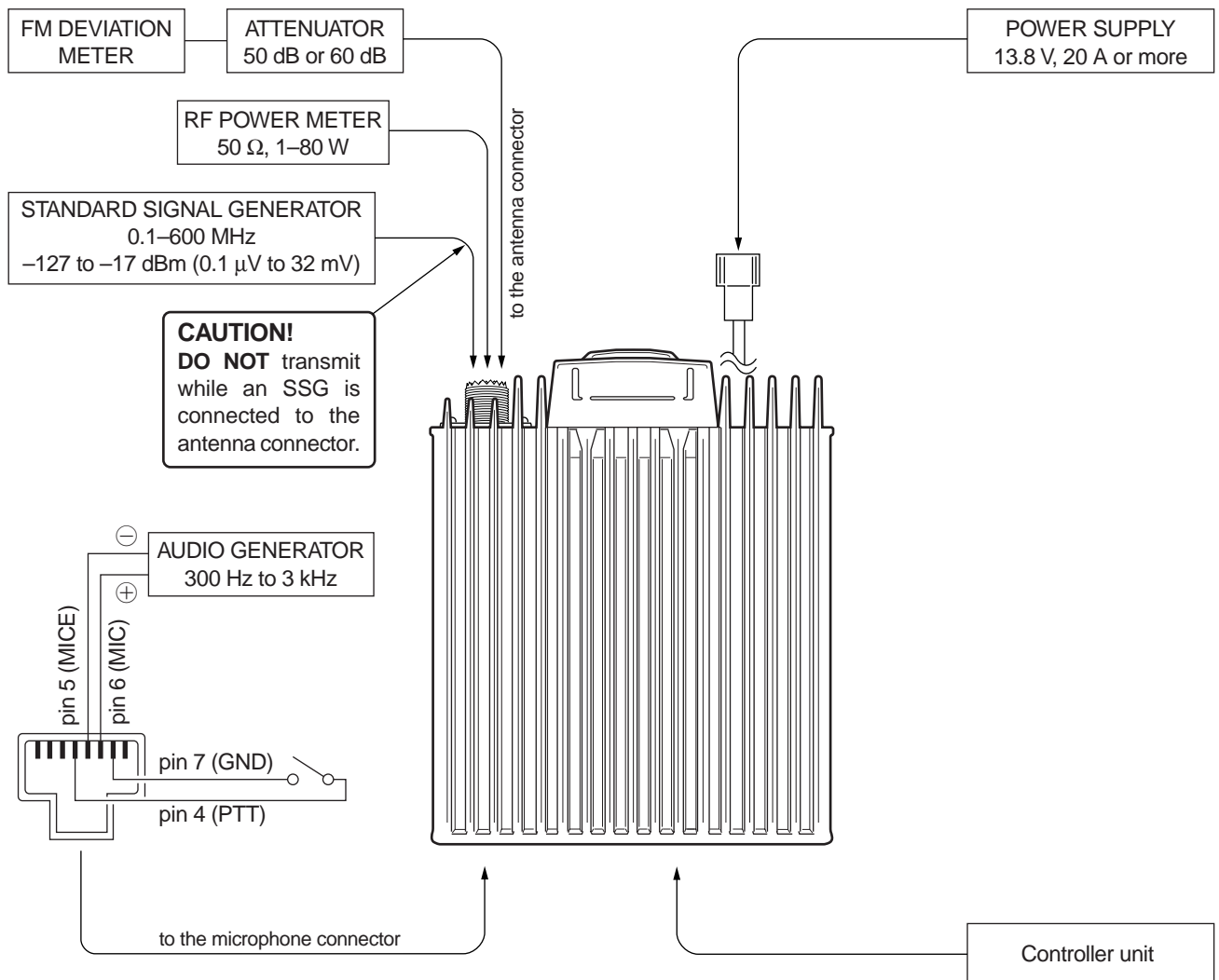
## 5-1 PREPARATION

All adjustments in this section must be performed on wide bandwidth condition unless specified otherwise.  
(Narrow bandwidth is selectable for Europe and Italy versions only.)

### ■ REQUIRED TEST EQUIPMENT

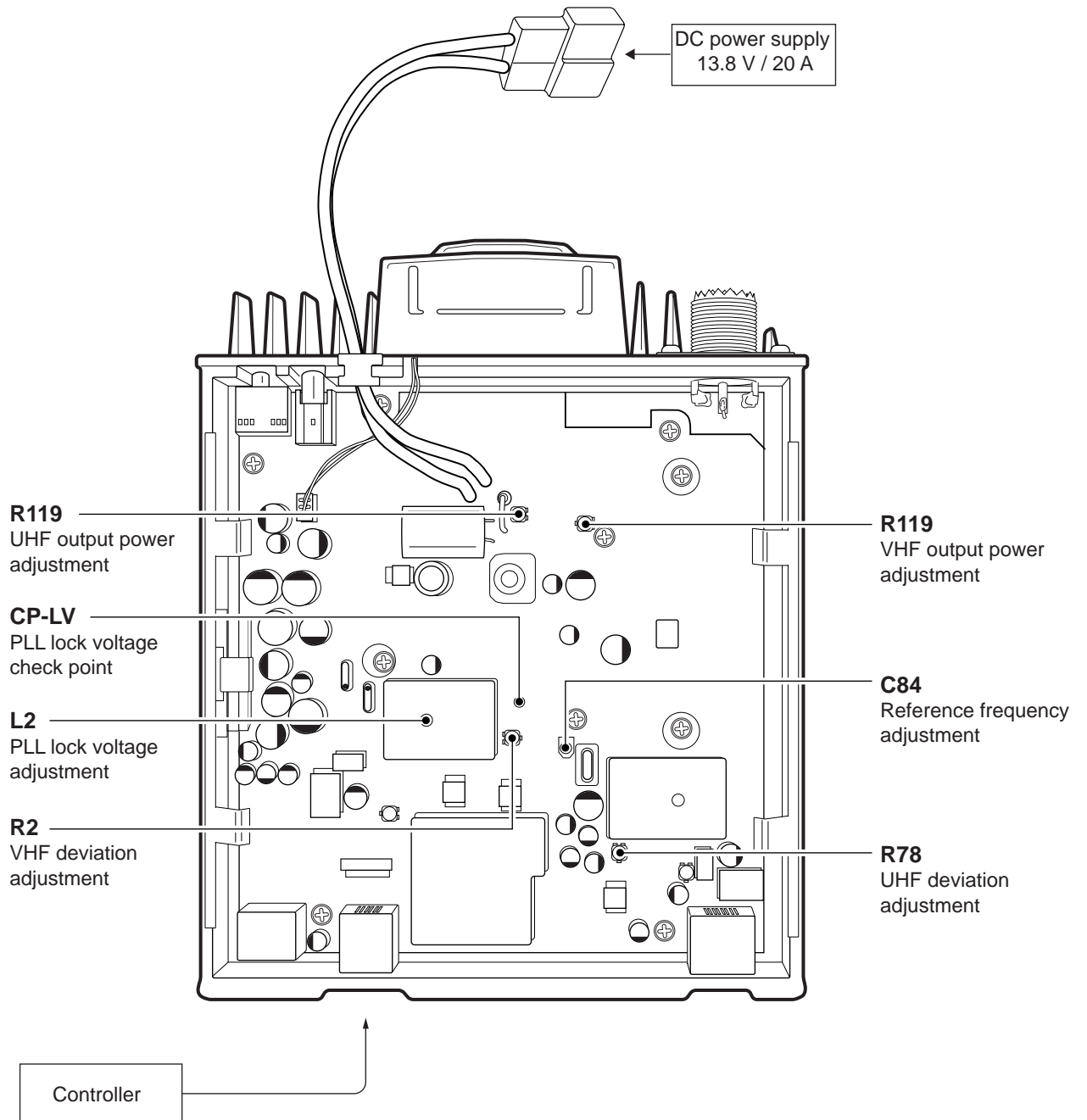
EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage : 13.8 V DC Current capacity : 20 A or more	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 1–80 W Frequency range : 100–600 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–600 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–600 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
FM deviation meter	Frequency range : 30–600 MHz Measuring range : 0 to ±10 kHz	AC millivoltmeter	Measuring range : 10 mV–10 V
DC voltmeter	Input impedance : 50 kΩ/V DC or better	External speaker	Input impedance : 8 Ω Capacity : 4 W or more
		Attenuator	Power attenuation : 50 or 60 dB Capacity : 100 W or more

### ■ CONNECTION



## 5-2 PLL AND TRANSMITTER ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
PLL LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>VHF displayed freq. : 145.000 MHz</li> <li>Receiving</li> </ul>	MAIN	Connect a digital multi-meter or oscilloscope to the check point CP-LV.	1.65 V	MAIN	L2	
PLL REFERENCE FREQUENCY	1 <ul style="list-style-type: none"> <li>UHF displayed freq. : 450.000 MHz [USA]</li> <li>440.000 MHz other</li> <li>Output power : Low</li> <li>Transmitting</li> </ul>	Rear panel	Loosely couple the frequency counter to the antenna connector.	450.0000 MHz [USA] 440.0000 MHz other	MAIN	C84	
UHF OUTPUT POWER	1 <ul style="list-style-type: none"> <li>UHF displayed freq. : 445.000 MHz [USA]</li> <li>435.000 MHz other</li> <li>Output power : High</li> <li>Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the antenna connector.	35 W	MAIN	R121	
	2 <ul style="list-style-type: none"> <li>Output power : Low</li> <li>Transmitting</li> </ul>			2-7 W			Verify
	3 <ul style="list-style-type: none"> <li>Output power : Mid-L</li> <li>Transmitting</li> </ul>			8-15 W			
	4 <ul style="list-style-type: none"> <li>Output power : Mid-H</li> <li>Transmitting</li> </ul>			16-24 W			
VHF OUTPUT POWER	1 <ul style="list-style-type: none"> <li>VHF displayed freq. : 145.000 MHz [EUR]</li> <li>146.000 MHz other</li> <li>Output power : High</li> <li>Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the antenna connector.	50 W	MAIN	R119	
	2 <ul style="list-style-type: none"> <li>Output power : Low</li> <li>Transmitting</li> </ul>			2-7 W			Verify
	3 <ul style="list-style-type: none"> <li>Output power : Mid-L</li> <li>Transmitting</li> </ul>			8-15 W			
	4 <ul style="list-style-type: none"> <li>Output power : Mid-H</li> <li>Transmitting</li> </ul>			16-24 W			
FREQUENCY DEVIATION	1 <ul style="list-style-type: none"> <li>UHF displayed freq. : 445.000 MHz [USA]</li> <li>435.000 MHz other</li> <li>Output power : Low</li> <li>Connect an audio generator to the [MIC] connector and set as: 1 kHz/ 80 mV [USA] 1 kHz/ 20 mV other</li> <li>TONE : OFF</li> <li>Set an FM deviation meter as: HPF : 50 Hz LPF : 20 kHz De-emphasis: OFF Detector : (P-P)/2</li> <li>Transmitting</li> </ul>	Rear panel	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.8 kHz	MAIN	R78	
	2 <ul style="list-style-type: none"> <li>VHF displayed freq. : 145.000 MHz [EUR]</li> <li>146.000 MHz other</li> <li>Output power : Low</li> <li>Transmitting</li> </ul>			±4.8 kHz			R2
	3 <ul style="list-style-type: none"> <li>IF bandwidth : Narrow [EUR, ITA] only</li> <li>Transmitting</li> </ul>			±2.0-±2.8 kHz			Verify



## 5-3 RECEIVER ADJUSTMENTS

The receiver adjustments must be performed after PLL ADJUSTMENTS.

ADJUSTMENT	ADJUSTMENT CONDITION	OPERATION	
SENSITIVITY	1	<ul style="list-style-type: none"> <li>• Turn into sensitivity setting mode.</li> </ul>	<ul style="list-style-type: none"> <li>• Connect a JIG1 to the [MIC] connector, then turn power ON.</li> </ul>
	2	<ul style="list-style-type: none"> <li>• Select an adjustment channel by pushing 1st or 2nd switch from the top on the left side.</li> <li>• Connect an SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Frequency : Same as displayed</li> <li>Level : 3.2 <math>\mu</math>V* (–97 dBm)</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> <li>Modulation : 1 kHz</li> </ul> </li> <li>• Receiving</li> </ul>	<ul style="list-style-type: none"> <li>• Push upper switch on the right side to store sampling data into memory.</li> </ul>
	3	<ul style="list-style-type: none"> <li>• Same adjustments as step 2 for another 4 channels.</li> </ul>	<ul style="list-style-type: none"> <li>• Push upper switch on the right side to store sampling data into memory at each adjustment.</li> <li>• Verify the display color will change after adjustment the last channel, then turn power OFF and disconnect a JIG1 from the [MIC] connector.</li> </ul>
S-METER	1	<ul style="list-style-type: none"> <li>• Turn into S-meter setting mode.</li> </ul>	<ul style="list-style-type: none"> <li>• Connect a JIG2 to the [MIC] connector, then turn power ON.</li> </ul>
	2	<ul style="list-style-type: none"> <li>• Select an adjustment channel by pushing 1st or 2nd switch from the top on the left side.</li> <li>• Displayed frequency : 127.200 MHz</li> <li>• Mode : AM</li> <li>• Connect an SSG to the antenna connector and set as:               <ul style="list-style-type: none"> <li>Level : 1.6 <math>\mu</math>V* (–103 dBm)</li> <li>Modulation : 1 kHz / 30 %</li> </ul> </li> <li>• Receiving</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that S-meter shows S3 (2 dots), then push upper switch on the right side to store sampling data into memory.</li> </ul>
	3	<ul style="list-style-type: none"> <li>• Displayed frequency : 145.200 MHz</li> <li>• Mode : FM</li> <li>• Set an SSG as:               <ul style="list-style-type: none"> <li>Level : 1.0 <math>\mu</math>V* (–107 dBm)</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> <li>Modulation : 1 kHz</li> </ul> </li> <li>• Receiving</li> </ul>	
	4	<ul style="list-style-type: none"> <li>• Displayed frequency : 360.200 MHz</li> <li>• Mode : AM</li> <li>• Set an SSG as:               <ul style="list-style-type: none"> <li>Level : 1.6 <math>\mu</math>V* (–103 dBm)</li> <li>Modulation : 1 kHz / 30 %</li> </ul> </li> <li>• Receiving</li> </ul>	
	5	<ul style="list-style-type: none"> <li>• Displayed frequency : 360.200 MHz</li> <li>• Mode : FM</li> <li>• Set an SSG as:               <ul style="list-style-type: none"> <li>Level : 1.0 <math>\mu</math>V* (–107 dBm)</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> <li>Modulation : 1 kHz</li> </ul> </li> <li>• Receiving</li> </ul>	
	6	<ul style="list-style-type: none"> <li>• Displayed frequency : 445.200 MHz [USA] 435.200 MHz other</li> <li>• Mode : FM</li> <li>• Receiving</li> </ul>	
	7	<ul style="list-style-type: none"> <li>• Displayed frequency : 900.200 MHz</li> <li>• Set an SSG as:               <ul style="list-style-type: none"> <li>Level : 6.3 <math>\mu</math>V* (–91 dBm)</li> <li>Deviation : <math>\pm</math>3.5 kHz</li> <li>Modulation : 1 kHz</li> </ul> </li> <li>• Mode : FM</li> <li>• Receiving</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that S-meter shows S3 (2 dots), then push upper switch on the right side to store sampling data into memory.</li> <li>• Verify the display color will change after adjustment the last channel, then turn power OFF and disconnect a JIG2 from the [MIC] connector.</li> </ul>

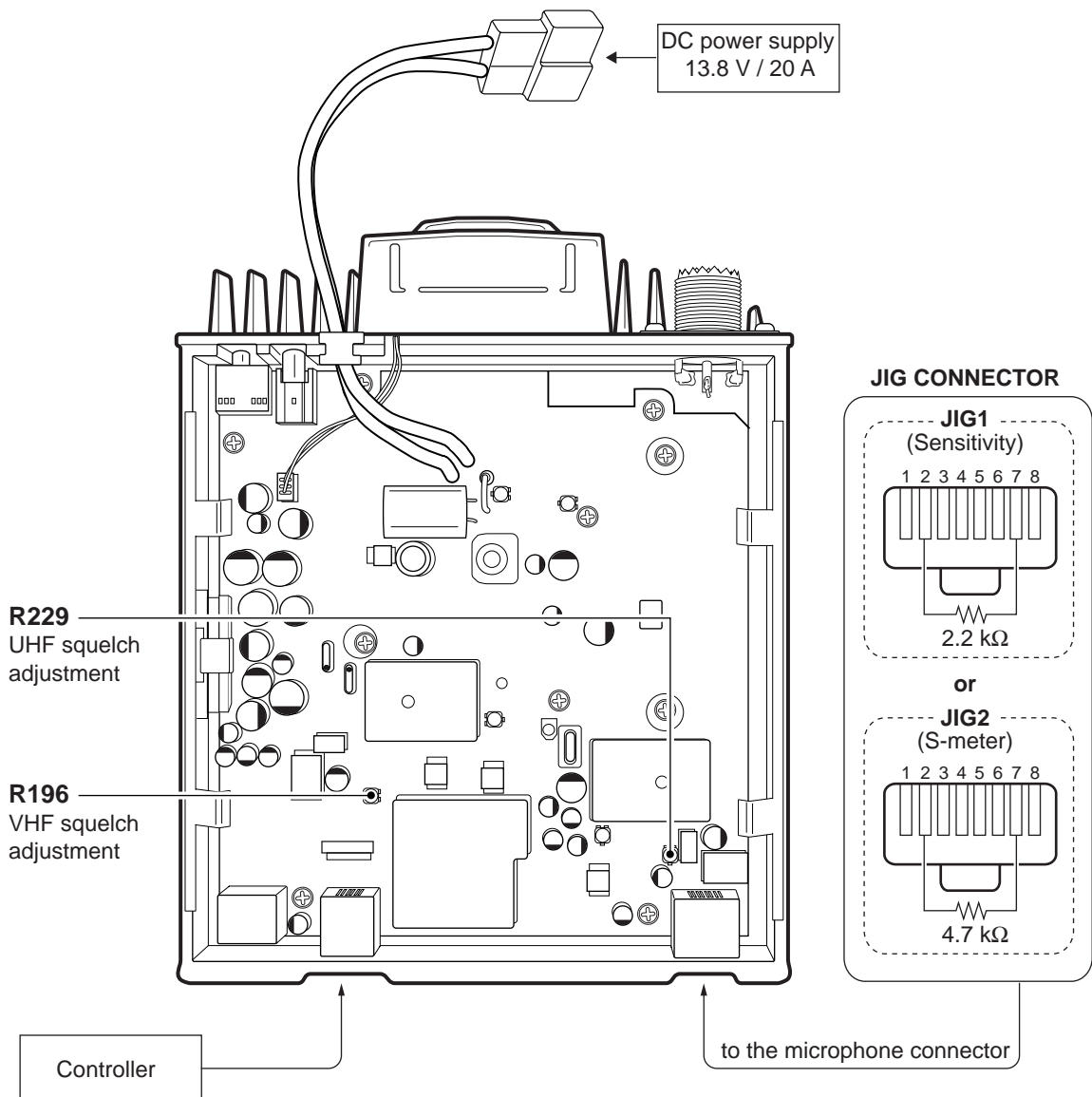
\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.



## RECEIVER ADJUSTMENTS (continued)

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
SQUELCH (UHF)	1	<ul style="list-style-type: none"> <li>UHF displayed freq. : 445.000 MHz [USA] 435.000 MHz other</li> <li>Set the squelch level to 22 % using the HM-98 microphone.</li> <li>R229 : Max clockwise</li> <li>set an SSG as: Level : 14 <math>\mu</math>V* (-85 dBm)</li> <li>Receiving</li> </ul>	Speaker		At the point where the signal just appears.	MAIN	R229
	(VHF)	2	<ul style="list-style-type: none"> <li>VHF displayed freq. : 145.000 MHz [EUR] 146.000 MHz other</li> <li>Set the squelch level to 22 % using the HM-98 microphone.</li> <li>R196 : Max clockwise</li> <li>set an SSG as: Level : 14 <math>\mu</math>V* (-85 dBm)</li> <li>Receiving</li> </ul>				

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



# SECTION 6 PARTS LIST

## [CONTROL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1130009250	S.IC	MN83951
IC2	1130008560	S.IC	TC75S51F (TE85L)
IC3	1180001830	S.IC	M5291FP
IC6	1120002580	S.IC	M52338FP
IC7	1130007420	S.IC	TC7W14FU (TE12L)
IC8	1190000950	S.IC	SED1354F0A (QFP15-128PIN)
IC9	1130009360	S.IC	LH61665AS-60A
IC10	1140007930	S.IC	HD6433032SK21F
IC11	1110004910	S.IC	S-80945ANMP-DD9-T2
IC14	1180000420	S.IC	TA78L05F (TE12R)
IC15	1180001850	S.IC	TA79L15F (TE12L)
IC16	1120002600	S.IC	M52045FP [EUR], [ITA]
	1120002590	S.IC	M52042FP other
IC17	1180000420	S.IC	TA78L05F (TE12R)
IC19	1130007110	S.IC	TC7W04FU (TE12L)
IC20	1130006550	S.IC	TC7S08FU (TE85R)
IC21	1120002610	S.IC	TC74AC244F (EL)
IC22	1180000420	S.IC	TA78L05F (TE12R)
IC23	1180000420	S.IC	TA78L05F (TE12R)
Q1	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q2	1510000510	S.TRANSISTOR	2SA1576A T106R
Q3	1510000510	S.TRANSISTOR	2SA1576A T106R
Q4	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q5	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q6	1510000510	S.TRANSISTOR	2SA1576A T106R
Q7	1510000510	S.TRANSISTOR	2SA1576A T106R
Q8	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q11	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q12	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q13	1510000510	S.TRANSISTOR	2SA1576A T106R
Q14	1530003300	S.TRANSISTOR	2SC3647S-TD
Q15	1530003300	S.TRANSISTOR	2SC3647S-TD
Q16	1510000580	S.TRANSISTOR	2SA1362-GR (TE85R)
Q17	1590000430	S.TRANSISTOR	DTC144EUA T106
Q18	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q19	1590000430	S.TRANSISTOR	DTC144EUA T106
Q20	1510000580	S.TRANSISTOR	2SA1362-GR (TE85R)
Q21	1520000200	S.TRANSISTOR	2SB798-T2 DK
D1	1750000550	S.DIODE	1SS355 TE-17
D2	1720000690	S.VARICAP	1SV282 (TPH2)
D3	1790001470	S.DIODE	SB10-05PCP-TD
D9	1750000550	S.DIODE	1SS355 TE-17
D10	1730002260	S.ZENER	MA8030-H (TX)
D11	1730002260	S.ZENER	MA8030-H (TX)
D12	1790001040	S.ZENER	MA8033-L (TX)
D13	1790001010	S.ZENER	MA8043-L (TX)
D14	1730002340	S.ZENER	MA8047-M (TX)
X1	6050010610	S.XTAL	CR-641 (4.433619 MHz)
	6050010620	S.XTAL	CR-640 (3.579545 MHz) [EUR], [ITA]
X2	6050009860	S.XTAL	CR-566 (12.288 MHz) other
X3	6060000730	S.CERAMIC	CSTCV26.25MXJ040
L1	6200005010	S.COIL	NL 252018T-100J
L2	6200005010	S.COIL	NL 252018T-100J
L3	6200005010	S.COIL	NL 252018T-100J
L4	6200005010	S.COIL	NL 252018T-100J
L5	6200005010	S.COIL	NL 252018T-100J
L7	6200005010	S.COIL	NL 252018T-100J
L8	6200003710	S.COIL	NL 252018T-2R7J
L9	6200005010	S.COIL	NL 252018T-100J
L10	6200005010	S.COIL	NL 252018T-100J
L11	6200008880	S.COIL	SLF7032T-681MR16-2
L13	6200005010	S.COIL	NL 252018T-100J
L14	6200005010	S.COIL	NL 252018T-100J
L15	6200005010	S.COIL	NL 252018T-100J
L16	6200005010	S.COIL	NL 252018T-100J
L18	6200008810	S.COIL	SLF6028T-101MR42
L19	6190001360	S.COIL	678XN-1369

## [CONTROL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
R1	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R2	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R3	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R4	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R5	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R6	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R7	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R8	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R9	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R10	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R11	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R12	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R13	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R14	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R15	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R16	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R17	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R18	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R20	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R21	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R22	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R23	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R24	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R25	7030003610	S.RESISTOR	ERJ3GEYJ 273 V (27 kΩ)
R26	7310003600	S.TRIMMER	EVM-1XSX50 B54 (503)
R27	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R28	7030000020	S.RESISTOR	MCR10EZJH 1 Ω (010)
R29	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R30	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R31	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R32	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R33	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R34	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R35	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R37	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R38	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R39	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R40	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R41	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R42	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R44	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R51	7030003800	S.RESISTOR	ERJ3GEYJ 105 V (1 MΩ)
R58	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R59	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω) [EUR], [ITA]
R60	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω) other
R61	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R62	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R63	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R65	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R84	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R86	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R87	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R89	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R100	7030003700	S.RESISTOR	ERJ3GEYJ 154 V (150 kΩ)
R106	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R107	7030003420	S.RESISTOR	ERJ3GEYJ 681 V (680 Ω)
R108	7030003530	S.RESISTOR	ERJ3GEYJ 562 V (5.6 kΩ)
R109	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R110	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R112	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R113	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R114	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R115	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R116	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R117	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R118	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R119	7030003580	S.RESISTOR	ERJ3GEYJ 153 V (15 kΩ)
R120	7030003540	S.RESISTOR	ERJ3GEYJ 682 V (6.8 kΩ)
R121	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R122	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R123	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R124	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R125	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R126	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)

S.=Surface mount





**[CONTROL UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
DS1	5030001660	LCD	EDTCA22QB0
DS2	5080000430	CFL	HMB S 3 AIW 83N/AZ ASSY
S1	2260002560	S.SWITCH	EVQ-PPX A25
S2	2260002560	S.SWITCH	EVQ-PPX A25
S3	2260002560	S.SWITCH	EVQ-PPX A25
S4	2260002560	S.SWITCH	EVQ-PPX A25
S5	2260002560	S.SWITCH	EVQ-PPX A25
S6	2260002560	S.SWITCH	EVQ-PPX A25
S7	2260002560	S.SWITCH	EVQ-PPX A25
S8	2260002560	S.SWITCH	EVQ-PPX A25
S9	2260002560	S.SWITCH	EVQ-PPX A25
S10	2260002560	S.SWITCH	EVQ-PPX A25
S11	2250000370	ENCODER	EVQ-VENF0124B
S12	2250000370	ENCODER	EVQ-VENF0124B
SP1	2510000820	SPEAKER	VS-57-0814
W4	7030003860	S.JUMPER	ERJ3GE JPW V [EUR], [ITA] only
W6	7030003860	S.JUMPER	ERJ3GE JPW V
W8	7030003860	S.JUMPER	ERJ3GE JPW V
W10	7030003860	S.JUMPER	ERJ3GE JPW V
W11	7030003860	S.JUMPER	ERJ3GE JPW V
W12	7030003860	S.JUMPER	ERJ3GE JPW V
W13	7030003860	S.JUMPER	ERJ3GE JPW V
W14	7030003860	S.JUMPER	ERJ3GE JPW V
WS1	8600036480	M.OTHER	FX2047 P01CO
EP1	0910050843	PCB	B 5254C
EP2	6910012350	S.BEAD	MMZ1608Y 102BT

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
IC1	1150001970	IC	M67746-01
IC2	1130009180	S.IC	M64076AGP 600C
IC3	1110003690	S.IC	M62354GP 75EC
IC4	1150001620	IC	M57788MR/SC-1318
IC5	1110002750	S.IC	TA75S01F (TE85R)
IC6	1140003830	S.IC	TC4W66F (TE12L) [EUR], [ITA] only
IC7	1140003830	S.IC	TC4W66F (TE12L) [EUR], [ITA] only
IC8	1110003490	S.IC	TA31136FN (D,EL)
IC9	1110001971	S.IC	μPC1676G-T1
IC10	1110004490	S.IC	M62429FP 700C
IC11	1130003760	S.IC	TC4S81F (TE85R)
IC12	1110002540	IC	LA4445
IC13	1130008090	S.IC	BU4066BCFV-E1
IC14	1180001250	S.IC	TA7808F (TE16L)
IC15	1180001070	S.IC	TA7805F (TE16L)
IC16	1110004750	S.IC	S-80945ALMP-DA9-T2
IC17	1140005880	S.IC	X25320S8I-2.7T6
IC19	1140007950	S.IC	HD6433876NB10H
	1140007960	S.IC	HD6433876NB11H
IC20	1110000960	S.IC	NJM4558M-T1
IC21	1130008090	S.IC	BU4066BCFV-E1
IC23	1110000960	S.IC	NJM4558M-T1
IC24	1130008560	S.IC	TA75S51F (TE85R)
IC25	1130007020	S.IC	TC7S66FU (TE85R)
IC26	1130008090	S.IC	BU4066BCFV-E1
IC27	1110000960	S.IC	NJM4558M-T1
IC28	1110003490	S.IC	TA31136FN (D,EL)
IC29	1130008230	S.IC	BU4053BCFV-E2
Q1	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q2	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q3	1590000430	S.TRANSISTOR	DTC144EUA T106
Q4	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q5	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q6	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q7	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q8	1530003550	S.TRANSISTOR	2SC5193-T1
Q9	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q10	1510000580	S.TRANSISTOR	2SA1362-GR (TE85R)
Q11	1530002680	S.TRANSISTOR	2SC3357-T2
Q12	1530002340	S.TRANSISTOR	2SC2954-T2B
Q13	1590000430	S.TRANSISTOR	DTC144EUA T106
Q14	1590000980	S.TRANSISTOR	DTB123EK T147
Q15	1580000490	S.FET	3SK166A-2-T7
Q16	1580000490	S.FET	3SK166A-2-T7
Q17	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q18	1560000530	S.FET	2SK880-GR (TE85R)
Q19	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q20	1530002930	S.TRANSISTOR	2SC4228 (M) -T1 R45
Q21	1530002930	S.TRANSISTOR	2SC4228 (M) -T1 R45
Q22	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q23	1530003550	S.TRANSISTOR	2SC5193-T1
Q24	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q25	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q26	1510000580	S.TRANSISTOR	2SA1362-GR (TE85R)
Q27	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q28	1530002680	S.TRANSISTOR	2SC3357-T2
Q29	1530002340	S.TRANSISTOR	2SC2954-T2B
Q30	1520000730	S.TRANSISTOR	2SB934P (DS) -(TX)
Q31	1530002280	S.TRANSISTOR	2SC4081 T107 S
Q32	1590001320	S.TRANSISTOR	DTC143ZUA T106
Q33	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q34	1590002270	S.TRANSISTOR	UMG9N TL
Q35	1590000980	S.TRANSISTOR	DTB123EK T147
Q36	1590000980	S.TRANSISTOR	DTB123EK T147
Q37	1590002270	S.TRANSISTOR	UMG9N TL
Q38	1590000980	S.TRANSISTOR	DTB123EK T147
Q39	1590000980	S.TRANSISTOR	DTB123EK T147
Q40	1530002600	S.TRANSISTOR	2SC4215-O (TE85R)
Q41	1530003550	S.TRANSISTOR	2SC5193-T1
Q42	1590000430	S.TRANSISTOR	DTC144EUA T106
Q43	1580000480	S.FET	3SK184-S (TX)
Q44	1580000490	S.FET	3SK166A-2-T7
Q45	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q46	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q47	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q48	1530002920	S.TRANSISTOR	2SC4226-T2 R25
Q49	1590000430	S.TRANSISTOR	DTC144EUA T106
Q50	1580000480	S.FET	3SK184-S (TX)

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
Q51	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q52	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R) [EUR], [ITA] only
Q53	1590000430	S.TRANSISTOR	DTC144EUA T106
Q54	1560000840	S.FET	2SK1829 (TE85R) [EUR], [ITA] only
Q55	1590001450	S.FET	2SJ144-GR (TE85R)
Q56	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q57	1560000530	S.FET	2SK880-GR (TE85R)
Q58	1590000720	S.TRANSISTOR	DTA144EUA T106 [EUR], [ITA] only
Q59	1560000530	S.FET	2SK880-GR (TE85R)
Q60	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q61	1590000430	S.TRANSISTOR	DTC144EUA T106
Q62	1590001450	S.FET	2SJ144-GR (TE85R)
Q63	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q64	1560000530	S.FET	2SK880-GR (TE85R)
Q65	1560000530	S.FET	2SK880-GR (TE85R)
Q66	1590000430	S.TRANSISTOR	DTC144EUA T106
Q67	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q68	1530003230	S.TRANSISTOR	2SC5085-Y (TE85R)
Q69	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q70	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q71	1530003090	S.TRANSISTOR	2SC4213-B (TE85R)
Q72	1590000430	S.TRANSISTOR	DTC144EUA T106
Q73	1590000430	S.TRANSISTOR	DTC144EUA T106
Q74	1590002110	S.TRANSISTOR	DTC143XU T107
Q75	1520000650	S.TRANSISTOR	2SB1201-S-TL
Q76	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q77	1520000460	S.TRANSISTOR	2SB1132 T100 R
Q78	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q79	1510000510	S.TRANSISTOR	2SA1576A T106R
Q80	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q81	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q82	1590000430	S.TRANSISTOR	DTC144EUA T106
Q83	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q84	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q85	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q86	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q87	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q88	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q89	1530002850	S.TRANSISTOR	2SC4116-BL (TE85R) [EUR], [ITA] only
Q90	1540000250	S.TRANSISTOR	2SD999-T2 CK
Q91	1590000720	S.TRANSISTOR	DTA144EUA T106
Q92	1590000680	S.TRANSISTOR	DTC114EUA T106
Q93	1590000430	S.TRANSISTOR	DTC144EUA T106
Q95	1590000430	S.TRANSISTOR	DTC144EUA T106
Q96	1530002060	S.TRANSISTOR	2SC4081 T107 R
Q98	1590000660	S.TRANSISTOR	DTC144TU T107
Q99	1530002490	S.TRANSISTOR	2SC3324-GR (TE85R)
Q100	1560000540	S.FET	2SK880-Y (TE85R)
Q101	1530002490	S.TRANSISTOR	2SC3324-GR (TE85R)
Q102	1560000540	S.FET	2SK880-Y (TE85R)
Q103	1590000430	S.TRANSISTOR	DTC144EUA T106 [EUR], [ITA] only
D1	1750000550	S.DIODE	1SS355 TE-17
D2	1790000620	S.DIODE	MA77 (TX)
D3	1720000370	S.VARICAP	HVU350TRF
D4	1790000450	S.DIODE	MA862 (TX)
D5	1750000370	S.DIODE	DA221 TL
D6	1750000550	S.DIODE	1SS355 TE-17
D7	1790001670	S.DIODE	RB706F-40T106
D8	1790001670	S.DIODE	RB706F-40T106
D9	1750000510	S.DIODE	UM9401F
D10	1160000060	S.DIODE	DAN202U T107
D11	1720000370	S.VARICAP	HVU350TRF
D12	1720000370	S.VARICAP	HVU350TRF
D13	1720000370	S.VARICAP	HVU350TRF
D14	1750000550	S.DIODE	1SS355 TE-17
D15	1720000370	S.VARICAP	HVU350TRF
D16	1750000550	S.DIODE	1SS355 TE-17
D18	1750000510	S.DIODE	UM9401F
D19	1750000550	S.DIODE	1SS355 TE-17
D20	1720000640	S.VARICAP	1SV284 (TPH3)
D21	1720000640	S.VARICAP	1SV284 (TPH3)
D22	1790000450	S.DIODE	MA862 (TX)
D23	1790000620	S.DIODE	MA77 (TX)
D24	1750000370	S.DIODE	DA221 TL
D25	1790001670	S.DIODE	RB706F-40T106

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	
D26	1790001670	S.DIODE	RB706F-40T106
D27	1750000510	S.DIODE	UM9401F
D28	1750000550	S.DIODE	1SS355 TE-17
D29	1160000060	S.DIODE	DAN202U T107
D30	1790000860	S.DIODE	MA133 (TX)
D31	1790001670	S.DIODE	RB706F-40T106
D32	1160000060	S.DIODE	DAN202U T107
D33	1790000620	S.DIODE	MA77 (TX)
D35	1750000550	S.DIODE	1SS355 TE-17
D36	1790000450	S.DIODE	MA862 (TX)
D37	1750000550	S.DIODE	1SS355 TE-17
D39	1750000510	S.DIODE	UM9401F
D40	1730002340	S.ZENER	MA8047-M (TX)
D41	1790001670	S.DIODE	RB706F-40T106
D42	1730002340	S.ZENER	MA8047-M (TX)
D43	1790001670	S.DIODE	RB706F-40T106
D44	1790001520	S.ZENER	MA8075-L (TX)
D45	1790000700	DIODE	DSA3A1
D46	1730000520	ZENER	RD20E B2
D47	1750000550	S.DIODE	1SS355 TE-17
D49	1750000550	S.DIODE	1SS355 TE-17 except [USA]
D50	1750000170	S.DIODE	DA115 T107 [EUR], [ITA]
	1160000060	S.DIODE	DAN202U T107 [CSA]
D52	1750000550	S.DIODE	1SS355 TE-17 [USA], [SEA]
D53	1750000550	S.DIODE	1SS355 TE-17 except [ITA], [CSA]
D54	1750000550	S.DIODE	1SS355 TE-17 except [ITA], [CSA]
D55	1750000170	S.DIODE	DA115 T107 [EUR], [ITA]
	1160000060	S.DIODE	DAN202U T107 [SEA]
D56	1750000550	S.DIODE	1SS355 TE-17 [ITA], [SEA]
D57	1750000550	S.DIODE	1SS355 TE-17 except [EUR]
D59	1710000600	DIODE	1SS254 [EUR]
D60	1710000600	DIODE	1SS254 except [USA]
D61	1790001000	S.ZENER	MA8062-L (TX)
D62	1750000550	S.DIODE	1SS355 TE-17
D63	1730002280	S.ZENER	MA8091-M (TX)
D64	1730002280	S.ZENER	MA8091-M (TX)
D65	1750000550	S.DIODE	1SS355 TE-17
D66	1750000550	S.DIODE	1SS355 TE-17
D67	1790000660	S.DIODE	MA728 (TX)
D68	1790001670	S.DIODE	RB706F-40T106
D70	1790001010	S.ZENER	MA8043-L (TX)
D71	1750000550	S.DIODE	1SS355 TE-17
D72	1710000870	S.DIODE	HVU131TRF
D73	1750000550	S.DIODE	1SS355 TE-17
D74	1750000130	S.DIODE	DA204U T107
D75	1750000130	S.DIODE	DA204U T107
D76	1790000620	S.DIODE	MA77 (TX)
D77	1790000620	S.DIODE	MA77 (TX)
D78	1790000620	S.DIODE	MA77 (TX)
D79	1750000550	S.DIODE	1SS355 TE-17
D80	1750000550	S.DIODE	1SS355 TE-17
F11	2010002240	MONOLITHIC	FL-288 (15.650 MHz)
F12	2010002360	S.MONOLITHIC	FL-300 (46.05 MHz)
F13	2040001020	S.SAW	EFCH445MWNP1 [USA], [CSA]
	2040001000	S.SAW	EFCH435MWNP1 other
F14	2020001590	CERAMIC	ALFY450F=K
F15	2020001460	CERAMIC	CFWS450HT [EUR], [ITA] only
F16	2020001520	CERAMIC	CFWS450F
X1	6050009820	XTAL	CR-549 (15.2 MHz)
X2	6070000200	DISCRIMINATOR	CDB450C24
X3	6070000200	DISCRIMINATOR	CDB450C24
X4	6050010580	S.XTAL	SMD-49 (10.000 MHz)
L1	6200002850	S.COIL	NL 252018T-R82J
L2	6130002420	S.COIL	LB-270
L3	6200002840	S.COIL	NL 252018T-R22J
L4	6200002840	S.COIL	NL 252018T-R22J
L5	6200005740	S.COIL	ELJRE 47NG-F
L6	6200005690	S.COIL	ELJRE 18NG-F
L7	6200006670	S.COIL	ELJRE 68NG-F
L8	6200005710	S.COIL	ELJRE 27NG-F
L9	6200006670	S.COIL	ELJRE 68NG-F
L10	6200005740	S.COIL	ELJRE 47NG-F
L11	6110001550	COIL	LA-235
L12	6110001550	COIL	LA-235

S.=Surface mount

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
L13	6170000230	COIL	LW-25
L15	6110001610	COIL	LA-244
L16	6110002150	COIL	LA-385
L17	6200002840	S.COIL	NL 252018T-R22J
L18	6200002850	S.COIL	NL 252018T-R82J
L19	6200002640	S.COIL	NL 252018T-R15J
L20	6200007760	S.COIL	LQN21A 82NJ04
L21	6200007760	S.COIL	LQN21A 82NJ04
L22	6200008090	S.COIL	LQN21A 68NJ04
L23	6200003270	S.COIL	NL 252018T-R56J
L24	6200003280	S.COIL	NL 252018T-2R2J
L25	6200002180	S.COIL	NL 252018T-R12J
L26	6200008090	S.COIL	LQN21A 68NJ04
L28	6110001560	COIL	LA-236
L29	6200002850	S.COIL	NL 252018T-R82J
L30	6200002320	S.COIL	LQN 1A 8N8J04
L31	6200005710	S.COIL	ELJRE 27NG-F
L32	6200005720	S.COIL	ELJRE 33NG-F
L33	6200005690	S.COIL	ELJRE 18NG-F
L34	6200005720	S.COIL	ELJRE 33NG-F
L35	6200005690	S.COIL	ELJRE 18NG-F
L36	6200005660	S.COIL	ELJRE 10NG-F
L37	6200005700	S.COIL	ELJRE 22NG-F
L38	6200005700	S.COIL	ELJRE 22NG-F
L39	6200005680	S.COIL	ELJRE 15NG-F
L40	6110002110	COIL	LA-382
L41	6170000230	COIL	LW-25
L42	6110001520	COIL	LA-232
L43	6110002110	COIL	LA-382
L44	6110001520	COIL	LA-232
L45	6110001520	COIL	LA-232
L46	6200004740	S.COIL	NL 252018T-1R2J
L47	6200003270	S.COIL	NL 252018T-R56J
L48	6200003960	S.COIL	MLF1608A 1R0K-T
L49	6200005740	S.COIL	ELJRE 47NG-F
L50	6200005720	S.COIL	ELJRE 33NG-F
L51	6200005740	S.COIL	ELJRE 47NG-F
L52	6200005740	S.COIL	ELJRE 47NG-F
L54	6110001590	COIL	LA-242
L55	6200005700	S.COIL	ELJRE 22NG-F
L56	6200005700	S.COIL	ELJRE 22NG-F
L59	6200005650	S.COIL	ELJRE 8N2Z-F
L60	6200005680	S.COIL	ELJRE 15NG-F
L61	6200005650	S.COIL	ELJRE 8N2Z-F
L62	6200005650	S.COIL	ELJRE 8N2Z-F
L63	6200002090	S.COIL	ELJFB 681K-F
L64	6200002090	S.COIL	ELJFB 681K-F
L65	6200000050	S.COIL	LQH 3N R39M 04
L66	6200007380	S.COIL	ELJFC 8R2K-F
L67	6200007380	S.COIL	ELJFC 8R2K-F
L68	6200004950	S.COIL	NL 252018T-1R8J
L69	6200004950	S.COIL	NL 252018T-1R8J
L70	6200005950	S.COIL	LQH 3N 2R2M04 (Q20)
L71	6200004920	S.COIL	MLF1608A 2R2K-T
L72	6200004920	S.COIL	MLF1608A 2R2K-T
L73	6200004920	S.COIL	MLF1608A 2R2K-T
L74	6200005950	S.COIL	LQH 3N 2R2M04 (Q20)
L75	6200004920	S.COIL	MLF1608A 2R2K-T
L76	6200002850	S.COIL	NL 252018T-R82J
L77	6200004920	S.COIL	MLF1608A 2R2K-T
L78	6110001550	COIL	LA-235
L79	6200005670	S.COIL	ELJRE 12NG-F
L80	6200005660	S.COIL	ELJRE 10NG-F
L81	6200005660	S.COIL	ELJRE 10NG-F
L82	6110001520	COIL	LA-232
R1	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R2	7310003580	S.TRIMMER	EVM-1XSX50 B15 (104)
R3	7030009540	S.RESISTOR	ERJ3EKF 8202 V (82 kΩ)
R4	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R5	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R6	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R7	7030003660	S.RESISTOR	ERJ3GEYJ 683 V (68 kΩ)
R8	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R9	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R10	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R11	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R12	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R13	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R14	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R15	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
R17	7030009550	S.RESISTOR	ERJ3EKF 1203 V (120 kΩ)
R18	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R19	7030003410	S.RESISTOR	ERJ3GEYJ 561 V (560 Ω)
R20	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R21	7030003400	S.RESISTOR	ERJ3GEYJ 471 V (470 Ω)
R22	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R23	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R24	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R25	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R26	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R27	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R28	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R29	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R30	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R31	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R32	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R33	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R34	7030003270	S.RESISTOR	ERJ3GEYJ 390 V (39 Ω)
R35	7030003340	S.RESISTOR	ERJ3GEYJ 151 V (150 Ω)
R36	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R37	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R38	7030000180	S.RESISTOR	MCR10EZHZJ 22 Ω (220)
R39	7030000180	S.RESISTOR	MCR10EZHZJ 22 Ω (220)
R40	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R41	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R42	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R43	7030001050	S.RESISTOR	MCR50JZHJ 22 Ω (220)
R44	7030000280	S.RESISTOR	MCR10EZHZJ 150 Ω (151)
R45	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R46	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R47	7030001130	S.RESISTOR	MCR50JZHJ 100 Ω (101)
R48	7030003670	S.RESISTOR	ERJ3GEYJ 823 V (82 kΩ)
R49	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R50	7030003760	S.RESISTOR	ERJ3GEYJ 474 V (470 kΩ)
R51	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R52	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R54	7030003840	S.RESISTOR	ERJ3GEYJ 225 V (2.2 MΩ)
R56	7030003510	S.RESISTOR	ERJ3GEYJ 392 V (3.9 kΩ)
R58	7030003490	S.RESISTOR	ERJ3GEYJ 272 V (2.7 kΩ)
R59	7030003600	S.RESISTOR	ERJ3GEYJ 223 V (22 kΩ)
R60	7030003470	S.RESISTOR	ERJ3GEYJ 182 V (1.8 kΩ)
R61	7030003430	S.RESISTOR	ERJ3GEYJ 821 V (820 Ω)
R62	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R63	7030003360	S.RESISTOR	ERJ3GEYJ 221 V (220 Ω)
R64	7030003350	S.RESISTOR	ERJ3GEYJ 181 V (180 Ω)
R65	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R66	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R67	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R68	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R69	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R70	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R71	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R72	7030003320	S.RESISTOR	ERJ3GEYJ 101 V (100 Ω)
R73	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R74	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R75	7030003680	S.RESISTOR	ERJ3GEYJ 104 V (100 kΩ)
R76	7030003500	S.RESISTOR	ERJ3GEYJ 332 V (3.3 kΩ)
R77	7030003520	S.RESISTOR	ERJ3GEYJ 472 V (4.7 kΩ)
R78	7310003580	S.TRIMMER	EVM-1XSX50 B15 (104)
R79	7030009540	S.RESISTOR	ERJ3EKF 8202 V (82 kΩ)
R80	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (10 kΩ)
R81	7510001100	S.THERMISTOR	NTCCM1608 4LH 104KC
R82	7030003440	S.RESISTOR	ERJ3GEYJ 102 V (1 kΩ)
R83	7030003720	S.RESISTOR	ERJ3GEYJ 224 V (220 kΩ)
R84	7030003740	S.RESISTOR	ERJ3GEYJ 334 V (330 kΩ)
R85	7030003630	S.RESISTOR	ERJ3GEYJ 393 V (39 kΩ)
R86	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R87	7030003590	S.RESISTOR	ERJ3GEYJ 183 V (18 kΩ)
R88	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R89	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R90	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R92	7030009550	S.RESISTOR	ERJ3EKF 1203 V (120 kΩ)
R93	7030003220	S.RESISTOR	ERJ3GEYJ 150 V (15 Ω)
R94	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R95	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R96	7030003620	S.RESISTOR	ERJ3GEYJ 333 V (33 kΩ)
R97	7030003380	S.RESISTOR	ERJ3GEYJ 331 V (330 Ω)
R98	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R99	7030003280	S.RESISTOR	ERJ3GEYJ 470 V (47 Ω)
R100	7030003640	S.RESISTOR	ERJ3GEYJ 473 V (47 kΩ)
R101	7030003480	S.RESISTOR	ERJ3GEYJ 222 V (2.2 kΩ)
R102	7030003560	S.RESISTOR	ERJ3GEYJ 103 V (100 kΩ)

S.=Surface mount

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R103	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R104	7030003440	S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)
R105	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R106	7030003420	S.RESISTOR ERJ3GEYJ 681 V (680 Ω)
R107	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R108	7030003280	S.RESISTOR ERJ3GEYJ 470 V (47 Ω)
R109	7030003240	S.RESISTOR ERJ3GEYJ 220 V (22 Ω)
R110	7030003420	S.RESISTOR ERJ3GEYJ 681 V (680 Ω)
R111	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R112	7030000180	S.RESISTOR MCR10EZJH 22 Ω (220)
R113	7030000180	S.RESISTOR MCR10EZJH 22 Ω (220)
R114	7030003420	S.RESISTOR ERJ3GEYJ 681 V (680 Ω)
R115	7030003430	S.RESISTOR ERJ3GEYJ 821 V (820 Ω)
R116	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R117	7030001050	S.RESISTOR MCR50ZJH 22 Ω (220)
R118	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R119	7310003580	S.TRIMMER EVM-1XSX50 B15 (104)
R120	7030003590	S.RESISTOR ERJ3GEYJ 183 V (18 kΩ)
R121	7310003580	S.TRIMMER EVM-1XSX50 B15 (104)
R122	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R123	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R124	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R125	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R126	7030003790	S.RESISTOR ERJ3GEYJ 824 V (820 kΩ)
R127	7030003610	S.RESISTOR ERJ3GEYJ 273 V (27 kΩ)
R128	7030003610	S.RESISTOR ERJ3GEYJ 273 V (27 kΩ)
R129	7030003650	S.RESISTOR ERJ3GEYJ 563 V (56 kΩ)
R130	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R131	7030001190	S.RESISTOR MCR50ZJH 330 Ω (331)
R132	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R133	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R134	7030001130	S.RESISTOR MCR50ZJH 100 Ω (101)
R135	7030000280	S.RESISTOR MCR10EZJH 150 Ω (151)
R136	7030003720	S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)
R137	7030003430	S.RESISTOR ERJ3GEYJ 821 V (820 Ω)
R138	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R139	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R140	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R141	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R142	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R143	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R144	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R145	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R146	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R147	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R148	7030003390	S.RESISTOR ERJ3GEYJ 391 V (390 Ω)
R149	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R150	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R151	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R152	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R153	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R154	7030003370	S.RESISTOR ERJ3GEYJ 271 V (270 Ω)
R155	7030003400	S.RESISTOR ERJ3GEYJ 471 V (470 Ω)
R156	7030003380	S.RESISTOR ERJ3GEYJ 331 V (330 Ω)
R157	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R158	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R159	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R160	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R162	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R163	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R164	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R165	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R166	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R167	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R168	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R169	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R170	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R171	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R172	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R173	7030000280	S.RESISTOR MCR10EZJH 150 Ω (151)
R174	7030003720	S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)
R175	7030003780	S.RESISTOR ERJ3GEYJ 684 V (680 kΩ)
R176	7030003820	S.RESISTOR ERJ3GEYJ 155 V (1.5 MΩ)
R177	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R178	7030003240	S.RESISTOR ERJ3GEYJ 220 V (22 Ω)
R179	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R180	7030003330	S.RESISTOR ERJ3GEYJ 121 V (120 Ω)
R181	7030003580	S.RESISTOR ERJ3GEYJ 153 V (15 kΩ)
R182	7030003520	S.RESISTOR ERJ3GEYJ 472 V (4.7 kΩ)
R183	7030003360	S.RESISTOR ERJ3GEYJ 221 V (220 Ω)
R184	7030003290	S.RESISTOR ERJ3GEYJ 560 V (56 Ω)
R185	7030003290	S.RESISTOR ERJ3GEYJ 560 V (56 Ω)

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION
R186	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R187	7030003220	S.RESISTOR ERJ3GEYJ 150 V (15 Ω)
R188	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R189	7030003500	S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)
R190	7030003360	S.RESISTOR ERJ3GEYJ 221 V (220 Ω)
R191	7030003410	S.RESISTOR ERJ3GEYJ 561 V (560 Ω)
R192	7030003720	S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)
R193	7030003410	S.RESISTOR ERJ3GEYJ 561 V (560 Ω)
R194	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
		[EUR], [ITA] other
R195	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R196	7510001180	S.THERMISTOR NTCCM1608 3NH 221KC
R197	7310003610	S.TRIMMER EVM-1XSX50 B14 (103)
R197	7030003570	S.RESISTOR ERJ3GEYJ 123 V (12 kΩ)
		[EUR], [ITA] only
R198	7030003460	S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ)
		[EUR], [ITA] other
R199	7030003550	S.RESISTOR ERJ3GEYJ 822 V (8.2 kΩ)
R199	7030003400	S.RESISTOR ERJ3GEYJ 471 V (470 Ω)
R200	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R201	7030003800	S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)
R202	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R203	7030003500	S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)
		[EUR], [ITA] other
R204	7030003460	S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ)
R204	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R205	7030003500	S.RESISTOR ERJ3GEYJ 332 V (3.3 kΩ)
		[EUR], [ITA] only
R206	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
		[EUR], [ITA] only
R207	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
		[EUR], [ITA] only
R208	7030003800	S.RESISTOR ERJ3GEYJ 105 V (1 MΩ)
		[EUR], [ITA] only
R209	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R210	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R211	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R212	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R213	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R214	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R215	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R216	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R217	7030003760	S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)
R219	7030003690	S.RESISTOR ERJ3GEYJ 124 V (120 kΩ)
R220	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R221	7030003360	S.RESISTOR ERJ3GEYJ 221 V (220 Ω)
R222	7030003410	S.RESISTOR ERJ3GEYJ 561 V (560 Ω)
R223	7030003460	S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ)
R224	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R225	7030003720	S.RESISTOR ERJ3GEYJ 224 V (220 kΩ)
R226	7030003410	S.RESISTOR ERJ3GEYJ 561 V (560 Ω)
R227	7030003660	S.RESISTOR ERJ3GEYJ 683 V (68 kΩ)
R228	7510001250	S.THERMISTOR NTCCM1608 3NH 471KC
R229	7310003610	S.TRIMMER EVM-1XSX50 B14 (103)
R230	7030003400	S.RESISTOR ERJ3GEYJ 471 V (470 Ω)
R231	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R232	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R233	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R234	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R235	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R236	7030003600	S.RESISTOR ERJ3GEYJ 223 V (22 kΩ)
R237	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R238	7030003680	S.RESISTOR ERJ3GEYJ 104 V (100 kΩ)
R239	7030003320	S.RESISTOR ERJ3GEYJ 101 V (100 Ω)
R240	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R241	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R242	7030003630	S.RESISTOR ERJ3GEYJ 393 V (39 kΩ)
R244	7030009550	S.RESISTOR ERJ3EKF 1203 V (120 kΩ)
R245	7030003760	S.RESISTOR ERJ3GEYJ 474 V (470 kΩ)
R246	7030003440	S.RESISTOR ERJ3GEYJ 102 V (1 kΩ)
R247	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R248	7030003460	S.RESISTOR ERJ3GEYJ 152 V (1.5 kΩ)
R249	7030003270	S.RESISTOR ERJ3GEYJ 390 V (39 Ω)
R250	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R251	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R252	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R253	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R254	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R255	7030003640	S.RESISTOR ERJ3GEYJ 473 V (47 kΩ)
R256	7030003620	S.RESISTOR ERJ3GEYJ 333 V (33 kΩ)
R257	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)
R258	7030003560	S.RESISTOR ERJ3GEYJ 103 V (10 kΩ)

S.=Surface mount







**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
C73	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C74	4550000530	S.TANTALUM TESVA 1V 104M1-8L
C76	4550000510	S.TANTALUM TESVA 1V 473M1-8L
C77	4550000550	S.TANTALUM TESVA 1V 224M1-8L
C78	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C80	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C81	4030001830	S.CERAMIC GRM40 RH 330J 50PT
C82	4030009990	S.CERAMIC C1608 CH 1H 200J-T-A
C83	4030001820	S.CERAMIC GRM40 RH 220J 50PT
C84	4610002160	S.TRIMMER CTZ3S-30C-W1-AF
C85	4030006920	S.CERAMIC C1608 CH 1H 010C-T-A
C86	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C87	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C88	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C89	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C90	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C91	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C92	4030006990	S.CERAMIC C1608 CH 1H 080D-T-A
C94	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C95	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C96	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C97	4030006920	S.CERAMIC C1608 CH 1H 010C-T-A
C98	4030006920	S.CERAMIC C1608 CH 1H 010C-T-A
C99	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C100	4030007080	S.CERAMIC C1608 CH 1H 390J-T-A
C101	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C102	4030006920	S.CERAMIC C1608 CH 1H 010C-T-A
C103	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C104	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C105	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C106	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C107	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C108	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C109	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C110	4030006950	S.CERAMIC C1608 CH 1H 040C-T-A
C111	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C112	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C113	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C114	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C115	4030006950	S.CERAMIC C1608 CH 1H 040C-T-A
C116	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C117	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C118	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C119	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C121	4030007030	S.CERAMIC C1608 CH 1H 150J-T-A
C122	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C123	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C124	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C125	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C126	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C127	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C128	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C130	4550000510	S.TANTALUM TESVA 1V 473M1-8L
C131	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C132	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C133	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C134	4030009560	S.CERAMIC C1608 CH 1H R75B-T-A
C135	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C136	4030009500	S.CERAMIC C1608 CH 1H 0R5B-T-A
C137	4030009500	S.CERAMIC C1608 CH 1H 0R5B-T-A
C139	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C140	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C141	4030009570	S.CERAMIC C1608 CH 1H 0R3B-T-A
C142	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C143	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C144	4030006970	S.CERAMIC C1608 CH 1H 060D-T-A
C145	4030010780	S.CERAMIC C1608 CH 1H 1R5C-T-A
C146	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C147	4030007050	S.CERAMIC C1608 CH 1H 220J-T-A
C148	4030006970	S.CERAMIC C1608 CH 1H 060D-T-A
C149	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C150	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C151	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C152	4550002980	S.TANTALUM TEMSVA 1C 225M-8L
C153	4030007010	S.CERAMIC C1608 CH 1H 100D-T-A
C154	4030007010	S.CERAMIC C1608 CH 1H 100D-T-A
C155	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C156	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C157	4030007010	S.CERAMIC C1608 CH 1H 100D-T-A
C158	4030006940	S.CERAMIC C1608 CH 1H 030C-T-A
C159	4030006940	S.CERAMIC C1608 CH 1H 030C-T-A
C160	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
C161	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C162	4030006980	S.CERAMIC C1608 CH 1H 070D-T-A
C163	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C164	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C165	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C166	4510004640	S.ELECTROLYTIC ECEV1CA470SP
C167	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C168	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C169	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C171	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C172	4030011080	S.CERAMIC GRM42-6 CH 060D 500PT
C173	4030011020	S.CERAMIC GRM42-6 CK 010C 500PT
C174	4030011150	S.CERAMIC GRM42-6 CH 130J 500PT
C175	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C176	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C177	4030011020	S.CERAMIC GRM42-6 CK 010C 500PT
C178	4030011130	S.CERAMIC GRM42-6 CH 110J 500PT
C179	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C180	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C181	4030011250	S.CERAMIC GRM42-6 W5R 471K 500PT
C182	4550006660	S.TANTALUM ECST1CC226R
C183	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C184	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C186	4030011250	S.CERAMIC GRM42-6 W5R 471K 500PT
C187	4030011100	S.CERAMIC GRM42-6 CH 080D 500PT
C188	4030011080	S.CERAMIC GRM42-6 CH 060D 500PT
C189	4030011060	S.CERAMIC GRM42-6 CH 040C 500PT
C190	4030011060	S.CERAMIC GRM42-6 CH 040C 500PT
C191	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C192	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C193	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C194	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C195	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C196	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C197	4510004630	S.ELECTROLYTIC ECEV1CA100SR
C198	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C199	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C200	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C201	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C202	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C203	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C204	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C205	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C206	4030007050	S.CERAMIC C1608 CH 1H 220J-T-A
C207	4030007020	S.CERAMIC C1608 CH 1H 120J-T-A
C208	4030006940	S.CERAMIC C1608 CH 1H 030C-T-A
C209	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C210	4030006910	S.CERAMIC C1608 CH 1H 0R5C-T-A
C211	4030006950	S.CERAMIC C1608 CH 1H 040C-T-A
C212	4030006920	S.CERAMIC C1608 CH 1H 010C-T-A
C213	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C214	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C215	4030007120	S.CERAMIC C1608 CH 1H 820J-T-A
C216	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C217	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C218	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C219	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C220	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C221	4030006980	S.CERAMIC C1608 CH 1H 070D-T-A
C222	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C223	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C224	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C225	4030007020	S.CERAMIC C1608 CH 1H 120J-T-A
C226	4030006910	S.CERAMIC C1608 CH 1H 0R5C-T-A
C227	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C228	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C229	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C230	4030007020	S.CERAMIC C1608 CH 1H 120J-T-A
C231	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C232	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C233	4030006940	S.CERAMIC C1608 CH 1H 030C-T-A
C234	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C235	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C236	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C237	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C238	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C239	4030007040	S.CERAMIC C1608 CH 1H 180J-T-A
C240	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C241	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C242	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C244	4030006970	S.CERAMIC C1608 CH 1H 060D-T-A
C245	4030011080	S.CERAMIC GRM42-6 CH 060D 500PT

S.=Surface mount

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
C246	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C247	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C248	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C249	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C250	4510004540	S.ELECTROLYTIC ECEV0JA470SR
C251	4030008880	S.CERAMIC C1608 JB 1C 223K-T-A
C252	4030008920	S.CERAMIC C1608 JB 1C 473K-T-A
C253	4030008900	S.CERAMIC C1608 JB 1C 333K-T-A
C254	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C255	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C256	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C257	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C258	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C259	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C260	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C261	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C263	4030011330	S.CERAMIC C1608 CH 1H 391J-T-A
C264	4030011330	S.CERAMIC C1608 CH 1H 391J-T-A
C265	4030010760	S.CERAMIC C1608 CH 1H 331J-T-A
C266	4030007150	S.CERAMIC C1608 CH 1H 151J-T-A
C267	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C268	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C269	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C270	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C271	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C272	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C273	4030007160	S.CERAMIC C1608 CH 1H 181J-T-A
C274	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C275	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C276	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C277	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C278	4510004540	S.ELECTROLYTIC ECEV0JA470SR
C279	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C280	4030008920	S.CERAMIC C1608 JB 1C 473K-T-A
C281	4030008900	S.CERAMIC C1608 JB 1C 333K-T-A
C282	4030007140	S.CERAMIC C1608 CH 1H 121J-T-A
C283	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C284	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C285	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C286	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C288	4030011330	S.CERAMIC C1608 CH 1H 391J-T-A
C289	4030011330	S.CERAMIC C1608 CH 1H 391J-T-A
C290	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C291	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C292	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C293	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C294	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C295	4030007160	S.CERAMIC C1608 CH 1H 181J-T-A
C296	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C297	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C298	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C299	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C300	4030009500	S.CERAMIC C1608 CH 1H 0R5B-T-A
C301	4030006980	S.CERAMIC C1608 CH 1H 070D-T-A
C302	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C303	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C304	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C305	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C306	4030007040	S.CERAMIC C1608 CH 1H 180J-T-A
C307	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C308	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C309	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C310	4030007050	S.CERAMIC C1608 CH 1H 220J-T-A
C311	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C312	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C313	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C314	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C315	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C316	4030006940	S.CERAMIC C1608 CH 1H 030C-T-A
C317	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C318	4030010780	S.CERAMIC C1608 CH 1H 1R5C-T-A
C319	4030010780	S.CERAMIC C1608 CH 1H 1R5C-T-A
C320	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C321	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C322	4030006990	S.CERAMIC C1608 CH 1H 080D-T-A

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION
C323	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C324	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C325	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C326	4030006930	S.CERAMIC C1608 CH 1H 020C-T-A
C327	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C328	4030006960	S.CERAMIC C1608 CH 1H 050C-T-A
C329	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C330	4510004440	S.ELECTROLYTIC ECEV1HA010SR
C331	4510004440	S.ELECTROLYTIC ECEV1HA010SR
C332	4510005810	S.ELECTROLYTIC ECEV1HAR47R
C333	4510005810	S.ELECTROLYTIC ECEV1HAR47R
C334	4510005810	S.ELECTROLYTIC ECEV1HAR47R
C335	4510004640	S.ELECTROLYTIC ECEV1CA470SP
C336	4510006240	S.ELECTROLYTIC ECEV1CA221P
C337	4510004640	S.ELECTROLYTIC ECEV1CA470SP
C338	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C339	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C340	4510006260	S.ELECTROLYTIC ECEV1AA471UP
C341	4510006260	S.ELECTROLYTIC ECEV1AA471UP
C342	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C343	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C344	4510006240	S.ELECTROLYTIC ECEV1CA221P
C345	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C346	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C347	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C348	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C349	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C350	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C351	4510004630	S.ELECTROLYTIC ECEV1CA100SR
C352	4510004640	S.ELECTROLYTIC ECEV1CA470SP
C353	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C354	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C355	4510004630	S.ELECTROLYTIC ECEV1CA100SR
C356	4510006220	S.ELECTROLYTIC ECEV1CA101UP
C357	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C358	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C359	4030008630	S.CERAMIC C1608 JF 1C 104Z-T-A
C360	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C361	4510004640	S.ELECTROLYTIC ECEV1CA470SP
C362	4510006020	ELECTROLYTIC 16 MV 2200 HC
C363	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C364	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C365	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C366	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C367	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C368	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C369	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C370	4030008880	S.CERAMIC C1608 JB 1C 223K-T-A
C371	4030008880	S.CERAMIC C1608 JB 1C 223K-T-A
C372	4030007050	S.CERAMIC C1608 CH 1H 220J-T-A
C373	4030007050	S.CERAMIC C1608 CH 1H 220J-T-A
C374	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C376	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C377	4510004630	S.ELECTROLYTIC ECEV1CA100SR
C378	4030006860	S.CERAMIC C1608 JB 1H 102K-T-A
C379	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C380	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C381	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C382	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C383	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C384	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C385	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C386	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C387	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C388	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C389	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C390	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C391	4030007090	S.CERAMIC C1608 CH 1H 470J-T-A
C392	4030007130	S.CERAMIC C1608 CH 1H 101J-T-A
C393	4030006900	S.CERAMIC C1608 JB 1E 103K-T-A
C394	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C395	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C396	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C397	4030009980	S.CERAMIC C1608 JB 1H 152K-T-A
C398	4030008910	S.CERAMIC C1608 JB 1C 393K-T-A
C399	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C400	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C401	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C402	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C403	4030011600	S.CERAMIC C1608 JB 1C 104KT-N
C404	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A
C405	4030008680	S.CERAMIC C2012 JF 1C 105Z-T-A

S.=Surface mount

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
C406	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C407	4030008860	S.CERAMIC	C1608 JB 1C 153K-T-A
C408	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C409	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A
C410	4030008860	S.CERAMIC	C1608 JB 1C 153K-T-A
C411	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A
C412	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A
C413	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C414	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C415	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C416	4030008860	S.CERAMIC	C1608 JB 1C 153K-T-A
C417	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C418	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A
C419	4030008860	S.CERAMIC	C1608 JB 1C 153K-T-A
C420	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A
C421	4030008770	S.CERAMIC	C1608 JB 1H 562K-T-A
C422	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C423	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C432	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C433	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C434	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C435	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C436	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A
C437	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C438	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C439	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C440	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C441	4030008900	S.CERAMIC	C1608 JB 1C 333K-T-A
C442	4510004440	S.ELECTROLYTIC	ECEV1HA010SR
C443	4030007020	S.CERAMIC	C1608 CH 1H 120J-T-A
C444	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C445	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C446	4030008630	S.CERAMIC	C1608 JF 1C 104Z-T-A
C447	4030008470	S.CERAMIC	C1608 JB 1H 272K-T-A
C448	4030009490	S.CERAMIC	C1608 JB 1H 821K-T-A
C449	4030007120	S.CERAMIC	C1608 CH 1H 820J-T-A
C450	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C451	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C452	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C453	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C454	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C455	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C456	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C457	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C458	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C459	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C461	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C462	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C463	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C464	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C465	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C466	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C467	4030011100	S.CERAMIC	GRM42-6 CH 080D 500PT
C470	4030006900	S.CERAMIC	C1608 JB 1E 103K-T-A
C471	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C472	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C473	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C474	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C475	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C476	4550006250	S.TANTALUM	TEMSVA 1A 106M-8L
C477	4550006250	S.TANTALUM	TEMSVA 1A 106M-8L
C478	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C479	4030011810	S.CERAMIC	C1608 JB 1A 224K-T-N
C480	4030007050	S.CERAMIC	C1608 CH 1H 220J-T-A
C481	4550006390	S.TANTALUM	TEMSVA 1C 335M-8L
C482	4550006390	S.TANTALUM	TEMSVA 1C 335M-8L
C483	4030008920	S.CERAMIC	C1608 JB 1C 473K-T-A
C484	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C485	4030006920	S.CERAMIC	C1608 CH 1H 010C-T-A
C486	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C487	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C488	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C489	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C490	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C491	4030012600	S.CERAMIC	C2012 JB 1A 105M-T-A
C492	4030008680	S.CERAMIC	C2012 JF 1C 105Z-T-A
C493	4030011100	S.CERAMIC	GRM42-6 CH 080D 500PT
C494	4030009570	S.CERAMIC	C1608 CH 1H 0R3B-T-A
C496	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C497	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C498	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C499	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A

**[MAIN UNIT]**

REF NO.	ORDER NO.	DESCRIPTION	
C500	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C501	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C502	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C503	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C504	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C505	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C506	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C507	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C508	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C510	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C511	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C512	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C513	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C514	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C515	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C516	4510004630	S.ELECTROLYTIC	ECEV1CA100SR
C517	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
[EUR], [ITA] only			
C518	4030008880	S.CERAMIC	C1608 JB 1C 223K-T-A
C519	4030006860	S.CERAMIC	C1608 JB 1H 102K-T-A
C520	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C521	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C522	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C523	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C524	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C525	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C526	4030005140	S.CERAMIC	C3216 JB 1E 104K-T-A
C527	4030011600	S.CERAMIC	C1608 JB 1C 104KT-N
C528	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
C529	4030009500	S.CERAMIC	C1608 CH 1H 0R5B-T-A
C530	4030006970	S.CERAMIC	C1608 CH 1H 060D-T-A
C531	4030007130	S.CERAMIC	C1608 CH 1H 101J-T-A
C532	4030006850	S.CERAMIC	C1608 JB 1H 471K-T-A
J1	6450001440	CONNECTOR	HSJ1403-01-010
J2	6450001900	CONNECTOR	HSJ0912-01-020
J3	6510021420	CONNECTOR	52018-6645
J4	6510014960	S.CONNECTOR	B2B-ZR-SM3-TF
J5	6510016480	CONNECTOR	52018-8845
J6	6510013610	S.CONNECTOR	10FM-1.0BP
J7	6450001840	CONNECTOR	TCS7568-43-201
W1	7120000470	JUMPER	ERDS2T0
W2	7030003860	S.JUMPER	ERJ3GE JPW V
except [EUR], [ITA]			
W3	7030003860	S.JUMPER	ERJ3GE JPW V
except [EUR], [ITA]			
W4	8900004880	CABLE	OPC-465
W5	7030003860	S.JUMPER	ERJ3GE JPW V
W7	7030003860	S.JUMPER	ERJ3GE JPW V
W8	7030003860	S.JUMPER	ERJ3GE JPW V
W9	7030003860	S.JUMPER	ERJ3GE JPW V
W10	7030003860	S.JUMPER	ERJ3GE JPW V
W11	7030003860	S.JUMPER	ERJ3GE JPW V
W12	7030003860	S.JUMPER	ERJ3GE JPW V
W13	7120000470	JUMPER	ERDS2T0
except [EUR]			
W14	7030003860	S.JUMPER	ERJ3GE JPW V
W15	7030003860	S.JUMPER	ERJ3GE JPW V
W16	7030003860	S.JUMPER	ERJ3GE JPW V
W17	7030003860	S.JUMPER	ERJ3GE JPW V
W18	7030003860	S.JUMPER	ERJ3GE JPW V
W19	7030003860	S.JUMPER	ERJ3GE JPW V
except [EUR], [ITA]			
EP1	0910050835	PCB	B 5253E
EP2	6910012350	S.BEAD	MMZ1608Y 102BT
EP3	6910012350	S.BEAD	MMZ1608Y 102BT

S.=Surface mount

# SECTION 7 MECHANICAL PARTS AND DISASSEMBLY

## [CHASSIS PARTS]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
J 1	6510004880	Antenna connector MR-DS-E 01	1
MF 1	2710000590	Fan motor MF40D-12H-001	1
MP 1	8010017670	2047 Chassis	1
MP 2	8810008660	Screw PH BT M3 × 8 NI-ZU	2
MP 3	8810008660	Screw PH BT M3 × 8 NI-ZU	4
MP 4	8810008660	Screw PH BT M3 × 8 NI-ZU	7
MP 5	8110006640	2047 Cover	1
MP 6	8810008450	Bind screw M4 × 8 ZK	1
MP 9	8110005750	1729 Fan cover	1
MP 10	8810009110	Screw PH No.0 M2.6 × 16 ZK	4
MP 11	8930049650	Thermally sheet (C)	1
MP 12	8930049650	Thermally sheet (C)	1
MP 13	8930027480	1126 TR-A clip	1

## [MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
W 4	8900004880	Cable OPC-465	1
MP 1	8510010880	1642 VCO case	2
MP 2	8930037120	1647 M-holder	2
MP 3	8930045960	2088 Spacer	1
MP 4	8510012160	2047 RF plate	1
MP 5	8510012220	2047 IC plate	1
MP 6	8510012280	2047 MAIN-A shield	1
MP 7	8510012270	2047 MAIN-B shield	1

**Screw abbreviations:** PH: Pan head FH: Flat head  
BT, A0: Self-tapping ZK: Black  
NI-ZU: Nickel-Zinc

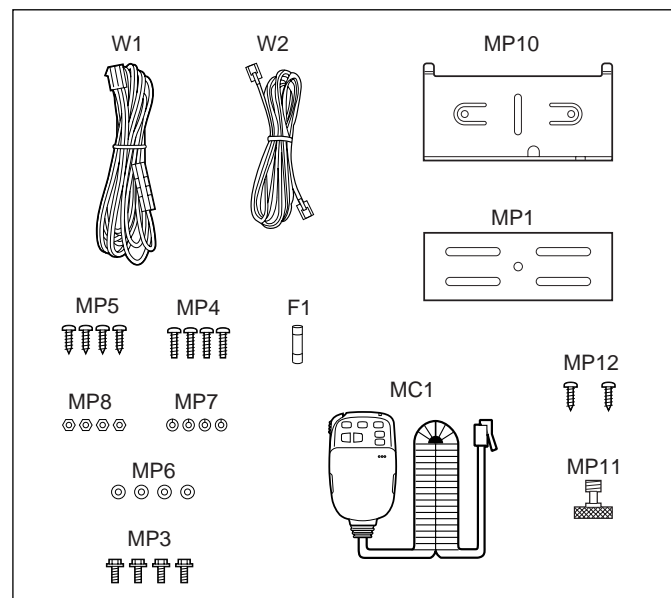
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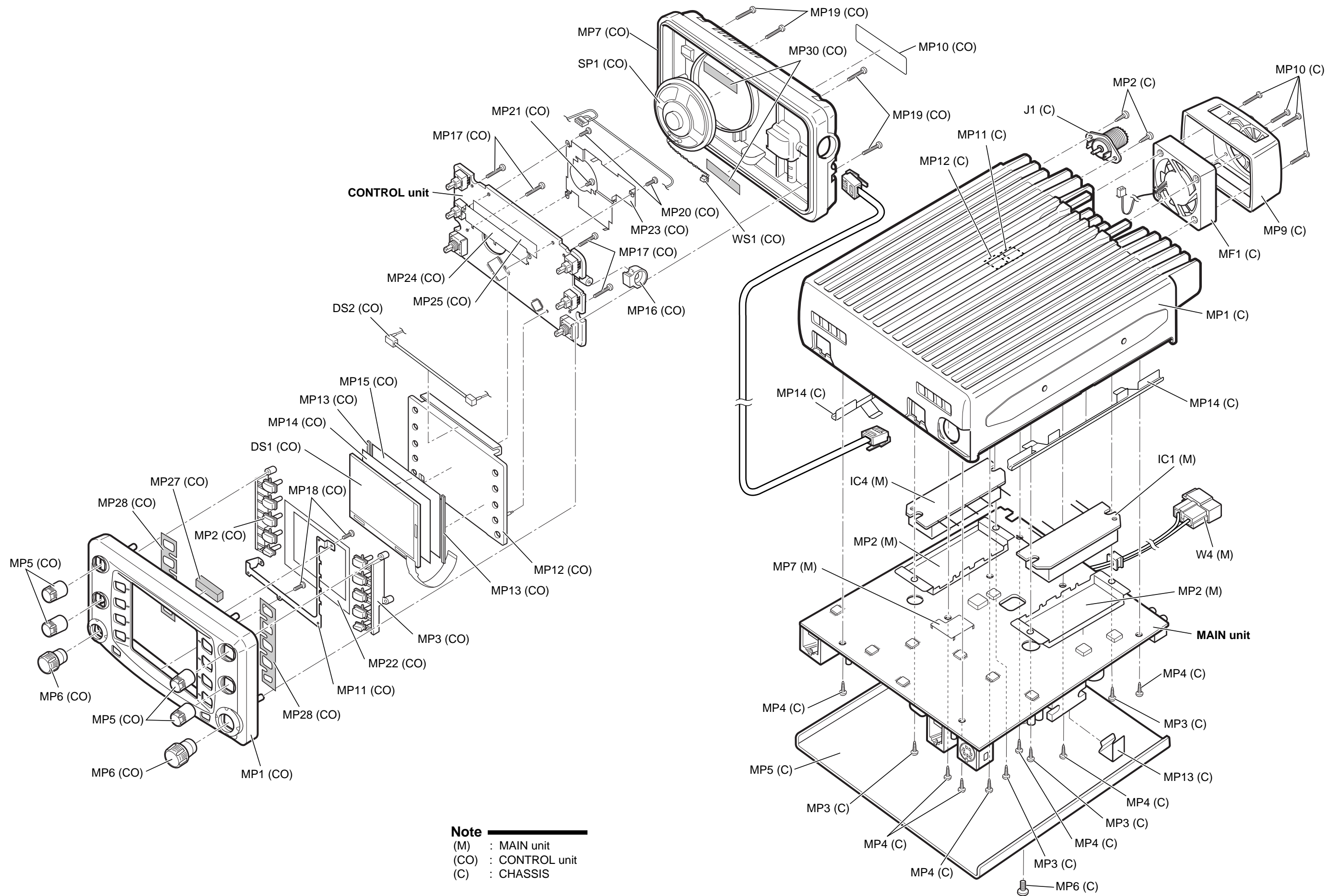
REF NO.	ORDER NO.	DESCRIPTION	QTY.
F 1	5210000080	Fuse FGB 20 A	1
W 1	Optional product	Cable OPC-346	1
W 2		Cable *OPC-837 ACC	1
MC 1	Optional product	Microphone HM-98	1
MP 1	8010016380	1542 Mobil bracket (B)	1
MP 3	8820000530	Frang bolt M4 × 8 NI	4
MP 4	8810000470	Screw PH M5 × 12 (+/-)	4
MP 5	8810000950	Screw PH A0 M5 × 16	4
MP 6	8850000150	Flat washer M5 NI BS	4
MP 7	8850000390	Spring washer M5	4
MP 8	8830000120	Nut M5	4
MP 9	8930007300	Mic-hanger except [CSA]	1
MP 10	8010017730	2047 Bracket	1
MP 11	8820001080	2047 Screw	1
MP 12	8810004350	Screw PH A0 M4 × 16	2
MP 13	8930049260	Non-woven sheet	2

\*OPC-837 ACC:  
OPC-872 (incl. female-female plug) is supplied as option.

## [CONTROL UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
DS 1	5030001660	LCD EDTCA22QB0	1
DS 2	5080000430	CFL HMB S 3 AIW 83N/AZ ASSY	1
MP 1	8210016000	2047 Front panel	1
MP 2	8930048580	2047 L-front key	1
MP 3	8930048590	2047 R-front key	1
MP 4	8930048600	2047 Key cap	1
MP 5	8610010690	Knob N-269	4
MP 6	8610010700	Knob N-270	2
MP 7	8210016010	2047 Rear panel	1
MP 8	8830001440	2047 Nut	1
MP 9	8930048820	2047 SP net	1
MP 11	8930048770	2047 LCD plate	1
MP 12	8210016070	2047 Reflector	1
MP 13	8930048810	Sponge (GA)	2
MP 14	8930048800	2047 A-sheet	1
MP 15	8930048790	2047 B-sheet	1
MP 16	8930048780	2047 Jack cover	1
MP 17	8810008990	Screw PH BT M2 × 10 ZK	4
MP 18	8810008640	Screw FH BT No.0 M2 × 4 NI-ZU	2
MP 19	8810008990	Screw PH BT M2 × 10 ZK	4
MP 20	8810009180	Screw PH BT No. 0 M2 × 5 NI-ZU	2
MP 21	8810000100	Screw PH M2 × 4 ZK	1
MP 22	8930049160	2047 C-sheet	1
MP 23	8510012370	2048 CPU plate	1
MP 24	8510012240	2047 LCD shield	1
MP 25	8930049070	Isolating plate (FR)	1
MP 27	8930049280	Sponge (GE)	1
MP 28	8930049250	2047S.W. sheet	2
MP 30	8930049270	Non-woven sheet	2
SP 1	2510000820	Speaker VS-57-0814	1
WS 1	8600036480	M. OTHER FX2047 P01CO	1





**Note**  
 (M) : MAIN unit  
 (CO) : CONTROL unit  
 (C) : CHASSIS

# SECTION 8 SEMI-CONDUCTOR INFORMATION

## 8 - 1 TRANSISTORS

NAME	SYMBOL	INSIDE VIEW
2SA1362-GR 2SA1576A R	AEG FA	
2SB1201-S 2SB934P-	2M B934	
2SB1132 T100 R 2SB798-T2 DK	BAR DK	
2SC3324-GR 2SC4081 R 2SC4116-BL 2SC4213-B 2SC4215-O 2SC4226 2SC4228 2SC5085-Y 2SC5193-T1	CBG BR LBL AB OY R25 R45 MCY T88	
2SC2954-T2B 2SC3357-T2 2SC3647S-TD 2SD999-T2 CK	QK RK CC CK	
DTA144EUA DTB123EK	16 F12	
DTC114EUA DTC143-XU DTC143-ZUA	24 43 123	

NAME	SYMBOL	INSIDE VIEW
2SJ144-GR	VG	
3SK166A-2-T7	K	
2SK880-GR 2SK880-Y	XG XY	
2SK1829	KI	
3SK184-S	3R	
UMG9N TL	G9	

## 8 - 2 DIODES

NAME	SYMBOL	INSIDE VIEW
DA114	AV	
DA115	AU	
DAN202U	N	
DA204U DA221 TL MA133 RB706F-40	K K MP 3J	
RD20E B2	202	
MA862	M11	
1SV282 1SV284 HVU350TRF	TD TL 4	

NAME	SYMBOL	INSIDE VIEW
1SS355 MA728	A 2A	
1SS254	yellow	
MA8030-H MA8033-L MA8043-L MA8047-M MA8062-L MA8075-L MA8091-M	3_0 3_3 4_3 4_7 6_2 7_5 9-1	
MA77	4B	
HVU131TRF	P1	
UM9401F	-	
SB10-05PCP	SA	

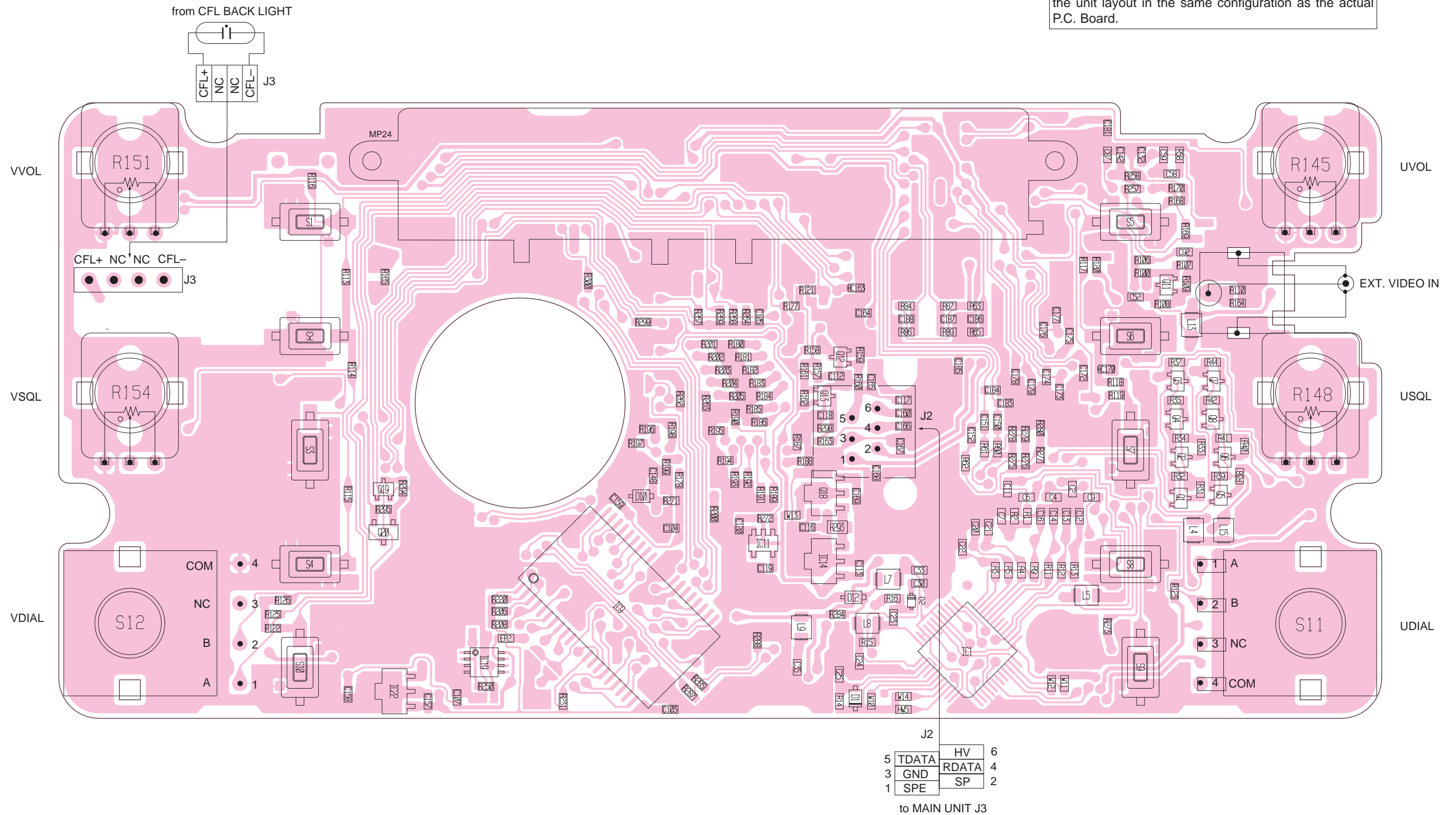


# SECTION 9 BOARD LAYOUTS

## 9 - 1 CONTROL UNIT

• TOP VIEW

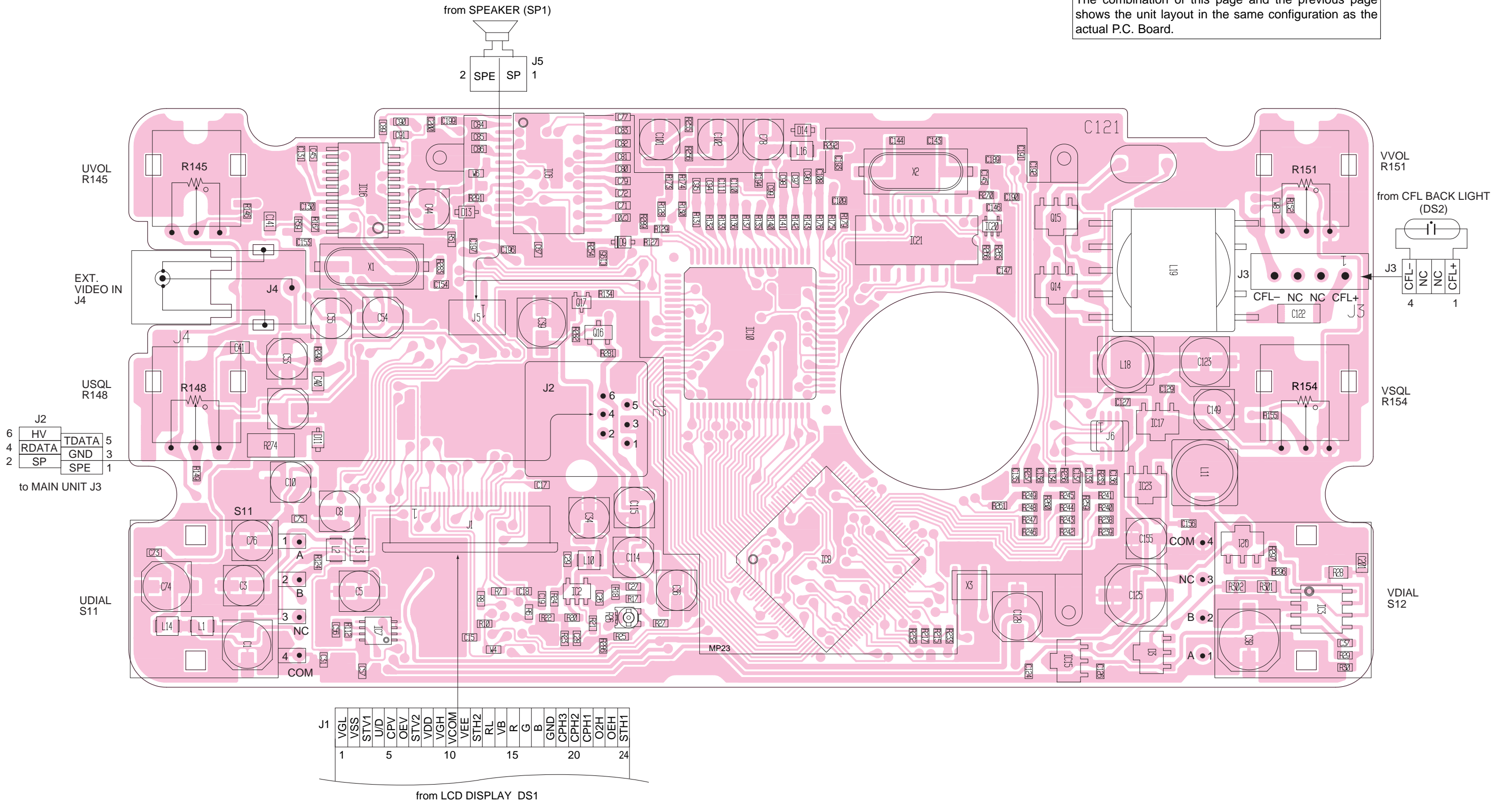
The combination of this page and the next page shows the unit layout in the same configuration as the actual P.C. Board.



# CONTROL UNIT

## • BOTTOM VIEW

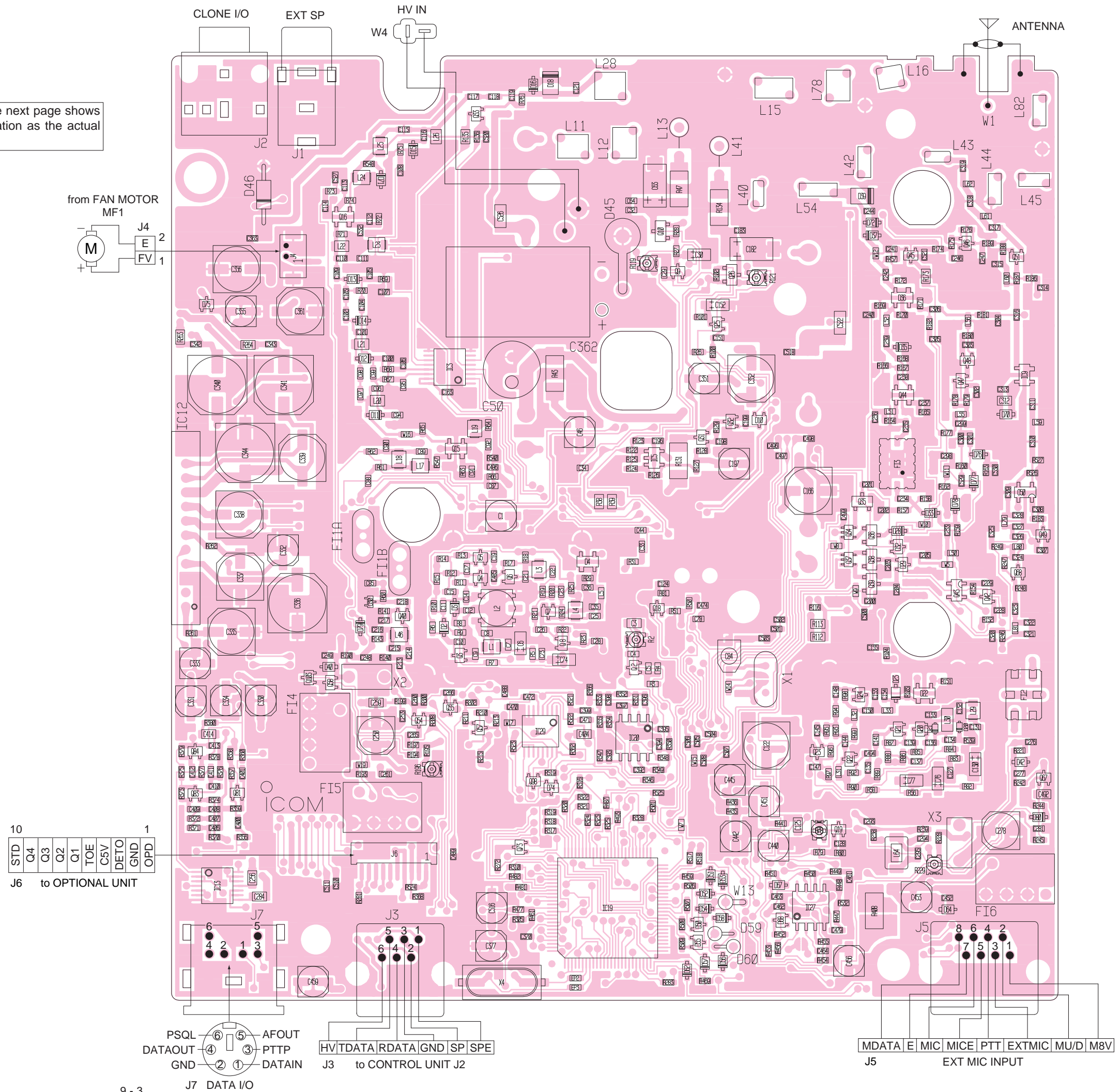
The combination of this page and the previous page shows the unit layout in the same configuration as the actual P.C. Board.



# MAIN UNIT

## • TOP VIEW

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

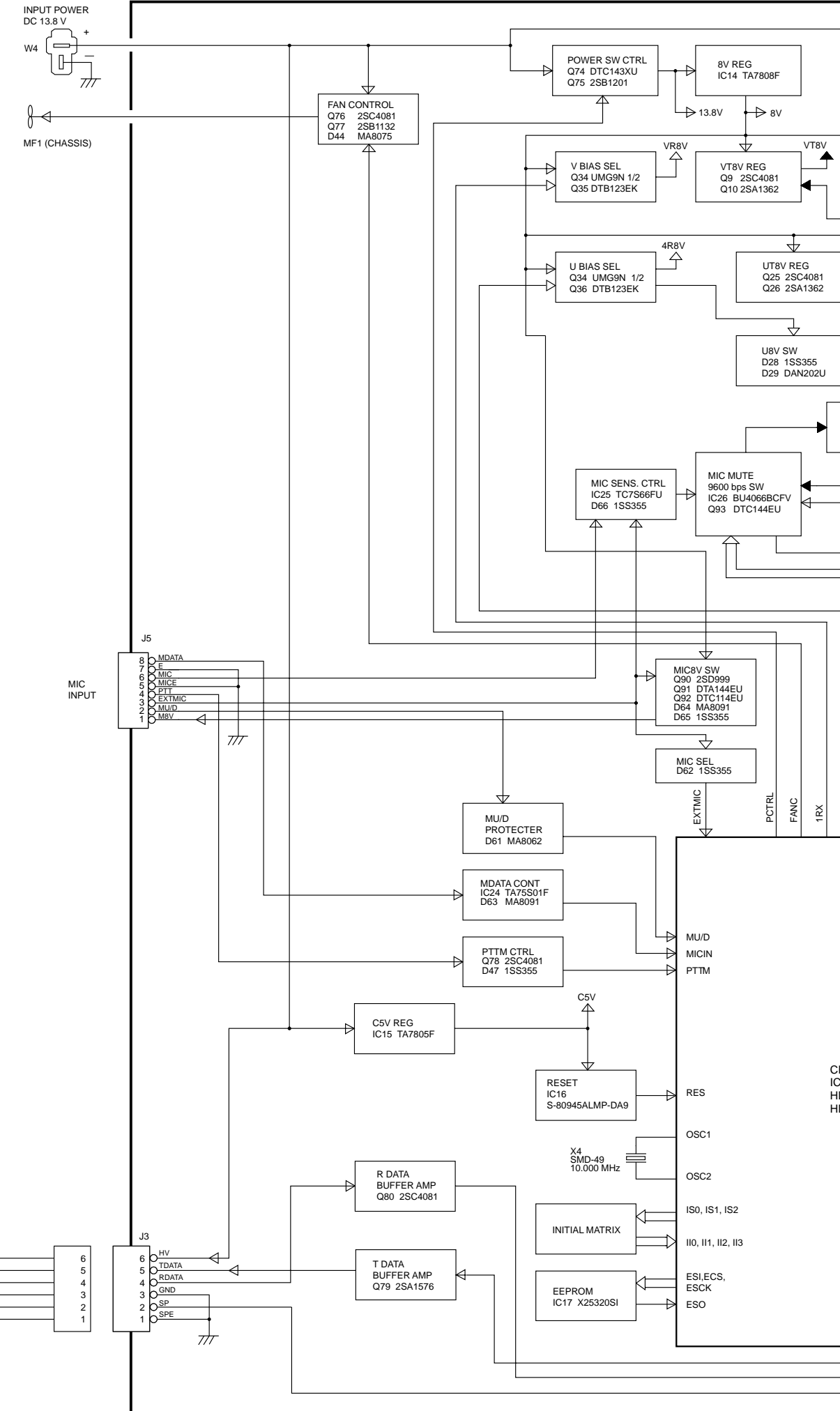
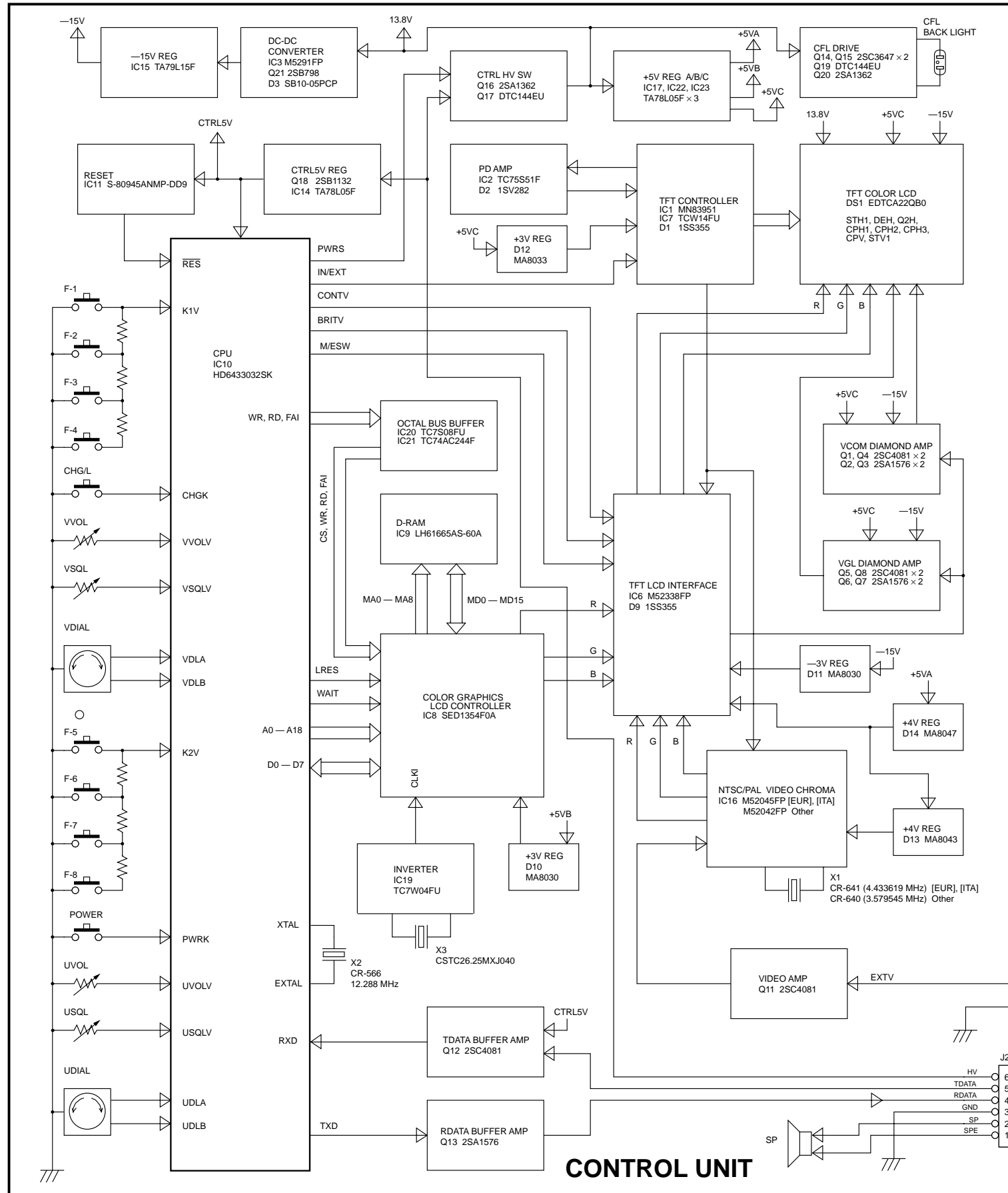


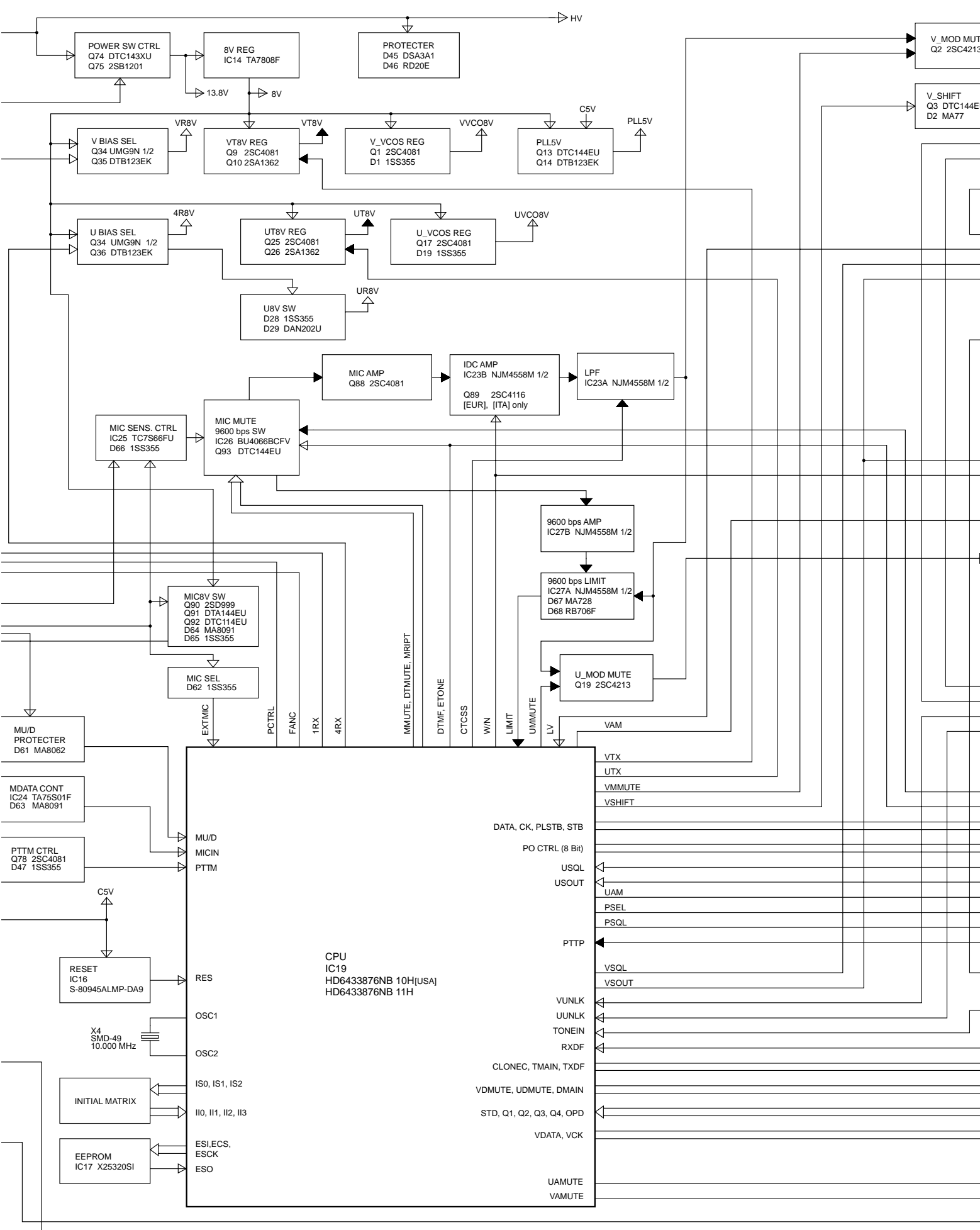
**MAIN UNIT**

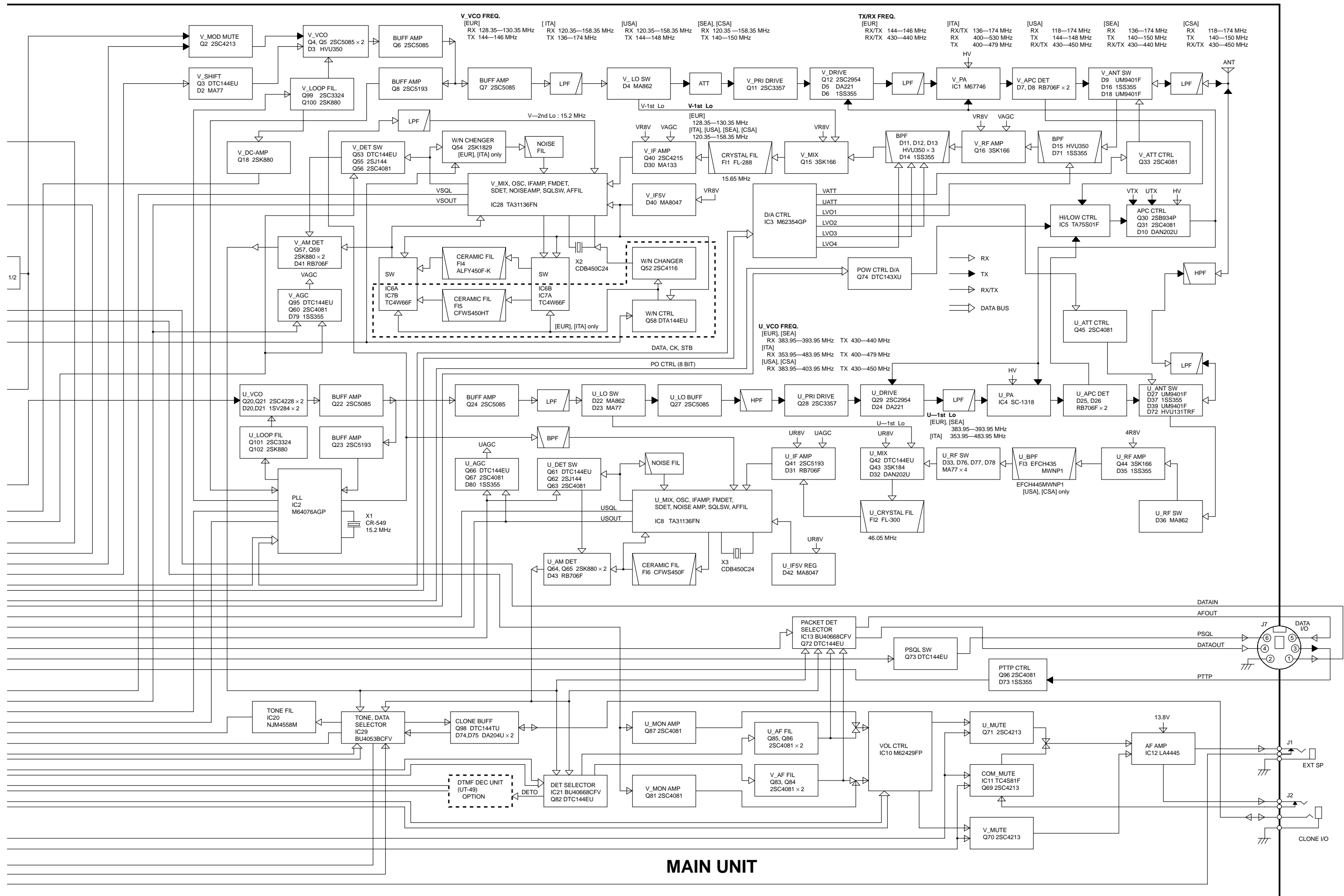
• **BOTTOM VIEW**



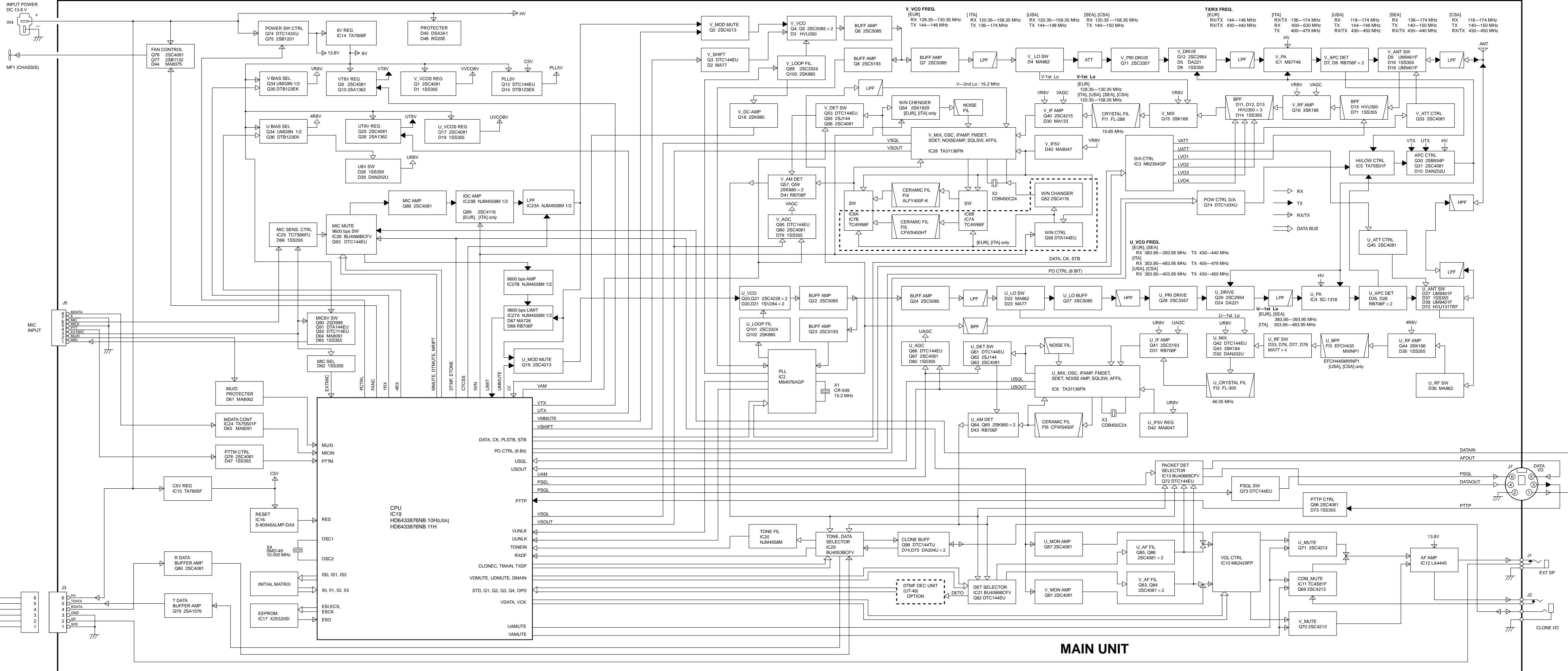
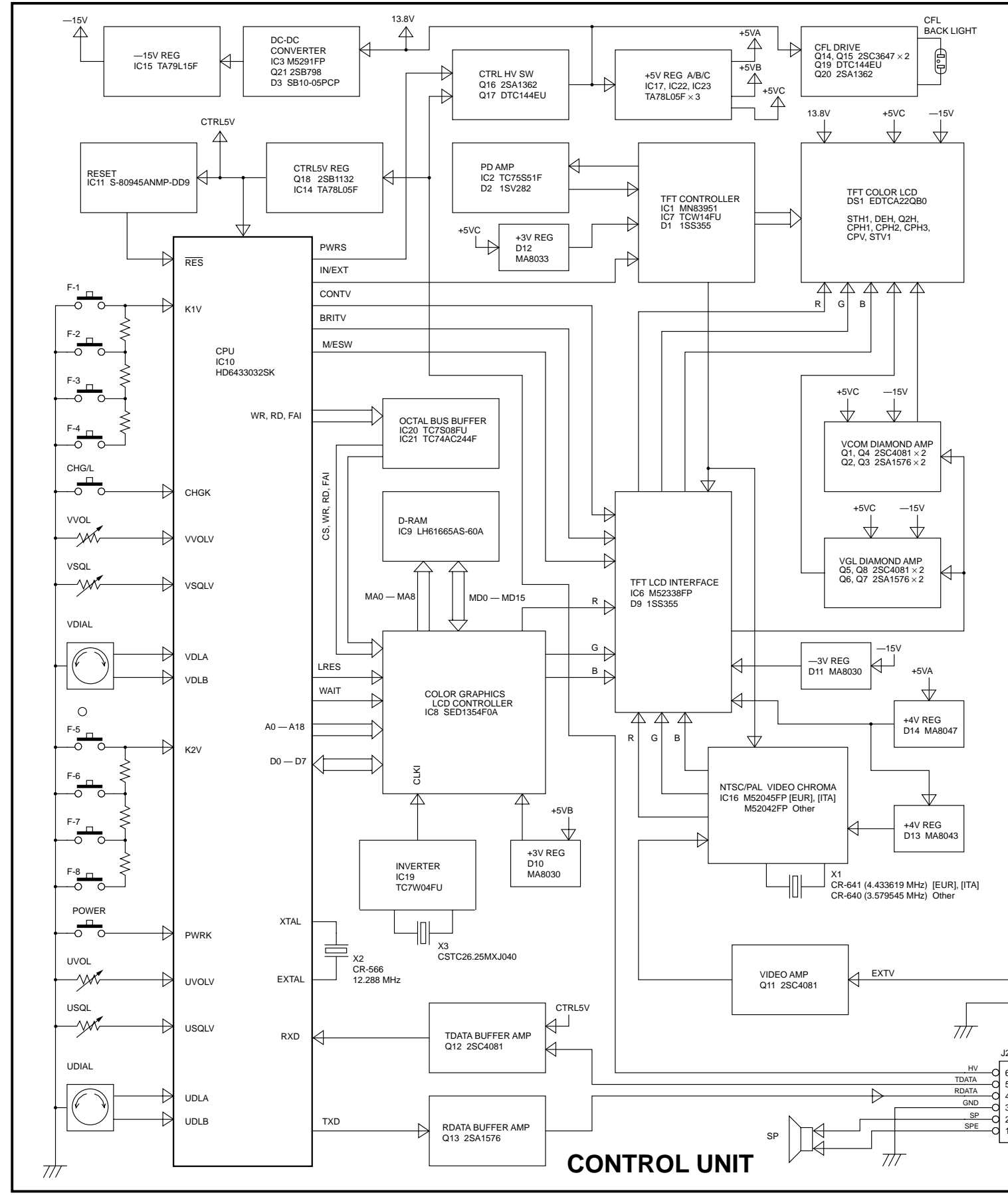
# SECTION 10 BLOCK DIAGRAM







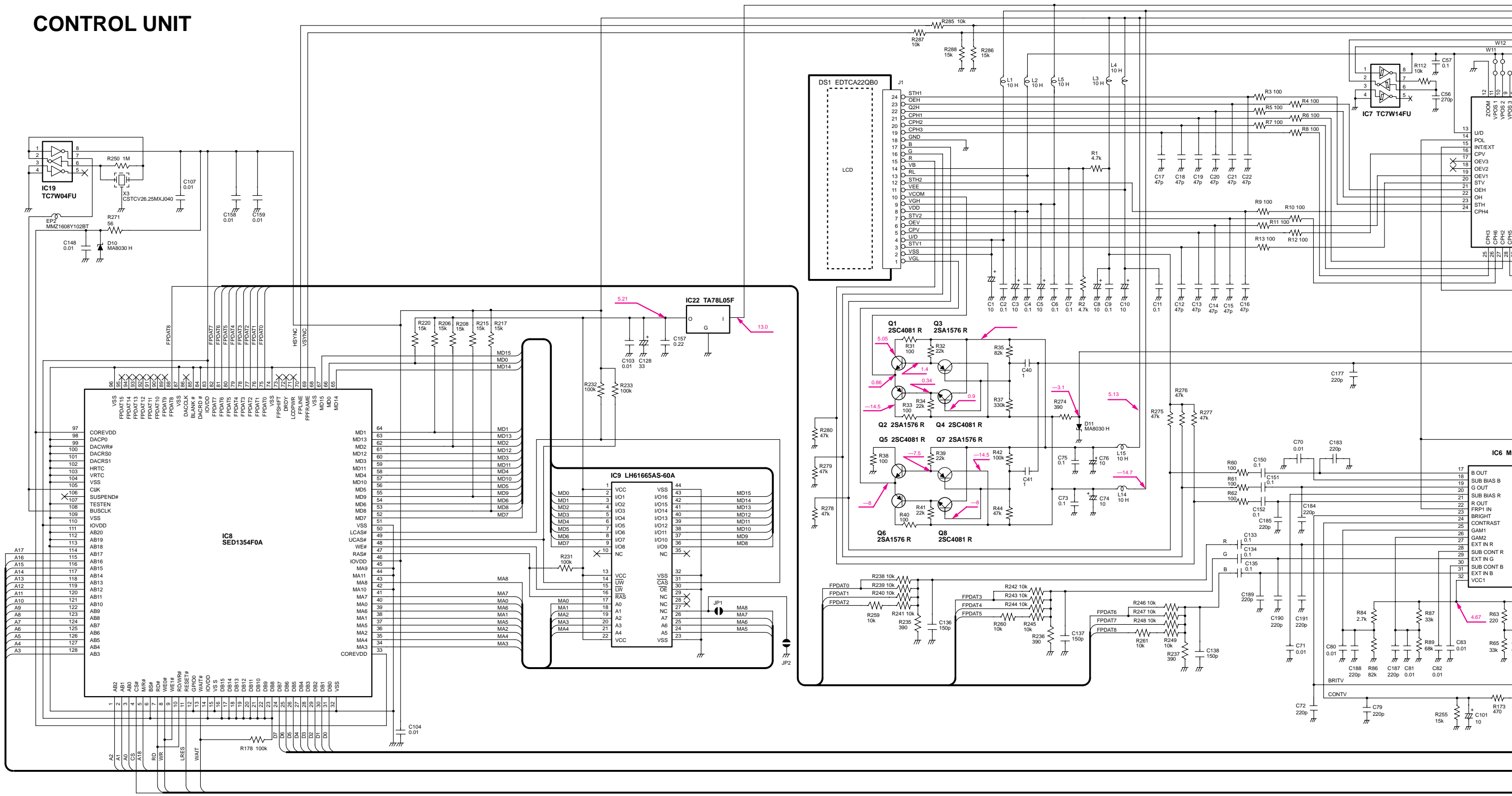
**SECTION 10 BLOCK DIAGRAM**

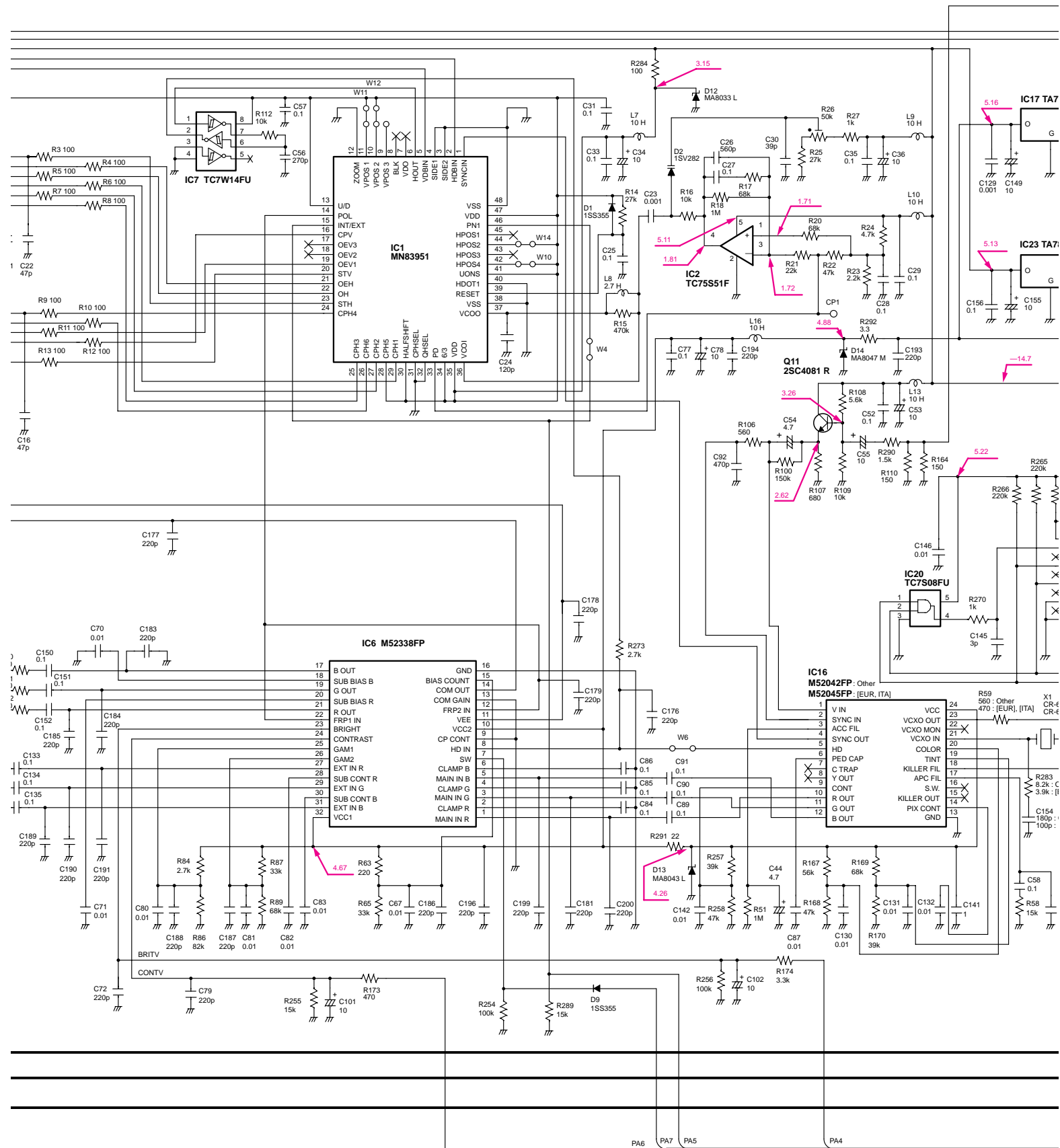


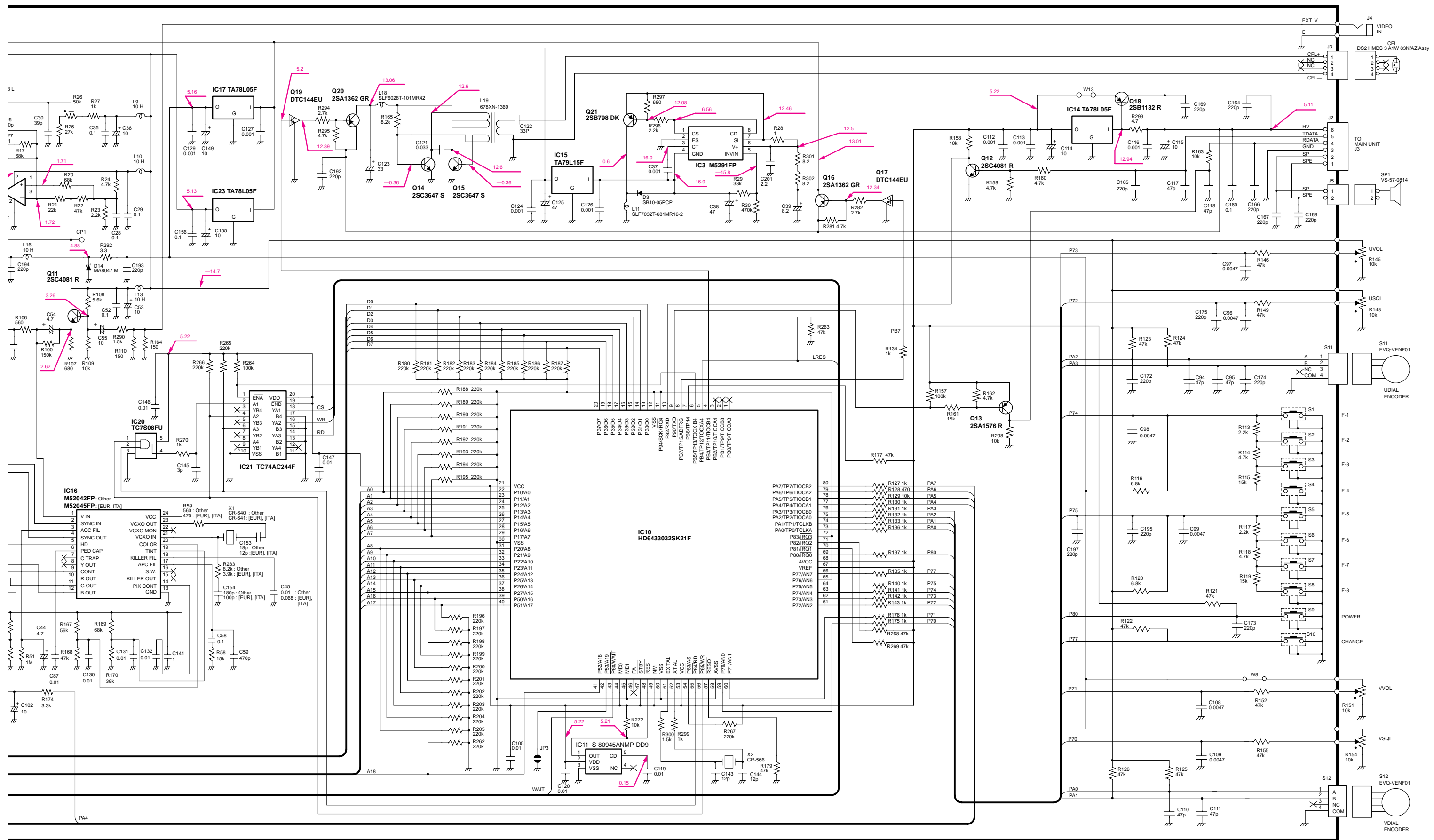


# SECTION 11 VOLTAGE DIAGRAM

## CONTROL UNIT

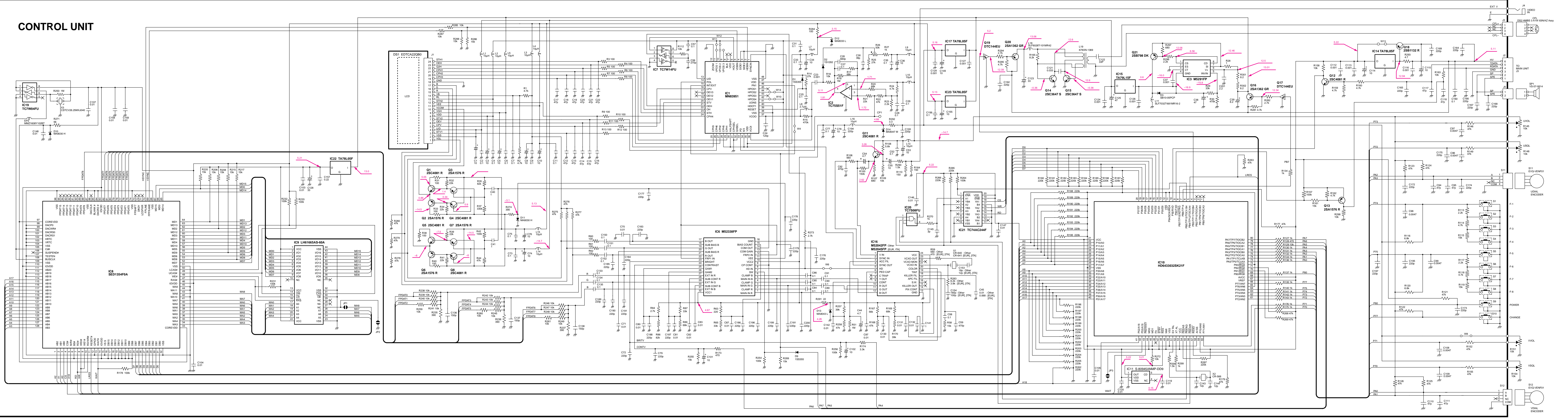






**COMPLETE VIEW**

**SECTION 11 VOLTAGE DIAGRAM**

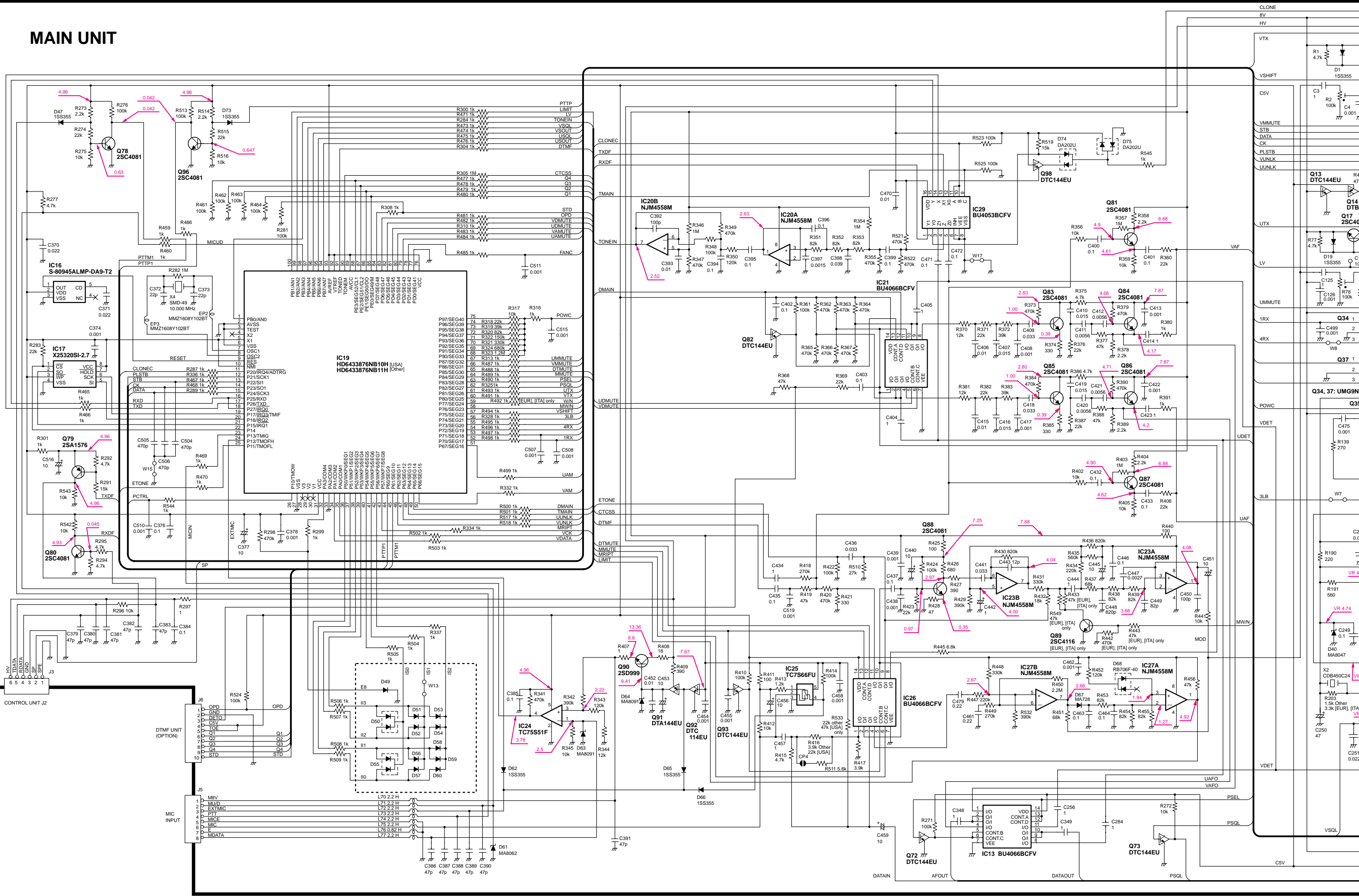


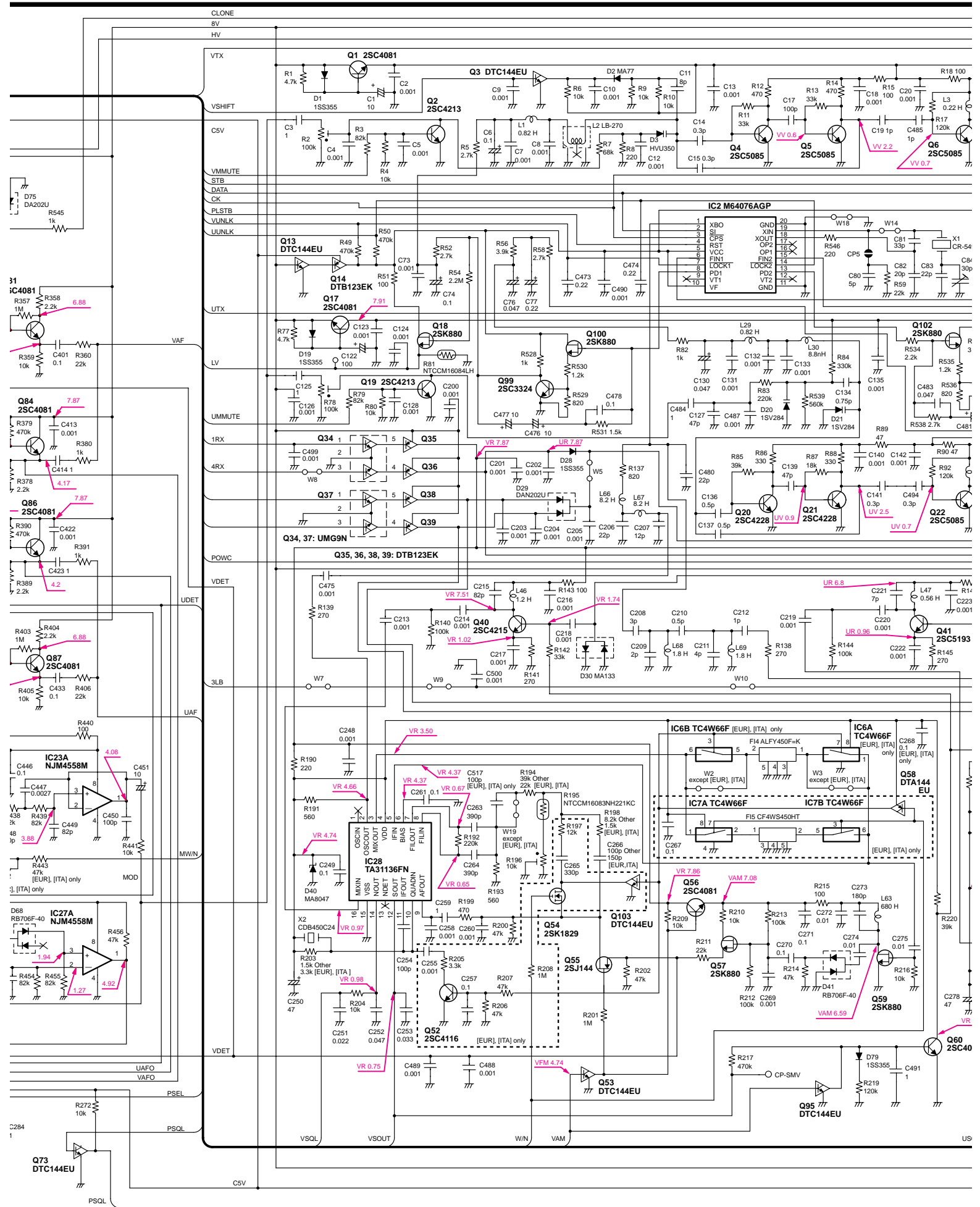
LEFT SIDE

CENTER

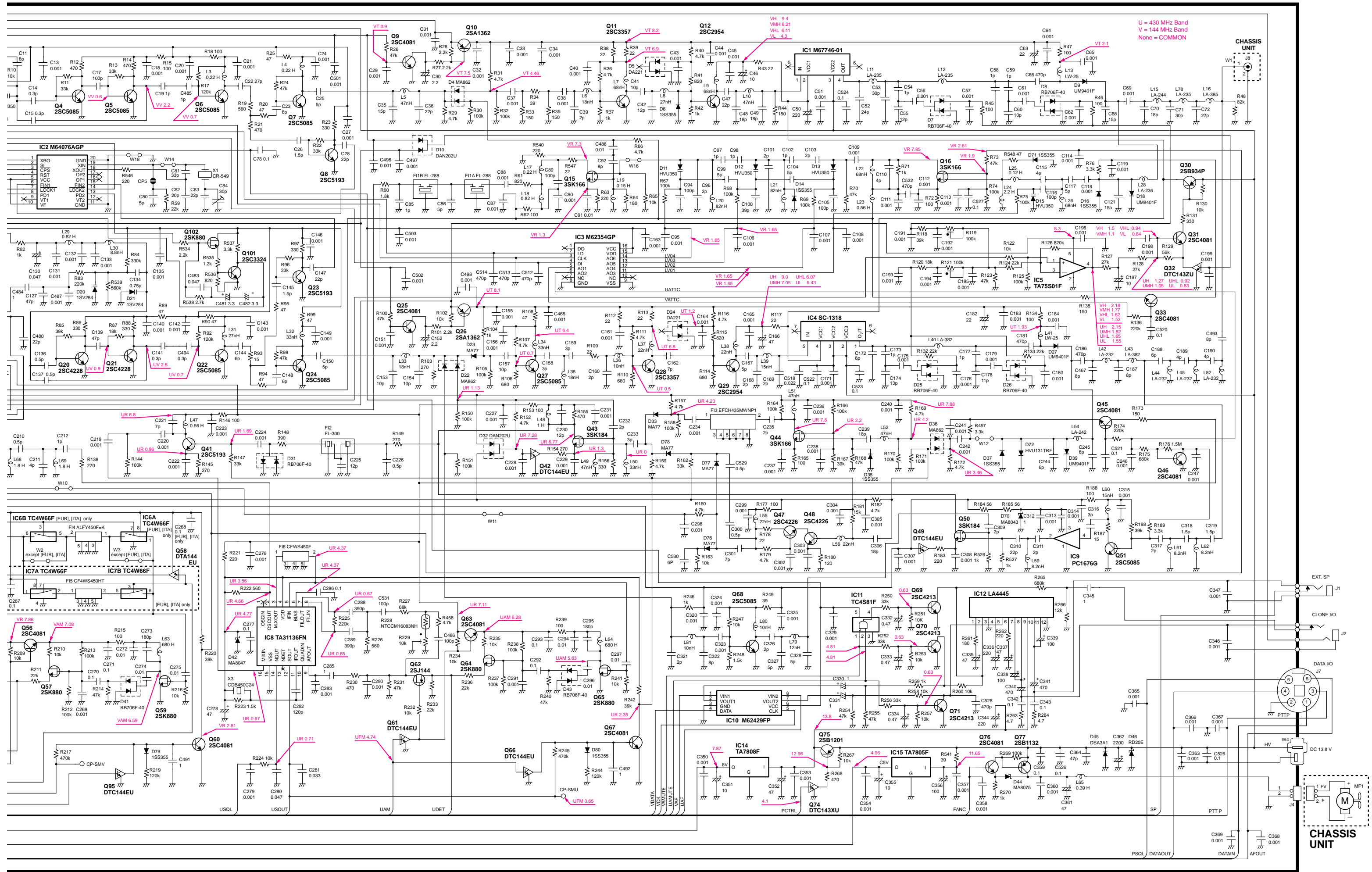
RIGHT SIDE

# MAIN UNIT





COMPLETE VIEW

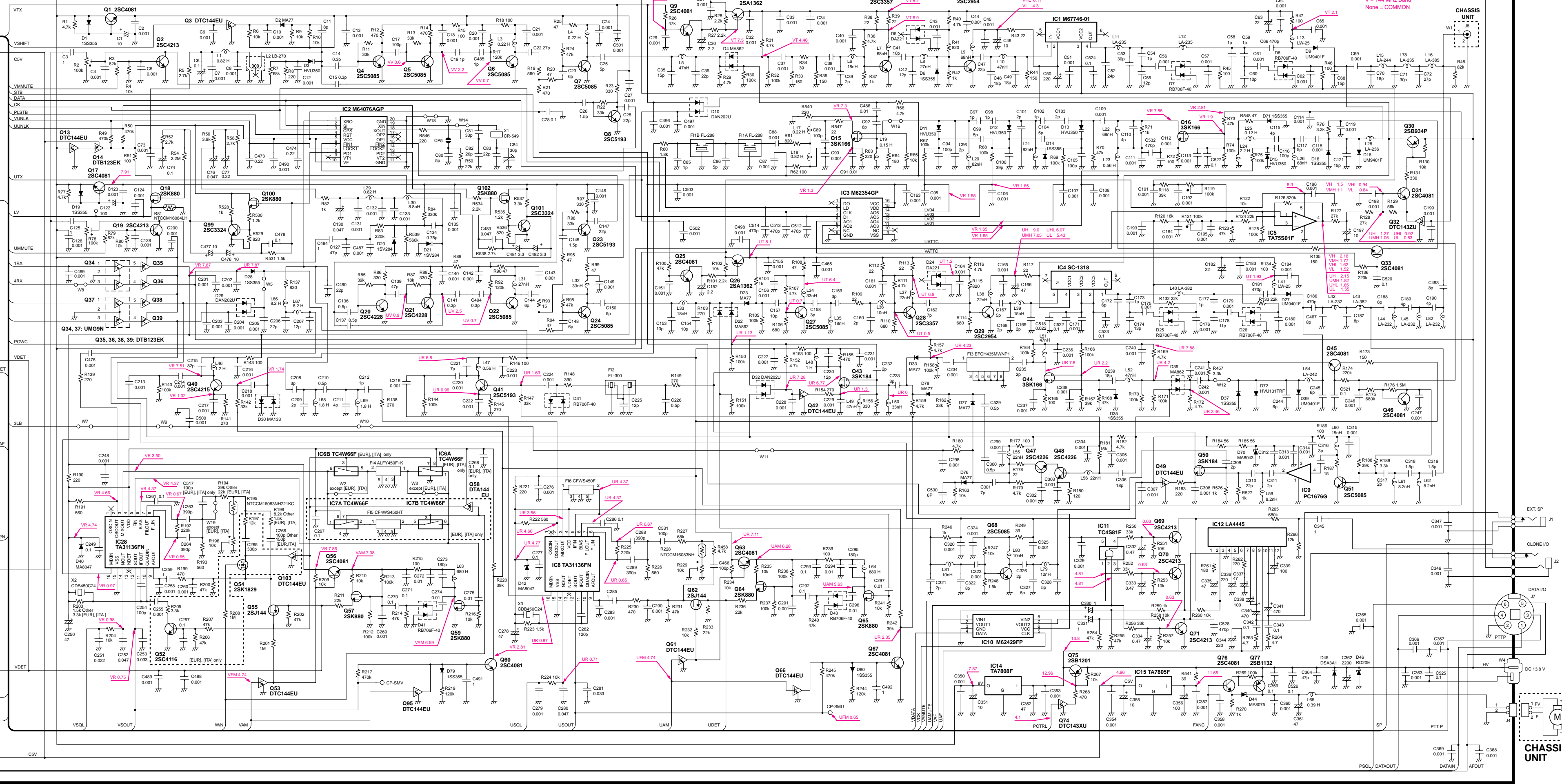
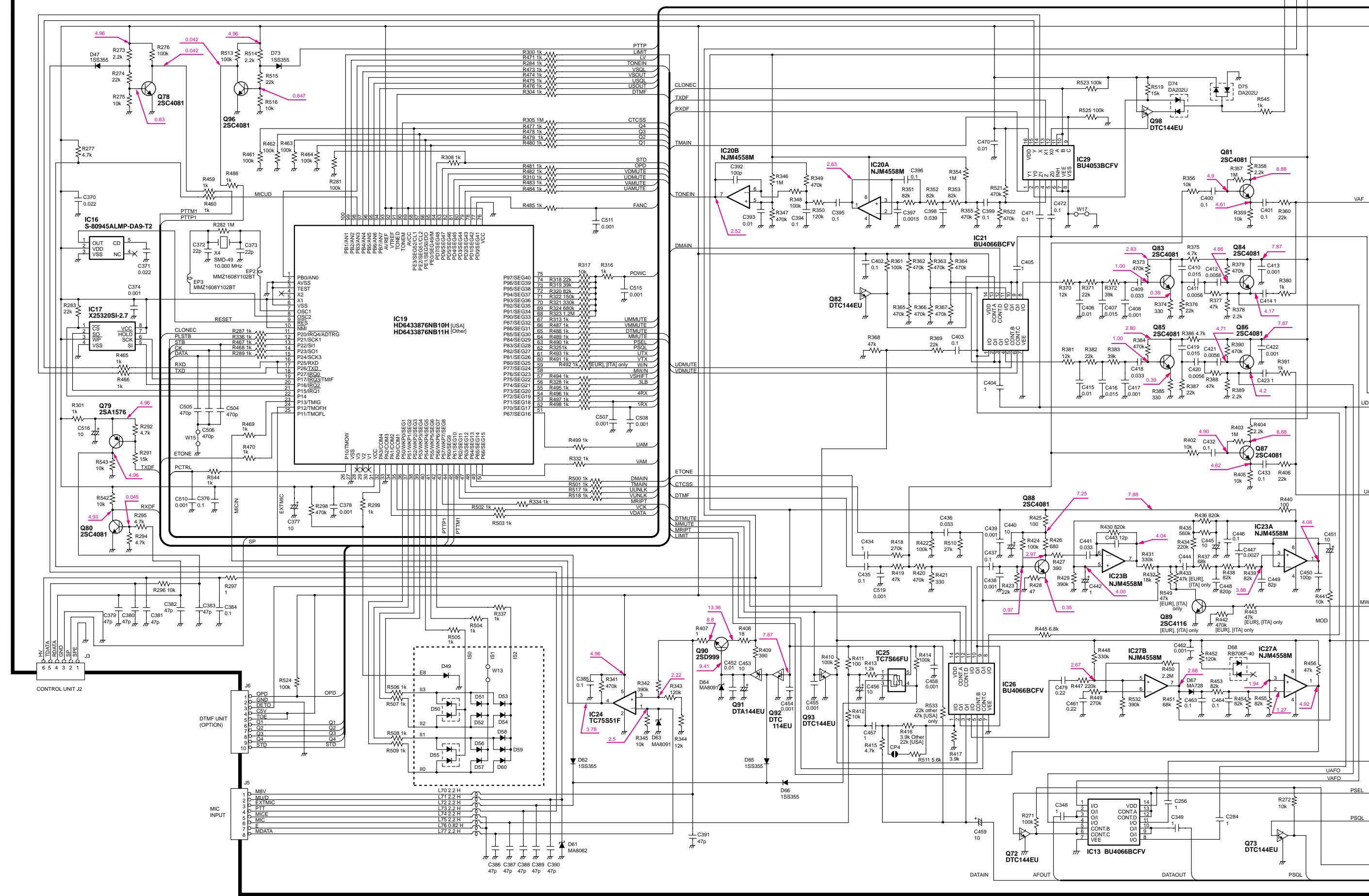


U = 430 MHz Band  
 V = 144 MHz Band  
 None = COMMON

CHASSIS UNIT

COMPLETE VIEW

MAIN UNIT



LEFT SIDE

CENTER

RIGHT SIDE



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