ICOM

SERVICE MANUAL

HF ALL BAND TRANSCEIVER

IC-765

Icom Inc.

INTRODUCTION

This service manual describes the latest service information for the **IC-765** HF ALL BAND TRANSCEIVER at the time of going to press and covers the following versions:

VERSION	VERSION NUMBER
U.S.A.	#02
Australia	#03
Europe	#04
France	#05

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

DANGER

Use **ONLY** the specified AC voltage described on the AC power socket. Other voltages may cause the transceiver damage or personal injury.

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 4 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>

1110001310	IC	μPC577HA	IC-765	MAIN UNIT	5 pieces
8810004690	Screw	BiH M4×5 ZK BS	IC-765	Top cover	10 pieces

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

REPAIR NOTE

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from a 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 40 dB~50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

TABLE OF CONTENTS

SECTION 1 SPECIFICATIONS

■ GENERAL

- Frequency coverage : Receive: 0.10000～30.00000 MHz
  Transmit: 160m band 1.8～2.0 MHz
  80m band 3.5～4.0 MHz
  40m band 7.0～7.3 MHz
  30m band 10.1～10.15 MHz
  20m band 14.0～14.35 MHz
  17m band 18.068～18.168 MHz
  15m band 21.0～21.45 MHz
  12m band 24.89～24.99 MHz
  10m band 28.0～29.7 MHz
- Modes : SSB (A3J), CW (A1), AM (A3), FM (F3), RTTY (F1)
- Frequency step : 10 Hz (with [TS] OFF), 1 kHz (with [TS] ON)
- Frequency stability : Less than ±200 Hz
  (+25 °C; +77 °F, up to 1 hour after power is turned ON)
  Less than ±30 Hz (+25 °C; +77 °F, after every hour)
  Less than ±350 Hz (0 °C～+50 °C; +32 °F～+122 °F)
  Less than ±100 Hz when the optional CR-282 is installed
- Antenna impedance : 50 Ω unbalanced (with [TUNER] OFF),
  16.7～150 Ω unbalanced (with [TUNER] ON)
- Power supply requirement : U.S.A. version AC 100～120 V
  Australia, Europe, France versions AC 200～240 V
- Power consumption : Transmitting max.: 650 VA min.: 250 VA
  Receiving max. audio: 80 VA standby: 75 VA
- Dimensions : 424(W)×150(H)×390(D) mm 16.7(W)×5.9(H)×15.4(D) in.
  (Projections not included)
- Weight : 17.5 kg (38.6 lb)
- Usable temperature range : −10 °C～+60 °C (+14 °F～+140 °F)

■ TRANSMITTER

- Output power : SSB 100 W PEP
  CW, RTTY, FM 100 W
  AM 40 W
- Modulation : SSB Balanced modulation
  FM Variable reactance modulation
  AM Low level modulation
- Max. frequency deviation : ±5 kHz
- RTTY shift width : 170 Hz, 850 Hz selectable
- Spurious emissions : Less than −60 dB
- Carrier suppression : Less than −40 dB
- Unwanted sideband : Less than −55 dB with 1000 Hz modulation
- Microphone impedance : 600 Ω
- Δ TX variable range : ±9.99 KHz

■ RECEIVER

- Receive system : SSB, CW, RTTY, AM Quadruple-conversion superheterodyne
  FM Triple-conversion superheterodyne
- Intermediate frequencies :

	SSB	CW, RTTY	AM	FM
1st	69.0115	69,0106	69.0100	69.0100
2nd	9.0115	9.0106	9.0100	9.0100
3rd	0.4550	0.4550	0.4550	0.4550
4th	9.0115	9.0106	9.0100	—

(Unit: MHz)

• Sensitivity ([PRE/ATT] switch is [PRE] position)	:	SSB, CW, RTTY (for 10 dB S/N)	0.1～0.5 MHz	Less than 0.7 μV
			0.5～1.8 MHz	Less than 1.0 μV
			1.8～30 MHz	Less than 0.15 μV
		AM narrow (for 10 dB S/N)	0.1～0.5 MHz	Less than 4.0 μV
			0.5～1.8 MHz	Less than 6.0 μV
			1.8～30 MHz	Less than 1.0 μV
		FM (for 12 dB SINAD)	28～30 MHz	Less than 0.3 μV
• FM squelch sensitivity	:	28～30 MHz Less than 0.3 μV		
• Selectivity ([IF SHIFT] switch is OFF)	:	SSB	More than 2.2 kHz/−6 dB	
			Less than 3.8 kHz/−60 dB	
		CW (narrow), RTTY (narrow)	More than 500 Hz/−6 dB	
			Less than 1.0 kHz/−60 dB	
		AM	More than 6.0 kHz/−6 dB	
			Less than 18.0 kHz/−50 dB	
		FM	More than 15.0 kHz/−6 dB	
			Less than 30 kHz/−50 dB	
• Spurious and image rejection ratio	:	Image: Less than −80 dB IF: Less than −70 dB		
• Audio output power	:	More than 2.6 W at 10 % distortion with an 8 Ω load		
• Audio output impedance	:	8 Ω		
• RIT variable range	:	±9.99 kHz		

■ ANTENNA TUNER

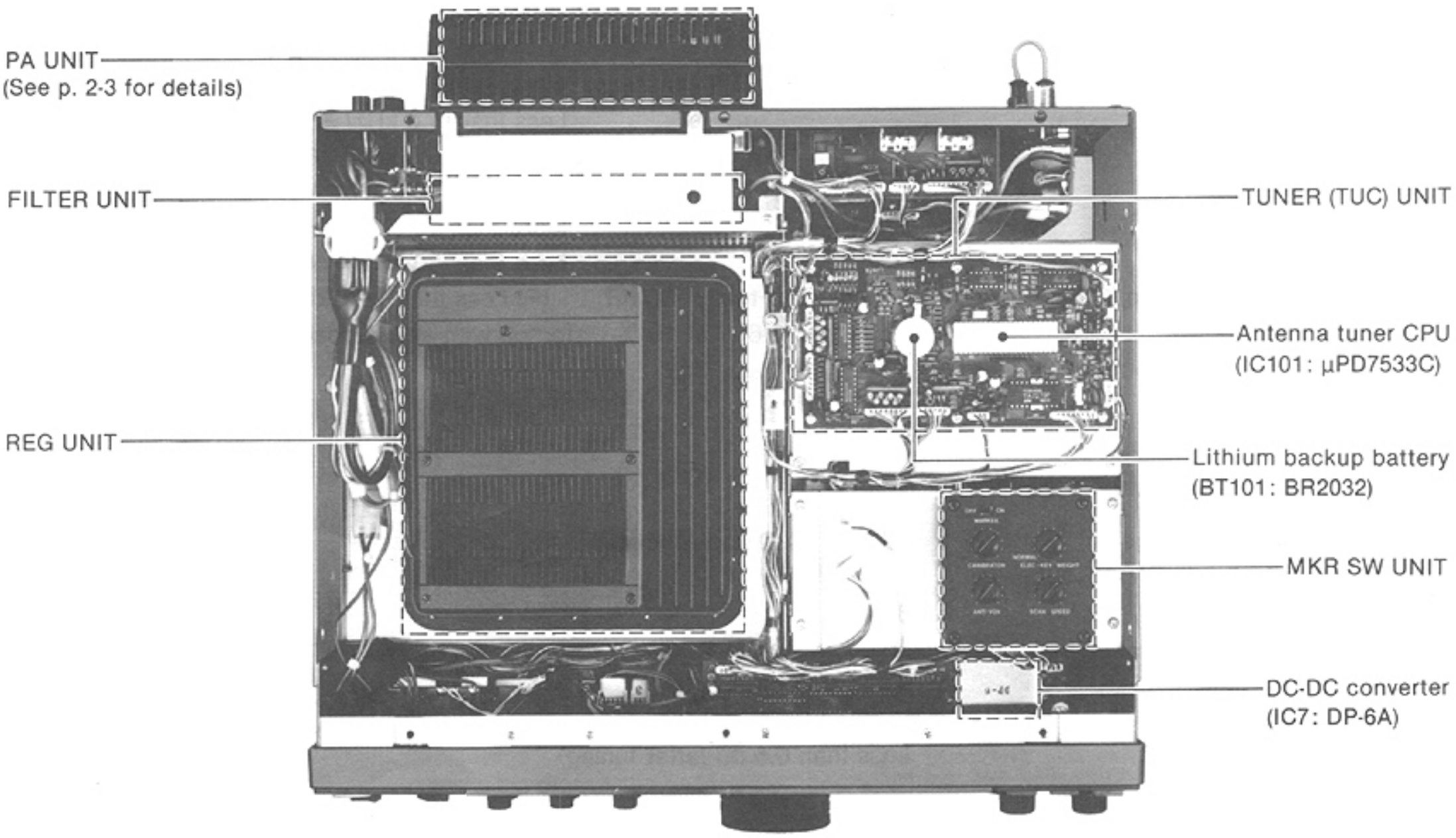
• Output matching range ([TUNER] switch is ON)	:	16.7～150 Ω unbalanced
• Minimum input power	:	8 W
• Band switching time	:	3 seconds or less
• Auto tuning time	:	3 seconds or less
• Auto tuning accuracy	:	VSWR 1.2 : 1 or less
• Insertion loss	:	Less than 0.5 dB (after tuning)

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

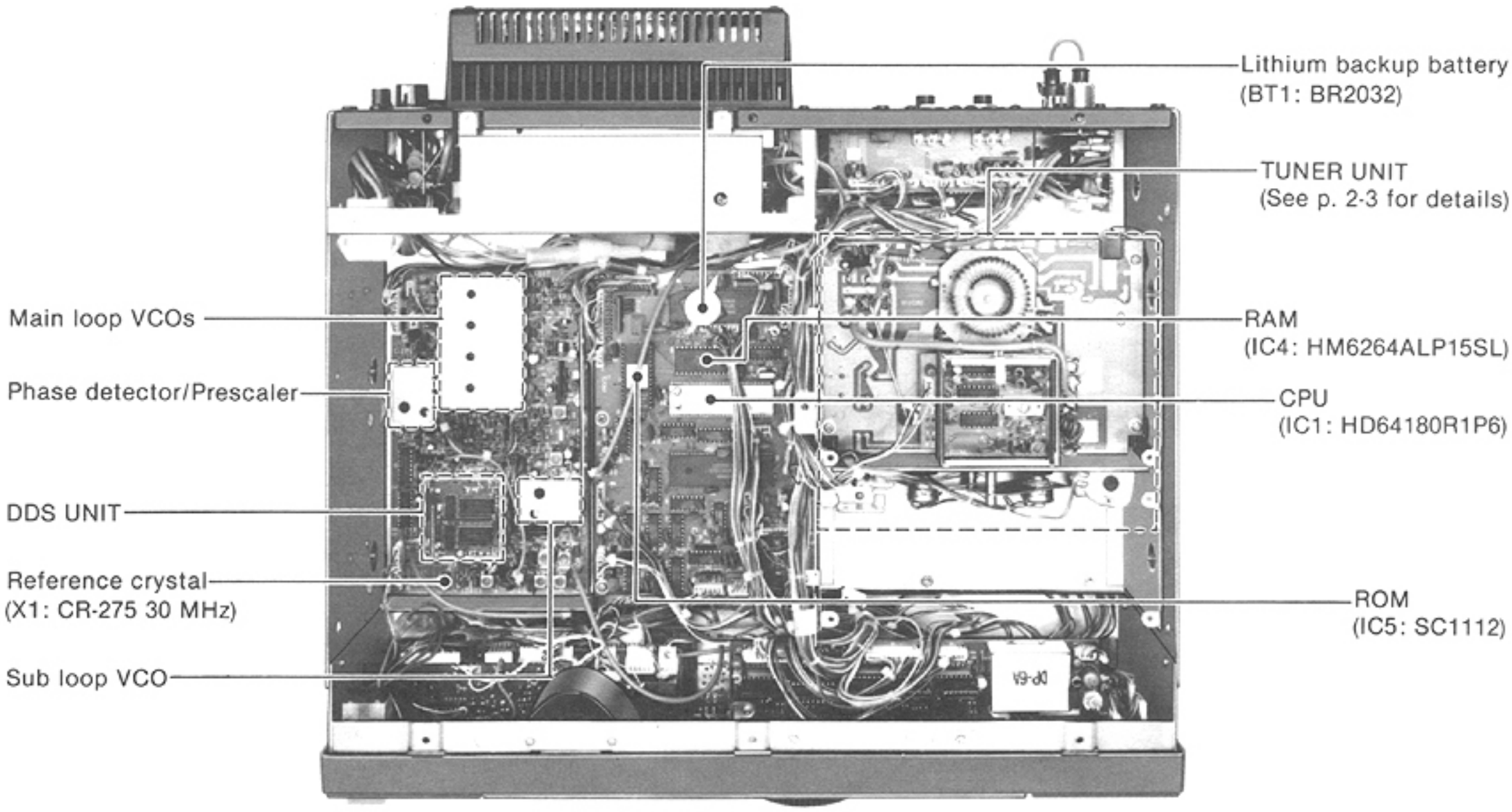
SECTION 2 INSIDE VIEWS

2-1 TOP VIEW

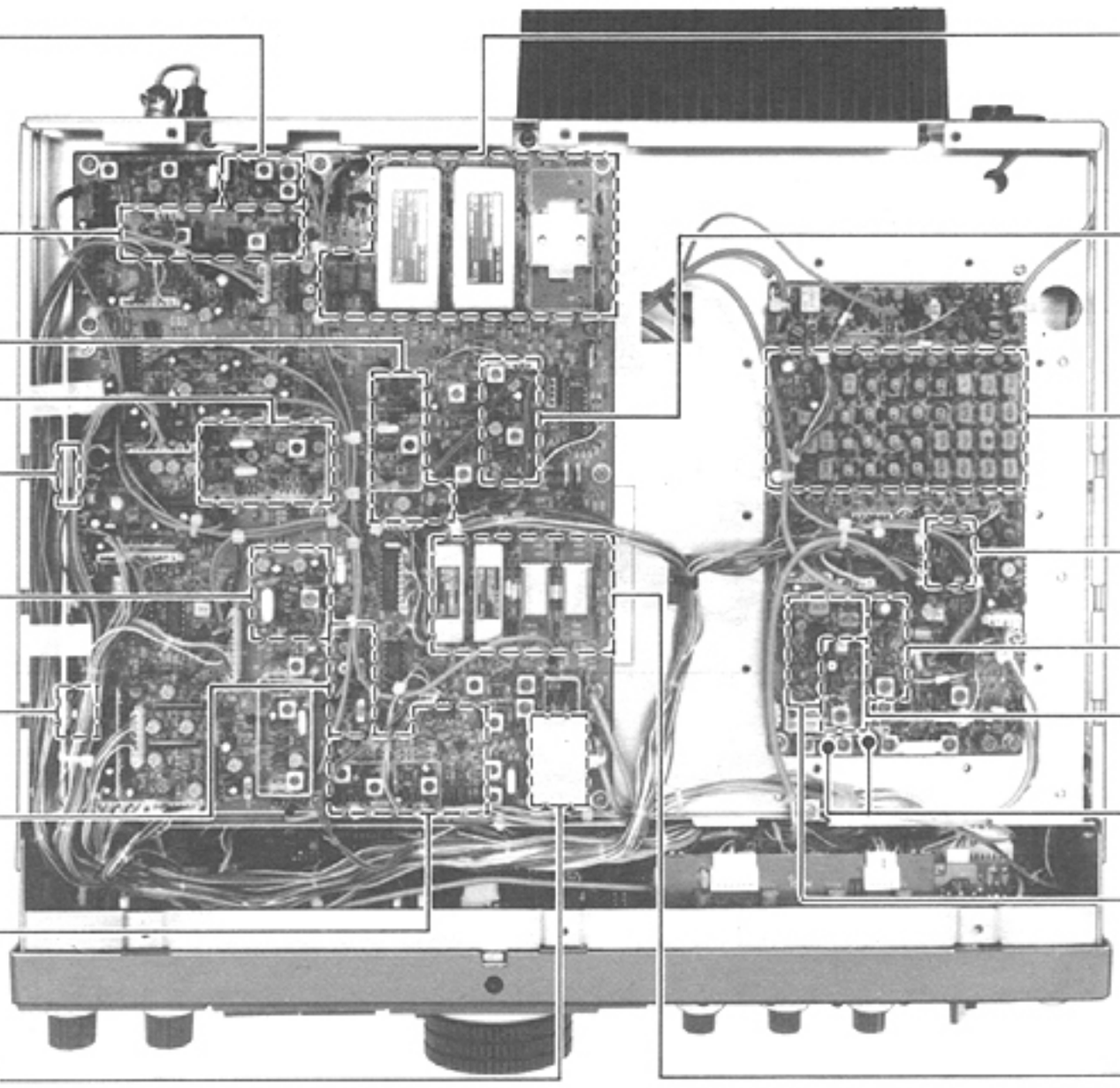
• REG AND TUNER (TUC) UNITS ARE ATTACHED



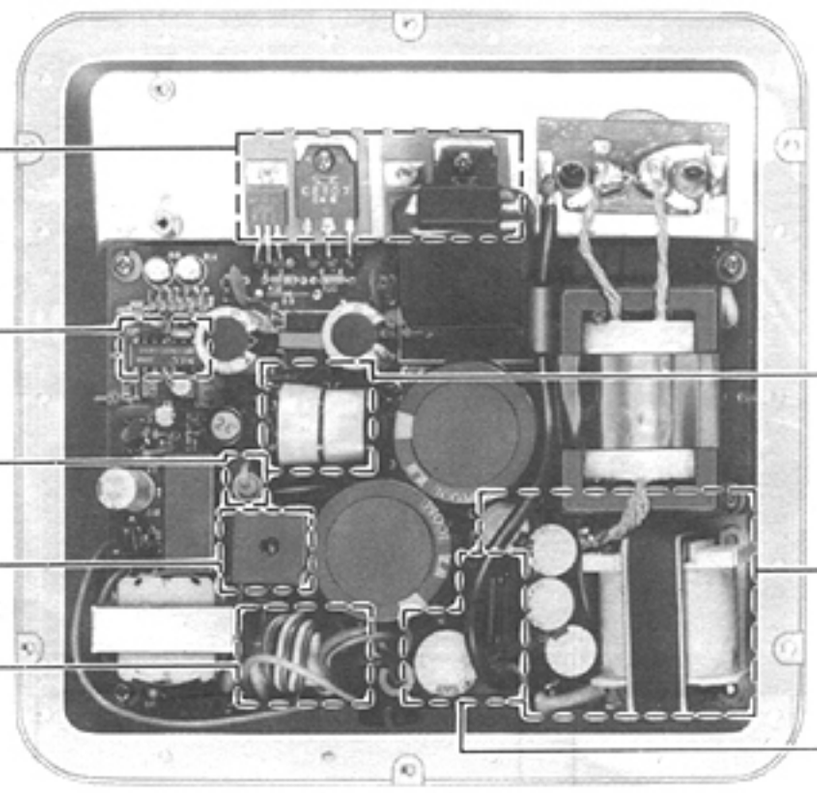
• REG AND TUNER (TUC) UNITS ARE REMOVED



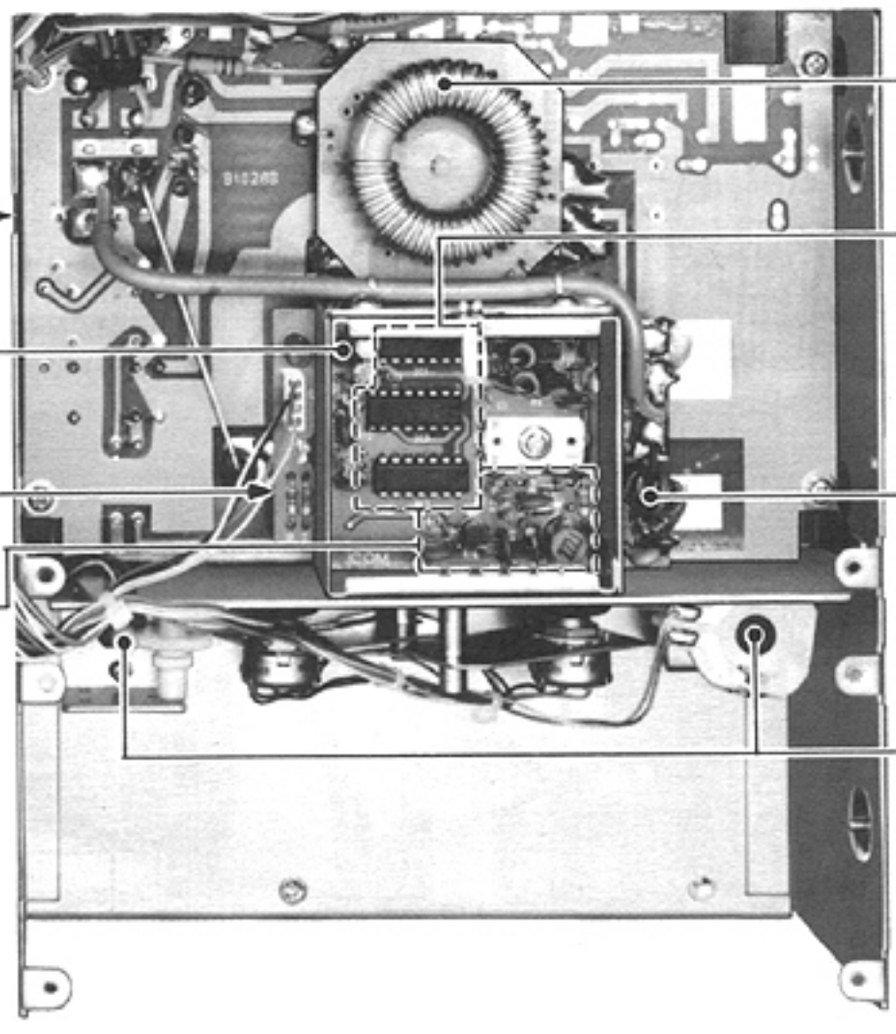
2-2 BOTTOM VIEW



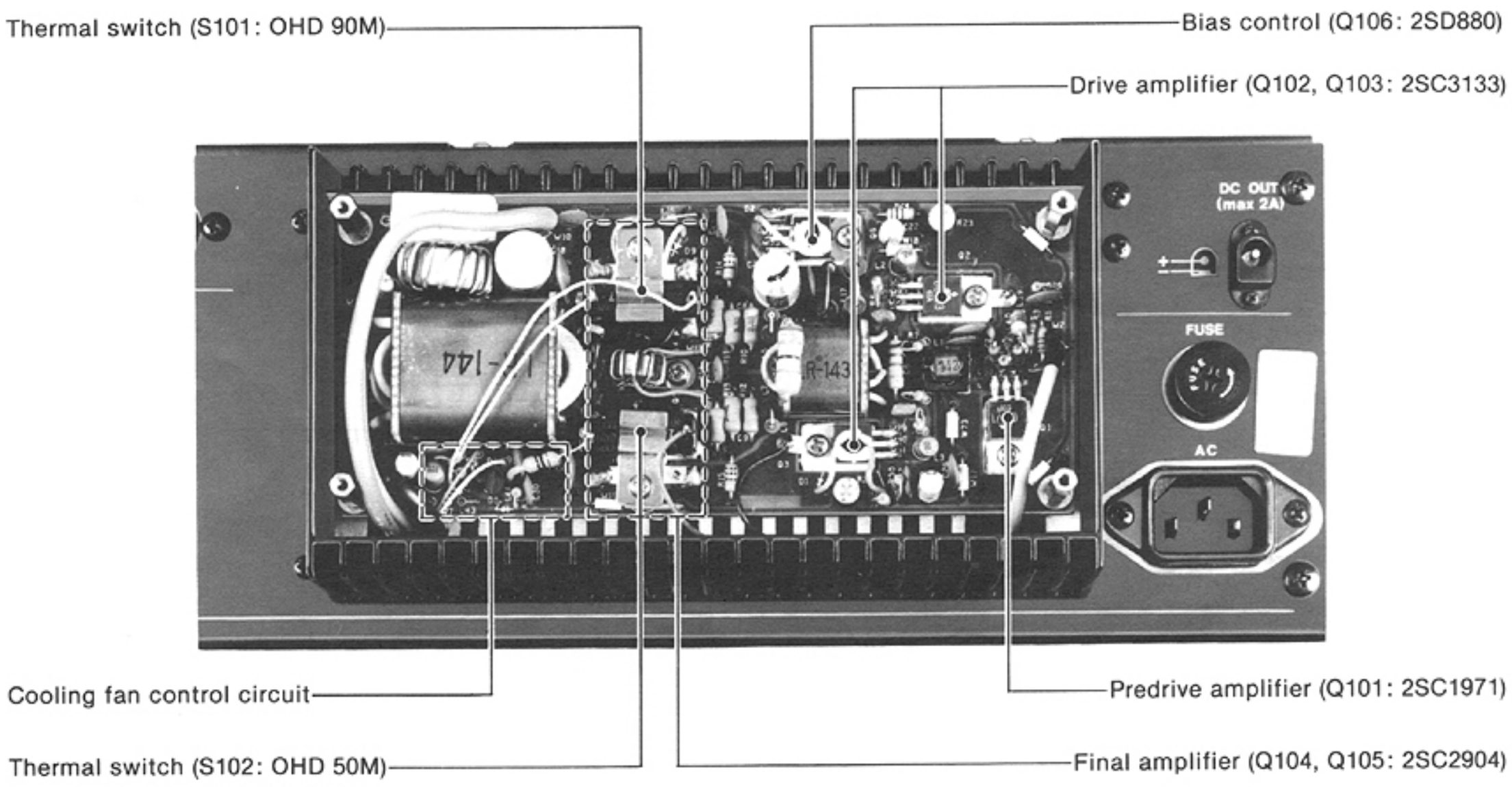
2-3 REG UNIT



2-4 TUNER UNIT



2-5 PA UNIT



SECTION 3 CIRCUIT DESCRIPTION

3-1 RECEIVER CIRCUITS

3-1-1 RF SWITCHING CIRCUIT (ANT SW AND RF UNITS)

RF signals from the antenna connector pass through the TUNER UNIT, the receive line switching relay (RL201), the receive antenna jacks and a low-pass filter. The signals either bypass or are attenuated at the 10 dB attenuator (R211) and are then applied to the RF UNIT via P201 (RF UNIT: J10). RL201 is a reed relay and is used as a switching relay corresponding to the full break-in switching speed.

The signals applied to the RF UNIT either bypass or are attenuated at a 20 dB attenuator using RL1. The signals are then applied to RF filters. The signals from the [X-VERTER] jack are also applied to the RF filters.

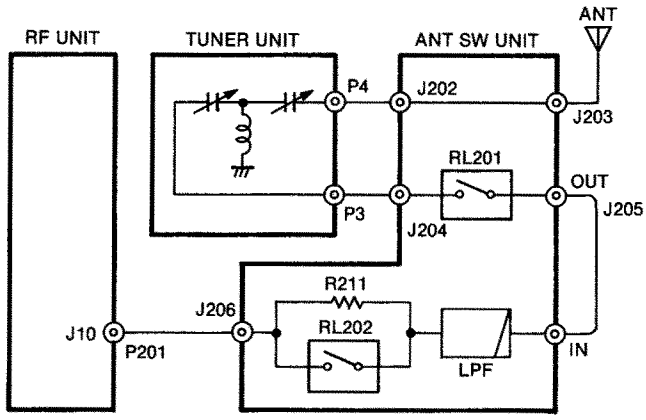


Fig. 1

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

The RF UNIT has 9 RF bandpass filters for signals above 1.6 MHz and 2 low-pass filters for signals below 1.6 MHz. The signals pass through one of the bandpass or low-pass filters depending on the receive frequency range. Pin diodes (D41~D44, D47) are used at the front-end switching diodes to prevent distortion caused by strong signals.

(1) 0.1~0.5 MHz

Signals are applied to a low-pass filter via D44. Diodes (D43, D44) are turned ON when "B1" line is "HIGH." Filtered signals are applied to a 30 MHz cut-off low-pass filter via D43.

(2) 0.5~1.6 MHz

Signals are applied to a low-pass filter via D42. Diodes (D41, D42) are turned ON when "B2" line is "HIGH." Filtered signals are applied to the 30 MHz cut-off low-pass filter via D41.

(3) 1.6 MHz AND ABOVE

Signals passed through D47 are applied to a high-pass filter consisting of L101, L102, C180~C182. This filter suppresses strong signals below 1.6 MHz such as a broadcasting station. Filtered signals are applied to one of the 9 bandpass filters depending on the frequency of the signals.

After passing through a bandpass filter, the signals are applied to an L-type attenuator by using D10 and D11. The attenuator functions as an RF AGC circuit. These diodes are pin diodes and are controlled by AGC bias voltage via Q3 and Q5. By combining 2 diodes D10 and D11, an input impedance of the circuit is maintained at approximately 50 Ω. When strong signals are received, the AGC circuit increases the attenuation level, preventing front-end overloading.

PREAMP CIRCUIT

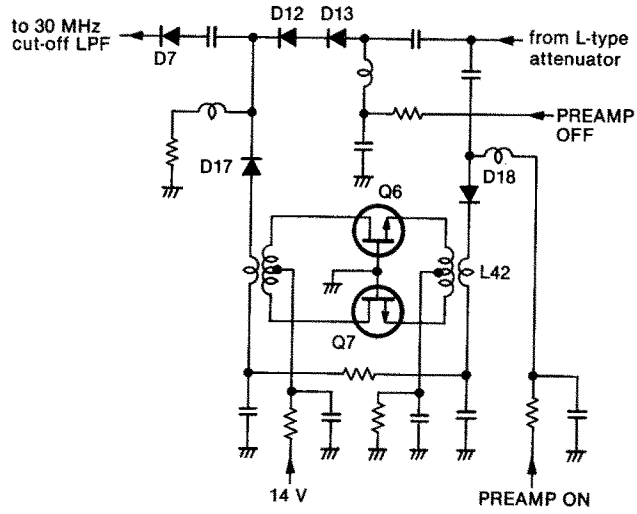


Fig. 2

When the [PRE/ATT] switch is set to the [PRE] position, the signals from the attenuator are amplified at the preamplifier circuit (Q6, Q7). The preamplifier provides 8~10 dB gain over a wideband frequency range. When the [PRE/ATT] switch is set to the [OFF] position, the signals bypass the preamplifier through D12 and D13. Amplified or bypassed signals are applied to the 30 MHz cut-off low-pass filter via D7.

(4) FILTER SWITCHING CIRCUIT

BPF or LPF switching voltage (B1~B11) is obtained at IC1 and IC2 by decoding band signals (B1~B11; see Section 3-4-3 for details) from the LOGIC UNIT.

3-1-3 1ST MIXER CIRCUIT (RF UNIT)

Filtered signals are applied to a 1st mixer circuit via the 30 MHz cut-off low-pass filter to suppress image frequency. The signals then enter the 1st mixer circuit (Q9, Q10) to be converted to a 69 MHz 1st IF signal.

EXACTNESS 1ST IF FREQUENCY

MODE	FREQUENCY (MHz)
SSB	69.0115
CW, RTTY	69.0106
AM, FM	69.0100

The 1st mixer circuit employs the Icom DFM (Direct Feed Mixer) system and a balanced mixer using low-noise junction FETs (2SK125 × 2) to expand the dynamic range.

A 1st LO signal (69.1115~99.0115 MHz) enters the RF UNIT from the PLL UNIT via P1. The signal is filtered at a high-pass filter, amplified at Q2, filtered at a low-pass filter, and then applied to the 1st mixer circuit (Q9, Q10).

The 1st IF signal is applied to a pair of MCFs (Monolithic Crystal Filter; FI1) to suppress out-of-band signals. The signal is amplified at the 1st IF amplifier (Q8) and then applied to the 2nd mixer (MAIN UNIT: IC17) via P2 (MAIN UNIT: J7).

A dual-gate FET is used on the 1st IF amplifier (Q8). The 2nd gate of Q8 is controlled by the AGC bias voltage from the MAIN UNIT.

3-1-4 IF CIRCUITS (MAIN UNIT)

The 1st IF signal from the RF UNIT is converted to a 9 MHz 2nd IF signal at the 2nd mixer (IC17). IC17 is a DBM (Double Balanced Mixer).

EXACTNESS 2ND IF FREQUENCY

MODE	FREQUENCY (MHz)
SSB	9.0115
CW, RTTY	9.0106
AM, FM	9.0100

A 2nd LO signal (60 MHz) from the PLL UNIT via P2 is amplified at Q63 and applied to the 2nd mixer. The converted 2nd IF signal passes through D86 (D85 for transmitting) and then the MCF (FI2).

The signal from FI2 passes through the noise blanker gates (D87~D90), and is then amplified at the 2nd IF amplifier (Q62). The signal enters one of the four 9 MHz filters (FI3, FI4, optional CW and AM filters) or bypasses them.

The signal from a 9 MHz filter passes through the impedance converter (Q64). The signal is mixed with a 3rd LO signal to be converted to a 455 kHz 3rd IF signal at IC18. The 3rd IF signal is amplified at the 3rd IF amplifier (Q65) and passes through one of the five 455 kHz filters (FI5~FI8, optional CW filter).

The signal from the 455 kHz filter passes through the impedance converter (Q70). The signal is mixed with a 4th LO signal to be converted to a 9 MHz 4th IF signal at IC19. In FM mode, the signal from Q70 is applied to an FM demodulator circuit via C265.

Dual-gate FETs are used on the 2nd and 3rd IF amplifiers (Q62, Q65). The 2nd gates of Q62 and Q65 are controlled by the AGC bias voltage. The 9 MHz and 455 kHz filters are selected with control signals from an IF filter switching circuit. Refer to Section 3-2-17 IF FILTER SWITCHING CIRCUIT for information regarding filters and filter switch/ operating mode combinations.

The 4th IF signal is then applied to a notch filter circuit.

RECEIVER IF CIRCUITS

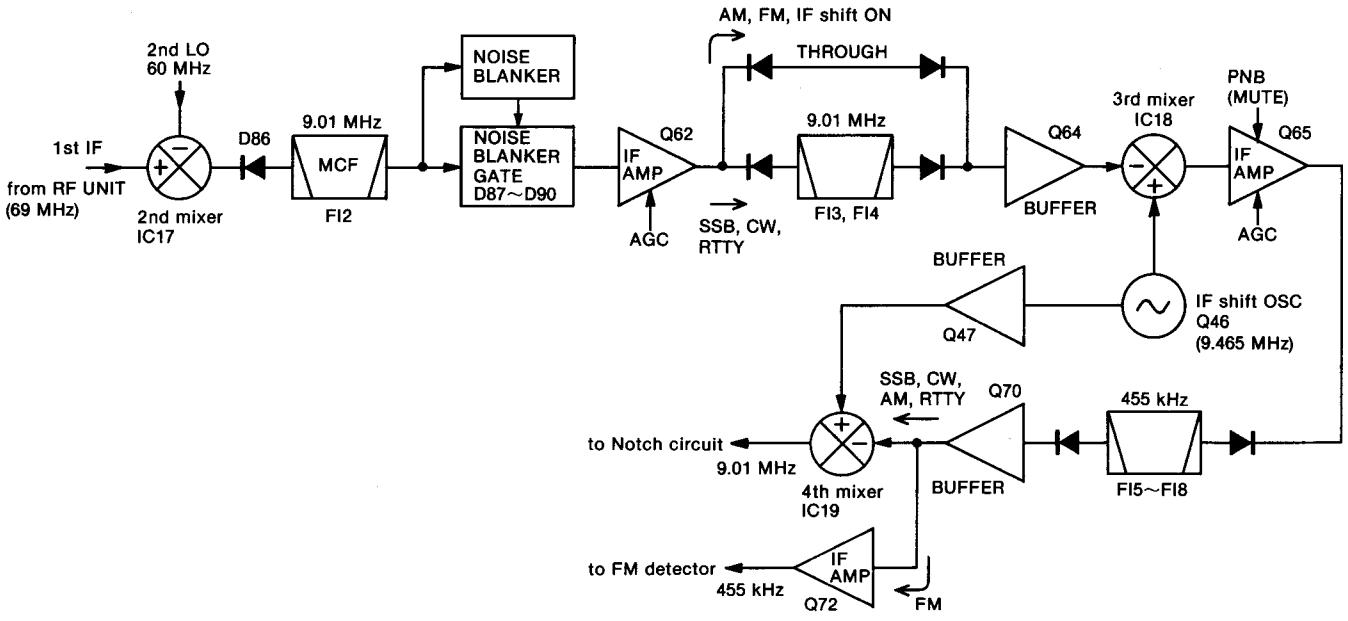


Fig. 3

3-1-5 NOISE BLANKER CIRCUIT (MAIN UNIT)

The IC-765 uses a noise trigger noise blanker circuit that cuts out pulse-type noise signals at the noise blanker gate (D87~D90).

A portion of the signal from FI2 is amplified at the noise amplifiers (Q55~Q57), which employs 2 dual-gate FETs for wide AGC dynamic range. The signal is detected at the noise detector (D83, D84). The detected voltage from the noise detector is applied to the noise blanker switch (Q61).

The threshold level of the noise blanker switch is controlled by the [NB LEVEL] control. When the detected voltage exceeds the threshold level, Q60 outputs a blanking signal to activate the noise blanker gate (D87~D90).

The signal from Q61 is also applied to the pulse width stretch circuit (IC16). This circuit consists of the Miller integrator (IC16b) and comparator (IC16a) to function as a blank pulse delay for corresponding to the "woodpecker" noise.

A portion of the detected voltage is applied to the noise AGC circuit (Q58) and fed back to the noise amplifier as noise AGC voltages. The time constant of the noise AGC circuit is determined by R264, R267 and C165. This AGC circuit does not operate to detect pulse-type noise.

Q59 cancels the noise blanker operation after 1~2 msec. to prevent unnecessary distortion from this circuit. When the [NB WIDE] switch is ON, C173 is connected in parallel with C175 to change the noise blanker cancelling time for 10 msec.

3-1-6 NOTCH FILTER CIRCUIT (MAIN UNIT)

The notch circuit attenuates a particular frequency at a resonance circuit. The IC-765 uses a bridge notch filter including a crystal as the resonance circuit.

NOTCH FILTER CIRCUIT

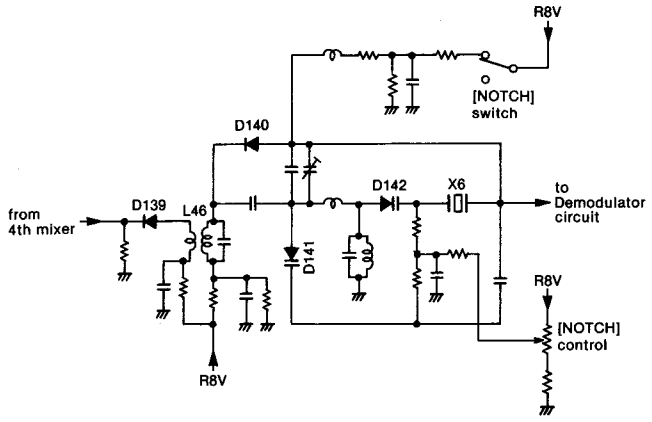


Fig. 4

The 4th IF signal passes through the bridge notch filter (D141, D142, X6, L47, L48). The [NOTCH] control varies the applying voltage to D141 and D142 to adjust the center frequency of the notch filter. When the [NOTCH] switch is turned OFF, D140 is turned ON and the 4th IF signal bypasses the notch filter through D140.

The signal from the notch filter is applied to the MCF (FI9) to filter leaked signal components from the 4th LO signal used at IC19. The signal is then applied to demodulator circuits.

3-1-7 IF SHIFT OSCILLATOR (MAIN UNIT)

A 9.465 MHz band signal (9.4636~9.4670) is oscillated at Q46 using X5. To adjust IF shift frequency, the bias voltage (0~8 V) controlled by the [IF SHIFT] control is applied to the varactor diode (D70). −5 V is applied to the anode of D70 to provide wideband frequency variation.

When the [IF SHIFT] switch is turned OFF or while transmitting, Q43 is turned ON and the IF shift frequency is fixed to the center frequency.

The output signal is applied to the 3rd mixer and buffer amplifier (Q47). The buffer-amplified signal is applied to the 4th mixer. The output frequency is adjusted by the [IF SHIFT] control to electronically change the center frequency of the 455 kHz IF filter.

3-1-8 BFO CIRCUIT (MAIN UNIT)

A 9 MHz signal oscillated at the BFO circuit (Q14, X1, X2) is buffer-amplified at Q13 and used at the balanced modulator (IC4) and the product detector (IC21). The BFO frequency is also used at the monitor detector (IC5). The BFO frequency is shifted with a mode signal using D13~D18.

In USB mode, the "USB" signal line becomes "HIGH," turning D13 ON. The frequency is then adjusted with C42 to set an USB carrier point. X2 provides USB BFO oscillation only.

In CW mode receiving, the "CW" signal line becomes "HIGH" and Q16 becomes OFF, turning D14 ON. The frequency is then adjusted with C307 to set a CW receive carrier point. A voltage controlled by the [CW PITCH] control is applied to the varactor diode (D19) to adjust receive CW audio tone.

In LSB mode, the "LSB" signal line turns "HIGH," turning D14 ON. In AM mode transmitting, the "AM" signal line becomes "HIGH" and Q15 turns OFF, turning D15 ON. The frequency is then adjusted with C45 to set a LSB carrier point.

In RTTY mode, the "RTTY" signal line becomes "HIGH," turning D17 ON. The frequency is then adjusted with L5 to set an RTTY carrier point (space frequency).

BFO FREQUENCY IN EACH MODE

MODE	FREQUENCY (MHz)
USB	9.0130
LSB, AM (Tx)	9.0100
CW (Rx)	9.0099
RTTY (Rx)	9.008475
AM (Rx), CW (Tx)	NO OUTPUT

3-1-9 DEMODULATOR CIRCUITS (MAIN UNIT)

The IC-765 has 3 detector circuits, a product detector, a diode detector and an FM detector to demodulate the SSB/CW/RTTY signal, AM signal and FM signal respectively.

The 4th IF signal (SSB, CW, AM and RTTY) from the notch circuit (IC19 through FI9) is amplified at Q71 and Q85, and then applied to the demodulator circuits.

In SSB/CW/RTTY mode, the 4th IF signal is mixed with BFO signal at the product detector (IC21) to demodulate the 4th IF signal into an AF signal. The detected signal passes through the AF input mode selector switch (IC15, pin 10 and 11).

In AM mode, the 4th IF signal from Q85 passes through the impedance converter (Q84) is detected at D151, amplified at Q83, and passes through the AF input mode selector switch (IC15, pins 8 and 9).

In FM mode, the 2nd IF signal from Q70 is amplified at Q72 and Q73, and is limiter-amplified at IC20 to remove AM components such as a noise signal. It is then applied to the ceramic discriminator (X7), D143 and D144 to demodulate the 3rd IF signal into an AF signal.

The detected signal is also applied to the AF input mode selector switch (IC15, pins 3 and 4) via the de-emphasis circuit (R427, C277). This de-emphasis circuit is an integrated circuit with frequency characteristics of −6 dB/octave.

3-1-10 AF INPUT MODE SELECTOR SWITCH (MAIN UNIT)

The AF signal from the demodulator, AM detector or FM detector is applied to the AF input mode selector switch (IC15) consisting of 4 analog switches. The AF signal is selected with a mode signal from the LOGIC UNIT and that passes through the squelch gate (IC15, pins 1 and 2). The AF signal is applied to an AF amp circuit.

3-1-11 AF AMP CIRCUIT (MAIN UNIT)

The AF signal from the AF input mode selector switch is applied to the AF preamplifier (IC6, pin 6). A CW sidetone signal, monitor signal and "VOIC" signal (output from the optional UT-36) are applied to the monitor AF amplifier (IC6, pin 2). The feedback level of the monitor amplifier is controlled by the [MONITOR GAIN] control to adjust the monitor AF level.

The output from the AF preamplifier and monitor amplifier is combined with an output from the beep tone circuit (Q22). The resulting signal is applied to the [RX TONE] control (TONE C UNIT, R602) and the [AF] control (AF VR UNIT, R318a). The AF signal is power-amplified at IC7 to drive the speaker.

The combined signal is applied to the [ACC(1)] socket provided for an external equipment.

3-1-12 AGC AND S-METER CIRCUIT (MAIN UNIT)

The receiver gain is determined by the voltage on the AGC line (Q76, emitter). When strong signals are received, the AGC circuit decreases the voltage on this line.

The IF signal from the impedance converter (Q84) is detected at D149 and D150, and applied to the base of Q77. The time constant (R438, R441, C280, C281) is connected to the AGC line that determines an AGC release time.

The time constant is controlled by the [AGC] switch. When the [AGC] switch is set to the [SLOW] position, R443, C283 and C284 are connected in parallel with the AGC line to obtain a slow AGC release time.

AGC CIRCUIT

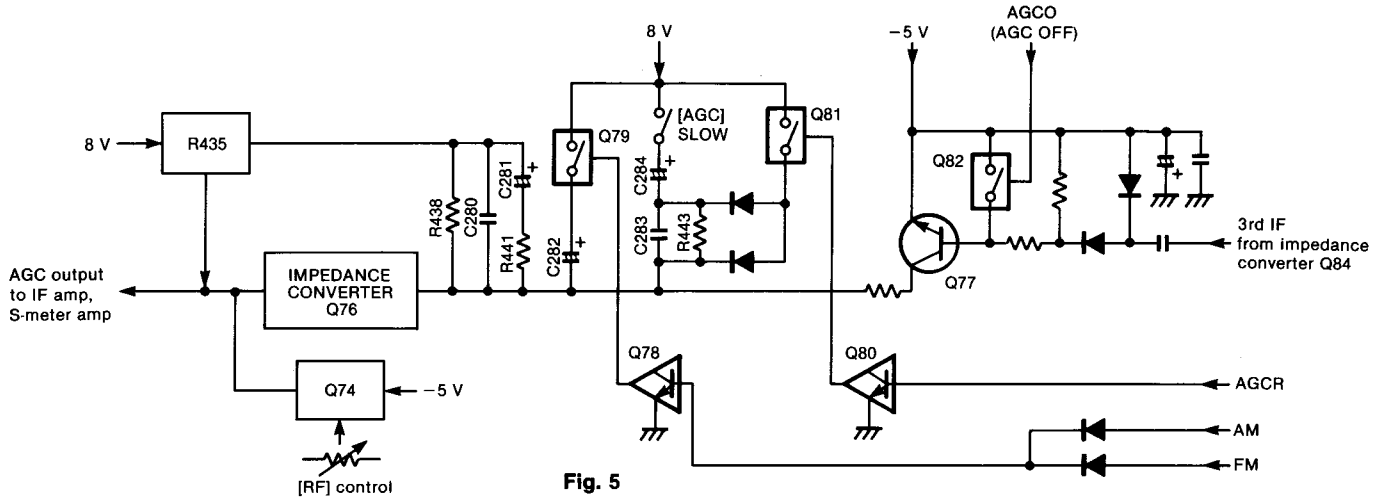


Fig. 5

When the [AGC] switch is set to the [OFF] position, Q82 is turned ON, shorting the detected voltage to deactivate the AGC circuit.

In AM or FM mode, the "AM" or "FM" signal line becomes "HIGH," turning Q78 and Q79 ON. C282 is then connected in parallel with the time constant to obtain an appropriate time constant for AM and FM.

Then impedance converter (Q76) applies AGC bias voltage to the IF amplifiers on the MAIN UNIT and to the L-type attenuator on the RF UNIT. Q74 supplies an AGC reference voltage to the AGC bias voltage line. The AGC bias voltage is controlled by the [RF] control.

The AGC bias voltage is applied to the differential amplifier (IC14 pin 2) where the difference between the AGC bias and reference voltages is detected. The reference voltage is adjusted with R219. The resulting S-meter signal passes through the meter switching circuit (IC13), and is then applied to the multi-function meter.

3-1-13 SQUELCH CIRCUIT (MAIN UNIT)

A squelch circuit mutes an audio output when the S-meter signal is lower than the [SQL] control setting level.

The S-meter signal from IC14 pin 1 is applied to the comparator (IC14 pin 5) to be compared to a reference voltage controlled by the [SQL] control.

In FM mode, the demodulated AF signal via the [SQL] control is applied to the noise amplifier (Q52, Q53) which amplifies noise components of frequencies of 10~20 kHz. The [SQL] control adjusts the Q53 input level. The resulting signals are rectified by D74 and D75, and are converted to DC voltage. The rectified voltage triggers the squelch switch (Q50).

The [SQL] control employs a double variable resistor to obtain 2 relational reference voltages. When the S-meter signal is lower than the threshold level, the comparator turns "HIGH" to activate the squelch gate (IC15, pins 1 and 2). When the noise squelch signal is higher than the threshold level, Q50 turns ON to activate the squelch gate. This signal is also applied to Q49, turning OFF the [RECEIVE] indicator.

3-2 TRANSMITTER CIRCUITS

3-2-1 MIC AMPLIFIER (MAIN UNIT)

Audio signals from the mic connector are amplified at the mic amplifier (Q301) on the AF VR UNIT. The signals pass through the [MIC TONE] and [MIC GAIN] controls, and are then applied to the mic amplifier (Q10) on the MAIN UNIT via J10 pin 1. An external modulation input from the [ACC(1)] socket pin 4 is applied to J10 pin 4.

These signals are applied to the buffer amplifier (Q11) and are then applied to the balanced modulator (IC4).

In FM mode, output signals from Q11 are applied to the IDC UNIT. The signals are limiter-amplified at the IDC UNIT, and are then applied to an FM Tx oscillator circuit.

When the tone function is activated, a subaudible tone is generated at the optional UT-30, amplified at Q32, and then applied to the FM Tx oscillator circuit.

When the [DATA] switch is turned ON, the audio signals are muted at Q302 on the AF VR UNIT for error-free data communication.

3-2-2 BALANCED MODULATOR (MAIN UNIT)

Output signals from the mic amplifier are applied to the balanced modulator circuit (IC4) to be converted to a 9 MHz IF signal. The BFO signal, buffer-amplified at Q13, is applied to IC4 pin 7 as a carrier signal. IC4 outputs a double sideband signal which passes through the 9 MHz filter (FI3) to create an SSB signal. In AM mode, the IF signal bypasses the 9 MHz filter.

R32 and R34 adjust the balance level of IC4 for maximum carrier suppression. In AM mode, Q12 and R37 upset the balance to create an AM carrier signal.

3-2-3 COMPRESSOR CIRCUIT (MAIN UNIT)

The signal from the 9 MHz filter passes through the impedance converter (Q64) and is then applied to the 1st mixer circuit (IC18) to obtain a 455 kHz IF signal. The signal passes through D114 or D116.

When the [COMP] switch is ON, the signal amplified at Q67 passes through the diode limiter (D120, D121) to obtain an average output power, improving signal intelligibility in SSB mode. When the [COMP] switch is OFF, the signal bypasses the above circuits through D116.

The amplified or bypassed signal is amplified at Q69 and applied to a 455 kHz IF filter.

COMPRESSOR CIRCUIT

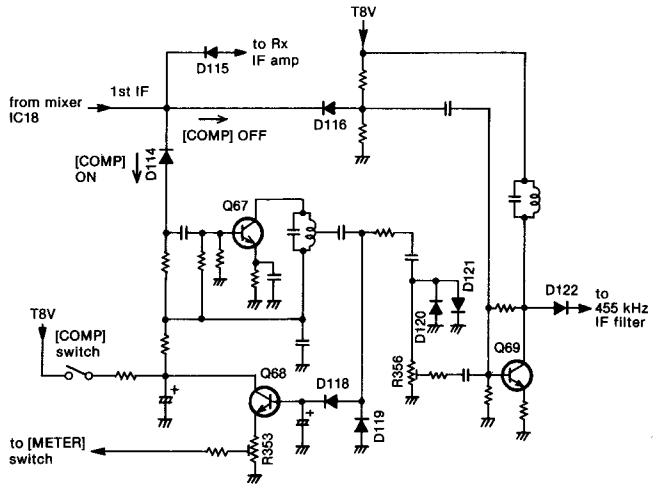


Fig. 6

3-2-4 CW/RTTY CARRIER OSCILLATOR (MAIN UNIT)

CW/RTTY carrier signals are generated at Q35 using X4 and applied to the Tx IF amplifier (Q34).

An RTTY keying signal is applied to Q37 via D35. The output signal is applied to Q35 to control the oscillation. When the polarity selector switch (S3) is reversed, the output signal is inverted at Q36 and applied to Q35. 170 Hz or 850 Hz shift frequencies can be selected with the shift width selector switch (S2). The oscillated frequency is adjusted with C123, C125 and C128.

In CW mode, the oscillation frequency is fixed to 9.0106 MHz using the "CW" signal line.

3-2-5 FM TX OSCILLATOR (MAIN UNIT)

The transmitter has its own IF circuit. An FM Tx oscillator circuit generates a 9.0105 MHz signal.

IDC UNIT output signals (microphone AF signals) and Q32 (subaudible tone signals) are applied to the modulation circuit (D31) in VCO (Q31) to produce an FM signal. The FM signal is applied to the Tx IF amplifier (Q34).

The resulting signal through D23 is combined with the 2nd IF signal (SSB, AM), passes through the MCF (FI1) and IF amplifier (Q33), and is then applied to the Tx 3rd mixer (IC17) via low-pass filter.

3-2-6 IF CIRCUITS (MAIN AND RF UNITS)

The 455 kHz IF signal from the compressor circuit passes through a 455 kHz filter where unwanted signals are removed. The resulting signal is amplified at Q70, and is then mixed with the IF SHIFT signal to be converted to a 9 MHz IF signal at IC19. Q70 and IC19 are used in receiving and transmitting.

The 9 MHz IF signal is combined with the IF signal for CW, RTTY and FM modes. The combined signal is applied to the MCF (FI1) and then to the IF amplifier (Q33). The IF amplifier is a dual-gate FET. The 1st gate of Q33 is controlled by an ALC bias voltage from the ALC circuit. The 2nd gate of Q33 is controlled by the [RF PWR] control.

The 9 MHz IF signal is converted to a 69 MHz IF signal at IC17 and then enters the RF UNIT. The signal is amplified at Q11 and is then applied to the double tuned filter (L32, L33, C77) to suppress spurious components. The 2nd gate of Q11 is also controlled by the ALC bias voltage. The amplified signal is converted to the displayed frequency at the balanced mixer (Q12, Q13).

3-2-7 RF CIRCUITS (RF AND PA UNITS)

The converted signal from Q12 and Q13 is applied to a 30 MHz low-pass filter where unwanted LO signal emission is reduced. The converted signal bypasses the preamplifier (Q6, Q7) and L-type attenuator (D10, D11) circuits. The signal passes through one of the 8 band-pass filter (1.8~30 MHz HF amateur bands), is amplified at Q14, and is then applied to the PA UNIT via J8.

When the "TRV8" signal line becomes "HIGH," D46 is turned ON. The signal from a bandpass filter is applied to the [X-VERTER] jack via J9 for use with an external transverter.

L101, L102 and C180~C182 form a high-pass filter to prevent re-application of strong signals below 1.6 MHz, such as those from a broadcasting station.

TRANSMITTER IF CIRCUITS

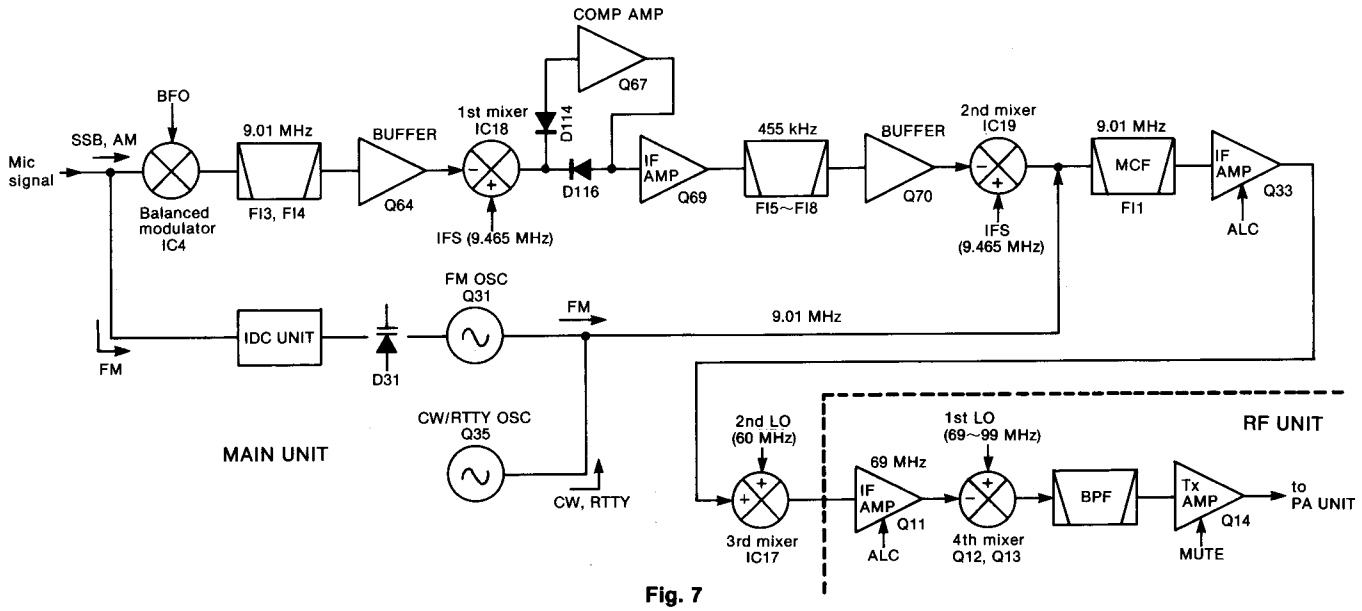


Fig. 7

Incoming signal from the RF UNIT is amplified at the predrive amplifier (Q101), the drive amplifier (Q102, Q103) and the power amplifier (Q104, Q105) to obtain stable 100 W RF output power in the PA UNIT. The predrive amplifier is a class A amplifier, and both the drive and power amplifiers are class AB push-pull amplifiers. A stable bias voltage is applied to the predrive, drive and power amplifiers. D101 controls a bias voltage to the drive amplifier. Q106, D102 and D109 supply a bias voltage to the power amplifier.

A 0.012 Ω resistor (R120), inserted in the HV line, is provided for the Ic meter. A voltage generated at both terminals of R120 is applied to the IF UNIT via the "IC+" and "IC−" signal line.

Thermal switches S101 and S102 detect the temperature of Q104 and Q105, and control the cooling fan speed.

TEMPERATURE °C (°F)		Below 50 (122)	50~90 (122~194)	Above 90 (194)
THERMAL SWITCH	S101	OFF	OFF	ON
	S102	OFF	ON	ON
COOLING FAN SPEED	RECEIVE	STOP	LOW	MID
	TRANSMIT	STOP	MID HIGH	HIGH

3-2-8 FILTER UNIT

The FILTER UNIT has 7 Chebyshev low-pass filters. The signal from the PA UNIT, applied to one of the low-pass filters depending on the transmit frequency range, suppresses high harmonic components.

The filter switching voltage, obtained at the LOGIC UNIT, passes through the TUNER UNIT and is applied to the FILTER UNIT via P1.

FREQUENCIES AND APPROPRIATE FILTERS

FILTER	FREQUENCY RANGE (MHz)
1.8 MHz	Below 2
3.5 MHz	2~4
7 MHz	4~8
10 MHz	8~11
14 MHz	11~15
21 MHz	15~22
28 MHz	22~30

The filtered signal passes through the SWR detector circuit (L18) and is then applied to the ANT SW UNIT. The forward signal from L18 is detected at D1 and applied to the MAIN UNIT as the "FOR" voltage. The reflection signal from L18 is detected at D2 and applied to the MAIN UNIT as the "REF" voltage.

SWR DETECTOR CIRCUIT

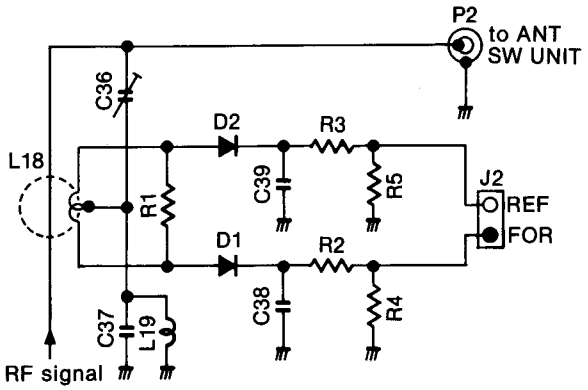


Fig. 8

3-2-9 ANTENNA SWITCHING CIRCUIT (ANT SW UNIT)

The RF signal from the FILTER UNIT passes through the diode switch (D201) and the TUNER UNIT, and is then applied to the antenna connector.

3-2-10 ALC CIRCUIT (MAIN UNIT)

The ALC (Auto Level Control) circuit stably controls the RF output power using the [RF PWR] control.

The "FOR" voltage from the FILTER UNIT is applied to IC9 pin 6 and 3. The "POC" voltage controlled by the [RF PWR] control is also applied to IC9 pin 5 as a reference voltage.

When the "FOR" voltage exceeds the "POC" voltage, IC9 controls the IF amplifiers to reduce the output power until the "FOR" and "POC" voltages are equalized using the impedance converter (Q27).

In AM mode, IC9 operates as an averaging ALC amplifier, because the capacitor (C91) is connected to the base of Q27 using Q25 and Q26. Q24 turns ON and the "POC" voltage is shifted for 40 W AM output power (maximum).

An external ALC input from the [ALC] jack or [ACC] sockets is applied to Q29. ALC operation is identical to that of the internal ALC.

3-2-11 APC CIRCUITS (MAIN UNIT)

An APC circuits protect the final transistors from high SWR and excessive current.

The "REF" voltage from the FILTER UNIT is applied to IC8 pin 5. The amplified signal is applied to IC10 pin 6. A reference voltage, determined by R120 and R121, is applied to IC10 pin 5. The output voltage from IC10 pin 7 is applied to the ALC line via D156 to reduce the output power.

The output voltage of the Ic meter amplifier (IC8 pin 1) is also applied to IC10 pin 6 to prevent excessive current.

3-2-12 CW KEYING CIRCUIT (MAIN UNIT)

A keying signal from the [ELEC-KEY] jack enters the electronic keyer IC (KEYER UNIT, IC401) and is applied to Q5 via the "KEY" signal line. A keying signal from the [KEY] jack is also applied to Q5.

When the CW key is closed, the "KEY" signal line becomes "LOW." IC3 pin 3 outputs a "LOW" signal to the FET switch (Q18) in the CW sidetone circuit. The "LOW" signal is also applied to the VOX UNIT via Q90.

IC3 pin 4 outputs a "HIGH" signal to Q30, turning the CW/RTTY carrier oscillator ON and OFF.

3-2-13 CW SIDETONE CIRCUIT (MAIN UNIT)

A CW sidetone circuit outputs an approx. 700 Hz signal.

In CW mode, the "CW" signal line becomes "HIGH," activating the CW sidetone oscillator (Q17). The CW sidetone signal passes through the FET switch (Q18) controlled by a CW keying signal line. The signal is then applied to the monitor amplifier (IC6 pin 2).

CW SIDETONE CIRCUIT

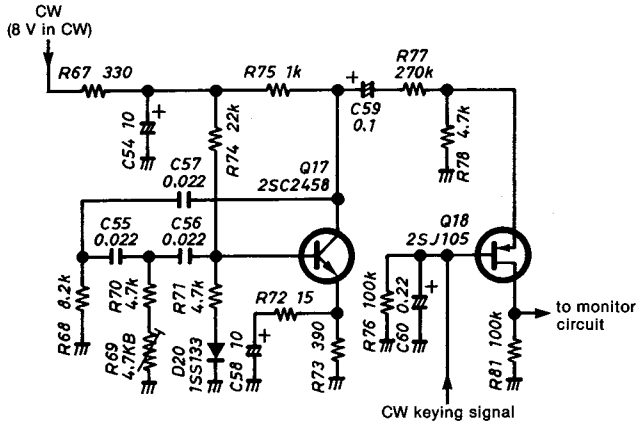


Fig. 9

3-2-14 MONITOR CIRCUIT (MAIN UNIT)

A portion of the 9 MHz IF signal from Q33 is amplified at Q19 and demodulated at IC5. The signal is applied to the monitor mute switch (Q21) and then to the monitor amplifier (IC6 pin 2).

In CW mode, the CW sidetone signal from Q17 is applied to the monitor amplifier.

3-2-15 TRANSMITTER METER CIRCUITS (MAIN UNIT)

(1) Po METER

The "FOR" voltage from the FILTER UNIT is applied to the Po meter amplifier (IC9 pin 3), and is then applied to the meter switch (S202 on the NB VR UNIT). D202 and C206 on the NB VR UNIT are used for peak power measurement.

(2) Ic METER

The "IC+" and "IC−" voltages, generated at the PA UNIT, are applied to the differential amplifier (IC8 pins 2 and 3). The resulting signal is applied to the meter switch.

(3) ALC METER

A voltage from the ALC line is applied to the ALC meter amplifier (IC10 pin 2), and is then applied to the meter switch.

(4) COMP METER

A portion of the output from the compressor amplifier (Q67) is detected at D118 and D119, amplified at Q68, and applied to the meter switch.

(5) SWR METER

The "FOR" voltage, amplified at the Po meter amplifier, is applied to the SWR UNIT. The "REF" voltage, amplified at IC8j, is also applied to the SWR UNIT. The SWR UNIT outputs a signal according to the ratio of "FOR" to "REF" voltage. The signal is applied to the meter switch.

3-2-16 METER SWITCHING CIRCUIT (MAIN UNIT)

The transmitter meter signal, selected with the meter switch, is applied to the meter switching circuit (IC13). The S-meter signal from IC14 pin 1 is also applied to IC13. The meter signal is selected with the "T8V" and "R8V" voltage lines.

3-2-17 T/R SWITCHING CIRCUIT (MAIN UNIT)

When the PTT or [TRANSMIT/RECEIVE] switch is set to transmit, IC2 pin 3 and IC2 pin 13 are "LOW." At this time, Q8 turns ON, and 0 V is present on the "R8V" line. Q6 turns OFF, and there is 8 V present on the "T8V" line.

When the PTT or [TRANSMIT/RECEIVE] switch is set to receive, IC2 pin 3 and IC2 pin 13 are "HIGH." At this time, Q8 turns OFF, and 8 V is present on the "R8V" line. Q6 turns ON, and there is 0 V present on the "T8V" line.

R10, R11, C12 and C13 provide an appropriate Tx/Rx switching timing.

3-2-18 IF FILTER SWITCHING CIRCUIT (MAIN UNIT)

The IC-765 has two 9 MHz IF filters (plus 1 bypass circuit) and four 455 kHz IF filters. IF filter combinations are selected with mode signals and "R8V" and "T8V" voltages. IC12 is a voltage buffer that turns ON the filter switching diodes.

3-2-19 VOX CIRCUIT (VOX UNIT)

A VOX (voice-operated relay) function controls the transmitter with speaking voice.

A portion of the output from the microphone amplifier (AF VR UNIT Q301) is applied to the VOXI terminal via the [VOX GAIN] control. A portion of the output from the AF power amplifier (MAIN UNIT IC7) is applied to the AVOX terminal via the [ANTI-VOX] control.

The Tx/Rx switching or break-in delay time is adjusted with the [VOX DELAY] control, changing the time constant (MAIN UNIT R3, C9) of the CW keying line. When the [FULL BK-IN] switch is turned ON, C9 is disconnected, reducing a break-in delay time.

3-3 PLL CIRCUITS

3-3-1 GENERAL DESCRIPTION

The PLL UNIT generates a 1st LO signal (69.1115~ 99.0115 MHz variable) used in the RF UNIT and 2nd LO signal (60 MHz fixed) used in the MAIN UNIT. The IC-765 uses a dual loop PLL system. A main loop PLL uses 4 VCO circuits for all HF band coverage within 500 kHz steps. A sub loop PLL uses a DDS (Direct Digital Synthesizer) System for 500 kHz coverage within 10 Hz steps. The DDS System provides a rapid lockup time and high quality frequency oscillation.

PLL CIRCUIT BLOCK DIAGRAM

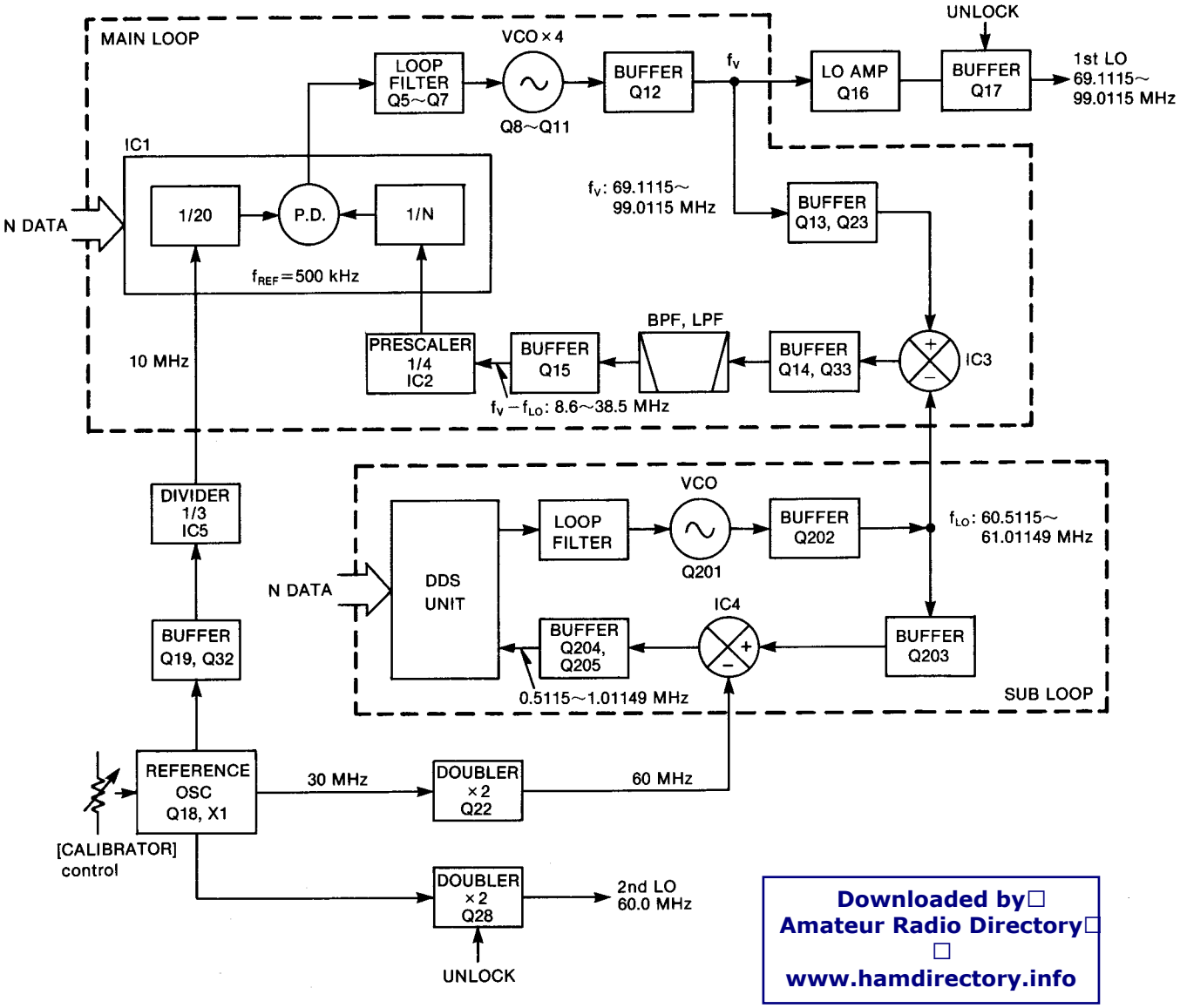


Fig. 10

3-3-2 REFERENCE OSCILLATOR CIRCUIT

A 30 MHz reference frequency is produced by the oscillator Q18 and X1. The reference frequency, buffer-amplified at Q19 and Q32, is divided by 3 at IC5 and is then applied to the PLL circuit as the PLL reference frequency.

The signal oscillated at Q18 is multiplied by 2 at Q28. The resulting 60 MHz signal is filtered at a bandpass filter and is then applied to the MAIN UNIT via J4 as the 2nd LO signal.

3-3-3 MAIN LOOP

The main loop uses the PLL IC (IC1) which contains a programmable divider, phase detector, data shift register and data latch circuits. The main loop generates 69.1115 ~99.0115 MHz signals in 500 kHz steps. Because the sub loop produces 10 Hz steps, the PLL produces a 30 MHz frequency range in 10 Hz steps.

The oscillated signal at one of the 4 VCOs (Q8~Q11; see Section 3-3-4 for details) is amplified at Q12, Q13 and Q23. The signal is mixed with a sub loop output (f_{LO}: 60.5115~61.01149 MHz) at IC3 and filtered at the low-pass filter (L19~L21, C66~C72). Q12 is an isolator which ensures that the mixer input does not affect the VCO output.

The mixed signal is amplified at Q14 and Q33 and is then filtered at one of the 3 Chebyshev filters. The filter is selected by the "VCO1"~"VCO4" signals from the LOGIC UNIT. The filtered signal, amplified at Q15, is then applied to the prescaler (IC2). The signal, divided by 4, is applied to the PLL IC (IC1).

The phase of the divided signal at IC2, detected at IC1 using a reference frequency (f_{REF}) of 500 kHz, is then output from pin 17. The 500 kHz frequency is obtained from the reference oscillator (X1). 30 MHz oscillated at X1, is divided by 3 at IC5 and divided by 20 at a programmable divider section of IC1.

The phase detected signal is then converted to a lock voltage at the loop filter (Q5~Q7), and applied to the VCO. Thus, the VCO output (PLL output) is locked to produce stable oscillation.

The PLL output is amplified at Q16 and Q17, and is then applied to the RF UNIT via J3 (RF UNIT: P1) as the 1st LO signal. The PLL oscillation frequency is obtained with the following calculation:

$f_V = f_{LO} + N_T \times f_{REF}$

f_V: Main loop output
f_{LO}: Sub loop output
N_T: Dividing ratio from the LOGIC UNIT
f_{REF}: Reference frequency (500 kHz)

3-3-4 VCO CIRCUIT

A transceiver's C/N ratio is determined by the VCO and the loop filter. 4 VCO circuits keep the low noise and reduce spurious emissions. Q1~Q4 are VCO switches which select the operating VCO with "VCO1"~"VCO4" lines.

3-3-5 SUB LOOP

The sub loop uses the DDS system that generates 60.5115~61.01149 MHz signals in 10 Hz steps.

An oscillated signal at the VCO (Q201) is buffer-amplified at Q202 and Q203, and mixed with a 60 MHz signal at IC4. The resulting signal passes through a low-pass filter, is amplified at Q204 and Q205, and is then applied to the DDS UNIT.

An output pulse-type signal from the DDS UNIT passes through the loop filter (R201, R202, C201, C225, L201) where it is converted into a DC signal (lock voltage). The lock voltage is applied to the VCO to lock the oscillating frequency.

3-3-6 MARKER CIRCUIT

A 10 MHz signal is output from IC5 pin 8. The signal is divided by 100 at IC6 to obtain a 100 kHz signal. The 100 kHz signal is applied to the RF UNIT via P1 (RF UNIT: J6).

3-3-7 MUTE CIRCUIT

When the main loop is unlocked, the "LD" terminal (IC1, pin 13) becomes "HIGH," turning Q24 and Q25 ON. When the sub loop is unlocked, the "LD" terminal on the DDS UNIT becomes "LOW," turning Q25 ON.

When Q25 is ON, Q25 outputs "HIGH" as a "PNB" signal. The "PNB" signal turns Q26 and Q27 ON, deactivating the PLL output buffer amplifier (Q17) and doubler (Q28). The "PNB" signal is also applied to the Rx IF amplifier (Q65) on the MAIN UNIT to cut off the receiver IF signal.

3-4 LOGIC CIRCUITS

3-4-1 CPU (LOGIC UNIT)

The CPU (IC1) uses an 8-bit CMOS CPU with 12.288 MHz clock for rapid operation. The CPU controls operating frequency, mode and the frequency display, etc. The memory contents such as memory channel information are stored in the RAM IC chip (IC4) using a lithium backup battery for more than 5 years.

The Icom CI-V network system allows that the IC-765 can be remotely controlled by a personal computer using an RS-232C I/O port.

3-4-2 SCAN SPEED CONTROL CIRCUIT (MATRIX UNIT)

PB7→PA6 is a scan speed input matrix which receives a scan clock signal. The scan speed clock signal is generated at IC1. Clock speed is determined by R18, R19, C5 and the [SCAN SPEED] control.

3-4-3 BAND SELECTION DATA

To select the correct bandpass filter, the low-pass filter (LPF) and VCOs on the PLL UNIT, the I/O expander (IC2) on the LOGIC UNIT outputs the following data:

R158~R163 and D112~D118 on the TUNER UNIT convert the "1.8 M"~"28 M" signals into the band voltage (0~ 7.4 V) for external equipment.

FREQUENCY (MHz)	BPF	BAND VOLTAGE	LPF	VCO
0.1~ 0.499	B1	7.4 V	1.8 M	VCO1
0.5~ 1.599	B2			
1.6~ 1.999	B3			
2.0~ 2.999	B4	6.4 V	3.5 M	
3.0~ 3.999	B5			
4.0~ 5.999	B6	5.4 V	7 M	
6.0~ 7.999	B7			
8.0~10.999	B8	0.0 V	10 M	VCO2
11.0~14.999	B9	4.4 V	14 M	
15.0~21.999	B10	3.4 V	21 M	VCO3
22.0~30.0	B11	2.4 V	28 M	VCO4

3-4-4 KEY MATRIX (MATRIX UNIT)

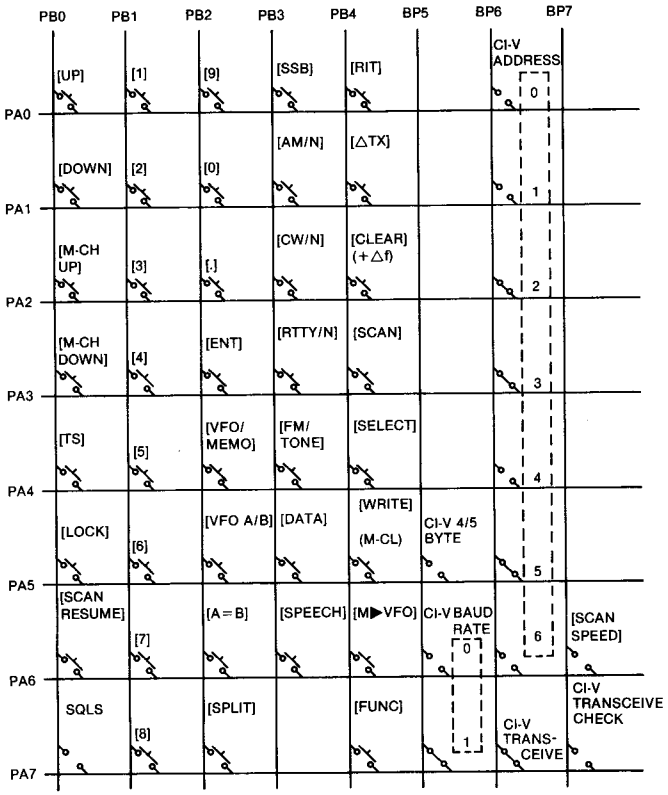


Fig. 11

3-5 ANTENNA TUNER CIRCUITS

3-5-1 MATCHING CIRCUIT

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

Using relays (RL7~RL12), the LPF selector signal from the LOGIC UNIT grounds one of the taps of L1 and L2. The LPF selector signal also connects the combination of capacitors C2/C3 or C4/C5 in parallel to variable capacitors (C17 and C18) when operating in the 1.8~3.5 MHz range.

After selecting the coils or capacitors, 2 motors (MF1, MF2) adjust C17 and C18 using an output of a motor control circuit to obtain a low SWR.

3-5-2 DETECTOR CIRCUIT

The antenna tuner has 2 detector circuits: a resistance component detector and a reactance component detector.

Resistance components are picked up by L201 and detected by D201 and D202 on the TDET UNIT. D201 outputs negative voltage and D202 outputs positive voltage. Output voltage of the resistance component detector is added to the voltage output from D201 and D202. When antenna impedance is higher than 50 Ω, output voltage is negative; when lower than 50 Ω, positive.

Reactance components are picked up by comparing the phases of the RF current and RF voltage. The RF current is detected by L201 and R205. RF voltage is detected by C203~C205. Both detector voltages are buffer-amplified at Q201 and Q202, and are then applied to the phase comparator (IC201~IC203). The output signal of IC203 is detected at D203 and D204. When the RF current phase leads the voltage phase, the detected voltage is negative; when the current lags the voltage, the detected voltage is positive.

3-5-3 MOTOR CONTROL CIRCUIT

The antenna tuner CPU (IC101) controls tuning motors and memorizes the best preset position on each band. The memory contents are stored in the CPU using a lithium backup battery for more than 5 years.

The output signal of the resistance detector (R_O) is compared with a reference voltage (V_{REF}) at IC103 pins 5 and 6, and applied to the A/D converter section (IC101, pin 19). The CPU outputs the RC1 or RC2 signal to the motor driver (IC102) to drive the motor (MF1) in the matching circuit. These signals become a pulse signal just around the preset position for precise and rapid tuning. To detect C18 rotation, voltage from the variable resistor (R5) is applied to the CPU.

The output signal of the resistance detector (ϕ_O) is compared with the reference voltage (V_{REF}) at IC103 pins 9 and 10, and applied to the A/D converter section (IC101, pin 18). The CPU outputs the ϕC1 or ϕC2 signal to the motor driver (IC102) to drive the motor (MF2) in the matching circuit. To detect C17 rotation, a voltage from the variable resistor (R4) is applied to the CPU.

The reset circuit stops the CPU working while the motor is not controlled. When the operating band is changed, the band signal comparator (IC108) outputs a "LOW" signal to a reset control circuit. The reset control circuit turns the CPU ON, setting C17 and C18 to their preset positions.

When the antenna tuner cannot tune from a previously memorized preset position, a re-try function is activated. The re-try function tunes C17 and C18 from end to end 3 times.

3-5-4 TUNER UNIT CPU PORT ALLOCATIONS

• INPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
ϕPV	16	Input port for the detection of C17 position.
RPV	17	Input port for the detection of C18 position.
ϕ	18	Input port for the reactance detection voltage. This voltage becomes $V_{REF}/2$ when antenna is matched.
R	19	Input port for the resistance detection voltage. This voltage becomes $V_{REF}/2$ when antenna is matched.
V_{REF}	20	Inputs a reference voltage for internal A/D converters.
SET	23	Input port for the SET mode signal.
WR	24	Input port for the WRITE signal.
PWRS	26	Detects the power. When the signal is "LOW," the CPU is backed up.
B1~B3	29~27	These are input ports for the 3-bit band signal from the LOGIC UNIT.
SEND	30	Inputs transmit/receive switching signals. This port becomes "LOW" while transmitting.
SWR	31	Detects a SWR signal. When the SWR exceeds 3, this port becomes "HIGH."
TUNR	32	Detects a tuner switch signal. The signal is "HIGH" when the [TUNER] switch is tuned ON.
RESET	34	Inputs a reset signal. This port becomes "HIGH" while transmitting or when operating band is changed.

• OUTPUT PORT

PORT NAME	PIN NUMBER	DESCRIPTION
WAIT	6	Outputs a control signal for the [WAIT] indicator. This port becomes "HIGH" while tuning or presetting. This port becomes "HIGH" and "LOW" alternately when the antenna tuner cannot tune the antenna with the re-try function.
b1~b3	8~10	These are output ports for the currently 3-bit band signal of the antenna tuner.
ϕC1, ϕC2	12, 11	Outputs a control signal for MF2.
RC1, RC2	14, 13	Outputs a control signal for MF1.
WAKE	25	Outputs a control signal for the reset circuit. This port becomes "HIGH" while the CPU clock is oscillated.
TUN	39	Outputs a tuner switch signal. The signal is "HIGH" when the TUNR port is "HIGH."

3-6 POWER SUPPLY CIRCUITS

The power supply circuit mainly consists of a ±140 V DC rectifier, a start-up circuit, a 13.8 V DC switching regulator, a 5, 8 V DC regulator and a DC-DC converter.

When turning ON the power, the 13.8 V switching regulator operates with the start-up circuit output voltage. After several milliseconds, the switching regulator operates on its own output voltage.

3-6-1 RECTIFIER CIRCUIT (REG UNIT)

AC voltage from the AC power socket passes through the [POWER] switch and is applied to the REG UNIT. The AC voltage passes through the line filter (L2, C1, C2) and R5. R5 prevents an entry of current until 13.8 V DC are supplied from the REG UNIT. After 13.8 V DC are regulated, the AC voltage bypasses R5 through RL1.

Either 110 or 230 V AC input is selected by jumper wires. The selected AC input is rectified and filtered by D1, C7 and C8 to obtain ±140 V DC. R1 and R2 keep the voltage balance of C7 and C8 constant.

3-6-2 START-UP CIRCUIT (REG UNIT)

The AC voltage is applied to the transformer (T1), rectified by D3, and applied to a start-up regulator. The start-up regulator (Q1) supplies 13.8 V DC to the switching regulator IC (IC2) until C9 is fully charged. IC1 is a photocoupler IC and used for a start-up regulator switch.

When the switching regulator is activated, the start-up circuit deactivates. IC2 then continuously generates 13.8 V DC, supplying the voltage to itself through D2.

3-6-3 SWITCHING REGULATOR (REG UNIT)

Passing through a line filter, ±140 V DC are applied to the pulse generator (Q2~Q5) and are converted to a pulse signal, which is then applied to the transformer (T2).

The output voltage is rectified and filtered by D4 and C30~C33 to obtain 13.8 V DC. The 13.8 V DC is fed back to the switching regulator IC (IC2). IC2 contains a 5 V reference voltage circuit, op-amp, comparator and current limiter circuit. IC2 controls the pulse generator and compares the feedback voltage to the reference voltage.

The 0.001 Ω resistor (R26) in the GND line provides detection of the total current limiter.

3-6-4 REGULATOR CIRCUITS

Either 8, 5, −5 or −33 V DC are supplied from their corresponding regulator circuits. These are regulated from the 13.8 V DC.

(1) 8 AND 5 V REGULATORS

8 or 5 V DC are regulated by three-terminal voltage regulators.

VOLTAGE	UNIT	REGULATOR
8 V	MAIN	IC1
	PLL	IC8
5 V	LOGIC	IC22
	PLL	IC7
	TUNER	IC104, IC204

(2) DC-DC CONVERTER (DISPLAY UNIT)

The 13.8 V DC is applied to the DC-DC converter circuit (IC7). IC7 outputs −5 V DC for operational amplifiers and −33 V DC for the frequency display (DS1).

SWITCHING REGULATOR BLOCK DIAGRAM

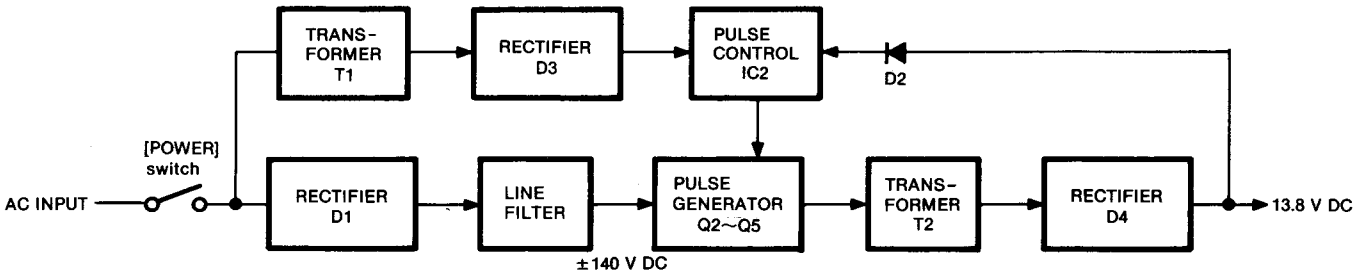


Fig. 12

SECTION 4 MECHANICAL PARTS AND DISASSEMBLY

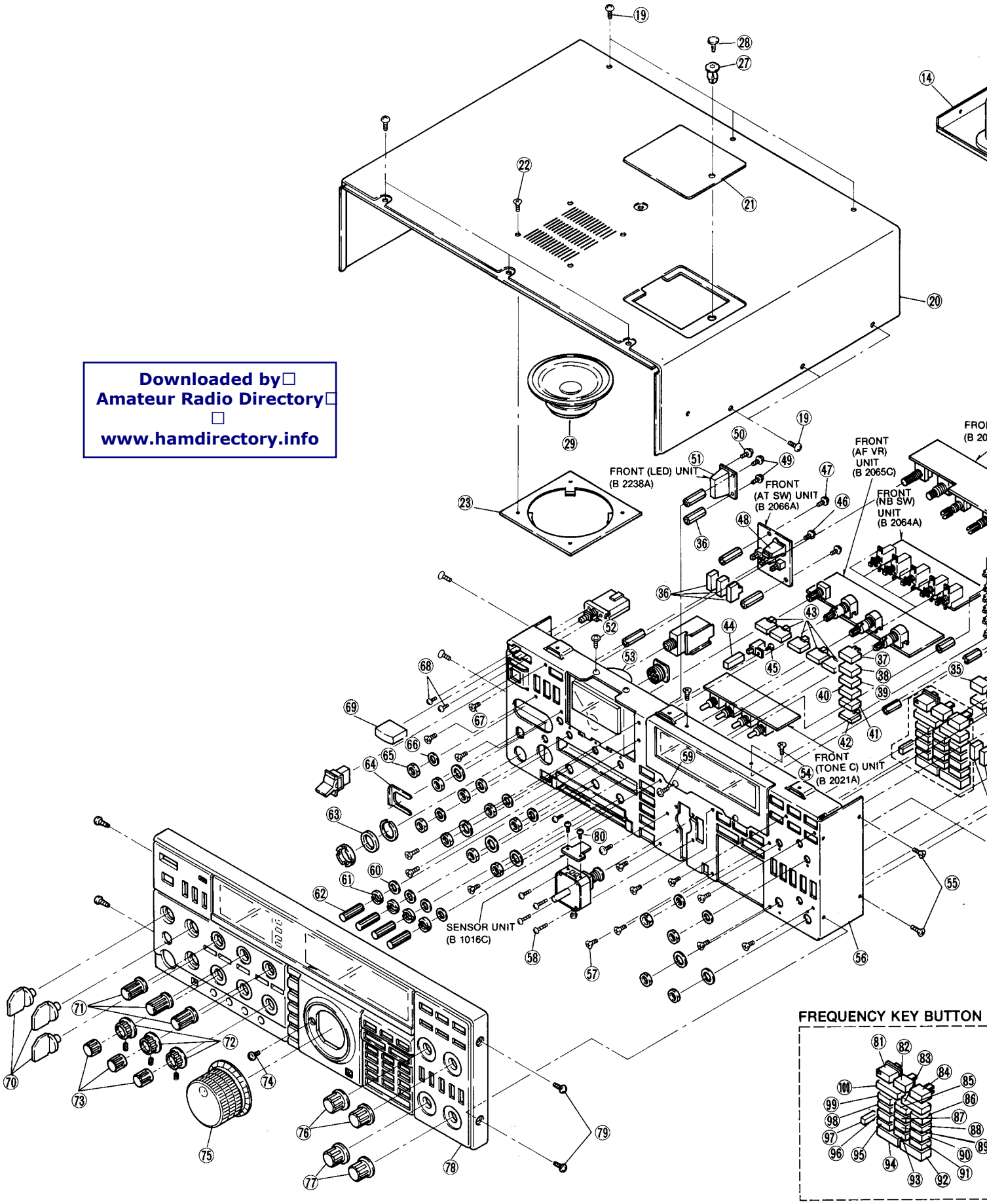
4-1 FRAME DISASSEMBLY

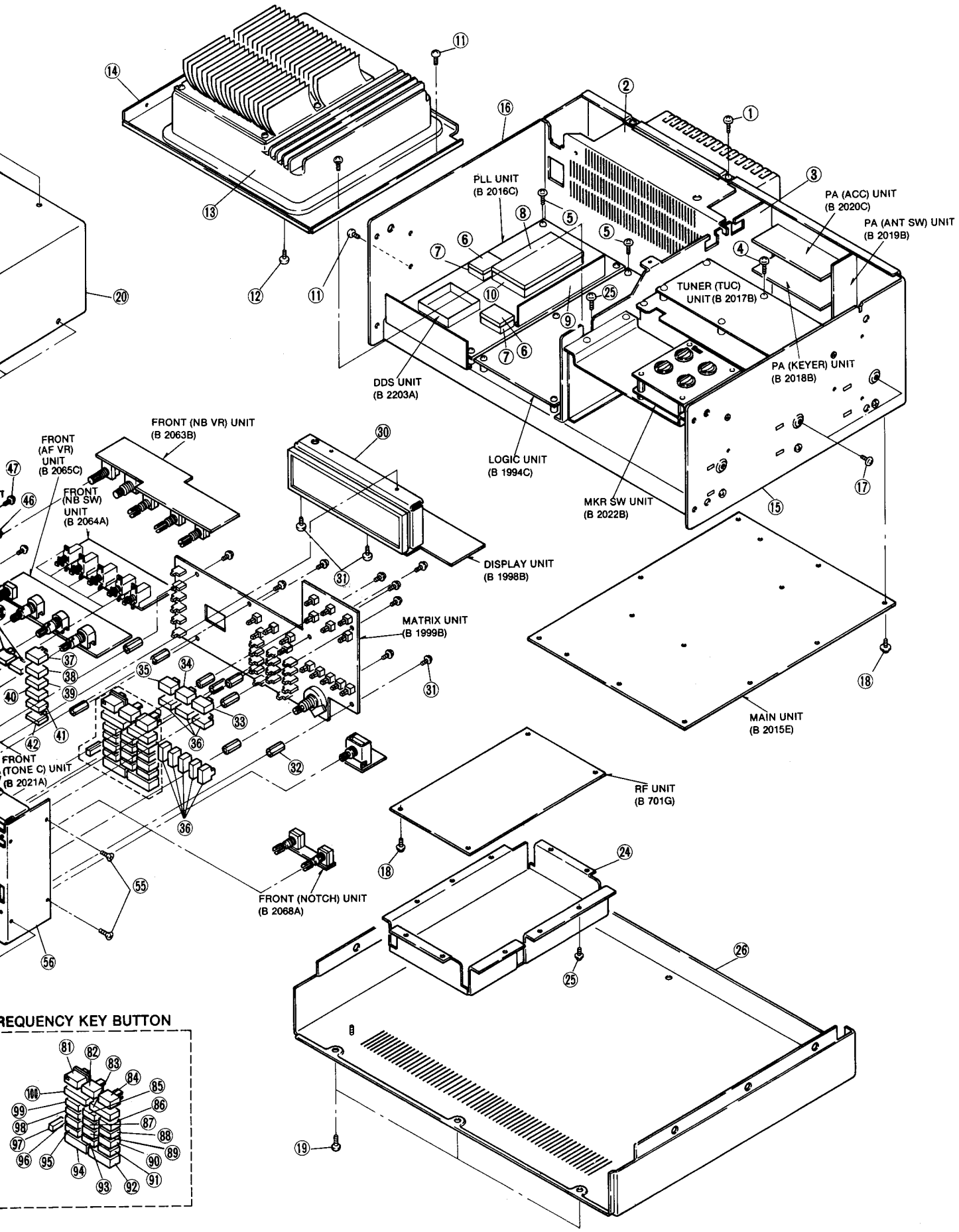
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810002160	Screw FH M3×5	2
②	8510005641	Filter shield plate-1	1
③	8010008460	Center partition plate	1
④	8810003360	Set screw C M3×6	6
⑤	8810003160	Set screw A M3×6	12
⑥	8510002660	194 VCO case cover (C)	2
⑦	8510000881	194 VCO case-1	2
⑧	8510001340	79 shield case cover	1
⑨	8410000611	REG heatsink plate-1	1
⑩	8510001330	79 shield case	1
⑪	8810000220	Screw PH M3×5	4
⑫	8810001350	Screw PH B1 M3×6	18
⑬	8110000020	PS cover	1
⑭	8010005660	PS Chassis -1	1
⑮	8010005590	Chassis side plate (R)-1	1
⑯	8010005600	Chassis side plate (L)-1	1
⑰	8810002180	Screw FH M3×8	2
⑱	8810003360	Set screw C M3×6	15
⑲	8810004690	Screw BiH M4×5 ZK BS	19
⑳	8110003450	Cover upper (A)	1
㉑	8110000640	Case cover (A)	1
㉒	8810002480	Screw FH M3×6 ZK BS	4
㉓	8930010040	77 SP plate	1
㉔	8510004420	560 RF case (A)-1	1
㉕	8810000220	Screw PH M3×5	10
㉖	8110003320	Cover bottom	1
㉗	8930006700	Nylatch G-2-1	1
㉘	8930006710	Nylatch G-2-3-1	1
㉙	2510000410	Speaker T080S01I0810	1
㉚	8930010051	560 LED plate-1	1
㉛	8810003360	Set screw C M3×6	12
㉜	8930000720	Thread spacer (V)	14
㉝	8610005570	Button K86 (A) [SCAN]	1
㉞	8610005560	Button K128 [SELECT]	1
㉟	8610005560	Button K128 [FUNC]	1
㊱	8610002850	Button K80 [IF SHIFT], [CW250Hz], etc.	11
㊲	8610005370	Button K83 (E) [SSB]	1
㊳	8610005380	Button K83 (F) [CW/N]	1
㊴	8610005390	Button K83 (G) [RTTY/N]	1
㊵	8610005400	Button K83 (H) [AM/N]	1
㊶	8610005410	Button K83 (I) [FM/TONE]	1
㊷	8610005360	Button K82 (A) [DATA]	1
㊸	8610002860	Button K81 [NB], [NB WIDE], etc.	5
㊹	8610003160	Button K26 (A) [SPEECH]	1
㊺	8810000020	Screw PH M2×5	1
㊻	8810001720	Screw PH B0 No.0-3 M1.4×4	2
㊼	8810003360	Set screw C M3×6	3
㊽	8930010160	Tuner LED holder	1
㊾	8810003160	Set screw A M3×6	2
㊿	8810004040	Screw PH B0 No.0-1 M2×5 ZU	2
(51)	8930010150	LED holder	1
(52)	8810001030	Screw PH B0 M2.6×5	2
(53)	8010005872	560 Meter holder-2	1
(54)	8810002160	Screw FH M3×5	2
(55)	8810002210	Screw FH M4×6	6
(56)	8010008480	SUB chassis (A)	1
(57)	8810002160	Screw FH M3×5	14
(58)	8810000180	Screw PH M2.6 ×12	4
(59)	8810000010	Screw PH M2×4	3
(60)	8850000160	Flat washer M 6 Ni BS	4
(61)	8830000030	VR nut (C)	4
(62)	8610005960	Knob N102 (B) [RX TONE], [MONITOR GAIN], etc.	4
(63)	8930003200	Spacer (P)	1
(64)	8930010070	Plate (B)	1
(65)	8830000030	VR nut (C)	2
(66)	8930011730	560 Spacer	2
(67)	8810002160	Screw FH M3×5	14
(68)	8810002170	Screw FH M3×6	2
(69)	8610002840	Button K79 [POWER]	1
(70)	8610005350	Knob N114 (A) [AGC], [METER], [PRE/ATT]	3
(71)	8610005340	Knob N113 (A) [NB LEVEL], [ELEC-KEY SPEED], [VOX DELAY]	3
(72)	8610005630	Knob N118 (A) [RF], [SQL], [RF PWR]	3
(73)	8610005620	Knob N71 (B) [AF], [CW PITCH], [MIC GAIN]	3
(74)	8810003740	Icom screw B10	1
(75)	8610005320	Knob N111 (A) [MAIN DIAL]	1
(76)	8610005330	Knob N112 (B) [IF SHIFT], [NOTCH]	2
(77)	8610005640	Knob N112 (C) [RIT/Δ TX], [MEMORY-CH]	2
(78)	8210005210	Front panel (A)	1
(79)	8810004690	Screw BiH M4×5 ZK BS	4
(80)	8810001700	Screw PH B0 No.0-3 M1.4×3	2

• FREQUENCY KEY BUTTON

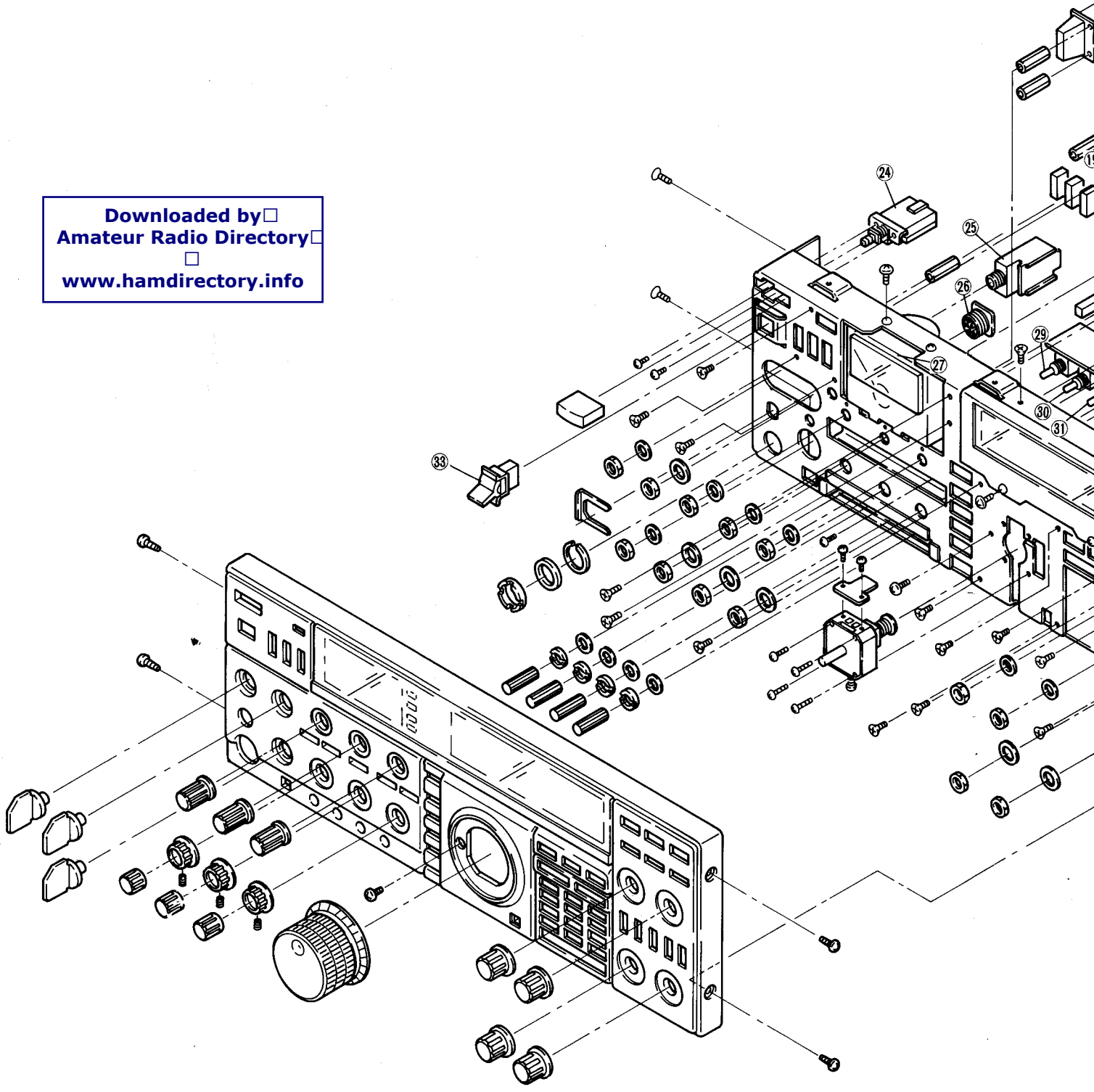
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
(81)	8610005310	Button K77 (A) [TS]	1
(82)	8610005600	Button K88 (B) [A=B]	1
(83)	8610005430	Button K84 (C) [VFO/MEMO]	1
(84)	8610005610	Button K88 (C) [SPLIT]	1
(85)	8610005450	Button K85 (M) [2]	1
(86)	8610005460	Button K85 (N) [3]	1
(87)	8610005480	Button K85 (P) [5]	1
(88)	8610005490	Button K85 (Q) [6]	1
(89)	8610005510	Button K85 (S) [8]	1
(90)	8610005520	Button K85 (T) [9]	1
(91)	8610005550	Button K85 (W) [ENT]	1
(92)	8610005580	Button K87 (B) [△ UP]	1
(93)	8610005530	Button K85 (U) [0]	1
(94)	8610005590	Button K87 (C) [▽ DOWN]	1
(95)	8610005540	Button K85 (V) [.]	1
(96)	8610005500	Button K85 (R) [7]	1
(97)	8610002830	Button K78 [LOCK]	1
(98)	8610005470	Button K85 (O) [4]	1
(99)	8610005440	Button K85 (L) [1]	1
(100)	8610005420	Button K84 (B) [VFO A/B]	1

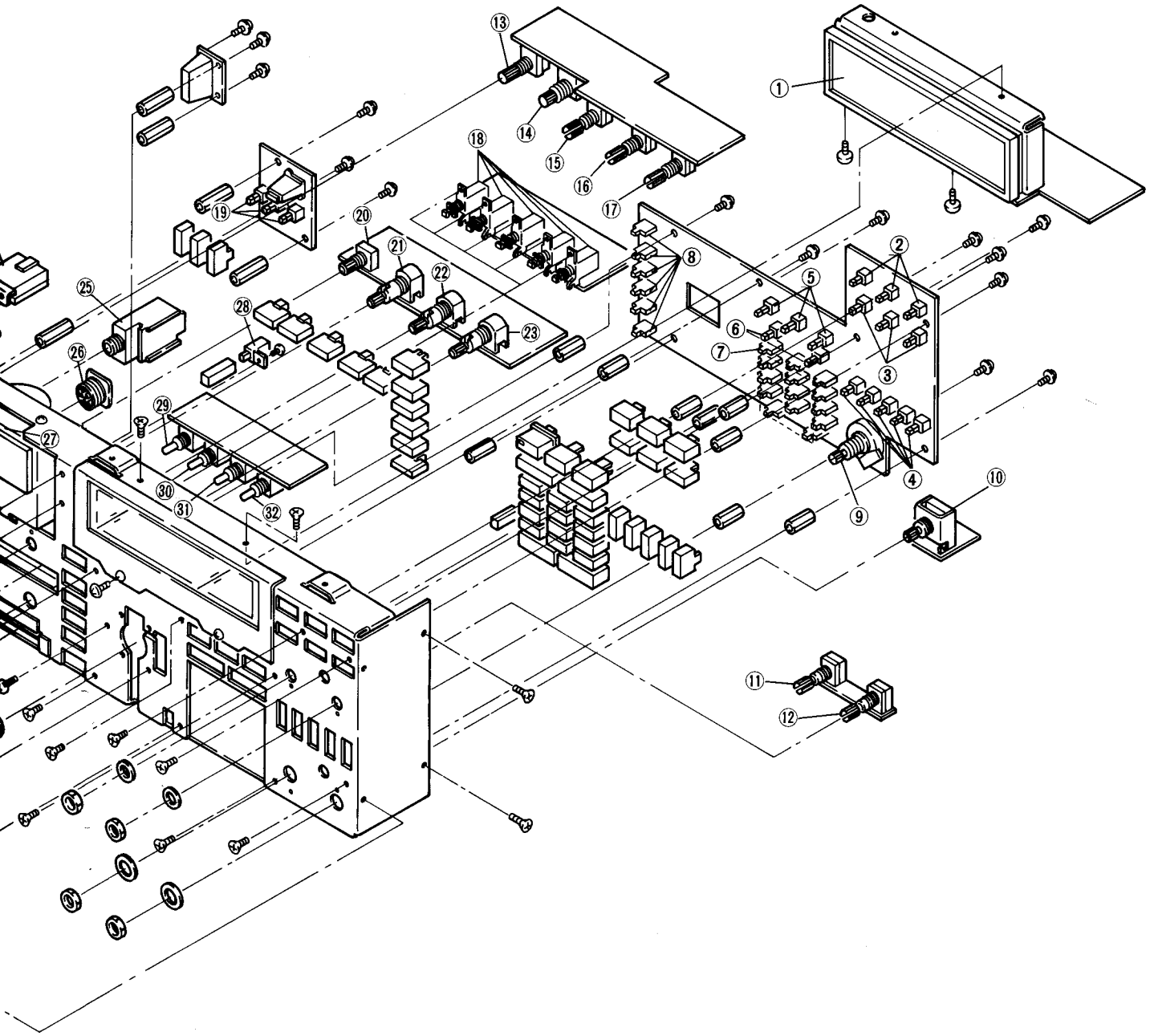
Screw abbreviations PH: Pan head FH: Flat head B0, B1, FT: Self-tapping screw ZK: Black Ni: Nickel
BS: Brass No. 0: Precision type screw BiH: Binding head




PLL UNIT
(B 2016C)
PA (ACC) UNIT
(B 2020C)
PA (ANT SW) UNIT
(B 2019B)
TUNER (TUC)
UNIT (B 2017B)
PA (KEYER) UNIT
(B 2018B)
DDS UNIT
(B 2203A)
LOGIC UNIT
(B 1994C)
MKR SW UNIT
(B 2022B)
FRONT (NB VR) UNIT
(B 2063B)
FRONT
(AF VR)
UNIT
(B 2065C)
FRONT
(NB SW)
UNIT
(B 2064A)
DISPLAY UNIT
(B 1998B)
MATRIX UNIT
(B 1999B)
MAIN UNIT
(B 2015E)
FRONT
(TONE C) UNIT
(B 2021A)
RF UNIT
(B 701G)
FRONT (NOTCH) UNIT
(B 2068A)
REQUENCY KEY BUTTON

4-2 FRONT PANEL

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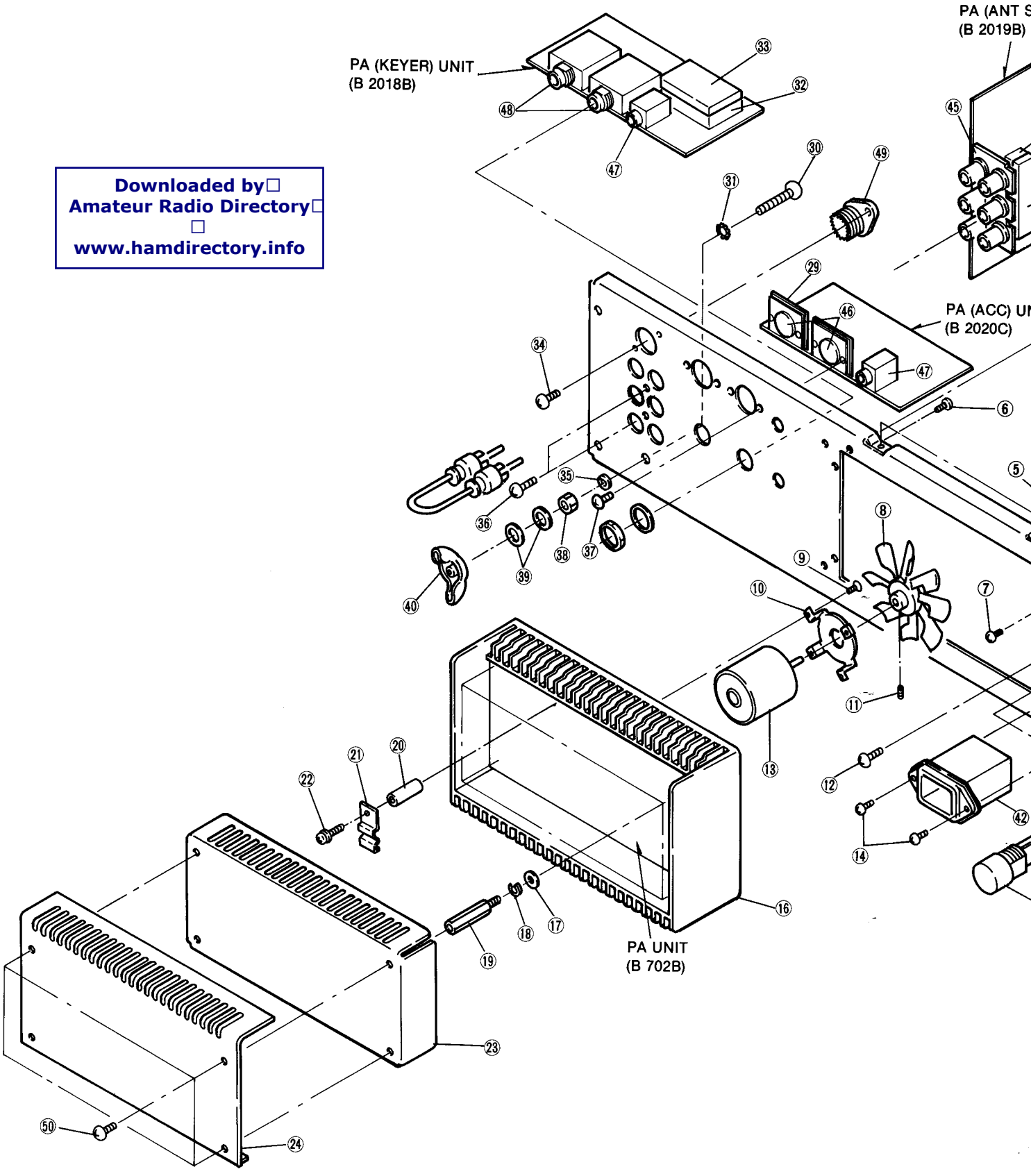
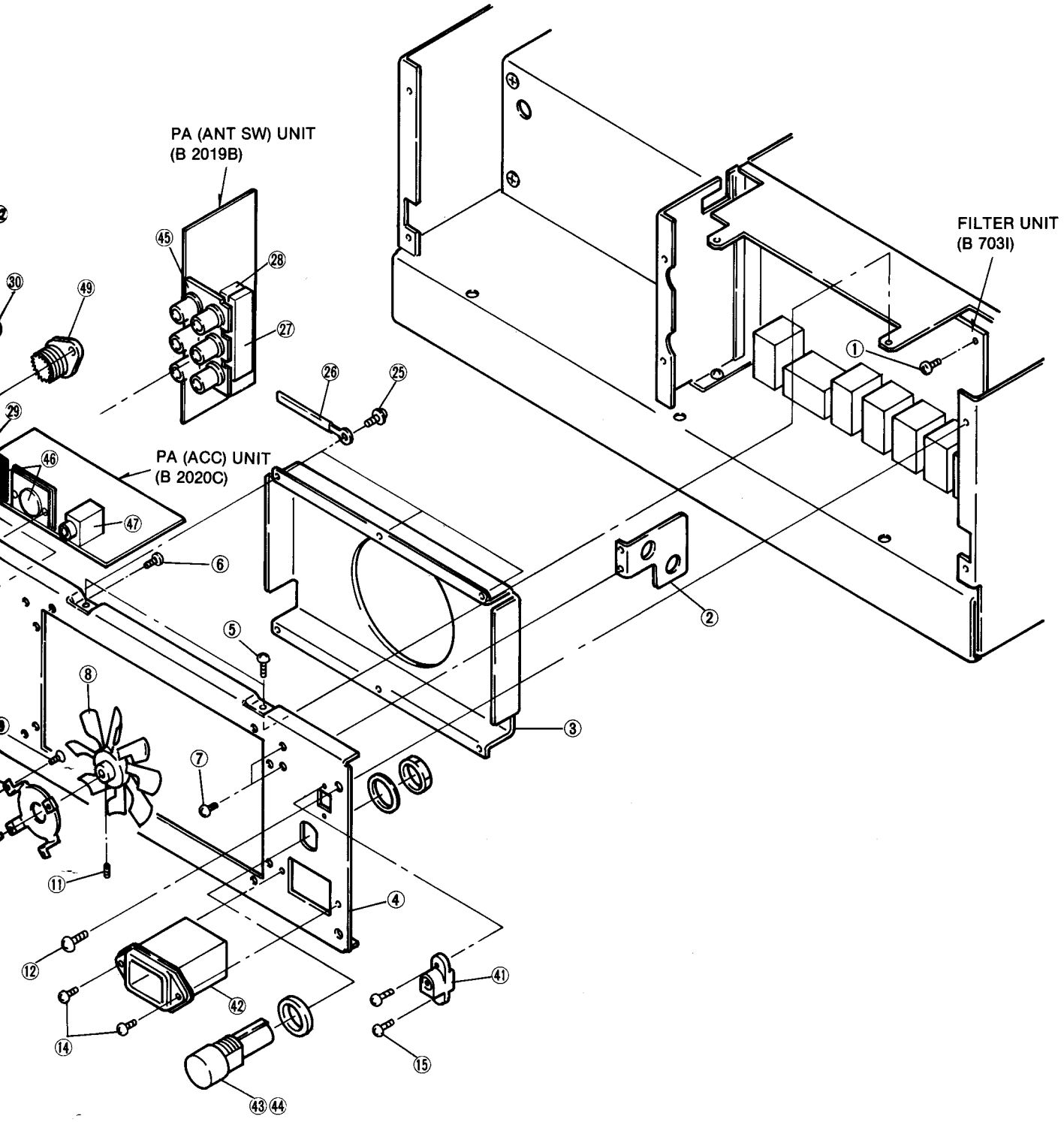
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	5020000110	FIP 12EM10 [FREQUENCY DISPLAY]	1
②	2230000530	Switch SPPH23078A [FUNC], [SELECT], [SCAN]	3
③	2230000550	Switch SPPH23079A [IF SHIFT], [CW 250Hz], [NOTCH]	3
④	2230000530	Switch SPPH23078A [RIT], [Δ TX], [CLEAR], [M ▶ VFO], [WRITE]	5
⑤	2230000550	Switch SPPH23079A [TS], [A=B], [SPLIT]	3
⑥	2230000600	Switch SPPQ19178A [VFO A/B], [VFO/MEMO]	2
⑦	2230000600	Switch SPPQ19178A [1], [2], [3], [4], [5], [6], [7], [8], [9], [0], [.], [ENT], [▽ DOWN], [UP△]	14
⑧	2230000600	Switch SPPQ19178A [SSB], [CW/N], [RTTY/N], [AM/N], [FM/TONE], [DATA]	6
⑨	7600000090	Switch EC24B50B000MB [RIT/Δ TX]	1
⑩	2260000880	Switch SRBM1L038A [MEMORY-CH]	1
⑪	7210001000	Variable Resistor RK0971110D04A (10KB) [IF SHIFT]	1
⑫	7210001010	Variable Resistor RK097111000AA (10KB) [NOTCH]	1
⑬	2210000120	Switch SRRU13071A [AGC]	1
⑭	2210000170	Switch SRBU16003A [METER]	1
⑮	7210001270	R203 Variable Resistor RK097111000WA (1KB) [NB LEVEL]	1
⑯	7210001580	Variable Resistor RK097111007ZA (250KC) [ELEC-KEY SPEED]	1
⑰	7210001300	Variable Resistor RK097111000XA (1MB) [VOX DELAY]	1
⑱	2230000210	Switch SPPJ31116A [NB], [NB WIDE], [FAST/SLOW], [VOX], [FULL BK-IN]	5
⑲	2230000550	Switch SPPH23079A [COMP], [MONI], [TUNER]	3
⑳	2210000160	Switch SRBU15015A [PRE/ATT]	1
㉑	7210001240	Variable Resistor RK1242210026A [AF, RF]	1
㉒	7210001590	Variable Resistor RK124232000MA (10KB × 3) [CW PITCH, SQL]	1
㉓	7210001550	Variable Resistor RK1242210032A (10KB•10KB) [MIC GAIN, RF PWR]	1
㉔	2230000120	Switch SDDSA3159A [POWER]	1
㉕	6450000190	Connector HLJ4815-01-030 [PHONES]	1
㉖	6510000290	Connector 8S-S-E [MICROPHONE]	1
㉗	5510000340	Meter KL-294G-5 (ME-25) [MULTI-FUNCTION METER]	1
㉘	2230000750	Switch SPPJ31332A [SPEECH]	1
㉙	7210001410	Variable Resistor RK097111T00PA (100KB) [RX TONE]	1
㉚	7210001410	Variable Resistor RK097111T00PA (100KB) [MONITOR GAIN]	1
㉛	7210001130	Variable Resistor RK097111T005A (10KB) [VOX GAIN]	1
㉜	7210001410	Variable Resistor RK097111T00PA (100KB) [MIC TONE]	1
㉝	2260000310	Switch M-2012J [TRANSMIT/RECEIVE]	1

4-3 REAR PANEL

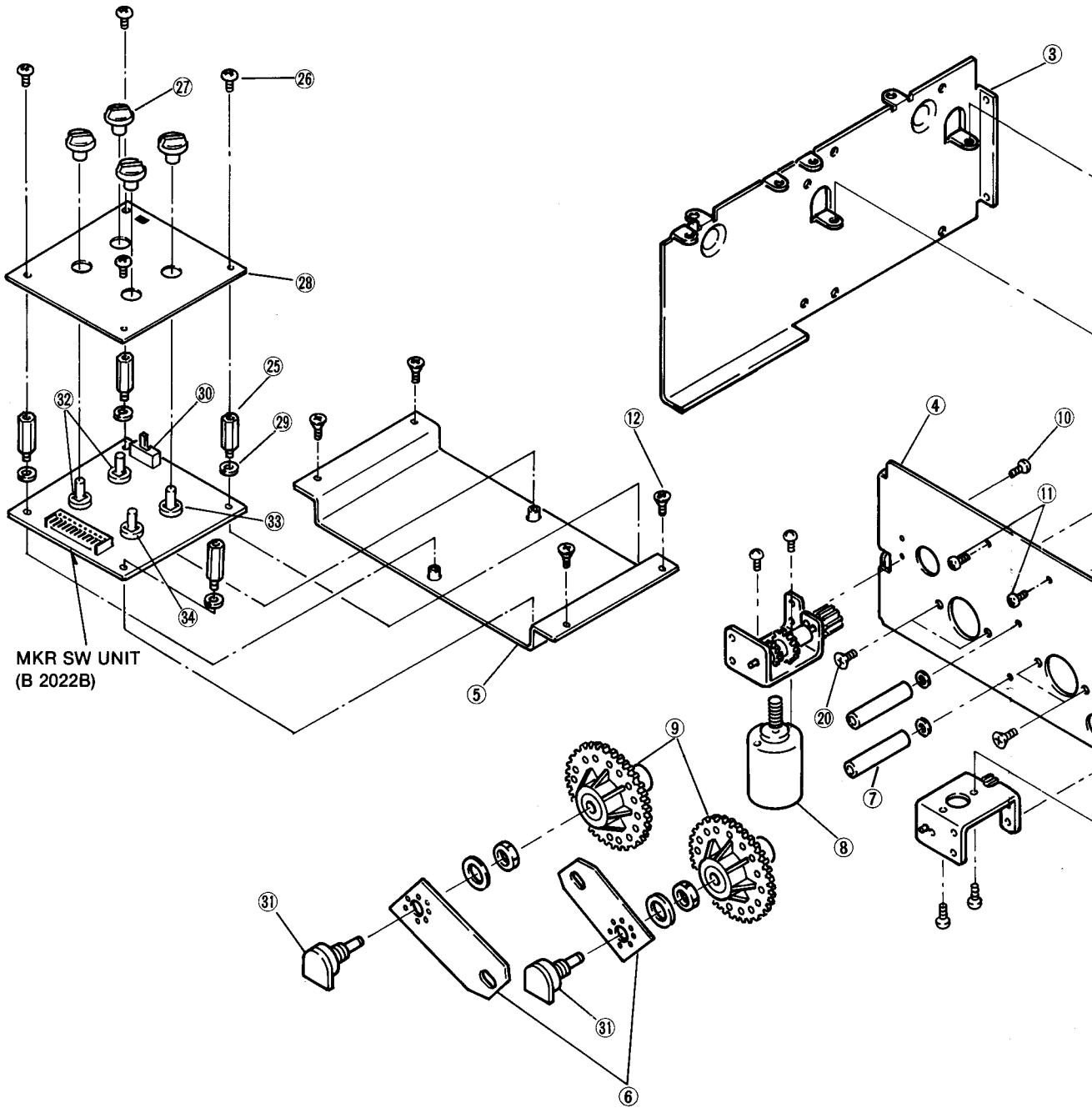
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8810003360	Set screw C M3×6	5
②	8310004880	C plate	1
③	8010001730	Heatsink hood	1
④	8010008471	Back panel-1	1
⑤	8810004280	Screw PH M3×5 ZK	2
⑥	8810003160	Set screw A M3×6	4
⑦	8810003710	Icom screw B 5	2
⑧	8010002470	Cooling fan (A)	1
⑨	8810000140	Screw PH M2.6×5	4
⑩	8010002070	Motor angle	1
⑪	8810003520	Hex socket screw M3×3 ZK	1
⑫	8810004690	Screw BiH M4×5 ZK BS	4
⑬	2710000050	Motor M6B12U22	1
⑭	8810004140	Set screw F M3×7 ZK SUS	2
⑮	8810004290	Screw PH M2×5 ZK	2
⑯	8410000411	263 Heatsink-2	1
⑰	8850000130	Flat washer M3 (3×8×0.5)Ni BS	4
⑱	8850000420	Spring washer M3 Ni	4
⑲	8930000140	Standoff (J)	4
⑳	8930000350	Spacer (D)	2
㉑	8930004200	Thermo sensor hold	2
㉒	8810003230	Set screw A M3×18	2
㉓	8510001590	PA Shield plate	1
㉔	8510001660	PA cover	1
㉕	8810003160	Set screw A M3×6	6
㉖	6910000690	59TC4772	6
㉗	8510002400	Mixer Shield case cover	1
㉘	8510002390	Mixer Shield case	1
㉙	8930015360	DIN plate	2
㉚	8810001980	Screw PH M5×16 Ni BS	1
㉛	8850000590	Star washer M5	1
㉜	8510000881	194 VCO case-1	1
㉝	8510003460	194 VCO case cover (A)	1
㉞	8810004140	Set screw F M3×7 ZK SUS	2
㉟	8850000440	Spring washer M5 Ni	1
㊱	8810004330	Screw PH B1 M3×6 ZK	2
㊲	8810003720	Icom screw B 6	4
㊳	8830000210	Nut M5 Ni BS	1
㊴	8850000150	Flat washer M5 Ni BS	2
㊵	8830000360	Wing Nut M5 Ni	1
㊶	6450000620	Jack (HEC0630-01-020) [DC OUT]	1
㊷	2040000280	Jack (10DEEG3M-1) [AC]	1
㊸	5220000050	Holder (FH-032C) [FUSE]	1
㊹	5210000070	Fuse (FGB 10A)	1
㊺	6450000250	Jack YKC21 0017 (KC21-0060) [RELAY], [ALC], [ANT IN], [OUT], [SPARE], [X-VERTER]	1
㊻	6450000470	Connector TCS4670-01-1111 [ACC (1)], [ACC (2)]	2
㊼	6450000670	Connector HSJ1505-01-010 [EXT SP], [REMOTE]	2
㊽	6450000460	Jack HLJ4306-01-3080 [ELEC-KEY], [KEY]	2
㊾	6510000410	Connector MR-DS-E 02 [ANT]	1
㊿	8810003710	Icom screw (B)5	4

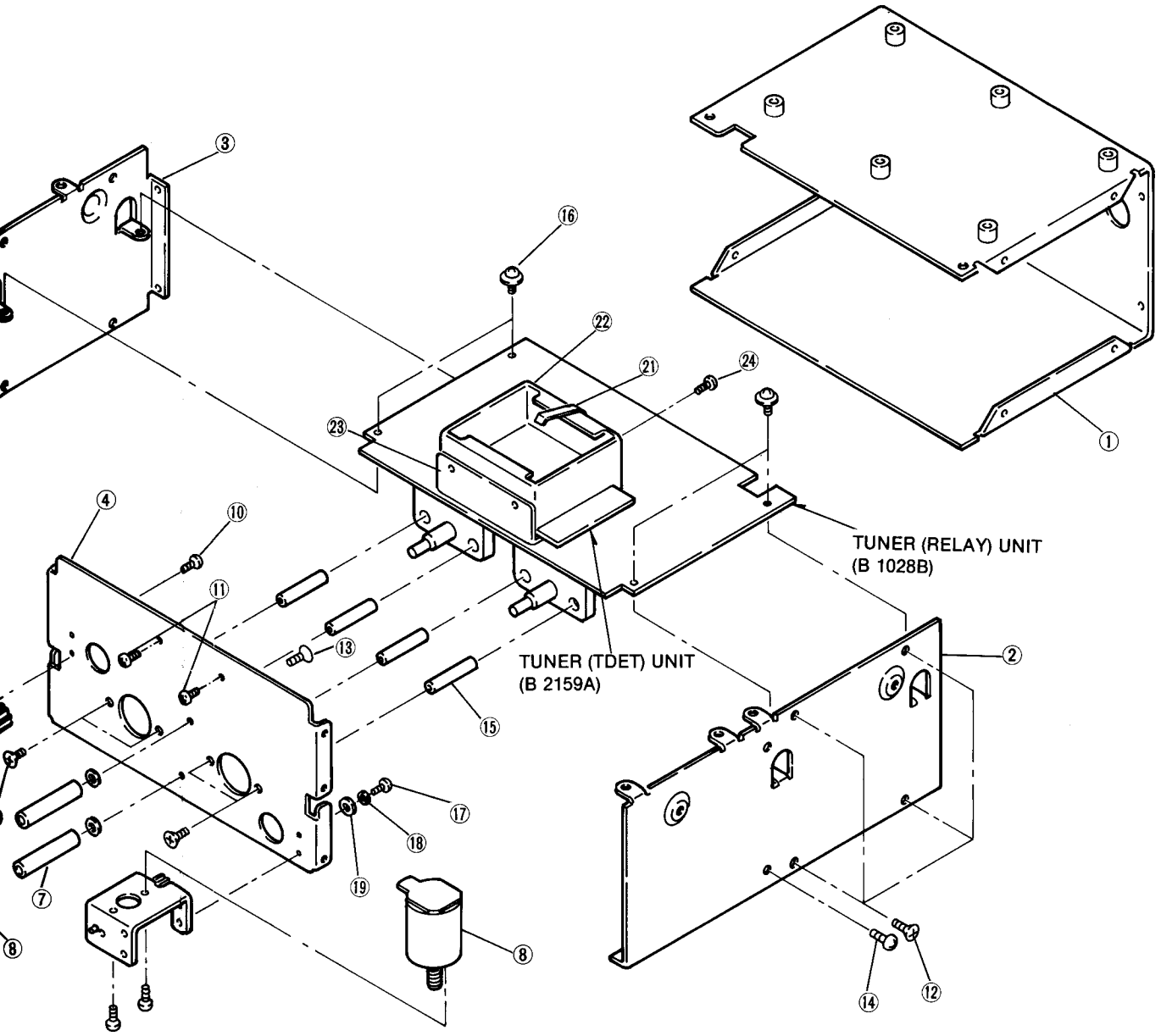
Screw abbreviations PH: Pan head FH: Flat head B0, B1, FT: Self-tapping screw ZK: Black Ni: Nickel BS: Brass BiH: Binding head




PA (ANT SW) UNIT
(B 2019B)
FILTER UNIT
(B 703I)
PA (ACC) UNIT
(B 2020C)

4-4 TUNER AND MKR SW UNITS

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TUNER (RELAY) UNIT
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TUNER (TDET) UNIT
(B 2159A)
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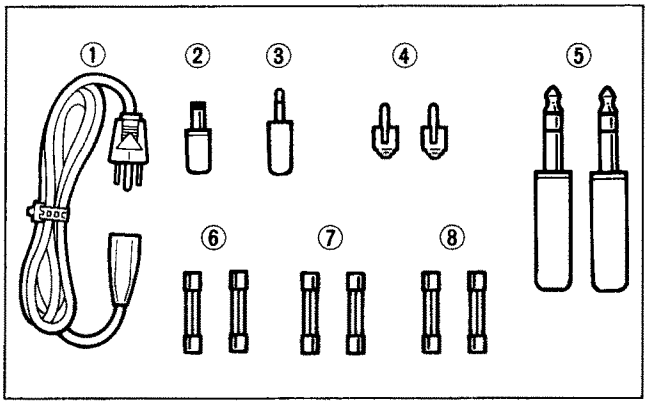
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	8010003140	Chassis (B)-1	1
②	8010008490	Tuner side plate (right)	1
③	8010008500	Tuner side plate (left)	1
④	8010008510	Tuner partition plate	1
⑤	8010008520	Tuner inner plate	1
⑥	8930002050	VR plate	2
⑦	8930000310	Stopper	2
⑧	8930000880	Gear G-15 (Incl. HMK2601-01-030)	2
⑨	8930005940	Gear G-16	2
⑩	8810003360	Set screw C M3×6	2
⑪	8810000130	Screw PH M2.6×4	2
⑫	8810002170	Screw FH M3×6	18
⑬	8810000360	Screw PH M4×6	2
⑭	8810000230	Screw PH M3×6	4
⑮	8820000520	Hex socket screw M4×6	4
⑯	8810003360	Set screw C M3×6	4
⑰	8810004340	Capbolt M3×6 ZK FE	2
⑱	8850000420	Spring washer M3 Ni	2
⑲	8850000130	Flat washer M3 (3×8×0.5)Ni BS	2
⑳	8810002180	Screw FH M3×8	4
㉑	8930001160	Ground spring	1
㉒	8510001430	SWR case	1
㉓	8510001560	DET case cover	1
㉔	8810002600	Screw BuH M2.6×4 Ni BS	2
㉕	8930007560	standoff (AF)	4
㉖	8810003710	Icom screw B 5	4
㉗	8610000460	Knob N62	4
㉘	8210004870	Volume panel	1
㉙	8850000420	Spring washer M3 Ni	4
㉚	2220000310	Switch [MARKER] (SSSU02283A)	1
㉛	7310001050	Trimmer EVH60AF15B14	2
㉜	7310000870	Trimmer RH1051D14J0PA (103) [CARIBRATOR], [ANTI-VOX]	2
㉝	7310000880	Trimmer RH1051D15J0JA (104) [ELEC-KEY WEIGHT]	1
㉞	7310000890	Trimmer RH1051D16J0AA (105) [SCAN SPEED]	1

Screw abbreviations PH: Pan head FH: Flat head B0, B1, FT: Self-tapping screw ZK: Black Ni: Nickel BS: Brass

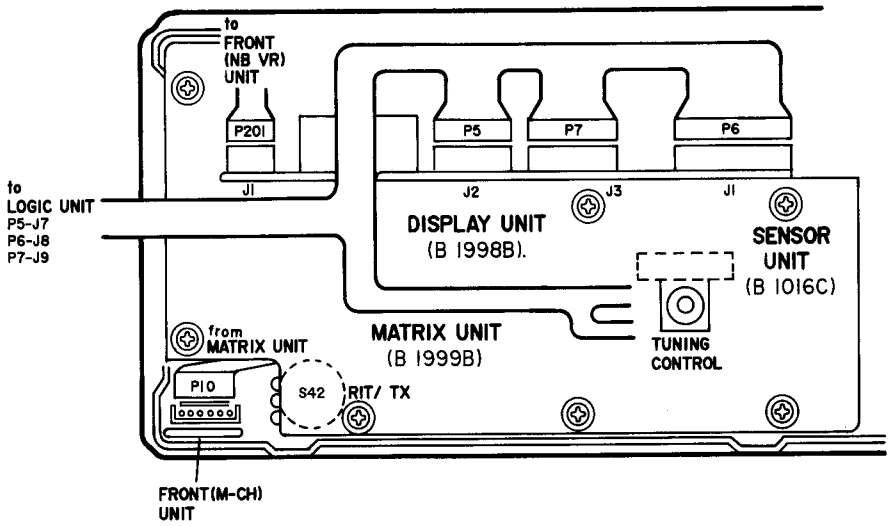
4-5 UNPACKING

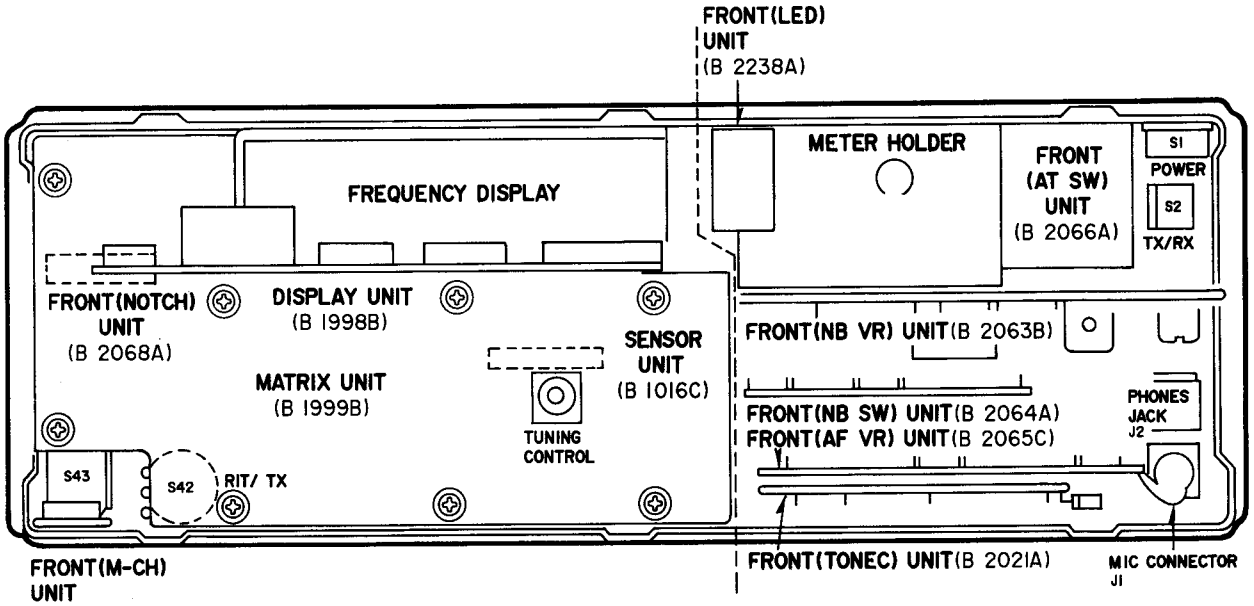


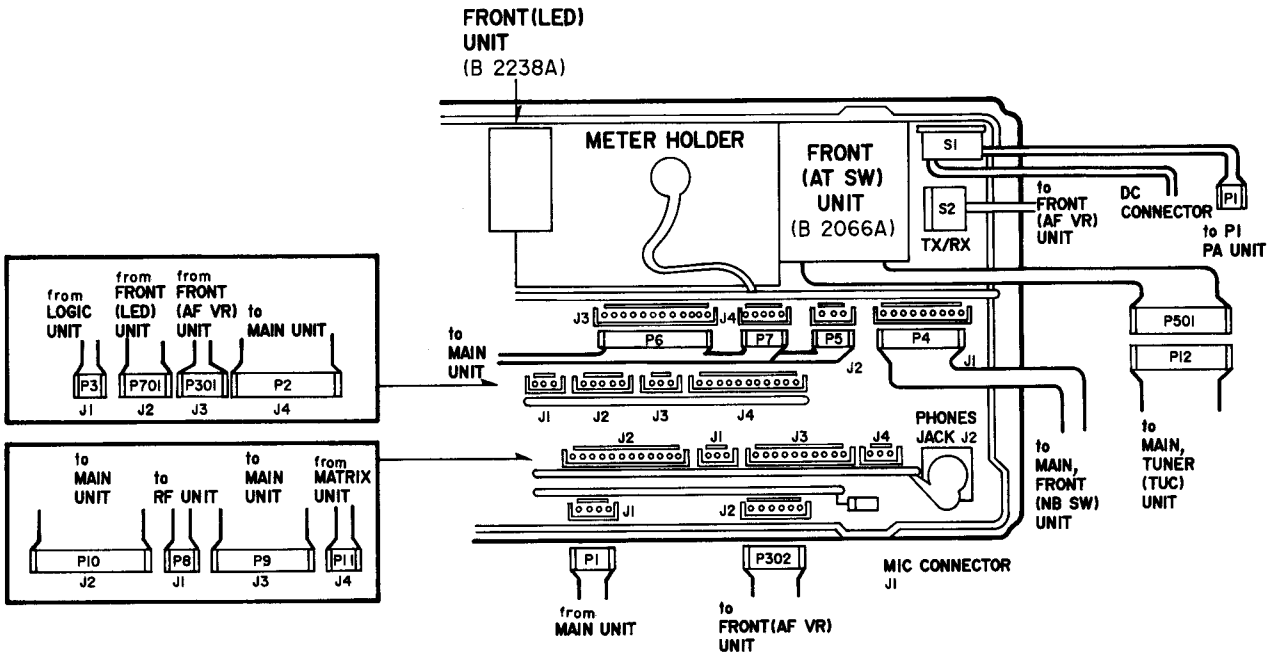
LABEL NUMBER	ORDER NO.	DESCRIPTION	QTY.
①	Optional cable	AC power cable OPC-034 (U.S.A.)	1
	Optional cable	AC power cable OPC-085 (AUSTRALIA)	1
	Optional cable	AC power cable OPC-048 A (EUROPE, FRANCE)	1
②	5610000010	Mini DC power plug AP301	1
③	5610000020	External speaker plug AP313 3.5φ CS plug	1
④	6510000070	Pin plug (RCA plug) BP-001	2
⑤	5610000050	1/4 inch 3 conductor plug AP330	2
⑥	5210000070	Spare Fuse (120 V AC type) FGB 10A (U.S.A.)	2
	5210000060	Spare Fuse (220~240 V AC type) FGB 5A (EUROPE, AUSTRALIA, FRANCE)	2
⑦	5210000040	Spare Fuse (DC line) FGB 2A	2
⑧	5210000060	Spare Fuse (Internal circuitry) FGB 5A	2

4-6 OTHER UNIT CONNECTOR ASSEMBLY

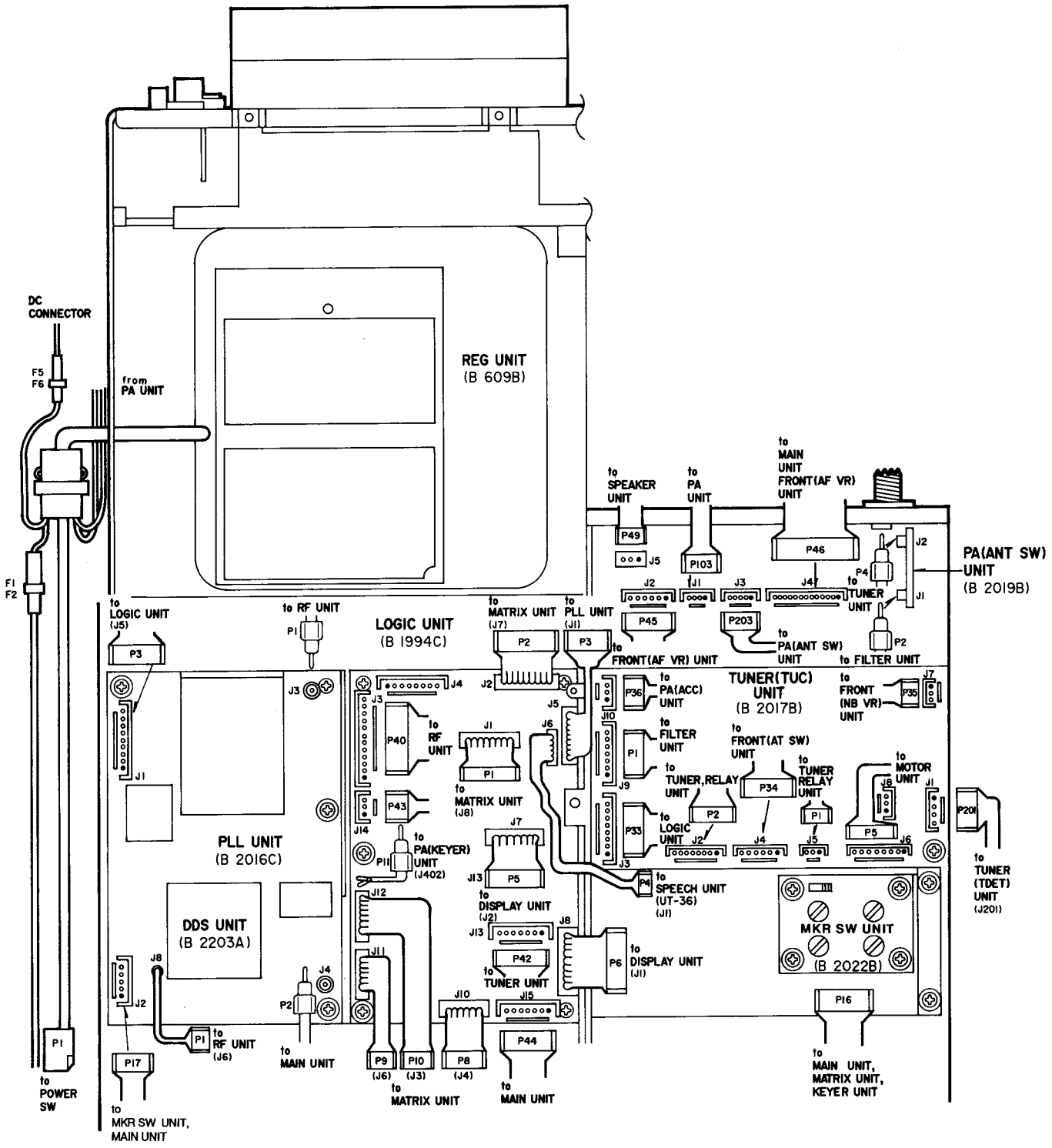
• **FRONT UNIT**



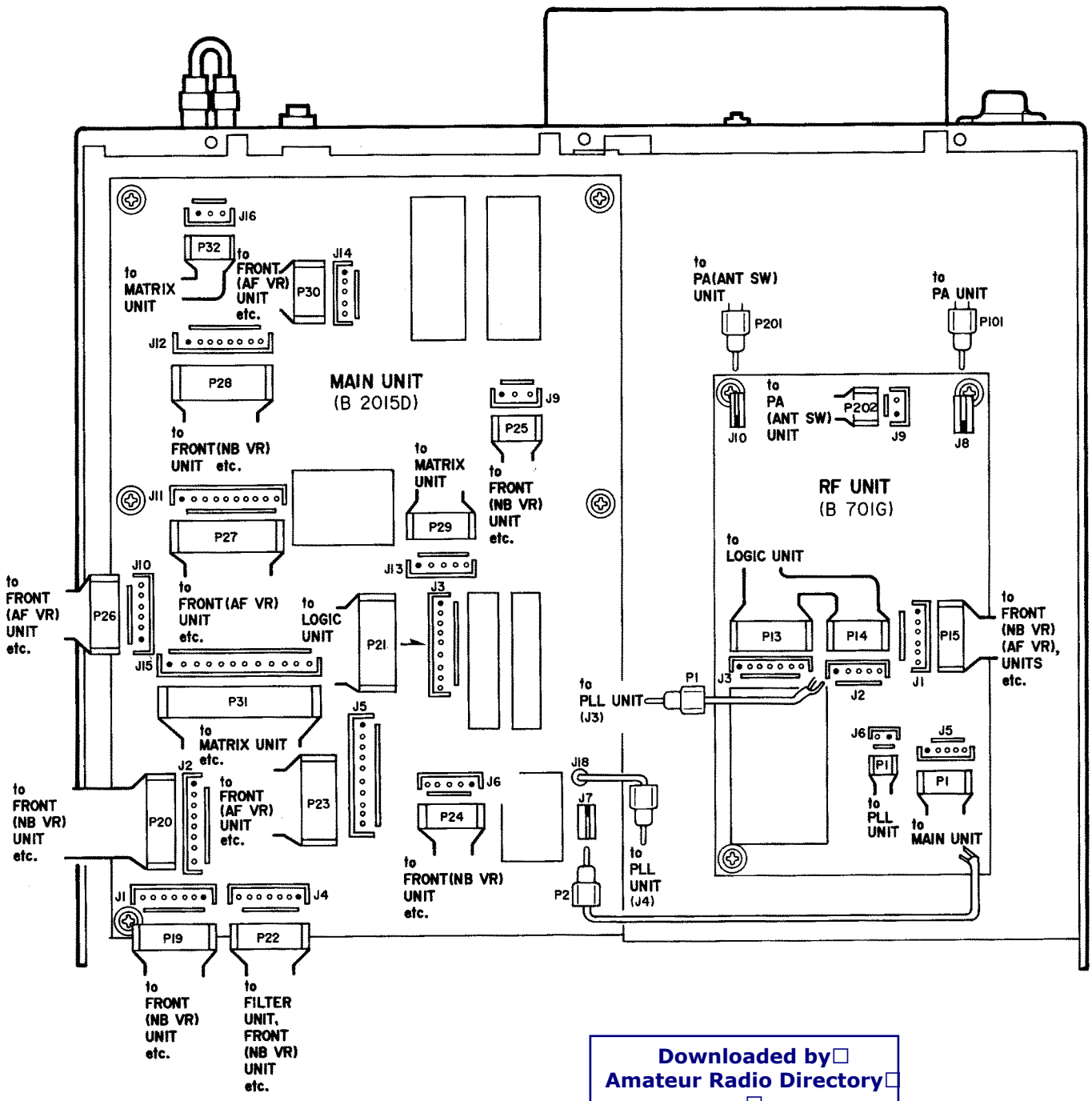




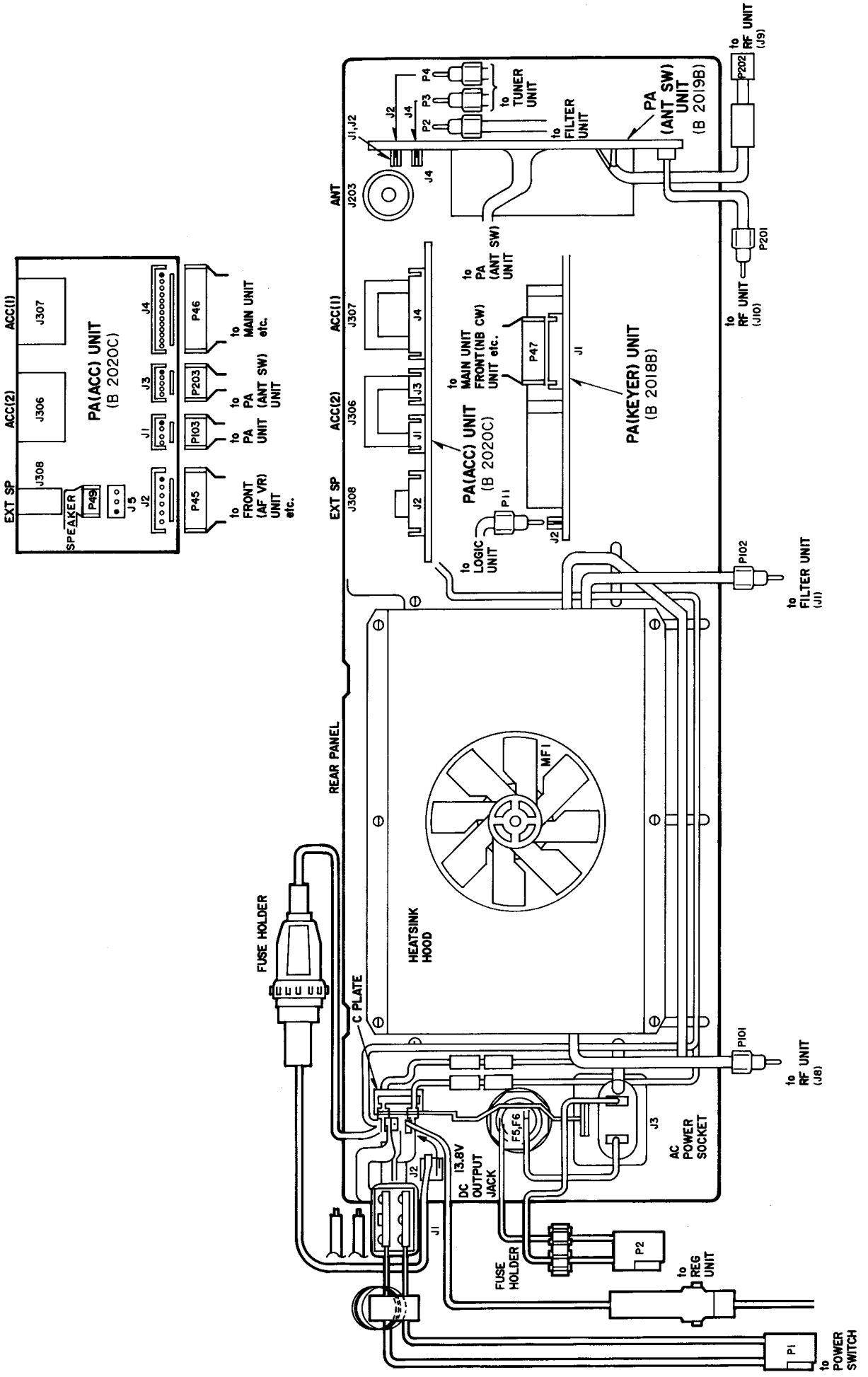
• REG, PLL, MKR AND TUNER UNITS



• MAIN AND RF UNITS



• REAR PANEL


PA(ACC) UNIT
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EXT SP
ACC(2)
ACC(1)
J308
J306
J307
SPEAKER
P49
J5
J2
J1
J3
J4
P45
P103
P203
P46
to FRONT (AF VR) UNIT etc.
to PA UNIT
to PA (ANT SW) UNIT
to MAIN UNIT etc.
REAR PANEL
ANT
J203
J1,J2
J2
J4
P4
P3
P2
to TUNER UNIT
to FILTER UNIT
PA (ANT SW) UNIT (B 2019B)
P202
to RF UNIT (J9)
P201
to RF UNIT (J10)
to PA (ANT SW) UNIT
to MAIN UNIT FRONT(NB CW) UNIT etc.
P47
J1
PA(KEYER) UNIT
(B 2018B)
P11
J2
to LOGIC UNIT
P102
to FILTER UNIT (J1)
MF1
HEATSINK HOOD
FUSE HOLDER
C PLATE
P101
to RF UNIT (J8)
J3
AC POWER SOCKET
F5,F6
DC 13.8V OUTPUT JACK
J2
J1
FUSE HOLDER
P2
to REG UNIT
P1
to POWER SWITCH

SECTION 5 PARTS LIST

[DISPLAY UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130004150	IC	TD62706P
IC2	1130004150	IC	TD62706P
IC3	1130004150	IC	TD62706P
IC4	1130004140	IC	MSL915RS
IC5	1130004140	IC	MSL915RS
IC6	1130003530	IC	μPD74HC42C
IC7	6910002011	DC converter	DP-6A
Q1	1530000110	Transistor	2SC2458-GR
Q2	1530000110	Transistor	2SC2458-GR
D1	1710000060	Diode	1SS55
D2	1710000060	Diode	1SS55
D3	1710000060	Diode	1SS55
D4	1710000060	Diode	1SS55
D5	1710000060	Diode	1SS55
D6	1710000060	Diode	1SS55
D7	1730000120	Zener	RD6.2E B2
L1	6180001180	Coil	FL 9H 471K
L2	6180001120	Coil	FL 5H 101K
L3	6180001120	Coil	FL 5H 101K
R1	7010003400	Resistor	ELR20J 1 kΩ
R2	7010003400	Resistor	ELR20J 1 kΩ
R3	7010003400	Resistor	ELR20J 1 kΩ
R4	7010003400	Resistor	ELR20J 1 kΩ
R5	7010003400	Resistor	ELR20J 1 kΩ
R6	7010003400	Resistor	ELR20J 1 kΩ
R7	7010003400	Resistor	ELR20J 1 kΩ
R8	7410000220	Resistor Array	RMX- 8 473K
R9	7010003400	Resistor	ELR20J 1 kΩ
R10	7010003400	Resistor	ELR20J 1 kΩ
R11	7010003400	Resistor	ELR20J 1 kΩ
R12	7010003400	Resistor	ELR20J 1 kΩ
R13	7010003400	Resistor	ELR20J 1 kΩ
R14	7010003400	Resistor	ELR20J 1 kΩ
R15	7010003400	Resistor	ELR20J 1 kΩ
R16	7410000150	Resistor Array	RMX- 6 473K
R17	7010003400	Resistor	ELR20J 1 kΩ
R18	7010003400	Resistor	ELR20J 1 kΩ
R19	7010003400	Resistor	ELR20J 1 kΩ
R20	7010003400	Resistor	ELR20J 1 kΩ
R21	7010003400	Resistor	ELR20J 1 kΩ
R22	7010003400	Resistor	ELR20J 1 kΩ
R23	7010003400	Resistor	ELR20J 1 kΩ
R24	7010003400	Resistor	ELR20J 1 kΩ
R25	7010003400	Resistor	ELR20J 1 kΩ
R26	7010003400	Resistor	ELR20J 1 kΩ
R27	7010003400	Resistor	ELR20J 1 kΩ
R28	7410000150	Resistor Array	RMX- 6 473K
R31	7010004450	Resistor	R20J 100 kΩ
R32	7010004450	Resistor	R20J 100 kΩ
R33	7010004320	Resistor	R20J 10 kΩ
R34	7010003620	Resistor	ELR20J 47 kΩ
R35	7010003620	Resistor	ELR20J 47 kΩ
R36	7010003620	Resistor	ELR20J 47 kΩ
R37	7010003620	Resistor	ELR20J 47 kΩ
R38	7010003620	Resistor	ELR20J 47 kΩ
R39	7010003620	Resistor	ELR20J 47 kΩ
R40	7010004410	Resistor	R20J 47 kΩ
R41	7010003620	Resistor	ELR20J 47 kΩ
C1	4010000520	Ceramic	DD108 B 472K 50V
C2	4510002380	Electrolytic	16 SS 470 μF (10X12.5)

[DISPLAY UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C3	4010000520	Ceramic	DD108 B 472K 50V
C4	4510002780	Electrolytic	16 SS 10 μF
C5	4510002970	Electrolytic	50 SS 4R7 μF
C6	4010000520	Ceramic	DD108 B 472K 50V
C7	4510002810	Electrolytic	16 SS 47 μF
C8	4010000520	Ceramic	DD108 B 472K 50V
C10	4040000260	Barrier Layer	UZE 08X 104M
C11	4040000260	Barrier Layer	UZE 08X 104M
C12	4040000260	Barrier Layer	UZE 08X 104M
C13	4040000260	Barrier Layer	UZE 08X 104M
C15	4530000350	Capacitor Array	B8ZC0111-32N
C16	4530000350	Capacitor Array	B8ZC0111-32N
C17	4530000270	Capacitor Array	B8XC0114-32N
C18	4530000030	Capacitor Array	B5RC0124-32N
DS1	5020000110	FLD	FIP 12EM10
EP1	0910020462	P.C. Board	B 1998B (DISPLAY)

[MKR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R1	7310000870	Trimmer	RH1051D14J0PA (103) [CALIBRATOR]
R2	7310000880	Trimmer	RH1051D15J0JA (104) [ELEC-KEY WEIGHT]
R3	7310000870	Trimmer	RH1051D14J0PA (103) [ANTI-VOX]
R4	7310000890	Trimmer	RH1051D16J0AA (105) [SCAN SPEED]
S1	2220000310	Switch	SSSU02283A [MARKER]
EP1	0910021202	P.C. Board	B 2022B (MKR)

[SENSOR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q1	1170000070	Photo transistor	IS-433
Q2	1170000070	Photo transistor	IS-433
Q3	1590000350	Transistor	RN1204
Q4	1590000350	Transistor	RN1204
DS1	1170000060	LED	GL-430
DS2	1170000060	LED	GL-430
R1	7010003320	Resistor	ELR20J 220 Ω
C1	4040000390	Barrier Layer	UAT 06V 103K
EP1	0910011723	P.C. Board	B 1016C (SENSOR)

[FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q101	1590000340	Transistor	RN1202
Q301	1530000940	Transistor	2SC1571G
Q302	1530000180	Transistor	2SC2878-B
Q501	1520000060	Transistor	2SB562C
D201	1790000240	Diode	1SS99
D202	1790000070	Diode	1SS237
D301	1710000040	Diode	1S953
D302	1710000040	Diode	1S953
D303	1710000160	Diode	1SS133
D304	1710000050	Diode	1SS53
D305	1710000050	Diode	1SS53
L201	6910000670	Coil	BT01RN1-A61-001
L202	6180002430	Coil	LAL 04NA 470K
L203	6910000670	Coil	BT01RN1-A61-001
L204	6910000670	Coil	BT01RN1-A61-001
L301	6180000900	Coil	LAL 03NA 101K
L302	6180000900	Coil	LAL 03NA 101K
L303	6180000900	Coil	LAL 03NA 101K
L304	6180000900	Coil	LAL 03NA 101K
L305	6180000900	Coil	LAL 03NA 101K
L306	6180000900	Coil	LAL 03NA 101K
L307	6180000900	Coil	LAL 03NA 101K
L308	6910000670	Coil	BT01RN1-A61-001
L309	6180000900	Coil	LAL 03NA 101K
R101	7010004500	Resistor	R20J 270 kΩ
R102	7010004100	Resistor	R20J 180 Ω
R103	7010004320	Resistor	R20J 10 kΩ
R104	7010004270	Resistor	R20J 4.7 kΩ
R105	7010004200	Resistor	R20J 1.2 kΩ
R201	7210001300	Variable Resistor	RK097111000XA (1MB) [VOX DELAY]
R202	7210001580	Variable Resistor	RK097111007ZA [ELEC-KEY SPEED]
R203	7210001270	Variable Resistor	RK097111000WA (1KB) [NB LEVEL]
R204	7010004270	Resistor	R20J 4.7 kΩ
R205	7010003480	Resistor	ELR20J 4.7 kΩ
R206	7010004070	Resistor	R20J 100 Ω
R207	7310000730	Trimmer	RH0651CN3J01A (332)
R208	7010003280	Resistor	ELR20J 100 Ω
R209	7010003280	Resistor	ELR20J 100 Ω
R210	7310000780	Trimmer	RH0651CS4J25A (473)
R211	7010004410	Resistor	R20J 47 kΩ
R212	7010004320	Resistor	R20J 10 kΩ
R213	7310000710	Trimmer	RH0651C13J1YA (102)
R214	7010004450	Resistor	R20J 100 kΩ
R301	7010003480	Resistor	ELR20J 4.7 kΩ
R302	7010003420	Resistor	ELR20J 1.5 kΩ
R303	7010004110	Resistor	R20J 220 Ω
R304	7010003370	Resistor	ELR20J 560 Ω
R305	7010004440	Resistor	R20J 82 kΩ
R306	7010003560	Resistor	ELR20J 18 kΩ
R307	7010003400	Resistor	ELR20J 1 kΩ
R308	7010003340	Resistor	ELR20J 330 Ω
R309	7010003240	Resistor	ELR20J 47 Ω
R310	7010001230	Resistor	R25J 4.7 kΩ
R311	7010004270	Resistor	R20J 4.7 kΩ
R312	7010001030	Resistor	R25J 100 Ω
R313	7010003530	Resistor	ELR20J 10 kΩ
R314	7010003620	Resistor	ELR20J 47 kΩ
R315	7010003240	Resistor	ELR20J 47 Ω
R316	7210001550	Variable Resistor	RK1242210032A 10KB [MIC GAIN, RF PWR]
R317	7210001590	Variable Resistor	RK124232000MA 10KB×3 [CW PITCH, SQL]
R318	7210001240	Variable Resistor	RK1242210026A [AF, RF]
R319	7010001150	Resistor	R25J 1 kΩ
R320	7010001030	Resistor	R25J 100 Ω
R321	7010004250	Resistor	R20J 3.3 kΩ

[FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R322	7010000250	Resistor	ELR25J 100 Ω
R323	7010000250	Resistor	ELR25J 100 Ω
R324	7010000500	Resistor	ELR25J 10 kΩ
R401	7210001000	Variable Resistor	RK0971110D04A (10KB) [IF SHIFT]
R402	7210001010	Variable Resistor	RK097111000AA (10KB) [NOTCH]
R501	7010003580	Resistor	ELR20J 22 kΩ
R502	7010003400	Resistor	ELR20J 1 kΩ
R503	7010001190	Resistor	R25J 2.2 kΩ
R504	7010001240	Resistor	R25J 5.6 kΩ
R601	7210001410	Variable Resistor	RK097111T00PA (100KB) [MONITOR GAIN]
R602	7210001410	Variable Resistor	RK097111T00PA (100KB) [RX TONE]
R603	7210001130	Variable Resistor	RK097111T005A (10KB) [VOX GAIN]
R604	7210001410	Variable Resistor	RK097111T00PA (100KB) [MIC TONE]
C101	4510001150	Electrolytic	50 MS7 R47 µF
C201	4510002810	Electrolytic	16 SS 47 µF
C202	4010000520	Ceramic	DD108 B 472K 50V
C203	4510002720	Electrolytic	10 SS 47 µF
C204	4010000520	Ceramic	DD108 B 472K 50V
C205	4010000520	Ceramic	DD108 B 472K 50V
C206	4510001180	Electrolytic	50 MS7 3R3 µF
C207	4010000500	Ceramic	DD104 B 102K 50V
C301	4510002740	Electrolytic	10 SS 220 µF
C302	4010000520	Ceramic	DD108 B 472K 50V
C303	4010000520	Ceramic	DD108 B 472K 50V
C304	4010000520	Ceramic	DD108 B 472K 50V
C305	4510002720	Electrolytic	10 SS 47 µF
C306	4510002940	Electrolytic	50 SS 1 µF
C307	4510002720	Electrolytic	10 SS 47 µF
C308	4010000520	Ceramic	DD108 B 472K 50V
C309	4010000520	Ceramic	DD108 B 472K 50V
C310	4010000520	Ceramic	DD108 B 472K 50V
C311	4010000520	Ceramic	DD108 B 472K 50V
C312	4010000520	Ceramic	DD108 B 472K 50V
C313	4010000520	Ceramic	DD108 B 472K 50V
C314	4010000520	Ceramic	DD108 B 472K 50V
C315	4510001740	Electrolytic	50 RBP 1 µF
C601	4310000060	Mylar	F2D 50V 223K
C602	4310000060	Mylar	F2D 50V 223K
C603	4310000120	Mylar	F2D 50V 473K
C604	4310000120	Mylar	F2D 50V 473K
DS1	5080000060	Lamp	BQ044-32582A
DS501	5040000830	LED	SLP275B-50
DS502	5040000800	LED	SLP175B-50
DS702	5040000920	LED	SLP162B
DS703	5040000910	LED	SLP262B
DS704	5040000940	LED	SLP462B
DS705	5040000920	LED	SLP162B
ME1	5510000340	Meter	KL-294G-5 (ME-25) [MULTI-FUNCTION METER]
S1	2230000120	Switch	SDDSA3159A [POWER]
S2	2260000310	Switch	M-2012J [TRANSMIT/RECEIVE]
S3	2230000750	Switch	SPPJ31332A [SPEECH]
S101	2230000210	Switch	SPPJ31116A [NB]
S102	2230000210	Switch	SPPJ31116A [NB WIDE]
S103	2230000210	Switch	SPPJ31116A [FAST/SLOW]
S104	2230000210	Switch	SPPJ31116A [VOX]
S105	2230000210	Switch	SPPJ31116A [FULL BK-IN]
S201	2210000120	Switch	SRRU13071A [AGC]
S202	2210000170	Switch	SRBU16003A [METER]
S301	2210000160	Switch	SRBU15015A [PRE/ATT]

[FRONT UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
S501	2230000550	Switch	SPPH23079A [COMP]
S502	2230000550	Switch	SPPH23079A [MONI]
S503	2230000550	Switch	SPPH23079A [TUNER]
EP1	0910006330	F.P.C. Board	B 792 (MIC)
EP101	0910021041	P.C. Board	B 2064A (NB SW)
EP201	0910021072	P.C. Board	B 2063B (NB VR)
EP301	0910021053	P.C. Board	B 2065C (AF VR)
EP401	0910021031	P.C. Board	B 2068A (NOTCH)
EP501	0910021061	P.C. Board	B 2066A (AT SW)
EP601	0910021311	P.C. Board	B 2021A (TONE C)
EP701	0910022891	P.C. Board	B 2238A (LED)

[SWR UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	IC	NJM4558M (T1)
IC2	1110000960	IC	NJM4558M (T1)
Q1	1560000360	FET	2SK209-Y
Q2	1560000360	FET	2SK209-Y
D1	1750000030	Diode	1SS187
R1	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R2	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R3	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R4	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R5	7030000600	Resistor	MCR10EZHJ 68 kΩ (683)
R6	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R7	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R8	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R9	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R10	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R11	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R12	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R13	7030000630	Resistor	MCR10EZHJ 120 kΩ (124)
R14	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R15	7030000480	Resistor	MCR10EZHJ 6.8 kΩ (682)
R16	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R17	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
R18	7030000740	Resistor	MCR10EZHJ 1 MΩ (105)
R19	7030000570	Resistor	MCR10EZHJ 39 kΩ (393)
C1	4030003360	Ceramic	GRM40 F 473Z 50PT
C2	4030001140	Ceramic	GRM40 F 103Z 50PT
C3	4030003360	Ceramic	GRM40 F 473Z 50PT
C4	4030003360	Ceramic	GRM40 F 473Z 50PT
C5	4030003360	Ceramic	GRM40 F 473Z 50PT
C6	4030001090	Ceramic	GRM40 B 471K 50PT
C7	4030003460	Ceramic	GRM40 B 562K 50PT
EP1	0910014861	P.C. Board	B 1332A (SWR)

[MATRIX UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130000040	IC	TC4011UBP
IC2	1130000040	IC	TC4011UBP
Q1	1590000350	Transistor	RN1204
Q2	1590000350	Transistor	RN1204
Q3	1510000070	Transistor	2SA1048-Y
Q4	1530000110	Transistor	2SC2458-GR
Q5	1530000591	Transistor	2SC2785 EL
Q6	1510000070	Transistor	2SA1048-Y
Q7	1590000350	Transistor	RN1204
D1	1710000160	Diode	1SS133
D2	1710000160	Diode	1SS133
D3	1710000160	Diode	1SS133
D4	1710000160	Diode	1SS133
D5	1710000160	Diode	1SS133
D6	1710000160	Diode	1SS133
D7	1710000160	Diode	1SS133
D8	1710000160	Diode	1SS133
D9	1710000160	Diode	1SS133
D10	1710000160	Diode	1SS133
D11	1710000160	Diode	1SS133
D12	1710000160	Diode	1SS133
D13	1710000160	Diode	1SS133
D14	1710000160	Diode	1SS133
D15	1710000160	Diode	1SS133
D16	1710000160	Diode	1SS133
D17	1710000160	Diode	1SS133
D18	1710000160	Diode	1SS133
D19	1710000160	Diode	1SS133
D20	1710000160	Diode	1SS133
D21	1710000160	Diode	1SS133
D22	1710000160	Diode	1SS133
D23	1710000160	Diode	1SS133
D24	1710000160	Diode	1SS133
D25	1710000160	Diode	1SS133
D26	1710000160	Diode	1SS133
D27	1710000160	Diode	1SS133
D28	1710000160	Diode	1SS133
D29	1710000160	Diode	1SS133
D30	1710000160	Diode	1SS133
D31	1710000160	Diode	1SS133
D32	1710000160	Diode	1SS133
D33	1710000160	Diode	1SS133
D34	1710000160	Diode	1SS133
D35	1710000160	Diode	1SS133
D36	1710000160	Diode	1SS133
D37	1710000160	Diode	1SS133
D38	1710000160	Diode	1SS133
D39	1710000160	Diode	1SS133
D40	1710000160	Diode	1SS133
D41	1710000160	Diode	1SS133
D42	1710000160	Diode	1SS133
D43	1710000160	Diode	1SS133
D44	1710000160	Diode	1SS133
D45	1710000160	Diode	1SS133
D46	1710000160	Diode	1SS133
D47	1710000160	Diode	1SS133
D48	1710000160	Diode	1SS133
D49	1710000160	Diode	1SS133
D53	1710000160	Diode	1SS133
D54	1710000160	Diode	1SS133
D55	1710000160	Diode	1SS133
D56	1710000160	Diode	1SS133
D57	1710000160	Diode	1SS133
D58	1710000160	Diode	1SS133
R1	7010003300	Resistor	ELR20J 150 Ω
R2	7010003240	Resistor	ELR20J 47 Ω
R3	7010003410	Resistor	ELR20J 1.2 kΩ
R4	7010004190	Resistor	R20J 1 kΩ
R5	7010004410	Resistor	R20J 47 kΩ
R6	7010003650	Resistor	ELR20J 82 kΩ
R7	7010003670	Resistor	ELR20J 120 kΩ

[MATRIX UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R8	7010003750	Resistor	ELR20J 560 kΩ
R9	7010003670	Resistor	ELR20J 120 kΩ
R10	7010003750	Resistor	ELR20J 560 kΩ
R11	7010003650	Resistor	ELR20J 82 kΩ
R12	7010003800	Resistor	ELR20J 1.8 MΩ
R13	7010003800	Resistor	ELR20J 1.8 MΩ
R14	7010004230	Resistor	R20J 2.2 kΩ
R15	7010004270	Resistor	R20J 4.7 kΩ
R16	7010003620	Resistor	ELR20J 47 kΩ
R17	7010003480	Resistor	ELR20J 4.7 kΩ
R18	7010003720	Resistor	ELR20J 330 kΩ
R19	7010004600	Resistor	R20J 2.2 MΩ
R20	7010004410	Resistor	R20J 47 kΩ
R21	7010004410	Resistor	R20J 47 kΩ
C1	4010000500	Ceramic	DD104 B 102K 50V
C2	4010000500	Ceramic	DD104 B 102K 50V
C3	4040000260	Barrier Layer	UZE 08X 104M
C4	4040000260	Barrier Layer	UZE 08X 104M
C5	4040000210	Barrier Layer	UAT 06X 153K
C6	4010000520	Ceramic	DD108 B 472K 50V
DS1	5040000390	LED	SLB-23VR 5F
DS2	5040000860	LED	SLB-23MG 5F
DS3	5040000860	LED	SLB-23MG 5F
S1	2230000600	Switch	SPPQ19178A [SSB]
S2	2230000600	Switch	SPPQ19178A (CW/N]
S3	2230000600	Switch	SPPQ19178A [RTTY/N]
S4	2230000600	Switch	SPPQ19178A [AM/N]
S5	2230000600	Switch	SPPQ19178A [FM/TONE]
S6	2230000600	Switch	SPPQ19178A [DATA]
S7	2230000530	Switch	SPPH23078A [FUNK]
S8	2230000530	Switch	SPPH23078A [SELECT]
S9	2230000530	Switch	SPPH23078A [SCAN]
S10	2230000530	Switch	SPPH23078A [RIT]
S11	2230000530	Switch	SPPH23078A [△TX]
S12	2230000530	Switch	SPPH23078A [CLEAR]
S13	2230000530	Switch	SPPH23078A [M►VFO]
S14	2230000530	Switch	SPPH23078A [MW]
S15	2230000550	Switch	SPPH23079A [TS]
S16	2230000530	Switch	SPPH23078A [A=B]
S17	2230000550	Switch	SPPH23079A [SPLIT]
S18	2230000600	Switch	SPPQ19178A [A/B]
S19	2230000600	Switch	SPPQ19178A [VFO/MEMO]
S20	2230000600	Switch	SPPQ19178A [1.8 (1)]
S21	2230000600	Switch	SPPQ19178A [3.5 (2)]
S22	2230000600	Switch	SPPQ19178A [7 (3)]
S23	2230000600	Switch	SPPQ19178A [10 (4)]
S24	2230000600	Switch	SPPQ19178A [14 (5)]
S25	2230000600	Switch	SPPQ19178A [18 (6)]
S26	2230000600	Switch	SPPQ19178A [21 (7)]
S27	2230000600	Switch	SPPQ19178A [24.5 (8)]
S28	2230000600	Switch	SPPQ19178A [28 (9)]
S29	2230000600	Switch	SPPQ19178A [29 (10)]
S30	2230000600	Switch	SPPQ19178A [GENE (•)]
S31	2230000600	Switch	SPPQ19178A [ENT]
S32	2230000600	Switch	SPPQ19178A [DOWN]
S33	2230000600	Switch	SPPQ19178A [UP]
S34	2230000550	Switch	SPPH23079A [LOCK]
S35	2220000050	Switch	SSSS21148A
S36	6190000180	Switch	SCS-06A
S37	6190000180	Switch	SCS-06A
S38	2230000550	Switch	SPPH23079A [IF SHIFT]
S39	2230000550	Switch	SPPH23079A [CW 250 Hz]
S40	2230000550	Switch	SPPH23079A [NOTCH]
S41	2220000360	Switch	ESD-1111212 [TS]
S42	7600000090	Encoder	EC24B50B000MB [RIT]
S43	2260000880	Switch	SRBM1L038A [M-CH]
EP1	0910020572	P.C. Board	B 1999B (MATRIX)

[DDS UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140000500	IC	SC1051
IC2	1130002600	IC	SC1052
IC3	1130002610	IC	SC1053
IC4	1130002461	IC	TC74HCT374AF
IC5	1130002461	IC	TC74HCT374AF
X1	6050003230	Crystal	CR-180
L1	6200000040	Coil	LQN 5N 331K
L2	6200000040	Coil	LQN 5N 331K
L3	6200000040	Coil	LQN 5N 331K
R1	7030000740	Resistor	MCR10EZHJ 1 MΩ (105)
R2	7030000360	Resistor	MCR10EZHJ 680 Ω (681)
R3	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
R4	7410000320	Resistor Array	GF 5096
R5	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R6	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R7	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
C1	4610000520	Trimmer	TZB04N100BA006
C2	4030000950	Ceramic	GRM40 CH 330J 50PT
C3	4030001150	Ceramic	GRM40 F 104Z 25PT
C7	4030000720	Ceramic	GRM40 SL 680J 50PT
C8	4030000560	Ceramic	GRM40 SL 020C 50PT
C9	4030000750	Ceramic	GRM40 SL 121J 50PT
C10	4030000610	Ceramic	GRM40 SL 070D 50PT
C11	4030000750	Ceramic	GRM40 SL 121J 50PT
C12	4030000640	Ceramic	GRM40 SL 120J 50PT
C13	4030000720	Ceramic	GRM40 SL 680J 50PT
C14	4030001150	Ceramic	GRM40 F 104Z 25PT
C15	4030001150	Ceramic	GRM40 F 104Z 25PT
C16	4030001150	Ceramic	GRM40 F 104Z 25PT
C17	4030001150	Ceramic	GRM40 F 104Z 25PT
C18	4030002430	Ceramic	GRM40 TH 220J 50PT
C19	4030001100	Ceramic	GRM40 B 102K 50PT
C20	4030001100	Ceramic	GRM40 B 102K 50PT
EP1	0910022511	P.C. Board	B 2203A (DDS)

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1130002960	IC	TC9181P
IC2	1130004120	IC	TD6102P
IC3	1110001320	IC	μPC1037HA
IC4	1110001320	IC	μPC1037HA
IC5	1120000100	IC	M74LS90P
IC6	1120000410	IC	SN74LS390N
IC7	1180000160	IC	μA78M05UC
IC8	1180000640	IC	MC7808CT
Q1	1590000340	Transistor	RN1202
Q2	1590000340	Transistor	RN1202
Q3	1590000340	Transistor	RN1202
Q4	1590000340	Transistor	RN1202
Q5	1530000940	Transistor	2SC1571G
Q6	1530000940	Transistor	2SC1571G
Q7	1530000940	Transistor	2SC1571G
Q8	1560000090	FET	2SK192A-GR
Q9	1560000090	FET	2SK192A-GR
Q10	1560000090	FET	2SK192A-GR
Q11	1560000090	FET	2SK192A-GR

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q12	1530000150	Transistor	2SC2668-O
Q13	1530000150	Transistor	2SC2668-O
Q14	1530000150	Transistor	2SC2668-O
Q15	1530000150	Transistor	2SC2668-O
Q16	1530000150	Transistor	2SC2668-O
Q17	1530000150	Transistor	2SC2668-O
Q18	1530000150	Transistor	2SC2668-O
Q19	1530000150	Transistor	2SC2668-O
Q20	1590000350	Transistor	RN1204
Q22	1530000150	Transistor	2SC2668-O
Q23	1530000150	Transistor	2SC2668-O
Q24	1590000340	Transistor	RN1202
Q25	1590000360	Transistor	RN2202
Q26	1590000340	Transistor	RN1202
Q27	1590000340	Transistor	RN1202
Q28	1530000591	Transistor	2SC2785 EL
Q29	1590000340	Transistor	RN1202
Q30	1590000340	Transistor	RN1202
Q31	1590000340	Transistor	RN1202
Q32	1530000591	Transistor	2SC2785 EL
Q33	1530000150	Transistor	2SC2668-O
Q201	1560000090	FET	2SK192A-GR
Q202	1530000150	Transistor	2SC2668-O
Q203	1530000150	Transistor	2SC2668-O
Q204	1530000150	Transistor	2SC2668-O
Q205	1530000150	Transistor	2SC2668-O
D1	1710000050	Diode	1SS53
D2	1710000050	Diode	1SS53
D3	1710000050	Diode	1SS53
D4	1710000050	Diode	1SS53
D5	1710000050	Diode	1SS53
D6	1720000120	Varicap	FC52M
D7	1720000050	Varicap	1SV50E
D8	1720000050	Varicap	1SV50E
D9	1720000050	Varicap	1SV50E
D10	1710000050	Diode	1SS53
D11	1710000050	Diode	1SS53
D12	1710000050	Diode	1SS53
D13	1710000050	Diode	1SS53
D14	1710000050	Diode	1SS53
D15	1710000050	Diode	1SS53
D16	1720000050	Varicap	1SV50E
D17	1730000100	Zener	RD5.1E B2
D18	1710000050	Diode	1SS53
D19	1710000050	Diode	1SS53
D20	1730000100	Zener	RD5.1E B2
D21	1710000580	Diode	1SS265
D201	1720000120	Varicap	FC52M
D202	1790000070	Diode	1SS237
D203	1730000100	Zener	RD5.1E B2
X1	6050005710	Crystal	CR-275
L1	6140000580	Coil	LR-79
L2	6140000580	Coil	LR-79
L3	6140000580	Coil	LR-79
L4	6140000580	Coil	LR-79
L5	6130002110	Coil	LB-206
L6	6170000230	Coil	LW-25
L7	6130000990	Coil	LB-135
L8	6170000230	Coil	LW-25
L9	6130000990	Coil	LB-135
L10	6170000230	Coil	LW-25
L11	6130000990	Coil	LB-135
L12	6170000230	Coil	LW-25
L13	6110001610	Coil	LA-244
L14	6110001620	Coil	LA-245
L15	6110001700	Coil	LA-256
L18	6180000900	Coil	LAL 03NA 101K
L19	6180000690	Coil	LAL 03NA R22M
L20	6180000700	Coil	LAL 03NA R27M

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L21	6180000700	Coil	LAL 03NA R27M
L22	6180000900	Coil	LAL 03NA 101K
L23	6180000730	Coil	LAL 03NA R47M
L24	6180000750	Coil	LAL 03NA R68M
L25	6180000750	Coil	LAL 03NA R68M
L26	6180000730	Coil	LAL 03NA R47M
L27	6180000730	Coil	LAL 03NA R47M
L28	6180000740	Coil	LAL 03NA R56M
L29	6180000750	Coil	LAL 03NA R68M
L30	6180000770	Coil	LAL 03NA 1R0M
L32	6180000710	Coil	LAL 03NA R33M
L33	6180000720	Coil	LAL 03NA R39M
L34	6180000720	Coil	LAL 03NA R39M
L35	6180000750	Coil	LAL 03NA R68M
L36	6180000740	Coil	LAL 03NA R56M
L37	6180002540	Coil	LAL 02NA 470K
L38	6180000900	Coil	LAL 03NA 101K
L39	6180000900	Coil	LAL 03NA 101K
L40	6180000750	Coil	LAL 03NA R68M
L41	6180000900	Coil	LAL 03NA 101K
L42	6180000900	Coil	LAL 03NA 101K
L43	6180000900	Coil	LAL 03NA 101K
L44	6170000180	Coil	LW-19
L45	6150000760	Coil	LS-94
L46	6150000990	Coil	LS-114
L47	6150000990	Coil	LS-114
L48	6150002520	Coil	LS-276
L49	6150002520	Coil	LS-276
L50	6150000990	Coil	LS-114
L51	6150000990	Coil	LS-114
L52	6910000670	Coil	BT01RN1-A61-001
L53	6910000670	Coil	BT01RN1-A61-001
L54	6910000670	Coil	BT01RN1-A61-001
L55	6180000900	Coil	LAL 03NA 101K
L56	6180002270	Coil	LAL 03NA 470K
L57	6180000900	Coil	LAL 03NA 101K
L58	6180000900	Coil	LAL 03NA 101K
L59	6180000810	Coil	LAL 03NA 2R2M
L60	6180001510	Coil	LAL 02NA 101K
L201	6140000580	Coil	LR-79
L202	6150003100	Coil	LS-316
L203	6180000850	Coil	LAL 03NA 4R7K
L204	6180000850	Coil	LAL 03NA 4R7K
L205	6180000900	Coil	LAL 03NA 101K
L206	6180000900	Coil	LAL 03NA 101K
R1	7010003550	Resistor	ELR20J 15 kΩ
R2	7010004070	Resistor	R20J 100 Ω
R3	7010003440	Resistor	ELR20J 2.2 kΩ
R4	7010004490	Resistor	R20J 220 kΩ
R5	7010003400	Resistor	ELR20J 1 kΩ
R6	7010001190	Resistor	R25J 2.2 kΩ
R7	7010003660	Resistor	ELR20J 100 kΩ
R8	7010003660	Resistor	ELR20J 100 kΩ
R9	7010004450	Resistor	R20J 100 kΩ
R10	7010003660	Resistor	ELR20J 100 kΩ
R11	7010004450	Resistor	R20J 100 kΩ
R12	7010003660	Resistor	ELR20J 100 kΩ
R13	7010003660	Resistor	ELR20J 100 kΩ
R14	7010003660	Resistor	ELR20J 100 kΩ
R15	7010003300	Resistor	ELR20J 150 Ω
R16	7010004250	Resistor	R20J 3.3 kΩ
R17	7010003300	Resistor	ELR20J 150 Ω
R18	7010003460	Resistor	ELR20J 3.3 kΩ
R19	7010003300	Resistor	ELR20J 150 Ω
R20	7010003460	Resistor	ELR20J 3.3 kΩ
R21	7010004090	Resistor	R20J 150 Ω
R22	7010004250	Resistor	R20J 3.3 kΩ
R23	7010004110	Resistor	R20J 220 Ω
R24	7010004010	Resistor	R20J 33 Ω
R25	7010003320	Resistor	ELR20J 220 Ω
R26	7010003480	Resistor	ELR20J 4.7 kΩ
R27	7010003340	Resistor	ELR20J 330 Ω
R28	7010004070	Resistor	R20J 100 Ω

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R29	7010003320	Resistor	ELR20J 220 Ω
R30	7010003530	Resistor	ELR20J 10 kΩ
R31	7010003360	Resistor	ELR20J 470 Ω
R32	7010004070	Resistor	R20J 100 Ω
R33	7010004370	Resistor	R20J 22 kΩ
R34	7010003280	Resistor	ELR20J 100 Ω
R37	7010003440	Resistor	ELR20J 2.2 kΩ
R38	7010003400	Resistor	ELR20J 1 kΩ
R39	7010003400	Resistor	ELR20J 1 kΩ
R40	7010004190	Resistor	R20J 1 kΩ
R41	7010004070	Resistor	R20J 100 Ω
R42	7010003390	Resistor	ELR20J 820 Ω
R43	7010003580	Resistor	ELR20J 22 kΩ
R44	7010003490	Resistor	ELR20J 5.6 kΩ
R45	7010003320	Resistor	ELR20J 220 Ω
R46	7010003480	Resistor	ELR20J 4.7 kΩ
R47	7010003280	Resistor	ELR20J 100 Ω
R48	7010003280	Resistor	ELR20J 100 Ω
R49	7010003280	Resistor	ELR20J 100 Ω
R50	7010003400	Resistor	ELR20J 1 kΩ
R51	7010003400	Resistor	ELR20J 1 kΩ
R52	7010003400	Resistor	ELR20J 1 kΩ
R53	7010003320	Resistor	ELR20J 220 Ω
R54	7010003400	Resistor	ELR20J 1 kΩ
R55	7010003320	Resistor	ELR20J 220 Ω
R56	7010003400	Resistor	ELR20J 1 kΩ
R57	7010003320	Resistor	ELR20J 220 Ω
R58	7010003530	Resistor	ELR20J 10 kΩ
R59	7010003530	Resistor	ELR20J 10 kΩ
R60	7010003400	Resistor	ELR20J 1 kΩ
R61	7010003440	Resistor	ELR20J 2.2 kΩ
R62	7010003240	Resistor	ELR20J 47 Ω
R63	7010003320	Resistor	ELR20J 220 Ω
R64	7010004370	Resistor	R20J 22 kΩ
R65	7010003360	Resistor	ELR20J 470 Ω
R66	7010003530	Resistor	ELR20J 10 kΩ
R67	7010003280	Resistor	ELR20J 100 Ω
R68	7010003280	Resistor	ELR20J 100 Ω
R69	7010003530	Resistor	ELR20J 10 kΩ
R70	7010003530	Resistor	ELR20J 10 kΩ
R71	7010003320	Resistor	ELR20J 220 Ω
R72	7410000080	Resistor Array	RMX- 4 473K
R73	7010004190	Resistor	R20J 1 kΩ
R74	7010004190	Resistor	R20J 1 kΩ
R75	7010004190	Resistor	R20J 1 kΩ
R76	7010004070	Resistor	R20J 100 Ω
R77	7010004320	Resistor	R20J 10 kΩ
R78	7010003320	Resistor	ELR20J 220 Ω
R79	7010003400	Resistor	ELR20J 1 kΩ
R80	7010003400	Resistor	ELR20J 1 kΩ
R81	7010004230	Resistor	R20J 2.2 kΩ
R82	7010003530	Resistor	ELR20J 10 kΩ
R83	7010004270	Resistor	R20J 4.7 kΩ
R84	7010003360	Resistor	ELR20J 470 Ω
R85	7010003240	Resistor	ELR20J 47 Ω
R86	7010003240	Resistor	ELR20J 47 Ω
R87	7010003420	Resistor	ELR20J 1.5 kΩ
R88	7010003550	Resistor	ELR20J 15 kΩ
R89	7010000050	Resistor	ELR25J 2.2 Ω
R90	7010003480	Resistor	ELR20J 4.7 kΩ
R91	7010003440	Resistor	ELR20J 2.2 kΩ
R93	7010003620	Resistor	ELR20J 47 kΩ
R94	7010003400	Resistor	ELR20J 1 kΩ
R95	7010001110	Resistor	R25J 470 Ω
R96	7010003280	Resistor	ELR20J 100 Ω
R97	7010003580	Resistor	ELR20J 22 kΩ
R98	7010003530	Resistor	ELR20J 10 kΩ
R99	7010003400	Resistor	ELR20J 1 kΩ
R100	7010001030	Resistor	R25J 100 Ω
R101	7010004370	Resistor	R20J 22 kΩ
R102	7010004070	Resistor	R20J 100 Ω
R103	7010003340	Resistor	ELR20J 330 Ω
R104	7010003400	Resistor	ELR20J 1 kΩ
R105	7010004030	Resistor	R20J 47 Ω
R106	7010003250	Resistor	ELR20J 56 Ω

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R107	7010001030	Resistor	R25J 100 Ω
R108	7010003280	Resistor	ELR20J 100 Ω
R109	7010003580	Resistor	ELR20J 22 kΩ
R110	7010003320	Resistor	ELR20J 220 Ω
R111	7010003530	Resistor	ELR20J 10 kΩ
R112	7010003320	Resistor	ELR20J 220 Ω
R113	7010003320	Resistor	ELR20J 220 Ω
R114	7010003320	Resistor	ELR20J 220 Ω
R116	7010003400	Resistor	ELR20J 1 kΩ
R117	7010003280	Resistor	ELR20J 100 Ω
R118	7010004270	Resistor	R20J 4.7 kΩ
R120	7010003530	Resistor	ELR20J 10 kΩ
R121	7010003530	Resistor	ELR20J 10 kΩ
R122	7010003360	Resistor	ELR20J 470 Ω
R123	7010003280	Resistor	ELR20J 100 Ω
R124	7010003300	Resistor	ELR20J 150 Ω
R125	7010003260	Resistor	ELR20J 68 Ω
R126	7010004150	Resistor	R20J 470 Ω
R127	7010003480	Resistor	ELR20J 4.7 kΩ
R128	7010003480	Resistor	ELR20J 4.7 kΩ
R201	7010001230	Resistor	R25J 4.7 kΩ
R202	7010003280	Resistor	ELR20J 100 Ω
R203	7010003280	Resistor	ELR20J 100 Ω
R204	7010003660	Resistor	ELR20J 100 kΩ
R207	7010003530	Resistor	ELR20J 10 kΩ
R208	7010003530	Resistor	ELR20J 10 kΩ
R209	7010003340	Resistor	ELR20J 330 Ω
R210	7010004110	Resistor	R20J 220 Ω
R211	7010003320	Resistor	ELR20J 220 Ω
R212	7010003530	Resistor	ELR20J 10 kΩ
R213	7010001030	Resistor	R25J 100 Ω
R214	7010003580	Resistor	ELR20J 22 kΩ
R215	7010003360	Resistor	ELR20J 470 Ω
R216	7010003280	Resistor	ELR20J 100 Ω
R217	7010003440	Resistor	ELR20J 2.2 kΩ
R218	7010003280	Resistor	ELR20J 100 Ω
R219	7010003480	Resistor	ELR20J 4.7 kΩ
R220	7010003440	Resistor	ELR20J 2.2 kΩ
R221	7010003400	Resistor	ELR20J 1 kΩ
R222	7010004070	Resistor	R20J 100 Ω
R223	7010004190	Resistor	R20J 1 kΩ
R224	7010003550	Resistor	ELR20J 15 kΩ
R225	7010003400	Resistor	ELR20J 1 kΩ
R226	7010003400	Resistor	ELR20J 1 kΩ
R227	7010003400	Resistor	ELR20J 1 kΩ
R228	7010003530	Resistor	ELR20J 10 kΩ
C1	4010000500	Ceramic	DD104 B 102K 50V
C2	4550000360	Tantalum	DN 1V R47M
C3	4550000360	Tantalum	DN 1V R47M
C4	4510001100	Electrolytic	16 MS7 10 µF
C5	4040000260	Barrier Layer	UZE 08X 104M
C6	4010000520	Ceramic	DD108 B 472K 50V
C7	4040000250	Barrier Layer	UAT 08X 473M
C8	4040000250	Barrier Layer	UAT 08X 473M
C9	4010000840	Ceramic	DD105 CH 390J 50V
C10	4010000700	Ceramic	DD104 CH 100D 50V
C11	4610001130	Trimmer	CVSSA1001
C12	4010000880	Ceramic	DD106 CH 560J 50V
C13	4010000720	Ceramic	DD104 CH 120J 50V
C14	4010000720	Ceramic	DD104 CH 120J 50V
C15	4010000520	Ceramic	DD108 B 472K 50V
C16	4010000020	Ceramic	DD104 SL 010C 50V
C17	4010000520	Ceramic	DD108 B 472K 50V
C18	4010000900	Ceramic	DD107 CH 680J 50V
C19	4010000720	Ceramic	DD104 CH 120J 50V
C20	4610001130	Trimmer	CVSSA1001
C21	4010000860	Ceramic	DD106 CH 470J 50V
C22	4010000720	Ceramic	DD104 CH 120J 50V
C23	4010000720	Ceramic	DD104 CH 120J 50V
C24	4010000520	Ceramic	DD108 B 472K 50V
C25	4010000020	Ceramic	DD104 SL 010C 50V
C26	4010000520	Ceramic	DD108 B 472K 50V
C27	4010000870	Ceramic	DD106 CH 510J 50V

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C28	4010000680	Ceramic	DD104 CH 080D 50V
C29	4610001000	Trimmer	CVSSA0701
C30	4010000860	Ceramic	DD106 CH 470J 50V
C31	4010000720	Ceramic	DD104 CH 120J 50V
C32	4010000680	Ceramic	DD104 CH 080D 50V
C33	4010000520	Ceramic	DD108 B 472K 50V
C34	4010000020	Ceramic	DD104 SL 010C 50V
C35	4010000850	Ceramic	DD106 CH 430J 50V
C36	4010000650	Ceramic	DD104 CH 050C 50V
C37	4610001000	Trimmer	CVSSA0701
C38	4010000820	Ceramic	DD105 CH 330J 50V
C39	4010000720	Ceramic	DD104 CH 120J 50V
C40	4010000650	Ceramic	DD104 CH 050C 50V
C41	4010000520	Ceramic	DD108 B 472K 50V
C42	4010000020	Ceramic	DD104 SL 010C 50V
C43	4010000500	Ceramic	DD104 B 102K 50V
C44	4010000500	Ceramic	DD104 B 102K 50V
C45	4010000500	Ceramic	DD104 B 102K 50V
C46	4010000500	Ceramic	DD104 B 102K 50V
C47	4010000500	Ceramic	DD104 B 102K 50V
C48	4010000520	Ceramic	DD108 B 472K 50V
C49	4010000500	Ceramic	DD104 B 102K 50V
C50	4010000520	Ceramic	DD108 B 472K 50V
C51	4010000520	Ceramic	DD108 B 472K 50V
C52	4010000500	Ceramic	DD104 B 102K 50V
C53	4010000180	Ceramic	DD104 SL 220J 50V
C54	4010000150	Ceramic	DD104 SL 150J 50V
C55	4010000260	Ceramic	DD104 SL 470J 50V
C56	4010000070	Ceramic	DD104 SL 050C 50V
C57	4010000210	Ceramic	DD104 SL 300J 50V
C58	4010000280	Ceramic	DD104 SL 560J 50V
C59	4010000360	Ceramic	DD106 SL 181J 50V
C60	4010000280	Ceramic	DD104 SL 560J 50V
C61	4010000500	Ceramic	DD104 B 102K 50V
C62	4010000520	Ceramic	DD108 B 472K 50V
C63	4510001100	Electrolytic	16 MS7 10 µF
C64	4010000520	Ceramic	DD108 B 472K 50V
C65	4010000520	Ceramic	DD108 B 472K 50V
C66	4010000310	Ceramic	DD104 SL 750J 50V
C67	4010000220	Ceramic	DD104 SL 330J 50V
C68	4010000340	Ceramic	DD105 SL 121J 50V
C69	4010000160	Ceramic	DD104 SL 180J 50V
C70	4010000350	Ceramic	DD106 SL 151J 50V
C71	4010000080	Ceramic	DD104 SL 060D 50V
C72	4010000330	Ceramic	DD105 SL 101J 50V
C73	4010000500	Ceramic	DD104 B 102K 50V
C74	4010000520	Ceramic	DD108 B 472K 50V
C75	4010000520	Ceramic	DD108 B 472K 50V
C76	4010000520	Ceramic	DD108 B 472K 50V
C77	4010000240	Ceramic	DD104 SL 390J 50V
C78	4010000230	Ceramic	DD104 SL 360J 50V
C79	4010000320	Ceramic	DD104 SL 820J 50V
C80	4010000160	Ceramic	DD104 SL 180J 50V
C81	4010000330	Ceramic	DD105 SL 101J 50V
C82	4010000080	Ceramic	DD104 SL 060D 50V
C83	4010000290	Ceramic	DD104 SL 620J 50V
C84	4010000520	Ceramic	DD108 B 472K 50V
C85	4010000520	Ceramic	DD108 B 472K 50V
C86	4010000520	Ceramic	DD108 B 472K 50V
C88	4010000270	Ceramic	DD104 SL 510J 50V
C89	4010000180	Ceramic	DD104 SL 220J 50V
C90	4010000280	Ceramic	DD104 SL 560J 50V
C91	4010000140	Ceramic	DD104 SL 120J 50V
C92	4010000230	Ceramic	DD104 SL 360J 50V
C93	4010000320	Ceramic	DD104 SL 820J 50V
C94	4040000450	Barrier Layer	RAU 08SA 681K
C95	4010000270	Ceramic	DD104 SL 510J 50V
C96	4010000380	Ceramic	DD107 SL 221J 50V
C97	4010000330	Ceramic	DD105 SL 101J 50V
C100	4010000520	Ceramic	DD108 B 472K 50V
C101	4010000520	Ceramic	DD108 B 472K 50V
C104	4010000240	Ceramic	DD104 SL 390J 50V
C105	4010000160	Ceramic	DD104 SL 180J 50V
C106	4010000250	Ceramic	DD104 SL 430J 50V
C107	4010000120	Ceramic	DD104 SL 100D 50V

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C108	4010000200	Ceramic	DD104 SL 270J 50V
C109	4010000310	Ceramic	DD104 SL 750J 50V
C110	4010000350	Ceramic	DD106 SL 151J 50V
C111	4010000240	Ceramic	DD104 SL 390J 50V
C112	4010000430	Ceramic	DD109 SL 471J 50V
C113	4010000290	Ceramic	DD104 SL 620J 50V
C116	4010000520	Ceramic	DD108 B 472K 50V
C117	4010000520	Ceramic	DD108 B 472K 50V
C118	4010000520	Ceramic	DD108 B 472K 50V
C119	4010000500	Ceramic	DD104 B 102K 50V
C120	4010000500	Ceramic	DD104 B 102K 50V
C121	4040000150	Barrier Layer	UAT 05X 472K
C122	4510001100	Electrolytic	16 MS7 10 µF
C123	4510001100	Electrolytic	16 MS7 10 µF
C124	4010000520	Ceramic	DD108 B 472K 50V
C125	4010000260	Ceramic	DD104 SL 470J 50V
C126	4010000500	Ceramic	DD104 B 102K 50V
C127	4010000520	Ceramic	DD108 B 472K 50V
C128	4010000520	Ceramic	DD108 B 472K 50V
C129	4010000100	Ceramic	DD104 SL 080D 50V
C130	4010000520	Ceramic	DD108 B 472K 50V
C131	4010000260	Ceramic	DD104 SL 470J 50V
C132	4510001100	Electrolytic	16 MS7 10 µF
C133	4010000520	Ceramic	DD108 B 472K 50V
C134	4040000150	Barrier Layer	UAT 05X 472K
C135	4010000520	Ceramic	DD108 B 472K 50V
C136	4010000120	Ceramic	DD104 SL 100D 50V
C137	4510002810	Electrolytic	16 SS 47 µF
C138	4010000920	Ceramic	DD107 CH 820J 50V
C139	4010000520	Ceramic	DD108 B 472K 50V
C140	4010000920	Ceramic	DD107 CH 820J 50V
C141	4510001100	Electrolytic	16 MS7 10 µF
C142	4010000520	Ceramic	DD108 B 472K 50V
C143	4010000260	Ceramic	DD104 SL 470J 50V
C144	4550000340	Tantalum	DN 1C 100M
C145	4010000520	Ceramic	DD108 B 472K 50V
C146	4010000500	Ceramic	DD104 B 102K 50V
C147	4010000120	Ceramic	DD104 SL 100D 50V
C148	4510001100	Electrolytic	16 MS7 10 µF
C149	4010000520	Ceramic	DD108 B 472K 50V
C150	4010000330	Ceramic	DD105 SL 101J 50V
C151	4010000330	Ceramic	DD105 SL 101J 50V
C152	4010000120	Ceramic	DD104 SL 100D 50V
C153	4010000520	Ceramic	DD108 B 472K 50V
C154	4040000260	Barrier Layer	UZE 08X 104M
C155	4010000100	Ceramic	DD104 SL 080D 50V
C156	4010000520	Ceramic	DD108 B 472K 50V
C157	4010000020	Ceramic	DD104 SL 010C 50V
C158	4010000100	Ceramic	DD104 SL 080D 50V
C159	4010000330	Ceramic	DD105 SL 101J 50V
C160	4010000260	Ceramic	DD104 SL 470J 50V
C161	4010000520	Ceramic	DD108 B 472K 50V
C162	4010000520	Ceramic	DD108 B 472K 50V
C163	4010000500	Ceramic	DD104 B 102K 50V
C164	4010000120	Ceramic	DD104 SL 100D 50V
C165	4010000020	Ceramic	DD104 SL 010C 50V
C166	4010000120	Ceramic	DD104 SL 100D 50V
C167	4010000500	Ceramic	DD104 B 102K 50V
C168	4010000330	Ceramic	DD105 SL 101J 50V
C169	4010000520	Ceramic	DD108 B 472K 50V
C170	4040000260	Barrier Layer	UZE 08X 104M
C171	4010000100	Ceramic	DD104 SL 080D 50V
C172	4010000520	Ceramic	DD108 B 472K 50V
C173	4010000020	Ceramic	DD104 SL 010C 50V
C174	4010000120	Ceramic	DD104 SL 100D 50V
C175	4010000520	Ceramic	DD108 B 472K 50V
C176	4040000150	Barrier Layer	UAT 05X 472K
C177	4010000520	Ceramic	DD108 B 472K 50V
C178	4010000520	Ceramic	DD108 B 472K 50V
C179	4010000520	Ceramic	DD108 B 472K 50V
C180	4510002810	Electrolytic	16 SS 47 µF
C181	4010000520	Ceramic	DD108 B 472K 50V
C182	4510002810	Electrolytic	16 SS 47 µF
C183	4010000520	Ceramic	DD108 B 472K 50V
C184	4510002810	Electrolytic	16 SS 47 µF

[PLL UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C185	4010000520	Ceramic	DD108 B 472K 50V
C186	4510002810	Electrolytic	16 SS 47 µF
C187	4010000520	Ceramic	DD108 B 472K 50V
C188	4510003040	Electrolytic	16 SS 100 µF
C189	4010000520	Ceramic	DD108 B 472K 50V
C190	4010000500	Ceramic	DD104 B 102K 50V
C191	4010000520	Ceramic	DD108 B 472K 50V
C192	4010000520	Ceramic	DD108 B 472K 50V
C193	4010000520	Ceramic	DD108 B 472K 50V
C194	4550000340	Tantalum	DN 1C 100M
C195	4010000520	Ceramic	DD108 B 472K 50V
C197	4510001970	Electrolytic	50 MS7 0R1 µF
C201	4010000520	Ceramic	DD108 B 472K 50V
C202	4010000780	Ceramic	DD104 CH 220J 50V
C203	4010000890	Ceramic	DD106 CH 620J 50V
C204	4010000900	Ceramic	DD107 CH 680J 50V
C205	4010000740	Ceramic	DD104 CH 150J 50V
C206	4010000720	Ceramic	DD104 CH 120J 50V
C207	4510001100	Electrolytic	16 MS7 10 µF
C209	4010000020	Ceramic	DD104 SL 010C 50V
C210	4010000520	Ceramic	DD108 B 472K 50V
C211	4010000500	Ceramic	DD104 B 102K 50V
C212	4010000520	Ceramic	DD108 B 472K 50V
C213	4010000520	Ceramic	DD108 B 472K 50V
C214	4010000500	Ceramic	DD104 B 102K 50V
C215	4010000520	Ceramic	DD108 B 472K 50V
C216	4010000520	Ceramic	DD108 B 472K 50V
C217	4010000380	Ceramic	DD107 SL 221J 50V
C218	4010000520	Ceramic	DD108 B 472K 50V
C219	4040000260	Barrier Layer	UZE 08X 104M
C220	4040000150	Barrier Layer	UAT 05X 472K
C221	4510001100	Electrolytic	16 MS7 10 µF
C222	4040000260	Barrier Layer	UZE 08X 104M
C223	4040000150	Barrier Layer	UAT 05X 472K
C224	4040000260	Barrier Layer	UZE 08X 104M
C225	4550000350	Tantalum	DN 1V 010M
C226	4610000780	Trimmer	CV38D 2001
EP1	0910021363	P.C. Board	B 2016C (PLL)
EP2	6910000630	Bead core	FSOH070RN
EP3	6910000630	Bead core	FSOH070RN

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140001220	IC	HD64180R1P6
IC2	1140000940	IC	TMP82C255AN-2-Z
IC3	1140000940	IC	TMP82C255AN-2-Z
IC4	1130003771	IC	HM6264ALP15SL
IC5	1130004310	IC	SC1112
IC6	1130003530	IC	µPD74HC42C
IC7	1130000770	IC	µPD4028BC
IC8	1130001030	IC	µPD4528BC
IC9	1130002060	IC	µPD4024BC
IC10	1130002060	IC	µPD4024BC
IC11	1130000620	IC	µPD4011BC
IC12	1130000620	IC	µPD4011BC
IC13	1130000620	IC	µPD4011BC
IC14	1130000600	IC	µPD4001BC
IC15	1130000620	IC	µPD4011BC
IC16	1130000670	IC	µPD4071BC
IC17	1130000600	IC	µPD4001BC
IC18	1130003620	IC	µPD74HC32C
IC19	1130003720	IC	µPD74HC00C
IC20	1130000620	IC	µPD4011BC
IC21	1110001680	IC	S-8054ALB
IC22	1180000270	IC	NJM78M05A
IC23	1160000010	IC	DAN401

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC24	1160000010	IC	DAN401
Q1	1530000110	Transistor	2SC2458-GR
Q2	1510000080	Transistor	2SA1048-GR
Q3	1590000350	Transistor	RN1204
Q4	1530000110	Transistor	2SC2458-GR
Q5	1530000110	Transistor	2SC2458-GR
Q6	1530000110	Transistor	2SC2458-GR
Q7	1590000350	Transistor	RN1204
Q8	1590000350	Transistor	RN1204
D1	1710000050	Diode	1SS53
D2	1710000160	Diode	1SS133
D3	1710000160	Diode	1SS133
D4	1710000160	Diode	1SS133
D5	1710000160	Diode	1SS133
D6	1710000160	Diode	1SS133
D7	1710000160	Diode	1SS133
D8	1710000160	Diode	1SS133
D9	1710000160	Diode	1SS133
X1	6050005760	Crystal	CR-276
L1	6910000670	Coil	BT01RN1-A61-001
L2	6910000670	Coil	BT01RN1-A61-001
L3	6180000990	Coil	LAL 04NA 101K
L4	6180000900	Coil	LAL 03NA 101K
R1	7010003400	Resistor	ELR20J 1 kΩ
R2	7010003400	Resistor	ELR20J 1 kΩ
R3	7010003400	Resistor	ELR20J 1 kΩ
R4	7010003400	Resistor	ELR20J 1 kΩ
R5	7010003400	Resistor	ELR20J 1 kΩ
R6	7010003400	Resistor	ELR20J 1 kΩ
R7	7010003400	Resistor	ELR20J 1 kΩ
R8	7010003400	Resistor	ELR20J 1 kΩ
R9	7010003400	Resistor	ELR20J 1 kΩ
R10	7010003400	Resistor	ELR20J 1 kΩ
R11	7010003400	Resistor	ELR20J 1 kΩ
R12	7010003360	Resistor	ELR20J 470 Ω
R13	7010003360	Resistor	ELR20J 470 Ω
R14	7010003360	Resistor	ELR20J 470 Ω
R15	7010003360	Resistor	ELR20J 470 Ω
R16	7010003360	Resistor	ELR20J 470 Ω
R17	7010003360	Resistor	ELR20J 470 Ω
R18	7010003360	Resistor	ELR20J 470 Ω
R19	7010003360	Resistor	ELR20J 470 Ω
R20	7010003400	Resistor	ELR20J 1 kΩ
R21	7010003400	Resistor	ELR20J 1 kΩ
R22	7010003400	Resistor	ELR20J 1 kΩ
R23	7010003400	Resistor	ELR20J 1 kΩ
R24	7010003400	Resistor	ELR20J 1 kΩ
R26	7010003620	Resistor	ELR20J 47 kΩ
R27	7010004190	Resistor	R20J 1 kΩ
R28	7010003620	Resistor	ELR20J 47 kΩ
R29	7010003530	Resistor	ELR20J 10 kΩ
R30	7010003480	Resistor	ELR20J 4.7 kΩ
R31	7010003530	Resistor	ELR20J 10 kΩ
R32	7010003530	Resistor	ELR20J 10 kΩ
R33	7010004320	Resistor	R20J 10 kΩ
R34	7010003620	Resistor	ELR20J 47 kΩ
R35	7010003620	Resistor	ELR20J 47 kΩ
R36	7010003660	Resistor	ELR20J 100 kΩ
R37	7010004320	Resistor	R20J 10 kΩ
R38	7010003400	Resistor	ELR20J 1 kΩ
R39	7010003400	Resistor	ELR20J 1 kΩ
R40	7010003400	Resistor	ELR20J 1 kΩ
R41	7010003400	Resistor	ELR20J 1 kΩ
R42	7010003400	Resistor	ELR20J 1 kΩ
R43	7010003400	Resistor	ELR20J 1 kΩ

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R44	7010003400	Resistor	ELR20J 1 kΩ
R45	7010003400	Resistor	ELR20J 1 kΩ
R46	7010003400	Resistor	ELR20J 1 kΩ
R47	7010003400	Resistor	ELR20J 1 kΩ
R48	7010003400	Resistor	ELR20J 1 kΩ
R49	7010003400	Resistor	ELR20J 1 kΩ
R50	7010003400	Resistor	ELR20J 1 kΩ
R51	7010003400	Resistor	ELR20J 1 kΩ
R52	7010003400	Resistor	ELR20J 1 kΩ
R53	7010003400	Resistor	ELR20J 1 kΩ
R54	7010003400	Resistor	ELR20J 1 kΩ
R55	7010003400	Resistor	ELR20J 1 kΩ
R56	7010003400	Resistor	ELR20J 1 kΩ
R57	7010003400	Resistor	ELR20J 1 kΩ
R58	7010003400	Resistor	ELR20J 1 kΩ
R59	7010003400	Resistor	ELR20J 1 kΩ
R60	7010003400	Resistor	ELR20J 1 kΩ
R61	7010003400	Resistor	ELR20J 1 kΩ
R62	7010003400	Resistor	ELR20J 1 kΩ
R63	7010003760	Resistor	ELR20J 680 kΩ
R64	7010003620	Resistor	ELR20J 47 kΩ
R65	7010003400	Resistor	ELR20J 1 kΩ
R66	7010003400	Resistor	ELR20J 1 kΩ
R67	7010003400	Resistor	ELR20J 1 kΩ
R68	7010003400	Resistor	ELR20J 1 kΩ
R69	7010003400	Resistor	ELR20J 1 kΩ
R70	7010003400	Resistor	ELR20J 1 kΩ
R71	7010003400	Resistor	ELR20J 1 kΩ
R72	7410000080	Resistor Array	RMX- 4 473K
R73	7010003620	Resistor	ELR20J 47 kΩ
R74	7010003620	Resistor	ELR20J 47 kΩ
R75	7010003620	Resistor	ELR20J 47 kΩ
R76	7410000150	Resistor Array	RMX- 6 473K
R77	7010003620	Resistor	ELR20J 47 kΩ
R78	7010003620	Resistor	ELR20J 47 kΩ
R79	7010003620	Resistor	ELR20J 47 kΩ
R80	7010004610	Resistor	R20J 3.3 MΩ
R81	7010003310	Resistor	ELR20J 180 Ω
R82	7010003310	Resistor	ELR20J 180 Ω
R83	7010003400	Resistor	ELR20J 1 kΩ
R84	7010003400	Resistor	ELR20J 1 kΩ
R85	7010003400	Resistor	ELR20J 1 kΩ
R86	7010004190	Resistor	R20J 1 kΩ
R87	7010003400	Resistor	ELR20J 1 kΩ
R88	7010003400	Resistor	ELR20J 1 kΩ
R89	7010004190	Resistor	R20J 1 kΩ
R90	7010003400	Resistor	ELR20J 1 kΩ
R91	7010003400	Resistor	ELR20J 1 kΩ
R92	7010003400	Resistor	ELR20J 1 kΩ
R93	7010003400	Resistor	ELR20J 1 kΩ
R94	7010003480	Resistor	ELR20J 4.7 kΩ
R95	7010003610	Resistor	ELR20J 39 kΩ
R96	7410000220	Resistor Array	RMX- 8 473K
R97	7010003620	Resistor	ELR20J 47 kΩ
R98	7010003620	Resistor	ELR20J 47 kΩ
R99	7010003360	Resistor	ELR20J 470 Ω
R100	7010003360	Resistor	ELR20J 470 Ω
R101	7010003360	Resistor	ELR20J 470 Ω
R102	7010003360	Resistor	ELR20J 470 Ω
C1	4530000250	Capacitor Array	B8XC0112-32N
C2	4530000050	Capacitor Array	B5RC0126-32N
C3	4530000250	Capacitor Array	B8XC0112-32N
C4	4530000050	Capacitor Array	B5RC0126-32N
C5	4010000520	Ceramic	DD108 B 472K 50V
C6	4010000520	Ceramic	DD108 B 472K 50V
C7	4040000260	Barrier Layer	UZE 08X 104M
C8	4010000260	Ceramic	DD104 SL 470J 50V
C9	4040000260	Barrier Layer	UZE 08X 104M
C10	4010000520	Ceramic	DD108 B 472K 50V
C11	4010000520	Ceramic	DD108 B 472K 50V
C12	4010000520	Ceramic	DD108 B 472K 50V
C13	4010000170	Ceramic	DD104 SL 200J 50V
C14	4010000170	Ceramic	DD104 SL 200J 50V

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C15	4040000260	Barrier Layer	UZE 08X 104M
C16	4040000260	Barrier Layer	UZE 08X 104M
C17	4040000260	Barrier Layer	UZE 08X 104M
C18	4530000250	Capacitor Array	B8XC0112-32N
C19	4040000260	Barrier Layer	UZE 08X 104M
C20	4040000260	Barrier Layer	UZE 08X 104M
C21	4010000520	Ceramic	DD108 B 472K 50V
C22	4010000520	Ceramic	DD108 B 472K 50V
C23	4010000520	Ceramic	DD108 B 472K 50V
C24	4040000260	Barrier Layer	UZE 08X 104M
C25	4510002720	Electrolytic	10 SS 47 µF
C26	4510002640	Electrolytic	25 SS 47 µF
C27	4040000260	Barrier Layer	UZE 08X 104M
C28	4040000260	Barrier Layer	UZE 08X 104M
C29	4040000260	Barrier Layer	UZE 08X 104M
C30	4040000260	Barrier Layer	UZE 08X 104M
C31	4530000030	Capacitor Array	B5RC0124-32N
C32	4010000520	Ceramic	DD108 B 472K 50V
C33	4040000260	Barrier Layer	UZE 08X 104M
C34	4040000260	Barrier Layer	UZE 08X 104M
C35	4010000520	Ceramic	DD108 B 472K 50V
C36	4040000260	Barrier Layer	UZE 08X 104M
C37	4040000260	Barrier Layer	UZE 08X 104M
C38	4530000250	Capacitor Array	B8XC0112-32N
C39	4040000260	Barrier Layer	UZE 08X 104M
C40	4040000260	Barrier Layer	UZE 08X 104M
C41	4040000260	Barrier Layer	UZE 08X 104M
C42	4040000260	Barrier Layer	UZE 08X 104M
C43	4040000260	Barrier Layer	UZE 08X 104M
C44	4040000260	Barrier Layer	UZE 08X 104M
C45	4040000260	Barrier Layer	UZE 08X 104M
C46	4010000500	Ceramic	DD104 B 102K 50V
C47	4010000500	Ceramic	DD104 B 102K 50V
C48	4010000500	Ceramic	DD104 B 102K 50V
C49	4010000500	Ceramic	DD104 B 102K 50V
C50	4010000500	Ceramic	DD104 B 102K 50V
C51	4010000500	Ceramic	DD104 B 102K 50V
C52	4010000500	Ceramic	DD104 B 102K 50V
C53	4010000500	Ceramic	DD104 B 102K 50V
C54	4040000260	Barrier Layer	UZE 08X 104M
C55	4510002930	Electrolytic	50 SS R47 µF
C56	4010000330	Ceramic	DD105 SL 101J 50V
C57	4310000120	Mylar	F2D 50V 473K
C58	4040000260	Barrier Layer	UZE 08X 104M
C59	4010000330	Ceramic	DD105 SL 101J 50V
C60	4530000270	Capacitor Array	B8XC0114-32N
C61	4310000040	Mylar	F2D 50V 154K
C62	4040000260	Barrier Layer	UZE 08X 104M
C63	4010000520	Ceramic	DD108 B 472K 50V
C64	4010000330	Ceramic	DD105 SL 101J 50V
C65	4010000330	Ceramic	DD105 SL 101J 50V
C66	4010000330	Ceramic	DD105 SL 101J 50V
C67	4020000270	Cylinder	EP125 Y 223N
C68	4510003040	Electrolytic	16 SS 100 µF
SO1	2610000200	Socket	ICC05-028 360T
BT1	3020000020	Lithium Battery	BR2032-1T2
EP1	0910020533	P.C. Board	B 1994C (LOGIC)
EP2	6910000630	Bead core	FSOH070RN

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000290	IC	BA618
IC2	1110000290	IC	BA618
Q1	1530000440	Transistor	2SC945 P
Q2	1530000810	Transistor	2SC2053
Q3	1510000070	Transistor	2SA1048-Y
Q5	1530000180	Transistor	2SC2878-B
Q6	1560000130	FET	2SK125
Q7	1560000130	FET	2SK125
Q8	1580000110	FET	3SK74 M
Q9	1560000130	FET	2SK125
Q10	1560000130	FET	2SK125
Q11	1580000110	FET	3SK74 M
Q12	1580000100	FET	3SK74 K
Q13	1580000100	FET	3SK74 K
Q14	1530000810	Transistor	2SC2053
Q15	1530000180	Transistor	2SC2878-B
Q16	1590000340	Transistor	RN1202
Q17	1530000440	Transistor	2SC945 P
Q18	1590000340	Transistor	RN1202
Q19	1590000340	Transistor	RN1202
Q20	1540000070	Transistor	2SD468C
Q21	1590000350	Transistor	RN1204
D1	1710000040	Diode	1S953
D2	1710000040	Diode	1S953
D3	1710000050	Diode	1SS53
D4	1710000050	Diode	1SS53
D5	1710000350	Diode	1N4002
D6	1710000350	Diode	1N4002
D7	1710000050	Diode	1SS53
D9	1710000050	Diode	1SS53
D10	1710000270	Diode	MI204
D11	1710000270	Diode	MI204
D12	1710000050	Diode	1SS53
D13	1710000050	Diode	1SS53
D14	1710000050	Diode	1SS53
D15	1710000050	Diode	1SS53
D16	1710000580	Diode	1SS265
D17	1710000050	Diode	1SS53
D18	1710000050	Diode	1SS53
D19	1710000050	Diode	1SS53
D20	1710000050	Diode	1SS53
D21	1710000050	Diode	1SS53
D22	1710000050	Diode	1SS53
D23	1710000050	Diode	1SS53
D24	1710000050	Diode	1SS53
D25	1710000050	Diode	1SS53
D26	1710000050	Diode	1SS53
D27	1710000050	Diode	1SS53
D28	1710000050	Diode	1SS53
D29	1710000050	Diode	1SS53
D30	1710000050	Diode	1SS53
D31	1710000050	Diode	1SS53
D32	1710000050	Diode	1SS53
D33	1710000050	Diode	1SS53
D34	1710000050	Diode	1SS53
D35	1710000050	Diode	1SS53
D36	1710000050	Diode	1SS53
D37	1710000050	Diode	1SS53
D38	1710000050	Diode	1SS53
D39	1710000050	Diode	1SS53
D40	1710000050	Diode	1SS53
D41	1710000270	Diode	MI204
D42	1710000270	Diode	MI204
D43	1710000270	Diode	MI204
D44	1710000270	Diode	MI204
D45	1710000050	Diode	1SS53
D46	1710000060	Diode	1SS55
D47	1710000270	Diode	MI204
D48	1710000050	Diode	1SS53
D49	1710000050	Diode	1SS53
D50	1710000050	Diode	1SS53

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D51	1730000210	Zener	RD9.1E B3
D52	1710000050	Diode	1SS53
D53	1710000050	Diode	1SS53
D54	1710000050	Diode	1SS53
FI1	2010001010	Monolithic	69M15B (FL-120)
L1	6180000990	Coil	LAL 04NA 101K
L2	6180000990	Coil	LAL 04NA 101K
L3	6180000990	Coil	LAL 04NA 101K
L4	6180001000	Coil	LAL 04NA 102K
L5	6180001000	Coil	LAL 04NA 102K
L6	6180001140	Coil	FL 5H 102K
L7	6180001140	Coil	FL 5H 102K
L8	6180000990	Coil	LAL 04NA 101K
L9	6180000990	Coil	LAL 04NA 101K
L10	6180000990	Coil	LAL 04NA 101K
L11	6180000990	Coil	LAL 04NA 101K
L12	6180000030	Coil	LB4-R15J
L13	6180000100	Coil	LB4-R50J
L14	6180001120	Coil	FL 5H 101K
L15	6140001260	Coil	LR-151
L16	6140001460	Coil	LR-170
L17	6150003400	Coil	LS-365
L18	6150002430	Coil	LS-254
L19	6150002430	Coil	LS-254
L20	6150002430	Coil	LS-254
L21	6150001770	Coil	LS-198
L22	6140001500	Coil	LR-171
L23	6110001790	Coil	LA-268
L24	6110001720	Coil	LA-258
L25	6180001450	Coil	RFC S4 102K
L29	6110000670	Coil	LA-96
L30	6130000690	Coil	LB-86A
L31	6150000990	Coil	LS-114
L32	6150000990	Coil	LS-114
L33	6150001770	Coil	LS-198
L34	6140000540	Coil	LR-75A
L35	6180001140	Coil	FL 5H 102K
L36	6180001000	Coil	LAL 04NA 102K
L37	6180001140	Coil	FL 5H 102K
L38	6180001140	Coil	FL 5H 102K
L39	6180001140	Coil	FL 5H 102K
L40	6180001140	Coil	FL 5H 102K
L41	6140001060	Coil	LR-130
L42	6140001050	Coil	LR-129
L43	6180001140	Coil	FL 5H 102K
L44	6180000060	Coil	LB4-R34J
L45	6180000070	Coil	LB4-R36J
L46	6180000050	Coil	LB4-R30J
L47	6180000070	Coil	LB4-R36J
L48	6180001120	Coil	FL 5H 101K
L49	6180000090	Coil	LB4-R45J
L50	6180000100	Coil	LB4-R50J
L51	6180000100	Coil	LB4-R50J
L52	6180000110	Coil	LB4-R54J
L53	6180001120	Coil	FL 5H 101K
L54	6180000110	Coil	LB4-R54J
L55	6180000120	Coil	LB4-R65J
L56	6180000120	Coil	LB4-R65J
L57	6180000140	Coil	LB4-R83J
L58	6180001120	Coil	FL 5H 101K
L59	6180000130	Coil	LB4-R70J
L60	6180000140	Coil	LB4-R83J
L61	6180002000	Coil	EL0606SKI-1R0K
L62	6180002000	Coil	EL0606SKI-1R0K
L63	6180001120	Coil	FL 5H 101K
L64	6180002000	Coil	EL0606SKI-1R0K
L65	6180002010	Coil	EL0606SKI-1R2K
L66	6180002010	Coil	EL0606SKI-1R2K
L67	6180002010	Coil	EL0606SKI-1R2K
L68	6180001120	Coil	FL 5H 101K
L69	6180002020	Coil	EL0606SKI-1R5K

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L70	6180002020	Coil	EL0606SKI-1R5K
L71	6180002030	Coil	EL0606SKI-1R8K
L72	6180002030	Coil	EL0606SKI-1R8K
L73	6180001120	Coil	FL 5H 101K
L74	6180002030	Coil	EL0606SKI-1R8K
L75	6180002030	Coil	EL0606SKI-1R8K
L76	6180002040	Coil	EL0606SKI-2R2K
L77	6180002050	Coil	EL0606SKI-2R7K
L78	6180001120	Coil	FL 5H 101K
L79	6180002050	Coil	EL0606SKI-2R7K
L80	6180002060	Coil	EL0606SKI-3R3K
L81	6180002060	Coil	EL0606SKI-3R3K
L82	6180000210	Coil	LB4-4R3J
L83	6180001140	Coil	FL 5H 102K
L84	6180000190	Coil	LB4-3R6J
L85	6180000210	Coil	LB4-4R3J
L86	6180000220	Coil	LB4-5R1J
L87	6180000240	Coil	LB4-6R2J
L88	6180001140	Coil	FL 5H 102K
L89	6180001140	Coil	FL 5H 102K
L90	6180000240	Coil	LB4-6R2J
L91	6180000220	Coil	LB4-5R1J
L92	6180001140	Coil	FL 5H 102K
L93	6180001810	Coil	FL 5H 220K
L94	6180001810	Coil	FL 5H 220K
L95	6180001450	Coil	RFC S4 102K
L96	6140000080	Coil	LR-20
L97	6180001140	Coil	FL 5H 102K
L98	6180001120	Coil	FL 5H 101K
L99	6180001140	Coil	FL 5H 102K
L100	6180001140	Coil	FL 5H 102K
L101	6180000850	Coil	LAL 03NA 4R7K
L102	6180002060	Coil	EL0606SKI-3R3K
L103	6180001450	Coil	RFC S4 102K
L104	6910000670	Coil	BT01RN1-A61-001
L105	6910000670	Coil	BT01RN1-A61-001
L106	6180000880	Coil	LAL 03NA 100K
L107	6180000880	Coil	LAL 03NA 100K
R1	7010003870	Resistor	R20J 2.2 Ω
R2	7010004320	Resistor	R20J 10 kΩ
R3	7010000500	Resistor	ELR25J 10 kΩ
R4	7010000500	Resistor	ELR25J 10 kΩ
R5	7010000500	Resistor	ELR25J 10 kΩ
R6	7010000500	Resistor	ELR25J 10 kΩ
R7	7010000500	Resistor	ELR25J 10 kΩ
R8	7010001280	Resistor	R25J 10 kΩ
R9	7010000570	Resistor	ELR25J 33 kΩ
R10	7010000570	Resistor	ELR25J 33 kΩ
R11	7010003530	Resistor	ELR20J 10 kΩ
R12	7010001280	Resistor	R25J 10 kΩ
R13	7010003080	Resistor	ELR20J 2.2 Ω
R14	7410000110	Resistor Array	RMX- 6 103K
R15	7010000330	Resistor	ELR25J 470 Ω
R16	7010000350	Resistor	ELR25J 680 Ω
R17	7010000490	Resistor	ELR25J 8.2 kΩ
R18	7010000340	Resistor	ELR25J 560 Ω
R19	7010000250	Resistor	ELR25J 100 Ω
R20	7010000370	Resistor	ELR25J 1 kΩ
R21	7010000190	Resistor	ELR25J 33 Ω
R22	7010000290	Resistor	ELR25J 220 Ω
R23	7010000250	Resistor	ELR25J 100 Ω
R24	7310000720	Trimmer	RH0651CJ3J0CA (222)
R25	7010000310	Resistor	ELR25J 330 Ω
R26	7010000550	Resistor	ELR25J 22 kΩ
R27	7010000210	Resistor	ELR25J 47 Ω
R28	7010000210	Resistor	ELR25J 47 Ω
R29	7010003530	Resistor	ELR20J 10 kΩ
R30	7010000250	Resistor	ELR25J 100 Ω
R31	7010000320	Resistor	ELR25J 390 Ω
R32	7010000210	Resistor	ELR25J 47 Ω
R33	7010000250	Resistor	ELR25J 100 Ω
R34	7010000580	Resistor	ELR25J 39 kΩ
R35	7010000290	Resistor	ELR25J 220 Ω

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R36	7010000410	Resistor	ELR25J 2.2 kΩ
R37	7010000170	Resistor	ELR25J 22 Ω
R38	7010000170	Resistor	ELR25J 22 Ω
R39	7010001030	Resistor	R25J 100 Ω
R40	7010000250	Resistor	ELR25J 100 Ω
R41	7010003340	Resistor	ELR20J 330 Ω
R42	7010004260	Resistor	R20J 3.9 kΩ
R43	7010003250	Resistor	ELR20J 56 Ω
R44	7010000710	Resistor	ELR25J 470 kΩ
R45	7010000990	Resistor	R25J 47 Ω
R46	7010004160	Resistor	R20J 560 Ω
R47	7010004160	Resistor	R20J 560 Ω
R48	7010001070	Resistor	R25J 220 Ω
R49	7010003300	Resistor	ELR20J 150 Ω
R53	7010000410	Resistor	ELR25J 2.2 kΩ
R54	7010003280	Resistor	ELR20J 100 Ω
R55	7010000630	Resistor	ELR25J 100 kΩ
R56	7010000500	Resistor	ELR25J 10 kΩ
R57	7010000360	Resistor	ELR25J 820 Ω
R58	7010000250	Resistor	ELR25J 100 Ω
R59	7010004210	Resistor	R20J 1.5 kΩ
R60	7010000250	Resistor	ELR25J 100 Ω
R61	7010000270	Resistor	ELR25J 150 Ω
R62	7010000500	Resistor	ELR25J 10 kΩ
R63	7010004940	Resistor	ELR25J 68 Ω
R64	7010004940	Resistor	ELR25J 68 Ω
R65	7010000210	Resistor	ELR25J 47 Ω
R66	7010000250	Resistor	ELR25J 100 Ω
R67	7010003280	Resistor	ELR20J 100 Ω
R68	7010004070	Resistor	R20J 100 Ω
R69	7010001030	Resistor	R25J 100 Ω
R70	7010001030	Resistor	R25J 100 Ω
R71	7010001030	Resistor	R25J 100 Ω
R72	7010001030	Resistor	R25J 100 Ω
R73	7010001030	Resistor	R25J 100 Ω
R74	7010001030	Resistor	R25J 100 Ω
R75	7010001030	Resistor	R25J 100 Ω
R76	7010001030	Resistor	R25J 100 Ω
R77	7010001030	Resistor	R25J 100 Ω
R78	7010001030	Resistor	R25J 100 Ω
R79	7010000330	Resistor	ELR25J 470 Ω
R80	7010000240	Resistor	ELR25J 82 Ω
R81	7010000380	Resistor	ELR25J 1.2 kΩ
R82	7010000450	Resistor	ELR25J 4.7 kΩ
R83	7010000250	Resistor	ELR25J 100 Ω
R84	7010003320	Resistor	ELR20J 220 Ω
R85	7010000090	Resistor	ELR25J 4.7 Ω
R87	7010000500	Resistor	ELR25J 10 kΩ
R88	7010001070	Resistor	R25J 220 Ω
R89	7010000410	Resistor	ELR25J 2.2 kΩ
R90	7010000450	Resistor	ELR25J 4.7 kΩ
R91	7010000330	Resistor	ELR25J 470 Ω
R92	7010000220	Resistor	ELR25J 56 Ω
R93	7010003360	Resistor	ELR20J 470 Ω
R94	7010003520	Resistor	ELR20J 8.2 kΩ
R95	7010000410	Resistor	ELR25J 2.2 kΩ
R96	7010003480	Resistor	ELR20J 4.7 kΩ
R97	7010004150	Resistor	R20J 470 Ω
R100	7010003350	Resistor	ELR20J 390 Ω
R101	7010000450	Resistor	ELR25J 4.7 kΩ
R102	7010001230	Resistor	R25J 4.7 kΩ
R104	7010000240	Resistor	ELR25J 82 Ω
R105	7010001190	Resistor	R25J 2.2 kΩ
R106	7010000410	Resistor	ELR25J 2.2 kΩ
R108	7010000960	Resistor	R25J 27 Ω
R109	7010000190	Resistor	ELR25J 33 Ω
R110	7010000180	Resistor	ELR25J 27 Ω
R111	7010003390	Resistor	ELR20J 820 Ω
R113	7010001030	Resistor	R25J 100 Ω
R115	7010000590	Resistor	ELR25J 47 kΩ
R116	7010000730	Resistor	ELR25J 680 kΩ
R117	7010001280	Resistor	R25J 10 kΩ
R118	7010003550	Resistor	ELR20J 15 kΩ
R119	7010000520	Resistor	ELR25J 15 kΩ
R120	7010003440	Resistor	ELR20J 2.2 kΩ

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R121	7010003460	Resistor	ELR20J 3.3 kΩ
R122	7010001150	Resistor	R25J 1 kΩ
R123	7510000110	Thermistor	ERT-D2FGL251S
R124	7010000500	Resistor	ELR25J 10 kΩ
R125	7310001840	Trimmer	RH0421CS3J08A (472)
C1	4530000350	Capacitor Array	B8ZC0111-32N
C2	4530000350	Capacitor Array	B8ZC0111-32N
C3	4040000250	Barrier Layer	UAT 08X 473M
C6	4530000350	Capacitor Array	B8ZC0111-32N
C7	4530000350	Capacitor Array	B8ZC0111-32N
C11	4010000240	Ceramic	DD104 SL 390J 50V
C12	4010000240	Ceramic	DD104 SL 390J 50V
C13	4010000380	Ceramic	DD107 SL 221J 50V
C14	4010000500	Ceramic	DD104 B 102K 50V
C15	4040000250	Barrier Layer	UAT 08X 473M
C16	4510001170	Electrolytic	50 MS7 2R2 µF
C17	4010000500	Ceramic	DD104 B 102K 50V
C18	4010000100	Ceramic	DD104 SL 080D 50V
C19	4010000070	Ceramic	DD104 SL 050C 50V
C20	4010000150	Ceramic	DD104 SL 150J 50V
C21	4010000020	Ceramic	DD104 SL 010C 50V
C22	4010000120	Ceramic	DD104 SL 100D 50V
C23	4040000250	Barrier Layer	UAT 08X 473M
C24	4040000260	Barrier Layer	UZE 08X 104M
C25	4040000260	Barrier Layer	UZE 08X 104M
C26	4040000250	Barrier Layer	UAT 08X 473M
C27	4040000250	Barrier Layer	UAT 08X 473M
C28	4040000250	Barrier Layer	UAT 08X 473M
C29	4040000250	Barrier Layer	UAT 08X 473M
C30	4510001170	Electrolytic	50 MS7 2R2 µF
C31	4040000250	Barrier Layer	UAT 08X 473M
C32	4010000380	Ceramic	DD107 SL 221J 50V
C33	4040000250	Barrier Layer	UAT 08X 473M
C34	4040000250	Barrier Layer	UAT 08X 473M
C35	4040000250	Barrier Layer	UAT 08X 473M
C36	4040000250	Barrier Layer	UAT 08X 473M
C37	4040000250	Barrier Layer	UAT 08X 473M
C38	4040000250	Barrier Layer	UAT 08X 473M
C39	4040000250	Barrier Layer	UAT 08X 473M
C40	4040000250	Barrier Layer	UAT 08X 473M
C41	4010000040	Ceramic	DD104 SL 020C 50V
C43	4010000520	Ceramic	DD108 B 472K 50V
C44	4010000520	Ceramic	DD108 B 472K 50V
C45	4040000260	Barrier Layer	UZE 08X 104M
C47	4010000500	Ceramic	DD104 B 102K 50V
C48	4010000050	Ceramic	DD104 SL 030C 50V
C49	4010000120	Ceramic	DD104 SL 100D 50V
C50	4010000100	Ceramic	DD104 SL 080D 50V
C51	4040000260	Barrier Layer	UZE 08X 104M
C52	4010000100	Ceramic	DD104 SL 080D 50V
C54	4040000250	Barrier Layer	UAT 08X 473M
C55	4510002940	Electrolytic	50 SS 1 µF
C56	4010000320	Ceramic	DD104 SL 820J 50V
C57	4010000350	Ceramic	DD106 SL 151J 50V
C58	4010000120	Ceramic	DD104 SL 100D 50V
C59	4010000210	Ceramic	DD104 SL 300J 50V
C64	4010000200	Ceramic	DD104 SL 270J 50V
C65	4010000320	Ceramic	DD104 SL 820J 50V
C66	4010000190	Ceramic	DD104 SL 240J 50V
C67	4010000190	Ceramic	DD104 SL 240J 50V
C68	4010000240	Ceramic	DD104 SL 390J 50V
C69	4010000520	Ceramic	DD108 B 472K 50V
C70	4010000080	Ceramic	DD104 SL 060D 50V
C71	4040000260	Barrier Layer	UZE 08X 104M
C72	4010000500	Ceramic	DD104 B 102K 50V
C73	4010000520	Ceramic	DD108 B 472K 50V
C74	4010000520	Ceramic	DD108 B 472K 50V
C75	4010000520	Ceramic	DD108 B 472K 50V
C76	4010003320	Ceramic	DD104 UJ 080D 50V
C77	4010000150	Ceramic	DD104 SL 150J 50V
C78	4010000050	Ceramic	DD104 SL 030C 50V
C79	4040000250	Barrier Layer	UAT 08X 473M
C80	4040000250	Barrier Layer	UAT 08X 473M

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C81	4040000250	Barrier Layer	UAT 08X 473M
C82	4040000250	Barrier Layer	UAT 08X 473M
C84	4040000250	Barrier Layer	UAT 08X 473M
C85	4010000330	Ceramic	DD105 SL 101J 50V
C86	4040000460	Barrier Layer	RAU 08SA 821K
C87	4010000390	Ceramic	DD107 SL 271J 50V
C88	4010000260	Ceramic	DD104 SL 470J 50V
C89	4010000260	Ceramic	DD104 SL 470J 50V
C90	4010000330	Ceramic	DD105 SL 101J 50V
C91	4010000210	Ceramic	DD104 SL 300J 50V
C92	4040000250	Barrier Layer	UAT 08X 473M
C93	4040000250	Barrier Layer	UAT 08X 473M
C94	4010000350	Ceramic	DD106 SL 151J 50V
C95	4040000280	Barrier Layer	UAT 04V 122K
C96	4010000400	Ceramic	DD107 SL 301J 50V
C97	4010000330	Ceramic	DD105 SL 101J 50V
C98	4010000190	Ceramic	DD104 SL 240J 50V
C99	4010000380	Ceramic	DD107 SL 221J 50V
C100	4040000250	Barrier Layer	UAT 08X 473M
C101	4040000250	Barrier Layer	UAT 08X 473M
C102	4010000370	Ceramic	DD106 SL 201J 50V
C103	4040000300	Barrier Layer	UAT 04V 182K
C104	4010000400	Ceramic	DD107 SL 301J 50V
C105	4010000390	Ceramic	DD107 SL 271J 50V
C106	4010000240	Ceramic	DD104 SL 390J 50V
C107	4010000420	Ceramic	DD108 SL 391J 50V
C108	4040000250	Barrier Layer	UAT 08X 473M
C109	4040000250	Barrier Layer	UAT 08X 473M
C110	4010000400	Ceramic	DD107 SL 301J 50V
C111	4040000310	Barrier Layer	UAT 04V 222K
C112	4010000410	Ceramic	DD107 SL 331J 50V
C113	4010000350	Ceramic	DD106 SL 151J 50V
C114	4010000270	Ceramic	DD104 SL 510J 50V
C115	4010000420	Ceramic	DD108 SL 391J 50V
C116	4040000250	Barrier Layer	UAT 08X 473M
C117	4040000250	Barrier Layer	UAT 08X 473M
C118	4010000420	Ceramic	DD108 SL 391J 50V
C119	4040000320	Barrier Layer	UAT 05V 272K
C120	4010000430	Ceramic	DD109 SL 471J 50V
C121	4010000440	Ceramic	DD109 SL 511J 50V
C122	4010000310	Ceramic	DD104 SL 750J 50V
C123	4040000440	Barrier Layer	RAU 06SA 561K
C124	4040000250	Barrier Layer	UAT 08X 473M
C125	4040000250	Barrier Layer	UAT 08X 473M
C126	4040000440	Barrier Layer	RAU 06SA 561K
C127	4040000360	Barrier Layer	UAT 06V 562K
C128	4040000270	Barrier Layer	UAT 04V 102K
C129	4040000450	Barrier Layer	RAU 08SA 681K
C130	4010000320	Ceramic	DD104 SL 820J 50V
C131	4040000450	Barrier Layer	RAU 08SA 681K
C132	4040000250	Barrier Layer	UAT 08X 473M
C133	4040000250	Barrier Layer	UAT 08X 473M
C134	4040000270	Barrier Layer	UAT 04V 102K
C135	4040000370	Barrier Layer	UAT 06V 682K
C136	4040000280	Barrier Layer	UAT 04V 122K
C137	4040000270	Barrier Layer	UAT 04V 102K
C138	4010000350	Ceramic	DD106 SL 151J 50V
C139	4040000290	Barrier Layer	UAT 04V 152K
C140	4040000250	Barrier Layer	UAT 08X 473M
C141	4040000250	Barrier Layer	UAT 08X 473M
C142	4040000280	Barrier Layer	UAT 04V 122K
C143	4040000390	Barrier Layer	UAT 06V 103K
C144	4040000300	Barrier Layer	UAT 04V 182K
C145	4040000290	Barrier Layer	UAT 04V 152K
C146	4010000370	Ceramic	DD106 SL 201J 50V
C147	4040000290	Barrier Layer	UAT 04V 152K
C148	4040000250	Barrier Layer	UAT 08X 473M
C149	4040000250	Barrier Layer	UAT 08X 473M
C150	4040000290	Barrier Layer	UAT 04V 152K
C151	4040000400	Barrier Layer	UAT 08V 123K
C152	4040000350	Barrier Layer	UAT 05V 472K
C153	4040000290	Barrier Layer	UAT 04V 152K
C154	4010000390	Ceramic	DD107 SL 271J 50V
C155	4040000310	Barrier Layer	UAT 04V 222K
C156	4040000250	Barrier Layer	UAT 08X 473M

[RF UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C157	4040000260	Barrier Layer	UZE 08X 104M
C158	4040000250	Barrier Layer	UAT 08X 473M
C159	4040000330	Barrier Layer	UAT 05V 332K
C160	4010000420	Ceramic	DD108 SL 391J 50V
C161	4040000330	Barrier Layer	UAT 05V 332K
C162	4510001740	Electrolytic	50 RBP 1 µF
C163	4040000260	Barrier Layer	UZE 08X 104M
C164	4040000370	Barrier Layer	UAT 06V 682K
C165	4040000270	Barrier Layer	UAT 04V 102K
C166	4040000380	Barrier Layer	UAT 06V 822K
C167	4040000260	Barrier Layer	UZE 08X 104M
C168	4510002780	Electrolytic	16 SS 10 µF
C169	4040000250	Barrier Layer	UAT 08X 473M
C170	4040000250	Barrier Layer	UAT 08X 473M
C171	4040000290	Barrier Layer	UAT 04V 152K
C172	4040000260	Barrier Layer	UZE 08X 104M
C173	4040000250	Barrier Layer	UAT 08X 473M
C174	4040000250	Barrier Layer	UAT 08X 473M
C175	4040000250	Barrier Layer	UAT 08X 473M
C176	4040000250	Barrier Layer	UAT 08X 473M
C177	4040000250	Barrier Layer	UAT 08X 473M
C178	4040000260	Barrier Layer	UZE 08X 104M
C179	4040000260	Barrier Layer	UZE 08X 104M
C180	4040000300	Barrier Layer	UAT 04V 182K
C181	4040000290	Barrier Layer	UAT 04V 152K
C182	4040000350	Barrier Layer	UAT 05V 472K
C183	4040000260	Barrier Layer	UZE 08X 104M
C184	4040000260	Barrier Layer	UZE 08X 104M
C185	4040000250	Barrier Layer	UAT 08X 473M
C186	4040000250	Barrier Layer	UAT 08X 473M
C189	4040000260	Barrier Layer	UZE 08X 104M
C190	4040000260	Barrier Layer	UZE 08X 104M
C191	4010000500	Ceramic	DD104 B 102K 50V
C192	4010000520	Ceramic	DD108 B 472K 50V
C193	4010000520	Ceramic	DD108 B 472K 50V
C195	4010000520	Ceramic	DD108 B 472K 50V
C196	4040000260	Barrier Layer	UZE 08X 104M
C198	4010000500	Ceramic	DD104 B 102K 50V
C199	4010000500	Ceramic	DD104 B 102K 50V
C203	4010000520	Ceramic	DD108 B 472K 50V
C204	4550000010	Tantalum	DN 1C 4R7M
C205	4040000260	Barrier Layer	UZE 08X 104M
C206	4010000500	Ceramic	DD104 B 102K 50V
C207	4040000260	Barrier Layer	UZE 08X 104M
C208	4510001160	Electrolytic	50 MS7 1 µF
C209	4040000250	Barrier Layer	UAT 08X 473M
RL1	6330000070	Relay	FBR21D12-P
EP1	0910009417	P.C. Board	B 701G (RF)
EP8	6910000630	Bead core	FSOH070RN
EP9	6910000630	Bead core	FSOH070RN
EP14	6910000630	Bead core	FSOH070RN

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1180000300	IC	µA7808UC
IC2	1130000620	IC	µPD4011BC
IC3	1130000620	IC	µPD4011BC
IC4	1110001320	IC	µPC1037HA
IC5	1110001320	IC	µPC1037HA
IC6	1110000540	IC	NJM4558D
IC7	1110000890	IC	µPC1241H
IC8	1110000330	IC	M5218L
IC9	1110000330	IC	M5218L
IC10	1110000330	IC	M5218L

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC11	1120000970	IC	M54562P
IC12	1130001090	IC	µPD4051BC
IC13	1130001000	IC	µPD4066BC
IC14	1110000330	IC	M5218L
IC15	1130001000	IC	µPD4066BC
IC16	1110000540	IC	NJM4558D
IC17	1790000050	IC	ND487C1-3R
IC18	1110001320	IC	µPC1037HA
IC19	1110001320	IC	µPC1037HA
IC20	1110001310	IC	µPC577HA
IC21	1110001320	IC	µPC1037HA
Q1	1590000350	Transistor	RN1204
Q2	1540000070	Transistor	2SD468C
Q3	1590000340	Transistor	RN1202
Q4	1530000110	Transistor	2SC2458-GR
Q5	1590000340	Transistor	RN1202
Q6	1530000110	Transistor	2SC2458-GR
Q7	1540000060	Transistor	2SD880-Y
Q8	1530000110	Transistor	2SC2458-GR
Q9	1540000070	Transistor	2SD468C
Q10	1530000940	Transistor	2SC1571G
Q11	1530000110	Transistor	2SC2458-GR
Q12	1590000350	Transistor	RN1204
Q13	1530000591	Transistor	2SC2785 EL
Q14	1530000591	Transistor	2SC2785 EL
Q15	1590000350	Transistor	RN1204
Q16	1590000350	Transistor	RN1204
Q17	1530000110	Transistor	2SC2458-GR
Q18	1590000310	FET	2SJ105-GR
Q19	1560000100	FET	2SK241-Y
Q20	1590000350	Transistor	RN1204
Q21	1590000310	FET	2SJ105-GR
Q22	1530000110	Transistor	2SC2458-GR
Q23	1590000350	Transistor	RN1204
Q24	1590000350	Transistor	RN1204
Q25	1590000360	Transistor	RN2202
Q26	1530000180	Transistor	2SC2878-B
Q27	1510000080	Transistor	2SA1048-GR
Q29	1510000080	Transistor	2SA1048-GR
Q30	1590000350	Transistor	RN1204
Q31	1530000591	Transistor	2SC2785 EL
Q32	1530000110	Transistor	2SC2458-GR
Q33	1580000110	FET	3SK74 M
Q34	1560000100	FET	2SK241-Y
Q35	1530000591	Transistor	2SC2785 EL
Q36	1590000350	Transistor	RN1204
Q37	1530000110	Transistor	2SC2458-GR
Q38	1590000350	Transistor	RN1204
Q39	1590000360	Transistor	RN2202
Q40	1590000360	Transistor	RN2202
Q41	1590000360	Transistor	RN2202
Q42	1590000360	Transistor	RN2202
Q43	1590000350	Transistor	RN1204
Q44	1590000350	Transistor	RN1204
Q45	1590000350	Transistor	RN1204
Q46	1530000591	Transistor	2SC2785 EL
Q47	1530000591	Transistor	2SC2785 EL
Q48	1590000310	FET	2SJ105-GR
Q49	1530000110	Transistor	2SC2458-GR
Q50	1590000340	Transistor	RN1202
Q51	1590000360	Transistor	RN2202
Q52	1530000110	Transistor	2SC2458-GR
Q53	1530000110	Transistor	2SC2458-GR
Q54	1590000350	Transistor	RN1204
Q55	1580000110	FET	3SK74 M
Q56	1580000110	FET	3SK74 M
Q57	1530000591	Transistor	2SC2785 EL
Q58	1530000110	Transistor	2SC2458-GR
Q59	1530000180	Transistor	2SC2878-B
Q60	1510000080	Transistor	2SA1048-GR
Q61	1530000180	Transistor	2SC2878-B
Q62	1580000110	FET	3SK74 M
Q63	1530000150	Transistor	2SC2668-O

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
Q64	1530000591	Transistor	2SC2785 EL
Q65	1580000110	FET	3SK74 M
Q66	1590000340	Transistor	RN1202
Q67	1530000591	Transistor	2SC2785 EL
Q68	1530000110	Transistor	2SC2458-GR
Q69	1530000591	Transistor	2SC2785 EL
Q70	1530000591	Transistor	2SC2785 EL
Q71	1580000110	FET	3SK74 M
Q72	1530000591	Transistor	2SC2785 EL
Q73	1530000591	Transistor	2SC2785 EL
Q74	1510000080	Transistor	2SA1048-GR
Q76	1510000080	Transistor	2SA1048-GR
Q77	1530000110	Transistor	2SC2458-GR
Q78	1590000350	Transistor	RN1204
Q79	1590000360	Transistor	RN2202
Q80	1590000350	Transistor	RN1204
Q81	1590000360	Transistor	RN2202
Q82	1590000340	Transistor	RN1202
Q83	1530000110	Transistor	2SC2458-GR
Q84	1530000591	Transistor	2SC2785 EL
Q85	1580000110	FET	3SK74 M
Q86	1590000340	Transistor	RN1202
Q87	1530000110	Transistor	2SC2458-GR
Q88	1590000340	Transistor	RN1202
Q89	1590000340	Transistor	RN1202
Q90	1590000340	Transistor	RN1202
Q91	1530000110	Transistor	2SC2458-GR
D1	1730000120	Zener	RD6.2E B2
D2	1710000160	Diode	1SS133
D3	1710000160	Diode	1SS133
D4	1710000160	Diode	1SS133
D5	1710000160	Diode	1SS133
D6	1710000160	Diode	1SS133
D7	1710000160	Diode	1SS133
D8	1710000160	Diode	1SS133
D9	1710000160	Diode	1SS133
D10	1710000160	Diode	1SS133
D11	1710000580	Diode	1SS265
D13	1710000580	Diode	1SS265
D14	1710000580	Diode	1SS265
D15	1710000580	Diode	1SS265
D16	1710000580	Diode	1SS265
D17	1710000580	Diode	1SS265
D18	1710000580	Diode	1SS265
D19	1720000060	Varicap	1SV50 (1) E
D20	1710000160	Diode	1SS133
D21	1710000040	Diode	1S953
D22	1710000160	Diode	1SS133
D23	1710000580	Diode	1SS265
D24	1710000580	Diode	1SS265
D25	1790000070	Diode	1SS237
D26	1790000070	Diode	1SS237
D27	1710000160	Diode	1SS133
D28	1710000160	Diode	1SS133
D29	1710000160	Diode	1SS133
D30	1710000580	Diode	1SS265
D31	1720000060	Varicap	1SV50 (1) E
D32	1710000160	Diode	1SS133
D33	1710000580	Diode	1SS265
D34	1710000160	Diode	1SS133
D35	1710000160	Diode	1SS133
D36	1710000160	Diode	1SS133
D37	1710000160	Diode	1SS133
D38	1710000160	Diode	1SS133
D39	1710000160	Diode	1SS133
D40	1710000160	Diode	1SS133
D41	1710000160	Diode	1SS133
D42	1710000160	Diode	1SS133
D43	1710000160	Diode	1SS133
D44	1710000160	Diode	1SS133
D45	1710000160	Diode	1SS133
D46	1710000160	Diode	1SS133
D47	1710000160	Diode	1SS133

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D48	1710000160	Diode	1SS133
D49	1710000160	Diode	1SS133
D50	1710000160	Diode	1SS133
D51	1710000160	Diode	1SS133
D52	1710000160	Diode	1SS133
D53	1710000160	Diode	1SS133
D54	1710000160	Diode	1SS133
D55	1710000160	Diode	1SS133
D56	1710000160	Diode	1SS133
D57	1710000160	Diode	1SS133
D58	1710000160	Diode	1SS133
D59	1710000160	Diode	1SS133
D60	1710000160	Diode	1SS133
D61	1710000160	Diode	1SS133
D63	1710000160	Diode	1SS133
D64	1710000160	Diode	1SS133
D65	1730000110	Zener	RD5.6E B2
D66	1710000160	Diode	1SS133
D67	1710000160	Diode	1SS133
D68	1710000160	Diode	1SS133
D69	1710000160	Diode	1SS133
D70	1720000060	Varicap	1SV50 (1) E
D71	1710000160	Diode	1SS133
D72	1710000160	Diode	1SS133
D73	1710000160	Diode	1SS133
D74	1790000070	Diode	1SS237
D75	1790000070	Diode	1SS237
D76	1730000060	Zener	RD3.6E B1
D77	1710000160	Diode	1SS133
D78	1710000160	Diode	1SS133
D79	1710000160	Diode	1SS133
D80	1710000160	Diode	1SS133
D81	1710000160	Diode	1SS133
D82	1730000340	Zener	MZ304B
D83	1710000330	Diode	1K60
D84	1710000330	Diode	1K60
D85	1710000270	Diode	MI204
D86	1710000050	Diode	1SS53
D87	1710000050	Diode	1SS53
D88	1710000050	Diode	1SS53
D89	1710000050	Diode	1SS53
D90	1710000050	Diode	1SS53
D91	1710000050	Diode	1SS53
D92	1710000580	Diode	1SS265
D93	1710000580	Diode	1SS265
D94	1710000050	Diode	1SS53
D95	1710000050	Diode	1SS53
D96	1710000050	Diode	1SS53
D97	1710000050	Diode	1SS53
D98	1710000050	Diode	1SS53
D99	1710000050	Diode	1SS53
D100	1710000050	Diode	1SS53
D101	1710000050	Diode	1SS53
D102	1710000050	Diode	1SS53
D103	1710000050	Diode	1SS53
D104	1710000050	Diode	1SS53
D105	1710000050	Diode	1SS53
D106	1710000050	Diode	1SS53
D107	1710000050	Diode	1SS53
D108	1710000050	Diode	1SS53
D109	1710000050	Diode	1SS53
D110	1710000050	Diode	1SS53
D111	1710000050	Diode	1SS53
D112	1710000050	Diode	1SS53
D113	1710000050	Diode	1SS53
D114	1710000050	Diode	1SS53
D115	1710000050	Diode	1SS53
D116	1710000050	Diode	1SS53
D117	1710000050	Diode	1SS53
D118	1710000160	Diode	1SS133
D119	1710000330	Diode	1K60
D120	1710000160	Diode	1SS133
D121	1710000160	Diode	1SS133
D122	1710000050	Diode	1SS53
D123	1710000580	Diode	1SS265

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D124	1710000580	Diode	1SS265
D125	1710000580	Diode	1SS265
D126	1710000580	Diode	1SS265
D127	1710000580	Diode	1SS265
D128	1710000580	Diode	1SS265
D129	1710000580	Diode	1SS265
D130	1710000580	Diode	1SS265
D131	1710000580	Diode	1SS265
D132	1710000580	Diode	1SS265
D133	1710000580	Diode	1SS265
D134	1710000580	Diode	1SS265
D135	1710000580	Diode	1SS265
D136	1710000580	Diode	1SS265
D137	1710000580	Diode	1SS265
D138	1710000580	Diode	1SS265
D139	1710000580	Diode	1SS265
D140	1710000580	Diode	1SS265
D141	1720000050	Varicap	1SV50E
D142	1720000110	Varicap	FC51M
D143	1710000330	Diode	1K60
D144	1710000330	Diode	1K60
D145	1710000160	Diode	1SS133
D146	1710000160	Diode	1SS133
D147	1710000160	Diode	1SS133
D148	1710000160	Diode	1SS133
D149	1790000070	Diode	1SS237
D150	1790000070	Diode	1SS237
D151	1710000330	Diode	1K60
D152	1710000160	Diode	1SS133
D153	1710000160	Diode	1SS133
D154	1710000160	Diode	1SS133
D155	1790000070	Diode	1SS237
D156	1710000050	Diode	1SS53
D157	1710000160	Diode	1SS133
D158	1710000160	Diode	1SS133
D159	1710000050	Diode	1SS53
FI1	2010000630	Monolithic	9M20A (FL-87)
FI2	2010000270	Monolithic	9M15A (FL-23)
FI3	2010000320	Monolithic	9M22D2 (FL-30)
FI4	optional	Crystal	M09F05A (FL-32A)
FI5	2010000840	Crystal	X00F27A (FL-96)
FI6	optional	Crystal	X00F05A (FL-52A)
FI7	2020000150	Ceramic	CFW455HT
FI8	2020000120	Ceramic	CFW455E
FI9	2010000270	Monolithic	9M15A (FL-23)
X1	6050003020	Crystal	CR-168
X2	6050003030	Crystal	CR-169
X3	6050000280	Crystal	HC-12/U 9.0105
X4	6050003020	Crystal	CR-168
X5	6050001340	Crystal	CR- 1
X6	6050003020	Crystal	CR-168
X7	2020000200	Discriminator	CFY455S
L1	6910000670	Coil	BT01RN1-A61-001
L2	6910000670	Coil	BT01RN1-A61-001
L3	6180000900	Coil	LAL 03NA 101K
L4	6180000900	Coil	LAL 03NA 101K
L5	6150000750	Coil	LS-93A
L6	6180000900	Coil	LAL 03NA 101K
L7	6180000880	Coil	LAL 03NA 100K
L8	6170000140	Coil	LW-15
L9	6180000900	Coil	LAL 03NA 101K
L10	6150001200	Coil	LS-133
L11	6180000950	Coil	LAL 03NA 150K
L12	6150001470	Coil	LS-163
L13	6150001470	Coil	LS-163
L14	6150001470	Coil	LS-163
L15	6180000900	Coil	LAL 03NA 101K
L16	6150002820	Coil	LS-292
L17	6180000960	Coil	LAL 03NA 102K

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L18	6180000900	Coil	LAL 03NA 101K
L19	6180000900	Coil	LAL 03NA 101K
L20	6180000900	Coil	LAL 03NA 101K
L21	6150001590	Coil	LS-175
L22	6150001590	Coil	LS-175
L23	6150001590	Coil	LS-175
L24	6180000900	Coil	LAL 03NA 101K
L25	6180000780	Coil	LAL 03NA 1R2M
L26	6150002180	Coil	LS-226
L27	6150000700	Coil	LS-90A
L28	6150000700	Coil	LS-90A
L29	6150001590	Coil	LS-175
L30	6180000880	Coil	LAL 03NA 100K
L31	6110001630	Coil	LA-246
L32	6110001560	Coil	LA-236
L33	6180000760	Coil	LAL 03NA R82M
L34	6140000930	Coil	LR-116
L35	6140000930	Coil	LR-116
L36	6180000790	Coil	LAL 03NA 1R5M
L37	6150000990	Coil	LS-114
L38	6150000990	Coil	LS-114
L39	6180000960	Coil	LAL 03NA 102K
L40	6150002290	Coil	LS-240
L41	6150001320	Coil	LS-146
L42	6180000960	Coil	LAL 03NA 102K
L43	6150001320	Coil	LS-146
L44	6150002400	Coil	LS-251A
L45	6180000960	Coil	LAL 03NA 102K
L46	6150001590	Coil	LS-175
L47	6150002540	Coil	LS-282
L48	6150001590	Coil	LS-175
L49	6180000900	Coil	LAL 03NA 101K
L50	6150001590	Coil	LS-175
L51	6150001080	Coil	LS-122
L52	6150000160	Coil	LS-16
L53	6180000960	Coil	LAL 03NA 102K
L54	6180000900	Coil	LAL 03NA 101K
L55	6150002480	Coil	LS-266
L56	6180000900	Coil	LAL 03NA 101K
L57	6180000900	Coil	LAL 03NA 101K
L58	6180000900	Coil	LAL 03NA 101K
L59	6180000900	Coil	LAL 03NA 101K
L60	6180000900	Coil	LAL 03NA 101K
L61	6180000900	Coil	LAL 03NA 101K
L62	6180000900	Coil	LAL 03NA 101K
L63	6180000900	Coil	LAL 03NA 101K
L64	6180000900	Coil	LAL 03NA 101K
L65	6180000900	Coil	LAL 03NA 101K
L66	6180000900	Coil	LAL 03NA 101K
L67	6180000940	Coil	LAL 03NA 270K
R1	7010004070	Resistor	R20J 100 Ω
R2	7010003530	Resistor	ELR20J 10 kΩ
R3	7010003660	Resistor	ELR20J 100 kΩ
R4	7010004270	Resistor	R20J 4.7 kΩ
R5	7010004260	Resistor	R20J 3.9 kΩ
R6	7010003610	Resistor	ELR20J 39 kΩ
R7	7010003550	Resistor	ELR20J 15 kΩ
R8	7010003480	Resistor	ELR20J 4.7 kΩ
R9	7010004320	Resistor	R20J 10 kΩ
R10	7010003620	Resistor	ELR20J 47 kΩ
R11	7010003680	Resistor	ELR20J 150 kΩ
R12	7010003580	Resistor	ELR20J 22 kΩ
R13	7010004490	Resistor	R20J 220 kΩ
R14	7010003480	Resistor	ELR20J 4.7 kΩ
R15	7010004410	Resistor	R20J 47 kΩ
R16	7010001230	Resistor	R25J 4.7 kΩ
R17	7010004190	Resistor	R20J 1 kΩ
R18	7010000130	Resistor	ELR25J 10 Ω
R19	7010001230	Resistor	R25J 4.7 kΩ
R20	7010003400	Resistor	ELR20J 1 kΩ
R21	7010000130	Resistor	ELR25J 10 Ω
R22	7010003360	Resistor	ELR20J 470 Ω
R23	7010003280	Resistor	ELR20J 100 Ω

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R24	7010003280	Resistor	ELR20J 100 Ω
R25	7010003620	Resistor	ELR20J 47 kΩ
R26	7010003610	Resistor	ELR20J 39 kΩ
R27	7010003440	Resistor	ELR20J 2.2 kΩ
R28	7010003400	Resistor	ELR20J 1 kΩ
R29	7010004230	Resistor	R20J 2.2 kΩ
R30	7010004200	Resistor	R20J 1.2 kΩ
R31	7010003440	Resistor	ELR20J 2.2 kΩ
R32	7310000750	Trimmer	RH0651C14J2WA (103)
R33	7010004490	Resistor	R20J 220 kΩ
R34	7310000750	Trimmer	RH0651C14J2WA (103)
R35	7010004450	Resistor	R20J 100 kΩ
R36	7010004490	Resistor	R20J 220 kΩ
R37	7310000820	Trimmer	RH0651C16J0RA (105)
R38	7010003440	Resistor	ELR20J 2.2 kΩ
R39	7010003480	Resistor	ELR20J 4.7 kΩ
R40	7010001150	Resistor	R25J 1 kΩ
R42	7010003560	Resistor	ELR20J 18 kΩ
R43	7310000740	Trimmer	RH0651CS3J2KA (472)
R44	7010003810	Resistor	ELR20J 2.2 MΩ
R45	7010003540	Resistor	ELR20J 12 kΩ
R46	7010001030	Resistor	R25J 100 Ω
R47	7010001230	Resistor	R25J 4.7 kΩ
R48	7010004190	Resistor	R20J 1 kΩ
R49	7010003580	Resistor	ELR20J 22 kΩ
R50	7010003620	Resistor	ELR20J 47 kΩ
R51	7010004070	Resistor	R20J 100 Ω
R52	7010004070	Resistor	R20J 100 Ω
R53	7010003360	Resistor	ELR20J 470 Ω
R54	7010004370	Resistor	R20J 22 kΩ
R55	7010003580	Resistor	ELR20J 22 kΩ
R56	7010003530	Resistor	ELR20J 10 kΩ
R57	7010004070	Resistor	R20J 100 Ω
R58	7010001190	Resistor	R25J 2.2 kΩ
R59	7010001190	Resistor	R25J 2.2 kΩ
R60	7010004230	Resistor	R20J 2.2 kΩ
R61	7010004190	Resistor	R20J 1 kΩ
R62	7010004200	Resistor	R20J 1.2 kΩ
R63	7010003400	Resistor	ELR20J 1 kΩ
R64	7010003410	Resistor	ELR20J 1.2 kΩ
R65	7010003620	Resistor	ELR20J 47 kΩ
R66	7010003400	Resistor	ELR20J 1 kΩ
R67	7010004130	Resistor	R20J 330 Ω
R68	7010003520	Resistor	ELR20J 8.2 kΩ
R69	7310000740	Trimmer	RH0651CS3J2KA (472)
R70	7010003480	Resistor	ELR20J 4.7 kΩ
R71	7010003480	Resistor	ELR20J 4.7 kΩ
R72	7010003180	Resistor	ELR20J 15 Ω
R73	7010003350	Resistor	ELR20J 390 Ω
R74	7010003580	Resistor	ELR20J 22 kΩ
R75	7010003400	Resistor	ELR20J 1 kΩ
R76	7010003660	Resistor	ELR20J 100 kΩ
R77	7010003710	Resistor	ELR20J 270 kΩ
R78	7010003480	Resistor	ELR20J 4.7 kΩ
R80	7010003680	Resistor	ELR20J 150 kΩ
R81	7010004450	Resistor	R20J 100 kΩ
R82	7010004110	Resistor	R20J 220 Ω
R83	7010003280	Resistor	ELR20J 100 Ω
R84	7010003580	Resistor	ELR20J 22 kΩ
R85	7010003490	Resistor	ELR20J 5.6 kΩ
R86	7010003620	Resistor	ELR20J 47 kΩ
R87	7010003320	Resistor	ELR20J 220 Ω
R88	7010003450	Resistor	ELR20J 2.7 kΩ
R89	7010003450	Resistor	ELR20J 2.7 kΩ
R90	7010003530	Resistor	ELR20J 10 kΩ
R91	7010003780	Resistor	ELR20J 1 MΩ
R92	7310000740	Trimmer	RH0651CS3J2KA (472)
R93	7010004430	Resistor	R20J 68 kΩ
R94	7010004070	Resistor	R20J 100 Ω
R95	7010004070	Resistor	R20J 100 Ω
R96	7010003440	Resistor	ELR20J 2.2 kΩ
R97	7010004280	Resistor	R20J 5.6 kΩ
R98	7010003530	Resistor	ELR20J 10 kΩ
R99	7010003460	Resistor	ELR20J 3.3 kΩ
R100	7010004280	Resistor	R20J 5.6 kΩ

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R101	7010003530	Resistor	ELR20J 10 kΩ
R102	7010003580	Resistor	ELR20J 22 kΩ
R103	7010003580	Resistor	ELR20J 22 kΩ
R104	7010003690	Resistor	ELR20J 180 kΩ
R105	7010003280	Resistor	ELR20J 100 Ω
R106	7010004190	Resistor	R20J 1 kΩ
R107	7010003040	Resistor	ELR20J 1 Ω
R108	7010000010	Resistor	ELR25J 1 Ω
R109	7080000350	Resistor	CRB25FX 68 kΩ
R110	7080000320	Resistor	CRB25FX 33 kΩ
R111	7310001090	Trimmer	RH0621C13J1TA (102)
R112	7080000320	Resistor	CRB25FX 33 kΩ
R113	7080000350	Resistor	CRB25FX 68 kΩ
R114	7080000630	Resistor	CRB25FX 1 MΩ
R115	7310000750	Trimmer	RH0651C14J2WA (103)
R116	7010004190	Resistor	R20J 1 kΩ
R117	7310000750	Trimmer	RH0651C14J2WA (103)
R118	7010003580	Resistor	ELR20J 22 kΩ
R119	7010003580	Resistor	ELR20J 22 kΩ
R120	7010004270	Resistor	R20J 4.7 kΩ
R121	7010004420	Resistor	R20J 56 kΩ
R122	7010003620	Resistor	ELR20J 47 kΩ
R123	7310000750	Trimmer	RH0651C14J2WA (103)
R124	7010003740	Resistor	ELR20J 470 kΩ
R125	7010003700	Resistor	ELR20J 220 kΩ
R126	7010004470	Resistor	R20J 150 kΩ
R127	7010004420	Resistor	R20J 56 kΩ
R128	7010003490	Resistor	ELR20J 5.6 kΩ
R129	7010003700	Resistor	ELR20J 220 kΩ
R130	7010003700	Resistor	ELR20J 220 kΩ
R131	7010003700	Resistor	ELR20J 220 kΩ
R132	7010003660	Resistor	ELR20J 100 kΩ
R133	7010004560	Resistor	R20J 820 kΩ
R134	7010004570	Resistor	R20J 1 MΩ
R135	7010003820	Resistor	ELR20J 3.3 MΩ
R136	7310000780	Trimmer	RH0651CS4J25A (473)
R137	7010003550	Resistor	ELR20J 15 kΩ
R138	7310000780	Trimmer	RH0651CS4J25A (473)
R139	7010003390	Resistor	ELR20J 820 Ω
R141	7310000760	Trimmer	RH0651CJ4J01A (223)
R142	7010001510	Resistor	R25J 680 kΩ
R143	7010003700	Resistor	ELR20J 220 kΩ
R144	7010003800	Resistor	ELR20J 1.8 MΩ
R145	7010004230	Resistor	R20J 2.2 kΩ
R146	7010003300	Resistor	ELR20J 150 Ω
R147	7010004320	Resistor	R20J 10 kΩ
R148	7010004320	Resistor	R20J 10 kΩ
R149	7010003280	Resistor	ELR20J 100 Ω
R150	7010004270	Resistor	R20J 4.7 kΩ
R151	7010004160	Resistor	R20J 560 Ω
R153	7010004390	Resistor	R20J 33 kΩ
R154	7010003580	Resistor	ELR20J 22 kΩ
R155	7010003600	Resistor	ELR20J 33 kΩ
R156	7510000120	Thermistor	ERT-D2FGL332S
R157	7010003530	Resistor	ELR20J 10 kΩ
R158	7010003490	Resistor	ELR20J 5.6 kΩ
R159	7010003470	Resistor	ELR20J 3.9 kΩ
R160	7010003740	Resistor	ELR20J 470 kΩ
R161	7010003530	Resistor	ELR20J 10 kΩ
R162	7010003580	Resistor	ELR20J 22 kΩ
R163	7310000740	Trimmer	RH0651CS3J2KA (472)
R164	7010003320	Resistor	ELR20J 220 Ω
R165	7010004110	Resistor	R20J 220 Ω
R166	7010004230	Resistor	R20J 2.2 kΩ
R167	7010003720	Resistor	ELR20J 330 kΩ
R168	7010004230	Resistor	R20J 2.2 kΩ
R169	7010004270	Resistor	R20J 4.7 kΩ
R170	7010004110	Resistor	R20J 220 Ω
R171	7310000710	Trimmer	RH0651C13J1YA (102)
R172	7010004110	Resistor	R20J 220 Ω
R173	7010004190	Resistor	R20J 1 kΩ
R174	7010003250	Resistor	ELR20J 56 Ω
R175	7010003470	Resistor	ELR20J 3.9 kΩ
R176	7010004220	Resistor	R20J 1.8 kΩ
R178	7010003470	Resistor	ELR20J 3.9 kΩ

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R180	7010001220	Resistor	R25J 3.9 kΩ
R181	7010003470	Resistor	ELR20J 3.9 kΩ
R182	7010003160	Resistor	ELR20J 10 Ω
R183	7010001150	Resistor	R25J 1 kΩ
R184	7010004110	Resistor	R20J 220 Ω
R185	7010003620	Resistor	ELR20J 47 kΩ
R186	7010004130	Resistor	R20J 330 Ω
R187	7010004110	Resistor	R20J 220 Ω
R188	7010003620	Resistor	ELR20J 47 kΩ
R189	7010003600	Resistor	ELR20J 33 kΩ
R190	7010004320	Resistor	R20J 10 kΩ
R191	7010003530	Resistor	ELR20J 10 kΩ
R192	7010003480	Resistor	ELR20J 4.7 kΩ
R193	7010004410	Resistor	R20J 47 kΩ
R194	7010003480	Resistor	ELR20J 4.7 kΩ
R195	7010003480	Resistor	ELR20J 4.7 kΩ
R196	7010003600	Resistor	ELR20J 33 kΩ
R197	7010003550	Resistor	ELR20J 15 kΩ
R198	7410000080	Resistor Array	RMX- 4 473K
R199	7010003480	Resistor	ELR20J 4.7 kΩ
R200	7010004110	Resistor	R20J 220 Ω
R201	7310000740	Trimmer	RH0651CS3J2KA (472)
R202	7010004230	Resistor	R20J 2.2 kΩ
R203	7010003660	Resistor	ELR20J 100 kΩ
R204	7310000790	Trimmer	RH0651C15J1UA (104)
R205	7010004420	Resistor	R20J 56 kΩ
R206	7010004450	Resistor	R20J 100 kΩ
R207	7010003280	Resistor	ELR20J 100 Ω
R208	7010004410	Resistor	R20J 47 kΩ
R209	7010004320	Resistor	R20J 10 kΩ
R210	7010003580	Resistor	ELR20J 22 kΩ
R211	7010003600	Resistor	ELR20J 33 kΩ
R212	7010003440	Resistor	ELR20J 2.2 kΩ
R213	7010004090	Resistor	R20J 150 Ω
R214	7010003620	Resistor	ELR20J 47 kΩ
R215	7010003620	Resistor	ELR20J 47 kΩ
R216	7010003440	Resistor	ELR20J 2.2 kΩ
R217	7010004090	Resistor	R20J 150 Ω
R218	7010003670	Resistor	ELR20J 120 kΩ
R219	7310001720	Trimmer	RH0421C15J06A (104)
R220	7010004450	Resistor	R20J 100 kΩ
R221	7010004450	Resistor	R20J 100 kΩ
R222	7010003690	Resistor	ELR20J 180 kΩ
R223	7310000770	Trimmer	RH0651CN4J0TA (333)
R224	7310000750	Trimmer	RH0651C14J2WA (103)
R225	7010003630	Resistor	ELR20J 56 kΩ
R226	7010003700	Resistor	ELR20J 220 kΩ
R228	7010001280	Resistor	R25J 10 kΩ
R229	7010003620	Resistor	ELR20J 47 kΩ
R230	7010004080	Resistor	R20J 120 Ω
R231	7010004090	Resistor	R20J 150 Ω
R233	7010003630	Resistor	ELR20J 56 kΩ
R234	7010003480	Resistor	ELR20J 4.7 kΩ
R235	7010003400	Resistor	ELR20J 1 kΩ
R236	7010003580	Resistor	ELR20J 22 kΩ
R237	7010003480	Resistor	ELR20J 4.7 kΩ
R238	7010003360	Resistor	ELR20J 470 Ω
R239	7010003530	Resistor	ELR20J 10 kΩ
R240	7010003590	Resistor	ELR20J 27 kΩ
R241	7010004450	Resistor	R20J 100 kΩ
R242	7010003660	Resistor	ELR20J 100 kΩ
R243	7010004410	Resistor	R20J 47 kΩ
R244	7010004450	Resistor	R20J 100 kΩ
R245	7010003620	Resistor	ELR20J 47 kΩ
R246	7010004450	Resistor	R20J 100 kΩ
R247	7010004410	Resistor	R20J 47 kΩ
R248	7010004450	Resistor	R20J 100 kΩ
R249	7010004190	Resistor	R20J 1 kΩ
R250	7010003240	Resistor	ELR20J 47 Ω
R251	7010004450	Resistor	R20J 100 kΩ
R252	7010004190	Resistor	R20J 1 kΩ
R253	7010004090	Resistor	R20J 150 Ω
R254	7010004070	Resistor	R20J 100 Ω
R255	7010003530	Resistor	ELR20J 10 kΩ
R256	7010004090	Resistor	R20J 150 Ω

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R258	7010003480	Resistor	ELR20J 4.7 kΩ
R259	7010004090	Resistor	R20J 150 Ω
R260	7010003620	Resistor	ELR20J 47 kΩ
R261	7010004410	Resistor	R20J 47 kΩ
R262	7010003360	Resistor	ELR20J 470 Ω
R263	7010004090	Resistor	R20J 150 Ω
R264	7010001240	Resistor	R25J 5.6 kΩ
R265	7010003680	Resistor	ELR20J 150 kΩ
R266	7010003630	Resistor	ELR20J 56 kΩ
R267	7010003630	Resistor	ELR20J 56 kΩ
R268	7010004410	Resistor	R20J 47 kΩ
R269	7010003440	Resistor	ELR20J 2.2 kΩ
R270	7010003490	Resistor	ELR20J 5.6 kΩ
R271	7010004230	Resistor	R20J 2.2 kΩ
R272	7010004200	Resistor	R20J 1.2 kΩ
R273	7010003640	Resistor	ELR20J 68 kΩ
R274	7010003360	Resistor	ELR20J 470 Ω
R275	7010004320	Resistor	R20J 10 kΩ
R276	7010004320	Resistor	R20J 10 kΩ
R277	7010004370	Resistor	R20J 22 kΩ
R278	7010004320	Resistor	R20J 10 kΩ
R279	7010004300	Resistor	R20J 6.8 kΩ
R280	7010004130	Resistor	R20J 330 Ω
R281	7010003400	Resistor	ELR20J 1 kΩ
R282	7010003480	Resistor	ELR20J 4.7 kΩ
R283	7010004230	Resistor	R20J 2.2 kΩ
R284	7010003440	Resistor	ELR20J 2.2 kΩ
R285	7010003320	Resistor	ELR20J 220 Ω
R286	7010003400	Resistor	ELR20J 1 kΩ
R287	7010004490	Resistor	R20J 220 kΩ
R288	7010003240	Resistor	ELR20J 47 Ω
R289	7010003530	Resistor	ELR20J 10 kΩ
R290	7010003530	Resistor	ELR20J 10 kΩ
R291	7010003340	Resistor	ELR20J 330 Ω
R292	7010003320	Resistor	ELR20J 220 Ω
R293	7010003490	Resistor	ELR20J 5.6 kΩ
R294	7010003250	Resistor	ELR20J 56 Ω
R295	7010003330	Resistor	ELR20J 270 Ω
R296	7010003980	Resistor	R20J 18 Ω
R297	7010001080	Resistor	R25J 270 Ω
R298	7010004150	Resistor	R20J 470 Ω
R299	7010004160	Resistor	R20J 560 Ω
R300	7010003580	Resistor	ELR20J 22 kΩ
R301	7010003580	Resistor	ELR20J 22 kΩ
R302	7010003490	Resistor	ELR20J 5.6 kΩ
R303	7010004210	Resistor	R20J 1.5 kΩ
R304	7010004280	Resistor	R20J 5.6 kΩ
R305	7010004180	Resistor	R20J 820 Ω
R306	7010004210	Resistor	R20J 1.5 kΩ
R307	7010004110	Resistor	R20J 220 Ω
R308	7010003490	Resistor	ELR20J 5.6 kΩ
R309	7010004210	Resistor	R20J 1.5 kΩ
R310	7010001030	Resistor	R25J 100 Ω
R311	7010003420	Resistor	ELR20J 1.5 kΩ
R312	7010004110	Resistor	R20J 220 Ω
R313	7010003490	Resistor	ELR20J 5.6 kΩ
R314	7010004210	Resistor	R20J 1.5 kΩ
R315	7010004070	Resistor	R20J 100 Ω
R316	7010003420	Resistor	ELR20J 1.5 kΩ
R317	7010004110	Resistor	R20J 220 Ω
R318	7010004280	Resistor	R20J 5.6 kΩ
R319	7010004210	Resistor	R20J 1.5 kΩ
R320	7010004070	Resistor	R20J 100 Ω
R321	7010003420	Resistor	ELR20J 1.5 kΩ
R322	7010001070	Resistor	R25J 220 Ω
R323	7010003490	Resistor	ELR20J 5.6 kΩ
R324	7010004210	Resistor	R20J 1.5 kΩ
R325	7010001030	Resistor	R25J 100 Ω
R326	7010004210	Resistor	R20J 1.5 kΩ
R327	7010004110	Resistor	R20J 220 Ω
R328	7010004270	Resistor	R20J 4.7 kΩ
R329	7010004270	Resistor	R20J 4.7 kΩ
R330	7010004070	Resistor	R20J 100 Ω
R331	7010003490	Resistor	ELR20J 5.6 kΩ
R332	7010003400	Resistor	ELR20J 1 kΩ

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R333	7010003420	Resistor	ELR20J 1.5 kΩ
R334	7010003440	Resistor	ELR20J 2.2 kΩ
R335	7010004320	Resistor	R20J 10 kΩ
R336	7510000060	Thermistor	112-503-2AI
R337	7010003580	Resistor	ELR20J 22 kΩ
R338	7010003560	Resistor	ELR20J 18 kΩ
R339	7010003580	Resistor	ELR20J 22 kΩ
R340	7010003660	Resistor	ELR20J 100 kΩ
R341	7010003240	Resistor	ELR20J 47 Ω
R342	7010004130	Resistor	R20J 330 Ω
R343	7010004110	Resistor	R20J 220 Ω
R345	7010003480	Resistor	ELR20J 4.7 kΩ
R346	7010003510	Resistor	ELR20J 6.8 kΩ
R347	7010003410	Resistor	ELR20J 1.2 kΩ
R348	7010003620	Resistor	ELR20J 47 kΩ
R349	7010003530	Resistor	ELR20J 10 kΩ
R350	7010004130	Resistor	R20J 330 Ω
R351	7010004070	Resistor	R20J 100 Ω
R352	7010004030	Resistor	R20J 47 Ω
R353	7310000750	Trimmer	RH0651C14J2WA (103)
R354	7010003440	Resistor	ELR20J 2.2 kΩ
R355	7010003320	Resistor	ELR20J 220 Ω
R356	7310000760	Trimmer	RH0651CJ4J01A (223)
R357	7010003560	Resistor	ELR20J 18 kΩ
R358	7010003480	Resistor	ELR20J 4.7 kΩ
R359	7010003480	Resistor	ELR20J 4.7 kΩ
R360	7010004320	Resistor	R20J 10 kΩ
R361	7010003580	Resistor	ELR20J 22 kΩ
R362	7010004190	Resistor	R20J 1 kΩ
R363	7010001030	Resistor	R25J 100 Ω
R364	7010001030	Resistor	R25J 100 Ω
R365	7010004300	Resistor	R20J 6.8 kΩ
R366	7010001030	Resistor	R25J 100 Ω
R367	7010004300	Resistor	R20J 6.8 kΩ
R368	7010001030	Resistor	R25J 100 Ω
R369	7010003510	Resistor	ELR20J 6.8 kΩ
R370	7010001030	Resistor	R25J 100 Ω
R371	7010004300	Resistor	R20J 6.8 kΩ
R372	7010001030	Resistor	R25J 100 Ω
R373	7010004300	Resistor	R20J 6.8 kΩ
R374	7010001030	Resistor	R25J 100 Ω
R375	7010004300	Resistor	R20J 6.8 kΩ
R376	7010001030	Resistor	R25J 100 Ω
R377	7010003510	Resistor	ELR20J 6.8 kΩ
R378	7010004070	Resistor	R20J 100 Ω
R379	7010004070	Resistor	R20J 100 Ω
R380	7010004070	Resistor	R20J 100 Ω
R381	7010003510	Resistor	ELR20J 6.8 kΩ
R382	7010001230	Resistor	R25J 4.7 kΩ
R383	7010004270	Resistor	R20J 4.7 kΩ
R384	7010004300	Resistor	R20J 6.8 kΩ
R385	7010004070	Resistor	R20J 100 Ω
R386	7010004300	Resistor	R20J 6.8 kΩ
R387	7010004070	Resistor	R20J 100 Ω
R389	7010004260	Resistor	R20J 3.9 kΩ
R390	7010004190	Resistor	R20J 1 kΩ
R391	7310000750	Trimmer	RH0651C14J2WA (103)
R392	7010004490	Resistor	R20J 220 kΩ
R393	7010003440	Resistor	ELR20J 2.2 kΩ
R394	7010003480	Resistor	ELR20J 4.7 kΩ
R395	7010004270	Resistor	R20J 4.7 kΩ
R396	7010004320	Resistor	R20J 10 kΩ
R397	7010003440	Resistor	ELR20J 2.2 kΩ
R398	7010004450	Resistor	R20J 100 kΩ
R399	7010001400	Resistor	R25J 100 kΩ
R400	7010003450	Resistor	ELR20J 2.7 kΩ
R401	7010003460	Resistor	ELR20J 3.3 kΩ
R402	7010004320	Resistor	R20J 10 kΩ
R403	7010003660	Resistor	ELR20J 100 kΩ
R404	7010004110	Resistor	R20J 220 Ω
R405	7010003450	Resistor	ELR20J 2.7 kΩ
R406	7010003510	Resistor	ELR20J 6.8 kΩ
R407	7010003530	Resistor	ELR20J 10 kΩ
R408	7010004070	Resistor	R20J 100 Ω
R409	7010003240	Resistor	ELR20J 47 Ω

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R410	7010003340	Resistor	ELR20J 330 Ω
R411	7010001070	Resistor	R25J 220 Ω
R412	7010004300	Resistor	R20J 6.8 kΩ
R413	7510000150	Thermistor	ERT-D2FHL462S
R414	7310000750	Trimmer	RH0651C14J2WA (103)
R415	7010003400	Resistor	ELR20J 1 kΩ
R416	7010003670	Resistor	ELR20J 120 kΩ
R417	7010003310	Resistor	ELR20J 180 Ω
R418	7010004190	Resistor	R20J 1 kΩ
R420	7010003440	Resistor	ELR20J 2.2 kΩ
R421	7010004070	Resistor	R20J 100 Ω
R422	7010004070	Resistor	R20J 100 Ω
R424	7010004320	Resistor	R20J 10 kΩ
R425	7010003530	Resistor	ELR20J 10 kΩ
R426	7010003480	Resistor	ELR20J 4.7 kΩ
R427	7010003400	Resistor	ELR20J 1 kΩ
R429	7010001300	Resistor	R25J 15 kΩ
R430	7010004280	Resistor	R20J 5.6 kΩ
R431	7010003610	Resistor	ELR20J 39 kΩ
R432	7010003280	Resistor	ELR20J 100 Ω
R433	7010004270	Resistor	R20J 4.7 kΩ
R434	7010003400	Resistor	ELR20J 1 kΩ
R435	7310000710	Trimmer	RH0651C13J1YA (102)
R437	7010003370	Resistor	ELR20J 560 Ω
R438	7010003780	Resistor	ELR20J 1 MΩ
R439	7010003780	Resistor	ELR20J 1 MΩ
R440	7010003400	Resistor	ELR20J 1 kΩ
R441	7010004450	Resistor	R20J 100 kΩ
R443	7010003480	Resistor	ELR20J 4.7 kΩ
R444	7010004320	Resistor	R20J 10 kΩ
R445	7010003620	Resistor	ELR20J 47 kΩ
R446	7010001280	Resistor	R25J 10 kΩ
R447	7010003400	Resistor	ELR20J 1 kΩ
R448	7010003700	Resistor	ELR20J 220 kΩ
R449	7010004190	Resistor	R20J 1 kΩ
R450	7010004320	Resistor	R20J 10 kΩ
R451	7010003680	Resistor	ELR20J 150 kΩ
R452	7010001070	Resistor	R25J 220 Ω
R453	7010003580	Resistor	ELR20J 22 kΩ
R454	7010003580	Resistor	ELR20J 22 kΩ
R455	7010004070	Resistor	R20J 100 Ω
R456	7010003400	Resistor	ELR20J 1 kΩ
R457	7010001030	Resistor	R25J 100 Ω
R458	7010004110	Resistor	R20J 220 Ω
R459	7010001210	Resistor	R25J 3.3 kΩ
R461	7010001070	Resistor	R25J 220 Ω
R462	7010003340	Resistor	ELR20J 330 Ω
R463	7010003530	Resistor	ELR20J 10 kΩ
R464	7010003510	Resistor	ELR20J 6.8 kΩ
R465	7010003240	Resistor	ELR20J 47 Ω
R466	7010004070	Resistor	R20J 100 Ω
R467	7010001280	Resistor	R25J 10 kΩ
R468	7010003530	Resistor	ELR20J 10 kΩ
R469	7010003630	Resistor	ELR20J 56 kΩ
R470	7010004410	Resistor	R20J 47 kΩ
R471	7010003480	Resistor	ELR20J 4.7 kΩ
R472	7010004270	Resistor	R20J 4.7 kΩ
R473	7010004300	Resistor	R20J 6.8 kΩ
R474	7010004300	Resistor	R20J 6.8 kΩ
R475	7010003510	Resistor	ELR20J 6.8 kΩ
R476	7010004300	Resistor	R20J 6.8 kΩ
R477	7010004300	Resistor	R20J 6.8 kΩ
R478	7010003280	Resistor	ELR20J 100 Ω
R479	7010004250	Resistor	R20J 3.3 kΩ
R480	7010003660	Resistor	ELR20J 100 kΩ
R481	7010004270	Resistor	R20J 4.7 kΩ
R482	7080000630	Resistor	CRB25FX 1 MΩ
R483	7010003530	Resistor	ELR20J 10 kΩ
R484	7010001030	Resistor	R25J 100 Ω
R485	7010004050	Resistor	R20J 68 Ω
R486	7010001030	Resistor	R25J 100 Ω
R487	7010003250	Resistor	ELR20J 56 Ω
R488	7010003250	Resistor	ELR20J 56 Ω
R489	7010004250	Resistor	R20J 3.3 kΩ
R490	7010004270	Resistor	R20J 4.7 kΩ

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R491	7010001070	Resistor	R25J 220 Ω
R492	7010001070	Resistor	R25J 220 Ω
C2	4040000260	Barrier Layer	UZE 08X 104M
C3	4510002840	Electrolytic	25 SS 10 µF
C4	4040000260	Barrier Layer	UZE 08X 104M
C5	4510001100	Electrolytic	16 MS7 10 µF
C6	4510001100	Electrolytic	16 MS7 10 µF
C7	4510001150	Electrolytic	50 MS7 R47 µF
C8	4550000320	Tantalum	DN 1V 0R1M
C9	4550000360	Tantalum	DN 1V R47M
C10	4010000520	Ceramic	DD108 B 472K 50V
C11	4010000520	Ceramic	DD108 B 472K 50V
C12	4310000040	Mylar	F2D 50V 154K
C13	4310000030	Mylar	F2D 50V 104K
C14	4310000120	Mylar	F2D 50V 473K
C15	4510001160	Electrolytic	50 MS7 1 µF
C16	4040000260	Barrier Layer	UZE 08X 104M
C17	4510001160	Electrolytic	50 MS7 1 µF
C18	4040000260	Barrier Layer	UZE 08X 104M
C19	4010000500	Ceramic	DD104 B 102K 50V
C20	4510001100	Electrolytic	16 MS7 10 µF
C22	4310000020	Mylar	F2D 50V 103K
C23	4510001760	Electrolytic	25 RBP 4.7 µF
C24	4040000250	Barrier Layer	UAT 08X 473M
C25	4040000260	Barrier Layer	UZE 08X 104M
C26	4510003040	Electrolytic	16 SS 100 µF
C27	4010000520	Ceramic	DD108 B 472K 50V
C28	4010000500	Ceramic	DD104 B 102K 50V
C29	4010000520	Ceramic	DD108 B 472K 50V
C30	4510001150	Electrolytic	50 MS7 R47 µF
C31	4510001100	Electrolytic	16 MS7 10 µF
C32	4510001100	Electrolytic	16 MS7 10 µF
C33	4010000520	Ceramic	DD108 B 472K 50V
C34	4020000100	Cylinder	UP125 SL 220J
C35	4010000520	Ceramic	DD108 B 472K 50V
C36	4010000520	Ceramic	DD108 B 472K 50V
C37	4010000070	Ceramic	DD104 SL 050C 50V
C38	4020000130	Cylinder	UP125 SL 560J
C39	4010000520	Ceramic	DD108 B 472K 50V
C40	4010001020	Ceramic	DD111 CH 221J 50V
C41	4010001020	Ceramic	DD111 CH 221J 50V
C42	4610001200	Trimmer	CVSSE3001
C43	4010000840	Ceramic	DD105 CH 390J 50V
C44	4040000150	Barrier Layer	UAT 05X 472K
C45	4610001200	Trimmer	CVSSE3001
C46	4010000820	Ceramic	DD105 CH 330J 50V
C47	4010000520	Ceramic	DD108 B 472K 50V
C48	4010000780	Ceramic	DD104 CH 220J 50V
C49	4010000820	Ceramic	DD105 CH 330J 50V
C50	4010000520	Ceramic	DD108 B 472K 50V
C51	4010000520	Ceramic	DD108 B 472K 50V
C52	4010001020	Ceramic	DD111 CH 221J 50V
C53	4010000520	Ceramic	DD108 B 472K 50V
C54	4510001100	Electrolytic	16 MS7 10 µF
C55	4310000060	Mylar	F2D 50V 223K
C56	4310000060	Mylar	F2D 50V 223K
C57	4310000060	Mylar	F2D 50V 223K
C58	4550000340	Tantalum	DN 1C 100M
C59	4510001970	Electrolytic	50 MS7 0R1 µF
C60	4510001140	Electrolytic	50 MS7 R22 µF
C61	4010000150	Ceramic	DD104 SL 150J 50V
C63	4040000260	Barrier Layer	UZE 08X 104M
C64	4550000340	Tantalum	DN 1C 100M
C65	4510001150	Electrolytic	50 MS7 R47 µF
C66	4510001100	Electrolytic	16 MS7 10 µF
C67	4040000150	Barrier Layer	UAT 05X 472K
C68	4310000110	Mylar	F2D 50V 472K
C69	4310000110	Mylar	F2D 50V 472K
C70	4010000520	Ceramic	DD108 B 472K 50V
C71	4510001140	Electrolytic	50 MS7 R22 µF
C72	4310000010	Mylar	F2D 50V 102K
C73	4010000460	Ceramic	DD104 B 471K 50V

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C74	4510001170	Electrolytic	50 MS7 2R2 µF
C75	4510001170	Electrolytic	50 MS7 2R2 µF
C76	4510001100	Electrolytic	16 MS7 10 µF
C77	4510001100	Electrolytic	16 MS7 10 µF
C79	4510002810	Electrolytic	16 SS 47 µF
C80	4510000310	Electrolytic	16 MS16 1000 µF (12.5X16)
C81	4010000520	Ceramic	DD108 B 472K 50V
C82	4510002810	Electrolytic	16 SS 47 µF
C83	4510002870	Electrolytic	25 SS 100 µF
C84	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C85	4040000260	Barrier Layer	UZE 08X 104M
C86	4010000520	Ceramic	DD108 B 472K 50V
C87	4010000520	Ceramic	DD108 B 472K 50V
C88	4010000330	Ceramic	DD105 SL 101J 50V
C89	4040000260	Barrier Layer	UZE 08X 104M
C90	4040000260	Barrier Layer	UZE 08X 104M
C91	4510001750	Electrolytic	50 RBP 2.2 µF
C92	4510001160	Electrolytic	50 MS7 1 µF
C93	4510001100	Electrolytic	16 MS7 10 µF
C94	4010000520	Ceramic	DD108 B 472K 50V
C95	4550000390	Tantalum	DN 1V R22M
C96	4010000520	Ceramic	DD108 B 472K 50V
C97	4010000940	Ceramic	DD107 CH 101J 50V
C98	4010000940	Ceramic	DD107 CH 101J 50V
C99	4010000670	Ceramic	DD104 CH 070D 50V
C100	4010000700	Ceramic	DD104 CH 100D 50V
C101	4010000520	Ceramic	DD108 B 472K 50V
C102	4510001100	Electrolytic	16 MS7 10 µF
C103	4510001100	Electrolytic	16 MS7 10 µF
C104	4510001100	Electrolytic	16 MS7 10 µF
C105	4040000150	Barrier Layer	UAT 05X 472K
C106	4530000350	Capacitor Array	B8ZC0111-32N
C107	4010000520	Ceramic	DD108 B 472K 50V
C108	4550000410	Tantalum	DN 1V 4R7M
C109	4010000520	Ceramic	DD108 B 472K 50V
C110	4010000010	Ceramic	DD104 SL 0R5C 50V
C111	4010000520	Ceramic	DD108 B 472K 50V
C112	4010000520	Ceramic	DD108 B 472K 50V
C113	4010000520	Ceramic	DD108 B 472K 50V
C114	4010000520	Ceramic	DD108 B 472K 50V
C115	4010000520	Ceramic	DD108 B 472K 50V
C116	4010000520	Ceramic	DD108 B 472K 50V
C117	4010000520	Ceramic	DD108 B 472K 50V
C118	4010000150	Ceramic	DD104 SL 150J 50V
C119	4010000180	Ceramic	DD104 SL 220J 50V
C120	4010000520	Ceramic	DD108 B 472K 50V
C121	4010000940	Ceramic	DD107 CH 101J 50V
C122	4010000940	Ceramic	DD107 CH 101J 50V
C123	4610001200	Trimmer	CVSSE3001
C124	4010000780	Ceramic	DD104 CH 220J 50V
C125	4610001130	Trimmer	CVSSA1001
C126	4010000700	Ceramic	DD104 CH 100D 50V
C127	4010000780	Ceramic	DD104 CH 220J 50V
C128	4610001000	Trimmer	CVSSA0701
C129	4010000520	Ceramic	DD108 B 472K 50V
C130	4010000520	Ceramic	DD108 B 472K 50V
C131	4010000520	Ceramic	DD108 B 472K 50V
C132	4010000520	Ceramic	DD108 B 472K 50V
C133	4010001020	Ceramic	DD111 CH 221J 50V
C134	4010000940	Ceramic	DD107 CH 101J 50V
C135	4010000940	Ceramic	DD107 CH 101J 50V
C136	4010000100	Ceramic	DD104 SL 080D 50V
C137	4010000040	Ceramic	DD104 SL 020C 50V
C138	4010000520	Ceramic	DD108 B 472K 50V
C139	4010000330	Ceramic	DD105 SL 101J 50V
C140	4010000520	Ceramic	DD108 B 472K 50V
C141	4040000260	Barrier Layer	UZE 08X 104M
C142	4510001150	Electrolytic	50 MS7 R47 µF
C143	4510001180	Electrolytic	50 MS7 3R3 µF
C144	4510001120	Electrolytic	25 MS7 4R7 µF
C145	4550000410	Tantalum	DN 1V 4R7M
C146	4040000250	Barrier Layer	UAT 08X 473M
C147	4040000260	Barrier Layer	UZE 08X 104M
C148	4040000250	Barrier Layer	UAT 08X 473M

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C149	4550002460	Tantalum	DN 1V 3R3M
C150	4010000520	Ceramic	DD108 B 472K 50V
C151	4510001100	Electrolytic	16 MS7 10 µF
C152	4510001140	Electrolytic	50 MS7 R22 µF
C153	4510001970	Electrolytic	50 MS7 0R1 µF
C154	4040000260	Barrier Layer	UZE 08X 104M
C155	4040000260	Barrier Layer	UZE 08X 104M
C156	4040000260	Barrier Layer	UZE 08X 104M
C157	4040000250	Barrier Layer	UAT 08X 473M
C158	4010000520	Ceramic	DD108 B 472K 50V
C159	4010000520	Ceramic	DD108 B 472K 50V
C160	4010000330	Ceramic	DD105 SL 101J 50V
C161	4010000520	Ceramic	DD108 B 472K 50V
C162	4010000520	Ceramic	DD108 B 472K 50V
C163	4010000520	Ceramic	DD108 B 472K 50V
C164	4550000390	Tantalum	DN 1V R22M
C165	4510001170	Electrolytic	50 MS7 2R2 µF
C166	4010000520	Ceramic	DD108 B 472K 50V
C167	4010000520	Ceramic	DD108 B 472K 50V
C168	4020000210	Cylinder	UP125 B 102K
C169	4010000410	Ceramic	DD107 SL 331J 50V
C170	4310000020	Mylar	F2D 50V 103K
C171	4040000150	Barrier Layer	UAT 05X 472K
C172	4510001100	Electrolytic	16 MS7 10 µF
C173	4510001120	Electrolytic	25 MS7 4R7 µF
C174	4310000020	Mylar	F2D 50V 103K
C175	4510001150	Electrolytic	50 MS7 R47 µF
C176	4510002790	Electrolytic	16 SS 22 µF
C177	4010000410	Ceramic	DD107 SL 331J 50V
C179	4010000430	Ceramic	DD109 SL 471J 50V
C180	4010000520	Ceramic	DD108 B 472K 50V
C181	4020000040	Cylinder	UP125 SL 3R3K
C182	4040000250	Barrier Layer	UAT 08X 473M
C183	4010000500	Ceramic	DD104 B 102K 50V
C184	4040000260	Barrier Layer	UZE 08X 104M
C185	4010000520	Ceramic	DD108 B 472K 50V
C187	4010000520	Ceramic	DD108 B 472K 50V
C188	4010000500	Ceramic	DD104 B 102K 50V
C189	4010000200	Ceramic	DD104 SL 270J 50V
C190	4010000250	Ceramic	DD104 SL 430J 50V
C191	4010000140	Ceramic	DD104 SL 120J 50V
C192	4010000300	Ceramic	DD104 SL 680J 50V
C193	4010000240	Ceramic	DD104 SL 390J 50V
C194	4010000200	Ceramic	DD104 SL 270J 50V
C195	4040000150	Barrier Layer	UAT 05X 472K
C196	4010000380	Ceramic	DD107 SL 221J 50V
C197	4020000500	Cylinder	UP050 SL 8R2K
C198	4020000360	Cylinder	UP050 SL 2R2K
C199	4020000500	Cylinder	UP050 SL 8R2K
C200	4040000150	Barrier Layer	UAT 05X 472K
C201	4010000520	Ceramic	DD108 B 472K 50V
C202	4010000500	Ceramic	DD104 B 102K 50V
C203	4010000520	Ceramic	DD108 B 472K 50V
C204	4010000520	Ceramic	DD108 B 472K 50V
C205	4010000520	Ceramic	DD108 B 472K 50V
C206	4010000520	Ceramic	DD108 B 472K 50V
C207	4010000520	Ceramic	DD108 B 472K 50V
C208	4010000520	Ceramic	DD108 B 472K 50V
C209	4010000520	Ceramic	DD108 B 472K 50V
C210	4010000520	Ceramic	DD108 B 472K 50V
C211	4010000520	Ceramic	DD108 B 472K 50V
C212	4010000520	Ceramic	DD108 B 472K 50V
C213	4010000520	Ceramic	DD108 B 472K 50V
C214	4010000520	Ceramic	DD108 B 472K 50V
C215	4040000260	Barrier Layer	UZE 08X 104M
C216	4010000520	Ceramic	DD108 B 472K 50V
C217	4040000260	Barrier Layer	UZE 08X 104M
C218	4040000260	Barrier Layer	UZE 08X 104M
C219	4040000260	Barrier Layer	UZE 08X 104M
C220	4040000260	Barrier Layer	UZE 08X 104M
C221	4040000260	Barrier Layer	UZE 08X 104M
C222	4040000260	Barrier Layer	UZE 08X 104M
C223	4010000520	Ceramic	DD108 B 472K 50V
C224	4510001160	Electrolytic	50 MS7 1 µF
C225	4010000520	Ceramic	DD108 B 472K 50V

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C226	4040000260	Barrier Layer	UZE 08X 104M
C227	4040000260	Barrier Layer	UZE 08X 104M
C228	4010000380	Ceramic	DD107 SL 221J 50V
C229	4010000520	Ceramic	DD108 B 472K 50V
C230	4510001100	Electrolytic	16 MS7 10 µF
C231	4510001970	Electrolytic	50 MS7 0R1 µF
C232	4010000520	Ceramic	DD108 B 472K 50V
C233	4010000500	Ceramic	DD104 B 102K 50V
C234	4040000260	Barrier Layer	UZE 08X 104M
C235	4010000420	Ceramic	DD108 SL 391J 50V
C236	4020000250	Cylinder	UP125 X 472M
C237	4040000260	Barrier Layer	UZE 08X 104M
C238	4040000260	Barrier Layer	UZE 08X 104M
C239	4040000260	Barrier Layer	UZE 08X 104M
C240	4040000260	Barrier Layer	UZE 08X 104M
C241	4040000260	Barrier Layer	UZE 08X 104M
C242	4040000260	Barrier Layer	UZE 08X 104M
C243	4040000260	Barrier Layer	UZE 08X 104M
C244	4040000260	Barrier Layer	UZE 08X 104M
C245	4040000260	Barrier Layer	UZE 08X 104M
C246	4040000260	Barrier Layer	UZE 08X 104M
C247	4040000260	Barrier Layer	UZE 08X 104M
C248	4040000260	Barrier Layer	UZE 08X 104M
C249	4510001100	Electrolytic	16 MS7 10 µF
C250	4010000520	Ceramic	DD108 B 472K 50V
C251	4040000260	Barrier Layer	UZE 08X 104M
C252	4010000520	Ceramic	DD108 B 472K 50V
C253	4040000150	Barrier Layer	UAT 05X 472K
C254	4010000520	Ceramic	DD108 B 472K 50V
C255	4010000520	Ceramic	DD108 B 472K 50V
C256	4010000640	Ceramic	DD104 CH 040C 50V
C257	4610001000	Trimmer	CVSSA0701
C258	4010000650	Ceramic	DD104 CH 050C 50V
C259	4040000150	Barrier Layer	UAT 05X 472K
C260	4010000520	Ceramic	DD108 B 472K 50V
C261	4040000150	Barrier Layer	UAT 05X 472K
C262	4040000260	Barrier Layer	UZE 08X 104M
C263	4010000520	Ceramic	DD108 B 472K 50V
C264	4040000150	Barrier Layer	UAT 05X 472K
C265	4020000250	Cylinder	UP125 X 472M
C266	4040000260	Barrier Layer	UZE 08X 104M
C267	4040000260	Barrier Layer	UZE 08X 104M
C268	4040000260	Barrier Layer	UZE 08X 104M
C269	4040000260	Barrier Layer	UZE 08X 104M
C270	4040000260	Barrier Layer	UZE 08X 104M
C271	4040000260	Barrier Layer	UZE 08X 104M
C272	4040000260	Barrier Layer	UZE 08X 104M
C273	4510001120	Electrolytic	25 MS7 4R7 µF
C274	4010000520	Ceramic	DD108 B 472K 50V
C275	4010000520	Ceramic	DD108 B 472K 50V
C276	4310000020	Mylar	F2D 50V 103K
C277	4310000120	Mylar	F2D 50V 473K
C279	4310000120	Mylar	F2D 50V 473K
C280	4040000260	Barrier Layer	UZE 08X 104M
C281	4510001950	Electrolytic	50 MS7 R33 µF
C282	4510002940	Electrolytic	50 SS 1 µF
C283	4040000260	Barrier Layer	UZE 08X 104M
C284	4510001120	Electrolytic	25 MS7 4R7 µF
C285	4510001100	Electrolytic	16 MS7 10 µF
C286	4010000520	Ceramic	DD108 B 472K 50V
C287	4510001100	Electrolytic	16 MS7 10 µF
C288	4510001970	Electrolytic	50 MS7 0R1 µF
C289	4310000060	Mylar	F2D 50V 223K
C290	4310000010	Mylar	F2D 50V 102K
C291	4010000410	Ceramic	DD107 SL 331J 50V
C292	4010000520	Ceramic	DD108 B 472K 50V
C293	4010000520	Ceramic	DD108 B 472K 50V
C294	4010000520	Ceramic	DD108 B 472K 50V
C295	4020000100	Cylinder	UP125 SL 220J
C296	4010000150	Ceramic	DD104 SL 150J 50V
C297	4010000320	Ceramic	DD104 SL 820J 50V
C298	4010000520	Ceramic	DD108 B 472K 50V
C299	4510001100	Electrolytic	16 MS7 10 µF
C300	4510001140	Electrolytic	50 MS7 R22 µF
C301	4510001150	Electrolytic	50 MS7 R47 µF

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C302	4040000260	Barrier Layer	UZE 08X 104M
C303	4010000520	Ceramic	DD108 B 472K 50V
C304	4010000520	Ceramic	DD108 B 472K 50V
C305	4010000520	Ceramic	DD108 B 472K 50V
C306	4010000340	Ceramic	DD105 SL 121J 50V
C307	4610001200	Trimmer	CVSSE3001
C308	4010000120	Ceramic	DD104 SL 100D 50V
C309	4010000070	Ceramic	DD104 SL 050C 50V
C310	4550000350	Tantalum	DN 1V 010M
C311	4040000260	Barrier Layer	UZE 08X 104M
C312	4010000520	Ceramic	DD108 B 472K 50V
C313	4040000260	Barrier Layer	UZE 08X 104M
C314	4510001760	Electrolytic	25 RBP 4.7 µF
C315	4020000470	Cylinder	UP050 SL 4R7K
C316	4010000520	Ceramic	DD108 B 472K 50V
C317	4010000380	Ceramic	DD107 SL 221J 50V
C318	4010000520	Ceramic	DD108 B 472K 50V
C319	4010000700	Ceramic	DD104 CH 100D 50V
C320	4040000150	Barrier Layer	UAT 05X 472K
CP1	6910001040		IPS-1136
S1	2220000360	Switch	ESD-1111212 (RF power selector)
S2	2220000360	Switch	ESD-1111212 (RTTY shift width selector)
S3	2220000360	Switch	ESD-1111212 (RTTY polaity selector)
S4	2220000150	Switch	EVQRBAL 10 (CW narrow filter)
S5	2220000150	Switch	EVQRBAL 10 (AM filter)
S7	2220000150	Switch	EVQRBAL 10 (CW narrow filter)
SO5	6510004550	Socket	380598-2
SO6	6510004550	Socket	380598-2
SO7	6510004550	Socket	380598-2
SO8	6510004550	Socket	380598-2
SO9	6510006640	Socket	50864-1
SO10	6510006640	Socket	50864-1
SO11	6510006640	Socket	50864-1
SO12	6510006640	Socket	50864-1
SO13	6510006640	Socket	50864-1
SO14	6510006640	Socket	50864-1
SO15	6510006640	Socket	50864-1
SO16	6510006640	Socket	50864-1
EP1	0910021694	P.C. Board	B 2015D (MAIN)
EP8	6910000630	Bead core	FSOH070RN

[IDC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	IC	NJM4558M (T1)
R2	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R4	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R5	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R6	7030000610	Resistor	MCR10EZHJ 82 kΩ (823)
R7	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R8	7030000430	Resistor	MCR10EZHJ 2.7 kΩ (272)
R9	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)

[IDC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C1	4550000460	Tantalum	TESVA 1C 105M1-8L
C2	4030003400	Ceramic	GRM40 SL 102J 50PT
C3	4030003390	Ceramic	GRM42-6 SL 222J 50PT
C4	4030000750	Ceramic	GRM40 SL 121J 50PT
EP1	0910016114	P.C. Board	B 1328D (IDC)

[VOX UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	IC	NJM4558M (T1)
IC2	1120000430	IC	LA6393M-TP-T1
Q1	1590000420	Transistor	RN1404
Q2	1590000420	Transistor	RN1404
Q3	1590000410	Transistor	RN2404
Q4	1590000410	Transistor	RN2404
D1	1750000050	Diode	1SS193 (TE85R)
D2	1750000050	Diode	1SS193 (TE85R)
D3	1750000070	Diode	1SS226 (TE85R)
D4	1750000050	Diode	1SS193 (TE85R)
D5	1750000050	Diode	1SS193 (TE85R)
R1	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R2	7030000620	Resistor	MCR10EZHJ 100 kΩ (104)
R3	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R4	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R5	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R6	7030000540	Resistor	MCR10EZHJ 22 kΩ (223)
R7	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R8	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R9	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R10	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R11	7030000460	Resistor	MCR10EZHJ 4.7 kΩ (472)
R12	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R13	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R14	7030000580	Resistor	MCR10EZHJ 47 kΩ (473)
R15	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R16	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R17	7030000500	Resistor	MCR10EZHJ 10 kΩ (103)
R18	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R19	7030000380	Resistor	MCR10EZHJ 1 kΩ (102)
R20	7030000470	Resistor	MCR10EZHJ 5.6 kΩ (562)
R21	7030000420	Resistor	MCR10EZHJ 2.2 kΩ (222)
C1	4030001150	Ceramic	GRM40 F 104Z 25PT
C2	4550000460	Tantalum	TESVA 1C 105M1-8L
C3	4030001150	Ceramic	GRM40 F 104Z 25PT
C4	4030001150	Ceramic	GRM40 F 104Z 25PT
C5	4550000460	Tantalum	TESVA 1C 105M1-8L
EP1	0910016121	P.C. Board	B 1333A (VOX)

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC401	1140000400	IC	μPD7564CS-031
Q101	1530000790	Transistor	2SC1971
Q102	1530000190	Transistor	2SC3133
Q103	1530000190	Transistor	2SC3133
Q104	1530000200	Transistor	2SC2904
Q105	1530000200	Transistor	2SC2904
Q106	1540000060	Transistor	2SD880-Y
Q107	1530000070	Transistor	2SC2120-Y
Q201	1520000060	Transistor	2SB562C
Q202	1540000070	Transistor	2SD468C
Q203	1590000340	Transistor	RN1202
Q204	1590000340	Transistor	RN1202
Q401	1590000340	Transistor	RN1202
D101	1790000010	Diode	MV5
D102	1790000010	Diode	MV5
D109	1790000010	Diode	MV5
D201	1710000590	Diode	GM-3B
D202	1710000050	Diode	1SS53
D203	1710000050	Diode	1SS53
D204	1710000050	Diode	1SS53
D401	1730000100	Zener	RD5.1E B2
X401	6060000160	Ceramic resonator	CSB500E
L101	6140001170	Coil	LR-142
L102	6180001200	Coil	FL 4H 1R2M
L103	6180001200	Coil	FL 4H 1R2M
L104	6140001180	Coil	LR-143
L106	6910000670	Coil	BT01RN1-A61-001
L108	6910000670	Coil	BT01RN1-A61-001
L109	6140000610	Coil	LR-83
L110	6140001190	Coil	LR-144
L111	6140001210	Coil	LR-146
L112	6180001120	Coil	FL 5H 101K
L114	6910000670	Coil	BT01RN1-A61-001
L116	6910000670	Coil	BT01RN1-A61-001
L119	6180001120	Coil	FL 5H 101K
L120	6180000990	Coil	LAL 04NA 101K
L121	6170000210	Coil	LW-22
L122	6180001220	Coil	LAL 04NA 100K
L201	6180001180	Coil	FL 9H 471K
L202	6180001180	Coil	FL 9H 471K
L203	6110001780	Coil	LA-267
L204	6110001780	Coil	LA-267
L205	6180001120	Coil	FL 5H 101K
L206	6180000990	Coil	LAL 04NA 101K
L207	6180000990	Coil	LAL 04NA 101K
L301	6910000670	Coil	BT01RN1-A61-001
L302	6910000670	Coil	BT01RN1-A61-001
L303	6180000960	Coil	LAL 03NA 102K
L304	6910000670	Coil	BT01RN1-A61-001
L305	6910000670	Coil	BT01RN1-A61-001
L306	6910000670	Coil	BT01RN1-A61-001
L307	6910000670	Coil	BT01RN1-A61-001
L308	6910000670	Coil	BT01RN1-A61-001
L309	6910000670	Coil	BT01RN1-A61-001
L310	6910000670	Coil	BT01RN1-A61-001
L311	6910000670	Coil	BT01RN1-A61-001
L312	6910000670	Coil	BT01RN1-A61-001
L313	6910000670	Coil	BT01RN1-A61-001
L314	6910000670	Coil	BT01RN1-A61-001
L401	6910000670	Coil	BT01RN1-A61-001
R101	7010001070	Resistor	R25J 220 Ω
R102	7010001030	Resistor	R25J 100 Ω
R103	7010001110	Resistor	R25J 470 Ω
R104	7010000830	Resistor	R25J 2.2 Ω
R105	7010000870	Resistor	R25J 4.7 Ω

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R106	7010004940	Resistor	ELR25J 68 Ω
R107	7010000170	Resistor	ELR25J 22 Ω
R108	7010000170	Resistor	ELR25J 22 Ω
R109	7010004940	Resistor	ELR25J 68 Ω
R110	7080000650	Resistor	RSS1P 3R3 Ω
R111	7080000650	Resistor	RSS1P 3R3 Ω
R112	7080000650	Resistor	RSS1P 3R3 Ω
R113	7080000650	Resistor	RSS1P 3R3 Ω
R114	7010004650	Resistor	R50XJ 10 Ω
R115	7010004650	Resistor	R50XJ 10 Ω
R116	7080000650	Resistor	RSS1P 3R3 Ω
R117	7080000650	Resistor	RSS1P 3R3 Ω
R118	7010001340	Resistor	R25J 33 kΩ
R119	7010001150	Resistor	R25J 1 kΩ
R120	7100000510	Resistor	CP-5AJ 0.012 Ω
R121	7010001150	Resistor	R25J 1 kΩ
R122	7070000250	Resistor	CRH200 R-02J 4.7 Ω (4R7)
R123	7310000710	Trimmer	RH0651C13J1YA (102)
R124	7010004720	Resistor	R50XJ 100 Ω
R125	7100000010	Resistor	SRW1P 0R1 Ω (0R1)
R127	7310000680	Trimmer	RH0651C12J04A (101)
R128	7010004700	Resistor	R50XJ 68 Ω
R129	7010000130	Resistor	ELR25J 10 Ω
R130	7010000040	Resistor	ELR25J 1.8 Ω
R131	7010000170	Resistor	ELR25J 22 Ω
R132	7010004720	Resistor	R50XJ 100 Ω
R133	7010000410	Resistor	ELR25J 2.2 kΩ
R134	7010004730	Resistor	R50XJ 120 Ω
R146	7080000680	Resistor	RSF1B 220 ΩJ
R148	7010004650	Resistor	R50XJ 10 Ω
R149	7080000690	Resistor	RSF2B 15 ΩJ
R201	7100000540	Resistor	CP-5AJ 68 Ω
R202	7010004320	Resistor	R20J 10 kΩ
R203	7010004190	Resistor	R20J 1 kΩ
R204	7010003400	Resistor	ELR20J 1 kΩ
R205	7070000540	Resistor	CRH200 R-02J 27 Ω (270)
R206	7540000010	Absorber	DSA-301LA
R207	7010004190	Resistor	R20J 1 kΩ
R208	7010003530	Resistor	ELR20J 10 kΩ
R209	7010004130	Resistor	R20J 330 Ω
R210	7010004270	Resistor	R20J 4.7 kΩ
R211	7010003280	Resistor	ELR20J 100 Ω
R212	7010003260	Resistor	ELR20J 68 Ω
R213	7010004390	Resistor	R20J 33 kΩ
R214	7010004130	Resistor	R20J 330 Ω
R215	7010003600	Resistor	ELR20J 33 kΩ
R401	7010004270	Resistor	R20J 4.7 kΩ
R402	7010004270	Resistor	R20J 4.7 kΩ
R403	7010004190	Resistor	R20J 1 kΩ
R404	7010004370	Resistor	R20J 22 kΩ
R405	7010003360	Resistor	ELR20J 470 Ω
R406	7010004250	Resistor	R20J 3.3 kΩ
R407	7010003510	Resistor	ELR20J 6.8 kΩ
C1	4550000010	Tantalum	DN 1C 4R7M
C2	4550000010	Tantalum	DN 1C 4R7M
C3	4040000250	Barrier Layer	UAT 08X 473M
C4	4040000250	Barrier Layer	UAT 08X 473M
C5	4040000260	Barrier Layer	UZE 08X 104M
C6	4040000260	Barrier Layer	UZE 08X 104M
C7	4050000050	Feed through	TF318-452E102GMV
C8	4050000050	Feed through	TF318-452E102GMV
C9	4050000050	Feed through	TF318-452E102GMV
C10	4050000050	Feed through	TF318-452E102GMV
C101	4010000510	Ceramic	DD106 B 222K 50V
C102	4040000280	Barrier Layer	UAT 04V 122K
C103	4040000260	Barrier Layer	UZE 08X 104M
C104	4310000020	Mylar	F2D 50V 103K
C105	4310000020	Mylar	F2D 50V 103K
C106	4020000150	Cylinder	UP125 SL 101J
C107	4030001330	Ceramic	GR43 CH 471K
C108	4030001370	Ceramic	GR44 CH 682K
C109	4030001370	Ceramic	GR44 CH 682K
C110	4040000440	Barrier Layer	RAU 06SA 561K

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C112	4030001330	Ceramic	GR43 CH 471K
C113	4320000450	Dip Mica	DM19C 821J5
C114	4030001340	Ceramic	GR44 CH 102K
C116	4010000590	Ceramic	DD110 F 473Z 50V
C117	4040000250	Barrier Layer	UAT 08X 473M
C118	4510000310	Electrolytic	16 MS16 1000 µF (12.5X16)
C119	4030001420	Ceramic	GR44 Y5V 684Z
C120	4040000250	Barrier Layer	UAT 08X 473M
C121	4510002720	Electrolytic	10 SS 47 µF
C122	4510002780	Electrolytic	16 SS 10 µF
C123	4040000250	Barrier Layer	UAT 08X 473M
C124	4040000250	Barrier Layer	UAT 08X 473M
C125	4510002380	Electrolytic	16 SS 470 µF (10X12.5)
C126	4040000250	Barrier Layer	UAT 08X 473M
C127	4510002780	Electrolytic	16 SS 10 µF
C128	4040000260	Barrier Layer	UZE 08X 104M
C129	4010000520	Ceramic	DD108 B 472K 50V
C130	4040000250	Barrier Layer	UAT 08X 473M
C131	4040000260	Barrier Layer	UZE 08X 104M
C132	4040000250	Barrier Layer	UAT 08X 473M
C133	4040000250	Barrier Layer	UAT 08X 473M
C153	4010004080	Ceramic	DD12 SL 271K 500V
C154	4010004080	Ceramic	DD12 SL 271K 500V
C158	4040000260	Barrier Layer	UZE 08X 104M
C201	4040000250	Barrier Layer	UAT 08X 473M
C202	4040000250	Barrier Layer	UAT 08X 473M
C203	4010000520	Ceramic	DD108 B 472K 50V
C204	4040000250	Barrier Layer	UAT 08X 473M
C205	4040000250	Barrier Layer	UAT 08X 473M
C206	4010000520	Ceramic	DD108 B 472K 50V
C207	4010004210	Ceramic	DD63 YZ 203Z 500V
C208	4010000520	Ceramic	DD108 B 472K 50V
C209	4010000520	Ceramic	DD108 B 472K 50V
C210	4010000520	Ceramic	DD108 B 472K 50V
C211	4010000520	Ceramic	DD108 B 472K 50V
C212	4010000150	Ceramic	DD104 SL 150J 50V
C213	4010000150	Ceramic	DD104 SL 150J 50V
C214	4010000330	Ceramic	DD105 SL 101J 50V
C215	4040000260	Barrier Layer	UZE 08X 104M
C216	4010000520	Ceramic	DD108 B 472K 50V
C217	4010004210	Ceramic	DD63 YZ 203Z 500V
C218	4040000260	Barrier Layer	UZE 08X 104M
C219	4010000520	Ceramic	DD108 B 472K 50V
C220	4010000520	Ceramic	DD108 B 472K 50V
C301	4530000150	Capacitor Array	B7ZC0711-32N
C302	4010000520	Ceramic	DD108 B 472K 50V
C303	4010000520	Ceramic	DD108 B 472K 50V
C304	4010000520	Ceramic	DD108 B 472K 50V
C305	4010000520	Ceramic	DD108 B 472K 50V
C306	4010000410	Ceramic	DD107 SL 331J 50V
C307	4010000520	Ceramic	DD108 B 472K 50V
C308	4010000520	Ceramic	DD108 B 472K 50V
C309	4010000520	Ceramic	DD108 B 472K 50V
C401	4310000120	Mylar	F2D 50V 473K
C402	4310000110	Mylar	F2D 50V 472K
C403	4010000520	Ceramic	DD108 B 472K 50V
C404	4510001100	Electrolytic	16 MS7 10 µF
C405	4010000330	Ceramic	DD105 SL 101J 50V
C406	4010000330	Ceramic	DD105 SL 101J 50V
C407	4510001170	Electrolytic	50 MS7 2R2 µF
C408	4010000520	Ceramic	DD108 B 472K 50V
C409	4010000520	Ceramic	DD108 B 472K 50V
C410	4010000520	Ceramic	DD108 B 472K 50V
RL201	6330000520	Relay	UPM-12905Y
RL202	6330000070	Relay	FBR21D12-P
RL203	6330000620	Relay	SY-12
F1	5220000110	Holder	TFH-S30
F2	5210000060	Fuse	FGB 5A
F3	5220000110	Holder	TFH-S30
F4	5210000040	Fuse	FGB 2A

[PA UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
F5	5220000050	Holder	FH-032C
F6	5210000070	Fuse	FGB 10A (U.S.A.)
	5210000060	Fuse	FGB 5A (Other versions)
S101	6910000040	Thermostat	OHD 90M
S102	6910000030	Thermostat	OHD 50M
MF1	2710000050	Fan Motor	M6B12U22
EP1	6910000640	Bead core	FSOH090RN
EP7	6910000600	Bead core	FSOH050RN
EP101	0910005804	P.C. Board	B 702D (PA)
EP103	6910000600	Bead core	FSOH050RN
EP109	6910000600	Bead core	FSOH050RN
EP110	6910000600	Bead core	FSOH050RN
EP111	6910000600	Bead core	FSOH050RN
EP114	6910000630	Bead core	FSOH070RN
EP201	6910000630	Bead core	FSOH070RN
EP203	0910021182	P.C. Board	B 2019B (ANT SW)
EP301	0910021193	P.C. Board	B 2020C (ACC)
EP401	0910021172	P.C. Board	B 2018B (KEYER)

[TUNER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC101	1140000980	IC	µPD7533C-077
IC102	1110001791	IC	TA7279P
IC103	1110001870	IC	NJM2902N
IC104	1180000060	IC	NJM78L05A
IC105	1120000970	IC	M54562P
IC108	1130001100	IC	µPD4063BC
IC109	1130000620	IC	µPD4011BC
IC110	1130000620	IC	µPD4011BC
IC111	1120000970	IC	M54562P
IC112	1160000010	IC	DAN401
IC113	1160000010	IC	DAN401
IC201	1120000290	IC	SN74S132N
IC202	1120001640	IC	SN74S32N
IC203	1120000500	IC	SN74S112N
IC204	1180000010	IC	TA78L005AP
Q101	1520000060	Transistor	2SB562C
Q102	1590000340	Transistor	RN1202
Q103	1590000340	Transistor	RN1202
Q104	1590000340	Transistor	RN1202
Q105	1510000080	Transistor	2SA1048-GR
Q106	1530000110	Transistor	2SC2458-GR
Q107	1590000350	Transistor	RN1204
Q108	1520000060	Transistor	2SB562C
Q109	1520000060	Transistor	2SB562C
Q110	1590000340	Transistor	RN1202
Q201	1530000690	Transistor	2SC1740 S
Q202	1530000690	Transistor	2SC1740 S
Q203	1560000040	FET	2SK30ATM-Y
D1	1710000350	Diode	1N4002
D2	1710000350	Diode	1N4002
D101	1710000030	Diode	1S1555
D102	1710000030	Diode	1S1555
D103	1710000030	Diode	1S1555
D104	1710000030	Diode	1S1555
D105	1710000030	Diode	1S1555
D106	1710000030	Diode	1S1555
D107	1710000030	Diode	1S1555

[TUNER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D109	1710000030	Diode	1S1555
D110	1710000030	Diode	1S1555
D111	1710000030	Diode	1S1555
D112	1710000030	Diode	1S1555
D113	1710000030	Diode	1S1555
D114	1710000030	Diode	1S1555
D115	1710000030	Diode	1S1555
D116	1710000030	Diode	1S1555
D117	1710000030	Diode	1S1555
D118	1710000030	Diode	1S1555
D119	1730000190	Zener	RD8.2E B3
D120	1710000030	Diode	1S1555
D121	1710000030	Diode	1S1555
D122	1710000030	Diode	1S1555
D123	1710000030	Diode	1S1555
D124	1710000030	Diode	1S1555
D125	1710000030	Diode	1S1555
D126	1710000030	Diode	1S1555
D127	1710000030	Diode	1S1555
D128	1710000030	Diode	1S1555
D129	1710000030	Diode	1S1555
D130	1710000030	Diode	1S1555
D131	1710000030	Diode	1S1555
D132	1730000100	Zener	RD5.1E B2
D133	1730000210	Zener	RD9.1E B3
D201	1710000330	Diode	1K60
D202	1710000330	Diode	1K60
D203	1710000330	Diode	1K60
D204	1710000330	Diode	1K60
X101	6060000160	Ceramic resonator	CSB500E
L1	6110001220	Coil	LA-162
L2	6140001830	Coil	LR-219
L3	6180000990	Coil	LAL 04NA 101K
L101	6180000990	Coil	LAL 04NA 101K
L102	6180000990	Coil	LAL 04NA 101K
L103	6180000990	Coil	LAL 04NA 101K
L104	6180000990	Coil	LAL 04NA 101K
L105	6180000990	Coil	LAL 04NA 101K
L106	6180000990	Coil	LAL 04NA 101K
L107	6180000990	Coil	LAL 04NA 101K
L108	6180000990	Coil	LAL 04NA 101K
L109	6180000990	Coil	LAL 04NA 101K
L110	6180000900	Coil	LAL 03NA 101K
L111	6910000670	Coil	BT01RN1-A61-001
L112	6180000990	Coil	LAL 04NA 101K
L113	6180000990	Coil	LAL 04NA 101K
L114	6180000990	Coil	LAL 04NA 101K
L115	6180000990	Coil	LAL 04NA 101K
L116	6180000990	Coil	LAL 04NA 101K
L117	6180000990	Coil	LAL 04NA 101K
L118	6180000990	Coil	LAL 04NA 101K
L119	6180000990	Coil	LAL 04NA 101K
L120	6180000900	Coil	LAL 03NA 101K
L201	6140001030	Coil	LR-127A
L202	6180000450	Coil	RFC L6 222K
L204	6180001120	Coil	FL 5H 101K
L205	6170000330	Coil	LW-18A
L206	6170000330	Coil	LW-18A
R1	7070000550	Resistor	CRH200 R-02J 10 kΩ (103)
R3	7010001150	Resistor	R25J 1 kΩ
R4	7310001050	Trimmer	EVH60AF15B14
R5	7310001050	Trimmer	EVH60AF15B14
R101	7080000420	Resistor	CRB25FX 100 kΩ
R102	7080000630	Resistor	CRB25FX 1 MΩ
R103	7010004450	Resistor	R20J 100 kΩ
R104	7080000420	Resistor	CRB25FX 100 kΩ
R105	7310001710	Trimmer	RH0421C14J0KA (103)
R106	7080000420	Resistor	CRB25FX 100 kΩ
R107	7080001100	Resistor	CRB25FX 680 kΩ

[TUNER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R108	7010004450	Resistor	R20J 100 kΩ
R109	7080000420	Resistor	CRB25FX 100 kΩ
R110	7310001710	Trimmer	RH0421C14J0KA (103)
R111	7010004230	Resistor	R20J 2.2 kΩ
R112	7010003510	Resistor	ELR20J 6.8 kΩ
R113	7010004230	Resistor	R20J 2.2 kΩ
R114	7010004070	Resistor	R20J 100 Ω
R115	7010004070	Resistor	R20J 100 Ω
R116	7010004070	Resistor	R20J 100 Ω
R117	7010004070	Resistor	R20J 100 Ω
R118	7010004070	Resistor	R20J 100 Ω
R119	7010004070	Resistor	R20J 100 Ω
R120	7010004070	Resistor	R20J 100 Ω
R121	7010004070	Resistor	R20J 100 Ω
R122	7010003530	Resistor	ELR20J 10 kΩ
R123	7010004320	Resistor	R20J 10 kΩ
R124	7010004190	Resistor	R20J 1 kΩ
R125	7010004190	Resistor	R20J 1 kΩ
R126	7010004190	Resistor	R20J 1 kΩ
R127	7010003530	Resistor	ELR20J 10 kΩ
R128	7010004320	Resistor	R20J 10 kΩ
R129	7010004390	Resistor	R20J 33 kΩ
R130	7010004410	Resistor	R20J 47 kΩ
R131	7410000160	Resistor Array	RMX- 7 473K
R132	7010003530	Resistor	ELR20J 10 kΩ
R133	7010004320	Resistor	R20J 10 kΩ
R134	7010003400	Resistor	ELR20J 1 kΩ
R135	7010004410	Resistor	R20J 47 kΩ
R136	7010004320	Resistor	R20J 10 kΩ
R137	7010004270	Resistor	R20J 4.7 kΩ
R138	7310000640	Trimmer	RH0621CJ3J1GA (222)
R139	7010004200	Resistor	R20J 1.2 kΩ
R142	7010004550	Resistor	R20J 680 kΩ
R143	7010004550	Resistor	R20J 680 kΩ
R144	7010004410	Resistor	R20J 47 kΩ
R145	7010004410	Resistor	R20J 47 kΩ
R147	7010003620	Resistor	ELR20J 47 kΩ
R148	7010003620	Resistor	ELR20J 47 kΩ
R149	7010003530	Resistor	ELR20J 10 kΩ
R150	7010003530	Resistor	ELR20J 10 kΩ
R151	7010003400	Resistor	ELR20J 1 kΩ
R152	7010003400	Resistor	ELR20J 1 kΩ
R153	7010003400	Resistor	ELR20J 1 kΩ
R154	7010003400	Resistor	ELR20J 1 kΩ
R155	7010004190	Resistor	R20J 1 kΩ
R156	7010004190	Resistor	R20J 1 kΩ
R157	7010004190	Resistor	R20J 1 kΩ
R158	7080000210	Resistor	CRB25FX 750 Ω
R159	7080000240	Resistor	CRB25FX 1.8 kΩ
R160	7080000250	Resistor	CRB25FX 3.3 kΩ
R161	7080000270	Resistor	CRB25FX 5.6 kΩ
R162	7080000290	Resistor	CRB25FX 10 kΩ
R163	7010003480	Resistor	ELR20J 4.7 kΩ
R164	7010004410	Resistor	R20J 47 kΩ
R165	7010004410	Resistor	R20J 47 kΩ
R166	7010004370	Resistor	R20J 22 kΩ
R167	7010004320	Resistor	R20J 10 kΩ
R168	7010003620	Resistor	ELR20J 47 kΩ
R169	7010004410	Resistor	R20J 47 kΩ
R170	7010003620	Resistor	ELR20J 47 kΩ
R171	7010000310	Resistor	ELR25J 330 Ω
R172	7010003630	Resistor	ELR20J 56 kΩ
R173	7010004410	Resistor	R20J 47 kΩ
R201	7010004680	Resistor	R50XJ 33 Ω
R202	7010000500	Resistor	ELR25J 10 kΩ
R203	7010000500	Resistor	ELR25J 10 kΩ
R204	7010001150	Resistor	R25J 1 kΩ
R205	7010000200	Resistor	ELR25J 39 Ω
R206	7010000520	Resistor	ELR25J 15 kΩ
R207	7010000510	Resistor	ELR25J 12 kΩ
R208	7010000270	Resistor	ELR25J 150 Ω
R209	7010000520	Resistor	ELR25J 15 kΩ
R210	7010000510	Resistor	ELR25J 12 kΩ
R212	7010001190	Resistor	R25J 2.2 kΩ
R213	7010000410	Resistor	ELR25J 2.2 kΩ

[TUNER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R214	7010001150	Resistor	R25J 1 kΩ
R215	7010000750	Resistor	ELR25J 1 MΩ
R216	7010000500	Resistor	ELR25J 10 kΩ
R217	7010000450	Resistor	ELR25J 4.7 kΩ
C1	4010000520	Ceramic	DD108 B 472K 50V
C2	4010004270	Ceramic	DE1107 SL 121J 3KV
C3	4010004270	Ceramic	DE1107 SL 121J 3KV
C4	4010004250	Ceramic	DE1007 SL 101J 3KV
C5	4010004250	Ceramic	DE1007 SL 101J 3KV
C15	4040000250	Barrier Layer	UAT 08X 473M
C16	4040000250	Barrier Layer	UAT 08X 473M
C17	4620000030	Variable Capacitor	UV44 200PF
C18	4620000030	Variable Capacitor	UV44 200PF
C101	4040000250	Barrier Layer	UAT 08X 473M
C102	4040000250	Barrier Layer	UAT 08X 473M
C103	4010000380	Ceramic	DD107 SL 221J 50V
C104	4010000380	Ceramic	DD107 SL 221J 50V
C105	4040000250	Barrier Layer	UAT 08X 473M
C106	4530000270	Capacitor Array	B8XC0114-32N
C107	4530000270	Capacitor Array	B8XC0114-32N
C108	4530000030	Capacitor Array	B5RC0124-32N
C109	4040000250	Barrier Layer	UAT 08X 473M
C110	4510002640	Electrolytic	25 SS 47 µF
C111	4510002640	Electrolytic	25 SS 47 µF
C112	4040000260	Barrier Layer	UZE 08X 104M
C113	4040000250	Barrier Layer	UAT 08X 473M
C114	4040000250	Barrier Layer	UAT 08X 473M
C115	4040000250	Barrier Layer	UAT 08X 473M
C116	4510002640	Electrolytic	25 SS 47 µF
C117	4510001120	Electrolytic	25 MS7 4R7 µF
C118	4040000260	Barrier Layer	UZE 08X 104M
C119	4040000260	Barrier Layer	UZE 08X 104M
C120	4010000380	Ceramic	DD107 SL 221J 50V
C121	4010000380	Ceramic	DD107 SL 221J 50V
C122	4040000260	Barrier Layer	UZE 08X 104M
C123	4040000260	Barrier Layer	UZE 08X 104M
C124	4040000260	Barrier Layer	UZE 08X 104M
C125	4040000260	Barrier Layer	UZE 08X 104M
C126	4040000260	Barrier Layer	UZE 08X 104M
C127	4510002950	Electrolytic	50 SS 2R2 µF
C128	4010000460	Ceramic	DD104 B 471K 50V
C129	4010000460	Ceramic	DD104 B 471K 50V
C130	4040000260	Barrier Layer	UZE 08X 104M
C131	4040000260	Barrier Layer	UZE 08X 104M
C132	4040000350	Barrier Layer	UAT 05V 472K
C133	4040000260	Barrier Layer	UZE 08X 104M
C134	4040000260	Barrier Layer	UZE 08X 104M
C135	4510002830	Electrolytic	25 SS 4R7 µF
C136	4530000350	Capacitor Array	B8ZC0111-32N
C137	4510002830	Electrolytic	25 SS 4R7 µF
C138	4010000520	Ceramic	DD108 B 472K 50V
C139	4510001180	Electrolytic	50 MS7 3R3 µF
C201	4010004310	Ceramic	DE0705 SL 100D 1KV
C203	4010003860	Ceramic	DD06 SL 100D 500V
C204	4010000410	Ceramic	DD107 SL 331J 50V
C205	4610000480	Trimmer	BW 3P 210P
C206	4010000520	Ceramic	DD108 B 472K 50V
C207	4010000520	Ceramic	DD108 B 472K 50V
C208	4010000520	Ceramic	DD108 B 472K 50V
C209	4010000520	Ceramic	DD108 B 472K 50V
C210	4010000520	Ceramic	DD108 B 472K 50V
C211	4010000520	Ceramic	DD108 B 472K 50V
C212	4010000520	Ceramic	DD108 B 472K 50V
C213	4010000520	Ceramic	DD108 B 472K 50V
C214	4010000520	Ceramic	DD108 B 472K 50V
C215	4010000520	Ceramic	DD108 B 472K 50V
C216	4510002840	Electrolytic	25 SS 10 µF
C217	4510002840	Electrolytic	25 SS 10 µF
C218	4010000520	Ceramic	DD108 B 472K 50V
C222	4010000520	Ceramic	DD108 B 472K 50V
C223	4010000500	Ceramic	DD104 B 102K 50V

[TUNER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
RL1	6330000120	Relay	FBR323D012
RL2	6330000120	Relay	FBR323D012
RL3	6330000830	Relay	JY-12H-K-DW
RL7	6330000080	Relay	FBR313D012-22
RL8	6330000080	Relay	FBR313D012-22
RL9	6330000080	Relay	FBR313D012-22
RL10	6330000080	Relay	FBR313D012-22
RL11	6330000080	Relay	FBR313D012-22
RL12	6330000100	Relay	FBR311D012
RL13	6330000490	Relay	LY2-0 DC12V
MF1	8930000880	Motor	HMK2601-01-030
MF2	8930000880	Motor	HMK2601-01-030
BT101	3020000020	Lithium Battery	BR2032-1T2
EP1	0910011602	P.C. Board	B 1028B (RELAY)
EP2	6910000630	Bead core	FSOH070RN
EP3	6910000630	Bead core	FSOH070RN
EP101	0910021162	P.C. Board	B 2017B (TUC)
EP102	6910000600	Bead core	FSOH050RN
EP201	0910022021	P.C. Board	B 2159A (T DET)

[FILTER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D1	1710000330	Diode	1K60
D2	1710000330	Diode	1K60
D3	1710000350	Diode	1N4002
D4	1710000350	Diode	1N4002
D5	1710000350	Diode	1N4002
D6	1710000350	Diode	1N4002
D7	1710000350	Diode	1N4002
D8	1710000350	Diode	1N4002
D9	1710000350	Diode	1N4002
L2	6140000270	Coil	LR-47
L3	6140000270	Coil	LR-47
L5	6140001130	Coil	LR-138
L6	6140001140	Coil	LR-139
L7	6140001150	Coil	LR-140
L8	6140001160	Coil	LR-141
L9	6140001160	Coil	LR-141
L10	6140000680	Coil	LR-90
L11	6140000690	Coil	LR-91
L12	6140000330	Coil	LR-53
L13	6140000340	Coil	LR-54
L14	6110001260	Coil	LA-166
L15	6110001250	Coil	LA-165
L16	6110001280	Coil	LA-168
L17	6110001270	Coil	LA-167
L18	6140000100	Coil	LR-22A
L19	6180000450	Coil	RFC L6 222K
L20	6180000990	Coil	LAL 04NA 101K
L21	6180001120	Coil	FL 5H 101K
L22	6180001120	Coil	FL 5H 101K
L23	6180001120	Coil	FL 5H 101K
L24	6180001120	Coil	FL 5H 101K
L25	6180001120	Coil	FL 5H 101K
L26	6180001120	Coil	FL 5H 101K
L27	6180001120	Coil	FL 5H 101K
L28	6180001100	Coil	FL 4H 100K
L29	6180001100	Coil	FL 4H 100K
L30	6180001100	Coil	FL 4H 100K

[FILTER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
L31	6180001100	Coil	FL 4H 100K
L32	6180001100	Coil	FL 4H 100K
L33	6180001100	Coil	FL 4H 100K
L34	6110001700	Coil	LA-256
L35	6140001110	Coil	LR-136
R1	7010004700	Resistor	R50XJ 68 Ω
R2	7010001240	Resistor	R25J 5.6 kΩ
R3	7010001240	Resistor	R25J 5.6 kΩ
R4	7010000600	Resistor	ELR25J 56 kΩ
R5	7010000600	Resistor	ELR25J 56 kΩ
R7	7010004690	Resistor	R50XJ 47 Ω
C1	4320000310	Dip Mica	DM20C 182J5
C2	4320000200	Dip Mica	DM19C 471J5
C3	4320000320	Dip Mica	DM20C 222J5
C4	4010004030	Ceramic	DD10 SL 121K 500V
C5	4320000280	Dip Mica	DM20C 122J5
C6	4320000210	Dip Mica	DM19C 561J5
C7	4010004070	Ceramic	DD12 SL 221K 500V
C8	4320000280	Dip Mica	DM20C 122J5
C9	4010003990	Ceramic	DD09 SL 680K 500V
C10	4320000220	Dip Mica	DM19C 681J5
C11	4320000200	Dip Mica	DM19C 471J5
C12	4010004030	Ceramic	DD10 SL 121K 500V
C13	4320000210	Dip Mica	DM19C 561J5
C14	4010003990	Ceramic	DD09 SL 680K 500V
C15	4010004080	Ceramic	DD12 SL 271K 500V
C16	4010004070	Ceramic	DD12 SL 221K 500V
C17	4010003960	Ceramic	DD06 SL 390K 500V
C18	4320000200	Dip Mica	DM19C 471J5
C19	4010003990	Ceramic	DD09 SL 680K 500V
C20	4010004070	Ceramic	DD12 SL 221K 500V
C21	4010004050	Ceramic	DD12 SL 181K 500V
C22	4010003890	Ceramic	DD06 SL 180K 500V
C23	4010004100	Ceramic	DD14 SL 331K 500V
C24	4010004030	Ceramic	DD10 SL 121K 500V
C25	4010004050	Ceramic	DD12 SL 181K 500V
C26	4010003990	Ceramic	DD09 SL 680K 500V
C27	4010003860	Ceramic	DD06 SL 100D 500V
C28	4010004070	Ceramic	DD12 SL 221K 500V
C29	4010003970	Ceramic	DD07 SL 470K 500V
C30	4010004010	Ceramic	DD09 SL 101K 500V
C31	4010004000	Ceramic	DD09 SL 820K 500V
C32	4010003860	Ceramic	DD06 SL 100D 500V
C33	4010004000	Ceramic	DD09 SL 820K 500V
C34	4010003950	Ceramic	DD06 SL 330K 500V
C35	4010003990	Ceramic	DD09 SL 680K 500V
C36	4610000240	Trimmer	ECV1ZW 20X40
C37	4010000350	Ceramic	DD106 SL 151J 50V
C38	4010000500	Ceramic	DD104 B 102K 50V
C39	4010000500	Ceramic	DD104 B 102K 50V
C40	4010004000	Ceramic	DD09 SL 820K 500V
C41	4010004030	Ceramic	DD10 SL 121K 500V
C42	4040000250	Barrier Layer	UAT 08X 473M
C43	4040000250	Barrier Layer	UAT 08X 473M
C44	4040000250	Barrier Layer	UAT 08X 473M
C45	4040000250	Barrier Layer	UAT 08X 473M
C46	4040000250	Barrier Layer	UAT 08X 473M
C47	4040000250	Barrier Layer	UAT 08X 473M
C48	4040000250	Barrier Layer	UAT 08X 473M
C49	4040000250	Barrier Layer	UAT 08X 473M
C50	4010000520	Ceramic	DD108 B 472K 50V
C51	4010000520	Ceramic	DD108 B 472K 50V
C52	4010000520	Ceramic	DD108 B 472K 50V
C53	4010000520	Ceramic	DD108 B 472K 50V
C54	4010000520	Ceramic	DD108 B 472K 50V
C55	4010000520	Ceramic	DD108 B 472K 50V
C56	4010004100	Ceramic	DD14 SL 331K 500V
C57	4010004010	Ceramic	DD09 SL 101K 500V
RL1	6330000080	Relay	FBR313D012-22

[FILTER UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
RL2	6330000080	Relay	FBR313D012-22
RL3	6330000080	Relay	FBR313D012-22
RL4	6330000080	Relay	FBR313D012-22
RL5	6330000080	Relay	FBR313D012-22
RL6	6330000080	Relay	FBR313D012-22
RL7	6330000080	Relay	FBR313D012-22
RL8	6330000080	Relay	FBR313D012-22
RL9	6330000080	Relay	FBR313D012-22
RL10	6330000080	Relay	FBR313D012-22
RL11	6330000080	Relay	FBR313D012-22
RL12	6330000080	Relay	FBR313D012-22
RL13	6330000080	Relay	FBR313D012-22
RL14	6330000100	Relay	FBR311D012
EP1	0910011649	P.C. Board	B 703I (FILTER)
EP5	6910000630	Bead core	FSOH070RN

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1710000320	Photo Interrupter	N110
IC2	1110000190	IC	μPC1042C
Q1	1510000050	Transistor	2SA1015-Y
Q2	1530002160	Transistor	2SC3162 (U.S.A. only)
	1530002300	Transistor	2SC4051
Q3	1530002160	Transistor	2SC3162 (U.S.A. only)
	1530002300	Transistor	2SC4051
Q4	1530000750	Transistor	2SC2307
Q5	1530000750	Transistor	2SC2307
D1	1790000190	Diode	KBPC806
D2	1710000350	Diode	1N4002
D3	1710000350	Diode	1N4002
D4	1710000200	Diode	40F2R15
L2	6140000460	Coil	LR-66
L3	6140000470	Coil	LR-67
L4	6180000280	Coil	LB4-102J
L5	6140000450	Coil	LR-65A
L6	5920000080	Coil	TC-2A
R1	7010004800	Resistor	R50XJ 68 kΩ
R2	7010004800	Resistor	R50XJ 68 kΩ
R3	7010004810	Resistor	R50XJ 150 kΩ
R4	7010001380	Resistor	R25J 68 kΩ
R5	7100000120	Resistor	SRW2P 3 Ω (3R0)
R6	7010000190	Resistor	ELR25J 33 Ω
R7	7010001210	Resistor	R25J 3.3 kΩ
R9	7010000500	Resistor	ELR25J 10 kΩ
R10	7010000450	Resistor	ELR25J 4.7 kΩ
R11	7010000330	Resistor	ELR25J 470 Ω
R12	7010004800	Resistor	R50XJ 68 kΩ
R13	7010004800	Resistor	R50XJ 68 kΩ
R14	7310000970	Trimmer	EVN5AC A00B14 (10 kΩ)
R15	7010000520	Resistor	ELR25J 15 kΩ
R16	7010000450	Resistor	ELR25J 4.7 kΩ
R17	7010000450	Resistor	ELR25J 4.7 kΩ
R18	7010000450	Resistor	ELR25J 4.7 kΩ
R19	7310000990	Trimmer	EVN5AC A00BQ4 (47 kΩ)
R20	7010000500	Resistor	ELR25J 10 kΩ
R21	7010000480	Resistor	ELR25J 6.8 kΩ (U.S.A. only)

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R21	7010003510	Resistor	ELR20J 6.8 kΩ
R22	7010000440	Resistor	ELR25J 3.9 kΩ (U.S.A. only)
R23	7010003700	Resistor	ELR20J 220 kΩ
R23	7010000670	Resistor	ELR25J 220 kΩ (U.S.A. only)
R24	7010000500	Resistor	ELR25J 10 kΩ
R25	7010000330	Resistor	ELR25J 470 Ω
R26	8930003890	Resistor	0.001 5 W
R27	7010000520	Resistor	ELR25J 15 kΩ
R28	7010000090	Resistor	ELR25J 4.7 Ω
R29	7010000090	Resistor	ELR25J 4.7 Ω
R30	7010000870	Resistor	R25J 4.7 Ω
R31	7010000870	Resistor	R25J 4.7 Ω
R32	7010000950	Resistor	R25J 22 Ω
R33	7010000950	Resistor	R25J 22 Ω
R34	7080000100	Resistor	RSF3B 100 ΩJ
R35	7070000260	Resistor	CRH200 R-02J 22 Ω (220)
R36	7070000240	Resistor	CRH100X R-02J 3.9 Ω (3R9)
R37	7540000030	Absorber	ERZC07DK431
C1	4010004240	Ceramic	DE7100 F 222M VA1-KC
C2	4010004240	Ceramic	DE7100 F 222M VA1-KC
C3	4010004130	Ceramic	DD09 B 222K 500V
C4	4010004130	Ceramic	DD09 B 222K 500V
C5	4010004130	Ceramic	DD09 B 222K 500V
C6	4010004130	Ceramic	DD09 B 222K 500V
C7	4510000350	Electrolytic	CS042DRT681 (HPF200 680 µF)
C8	4510000350	Electrolytic	CS042DRT681 (HPF200 680 µF)
C9	4510002780	Electrolytic	16 SS 10 µF
C10	4010000530	Ceramic	DD112 B 103K 50V
C11	4010000530	Ceramic	DD112 B 103K 50V
C12	4510000660	Electrolytic	25 MS 470 µF
C13	4030001210	Ceramic	C5650 Y5V 1H 684Z
C14	4510000570	Electrolytic	16 MS 2200 µF
C15	4010004440	Ceramic	DE7090 B 102K VA1-KC
C16	4010004440	Ceramic	DE7090 B 102K VA1-KC
C17	4010004210	Ceramic	DD63 YZ 203Z 500V
C18	4510000080	Electrolytic	250 RHJ 33 µF
C19	4510000080	Electrolytic	250 RHJ 33 µF
C20	4010004240	Ceramic	DE7100 F 222M VA1-KC
C21	4010000520	Ceramic	DD108 B 472K 50V
C22	4310000010	Mylar	F2D 50V 102K
C23	4510003050	Electrolytic	TMG 2G 335K (DC400V 3.3 µF)
C24	4010004130	Ceramic	DD09 B 222K 500V
C25	4010004130	Ceramic	DD09 B 222K 500V
C26	4010004130	Ceramic	DD09 B 222K 500V
C27	4010004470	Ceramic	DD12 B 472K 500V
C28	4010004210	Ceramic	DD63 YZ 203Z 500V
C29	4010000410	Ceramic	DD107 SL 331J 50V
C30	4510000090	Electrolytic	ECEA16Z470
C31	4510000090	Electrolytic	ECEA16Z470
C32	4510000090	Electrolytic	ECEA16Z470
C33	4510000090	Electrolytic	ECEA16Z470
C34	4510002840	Electrolytic	25 SS 10 µF
C35	4010004650	Ceramic	DD410 SR 224M 12V
C36	4010004650	Ceramic	DD410 SR 224M 12V
C37	4310000060	Mylar	F2D 50V 223K
RL1	6330000200	Relay	VS-12TBN-E
T1	5910000110	Transformer	TP-22
T2	5910000160	Transformer	TP-27
T3	5920000120	Transformer	TI-5

[REG UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
EP1	0910005212	P.C. Board	B 609B (REG)
EP8	6910000640	Bead core	FSOH090RN
EP9	6910000640	Bead core	FSOH090RN

SECTION 6 ADJUSTMENT PROCEDURES

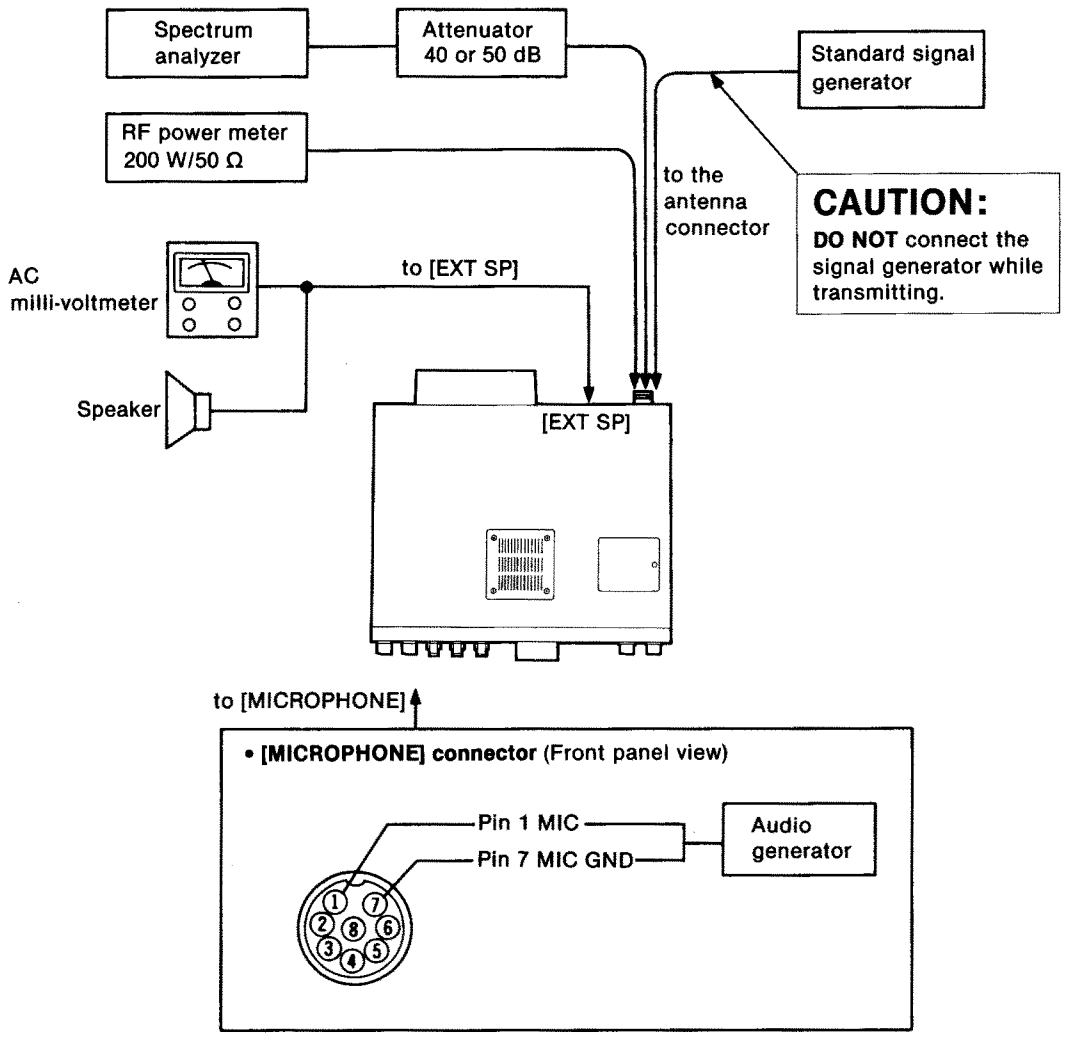
6-1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
RF power meter (terminated type)	Measuring range : 10~200 W Frequency range : 1.8~30 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	AC milli-voltmeter	Measuring range : 10 mV~10 V
		External speaker	Impedance : 8 Ω
		Ammeter	Measurement capability: 1 A and 30 A
Frequency counter	Frequency range : 0.1~100 MHz Frequency accuracy : ±1 ppm or better Sensitivity : 100 mV or better	Audio generator	Frequency range : 300~3000 Hz Output level : 1~500 mV
RF voltmeter	Frequency range : 0.1~100 MHz Measuring range : 0.01~10 V	Attenuator	Power attenuation : 40 or 50 dB Capacity : 150 W or more
Oscilloscope	Frequency range : DC~20 MHz Measuring range : 0.01~10 V	Spectrum analyzer	Frequency minimum : At least 90 MHz Spectrum bandwidth : ±100 kHz or more
Standard signal generator (SSG)	Frequency range : 0.1~30 MHz Output level : −127~−17 dBm (0.1 μV~32 mV)	Digital DC voltmeter	Input impedance : 10 MΩ/DC or better
		FM deviation meter	Frequency minimum : 30 MHz Mesuring range : 0~±10 kHz
DC voltmeter	Input impedance : 50 kΩ/DC or better		

CW: Clockwise
CCW: Counterclockwise

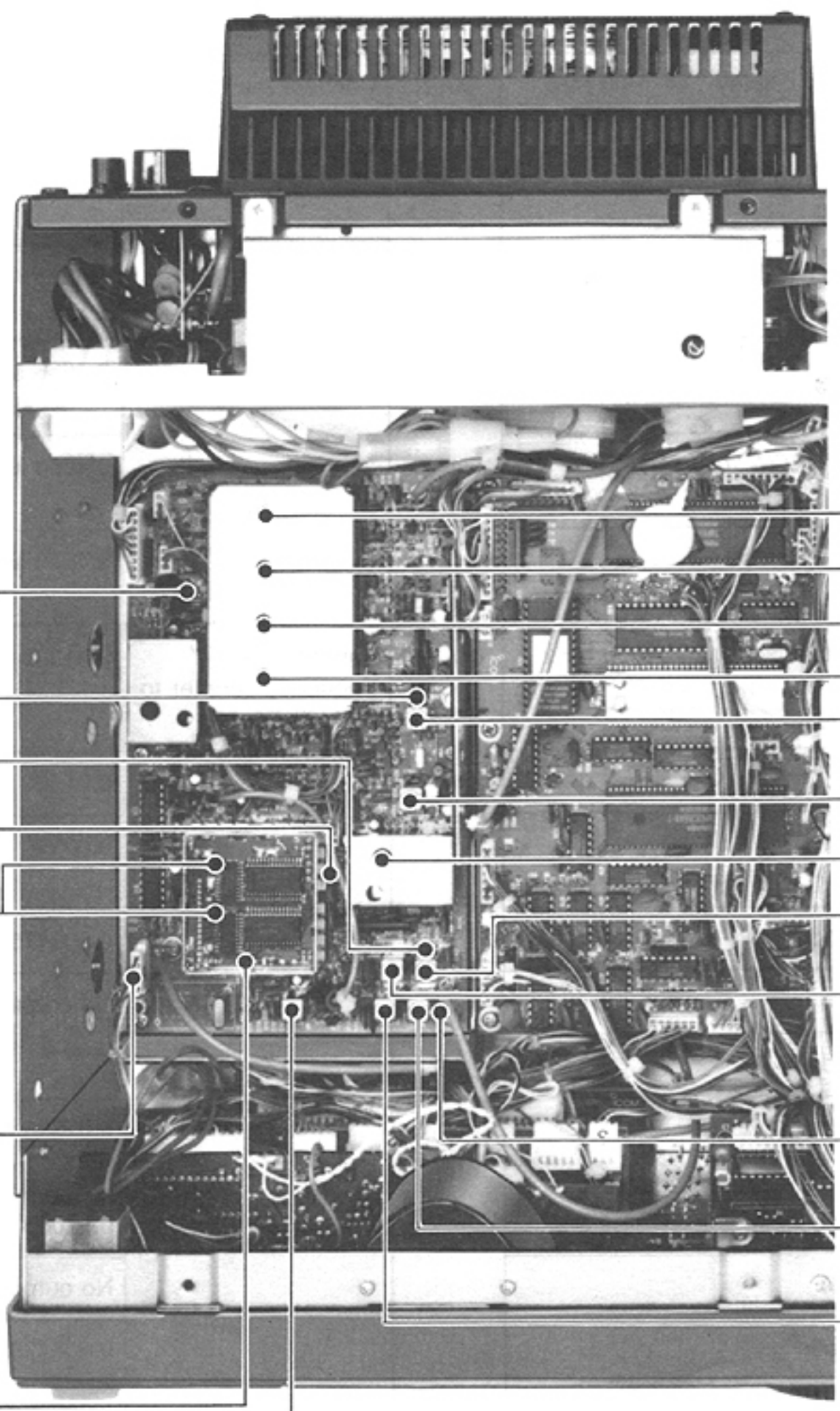
■ CONNECTION



6-2 PLL ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
DDS CLOCK	1	• Frequency display : 14.10000 MHz • USB mode • Receiving	DDS	Connect the frequency counter to IC4 pin 11 or IC5 pin 11.	5.24288 MHz	DDS	C1
DDS LOOP	1	• Frequency display : 8.00000 MHz • LSB mode • Receiving	PLL	Connect the RF voltmeter to R100.	Maximum waveform	PLL	L46, L47
	2			Connect the oscilloscope to R201.	1.1 V DC		C226
HPL LOCK VOLTAGE	1	• Frequency display : 7.99999 MHz • LSB mode	PLL	Connect the oscilloscope to R6.	6.5 V DC	PLL	C11
	2	• Frequency display : 14.99999 MHz					C20
	3	• Frequency display : 21.99999 MHz					C29
	4	• Frequency display : 29.99999 MHz					C37
	5	• Frequency display : 0.03000 MHz			More than 2 V DC		Verify
	6	• Frequency display : 8.00000 MHz					
	7	• Frequency display : 15.00000 MHz					
	8	• Frequency display : 22.00000 MHz					
HPL OUTPUT	1	• Frequency display : 8.00000 MHz • LSB mode • Receiving	PLL	Connect the RF voltmeter to R107.	Maximum level	PLL	L48, L49
REFERENCE FREQUENCY	1	• Frequency display : 8.00000 MHz • LSB mode • Receiving	PLL	Connect the DC voltmeter to J2 pin 2.	3 V	HATCH COVER	[CALIBRATOR] control
	2			Connect the frequency counter to J4.	60.00000 MHz	PLL	L45
2nd LO OUTPUT	1	• Frequency display : 8.00000 MHz • LSB mode • Receiving	PLL	Terminate P4 to ground with a 50 Ω resistor. Connect the RF voltmeter to P4.	More than −10 dBm	PLL	L50, L51

PLL UNIT



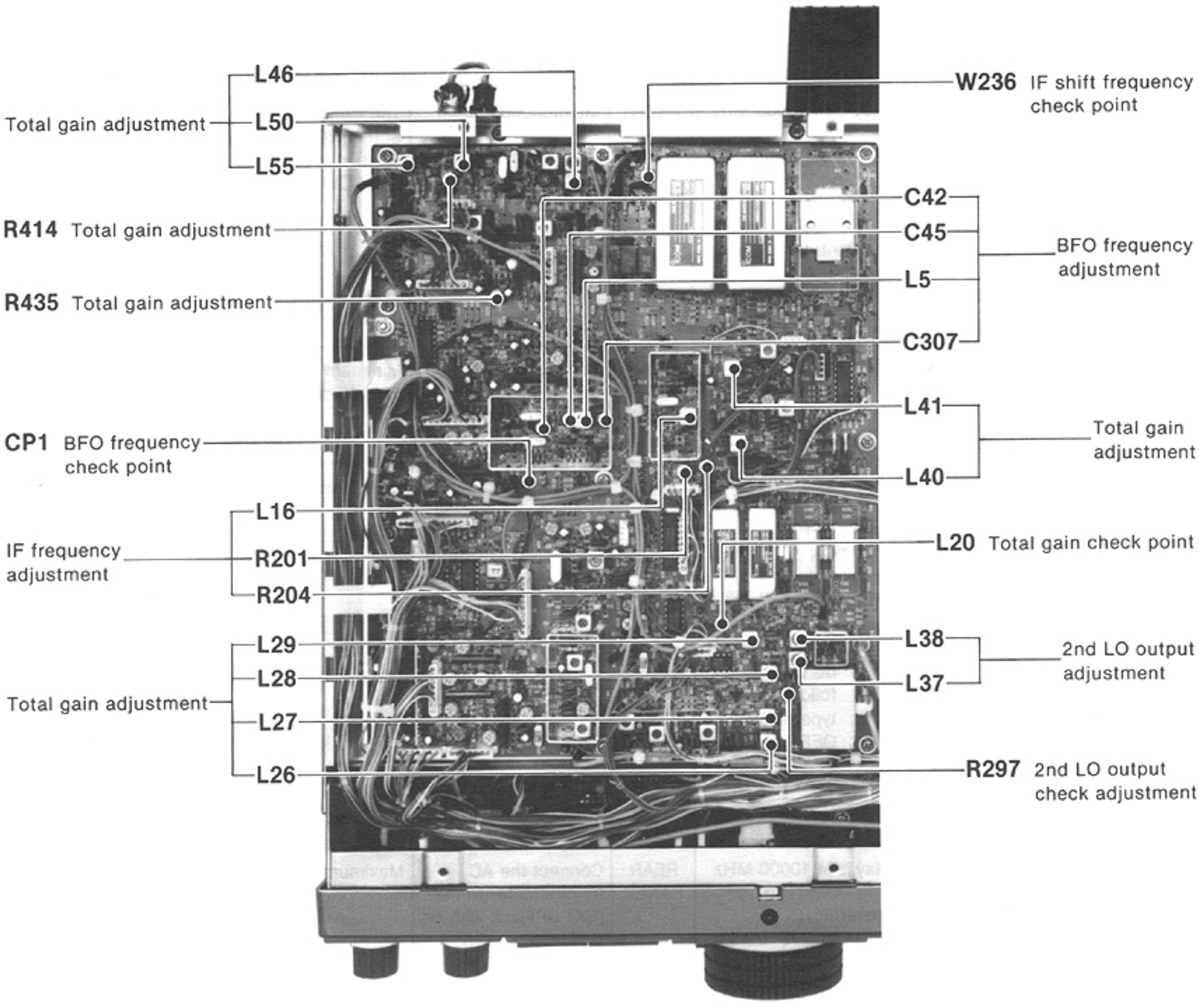
6-3 RECEIVER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
2nd LO OUTPUT	1	• Frequency display : 8.00000 MHz • USB mode	MAIN	Connect the RF voltmeter to R297.	Maximum level (+1~7 dBm)	MAIN	L37, L38
IF SHIFT FREQUENCY	1	• Frequency display : 14.1000 MHz • USB mode • [IF SHIFT] switch : ON • [IF SHIFT] control : Center • Receiving	MAIN	Connect the frequency counter to W236.	9.4665 MHz	MAIN	L16
	2	• [IF SHIFT] switch : OFF			9.4665 MHz		R201
	3	• CW NARROW mode			9.4656 MHz		R204
	4	• RTTY NARROW mode			9.4656 MHz±30 Hz		Verify
	5	• FM or AM mode			9.4650 MHz±300 Hz		Verify
BFO FREQUENCY	1	• Frequency display : 14.1000 MHz • USB mode • Receiving	MAIN	Connect the frequency counter to CP1.	9.01300 MHz	MAIN	C42
	2	• LSB mode			9.01000 MHz		C45
	3	• CW mode • [CW PITCH] control: Center			9.00990 MHz		C307
	4	• RTTY mode			9.008475 MHz		L5
	5	• AM mode			No output		Verify
	6	• FM mode					
	7	• USB mode • Transmitting			9.01300 MHz		Verify
	8	• LSB mode			9.01000 MHz		
	9	• CW mode			No output		
	10	• RTTY mode			9.008475 MHz		
	11	• AM mode			9.01000 MHz		
	12	• FM mode			No output		
	NOTE: Repeat adjustments 1 through 12 several times.						
TOTAL GAIN	1	• Frequency display : 14.10000 MHz • USB mode • R414 : Max. CW • [RF] control : Max. CW • [PRE/ATT] switch : OFF • [CW 250 Hz] switch: OFF • [NOTCH] switch : OFF • [IF SHIFT] control : Center • [RX TONE] control : Center • [SQL] control : Max. CCW • [AGC] switch : FAST • [RIT] switch : OFF • [NB] switch : OFF • Receiving	MAIN	Connect the digital DC voltmeter to L20.	3.9 V	MAIN	R435

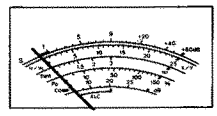
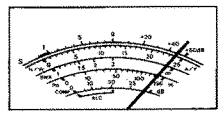
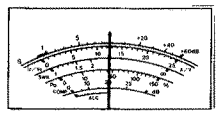
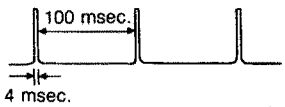
RECEIVER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
	2	• Set the signal generator; Level : 50 µV (−73 dBm) Mod. : OFF	FRONT PANEL	Multifunction meter	Maximum	MAIN	L26, L27, L28, L29, L40, L41, L46, L50, L55
	3		REAR PANEL	Connect the AC millivoltmeter to the [EXT SP] jack with an 8 Ω load.	2.5 Vrms	FRONT PANEL	[AF] control
	4	• Apply no signal to the antenna connector.			Adjust R414 to a point where the noise level is 30 dB down from 2.5 V.	MAIN	R414

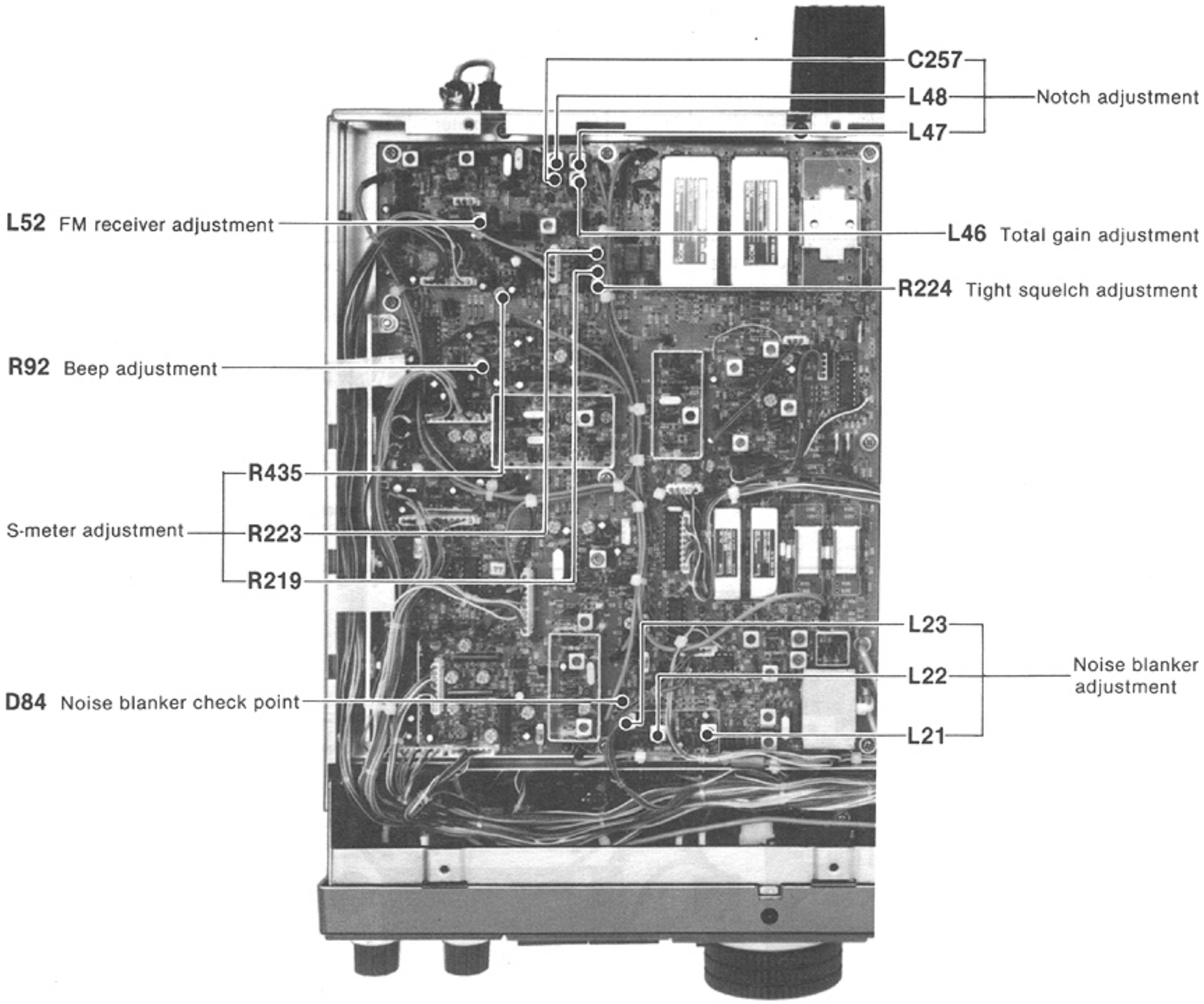
MAIN UNIT



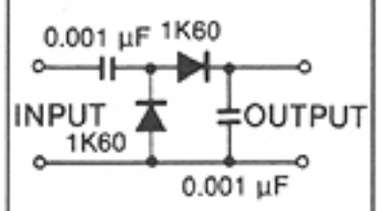
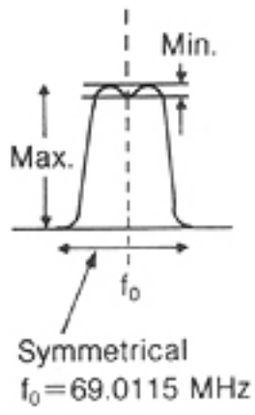
RECEIVER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
S-METER	1	• Frequency display : 14.10000 MHz • Set the signal generator; Level : OFF	FRONT PANEL	Multifunction meter (S scale)	S0 	MAIN	R219
	2	• Set the signal generator; Level : 16 mV (−23 dBm) Mod. : OFF		Multifunction meter (S scale)	S9+50 		R223
	3	• Set the signal generator; Level : 50 µV (−73 dBm) Mod. : OFF		Multifunction meter (S scale)	S9 		R435
TIGHT SQUELCH	1	• Frequency display : 14.10000 MHz • [PRE/ATT] switch : OFF • [SQL] control : Max. CW • Set the signal generator; Level : 16 mV (−23 dBm) Mod. : OFF	FRONT PANEL	[RECEIVE] indicator	Adjust R224 to the point where the squelch opens.	MAIN	R224
NOTCH	1	• Frequency display : 14.10000 MHz • USB mode • [NOTCH] switch : ON • Set the signal generator; Level : 50 µV (−73 dBm) Mod. : OFF • Adjust the tuning control to receive 1.5 kHz beat signal. • [NOTCH] control : Max. CW and CCW	FRONT PANEL	Multifunction meter	The same meter level at the [NOTCH] control rotation in max. CW and CCW.	MAIN	L48
	2	• [NOTCH] control : Center	REAR PANEL	Connect the AC millivoltmeter to the [EXT SP] jack with an 8 Ω load.	Minimum level (More than 45 dB down)	MAIN	L47, C257
NOISE BLANKER	1	• Frequency display : 14.10000 MHz • USB mode • [PRE/ATT] switch : OFF • [NB] switch : ON • [NB WIDE] switch : ON • [NB LEVEL] control: Max. CW • Set the signal generator; Level : 10 µV (−87 dBm) included following pulse-type noise. Mod. : OFF 	MAIN	Connect the oscilloscope to D84.	Maximum waveform	MAIN	L21, L22, L23
FM RECEIVER	1	• Frequency display : 14.10000 MHz • FM mode • Set the signal generator; Level : 50 µV (−73 dBm) Mod. : 1 kHz Dev. : ±3.5 kHz	REAR PANEL	Connect the AC millivoltmeter to the [EXT SP] jack with an 8 Ω load.	Maximum level	MAIN	L52
BEEP	1	• Receiving			Center	MAIN	R92

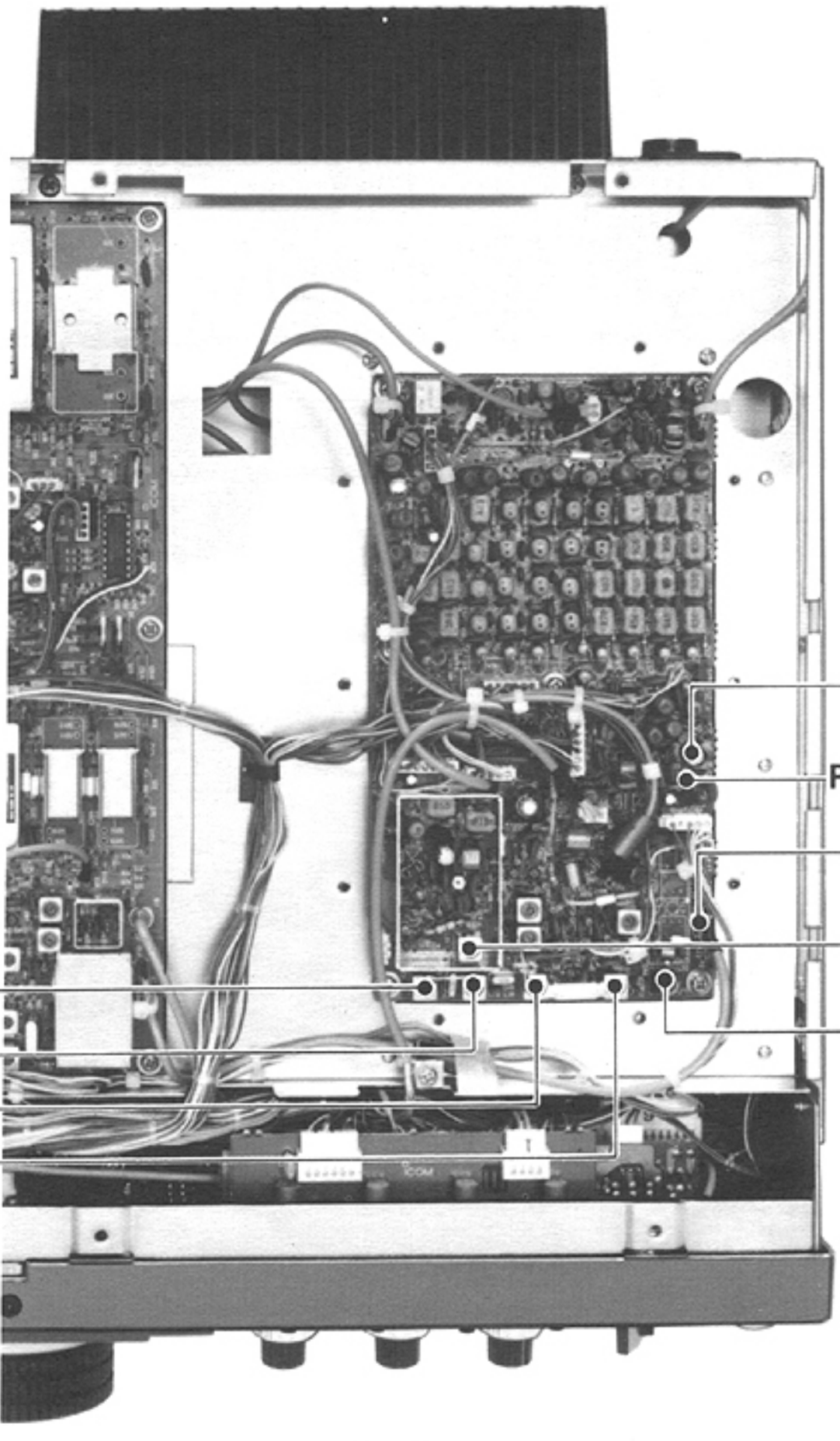
MAIN UNIT



RECEIVER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
AGC VOLTAGE	1	• Frequency display : 14.10000 MHz • USB mode	RF	Connect the DC voltmeter to the terminal of R105.	2.5 V	RF	R24
IF FILTER	1	• Frequency display : 14.10000 MHz • USB mode • Set the signal generator; Level : 50 µV (−73 dBm) Mod. : OFF	FRONT PANEL	Multifunction meter	Maximum level	RF	L30, L17, L18, L19, L20, L21
IF BAND WIDTH	1	• Frequency display : 14.10000 MHz • [AGC] switch : OFF • Set the RF sweep generator; Center frequency : 14.1 MHz Sweep band width: ±10 MHz	RF	Connect the oscilloscope to P2 through the detector. 	IF band width as follows 	RF	L17, L18, L19, L20

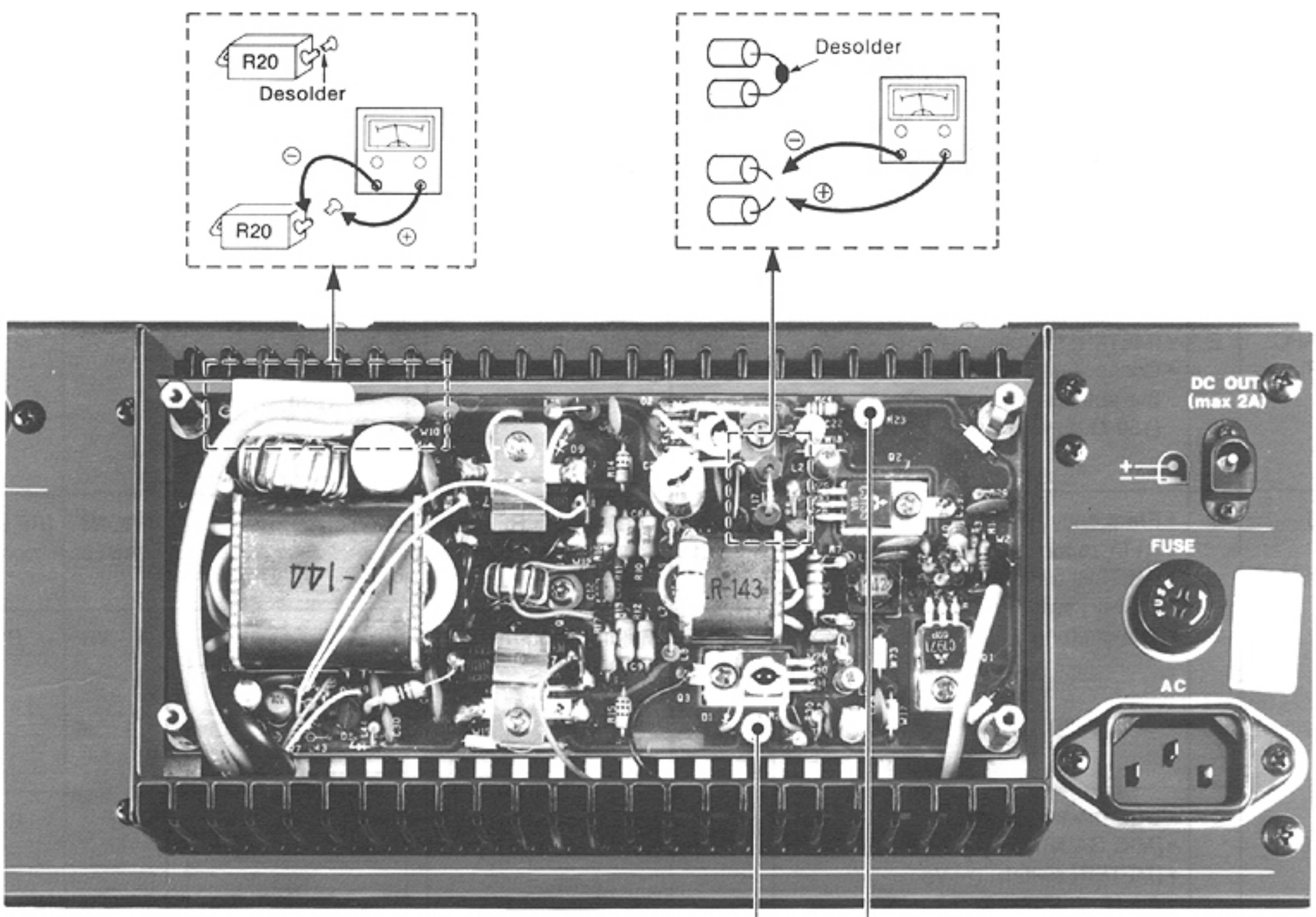
RF UNIT



6-4 TRANSMITTER ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
IDLING CURRENT For drive transistors	1	• Frequency display : 14.10000 MHz • USB mode • [MIC GAIN] control : Max. CCW • Apply no AF signal to the mic connector. • Transmitting	PA	Desolder the center of W35 and connect the ammeter.	100 mA	PA	R27
For final transistors	2			Desolder R20 and connect the ammeter.	500 mA	PA	R23
	NOTE: Resolder after making adjustments in steps 1 and 2.						

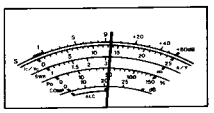
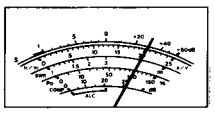
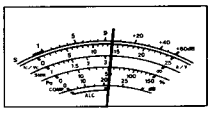
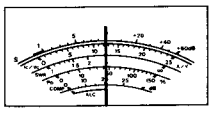
PA UNIT



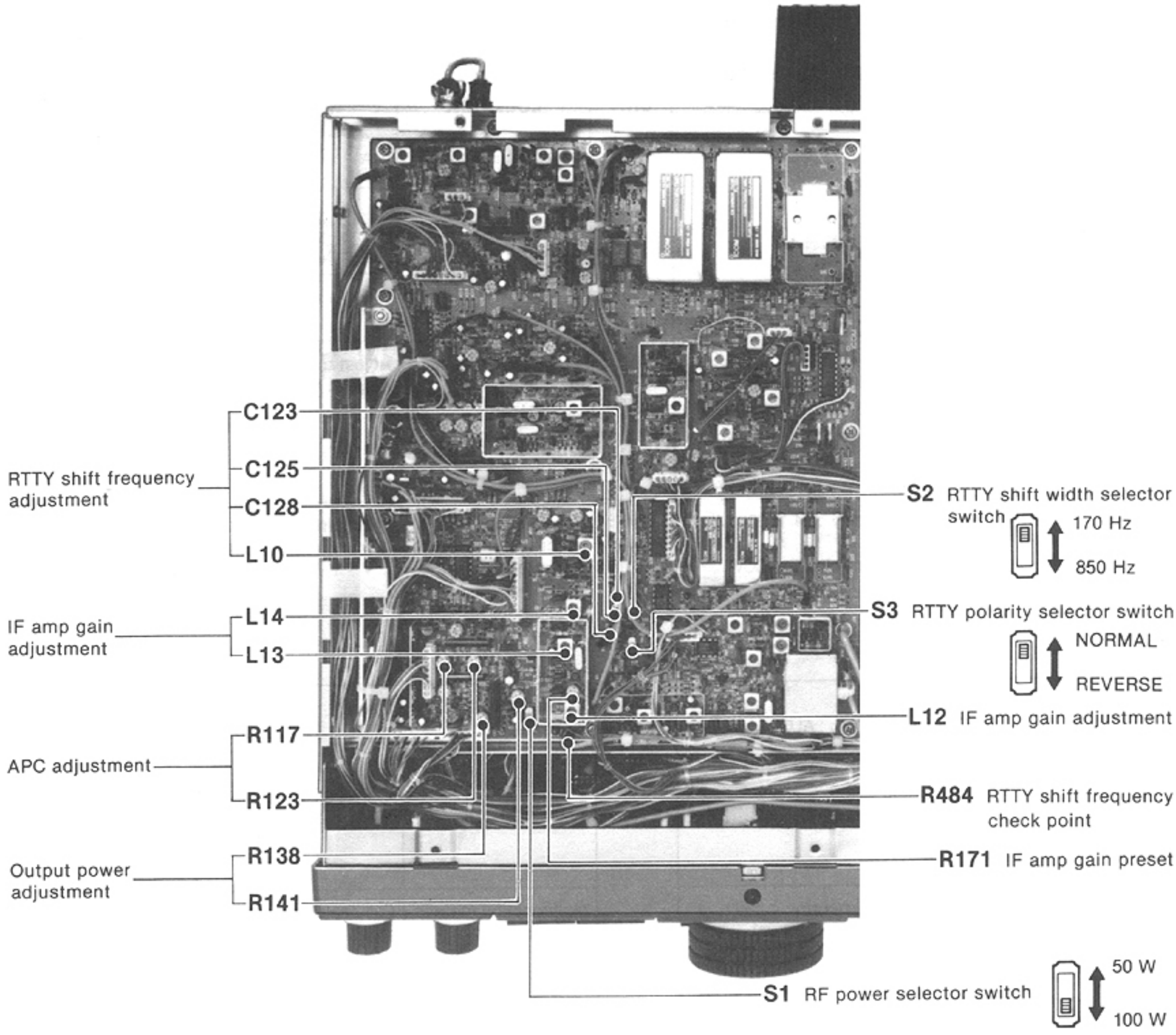
R27 Idling current adjustment (Drive transistor)

R23 Idling current adjustment (Final transistor)

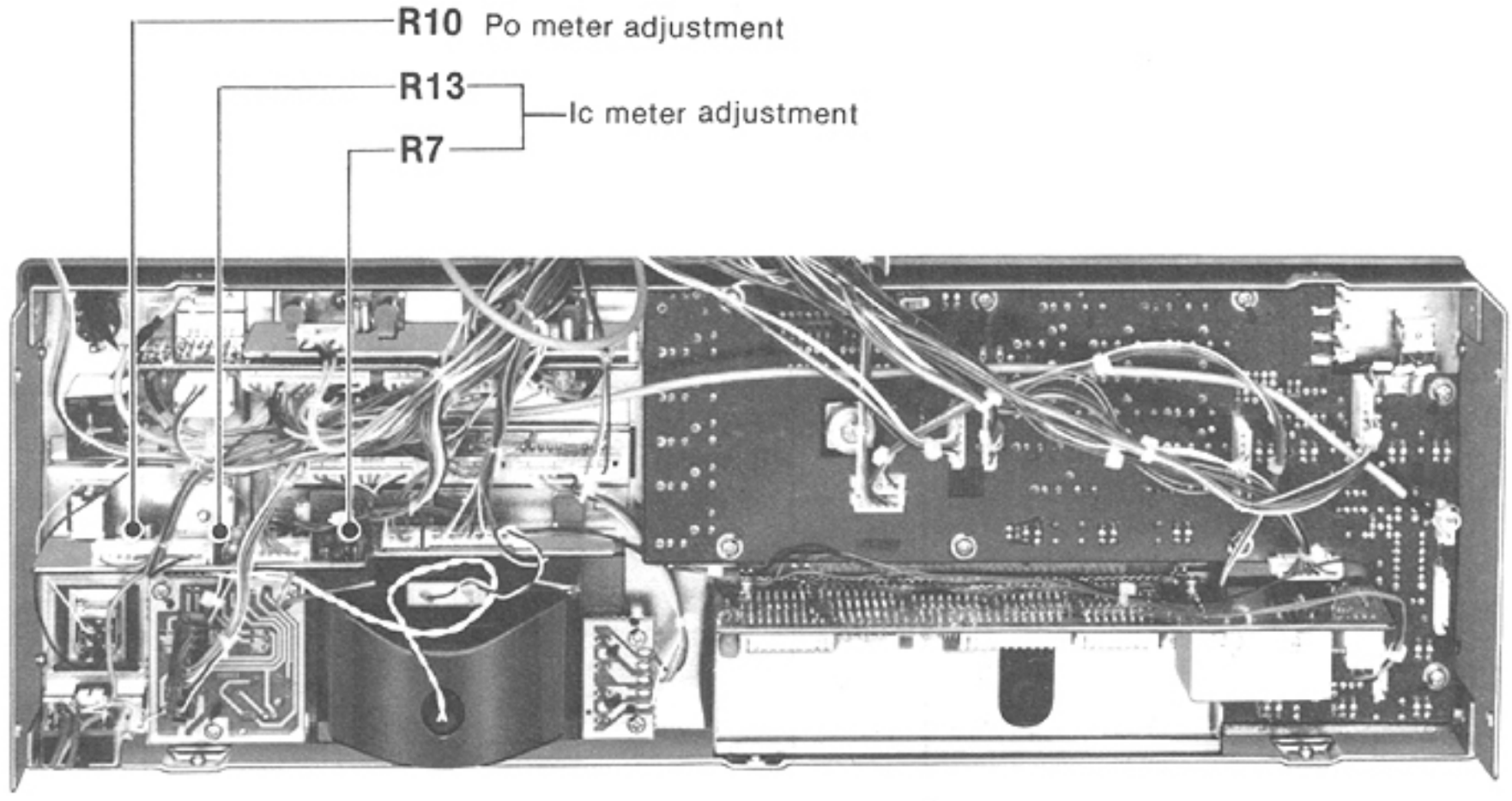
TRANSMITTER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
IF AMP GAIN	1	• Frequency display : 14.10000 MHz • RTTY mode • R171 : Max. CCW • Transmitting	MAIN	Connect the RF voltmeter to R484.	Maximum level (30~80 mVp-p.)	MAIN	L12, L13, L14
RTTY SHIFT FREQUENCY	1	• Frequency display : 14.10000 MHz • RTTY mode • S2 : 850 Hz • S3 : NORMAL • Transmitting	MAIN	Connect the frequency counter to R484.	9.01145 MHz	MAIN	C123
	2	• S2 : 170 Hz			9.01077 MHz		C125
	3	• S3 : REVERSE			9.0106 MHz		C128
	4	• FM mode			9.0100 MHz		L10
OUTPUT POWER	1	• Frequency display : 14.10000 MHz • RTTY mode • R117 : Max. CCW • R123 : Max. CCW • S1 : 100 W • Transmitting	REAR PANEL	Connect the RF power meter to the antenna connector.	100 W	MAIN	R138
	2	• S1 : 50 W			50 W		R141
APC	1	• Frequency display : 14.10000 MHz • RTTY mode • R123 : Max. CCW • R117 : Max. CW • Remove all connections from the antenna connector. • [RF PWR] control : Max. CW • Transmitting	REAR PANEL	Connect the ammeter to the AC power supply and IC-765.	22 A	MAIN	R117
(SWR APC METER)	2	• [METER] switch : Po • Connect an SWR3 dummy load to the antenna connector. (150 Ω dummy load)	FRONT PANEL	Multifunction meter (Po scale)	50 % 		R123
METER · Po METER	1	• Frequency display : 14.10000 MHz • RTTY mode • [METER] switch : Po • [COMP] switch : OFF • Transmitting	REAR PANEL	Connect the RF power meter to the antenna connector.	100 W	FRONT PANEL	[RF PWR] control
	2		FRONT PANEL	Multifunction meter (Po scale)	100 % 	NB VR	R10
Vc METER	3	• USB mode • [MIC GAIN] control : Max. CCW • [METER] switch : Vc • Apply no signal to the mic connector. • Transmitting		Multifunction meter (Vc scale)	13.8 V 		R13
SWR METER	4	• Frequency display : 14.10000 MHz • RTTY mode • [METER] switch : SWR • Connect an SWR3 dummy load to the antenna connector. (150 Ω dummy load) • Transmitting		Multifunction meter (SWR scale)	SWR3 		R7

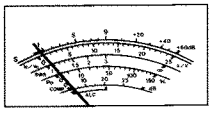
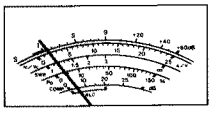
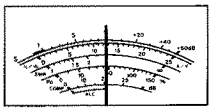
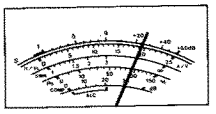
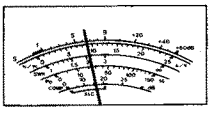
MAIN UNIT



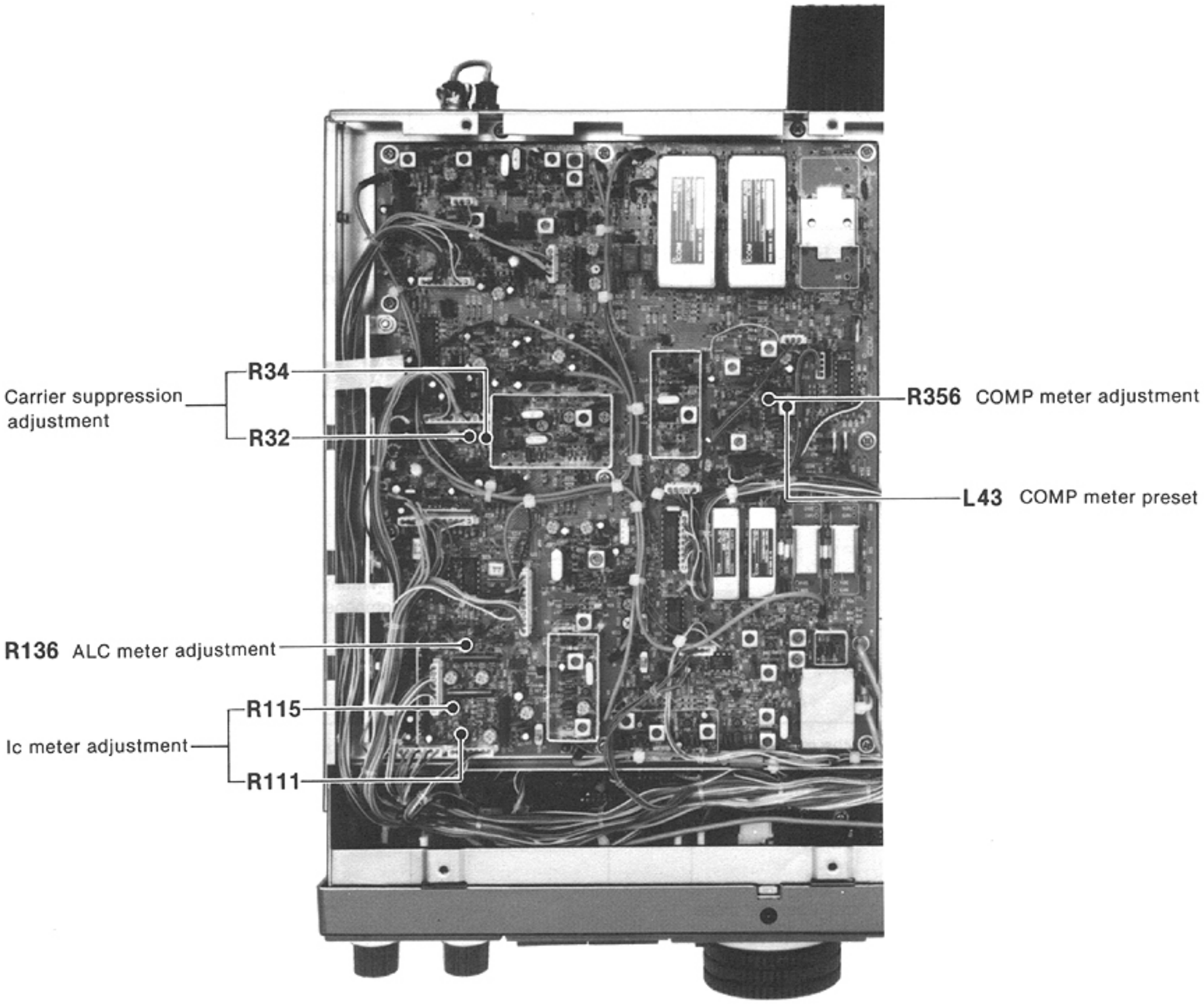
NB VR UNIT



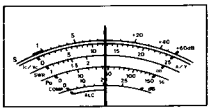
TRANSMITTER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
METER Ic METER	5	• CW mode • [METER] switch : Ic • Transmitting	FRONT PANEL	Multifunction meter (Ic scale)	1 A 	MAIN	R111
	6	• RTTY mode • [RF PWR] control : Max. CW • Transmitting		Multifunction meter (Ic scale)	Adjust to total current minus 4.5 A.		R115
CARRIER SUPPRESSION	1	• Frequency display : 14.10000 MHz • USB mode • [MIC GAIN] control : Max. CCW • [COMP] switch : ON • Transmitting	REAR PANEL	Connect the spectrum analyzer to the antenna connector via an attenuator.	Minimum carrier level (Less than −40 dB)	MAIN	R32, R34 Alternately adjust
ALC METER	1	• USB mode • [METER] switch : ALC • Set the audio generator; 3 mV/1.5 kHz • Transmitting	FRONT PANEL	Multifunction meter (Ic scale)	2 A 	FRONT PANEL	[MIC GAIN] control
		• Set the audio generator; 10 mV/1.5 kHz (10 dB up)		Multifunction meter (ALC scale)	Full scale in the ALC zone. 	MAIN	R136
COMP METER	1	• USB mode • [COMP] switch : ON • [METER] switch : COMP • L43 : Max. CCW • Input 2 audio signals into the mic connector: 1.1 kHz/3 mV 1.7 kHz/3 mV • Transmitting	FRONT PENEL	Multifunction meter (COMP scale)	25 dB 	FRONT PANEL	[MIC GAIN] control
	2	• [METER] switch : ALC		Multifunction meter (Ic scale)	9 A 	MAIN	R356

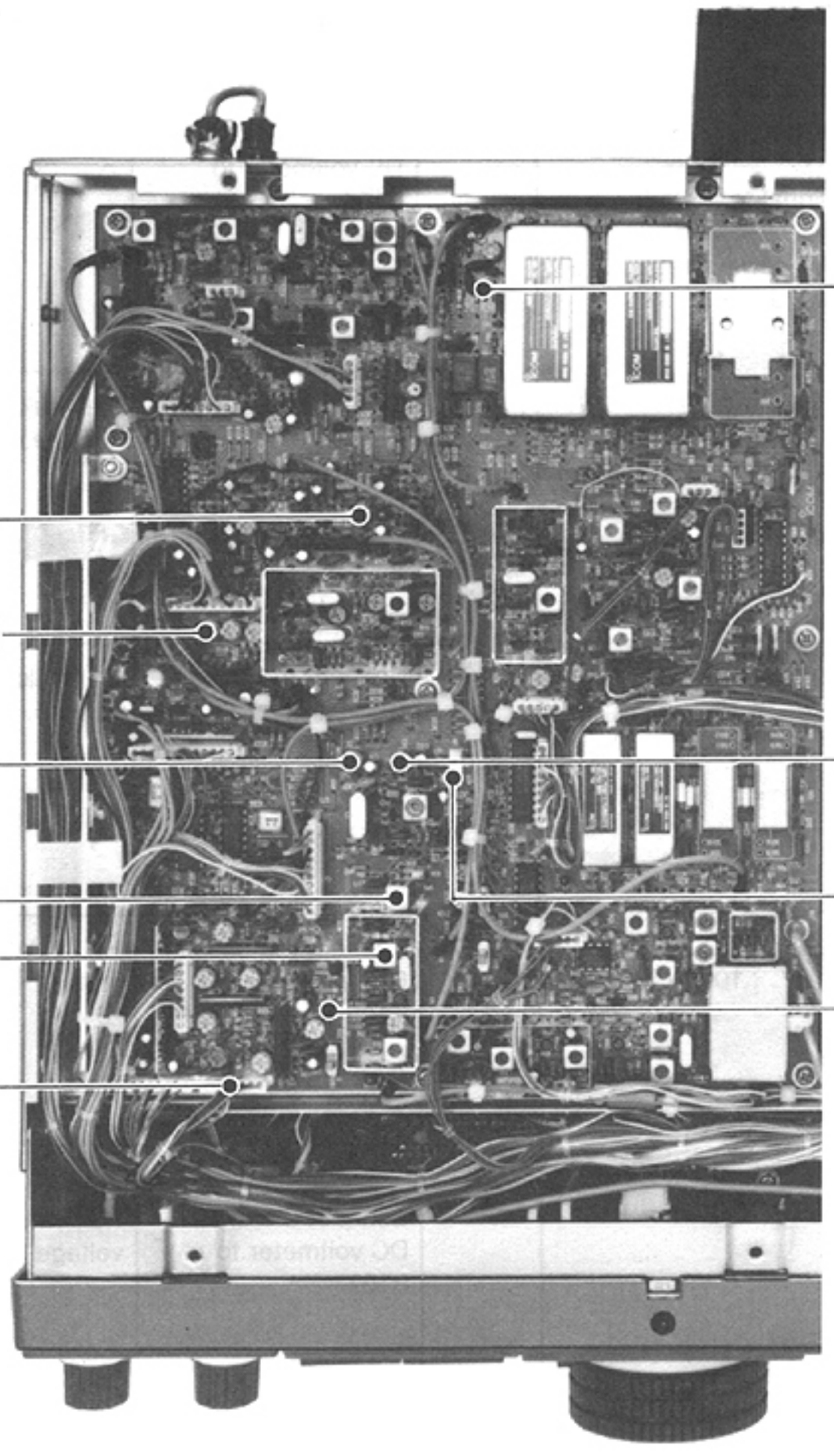
MAIN UNIT


R34
Carrier suppression adjustment
R32
R356 COMP meter adjustment
L43 COMP meter preset
R136 ALC meter adjustment
R115
Ic meter adjustment
R111

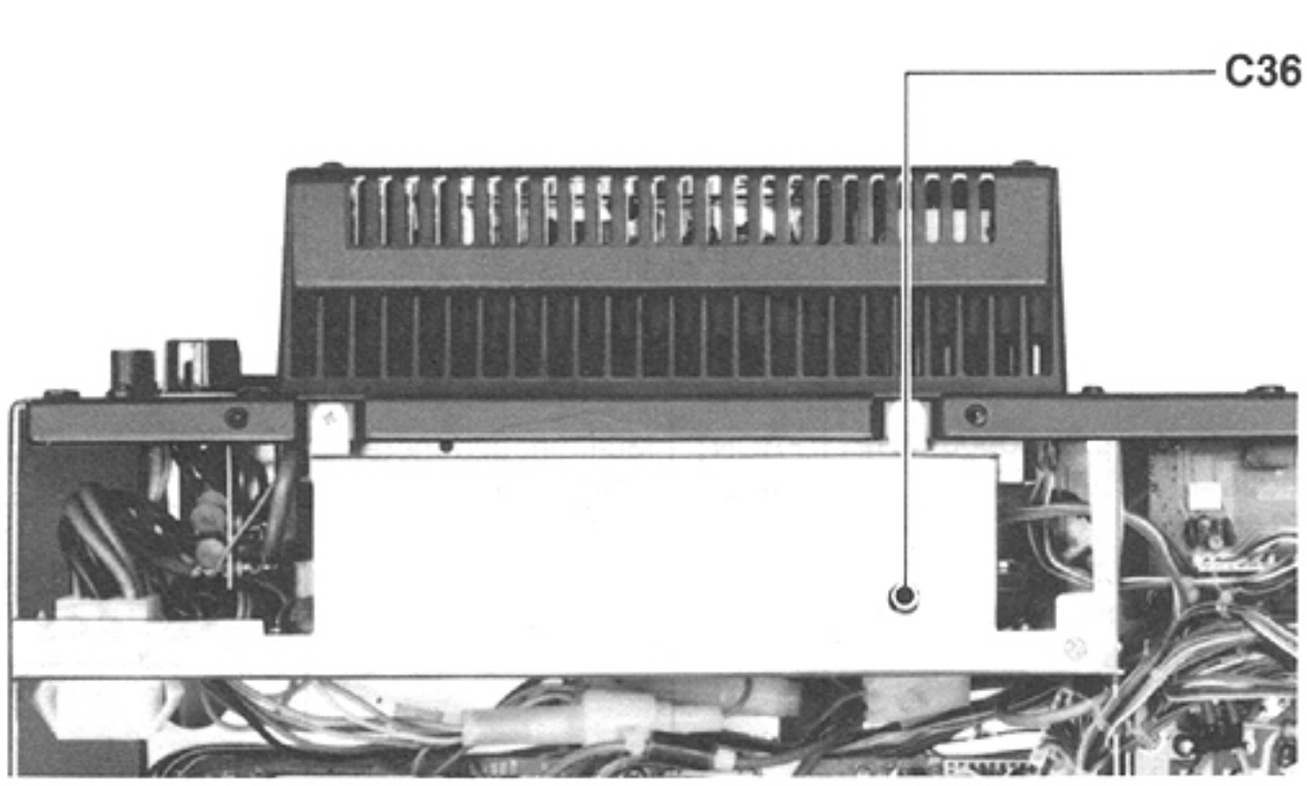
TRANSMITTER ADJUSTMENT (CONTINUED)

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
AM CARRIER LEVEL	1	• Frequency display : 14.10000 MHz • AM mode • [METER] switch : ALC • Transmitting	FRONT PANEL	Multifunction meter (ALC scale)	Full scale in the ALC zone. 	MAIN	R37
TRANSMIT SPURIOUS LEVEL	1	• Frequency display : 14.10000 MHz • USB mode • Set the audio generator; 10 mV/1.5 kHz • Transmitting	REAR PANEL	Connect the spectrum analyzer to the antenna connector via the attenuator.	Minimum spurious level of carrier frequency −455 kHz.	MAIN	R391
DEVIATION	1	• FM mode • [MIC GAIN] control: Max. CW • Set the audio generator; 10mV/1.0kHz • Transmitting		Connect the deviation meter to the antenna connector via the attenuator.	±4.7 kHz		R43
	2			Connect the oscilloscope to the antenna connector.	Minimum AM component.		L13, L14
	3	• Apply no signal to the mic connector. • Connect UT-30 (option) to J8 on the MAIN UNIT. • Push the [FM/TONE] switch.		Connect the deviation meter to the antenna connector via the attenuator.	±500 Hz		R163
	NOTE: Repeat steps 1 and 3 several times.						
CW SIDETONE	1	• CW mode • Connect a key to the [KEY] jack. • [MONITOR GAIN] control : Center • Key down • Transmitting	REAR PANEL	Connect the frequency counter to the [EXT SP] jack.	700 Hz	MAIN	R69
SWR DETECTOR	1	• Frequency display : 14.17500 MHz • SSB mode • Set the audio generator; 1.5 kHz • Ground L9 to the chassis. • Transmitting	REAR PANEL	Connect the RF power meter to the antenna connector.	100 W	Applied AF signal level	
			MAIN	Connect the DC voltmeter to pin 4 (J4).	Minimum voltage.	FILTER	C36
	NOTE: After completing the adjustment, return L9 to its original condition.						

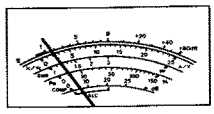
MAIN UNIT



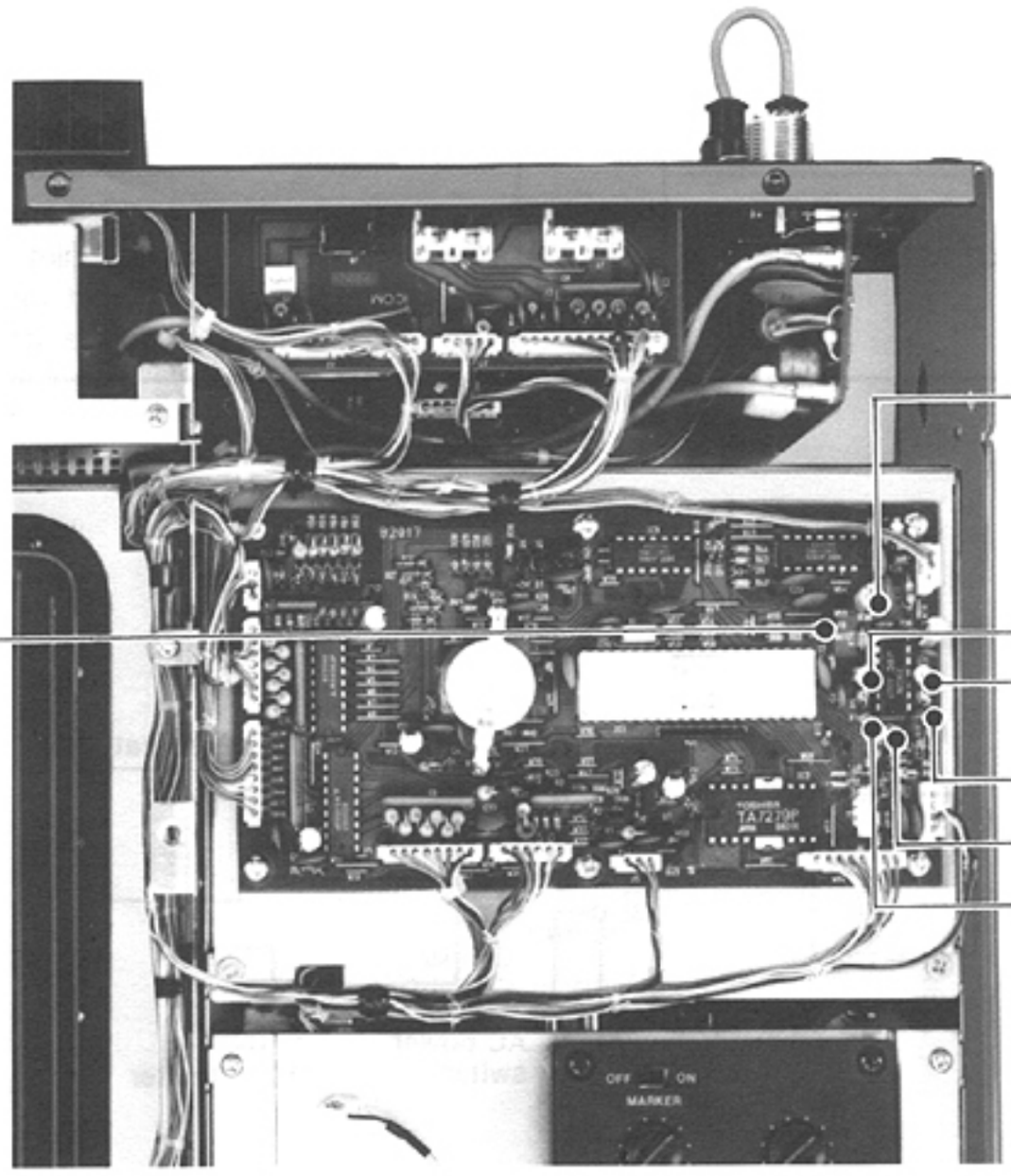
FILTER UNIT



6-5 TUNER UNIT ADJUSTMENT

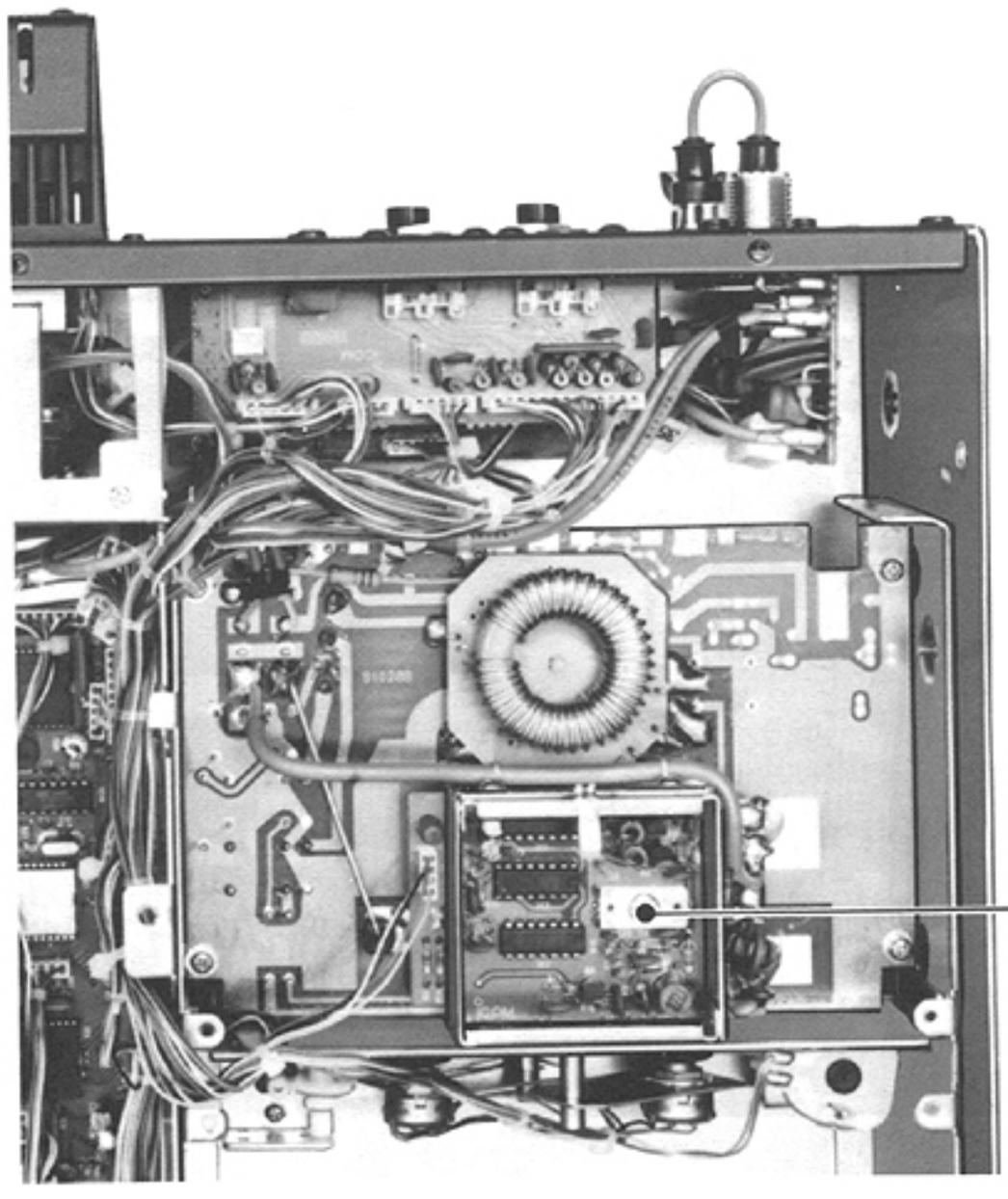
ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
REFERENCE VOLTAGE	1	• Frequency display : 7.10000 MHz • LSB mode • Apply no AF signal to the mic connector. • Connect the RF power meter to the antenna connector. • Transmitting	TUC	Connect the digital DC voltmeter to R104.	4.6 V~5.0 V	TUC	Verify
	2			Connect the digital DC voltmeter to R102.	Half value of R104 voltage. (Step 1 above)		R105
	3			Connect the digital DC voltmeter to R107.	Half value of R104 voltage. (Step 1 above)		R110
	4	• RTTY mode • Output power : 100 W • Transmitting	TUC	Connect the digital DC voltmeter to R102.	Half value of R104 voltage. (Step 1 above)	TDET	C5
	5			Connect the digital DC voltmeter to R107.	Half value of R104 voltage. (Step 1 above)		
		NOTE: Repeat the adjustment several times.					
DETECTOR	1	• Frequency display : 28.00000 MHz • RTTY mode • [TUNER] switch : OFF • Output power : 100 W • Connect an SWR3 dummy road to the antenna connector. (150 Ω dummy load) • Transmitting	TUC	Connect the DC voltmeter to collector of Q110. (IC101 pin 31)	Adjust R138 volume to the point where the voltage is just changed from 5 V to 0 V.	TUC	R138
	2	• Frequency display : 28.00000 MHz • RTTY mode • [TUNER] switch : ON • [METER] switch : SWR • Connect a 50 Ω dummy road to the antenna connector. • Transmitting	FRONT PANEL	Multifunction meter (SWR scale)	Less than SWR 1.2 		Verify

TUC UNIT



TDET UNIT

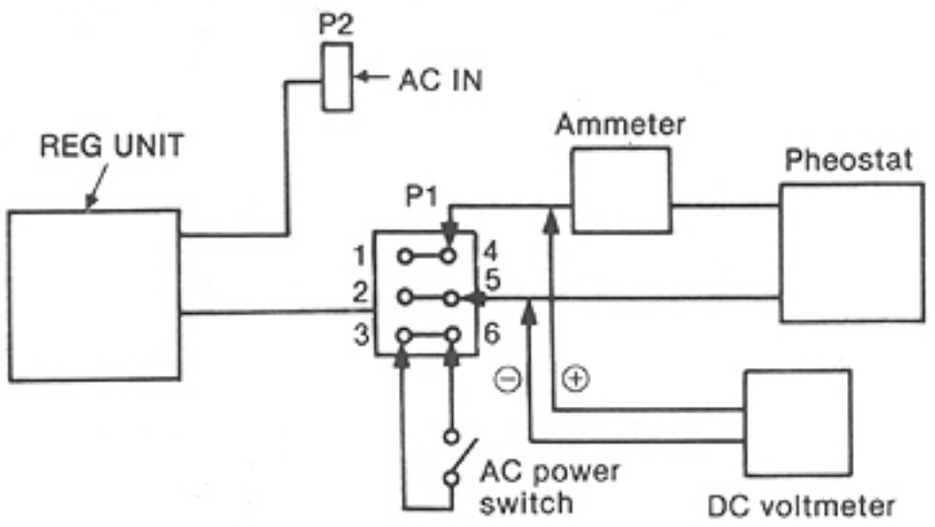
(located under the TUC UNIT)



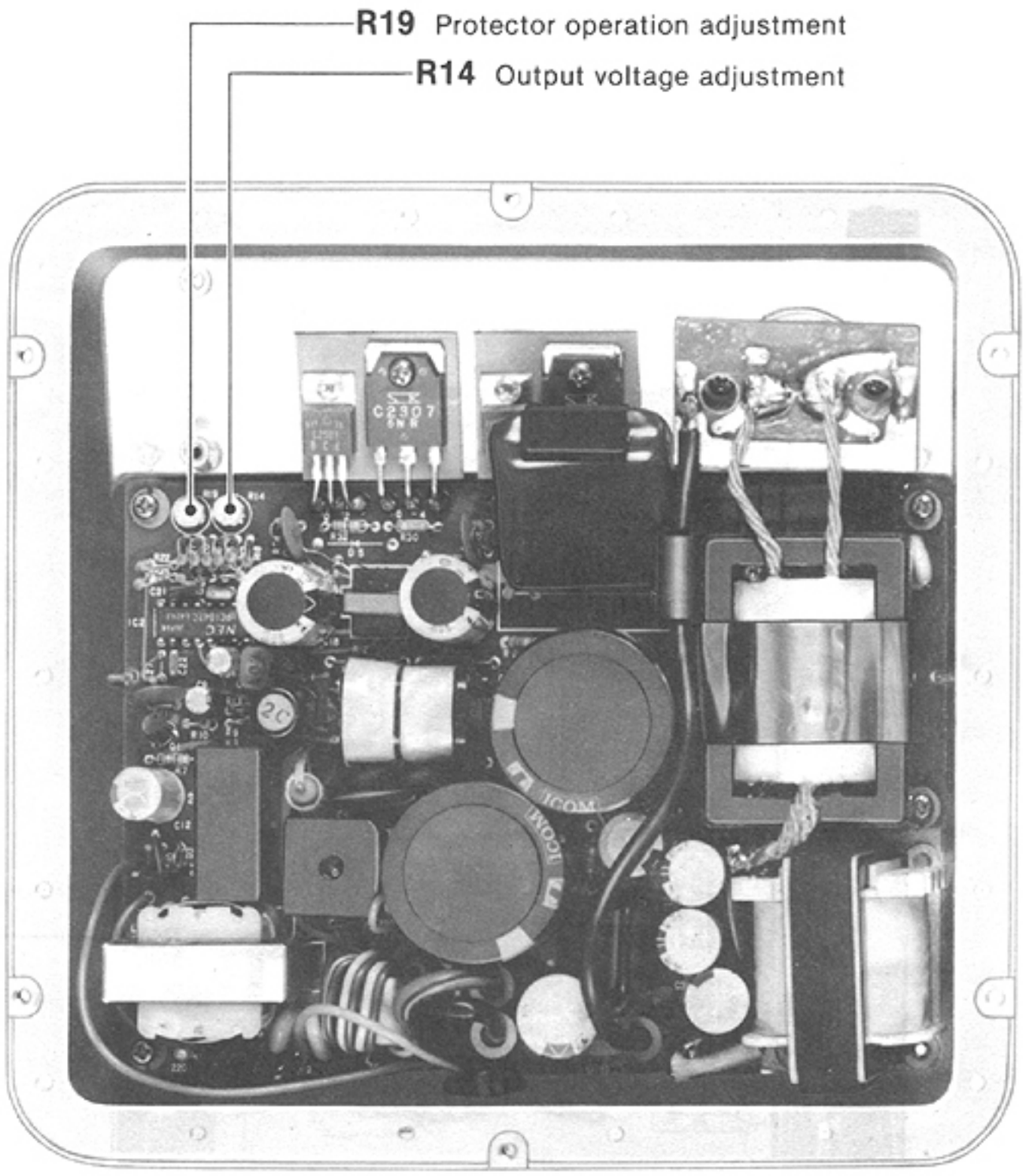
6-6 REG UNIT ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
OUTPUT VOLTAGE	1	• Rheostat : 1.38 Ω • AC power switch : ON	REG	Connect a DC voltmeter as shown below.	13.8 V	REG	R14
PROTECTOR OPERATION	2	• Rheostat : 0.55 Ω • AC power switch : ON			Adjust R19 volume to the point where the output voltage just before drops.		R19

CONNECTION



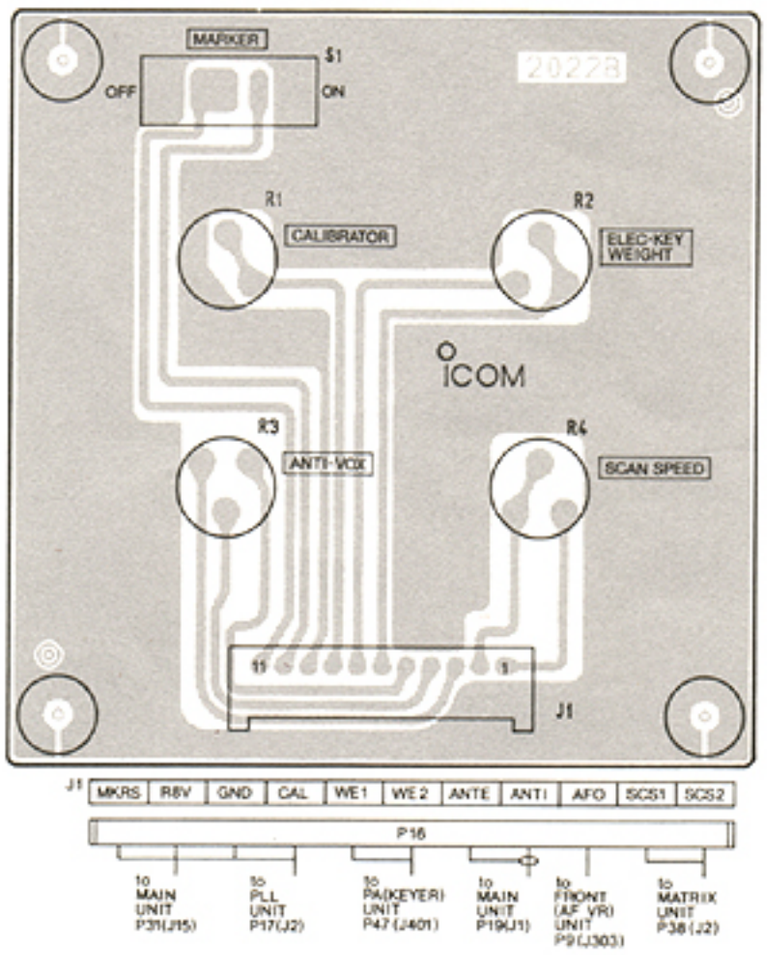
REG UNIT



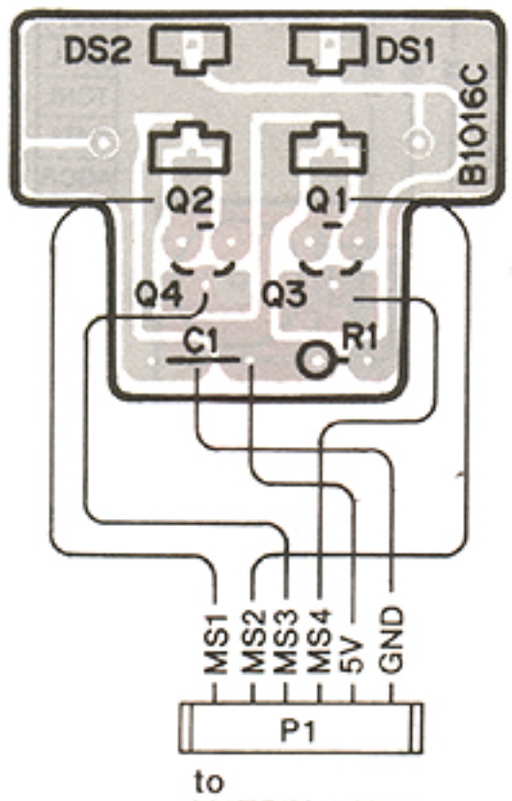
SECTION 7 BOARD LAYOUT

7-1 DISPLAY, MKR SW AND SENSOR UNITS

• MKR SW UNIT

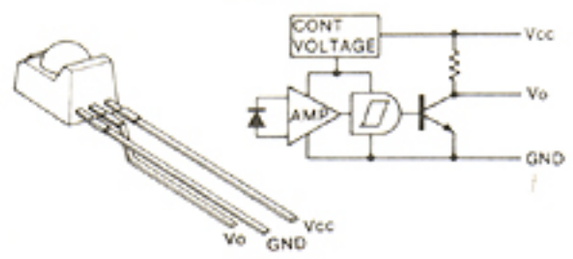


• SENSOR UNIT



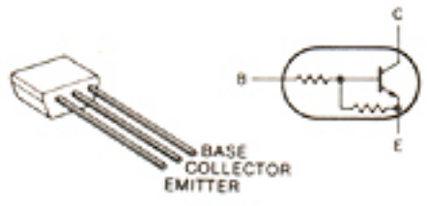
to
MATRIX UNIT
J5

IS-433



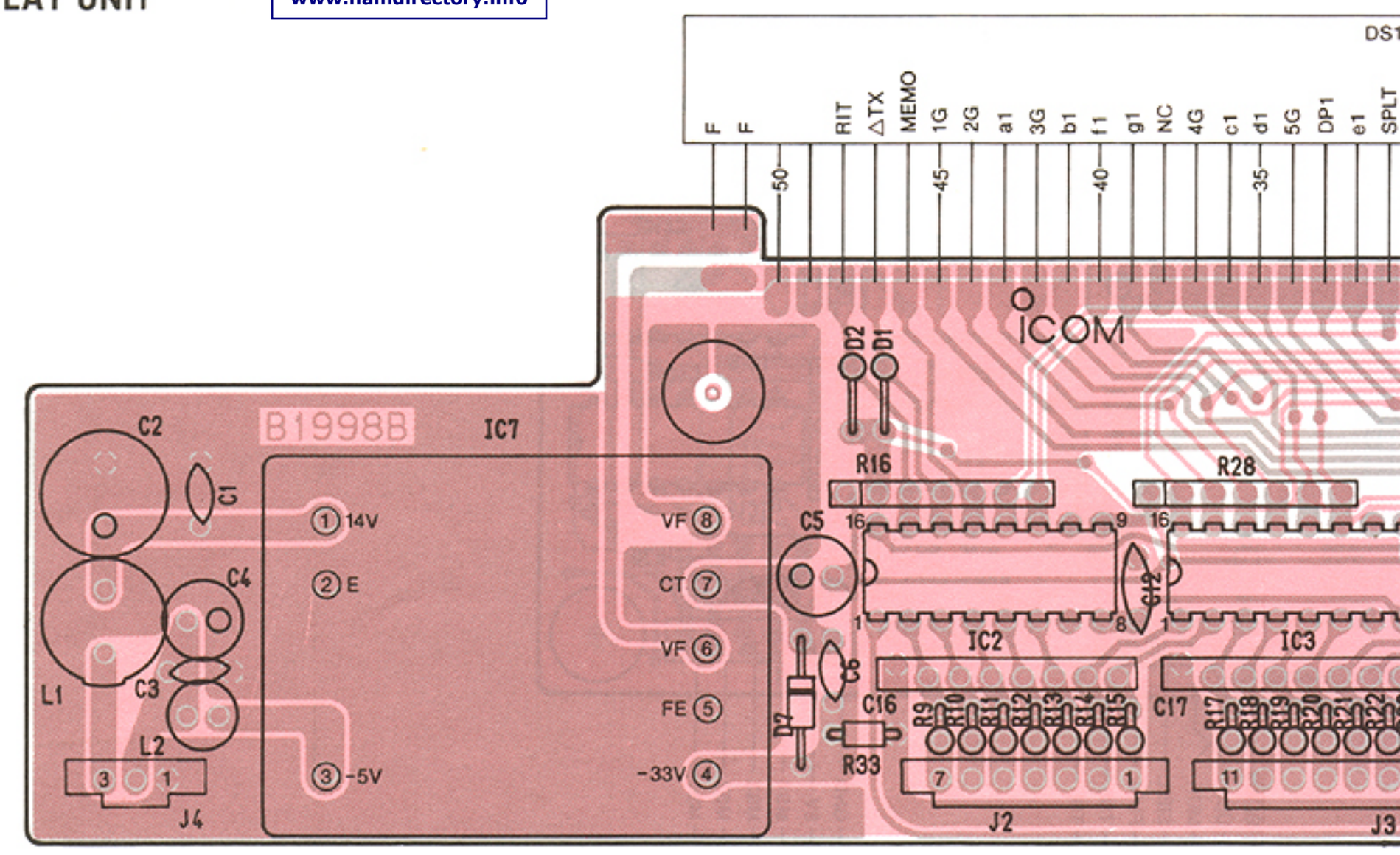
Q1, Q2

RN1204



Q3, Q4

• DISPLAY UNIT



J4	14V	-5V	GND

to
FRONT (NB VR)
UNIT
P201

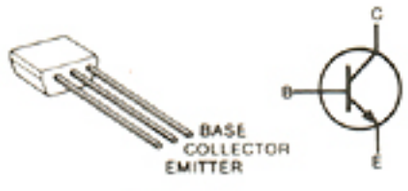
J2	RIT	△TX	MEMO	VFOA	VFOB	SPLT	SCAN

to
LOGIC UNIT
P5 (J7)

J3	SEA	SEB	SEC	SED	SEE	SEF

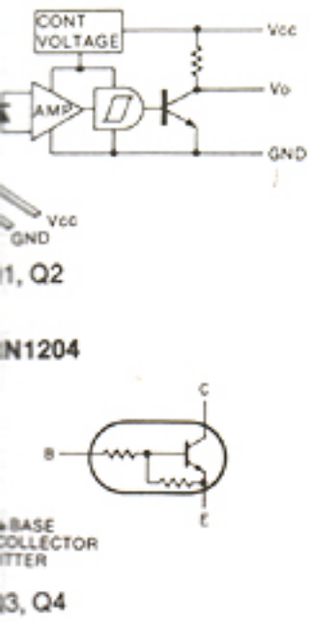
to
LOGIC UNIT
P7 (J9)

2SC2458-GR



Q1, Q2

S-433



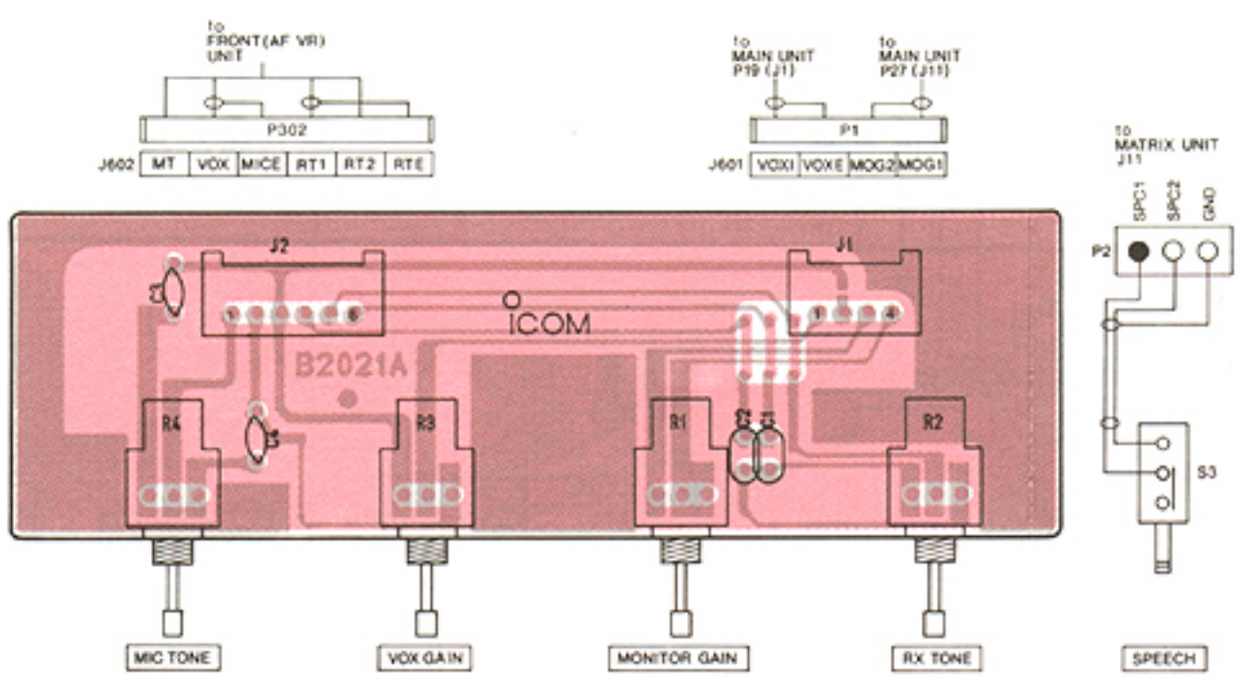
Q1, Q2

2SN1204

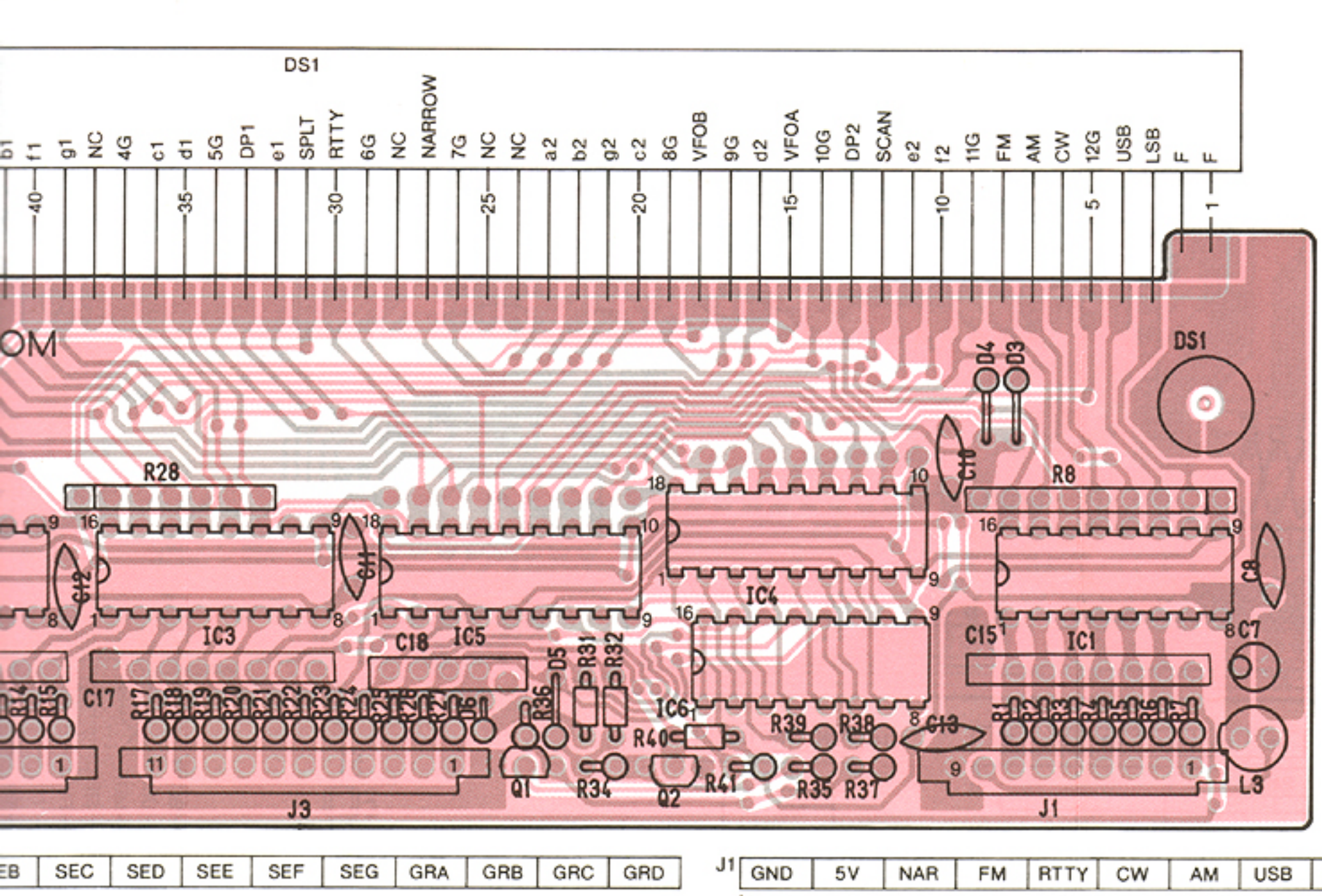
B:BASE
C:COLLECTOR
E:EMITTER

Q3, Q4

• FRONT (TONEC) UNIT



NOTE: Add "600" to the indicated on the unit for actual part number respectively.



EB	SEC	SED	SEE	SEF	SEG	GRA	GRB	GRC	GRD

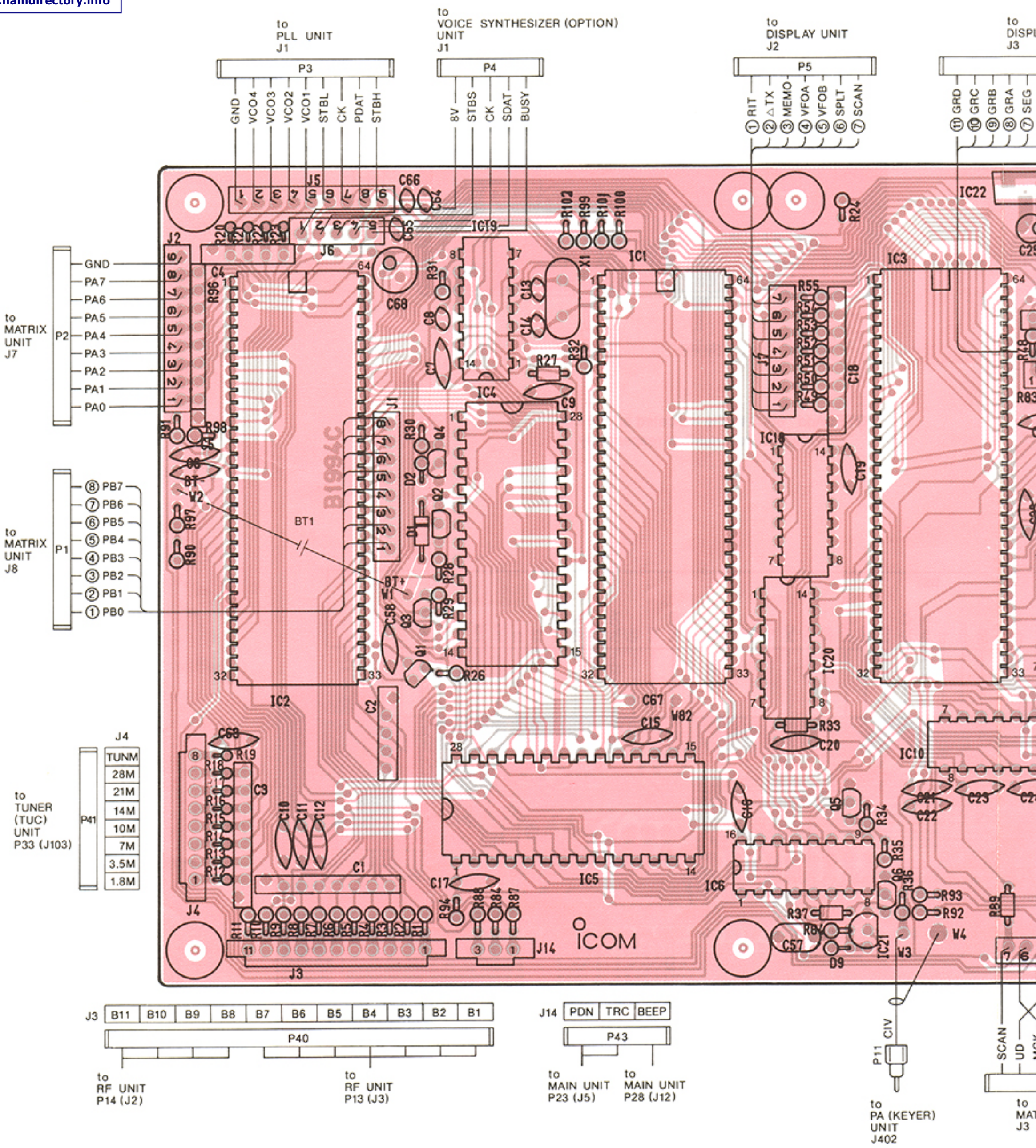
T

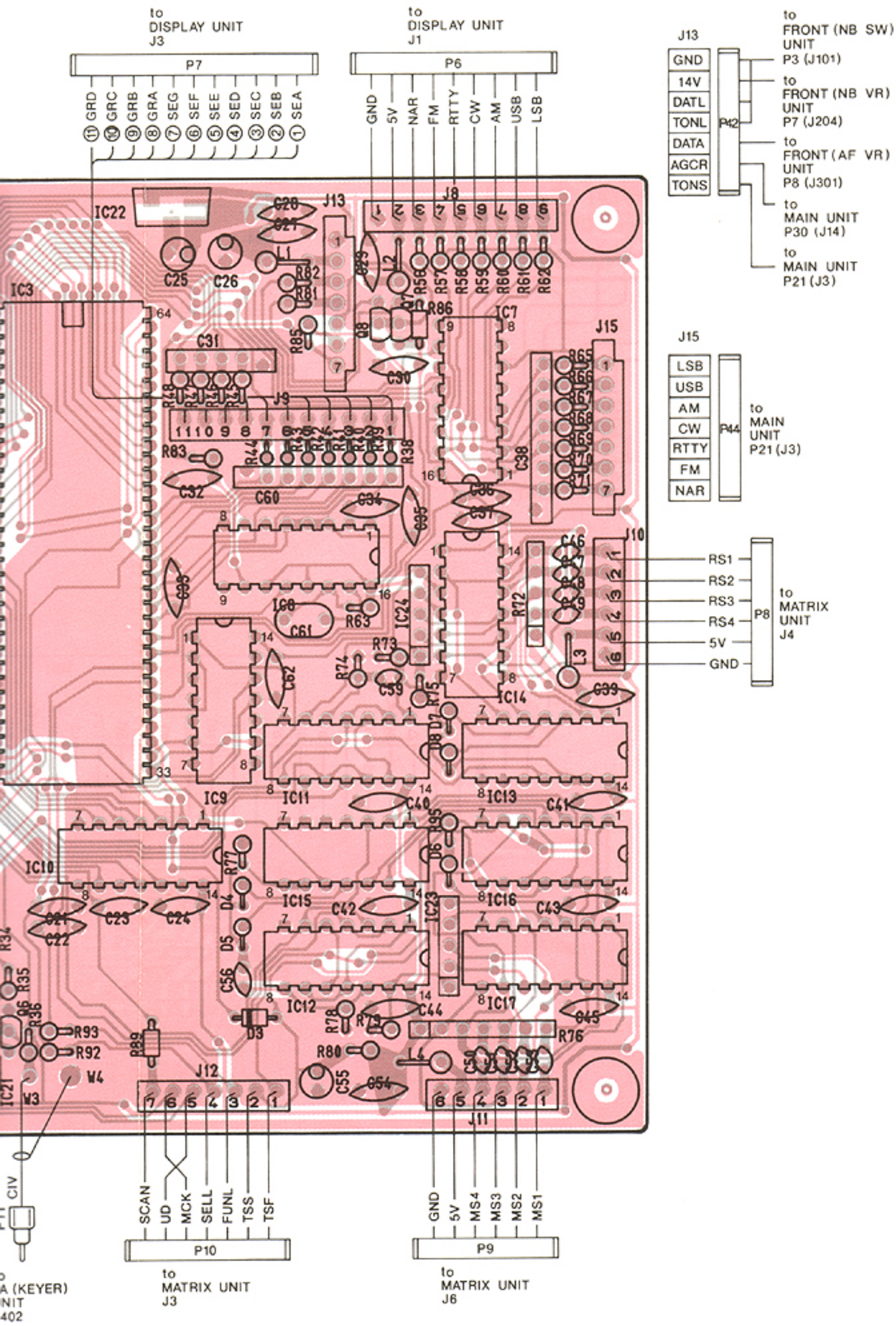
J1

GND	5V	NAR	FM	RTTY	CW	AM	USB	LSB

to LOGIC UNIT P6 (J8)

7-2 LOGIC UNIT

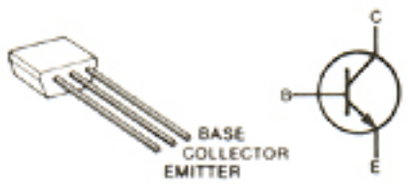




2SA1048 GR

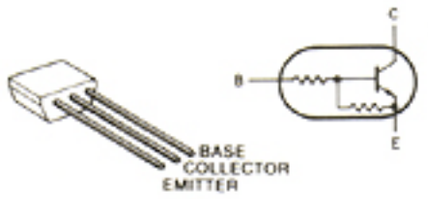
Q2

2SC2458 GR



Q1, Q4, Q5, Q6

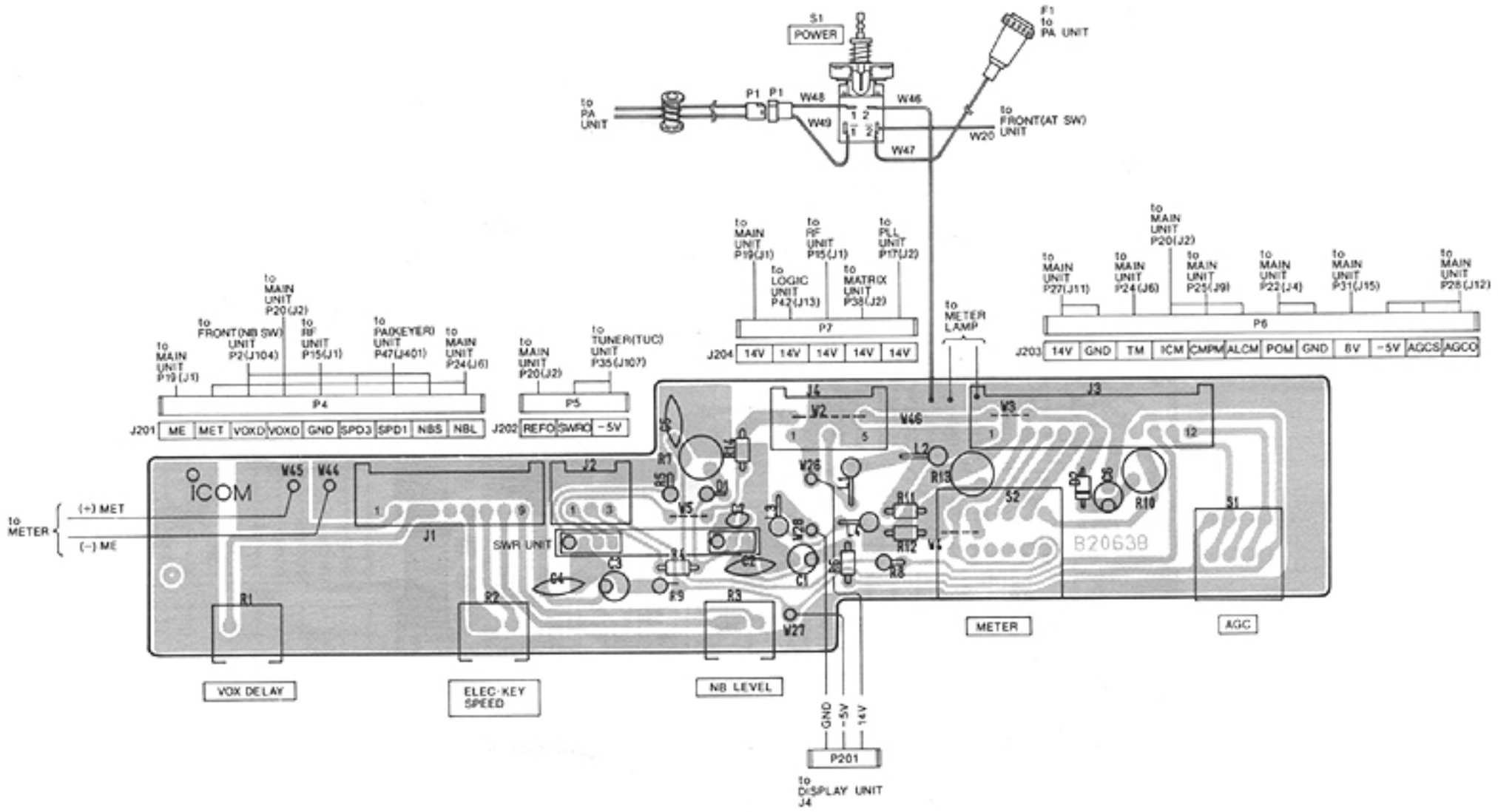
RN1204



Q3, Q7, Q8

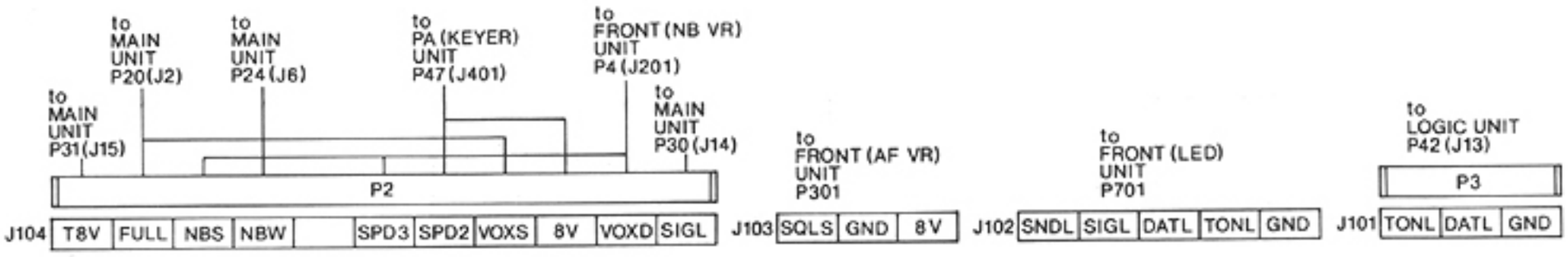
7-3 FRONT UNIT

• FRONT (NB VR) UNIT

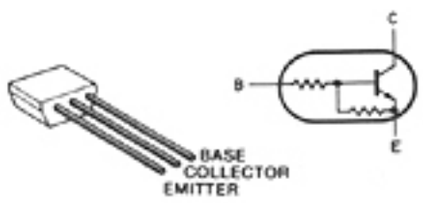


NOTE: Add "200" to the indicated on the unit for actual part number respectively.

• FRONT (NB SW) UNIT



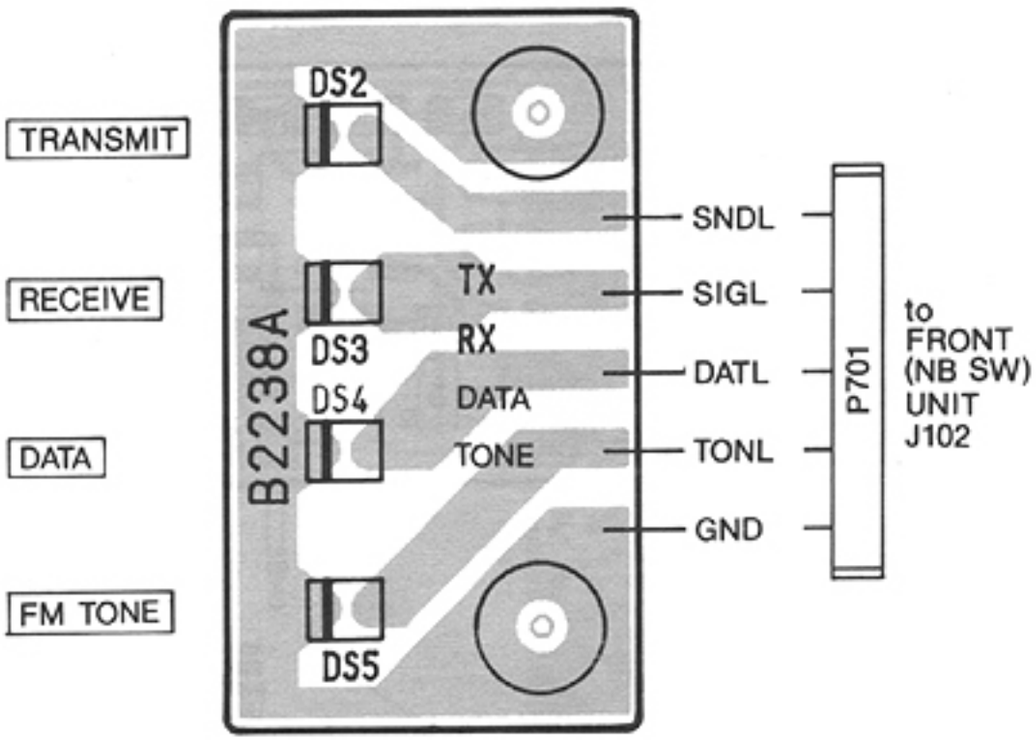
RN1202



Q101

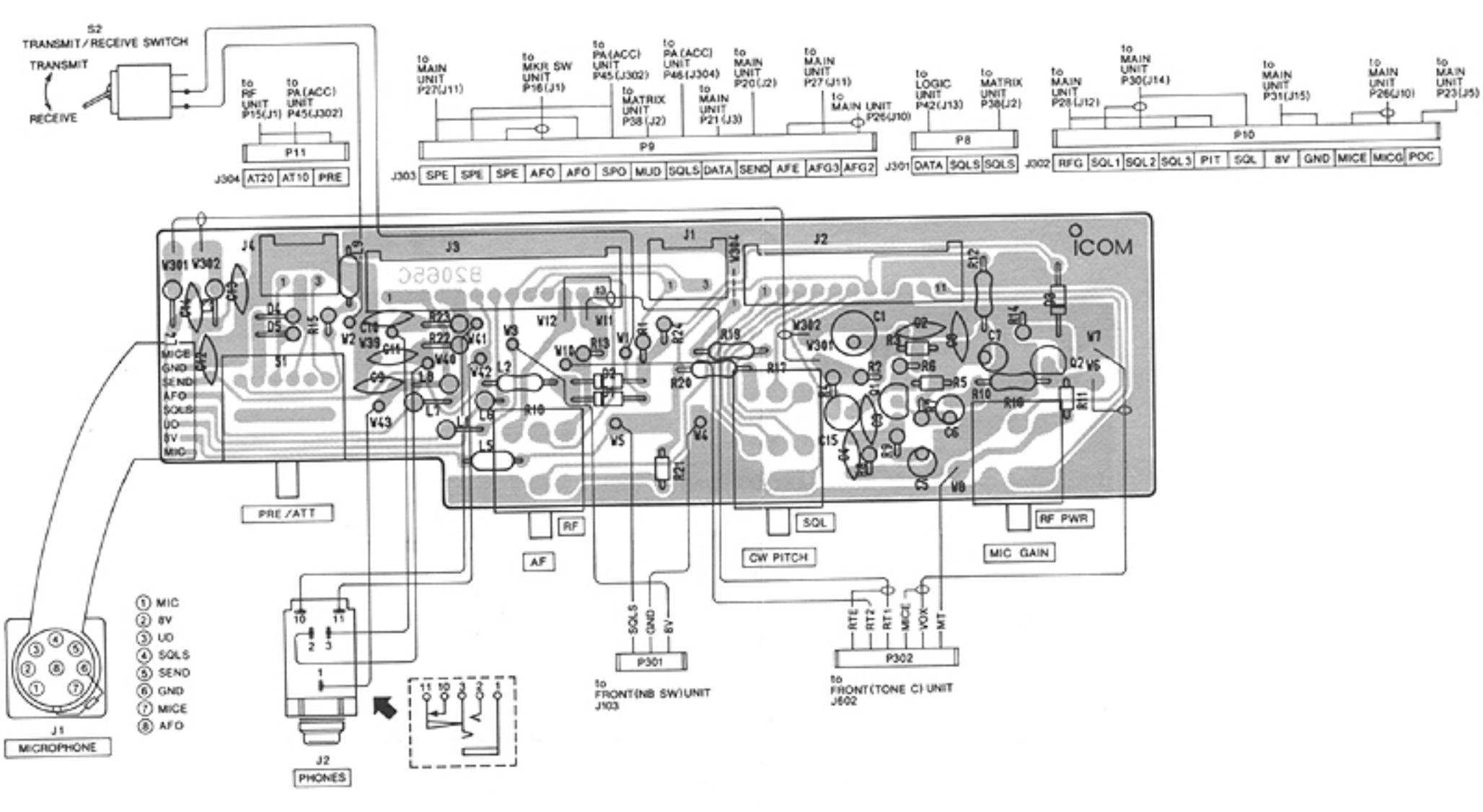
NOTE: Add "100" to the indicated on the unit for actual part number respectively.

• FRONT (LED) UNIT

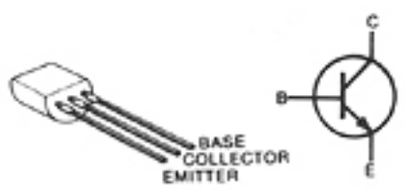


NOTE: Add "700" to the indicated on the unit for actual part number respectively.

• FRONT (AF VR) UNIT

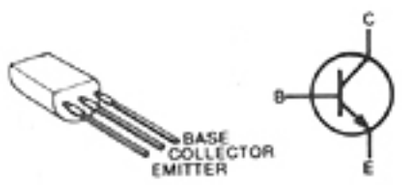


2SC1571G



Q301

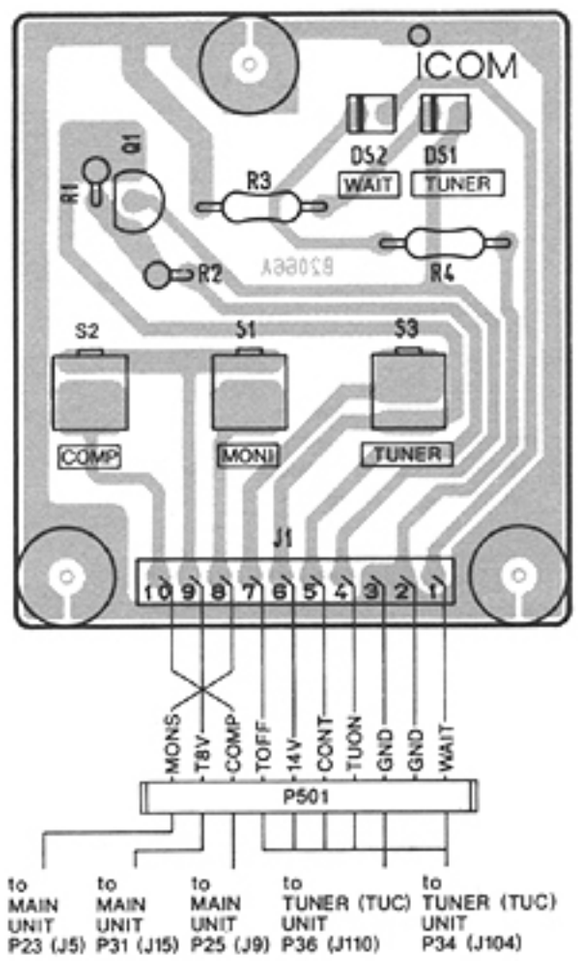
2SC2878 B



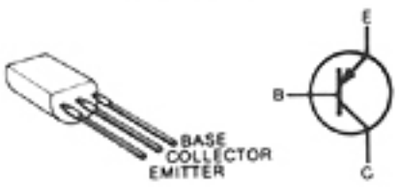
Q302

NOTE: Add "300" to the indicated on the unit for actual part number respectively.

• FRONT (AT SW) UNIT

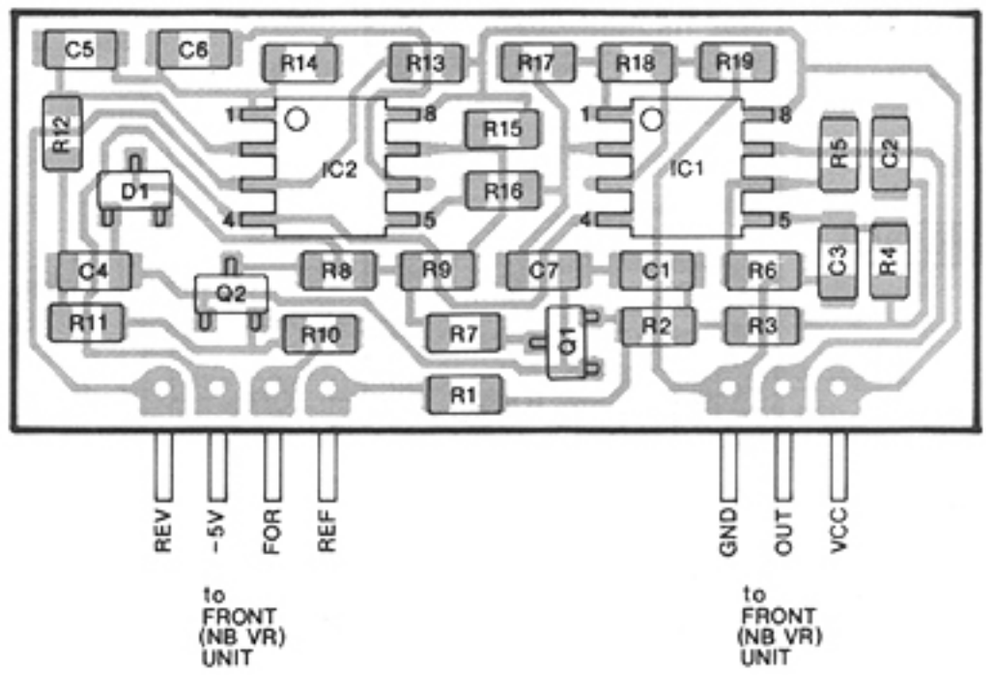


2SB562C

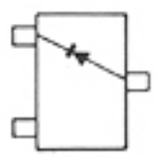


Q501

• FRONT (SWR) MODULE

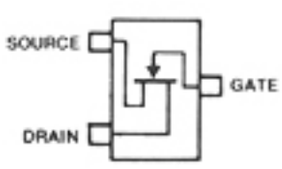


1SS187
(Symbol: D3)



D1

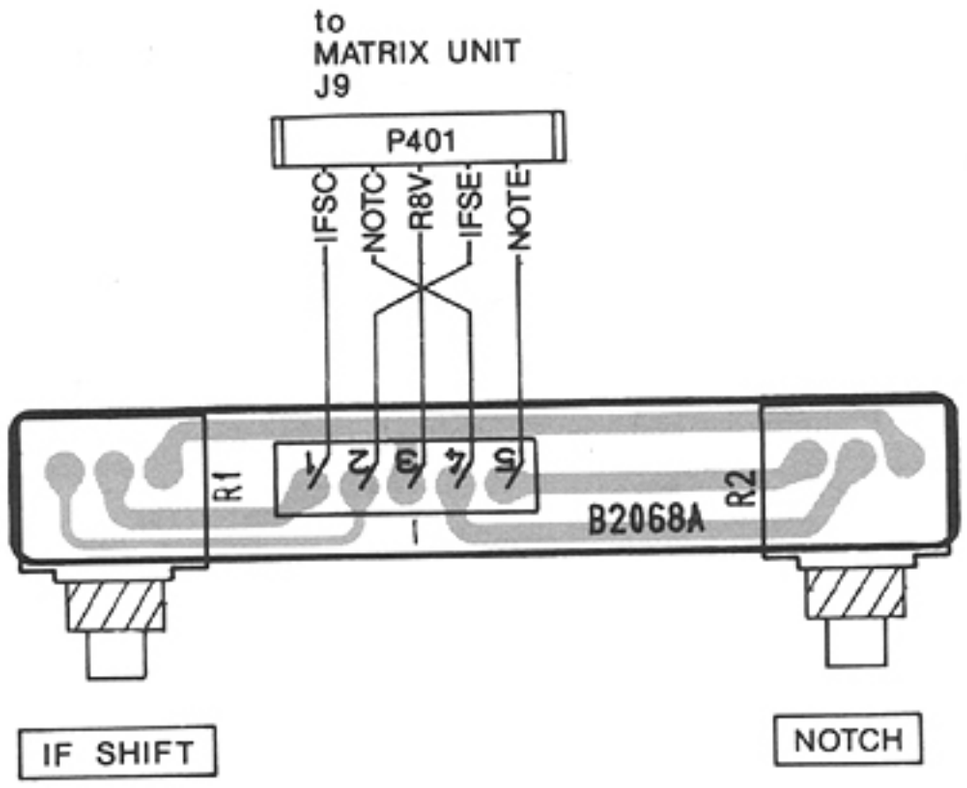
2SK209 Y
(Symbol: XY)



Q1, Q2

NOTE: Add "500" to the indicated on the unit for actual part number respectively.

• FRONT (NOTCH) UNIT

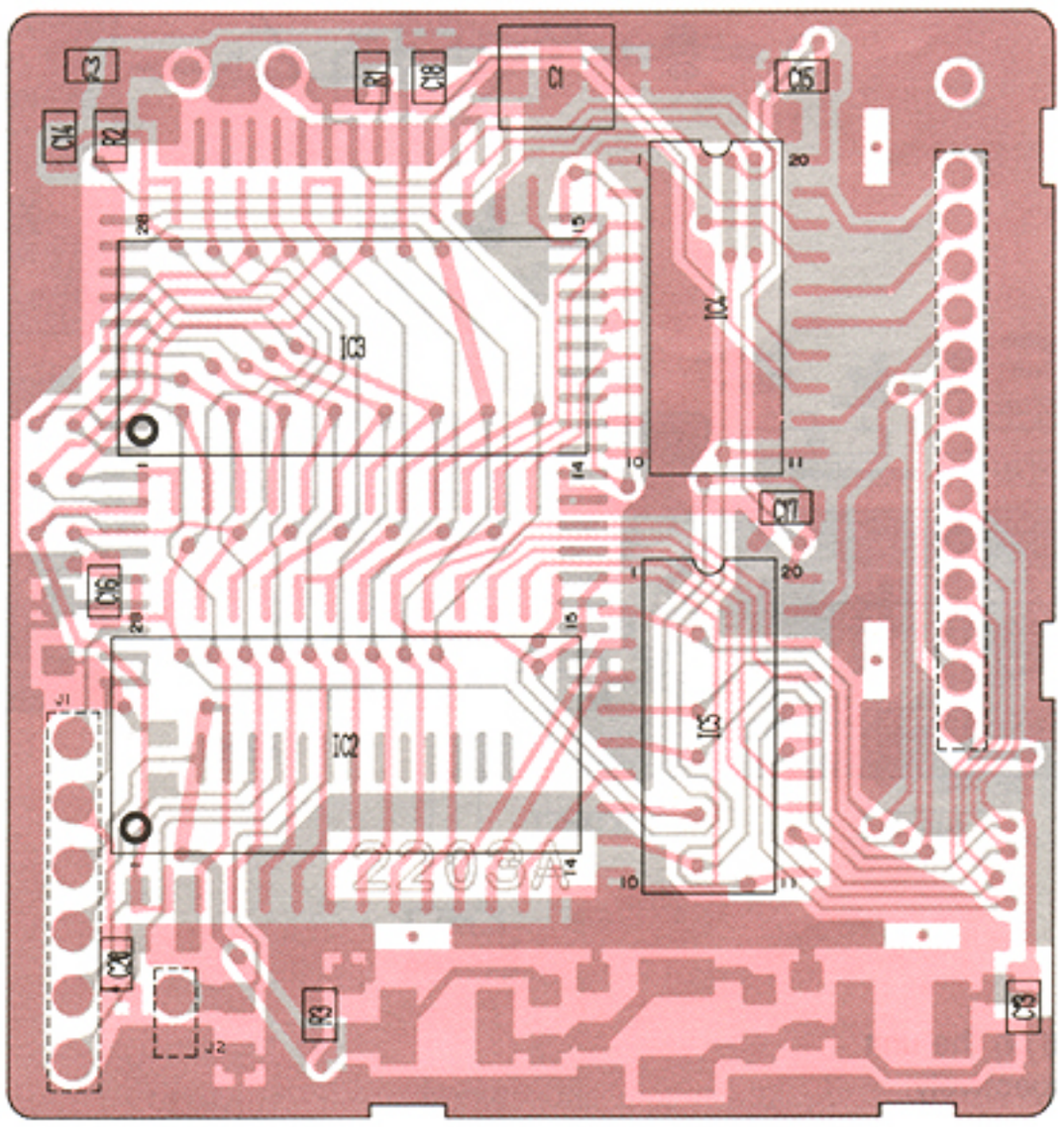


NOTE: Add "400" to the indicated on the unit for actual part number respectively.

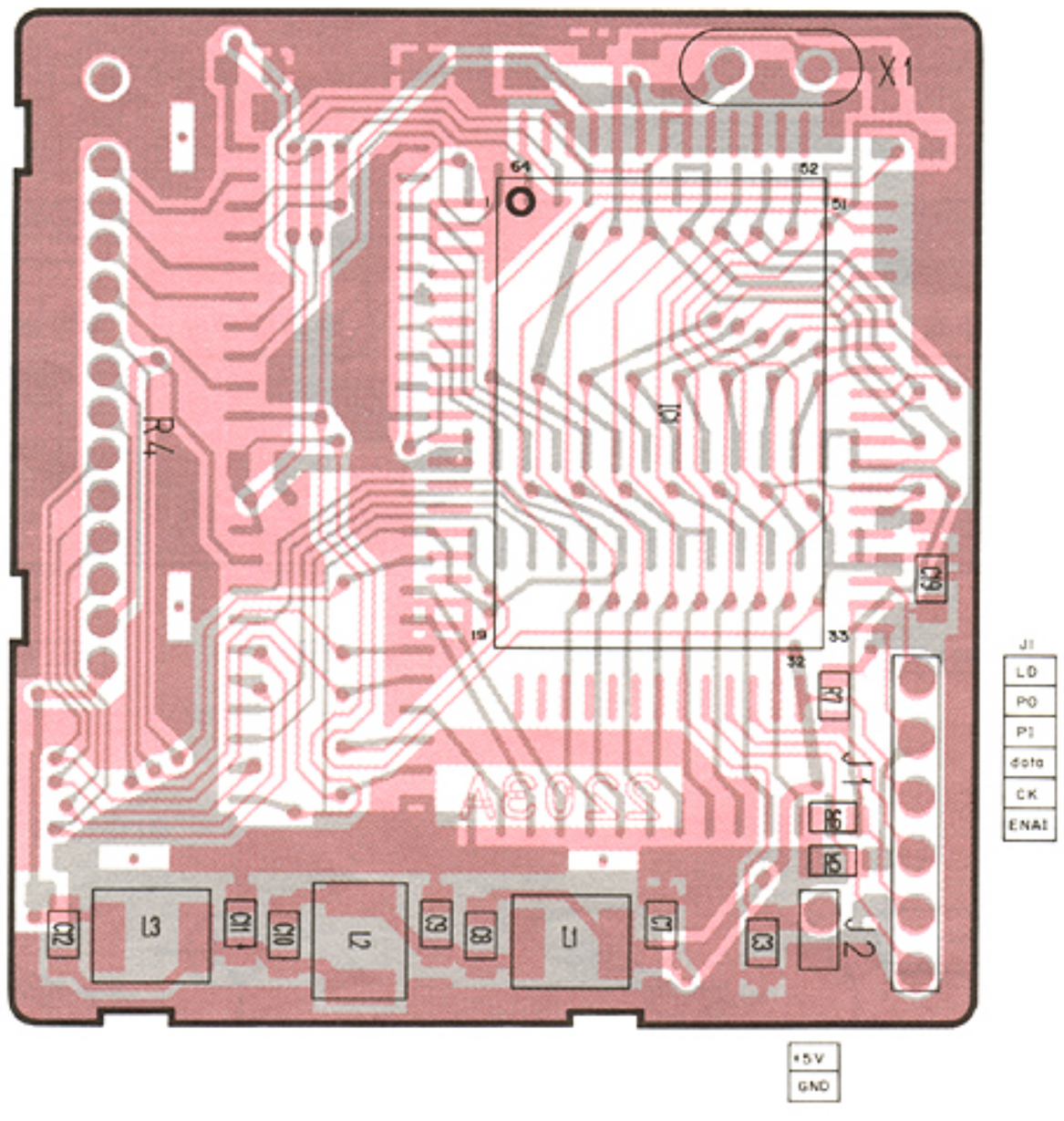
7-4 PLL AND DDS UNITS

• DDS UNIT

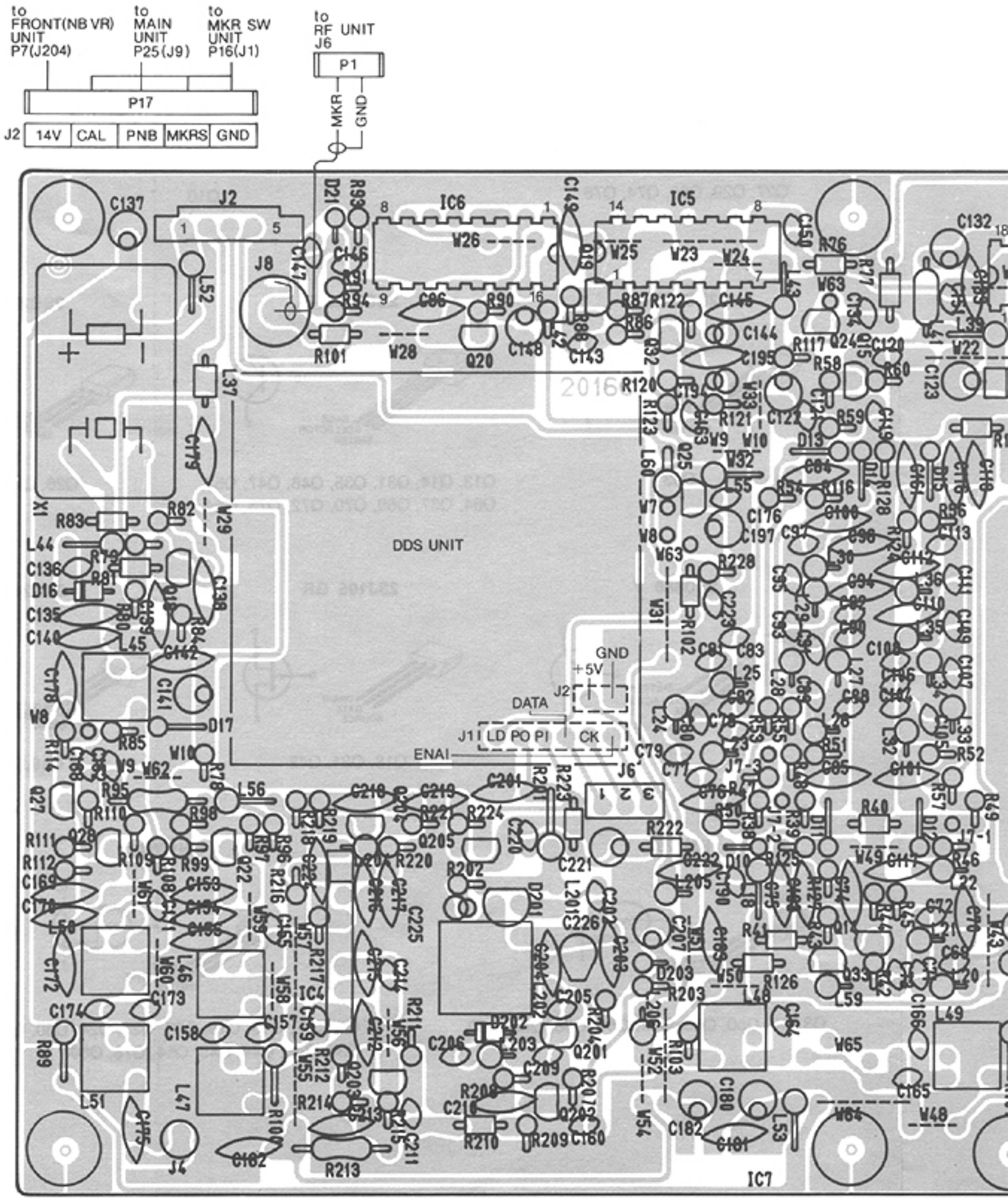
COMPONENT SIDE



FOIL SIDE



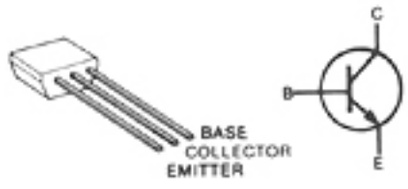
• PLL UNIT



2SC1571 G

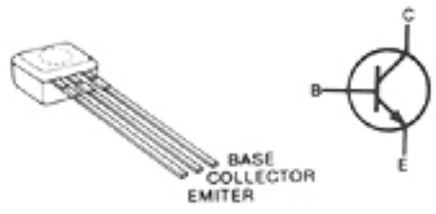
Q5, Q6, Q7

2SC2668 O



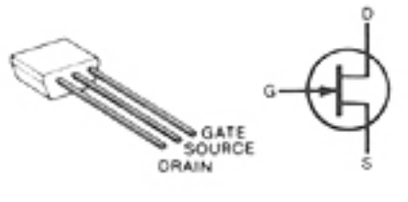
Q12, Q13, Q14, Q15, Q16, Q17,
Q18, Q19, Q22, Q23, Q33,
Q202, Q203, Q204, Q205

2SC2785 EL



Q28, Q32

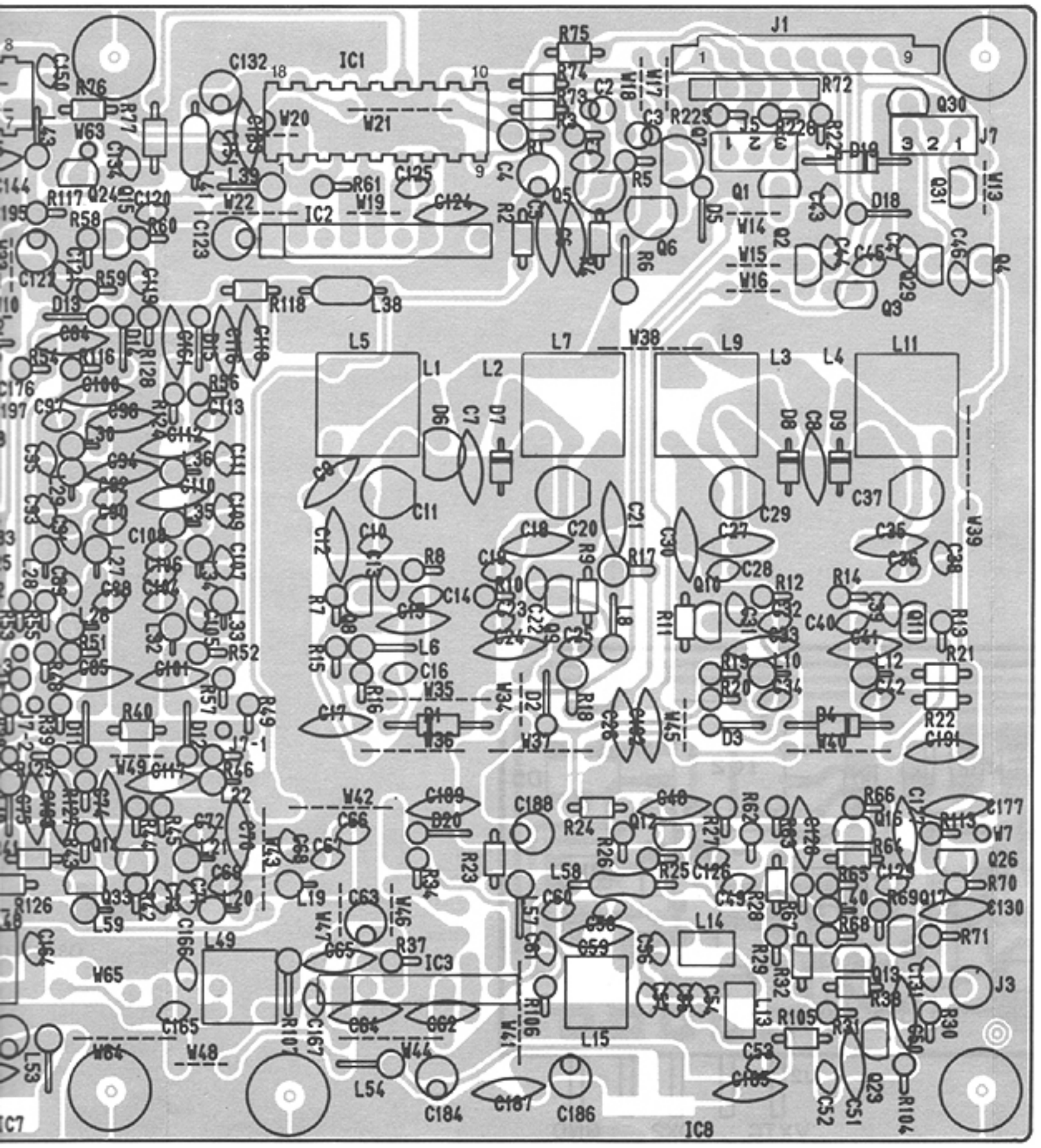
2SK192A GR



Q10, Q11, Q201, Q8, Q9

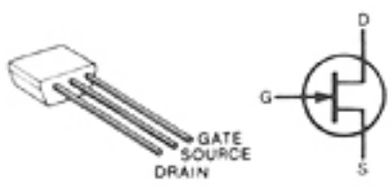
to
LOGIC UNIT
P3 (J5)

J1	STBH	PDAT	CK	STBL	VCO1	VCO2	VCO3	VCO4	GND



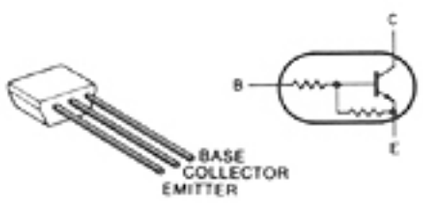
P1
1st LO
to
RF UNIT

2SK192A GR



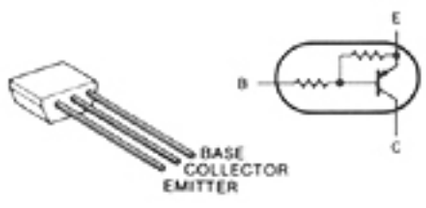
Q10, Q11, Q201, Q8, Q9

RN1202



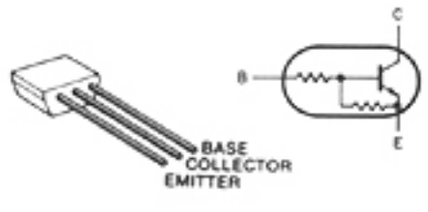
Q1, Q2, Q24, Q26, Q27, Q29, Q3, Q30, Q31, Q4

RN2202



Q25

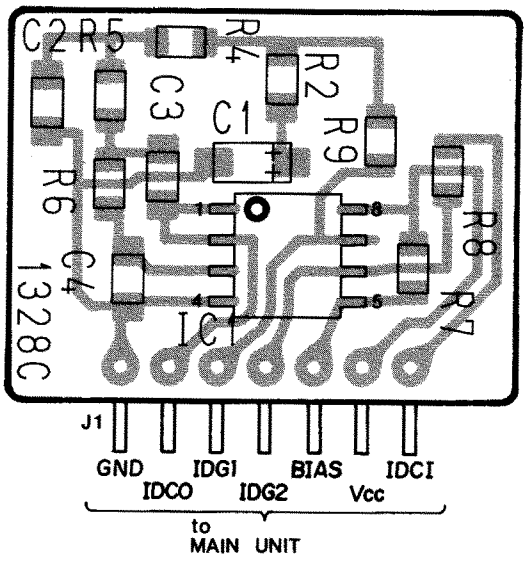
RN1204



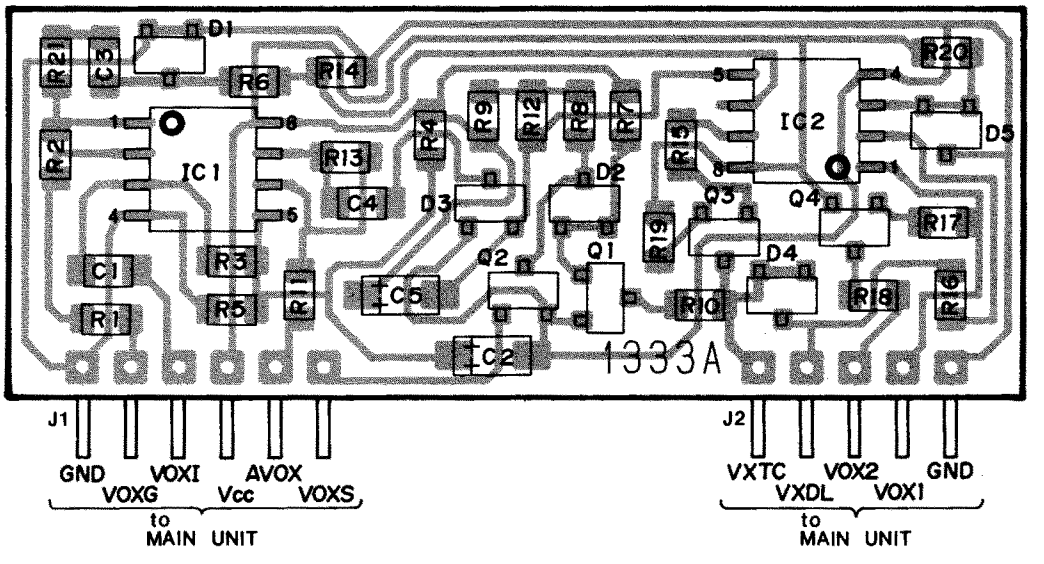
Q20

7-5 MAIN UNIT

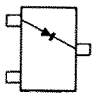
• IDC UNIT



• VOX UNIT

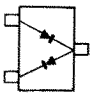


1SS193
(Symbol: F3)



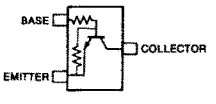
D1, D2, D4, D5

1SS226
(Symbol: C3)



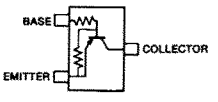
D3

RN1404
(Symbol: XD)



Q1, Q2

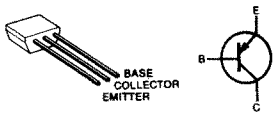
RN2404
(Symbol: YD)



Q3, Q4

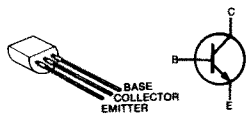
• MAIN UNIT

2SA1048 GR



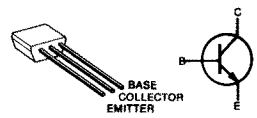
Q27, Q29, Q60, Q74, Q76

2SC1571G



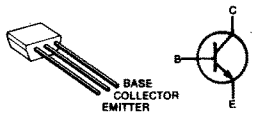
Q10

2SC2458 GR



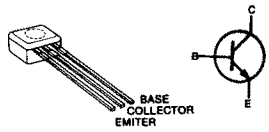
Q11, Q17, Q22, Q32, Q37, Q4, Q49, Q52, Q53, Q58, Q6, Q68, Q77, Q8, Q83, Q87, Q91

2SC2668 O



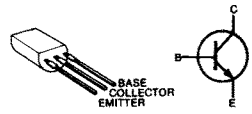
Q63

2SC2785 EL



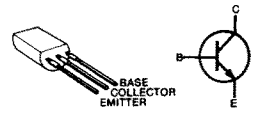
Q13, Q14, Q31, Q35, Q46, Q47, Q57, Q64, Q67, Q69, Q70, Q72, Q73, Q84

2SC2878 B



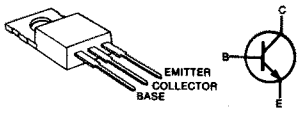
Q26, Q59, Q61

2SD468C



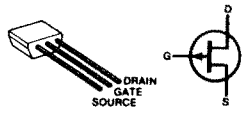
Q2, Q9

2SD880 Y



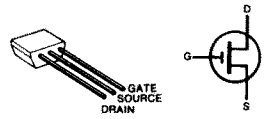
Q7

2SJ105 GR



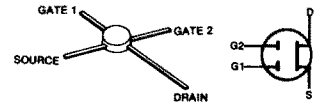
Q18, Q21, Q48

2SK241 Y



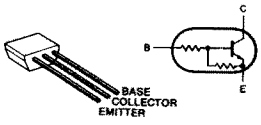
Q19, Q34

3SK74 M



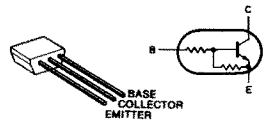
Q33, Q55, Q56, Q62, Q65, Q71, Q85

RN1202



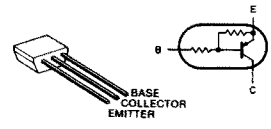
Q3, Q5, Q50, Q66, Q82, Q86, Q88, Q89, Q90

RN1204



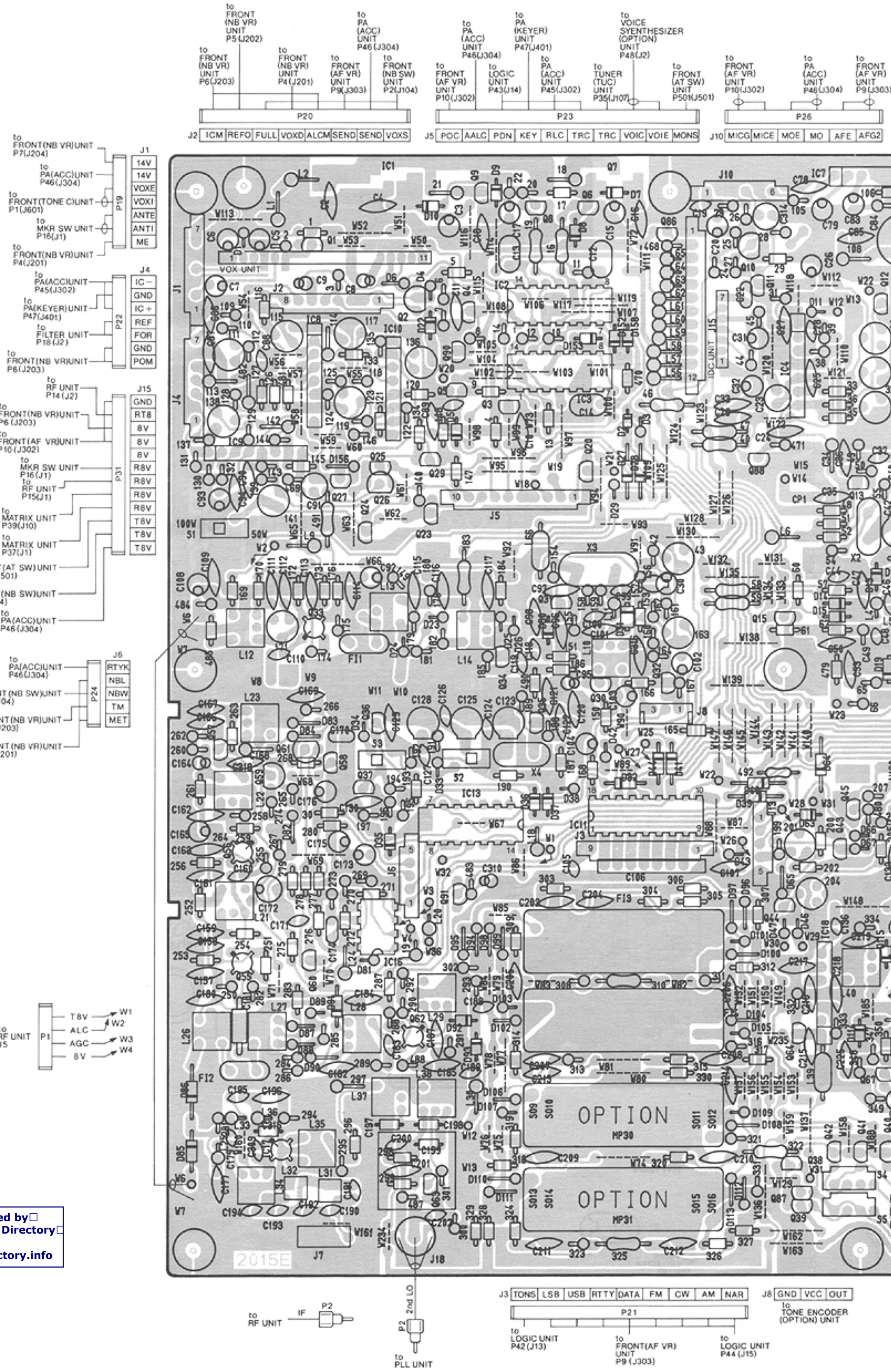
Q1, Q12, Q15, Q16, Q20, Q23, Q24, Q30, Q36, Q38, Q43, Q44, Q45, Q54, Q78, Q80

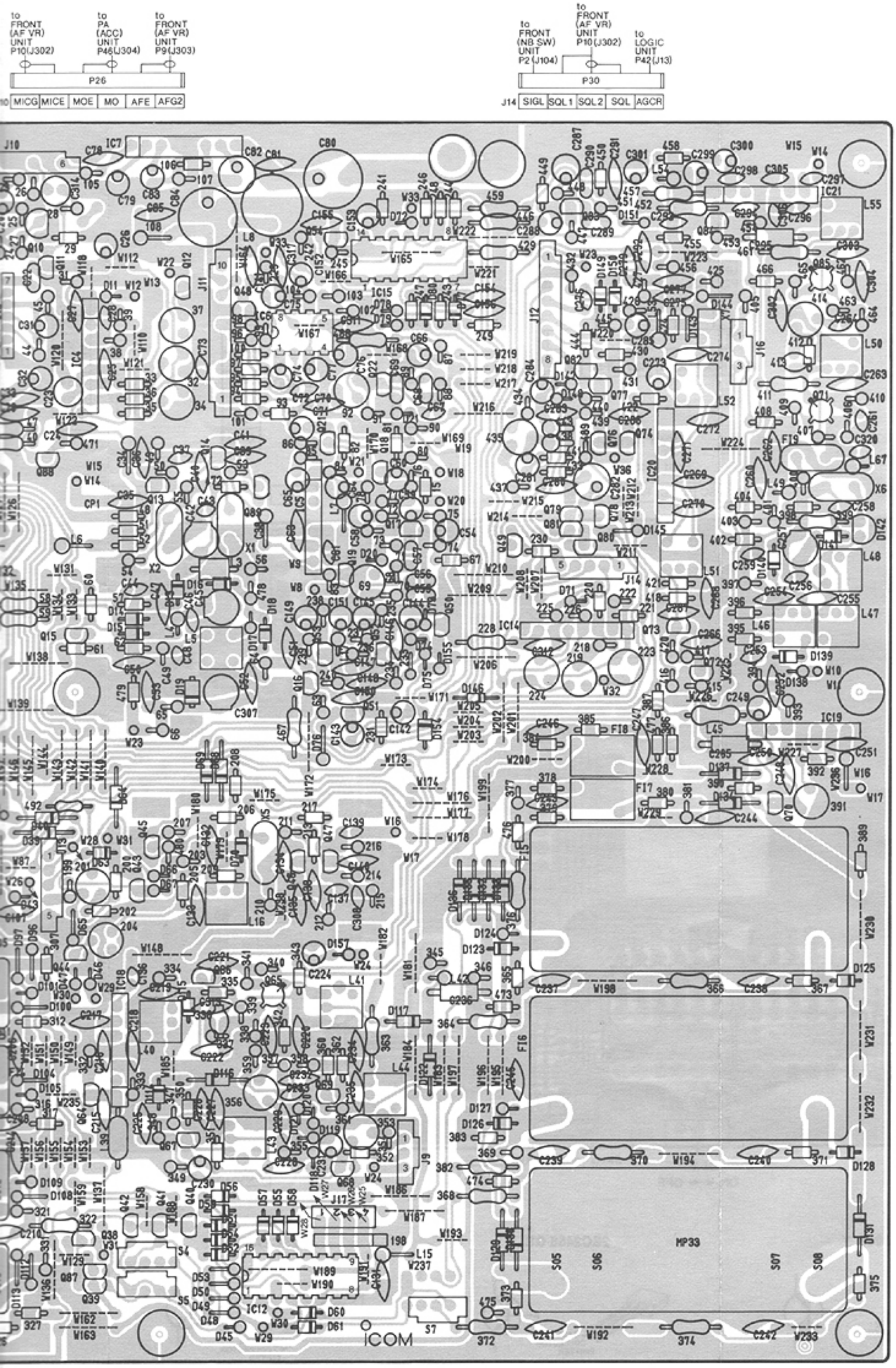
RN2202



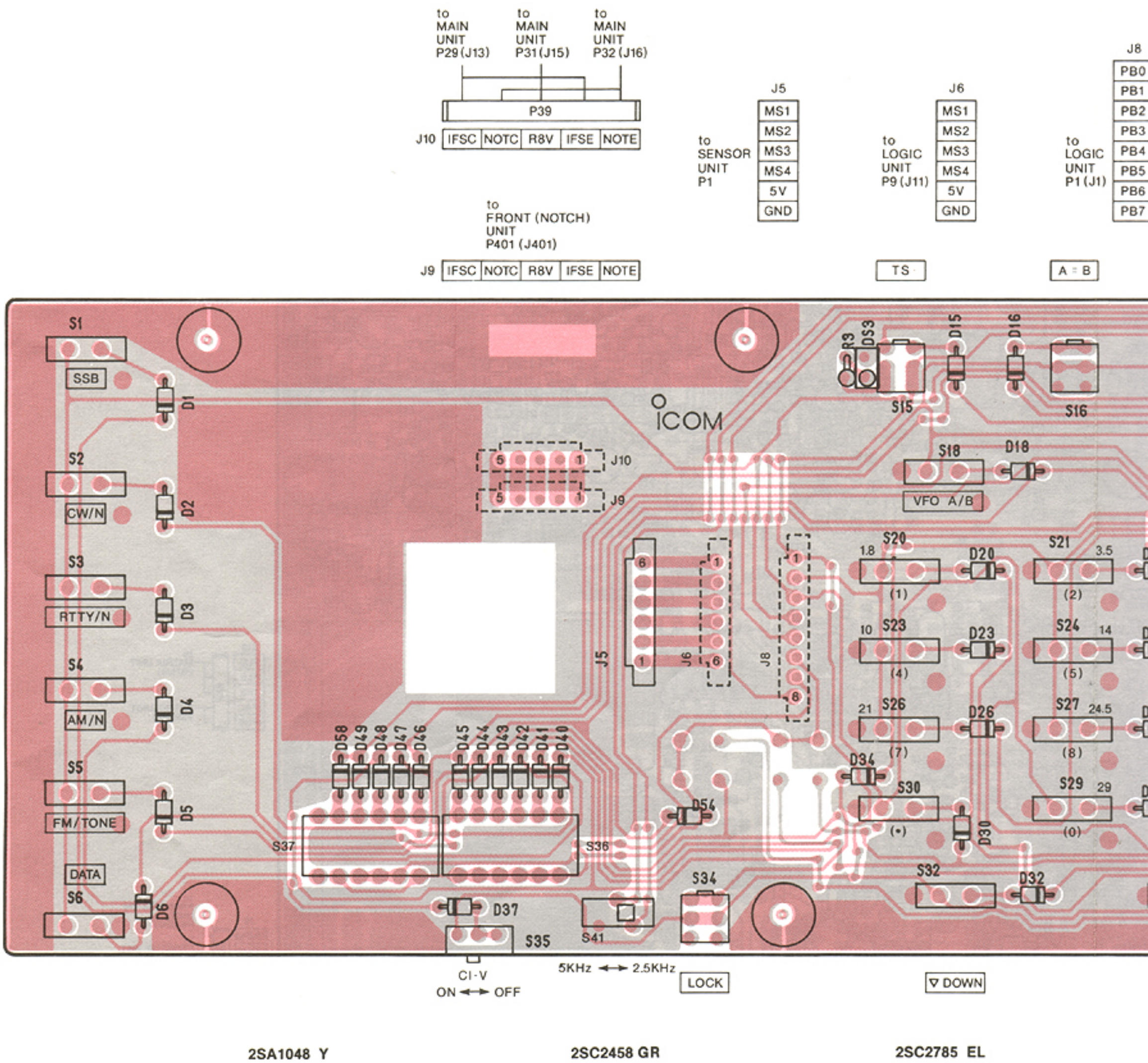
Q25, Q39, Q40, Q41, Q42, Q51, Q79, Q81

• MAIN UNIT




to FRONT (AF VR) UNIT P10(J302)
to PA (ACC) UNIT P46(J304)
to FRONT (AF VR) UNIT P9(J303)
P26
J10 MICG MICE MOE MO AFE AFG2
to FRONT (NB SW) UNIT P2 (J104)
to FRONT (AF VR) UNIT P10 (J302)
to LOGIC UNIT P42 (J13)
P30
J14 SIGL SQL1 SQL2 SQL AGCR
J11 SPE AFO 14V GND AFG3 AFG1 AAFE AAF MOG2 MOG1
P27
to FRONT(AF VR) UNIT P9 (J303)
to FRONT(NB VR) UNIT P6(J203)
FRONT(AF VR) UNIT P9(J303)
to PA(ACC) UNIT P46(J304)
to FRONT(TONE C) UNIT P1(J601)
J12 PIT -5V BEEP SQL3 GND RFG AGCO AGCS
P28
to FRONT(AF VR) UNIT P10(J302)
to LOGIC UNIT P43(J14)
to FRONT(NB VR) UNIT P6(J203)
J16 NOTE NOTS NOTC
P32
to MATRIX UNIT P39(J10)
to MATRIX UNIT P37(J1)
J13 FLC FLS IFS IFSC IFSE
P29
to MATRIX UNIT P37(J1)
to MATRIX UNIT P39(J10)
J9 CMPM COMP PNB
P25
to FRONT(NB VR) UNIT P6(J203)
to FRONT(AT SW) UNIT P501(J501)
to PLL UNIT P17(J2)
NAR
J8 GND VCC OUT
to TONE ENCODER (OPTION) UNIT
to LOGIC UNIT P44 (J15)
ICOM
MP33

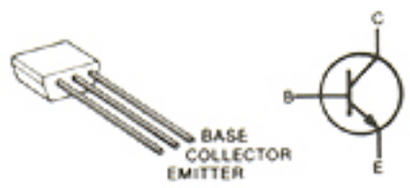
7-6 MATRIX UNIT



2SA1048 Y

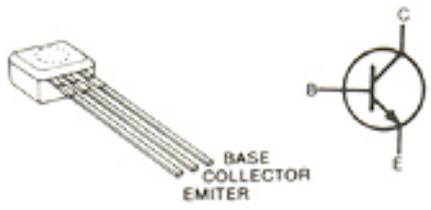
Q3, Q6

2SC2458 GR

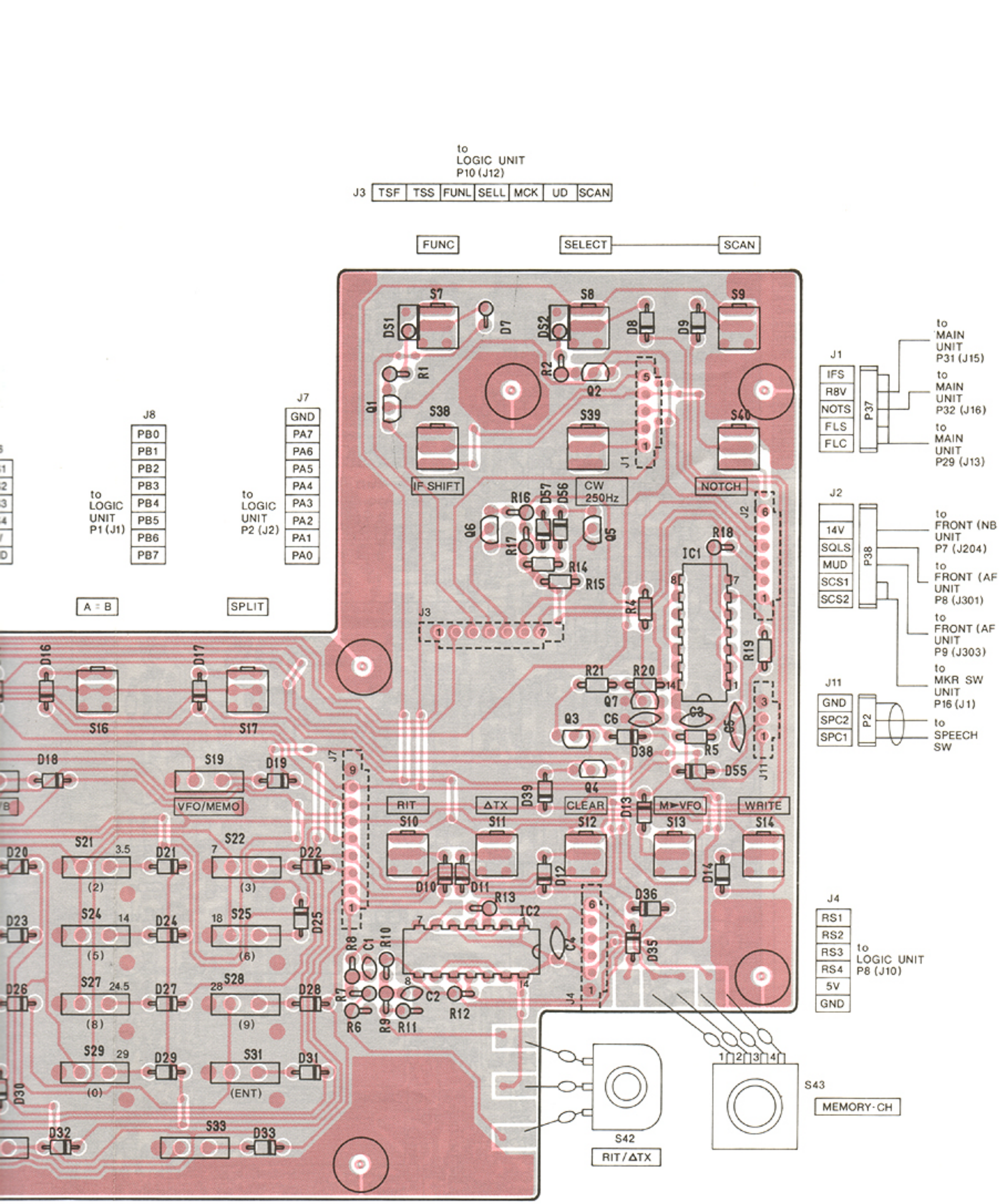


Q4

2SC2785 EL



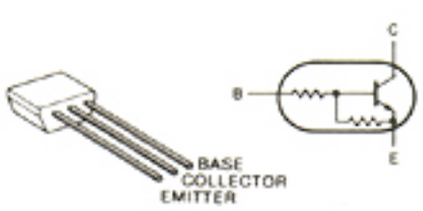
Q5



UP △

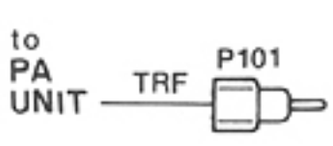
EL

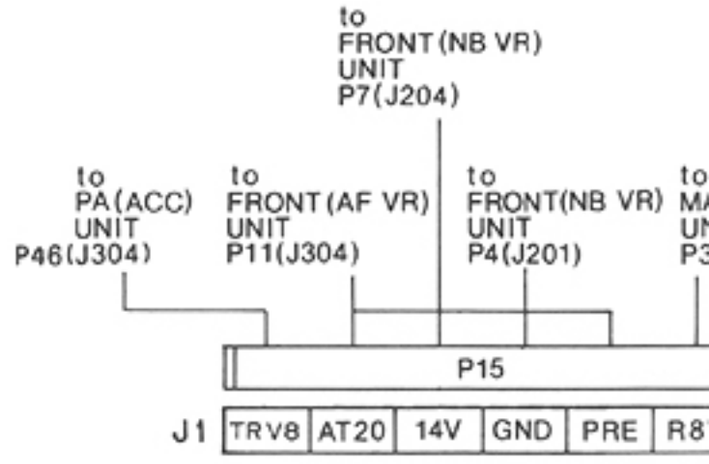
RN1204

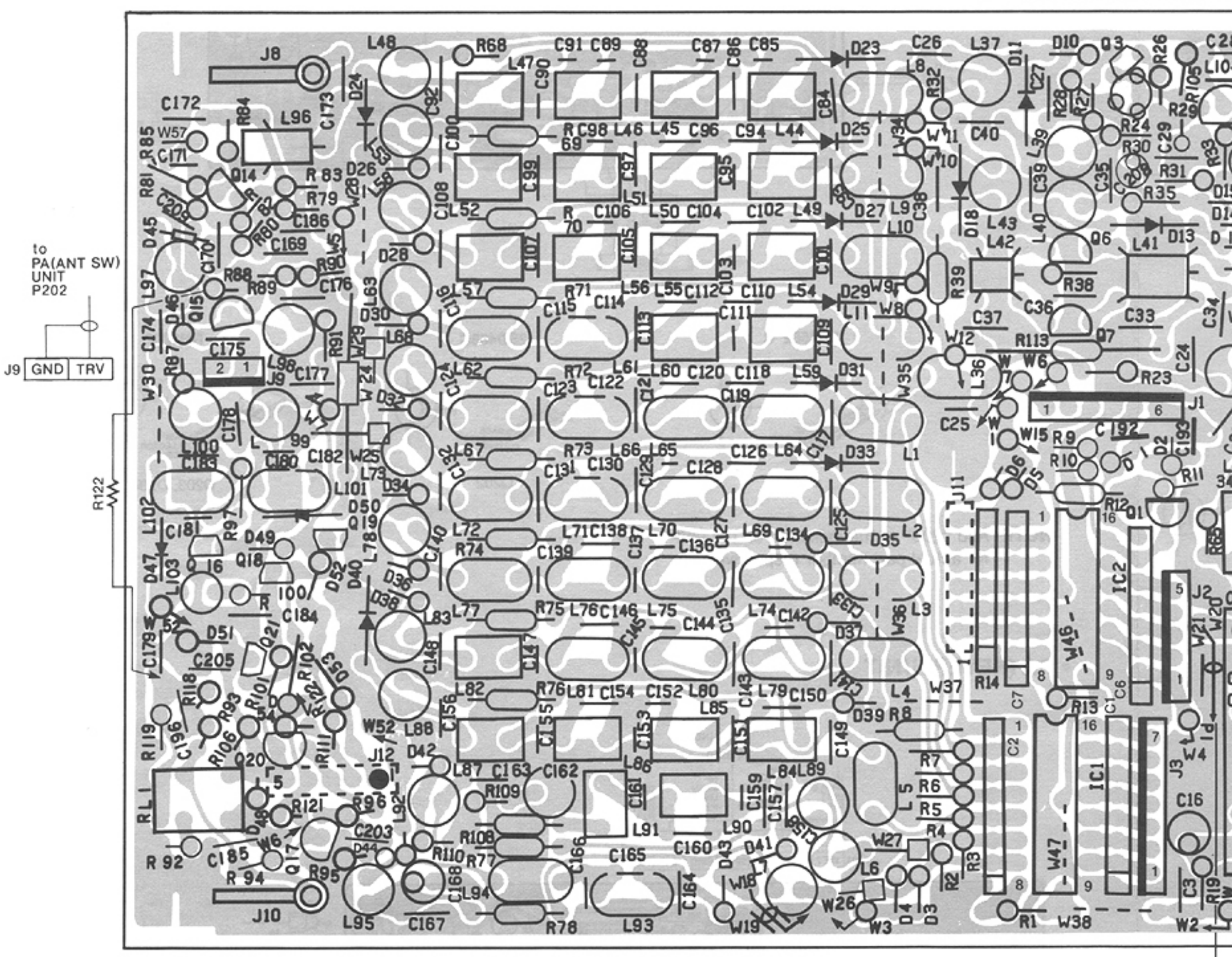


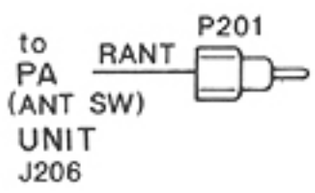
Q1, Q2, Q7

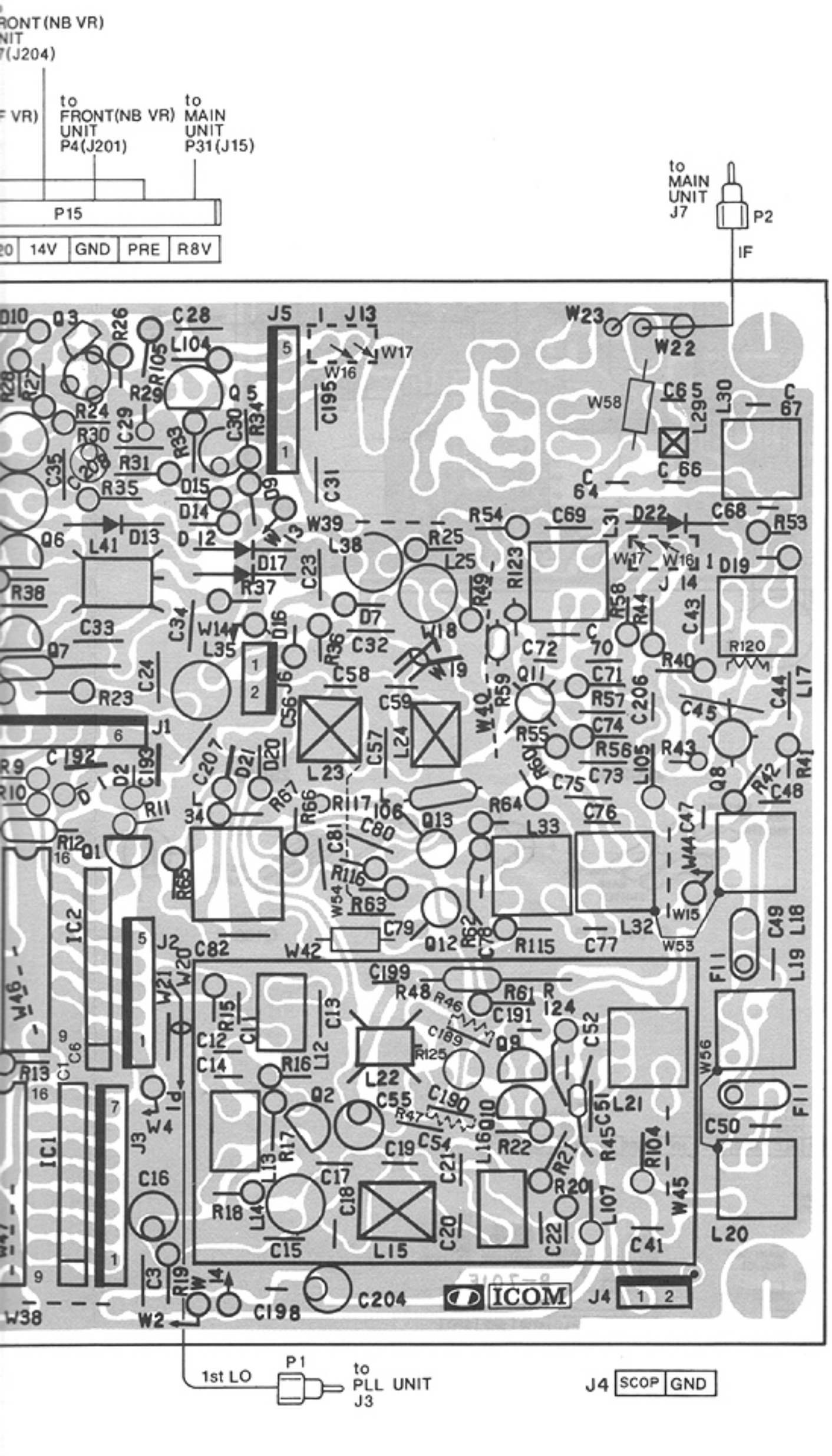
7-7 RF UNIT



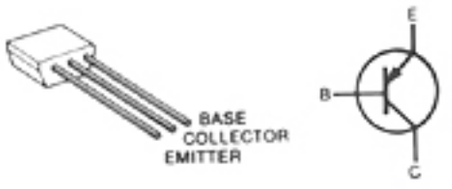






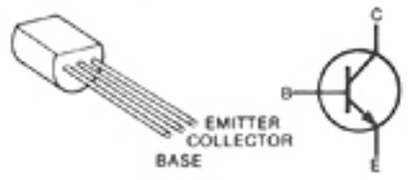


2SA1048 Y



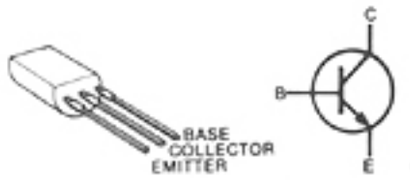
Q3

2SC2053



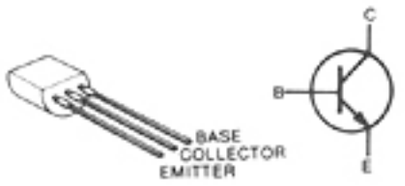
Q14, Q2

2SC2878 B



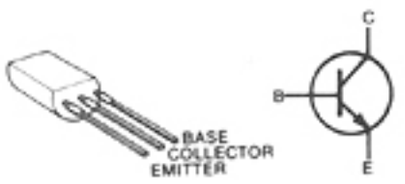
Q15, Q5

2SC945 P



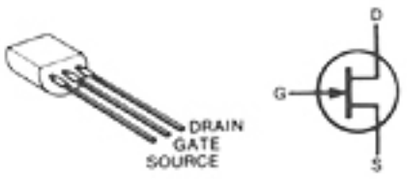
Q1, Q17

2SD468C



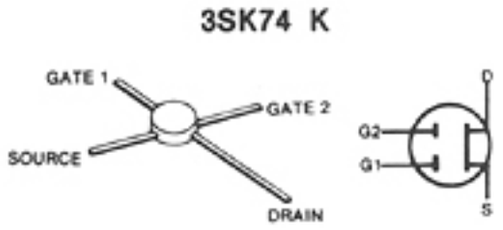
Q20

2SK125



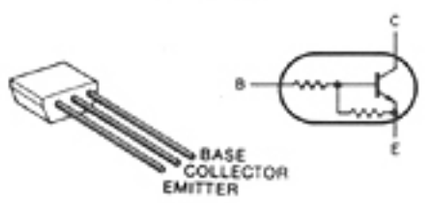
Q10, Q6, Q7, Q9

3SK74 K



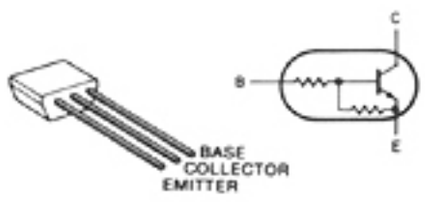
Q12, Q13, Q11, Q8

RN1204



Q21

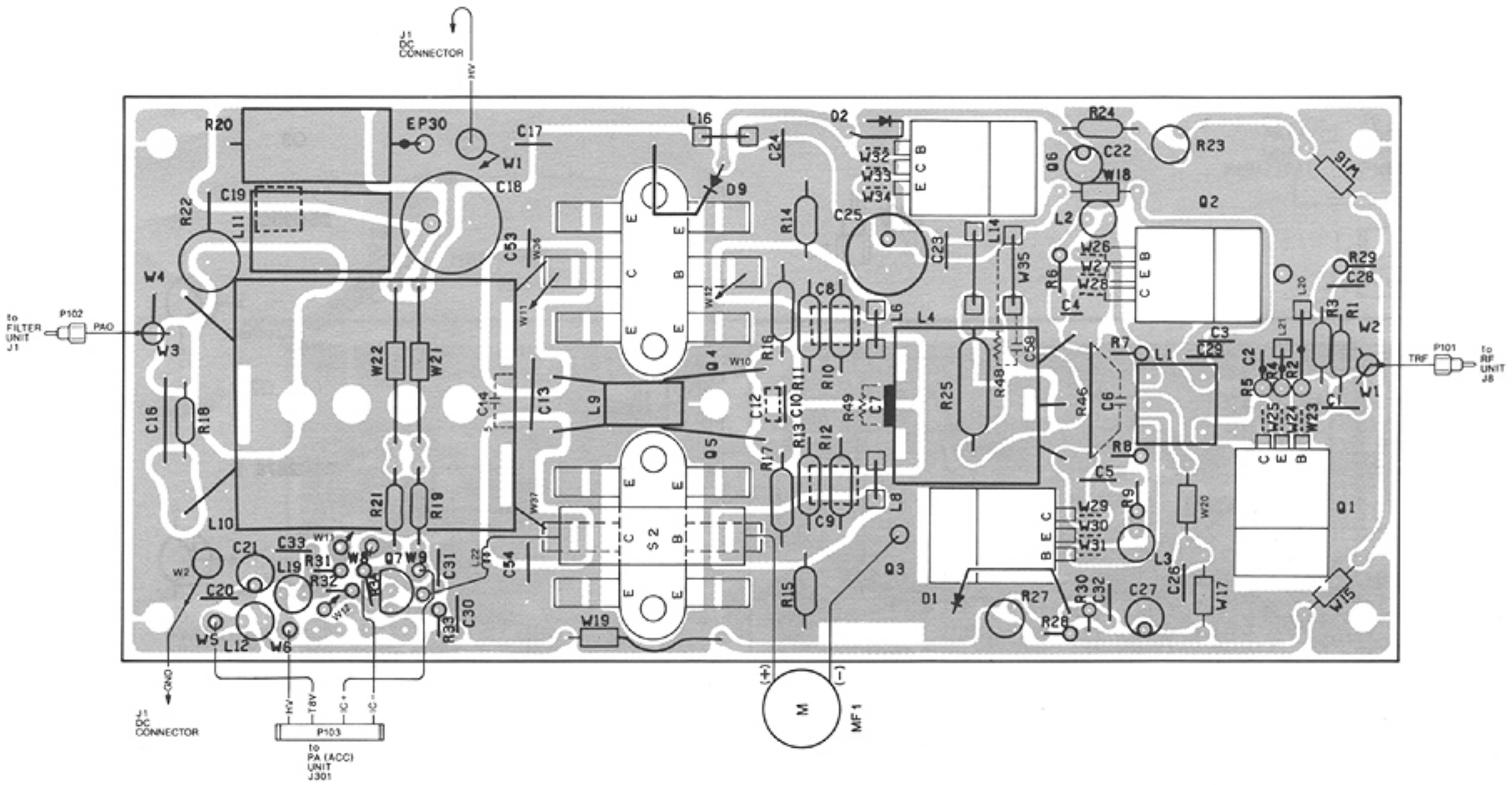
RN1202



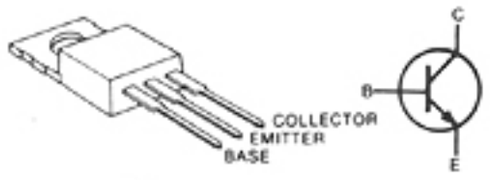
Q16, Q18, Q19

7-8 PA UNIT

• PA UNIT



2SC1971, 2SC3133

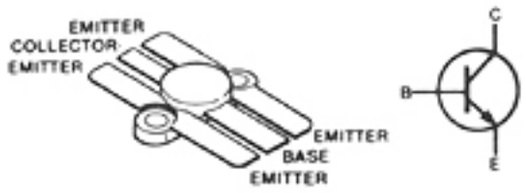


2SC1971 Q101
2SC3133 Q102, Q103

2SC2120 Y

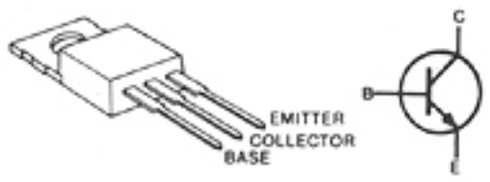
Q107

2SC2904



Q104, Q105

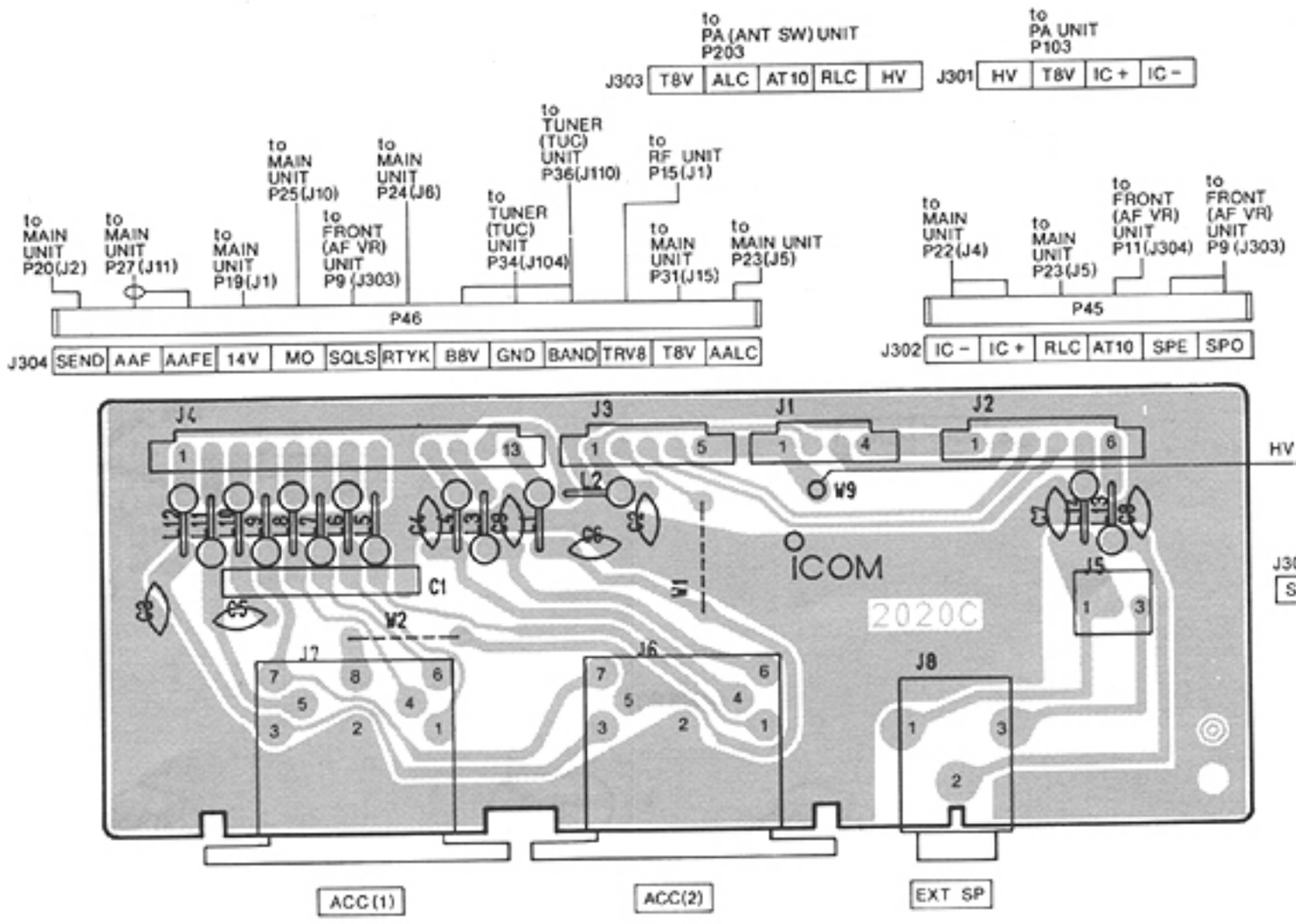
2SD880 Y



Q106

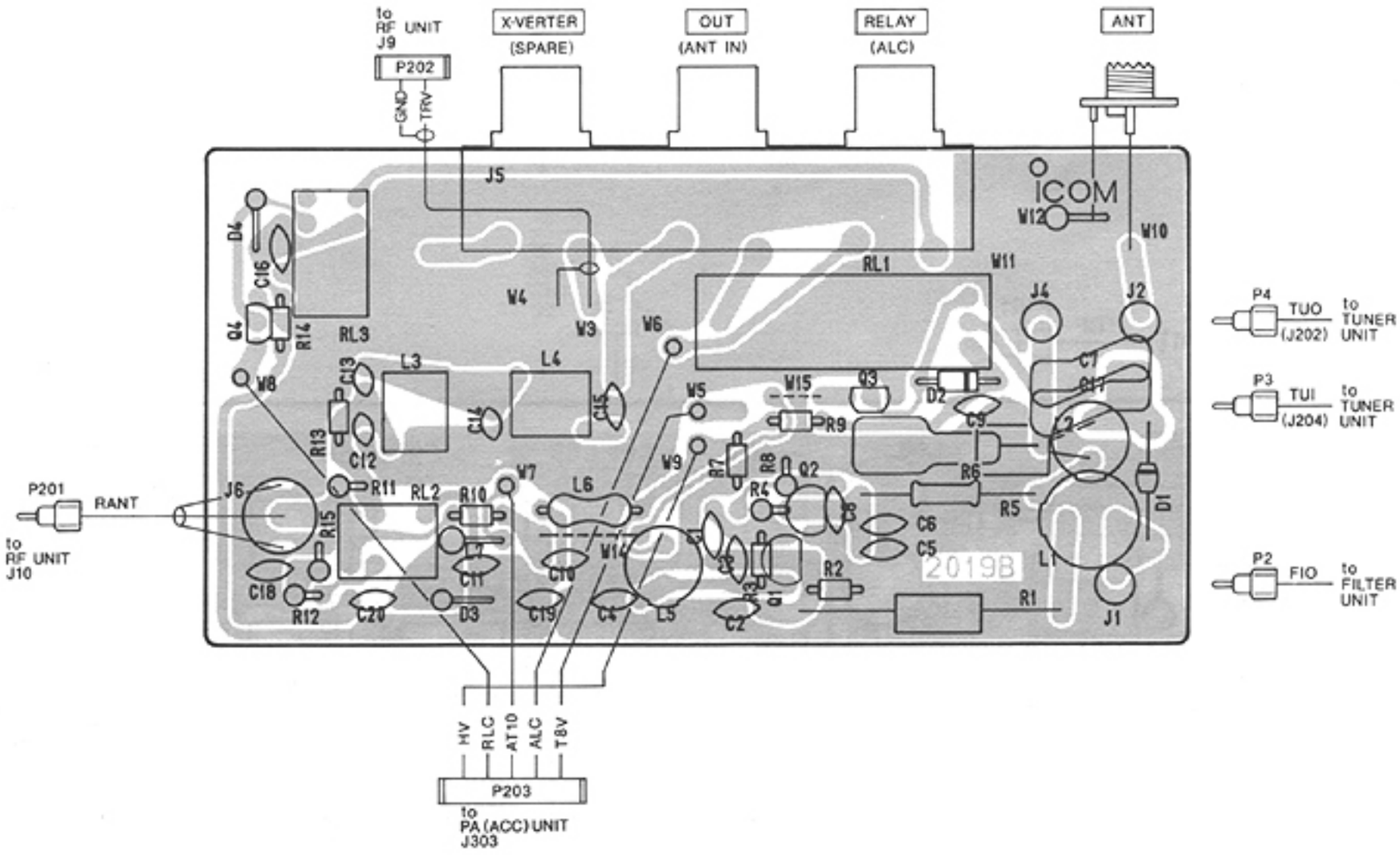
NOTE: Add "100" to the indicated on the unit for actual part number respectively.

• PA (ACC) UNIT

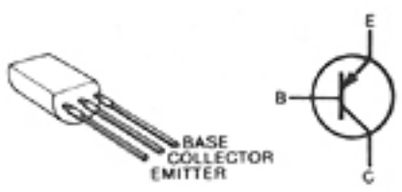


NOTE: Add "300" to the indicated on the unit for actual part number respectively.

• PA (ANT SW) UNIT

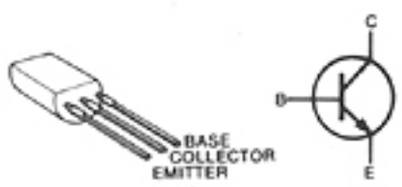


2SB562 C



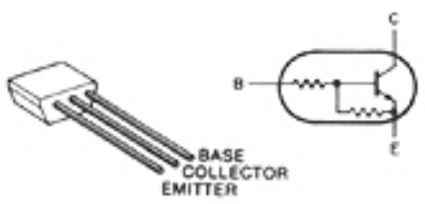
Q201

2SD468C



Q202

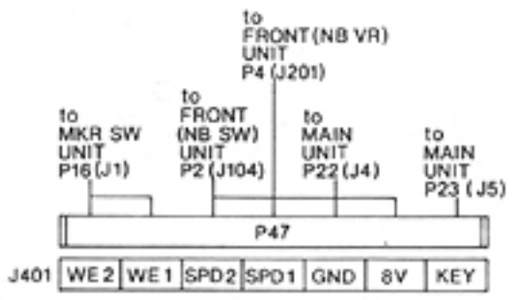
RN1202

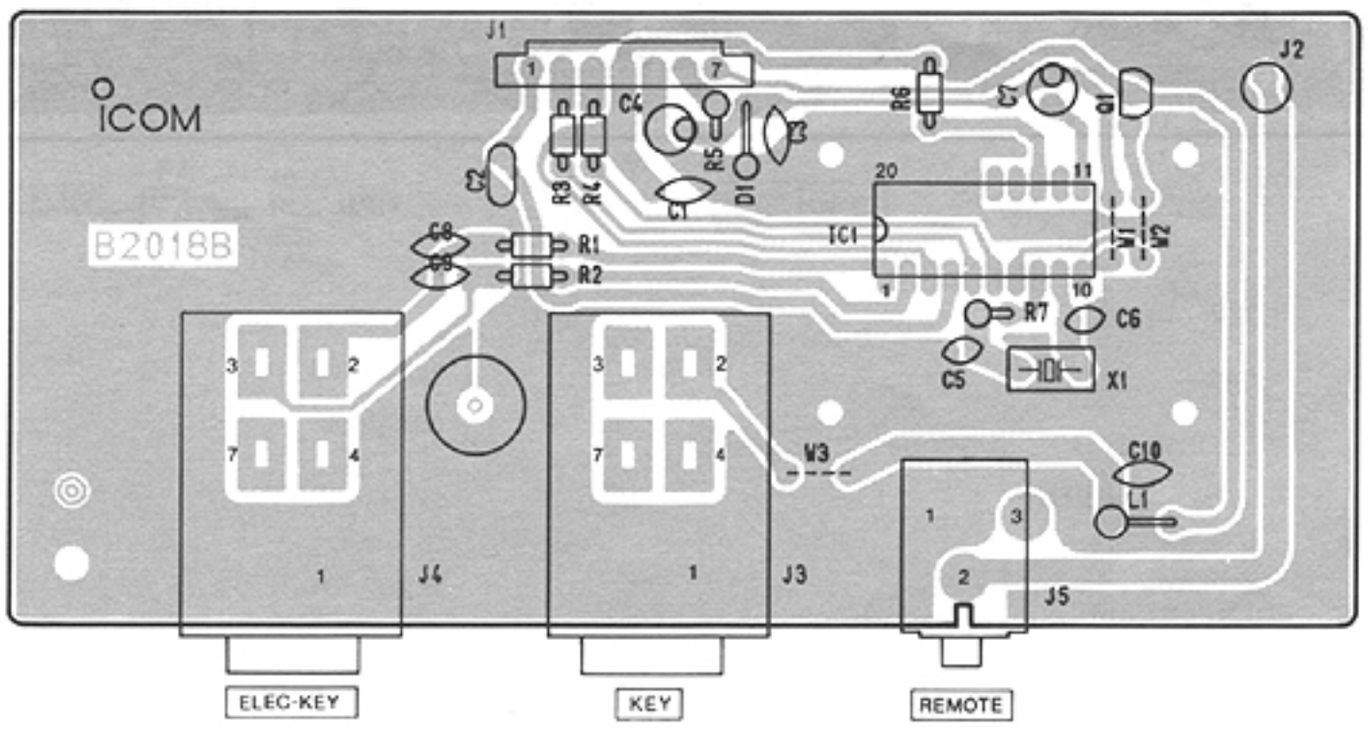


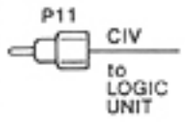
Q203, Q204

NOTE: Add "200" to the indicated on the unit for actual part number respectively.

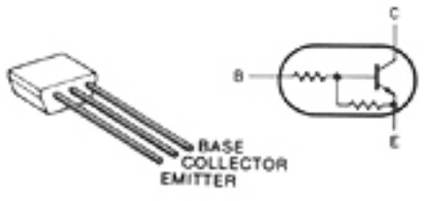
• PA (KEYER) UNIT







RN1202

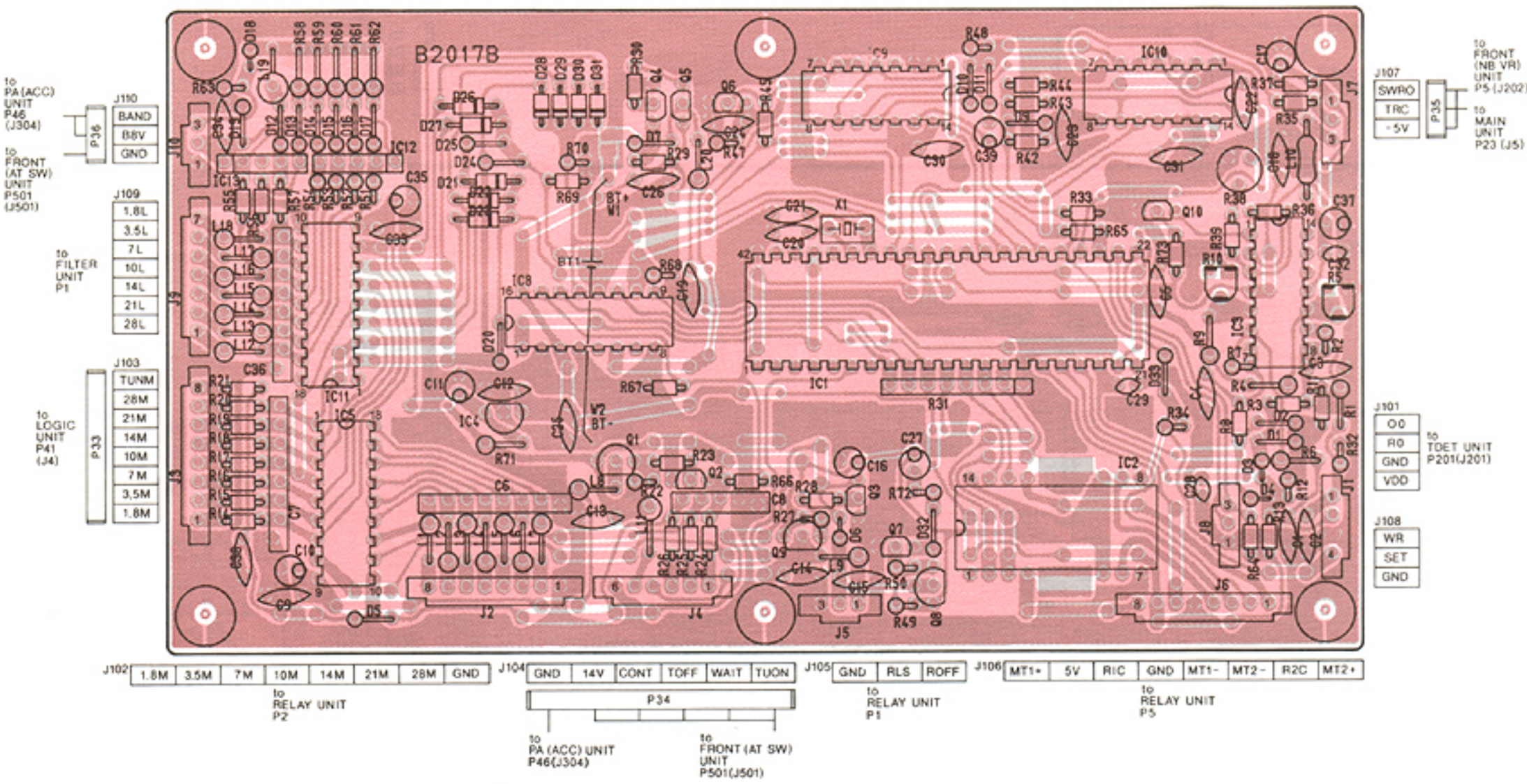


Q401

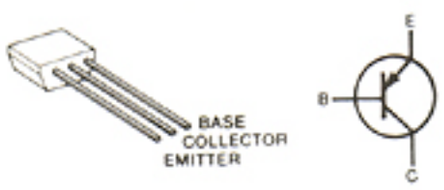
NOTE: Add "400" to the indicated on the unit for actual part number respectively.

7-9 TUNER UNIT

• TUNER (TUC) UNIT

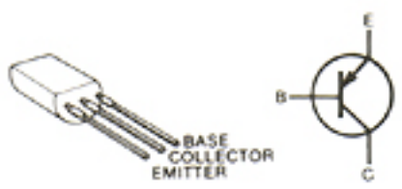


2SA1048 GR



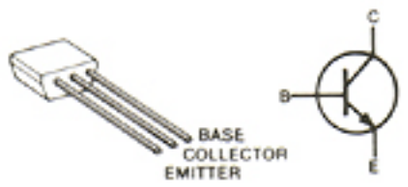
Q105

2SB562 C



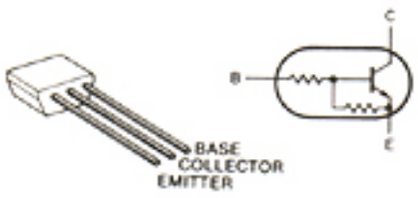
Q101, Q108, Q109

2SC2458 GR



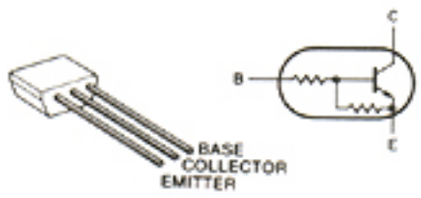
Q106

RN1202



Q102, Q103, Q104, Q110

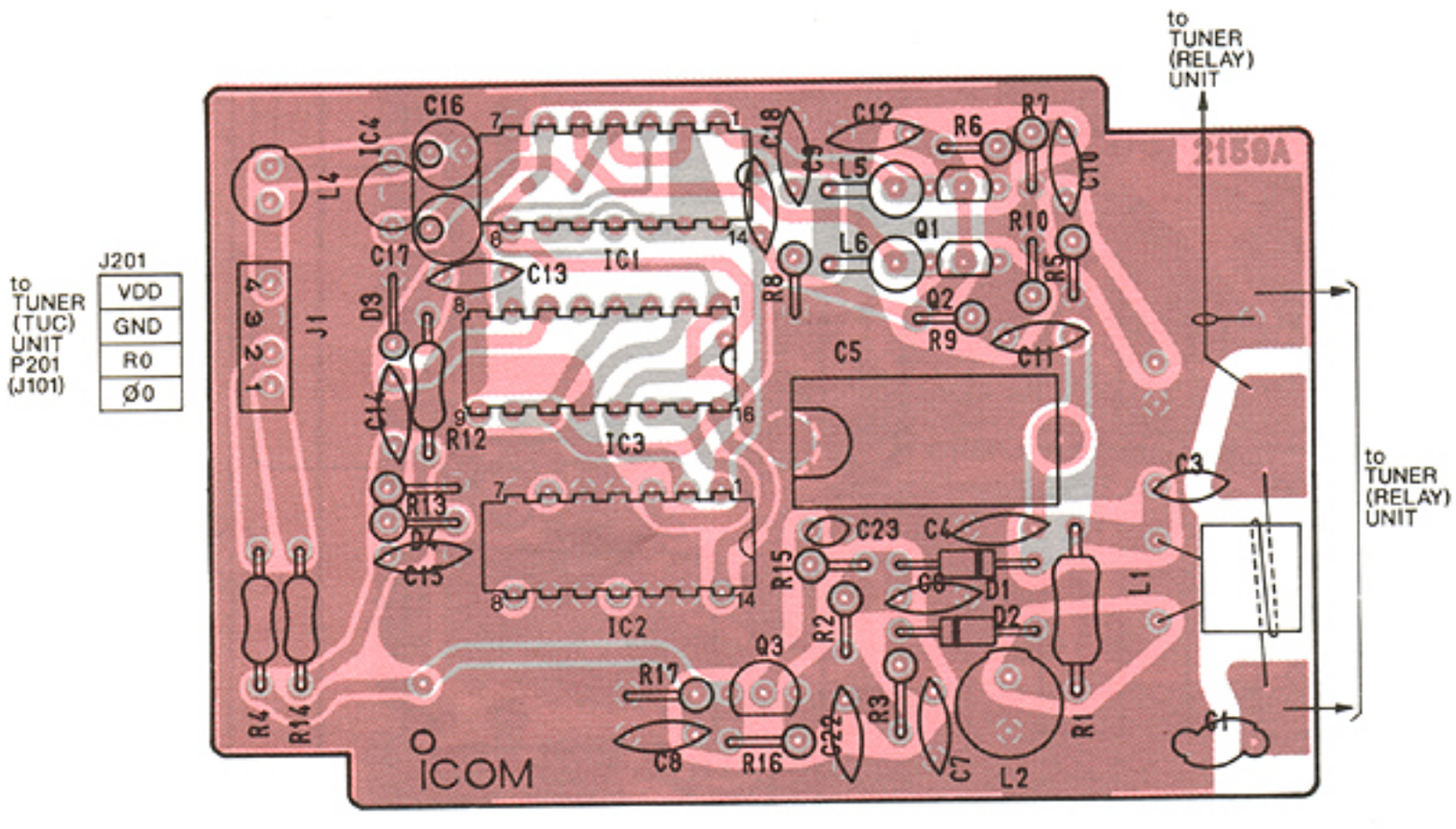
RN1204



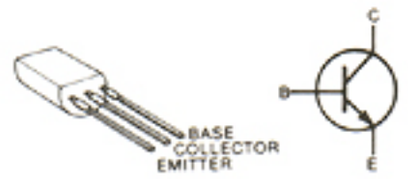
Q107

NOTE: Add "100" to the indicated on the unit for actual part number respectively.

• TUNER (T DET) UNIT



2SC1740 S



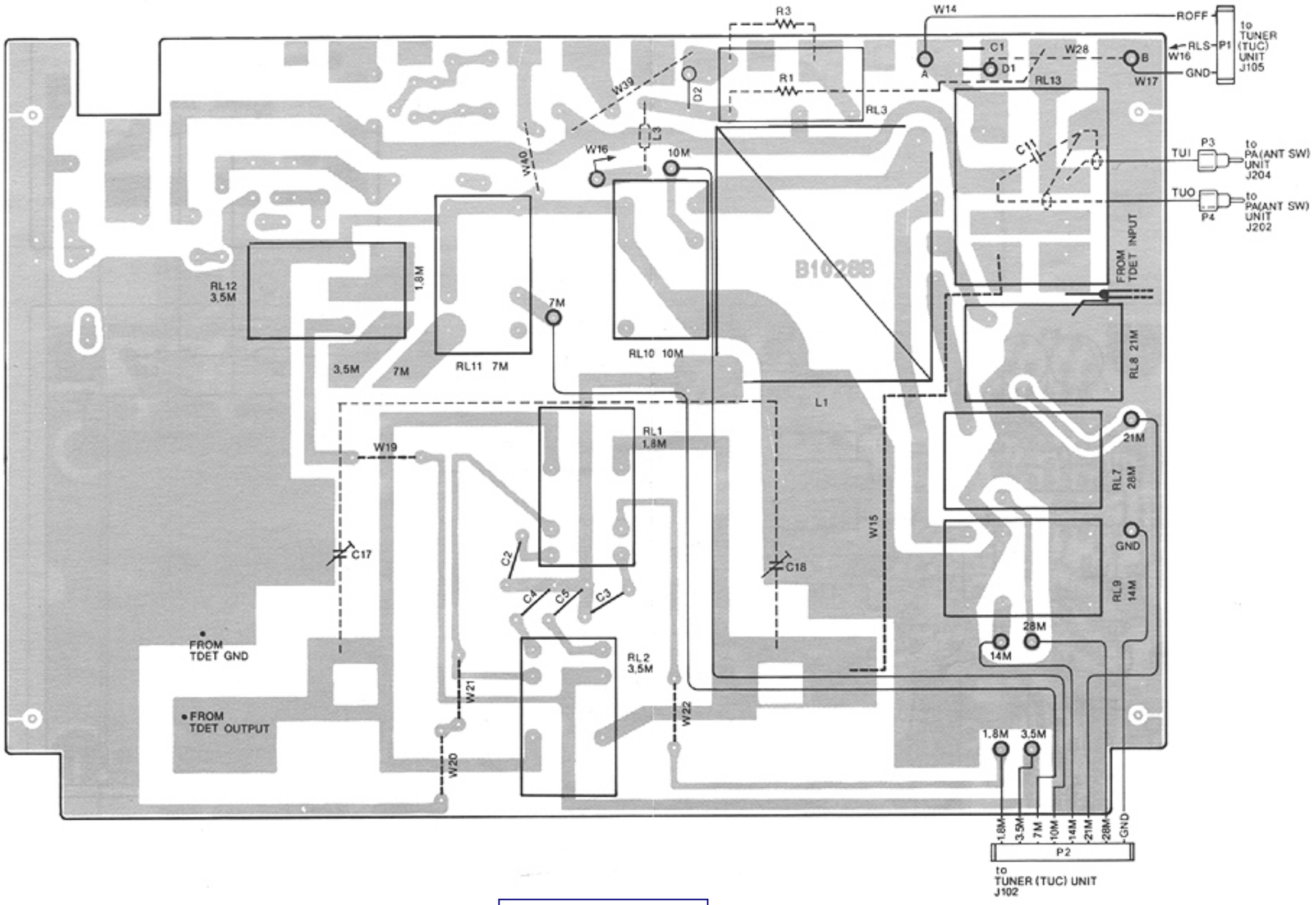
Q201, Q202

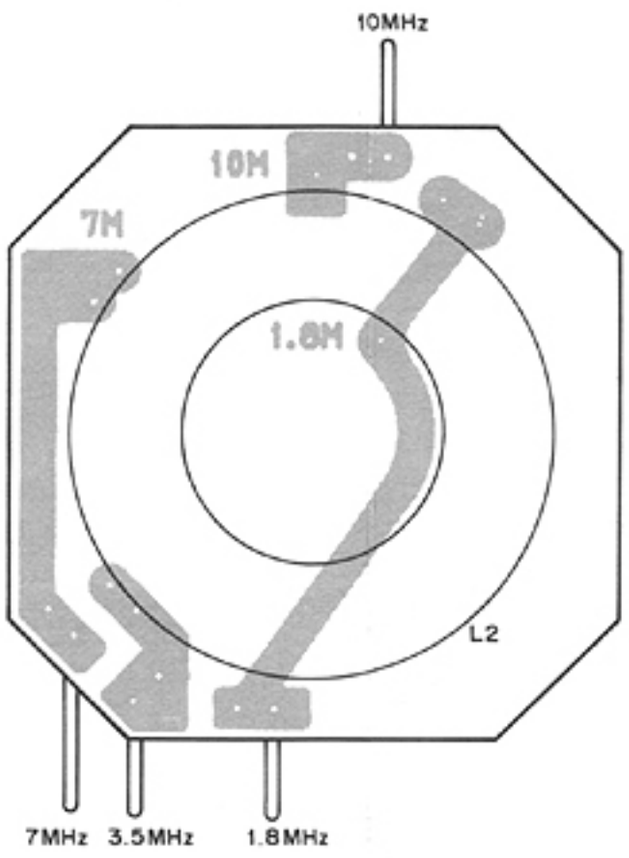
2SK30ATM-Y

Q203

NOTE: Add "200" to the indicated on the unit for actual part number respectively.

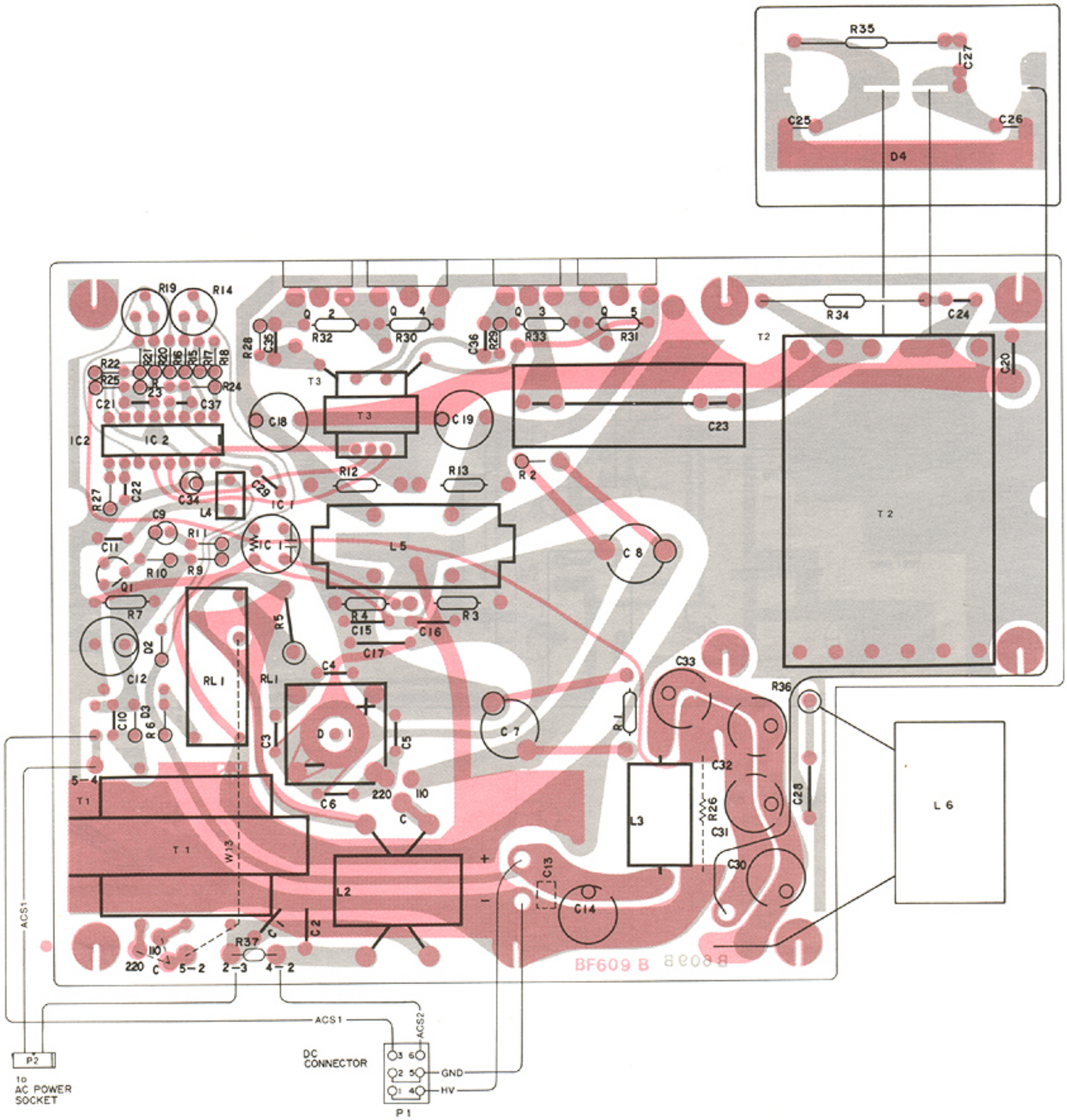
• TUNER (RELAY) UNIT



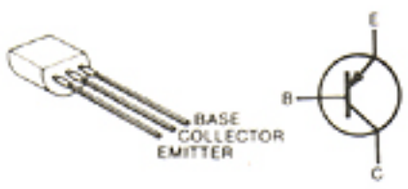


7-10 REG AND FILTER UNITS

- **REG UNIT**

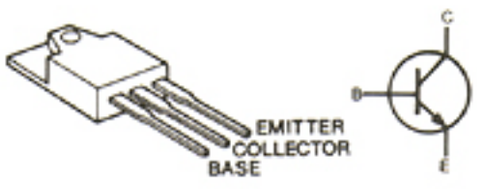


2SA1015 Y



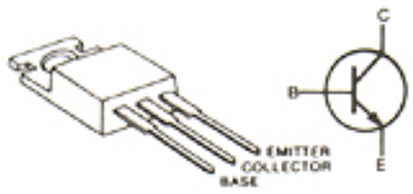
Q1

2SC2307



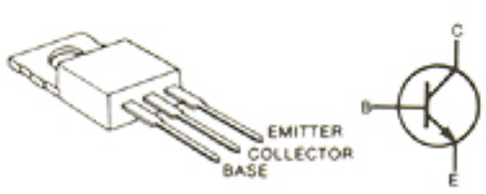
Q4, Q5

2SC3162 (U.S.A. Only)



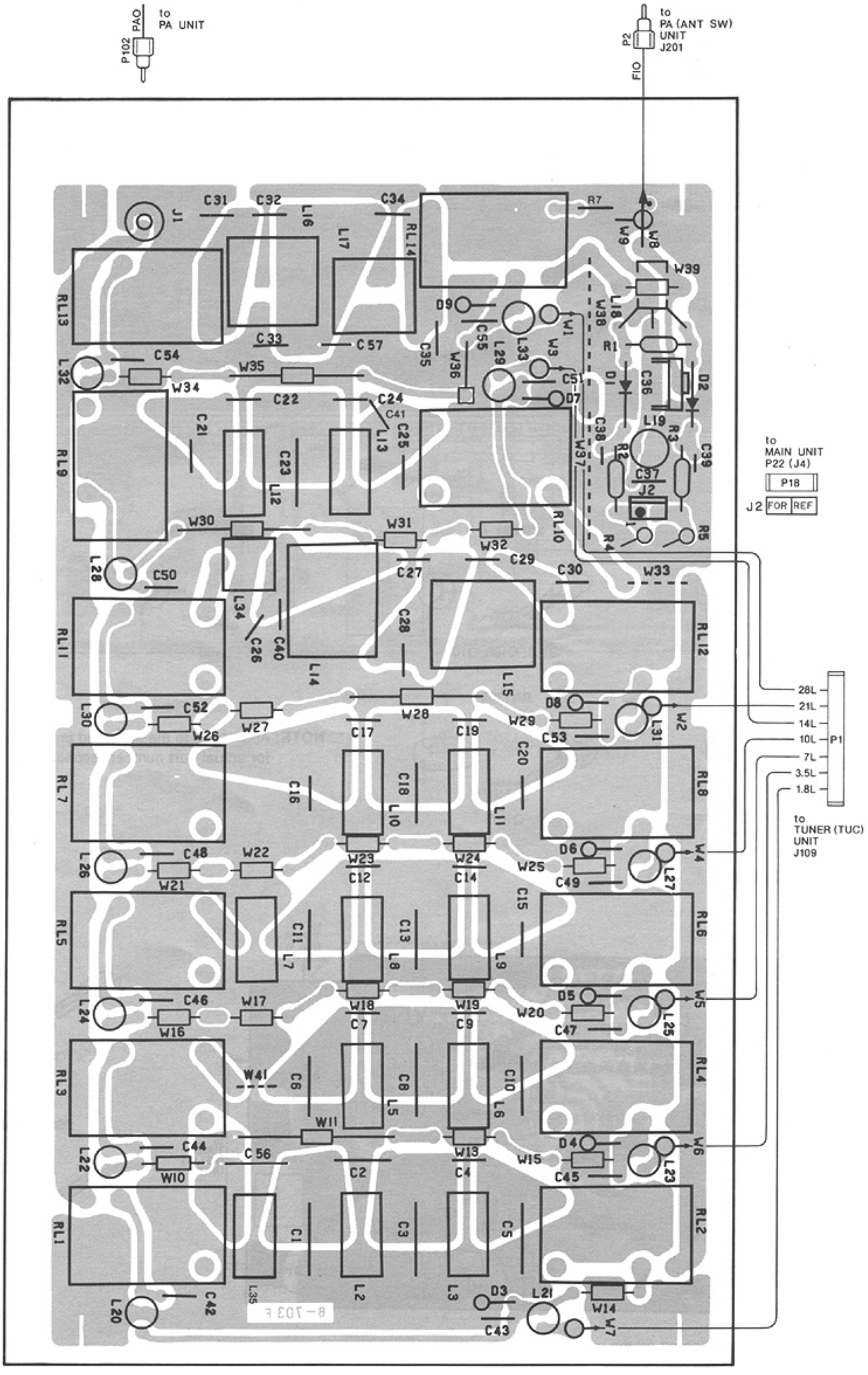
Q2, Q3

2SC4051

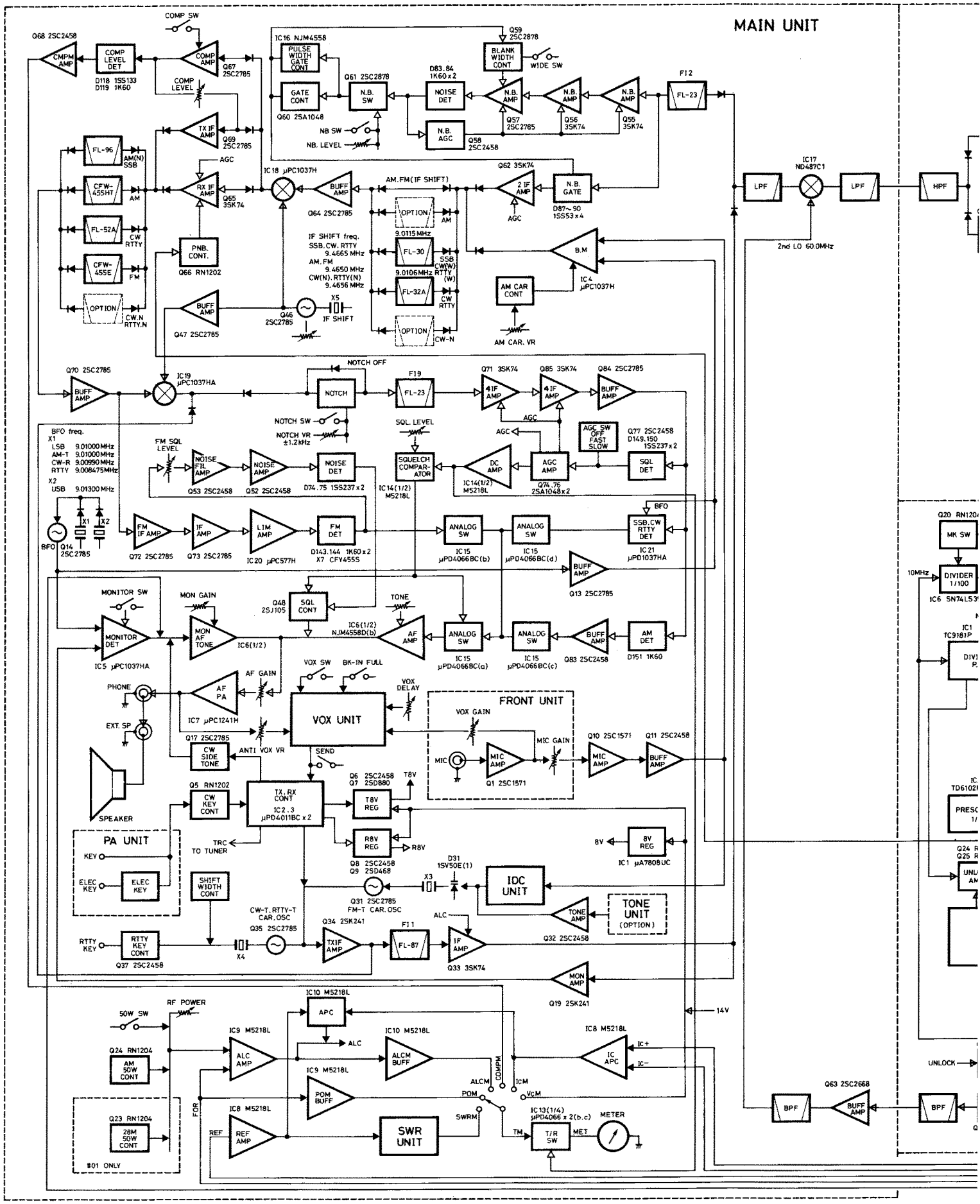


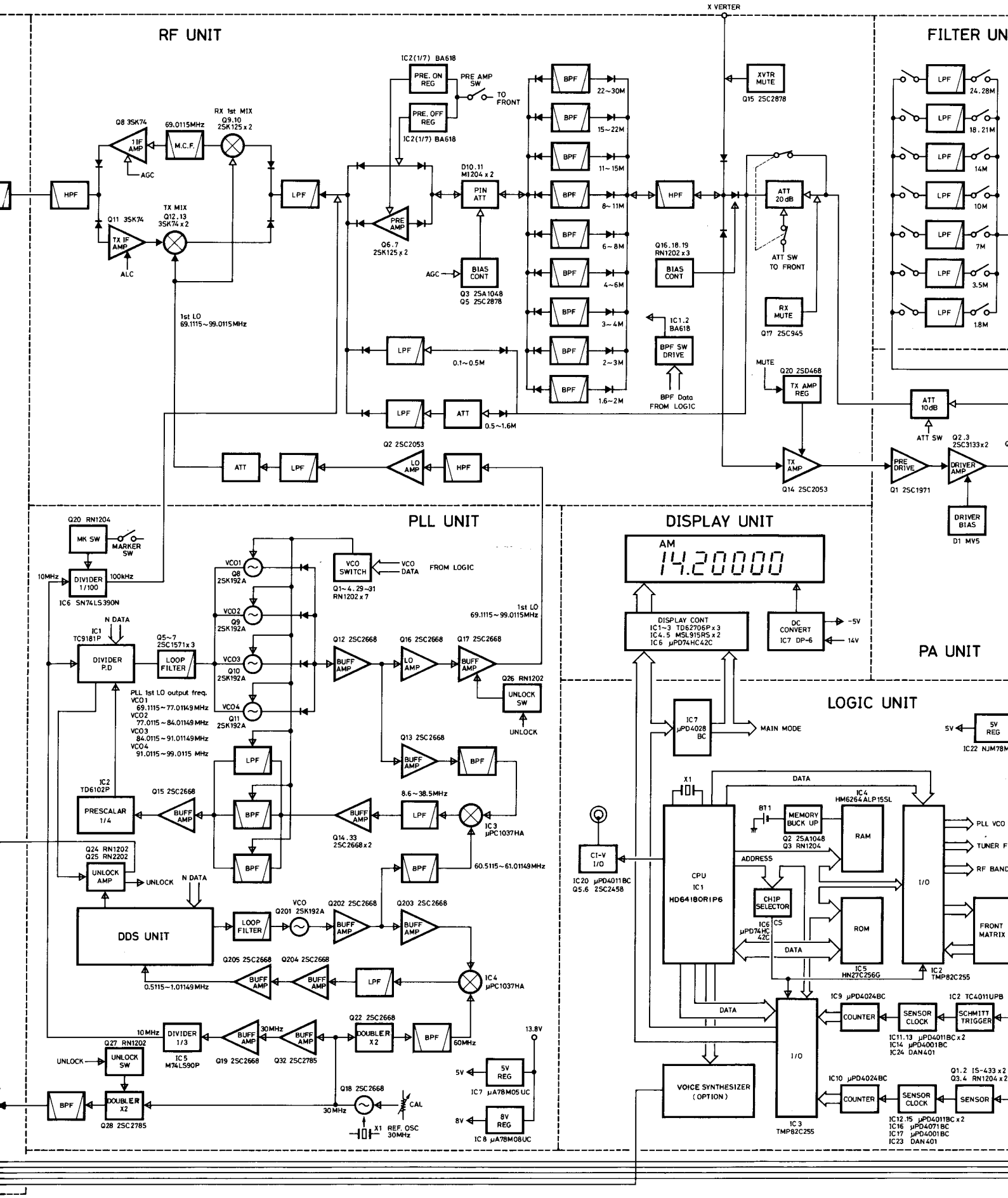
Q2, Q3

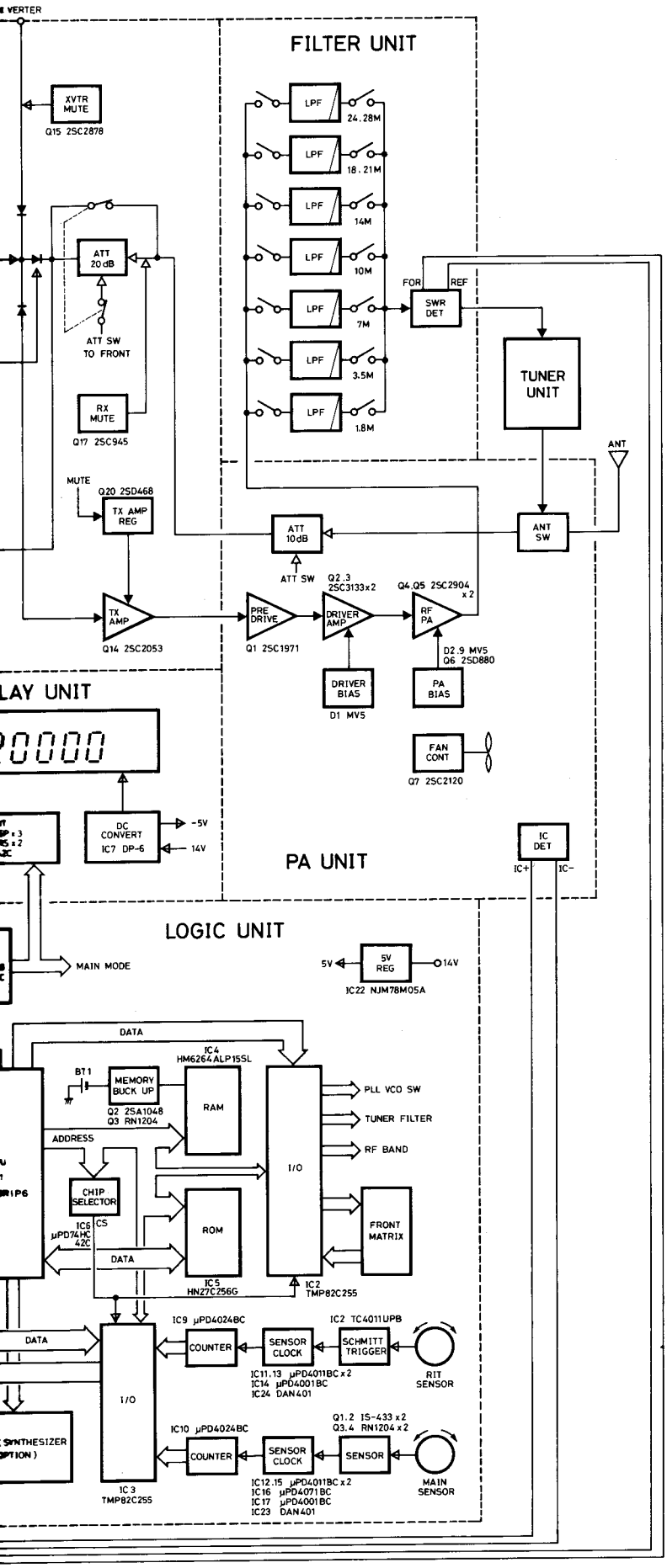
• FILTER UNIT

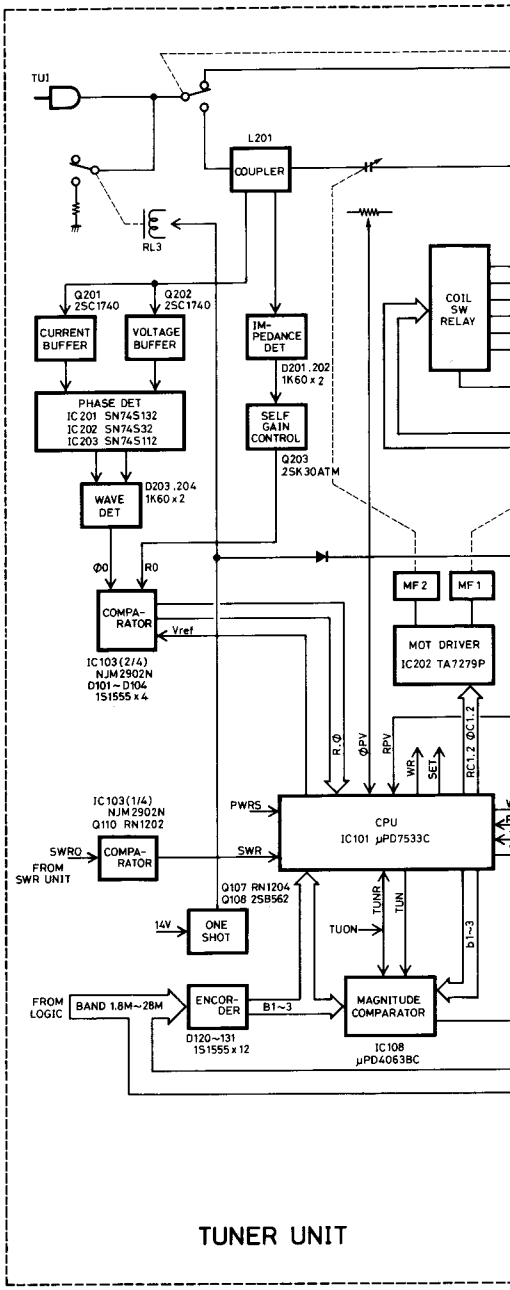

P102
PAO
to
PA UNIT
P2
FIO
to
PA (ANT SW)
UNIT
J201
to
MAIN UNIT
P22 (J4)
P18
J2 FOR REF
28L
21L
14L
10L
7L
3.5L
1.8L
P1
to
TUNER (TUC)
UNIT
J109
J1
J2
C31
C32
C34
L16
L17
RL14
R7
W9
W8
W39
RL13
D9
C55
L33
W1
W3
W38
L18
R1
C33
C57
C35
W36
L29
C51
D1
C36
D2
C54
L32
W35
W34
C22
C24
C41
D7
L19
R3
C38
C39
C21
L13
C25
C23
L12
W37
R2
C37
RL9
W30
W31
W32
RL10
R4
R5
L28
C50
C27
C29
C30
W33
L34
C26
C40
C28
RL11
L14
L15
RL12
W28
L30
C52
W27
W26
D8
W29
L31
W2
C17
C19
C53
C20
RL7
C16
C18
L10
L11
RL8
W23
W24
C12
C14
D6
W25
W4
C48
W22
W21
C49
L27
C15
RL5
C11
L7
C13
L8
L9
RL6
W18
W19
C7
C9
D5
W20
W5
L24
C46
W17
W16
C47
L25
RL3
W41
C6
C8
C10
L5
L6
RL4
W11
W13
C56
C2
C4
D4
W15
W6
L22
C44
W10
C45
L23
RL1
C1
C3
C5
RL2
L35
L2
L3
D3
L21
W14
W7
L20
C42
C43
8-703 F

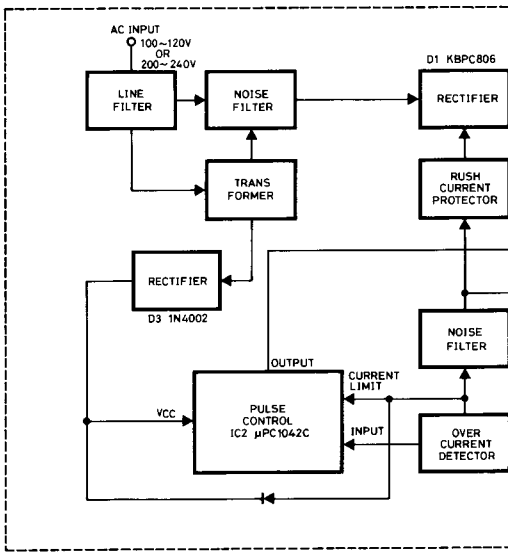
SECTION 8 BLOCK DIAGRAM

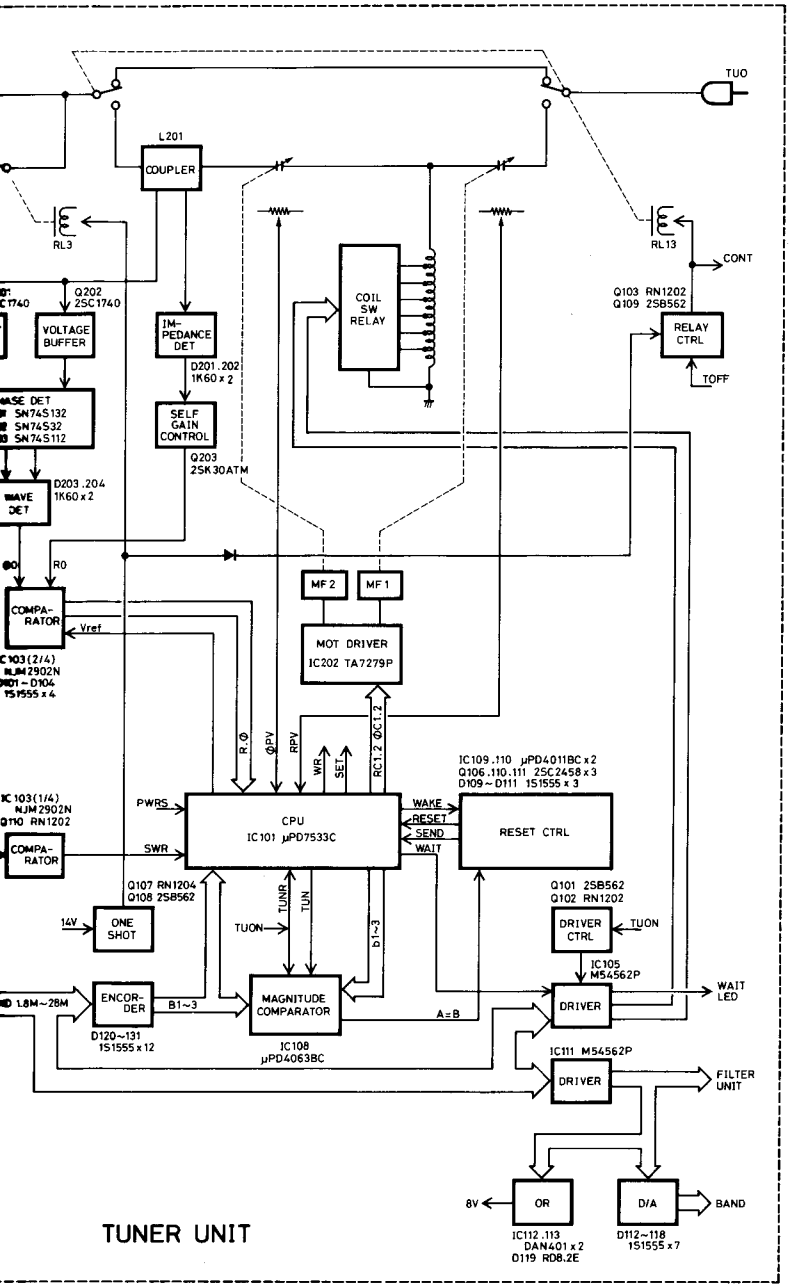


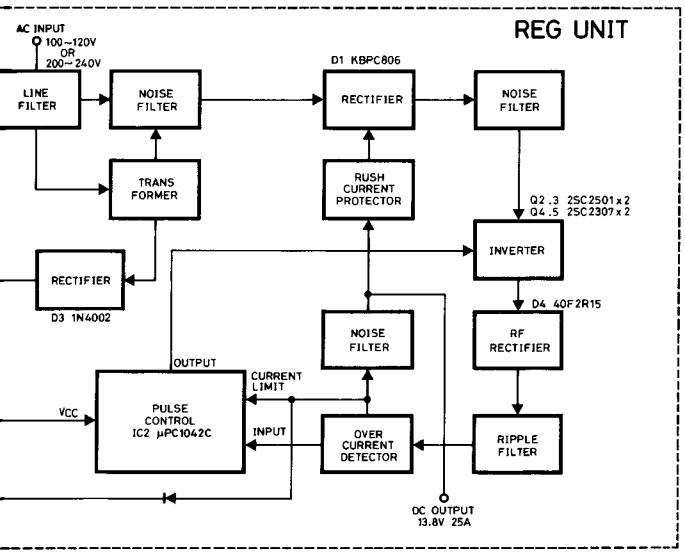



VERTER
FILTER UNIT
XVTR MUTE
Q15 2SC2878
LPF
24.28M
18.21M
14M
10M
7M
3.5M
1.8M
ATT 20dB
ATT SW TO FRONT
RX MUTE
Q17 2SC945
FOR
REF
SWR DET
TUNER UNIT
ANT
MUTE
Q20 2SD468
TX AMP REG
ATT 10dB
ANT SW
ATT SW
Q2.3 2SC3133x2
Q4.Q5 2SC2904 x2
TX AMP
Q14 2SC2053
PRE DRIVE
Q1 2SC1971
DRIVER AMP
RF PA
D2.9 MV5 Q6 2SD880
DRIVER BIAS
D1 MV5
PA BIAS
FAN CONT
Q7 2SC2120
LAY UNIT
DC CONVERT IC7 DP-6
-5V
14V
IC DET
IC+
IC-
PA UNIT
LOGIC UNIT
MAIN MODE
5V REG
5V
14V
IC22 NJM78M05A
DATA
IC4 HM6264ALP15SL
BT1
MEMORY BUCK UP
Q2 2SA1048
Q3 RN1204
RAM
ADDRESS
CHIP SELECTOR
IC6 µPD74HC 42C
CS
ROM
IC5 HN27C256G
I/O
PLL VCO SW
TUNER FILTER
RF BAND
FRONT MATRIX
IC2 TMP82C255
IC9 µPD4024BC
COUNTER
SENSOR CLOCK
IC2 TC4011UPB
SCHMITT TRIGGER
IC11.13 µPD4011BC x2
IC14 µPD4001BC
IC24 DAN401
RIT SENSOR
IC10 µPD4024BC
COUNTER
SENSOR CLOCK
Q1.2 IS-433 x2
Q3.4 RN1204 x2
SENSOR
IC12.15 µPD4011BC x2
IC16 µPD4071BC
IC17 µPD4001BC
IC23 DAN401
MAIN SENSOR
I/O
IC 3 TMP82C255


TU1
L201
COUPLER
RL3
Q201 2SC1740
Q202 2SC1740
CURRENT BUFFER
VOLTAGE BUFFER
IM-PEDANCE DET
D201.202 1K60 x 2
COIL SW RELAY
PHASE DET IC201 SN74S132 IC202 SN74S32 IC203 SN74S112
SELF GAIN CONTROL
Q203 2SK30ATM
WAVE DET
D203.204 1K60 x 2
ΦO
RO
COMPA-RATOR
Vref
IC103(2/4) NJM2902N D101~D104 1S1555 x4
MF2
MF1
MOT DRIVER IC202 TA7279P
R.Φ
ΦPV
RPV
WR
SET
RC1.2 ΦC1.2
IC103(1/4) NJM2902N Q110 RN1202
PWRS
CPU IC101 µPD7533C
SWRO
FROM SWR UNIT
COMPA-RATOR
SWR
Q107 RN1204 Q108 2SB562
14V
ONE SHOT
TUNR
TUN
TUON
b1~3
FROM LOGIC
BAND 1.8M~28M
ENCOR-DER
B1~3
MAGNITUDE COMPARATOR
D120~131 1S1555 x12
IC108 µPD4063BC
TUNER UNIT

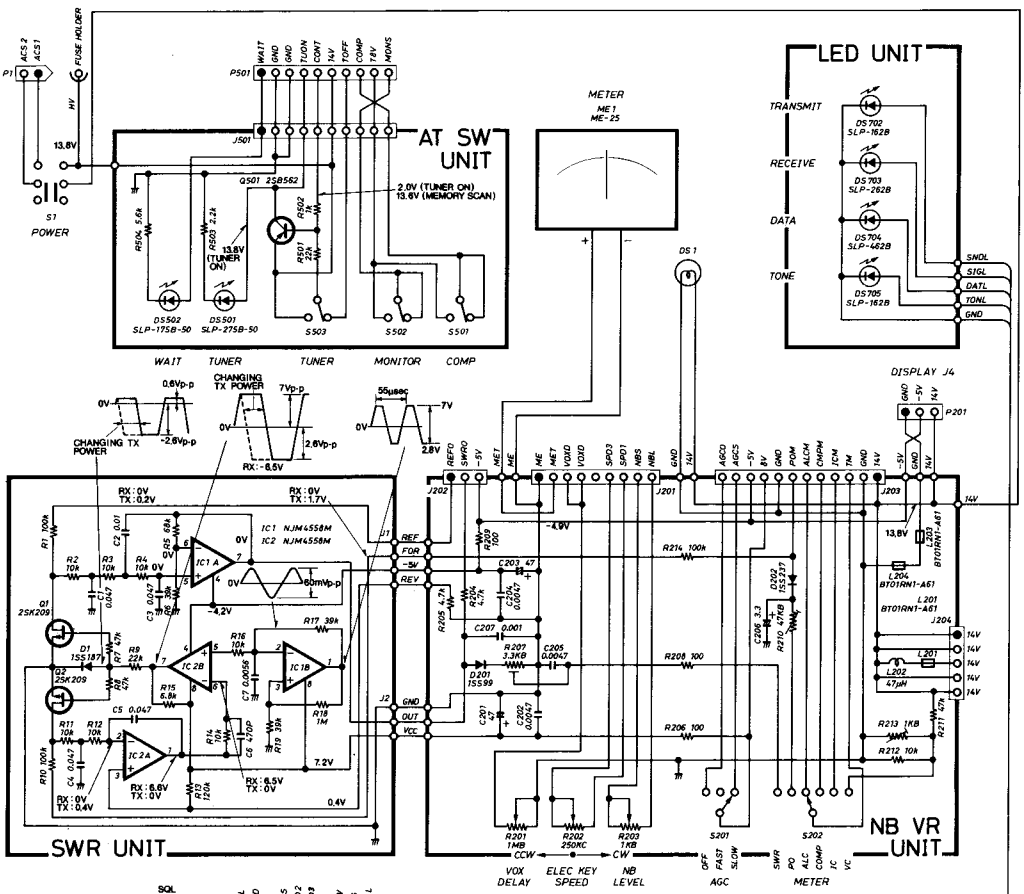

AC INPUT
100~120V OR 200~240V
LINE FILTER
NOISE FILTER
D1 KBPC806
RECTIFIER
TRANS FORMER
RUSH CURRENT PROTECTOR
RECTIFIER
D3 1N4002
NOISE FILTER
OUTPUT
CURRENT LIMIT
VCC
PULSE CONTROL IC2 µPC1042C
INPUT
OVER CURRENT DETECTOR

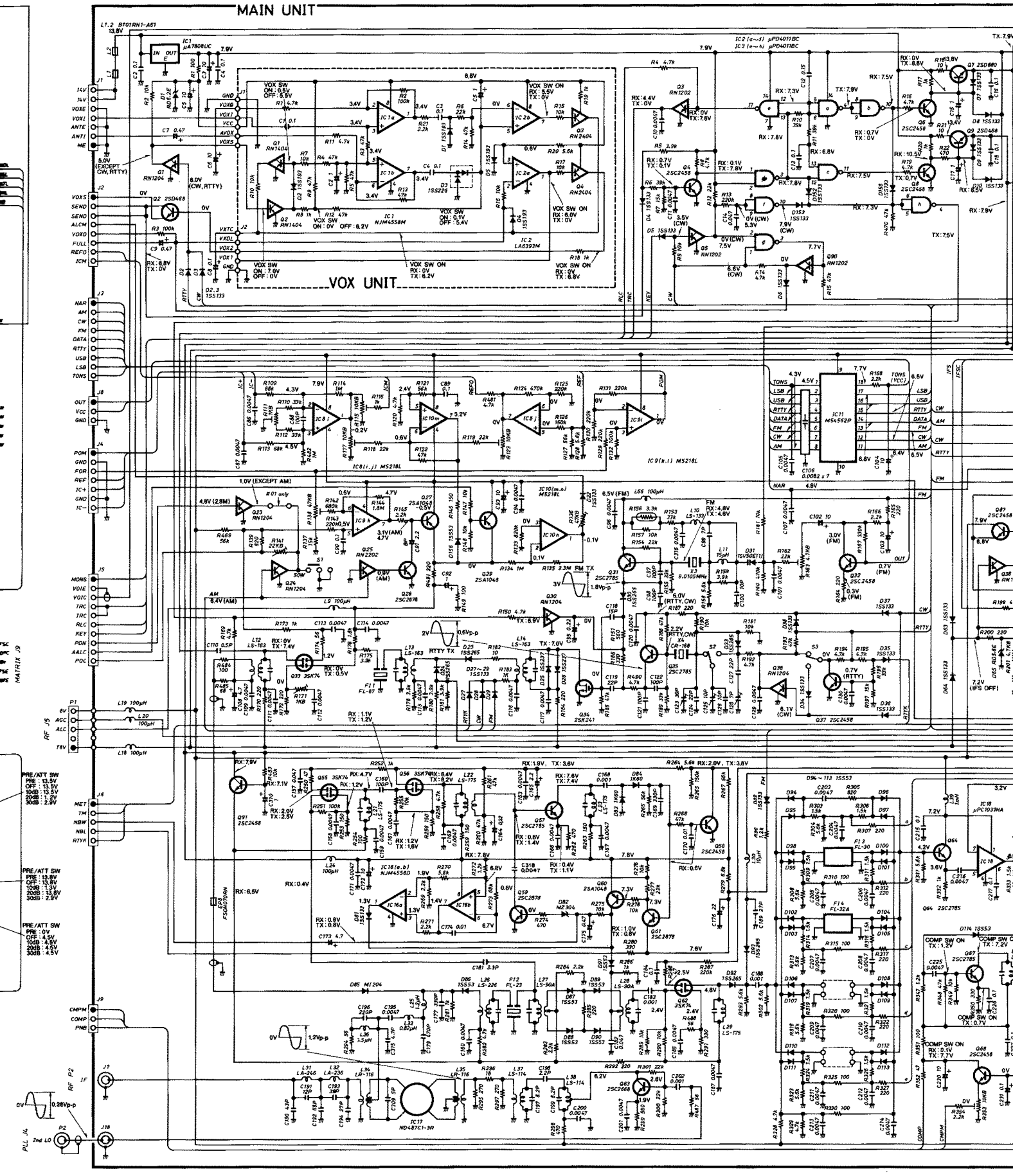


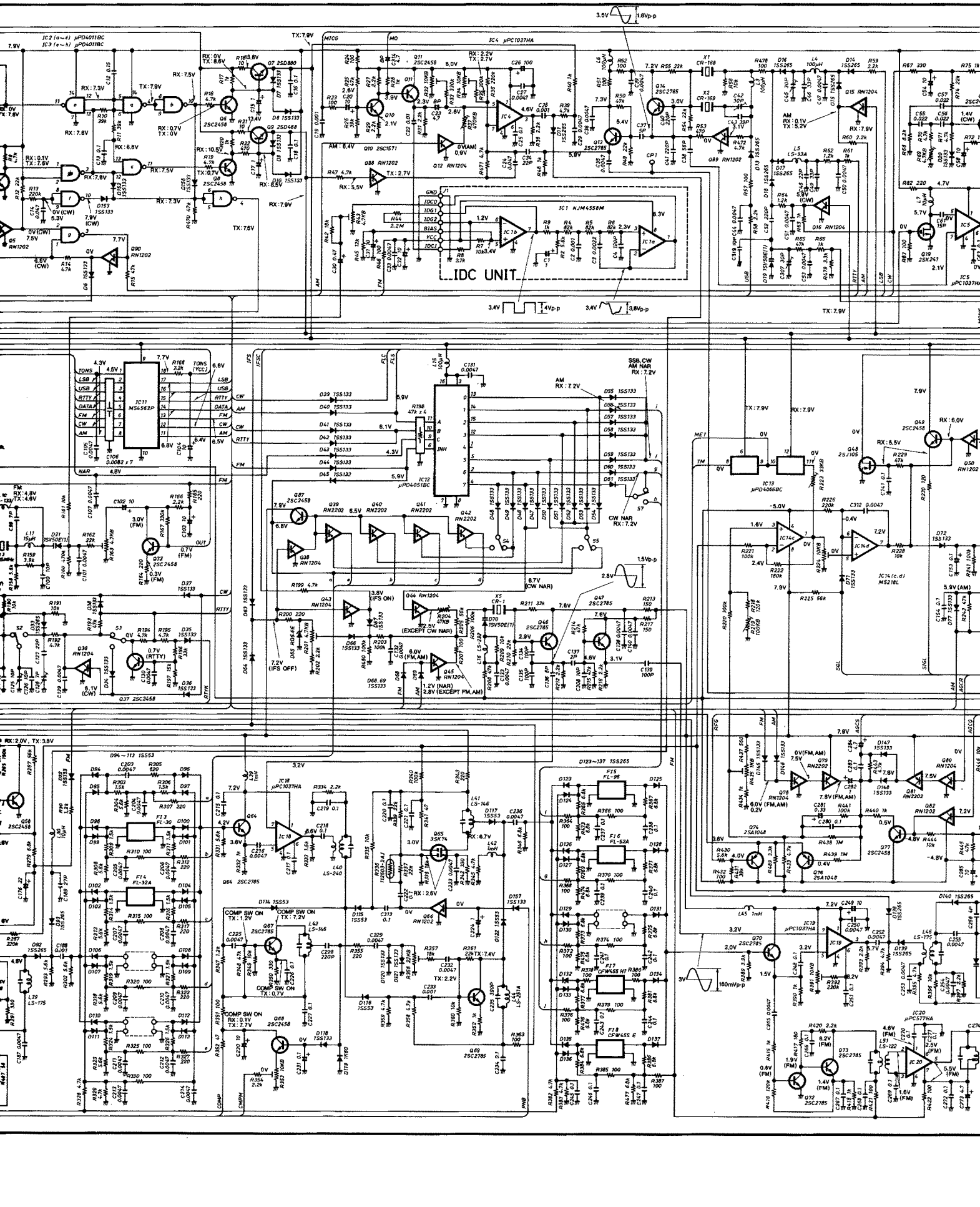


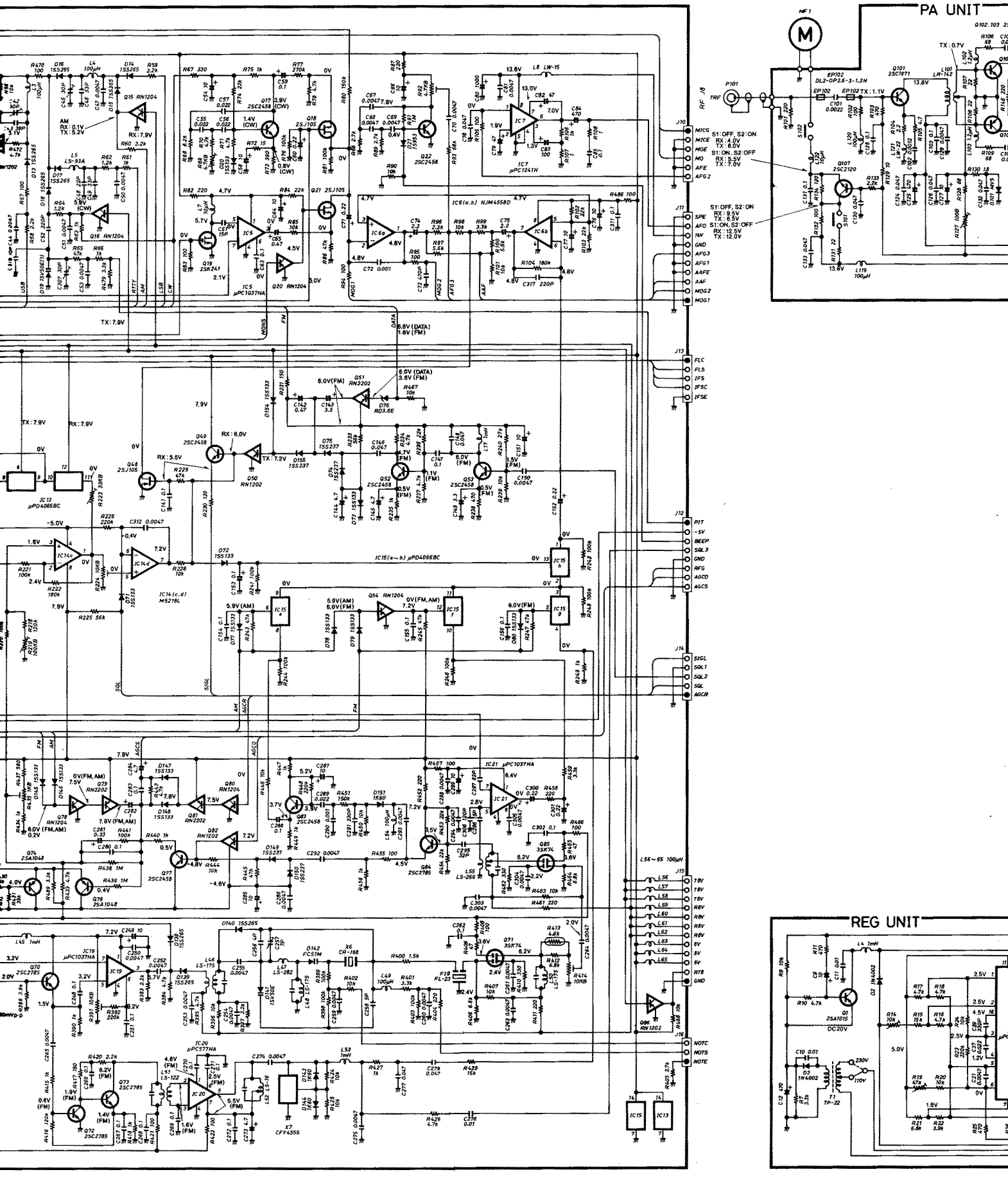
SECTION 9 VOLTAGE DIAGRAMS

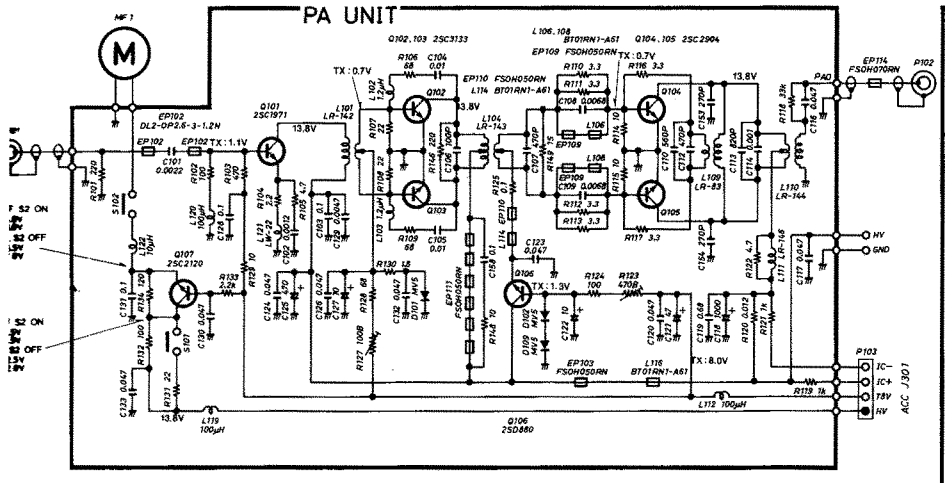
• FRONT, MAIN AND PA UNITS

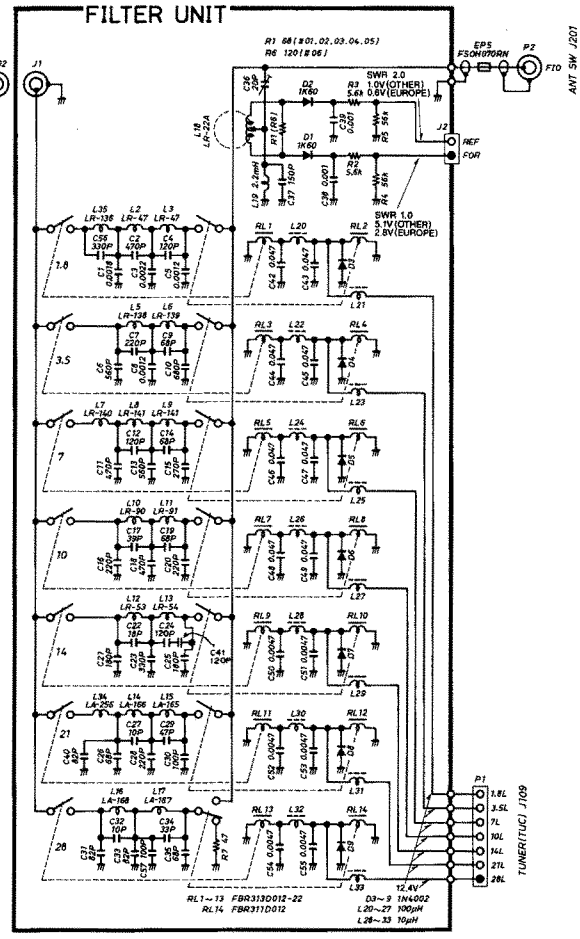


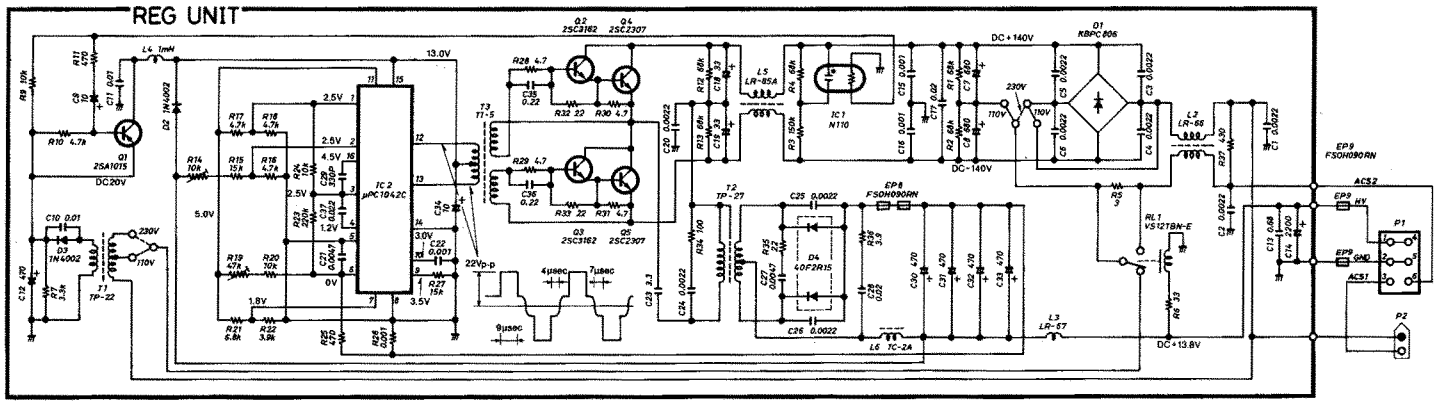

MAIN UNIT
VOX UNIT


IDC UNIT
IC1 NJM4558M
IC4 μPC1037HA
IC5 μPC1037HA
IC11 M54562P
IC12 μPD4051BC
IC13 μPD4066BC
IC14(c,d) M5218L
IC18 μPC1037HA
IC19 μPC1037HA
IC20 μPC577HA
IC2 (a~d) μPD4011BC
IC3 (e~h) μPD4011BC
TX:7.9V
RX:7.9V
TX:7.5V
RX:7.5V
RX:0V TX:8.6V
RX:0.7V TX:0V
RX:10.5V
TX:0.7V
RX:8.5V
RX:6.8V
TX:7.8V
RX:7.8V
RX:7.3V
RX:0.1V TX:7.8V
0V (CW) 5.3V
7.9V (CW)
6.8V (CW)
0V (CW) 7.5V
RX:2.2V TX:2.7V
AM:6.4V
0V(AM) 0.9V
RX:2.7V
RX:5.5V
TX:2.7V
AM RX:0.1V TX:5.2V
RX:7.9V
RX:6.0V
RX:5.5V
TX:7.9V
RX:7.2V
SSB,CW AM NAR RX:7.2V
CW NAR RX:7.2V
FM RX:4.8V TX:4.6V
NAR 4.8V
3.0V (FM)
0.7V (FM)
0.3V (FM)
0.7V (RTTY)
0.3V (RTTY)
6.1V (CW)
3.8V (IFS ON)
7.2V (IFS OFF)
6.0V (FM,AM)
1.2V (NAR) 2.8V (EXCEPT FM,AM)
2.5V (EXCEPT CW NAR)
6.7V (CW NAR)
0V(FM,AM) 7.5V
6.0V (FM,AM) 0.2V
7.8V (FM,AM)
COMP SW ON TX:1.2V
COMP SW ON TX:7.2V
COMP SW ON TX:0.7V
COMP SW ON RX:0.1V TX:7.7V
RX:2.6V
TX:6.7V
TX:2.2V
TX:7.4V
160mVp-p
3.5V 1.6Vp-p
3.4V 4Vp-p
3.4V 3.8Vp-p
1.5Vp-p
2.8V
-5.0V
-0.4V
5.9V (AM)
4.6V (FM)
6.2V (FM)
2.5V (FM)
1.9V (FM)
0.9V (FM)
1.4V (FM)
1.6V (FM)
5.5V (FM)
1.4V (CW)
2.1V
3.1V
3.2V
3.6V
4.2V
4.8V
-4.8V
7.7V
6.8V
6.5V
6.1V
5.9V
5.4V
4.3V
3.9V
2.3V
2.6V
2.1V
1.8V
1.5V
1.2V
0.9V
0.4V
0.2V
0V
7.2V
7.5V
7.6V
7.8V
8.2V
8.6V
9.0V
10.5V
13.4V
13.8V
FL-96
FL-52A
FL-32A
FL-30
CFW455 MT
CFW455 E
SSB
AM
FM
CW
RTTY
DATA
LSB
USB
IFS
IFSC
FLC
FLS
MTCG
MO
MET
TM
SGL
AGCR
AGCS
RFG
SIGL
CMPM
CMPH
PNB
COMP

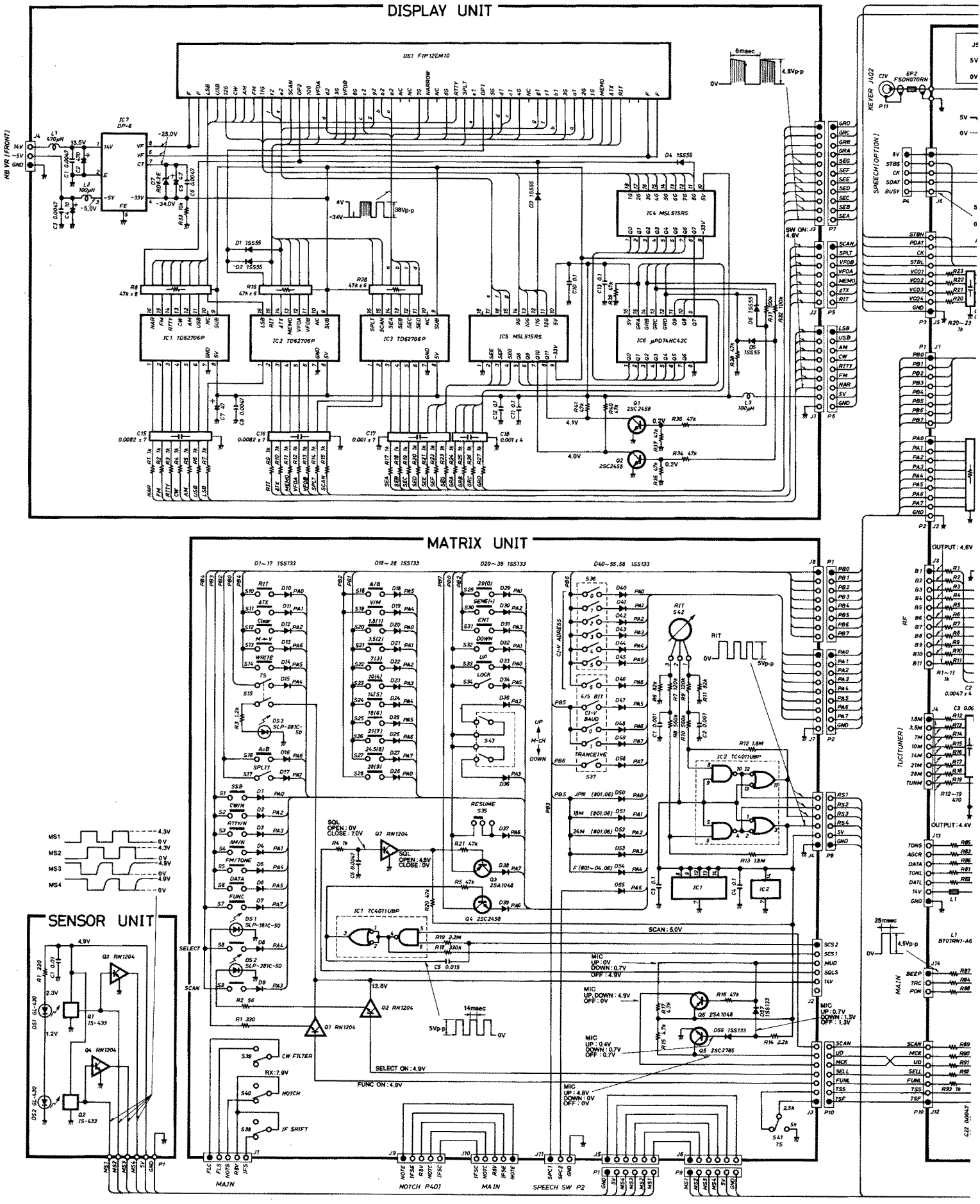

PA UNIT
REG UNIT
IC1 μPC1241H
IC5 μPC1037HA
IC6(a.b) NJM4558D
IC13 μPD4066BC
IC14(c.d) M5218L
IC15(e~h) μPD4066BC
IC19 μPC1037HA
IC20 μPC577HA
IC21 μPC1037HA
TX: 7.9V
RX: 7.9V
TX: 7.3V
RX: 6.0V
RX: 5.5V
TX: 0.7V
TX: 1.1V
13.8V
DC20V
230V
110V
P101
J10
J11
J12
J13
J14
J15
J16
MIC
MOE
MO
AFE
AFG2
SPE
AFO
1W
GND
AFG3
AFG1
AAFE
AAF
MOG2
MOG1
FLC
FLS
IFS
IFSC
IFSE
PTT
-5V
BEEP
SQL3
GND
RFG
AGCD
AGCS
SIGL
SQL1
SQL2
SQL
AGCR
8V
RT8
GND
NOTC
NOTS
NOTE
S1:OFF, S2:ON
RX: 4.0V
TX: 8.0V
S1:ON, S2:OFF
RX: 5.5V
TX: 7.0V
S1:OFF, S2:ON
RX: 9.5V
TX: 8.5V
S1:ON, S2:OFF
RX: 12.5V
TX: 12.0V
AM
FM
USB
LSB
CW
RTTY
MONS
DATA
SQL
SIGL
AGCR
AGCO

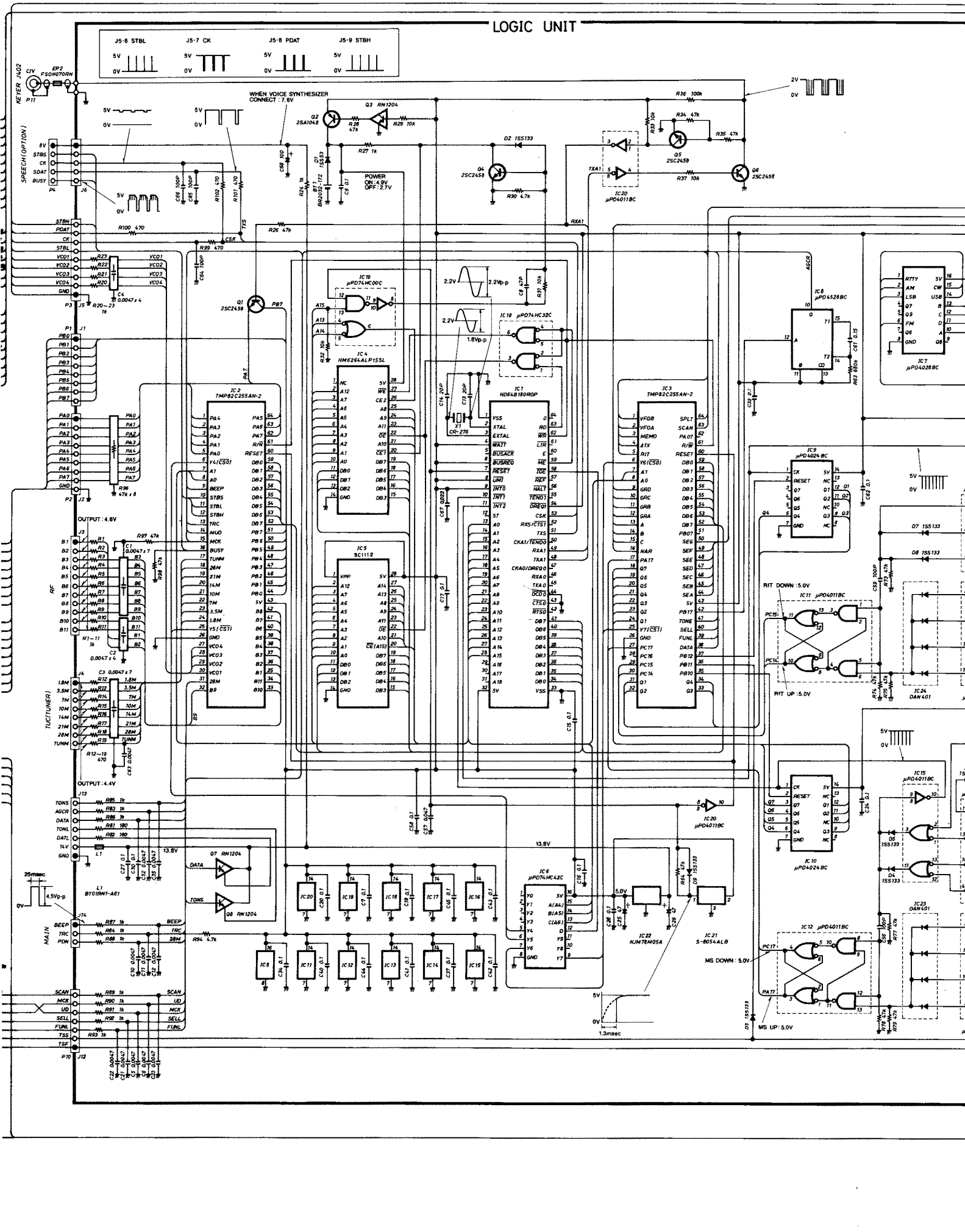


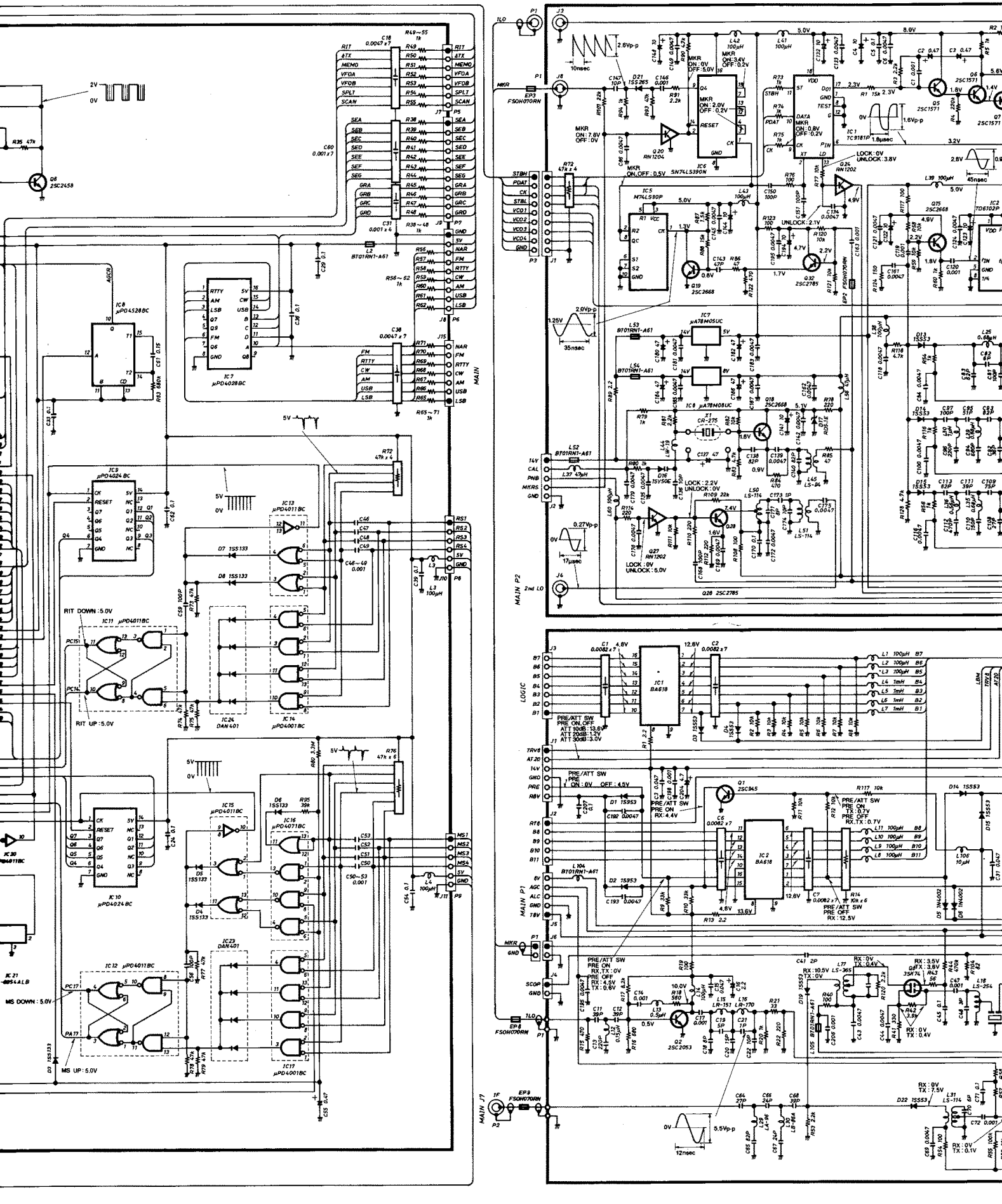




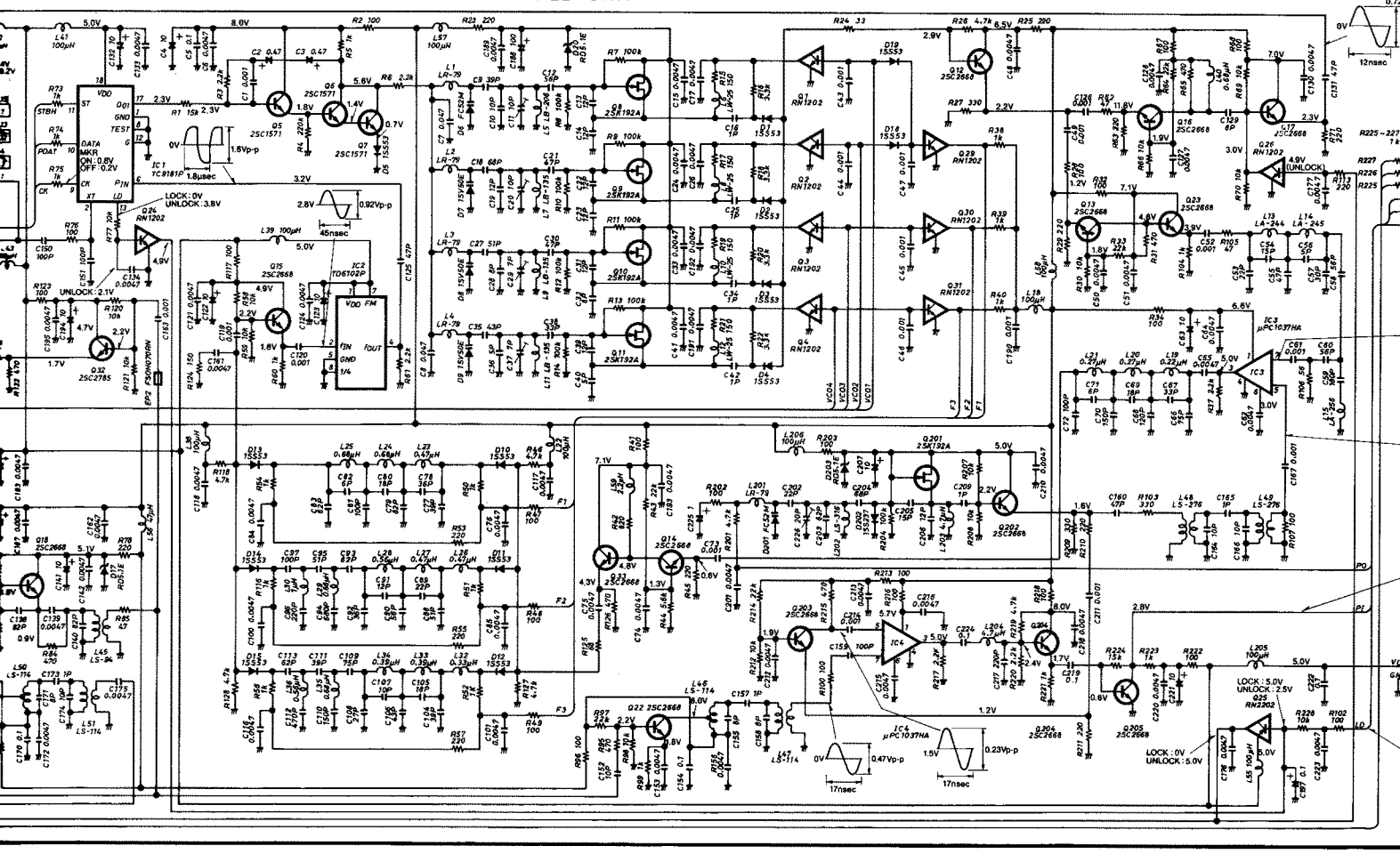
• DISPLAY, MATRIX, LOGIC, PLL, RF AND MKR SW UNITS



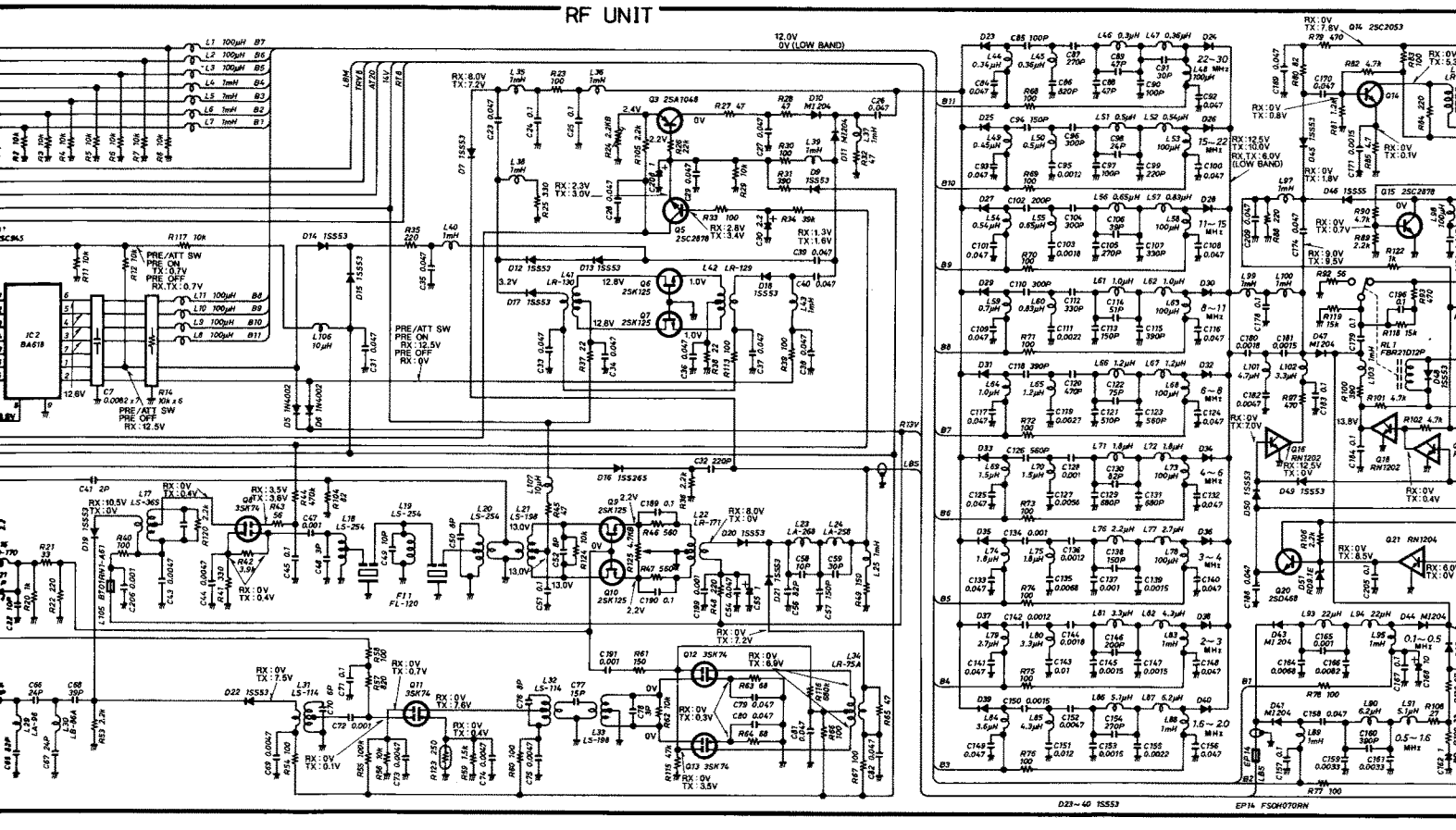


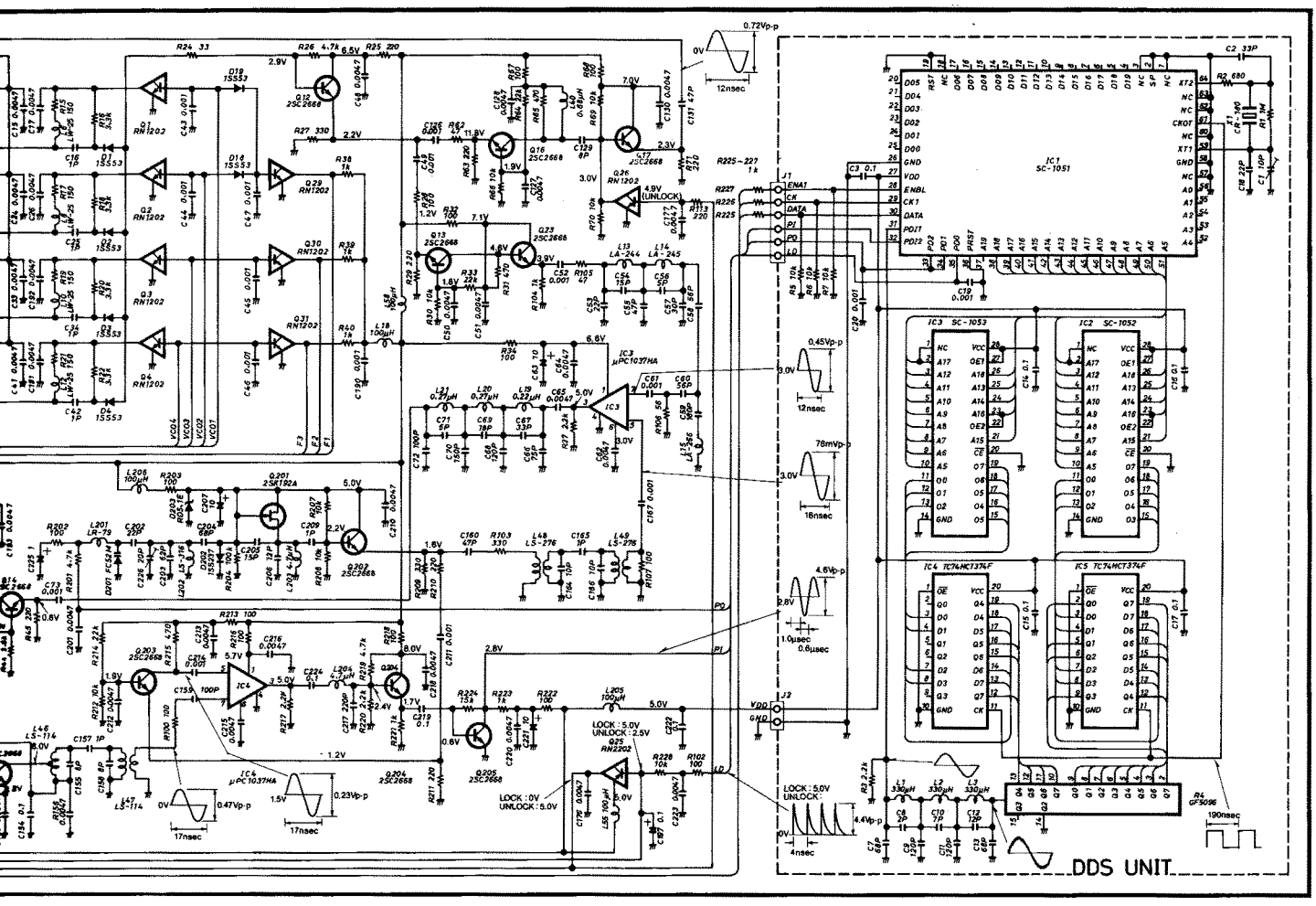

MAIN
MAIN P1
MAIN P2
MAIN J7
LOGIC
RIT DOWN : 5.0V
RIT UP : 5.0V
MS DOWN : 5.0V
MS UP : 5.0V
2nd LO
LOCK : 0V
UNLOCK : 5.0V
LOCK : 2.2V
UNLOCK : 0V
PRE/ATT SW
PRE ON
PRE OFF
ATT 10dB : 13.6V
ATT 20dB : 1.2V
ATT 30dB : 3.0V
PRE ON : 0V OFF : 4.5V
PRE ON RX : 4.4V
PRE ON TX : 0.7V
PRE OFF RX : 12.5V
PRE ON RX : 4.5V
PRE OFF TX : 0.6V
RX : 0V TX : 0.4V
RX : 3.5V TX : 3.8V
RX : 9V TX : 7.5V
RX : 0V TX : 0.1V

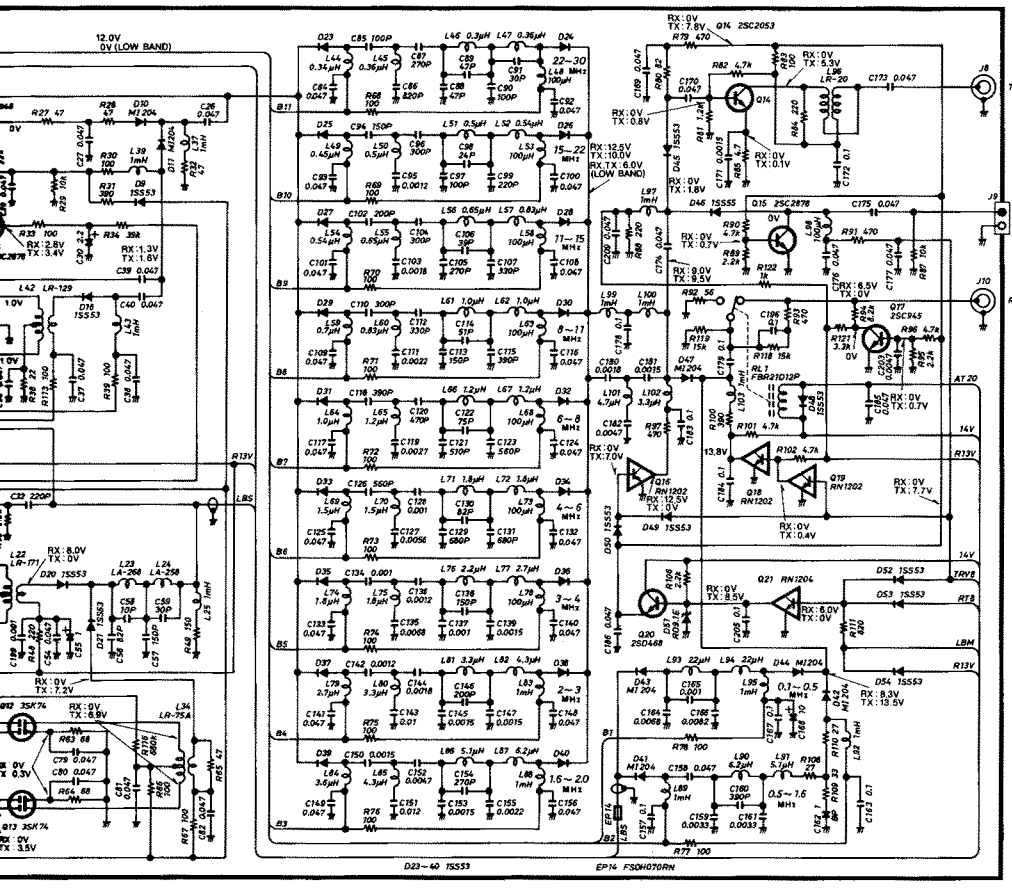
PLL UNIT

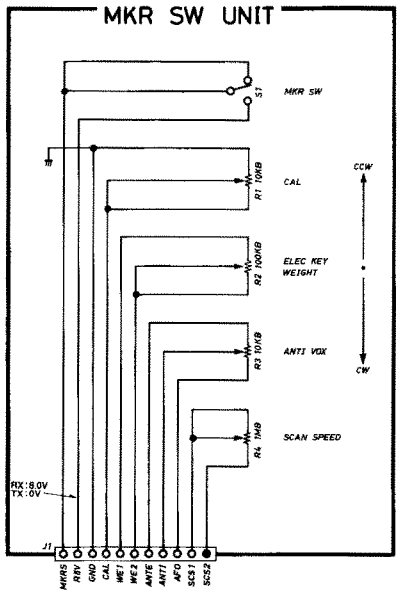


RF UNIT

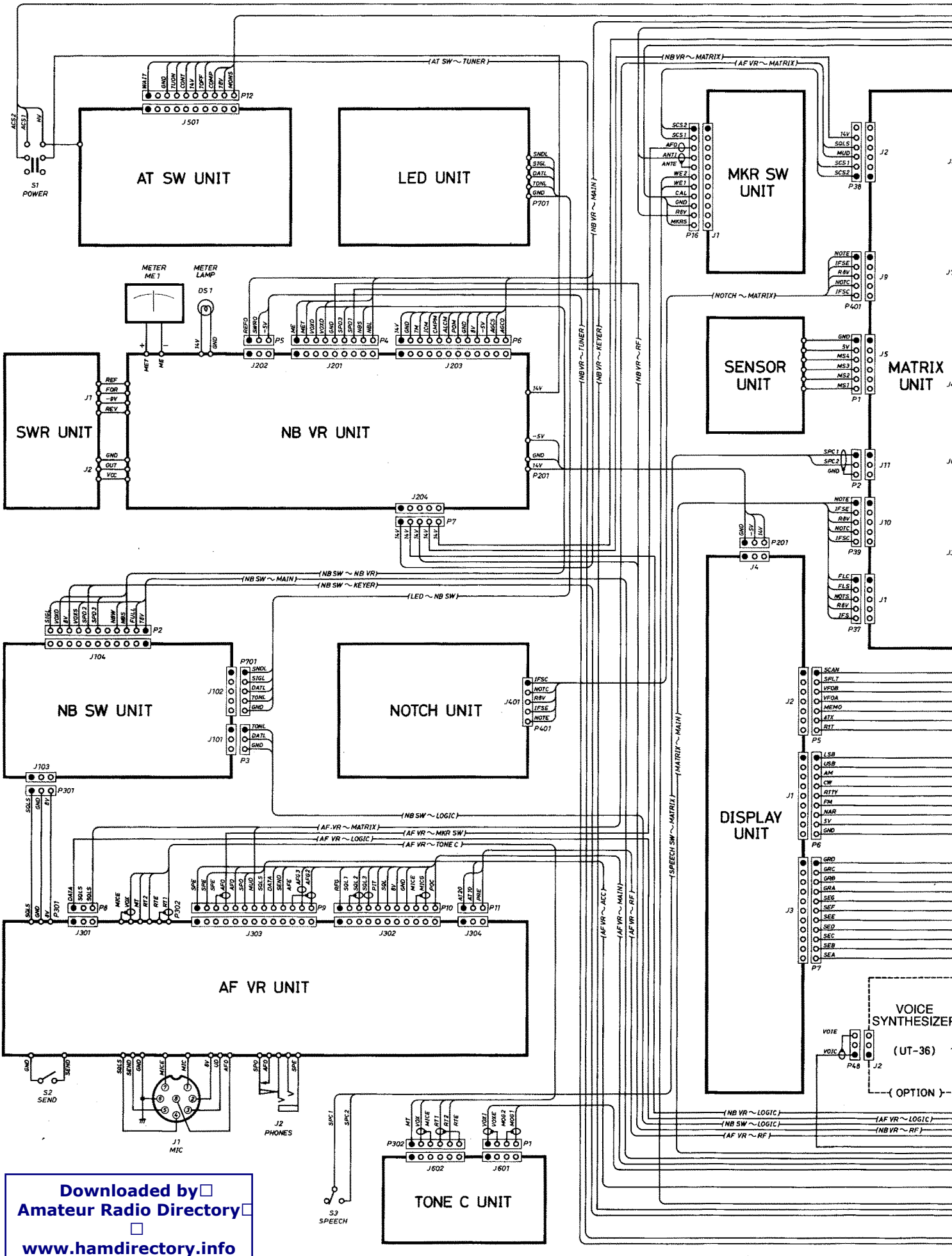


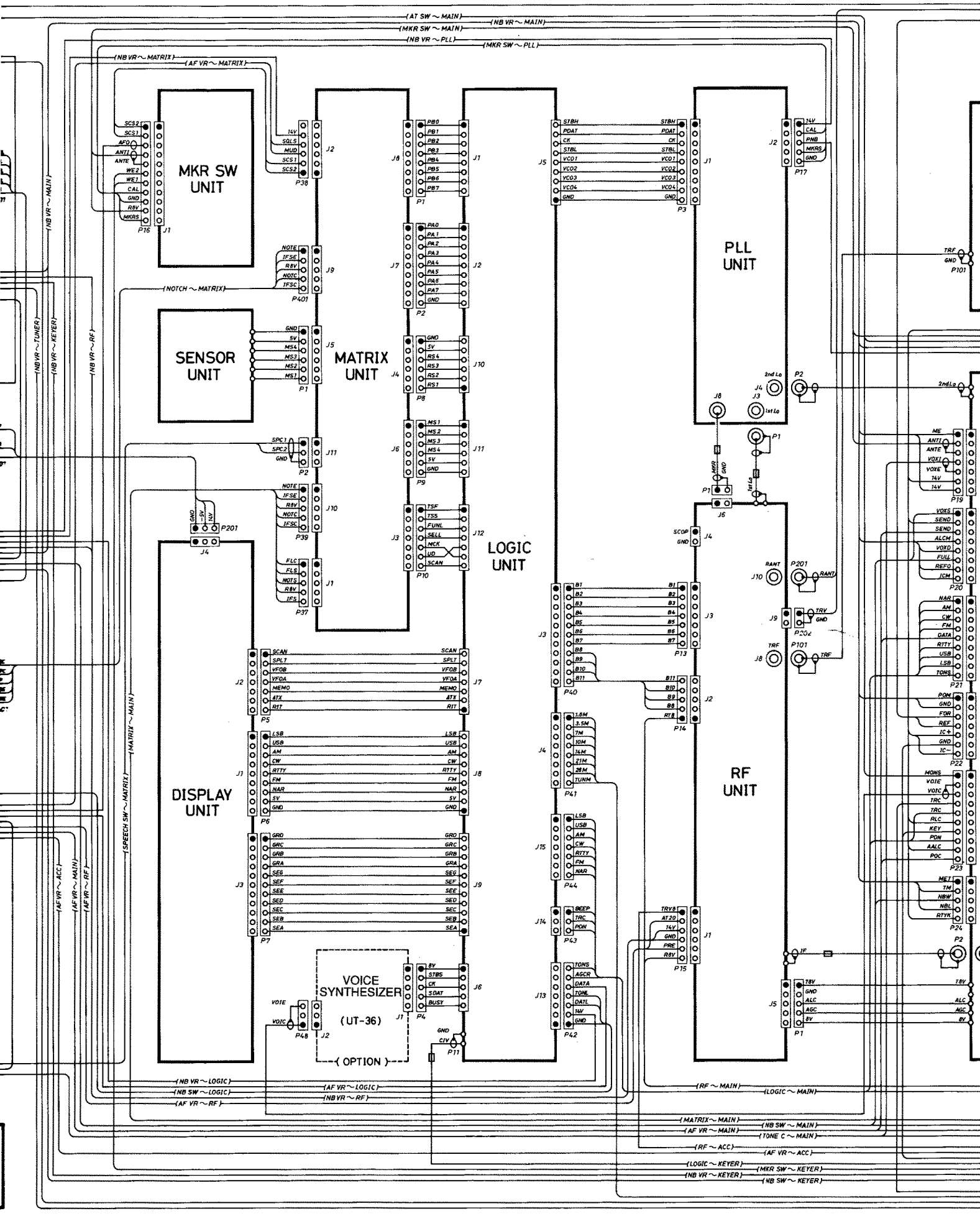


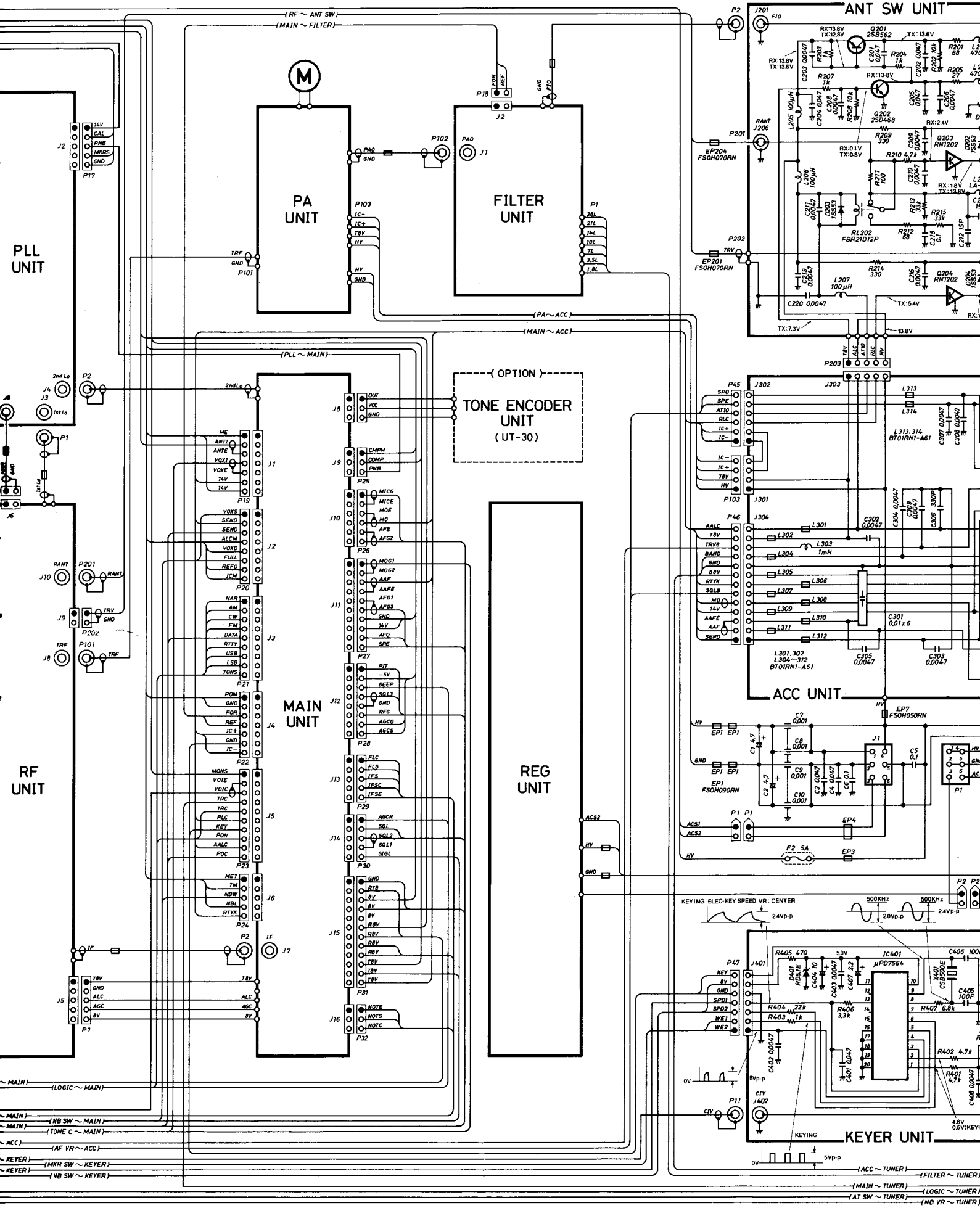


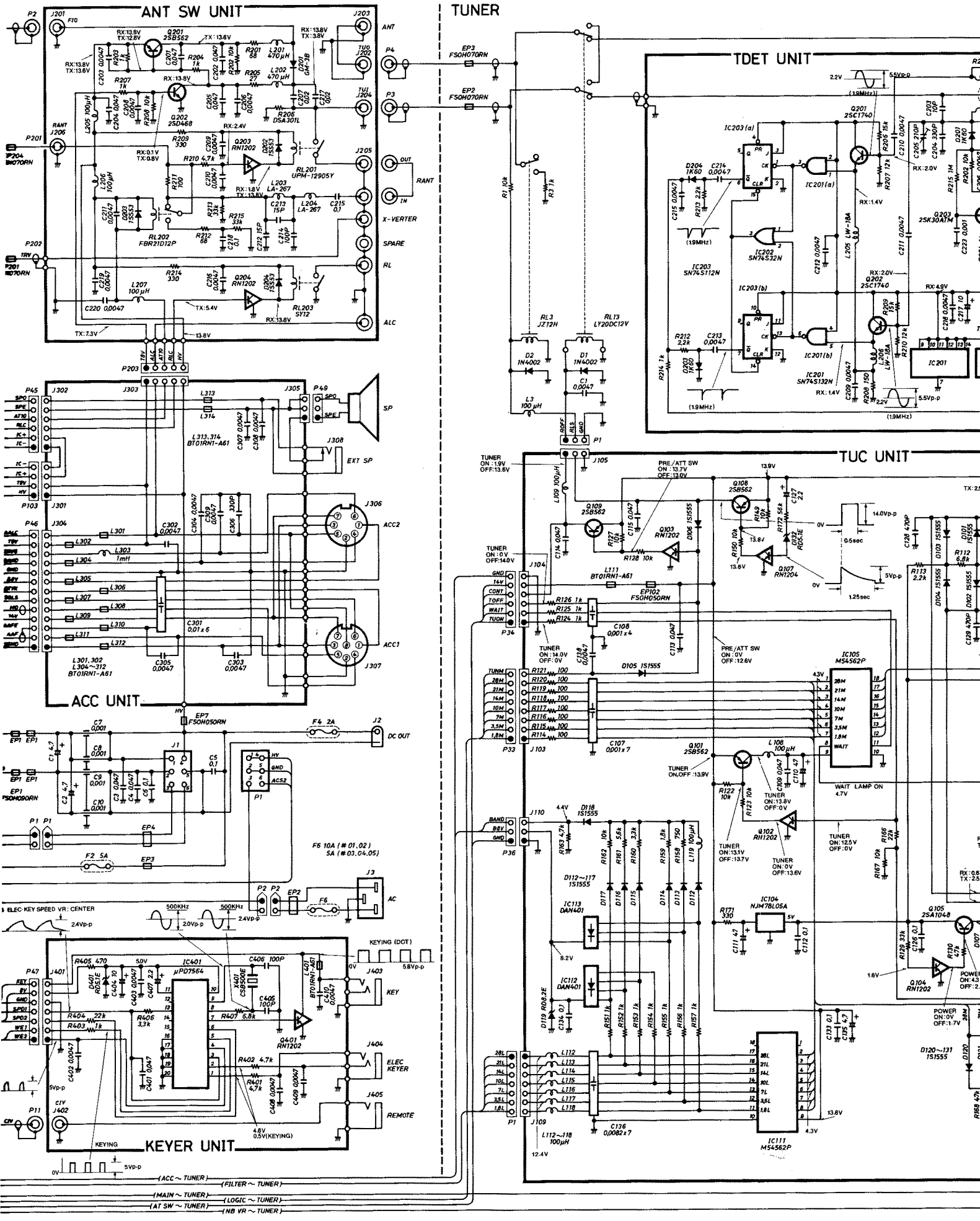


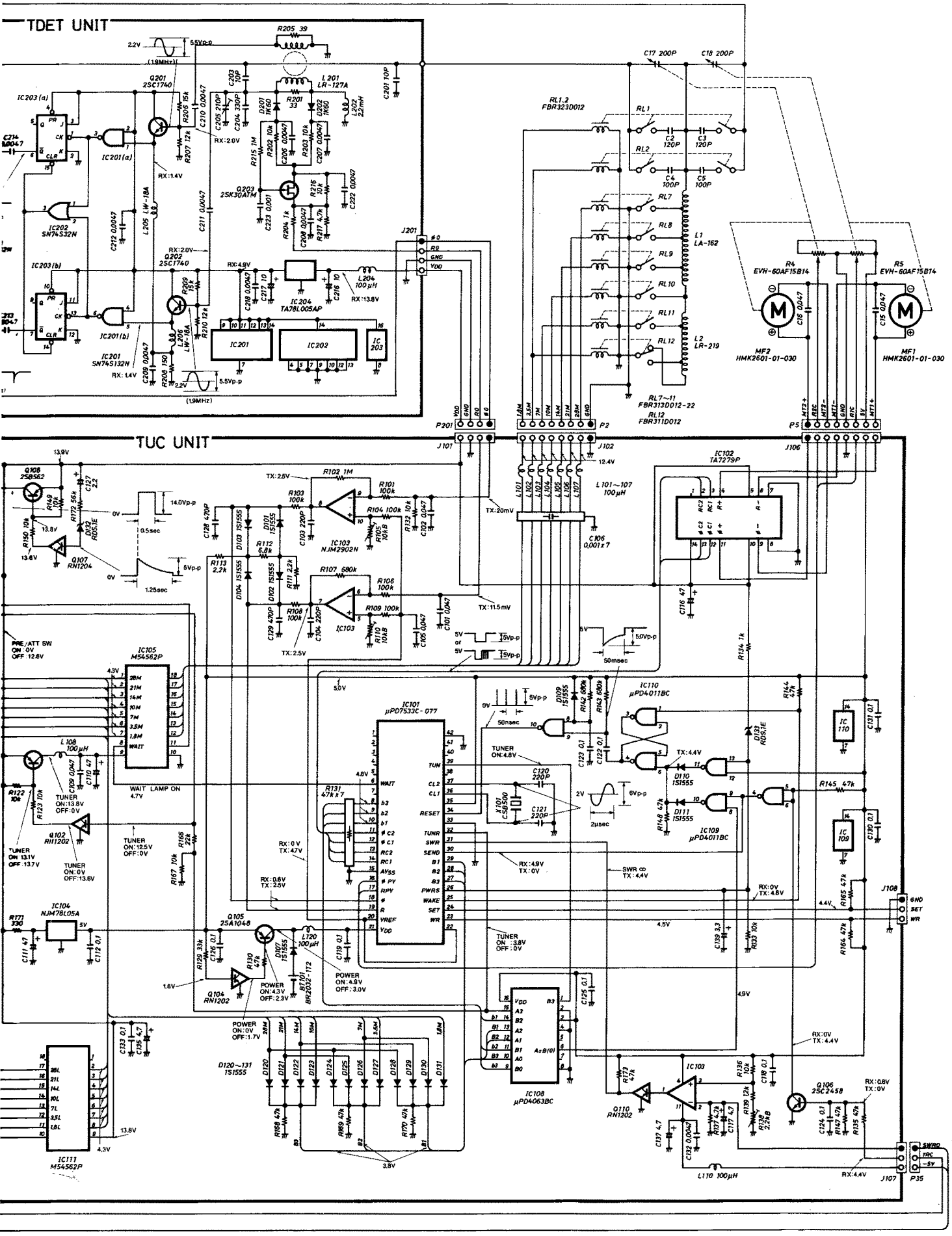
• PA UNIT




MKR SW UNIT
SENSOR UNIT
MATRIX UNIT
LOGIC UNIT
PLL UNIT
RF UNIT
DISPLAY UNIT
VOICE SYNTHESIZER
(UT-36)
(OPTION)
{AT SW ~ MAIN}
{NB VR ~ MAIN}
{MKR SW ~ MAIN}
{NB VR ~ PLL}
{MKR SW ~ PLL}
{NB VR ~ MATRIX}
{AF VR ~ MATRIX}
{NOTCH ~ MATRIX}
{NB VR ~ TUNER}
{NB VR ~ KEYER}
{NB VR ~ RF}
{SPEECH SW ~ MATRIX}
{MATRIX ~ MAIN}
{AF VR ~ ACC}
{AF VR ~ MAIN}
{AF VR ~ RF}
{NB VR ~ LOGIC}
{NB SW ~ LOGIC}
{AF VR ~ LOGIC}
{NB VR ~ RF}
{RF ~ MAIN}
{LOGIC ~ MAIN}
{MATRIX ~ MAIN}
{AF VR ~ MAIN}
{NB SW ~ MAIN}
{TONE C ~ MAIN}
{RF ~ ACC}
{AF VR ~ ACC}
{LOGIC ~ KEYER}
{MKR SW ~ KEYER}
{NB VR ~ KEYER}
{NB SW ~ KEYER}


ANT SW UNIT
PA UNIT
FILTER UNIT
PLL UNIT
RF UNIT
MAIN UNIT
REG UNIT
TONE ENCODER UNIT (UT-30)
ACC UNIT
KEYER UNIT
(RF ~ ANT SW)
(MAIN ~ FILTER)
(PA ~ ACC)
(MAIN ~ ACC)
(PLL ~ MAIN)
(OPTION)
(LOGIC ~ MAIN)
(NB SW ~ MAIN)
(TONE C ~ MAIN)
(AF VR ~ ACC)
(MKR SW ~ KEYER)
(NB SW ~ KEYER)
(ACC ~ TUNER)
(FILTER ~ TUNER)
(MAIN ~ TUNER)
(AT SW ~ TUNER)
(LOGIC ~ TUNER)
(NB VR ~ TUNER)
KEYING ELEC-KEY SPEED VR : CENTER
KEYING


ANT SW UNIT
TUNER
TDET UNIT
TUC UNIT
ACC UNIT
KEYER UNIT
SP
EXT SP
ACC2
ACC1
DC OUT
AC
ANT
RANT
X-VERTER
SPARE
RL
ALC
KEY
ELEC KEYER
REMOTE
KEYING (DOT)
WAIT LAMP ON
(ACC ~ TUNER)
(FILTER ~ TUNER)
(MAIN ~ TUNER)
(LOGIC ~ TUNER)
(AT SW ~ TUNER)
(NB VR ~ TUNER)


TDET UNIT
TUC UNIT
IC201
IC202
IC203
IC204 TA78L005AP
IC101 µPD7533C-077
IC102 TA7279P
IC103 NJM2902N
IC104 NJM78L05A
IC105 M54562P
IC108 µPD4063BC
IC109 µPD4011BC
IC110 µPD4011BC
IC111 M54562P
RL1,2 FBR323D012
RL7~11 FBR313D012-22
RL12 FBR311D012
MF1 HMK2601-01-030
MF2 HMK2601-01-030
R4 EVH-60AF15B14
R5 EVH-60AF15B14
L1 LA-162
L2 LR-219
L 101~107 100µH
L 108 100µH
L110 100µH
L201 LR-127A
L202 22mH
L204 100µH
L205 LW-18A
L206 LW-18A
L120 100µH
P201
P2
P5
J101
J102
J106
J107
J108
P35
X101 CSB500
TUNER ON:13.8V OFF:0V
TUNER ON:12.5V OFF:0V
TUNER ON:13.1V OFF:13.7V
TUNER ON:0V OFF:13.6V
TUNER ON:4.8V
TUNER ON :3.8V OFF :0V
WAIT LAMP ON 4.7V
PRE/ATT SW ON :0V OFF :12.6V
POWER ON:4.9V OFF:3.0V
POWER ON:4.3V OFF:2.3V
POWER ON:0V OFF:1.7V
RX:2.0V
RX:1.4V
RX:4.9V
RX:13.8V
RX:0 V TX:47V
RX:0.6V TX:2.5V
RX:4.9V TX:0V
RX:0V TX:4.8V
RX:0V TX:4.4V
RX:0.6V TX:0V
RX:4.4V
TX:2.5V
TX:20mV
TX:11.5mV
TX:4.4V
SWR ON TX:4.4V
SWRD
TRC
-5V

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Count on us!

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Printed in Japan

FACSIMILE TRANSLATION SUMMARY

FAX FROM: HOME COMPANY/Matsumoto
FAX TO: IA: Takahashi
REFERS TO FAX DATED:
PROBLEM/MODEL: IC-765 antenna switch
DATE: 2-20-90

SHORT SUMMARY OF MAIN POINTS-

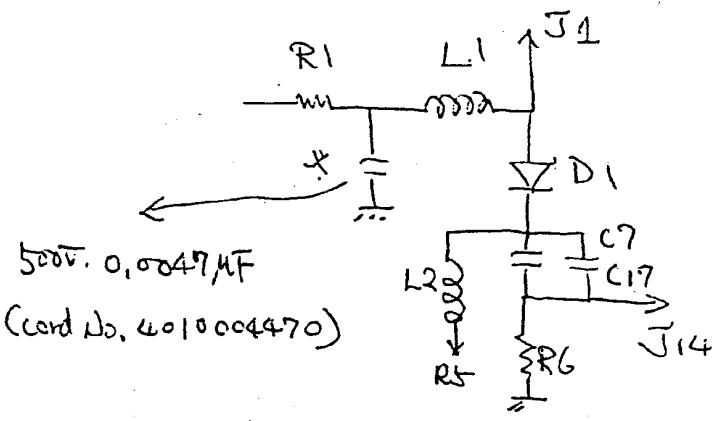
Re. IC-765 antenna switch unit.

Please try following modification.

Modification.

Install cap (0.0047uf 500v) between L1 and R1.

This mod. is incorporated in the factory production.



SUMMARY TRANSLATION: / IMMEDIATE DIST REQUIRED: /
FULL TRANSLATION: ROUTINE DISTRIBUTION:
FT REQUIRED BY: TRANSLATION BY: (KO)/MT

DISTRIBUTION TO: (RWB)/WBE/PH/(TM)/BRH/BM/(EG)/(CTS)/PMcf OTHER: Takahashi

11:28:07 C:\KUNI\FT2-20.3 February 20, 1990 KO

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765 MODIFICATION FOR IMPROVED T/R SWITCHING TIME

(prevents damage to D45, D46, D47, & Q15 on RF Board.)

PARTS NEEDED: 47K 1/8 watt resistor
150K 1/8 watt resister
1SS53 diode
Insulation for the resistor lead

1. Remove bottom cover
2. Remove screws from Main Unit and lift board
3. Remove R10 (39K) and R11 (39K) near IC-2
4. Install one end of new R11 (150k) to foil trace which connects to C13. Insulate remaining lead of R11 and solder it to Pin 3 of IC-2
5. Install new R10 (47K)
6. Solder D159 (1SS53) between Pins 3 and 13 of IC-2. Cathode Side of diode (striped end) goes to Pin 3
7. Modification is complete. No adjustment is necessary. Reinstall the Main unit and Bottom cover

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SERVICE BULLETIN

Unit Model: IC-765 SB # 26989 Effective Date: 09-26-89

Serial No. Affected: 1001 and above Product Group: Amateur

Background Information:

The automatic antenna tuner "hunts" after the first tuning phase is complete. This usually starts after a few months of use.

Technical Information:

The feedback circuit that controls the tuning motors becomes sensitive after a few months of "ageing". It requires a one time adjustment to correct.

Instructions:

1) Remove top cover and locate the Antenna Tuner board.

2) Locate R5 and R10 and set them to the center of their range.

3) Set the radio as follows: Tuner - ON
Frequency - 14.100 Mhz
Mode - RTTY

4) After transmit is engaged for 30 seconds,

5) Adjust each control (R5 and R10) so neither motor tunes while changing from SSB to RTTY and back to SSB.

NOTE: R5 (right) controls right motor and R10 (left) controls left motor.

6) Repeat this adjustment to verify proper operation and then check on all other bands.

7) Reinstall top cover and return to operation.

This Service Bulletin Consists of 1 pages total. Estimated time to complete is 15 minutes

Releases: Svc MA Eng JS Mkt BG

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