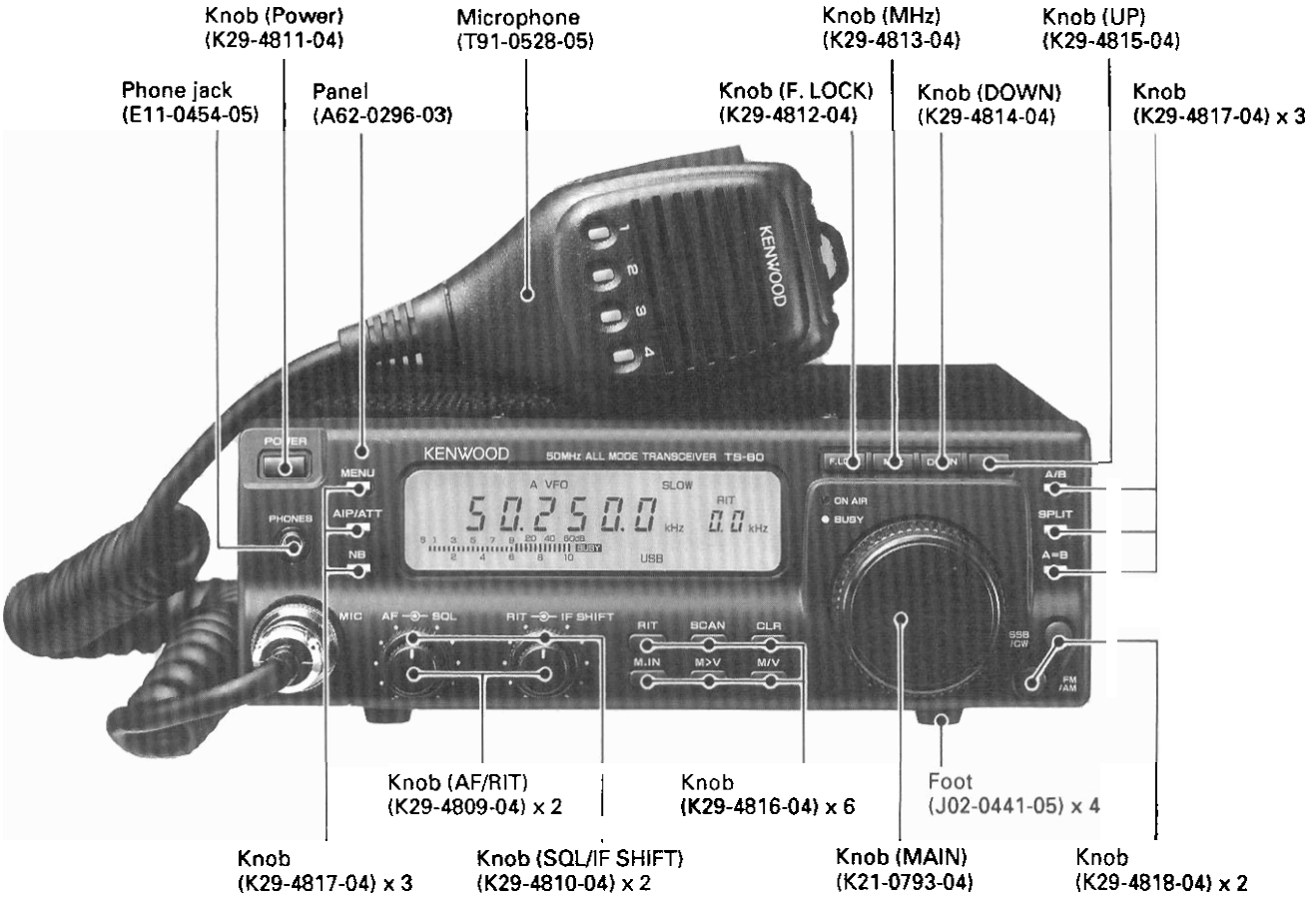
50MHz ALL MODE TRANSCEIVER

TS-60S

SERVICE MANUAL

KENWOOD

B51-8252-00 (O) 1095



CONTENTS

CIRCUIT DESCRIPTION

Frequency Configuration

The TS-60S uses double conversion in all transmission modes, double conversion in all reception modes except FM, and triple conversion in FM reception mode. (Fig. 1)

Mode	Display frequency
USB, LSB	Carrier point frequency
CW	Transmit carrier frequency
AM, FM	IF filter center frequency

Table 1 Display frequency in each mode

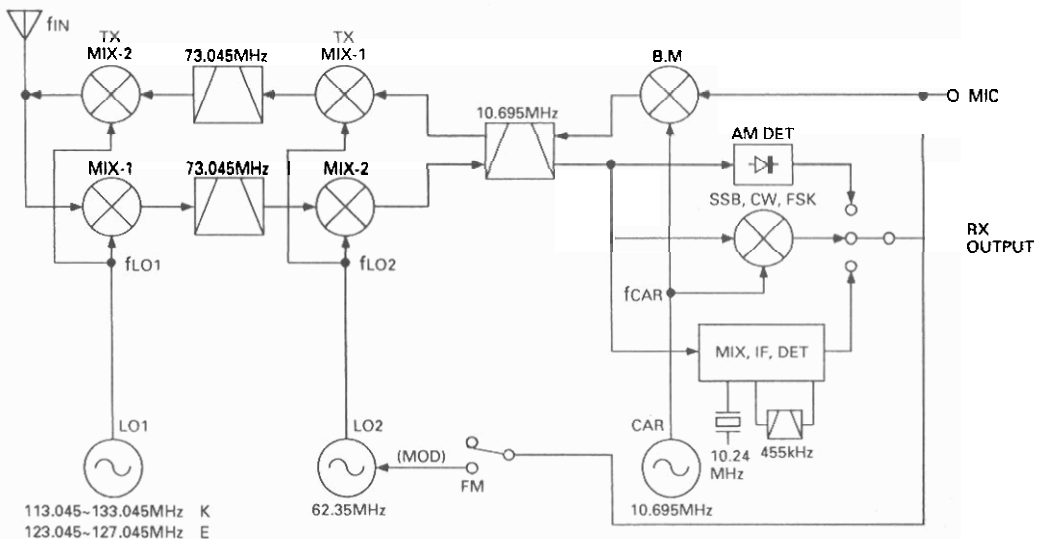


Fig. 1 Frequency configuration

The receiver frequency in SSB mode is given by the following equation when the receiver tone produced by the input frequency (fIN) from the antenna is zero beat (when an SSB signal with a carrier point of fIN is zeroed in):

$$f_{IN} = f_{LO1} - f_{LO2} - f_{CAR}$$

Since all these frequencies are generated by the PLL circuit, as shown in Figure 2 (PLL frequency configuration), the receiver frequency is determined only by the reference frequency, fSTD, and the PLL divide ratio. This means, the accuracy of the reference frequency determines the accuracy of the operating frequency of the transceiver.

The accuracy of the reference crystal oscillator used in the TS-60S is 10 ppm (–10 to +50°C). The accuracy of the optional temperature-compensated crystal oscillator (TCXO, SO-2) is 0.5 ppm (–10 to +50°C).

In SSB transmission mode or in other modes, the frequency is determined by the reference frequency (fSTD) and the PLL divide ratio. Table 1 lists the display frequencies in the various modes.

The pitch of the incoming signal in CW mode can be varied in 50-Hz steps in the range 400 to 1000Hz without changing the center frequency of the IF filter (variable CW pitch system).

FM transmission is carried out by applying the audio signal from the microphone to the 62.35-MHz VCO and modulating fLO2.

PLL Circuit Configuration

The TS-60S PLL circuit uses a reference frequency of 20MHz, and covers 40 to 60MHz (**K**), 50 to 54MHz (**E**) in 5- to 200-Hz steps, depending on how fast the encoder is turned. Figure 2 shows the frequency configuration of the PLL circuit. Figure 3 is a PLL block diagram.

1. Reference oscillator circuit

The reference frequency (fSTD) for frequency control is generated by the 20-MHz crystal oscillator, X1 and Q12 (2SC2714(Y)). The reference frequencies for other circuits are produced by dividing fSTD by two and by five by IC2 (μPD74HC390G). fSTD is divided by two to produce a 10-MHz PLL reference signal, which goes to IC11 (CXD1225M) and IC101 (CXD1225M). It is input to the CAR oscillator section to produce a 10.695-MHz signal. The 4-MHz signal produced by dividing fSTD by five goes to IC4 (SN16913P).

The crystal oscillator circuit can be replaced by an optional TCXO (SO-2). The TS-60S can be switched to the TCXO by removing a shorting jumper (W1/W2).

CIRCUIT DESCRIPTION

2. LO2 (PLL loop)

The VCO of IC10 (KCH14) generates a signal of 62.35MHz. The 10-MHz reference frequency is applied to pin 5 of IC101 (CXD1225M), and is divided by 200 (800 in FM mode) to produce a 50-kHz (12.5-kHz in FM mode) comparison frequency. The output from the VCO is applied to pin 11 of IC101, and is divided by 1247 (4988 in FM mode). It is then compared with the 50-kHz (12.5-kHz in FM mode) reference signal by the phase comparator to lock the VCO frequency. Divide ratio data is supplied by the digital unit.

The output is amplified by amplifier Q18 (2SC2954) and passes through a low-pass filter. The VCO is modulated in FM mode.

3. LO1 (PLL loop)

Q1, Q3 (2SK508NV) in the X58-4120-00 are VCOs. Q1 generates a signal of 113.045 to 123.044MHz; and Q3, a signal of 123.045 to 133.045MHz. **K type**

Q3 (2SK508NV) in the X58-4120-00 are VCO. Q3 generates a signal of 123.045 to 127.045MHz. **E type**

The 10-MHz reference signal is input to pin 5 of IC11 (CXD1225M) and is divided by 20 to produce a 500-kHz comparison frequency. The output signal from the VCO is mixed with a 75.045- to 75.545-MHz signal from the PLL (described later) to produce a 38.0- to 57.5-MHz signal. It is input to pin 11 of IC11, divided, and compared with the 500-kHz signal by the phase comparator, and the VCO frequency is locked. Divide ratio data is supplied by the digital unit.

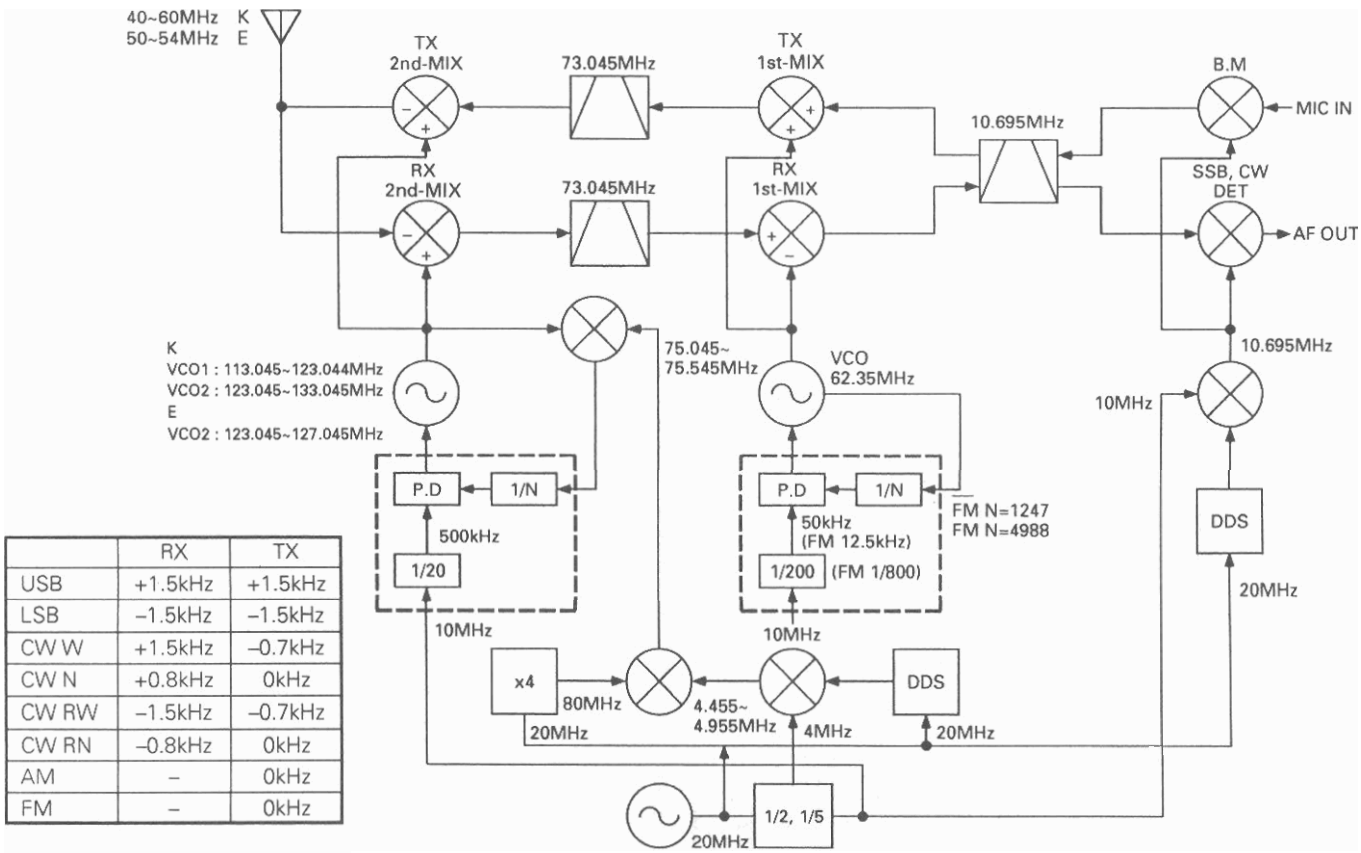
The 20-MHz reference signal is input to DDS1 (X58-4020-00), and the output signal is mixed with a 4-MHz signal by IC4 to generate a signal of 4.455 to 4.955MHz (in 5- or 200-Hz steps). The signal is mixed with the 80-MHz signal (4 x 20-MHz reference frequency) by IC5 (SN16913P) to produce a 75.045 to 75.545MHz signal (in 5- or 200-Hz steps).

4. CAR

The 20-MHz reference signal is input to DDS2 (X58-4020-00), and the output signal is mixed by IC7 (SN 16913P) with the 10MHz signal divided by IC2 to produce a 10.695-MHz signal. This signal passes through the band-pass filter and amplifier and is output for local oscillation and detection.

5. DDS

The DDS is the same as that used in the TS-50.



	RX	TX
USB	+1.5kHz	+1.5kHz
LSB	–1.5kHz	–1.5kHz
CW W	+1.5kHz	–0.7kHz
CW N	+0.8kHz	0kHz
CW RW	–1.5kHz	–0.7kHz
CW RN	–0.8kHz	0kHz
AM	–	0kHz
FM	–	0kHz

Fig. 2 PLL circuit frequency configuration

CIRCUIT DESCRIPTION

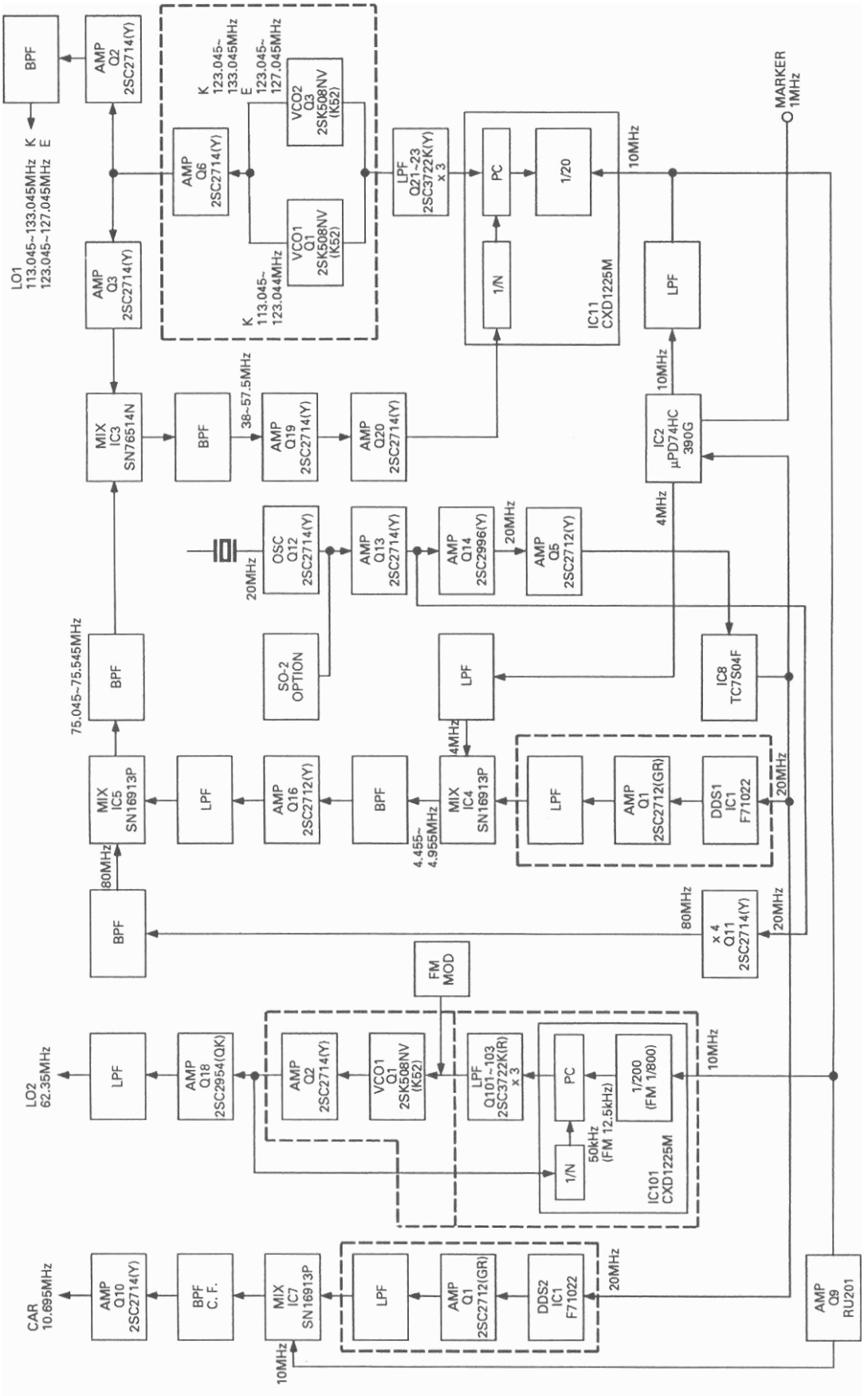


Fig. 3 PLL block diagram

CIRCUIT DESCRIPTION

Receiver Circuit Configuration

The configuration of the receiver circuit is double-conversion with a first IF of 73.045MHz and a second IF of 10.695 MHz, and triple-conversion in FM mode with a first IF of 73.045MHz, a second IF of 10.695MHz, and a third IF of 455kHz. (Fig. 5)

The incoming signal from the antenna passes through the antenna switch relay on the filter unit, then through the 60-MHz low-pass filter, and goes to the TX-RX unit. The signal passes through a 20dB attenuator and 54-MHz low-pass filter in the TX-RX unit, and goes through the band-pass filters. If AIP is off, the signal passing through band-pass filter is amplified by the RF amplifier, Q9, Q10 and Q69 (2SK520 x 3), and is input to the first mixer, Q5 to Q8 (2SK520 x 4). If AIP is on, the signal bypasses Q9, Q10 and Q69 and goes directly to the first mixer. It is mixed with the LO1 signal by the first mixer to produce a first IF signal of 73.045MHz.

The first IF signal of 73.045MHz passes through the MCF (XF1), is amplified by Q17 (3SK131), and mixed with the 62.35-MHz LO2 signal by the second mixer, Q18 and Q19 (2SK520 x 2), to produce a second IF signal of 10.695MHz.

The second IF signal of 10.695MHz is split into two. One signal goes to the NB amplifier, and the other passes through the NB gate FET (3SK131). The signal then passes through the CF (XF2) and is detected by IC2 (KCD04) in FM mode. In other modes, the signal goes to the IF filter of the X48-3110-00 unit. There are three types of IF filter: 6-kHz, 2.7-kHz, and 500-Hz (500-Hz is optional). The signal passing through the IF filter goes to IC3 (KCD08), and is product-detected in SSB and CW modes, and envelope-detected in AM mode.

1. Receiver front-end

The signal input to the TX-RX unit passes through the switching circuit of the attenuator and the 60-MHz low-pass filter, and goes to band-pass filters. If AIP is off, D49 and D11 turn on and D8 and D9 turn off, and the signal passing through filter is amplified by about 10 dB by Q9, Q10 and Q69 (2SK520 x 3) and output to the first mixer. If AIP is on, D49 and D11 turn off and D8 and D9 turn on, and the signal is output directly to the first mixer without passing through Q9, Q10 and Q69. The first mixer, is a quad balanced mixer, Q5 to Q8 (2SK520 x 4). (Fig. 4)

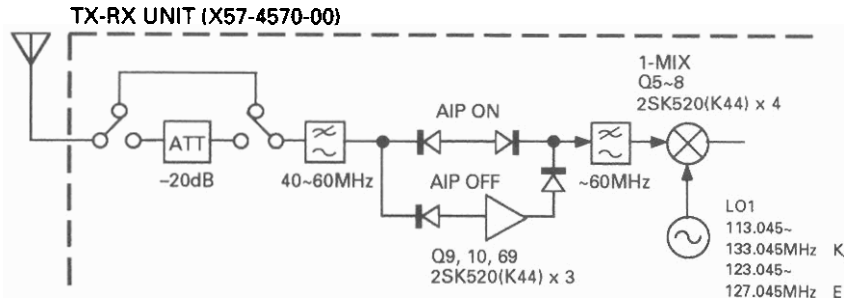


Fig. 4 Receiver front-end

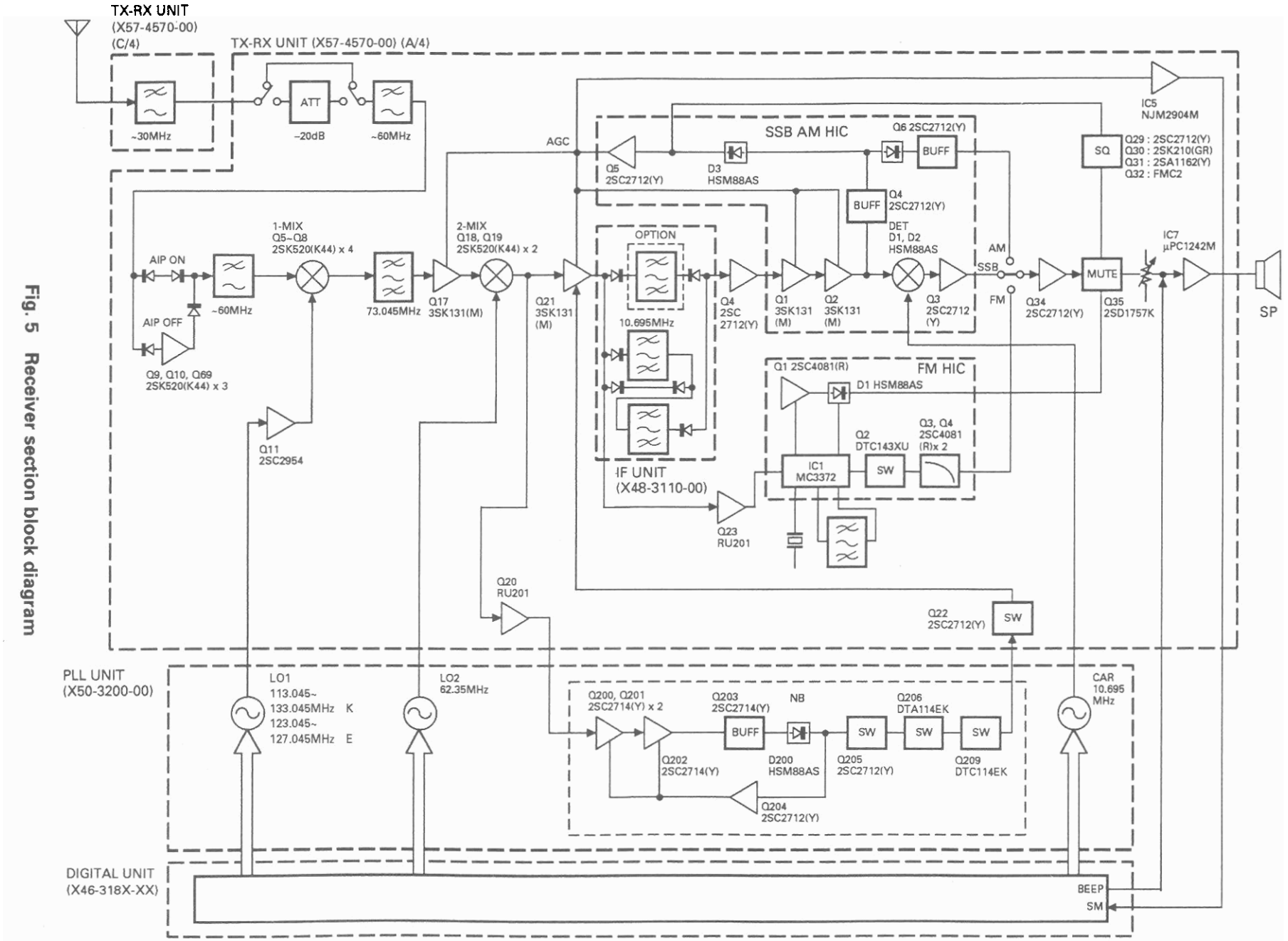


Fig. 5 Receiver section block diagram

CIRCUIT DESCRIPTION

2. Noise blanker circuits

The 10.695-MHz IF signal generated from the first IF of 73.045MHz by the second mixer is input to IF amplifier Q21 (3SK131), sent through Q20, amplified by noise amplifier Q200, Q201, and Q202 (2SC2714), sent through buffer Q203, and noise-detected by D200. This signal switches Q205, Q206, and Q209, and controls Q22 in the TX-RX unit. Q22 controls IF amplifier Q21 and blanks the noise.

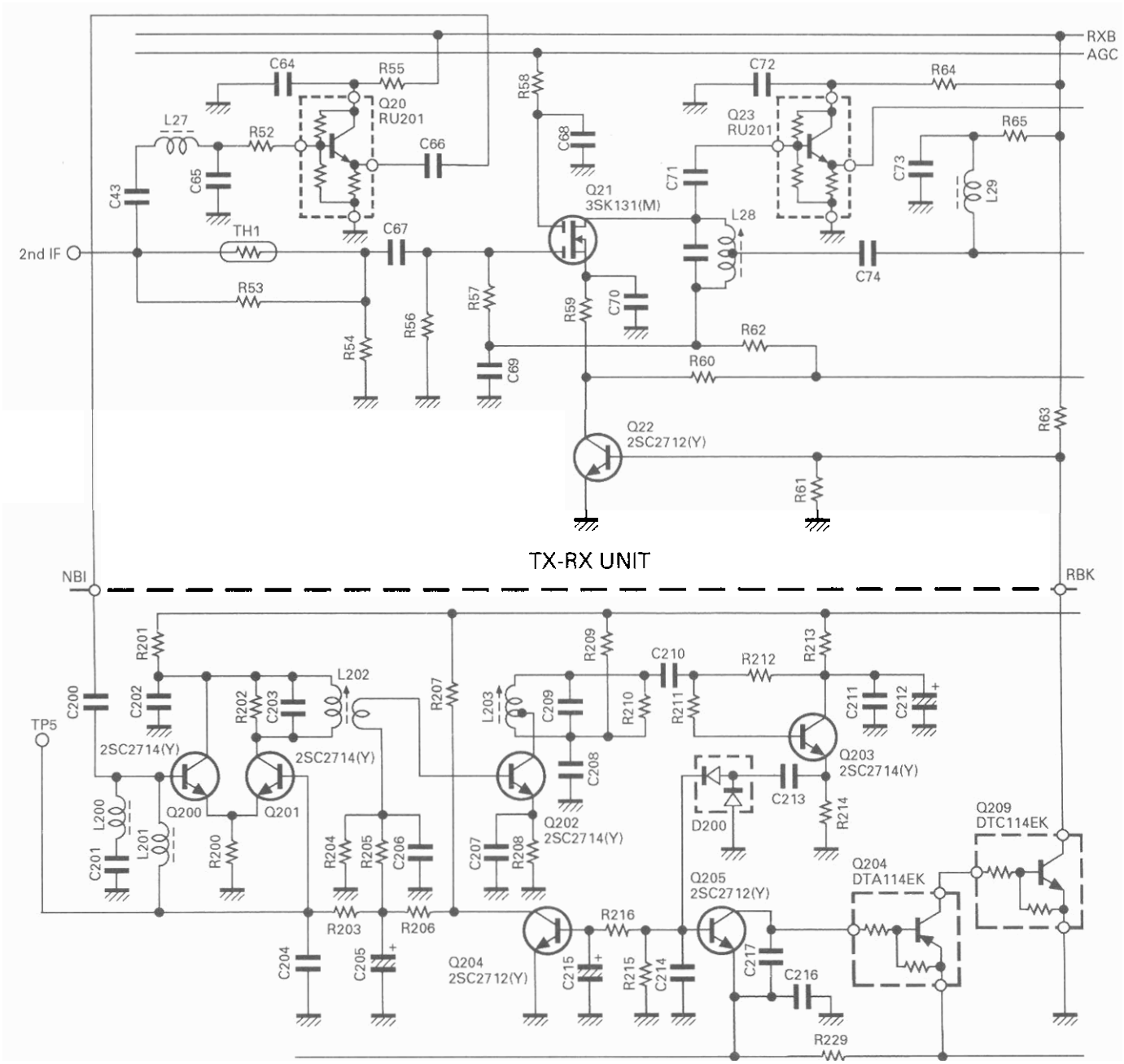


Fig. 6 Noise blanker circuits

CIRCUIT DESCRIPTION

3. SSB, AM, CW filter circuit

The second IF signal amplified by Q21 is input to the X48-3110-00 unit in all modes except FM.

If an optional CW filter (XF1) is installed and CW NARROW is elected in CW mode, the signal passes through XF1 according to the control signal from the microcomputer. If XF1 is not installed or CW NARROW is not selected, the signal passes through XF3 and XF2.

In SSB mode, the signal passes through XF3 and XF2.

In AM mode, the signal passes through XF3 and XF2 as in SSB mode if AM NARROW is selected. If AM NARROW is not selected, the signal passes through XF2 only.

In FM mode, the signal does not pass through the filter circuit in this unit.

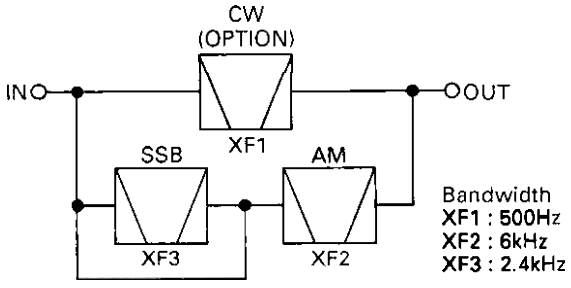


Fig. 7 Filter circuit

Item	Rating
Nominal center frequency	10.695kHz
Center frequency deviation	Within ±80Hz at 6dB
Pass bandwidth	500Hz or more at 6dB
Insertion loss	Within 5dB ± 2dB
Terminating impedance	1200Ω/6pF

Table 2 MCF (L71-0283-05) : IF unit XF1 (Option)

Item	Rating
Nominal center frequency	10.695MHz
Pass bandwidth	6kHz or more at 6dB
Attenuation bandwidth	40kHz or less at 60dB
Ripple	2dB or less
Insertion loss	3dB or less
Guaranteed attenuation	60dB or more within fo ± 1MHz
Terminating impedance	1.2kΩ ± 10% / 6pF ± 10%

Table 3 MCF (L71-0433-05) : IF unit XF2

Item	Rating
Nominal center frequency	10.695MHz
Center frequency deviation	Within ±200Hz at 6dB
Pass bandwidth and Attenuation bandwidth	2.2kHz or more at 6dB
	±1.5kHz or less at 20dB
	±2.4kHz or less at 60dB
Rinple	2dB or less
Insertion loss	5dB or less
Guaranteed attenuation	60dB or more within fo ± 40kHz
Terminating impedance	1.2kΩ ± 5% / 6pF ± 5%

Table 4 MCF (L71-0249-05) : IF unit XF3

4. SSB, AM, CW detection circuit

After unwanted signal components have been removed in the X48-3110-00 unit, the signal is input to IC3 (KCD08). The signal amplified by IC3 is mixed with the CAR signal input from CN11 in SSB and CW modes, and detected to output an audio signal. In AM mode, the signal is envelope-detected by the diode and capacitor to output an audio signal.

5. FM detection circuit

The impedance of the second IF signal amplified by Q21 is converted by Q23 (RU201) in FM mode, and unwanted signal components are removed by the CF (XF2). The resulting signal is input to the detection IC (IC2: KCD04). The signal is then mixed with the 10.24-MHz oscillator signal to generate the 455-kHz signal. The signal is passed through ceramic filter CF1, and detected by the quadrature detector with the signal phase-shifted by CD1.

6. Squelch circuit

In all modes except FM, the 10.695-MHz IF signal is detected by a diode in IC3, passed through Q29 and Q30, and a voltage proportional to the signal level appears at the base of Q31. When the SQ VR is turned clockwise, the emitter voltage of Q31 increases and Q32 is switched on.

In FM mode, as the IF signal increases, the noise level decreases, and the voltage at the SQ pin decreases, making the SC pin low. When the SQ VR is turned clockwise, the voltage at the SQ pin rises, and the SC pin goes high. Current flows through R77, and Q32 turns on.

Q35 turns on to mute the AF signal line. (Fig. 8)

CIRCUIT DESCRIPTION

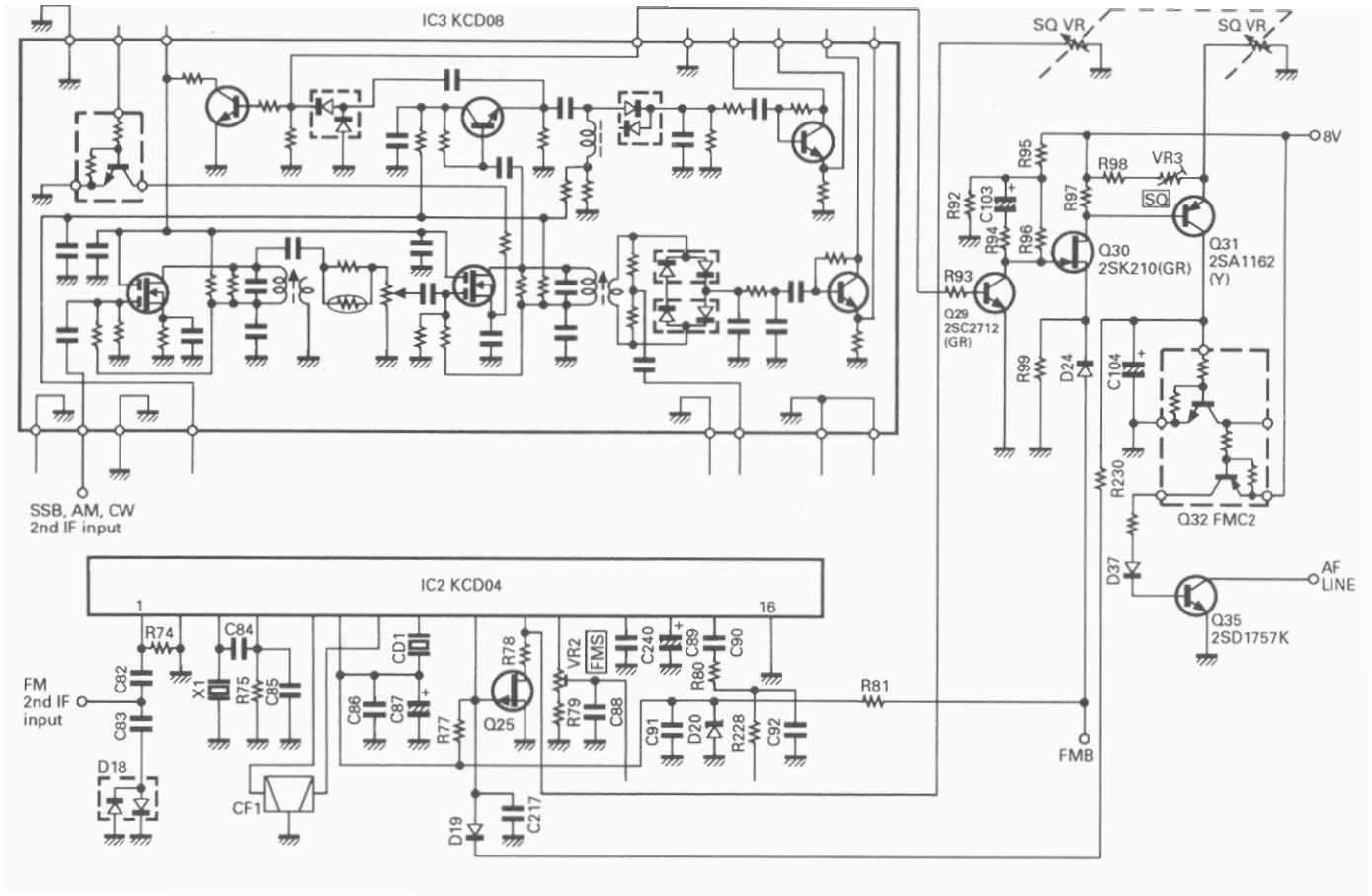


Fig. 8 Squelch circuit

7. Signalstrength meter circuit

In all modes except FM, the signalstrength meter circuit comprises operational amplifier IC5. The signal, level-detected by IC3, is input to IC5 (1/2) and amplified by about 8 dB by IC5 (2/2).

In FM mode, the level detection signal from IC2 is adjusted by VR2, selected by IC4 (BU4066BF) according to the mode, and output directly to the digital unit. (Fig. 9)

8. AGC circuit

The time constant for the signal envelope-detected by IC3 is changed in each mode by the analog switch. The effective value, not the peak value, is used in AM mode. When SLOW is selected in SSB and CW modes, the analog switch is turned on. (Fig. 9)

CIRCUIT DESCRIPTION

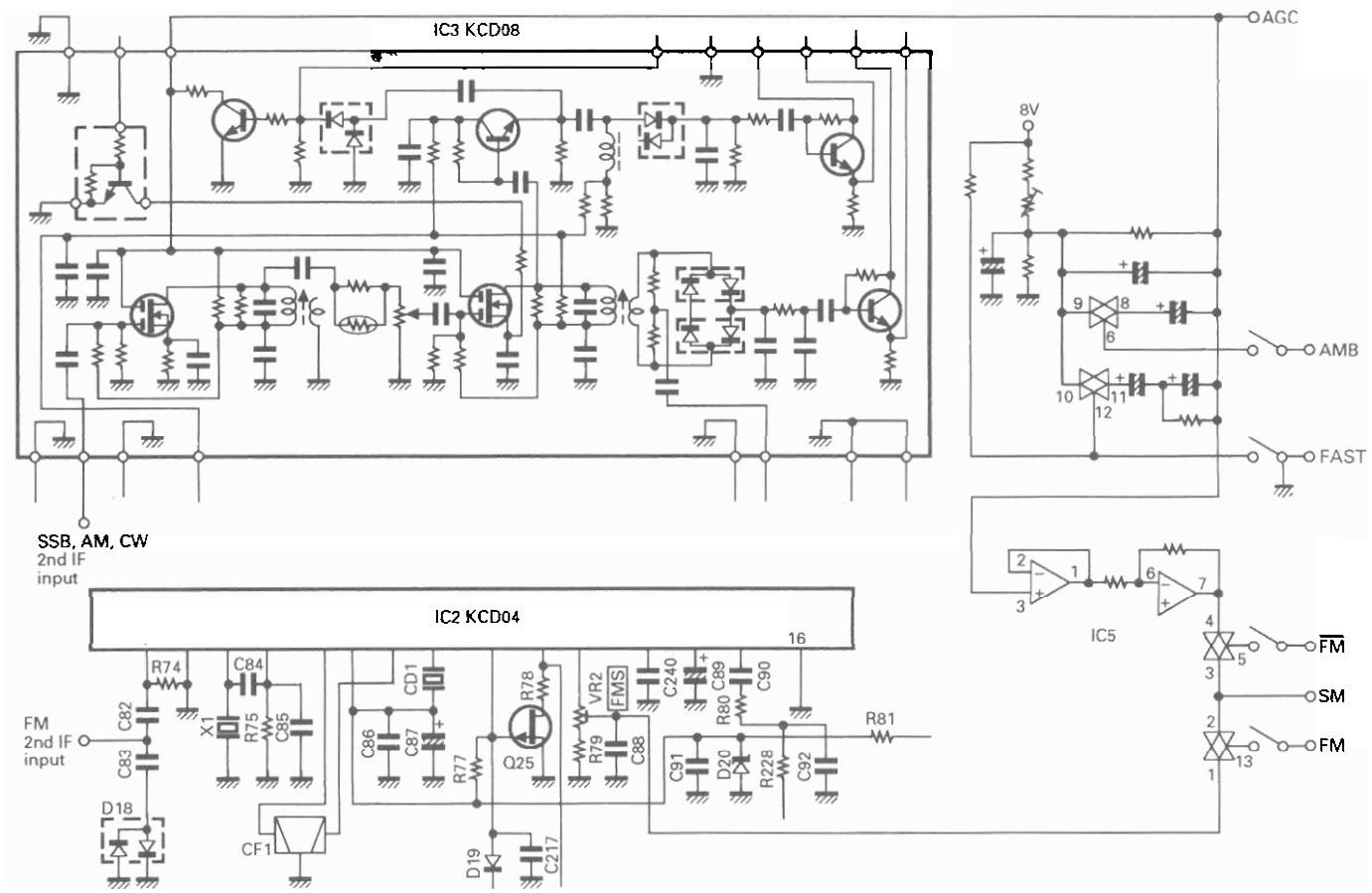


Fig. 9 S-meter and AGC circuits

Transmitter Circuit Configuration

The audio signal from the microphone enters CN15 of the TX-RX unit. The signal then goes to Q38 (2SC3722K) of the microphone amplifier, and is split and directed to the SSB and FM systems. In the SSB system, the signal, its gain properly adjusted by VR7, is amplified by Q40 (2SC2712(Y)), balance-modulated with the CAR signal (10.695MHz) input from CN11 by IC8 (μPC1037HA), passed through Q42 (2SC2712(Y)), and sent to the crystal filter in the X48-3110-00 unit. The SSB signal passing through the filter is amplified by Q43 (3SK131M).

The 62.35-MHz LO2 signal from the PLL unit is input from CN3 of the TX-RX unit, and mixed with the 10.695-MHz signal amplified by Q43, Q46, and Q47 (3SK131(M)) to produce a 73.045-MHz signal. The LO1 signal from the PLL unit is input from CN2 of the TX-RX unit, and mixed with the 73.045-MHz signal by Q48 and Q49 (3SK184(R)) to generate the desired signal. The signal passes through the band-pass filter and is amplified by Q50 (2SC2954) to produce the drive output, which goes to the final unit from CN19.

The signal is amplified to the appropriate power level for the type by the final unit. Harmonic components are attenuated by the filter unit, and the signal is output from the antenna connector.

In FM mode, the audio signal amplified by microphone amplifier Q38 and Q39 is input to CN1 of the PLL unit, and passes through the pre-emphasis and IDC circuit of IC201 to modulate LO2 (62.35MHz).

In AM mode, the signal is generated by unbalancing the carrier of SSB balance modulator IC8.

In CW mode, Q59 of the TX-RX unit is switched by the key, and the signal is input to IC1 of the digital unit. The sidetone monitor signal is generated by X59-4000-00 in the TX-RX unit, and output from the speaker. The CW control signal is output from IC1 of the digital unit, and input from CN17 of the TX-RX unit to switch Q46 and Q47 and generate the CW signal. (Fig. 10)

CIRCUIT DESCRIPTION

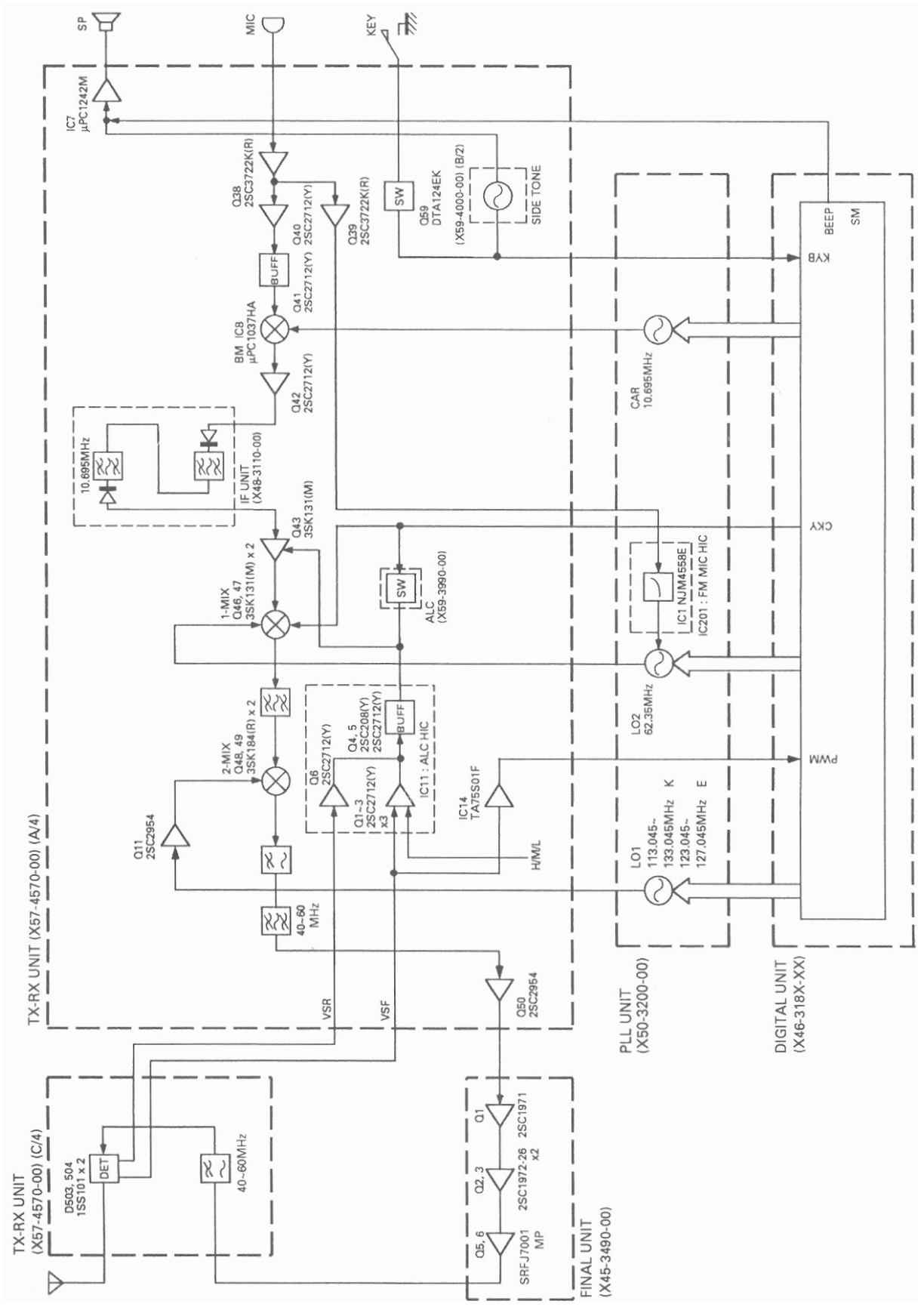


Fig. 10 Transmitter section block diagram

CIRCUIT DESCRIPTION

1. ALC circuit

The forward wave voltage detected in the filter unit passes through CN18 in the TX-RX unit, its level is adjusted by VR14, and it is applied to the differential amplifier comprising Q1 and Q2 (2SC2712(Y) x 2) in IC11. When VSF is applied to the base of Q1, the emitter voltage of Q1 and Q2 increases and the current flowing through the base of Q2 decreases; thus the collector voltage rises. When this voltage exceeds the emitter voltage of Q3 (2SC2712(Y)) (about 1.8V) plus VBE (about 0.6V), the current flows through the base of Q3 and the collector voltage drops. ALC time constants C and R are connected to this collector.

The collector voltage change is shifted by Q4 (2SK208) and D2 (3.6V), and matched with the voltage for keying by Q5 and D3 (RLS73) to generate the ALC voltage. This ALC voltage activates ALC by lowering the second gate voltage of Q43 (3SK131(M)) of the TX-RX unit. (Fig. 11)

2. Power control circuit

Power is controlled by lowering the base voltage of Q2 in IC11. As the base voltage of Q2 decreases, the emitter voltage of Q1 and Q2 decreases. This activates ALC and reduces the power even if the base voltage (VSF) of Q1 is low. The power is changed by IC12. In AM mode, Q63 turns on, and the power is reduced to about 1/4 of the power in other modes. (Fig. 11)

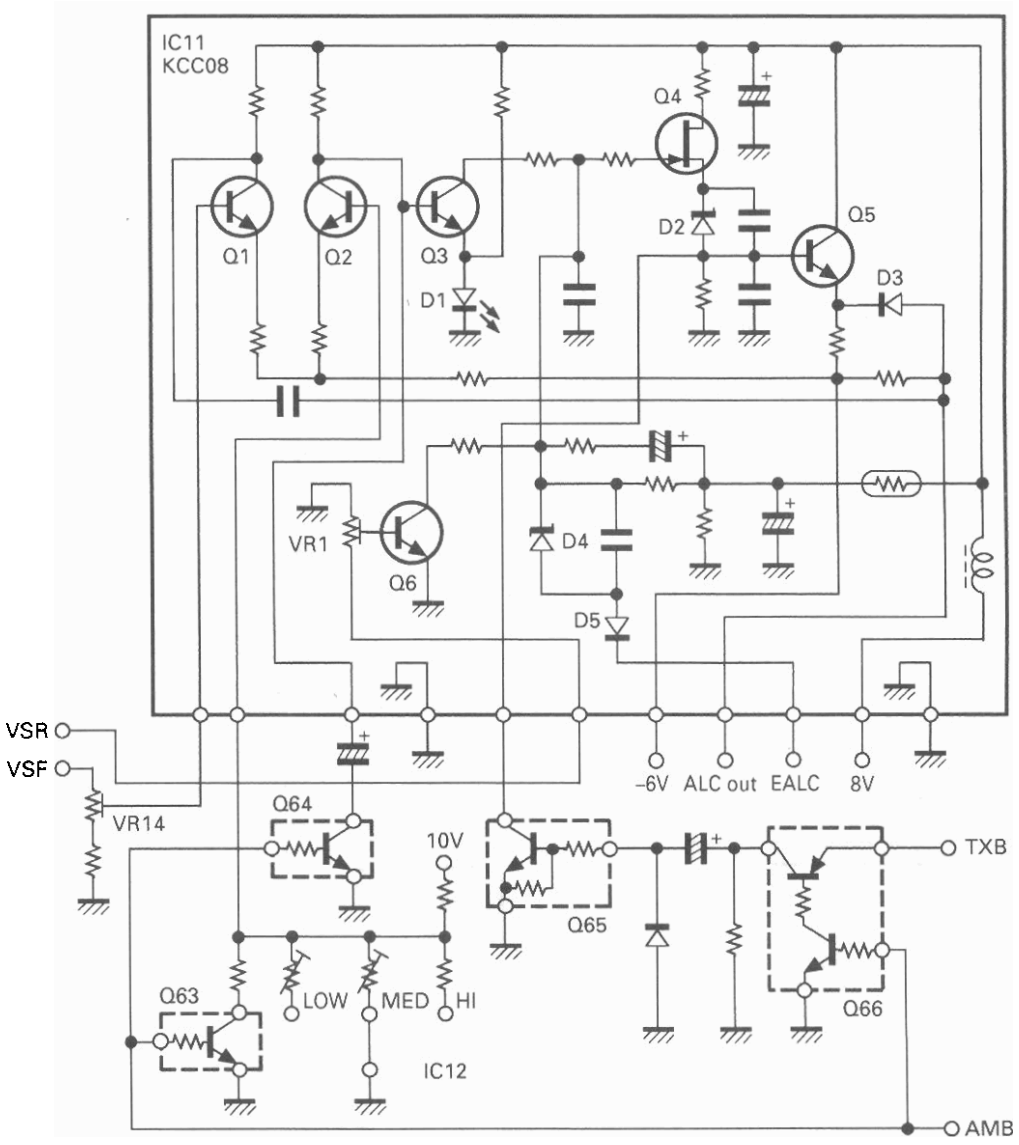


Fig. 11 ALC and power control circuits

CIRCUIT DESCRIPTION

3. Protection circuit

When the reflected wave voltage (VSR) detected by the filter unit rises, Q6 (2SC2714(Y)) in IC11 turns on to reduce the voltage of the ALC time constant line. The drive is decreased and the power is reduced to protect the final transistor.

4. Temperature protection

If the final heat sink temperature rises, Q8 in the final unit turns on and the fan starts running at low speed in both transmit and receive modes. If the final heat sink temperature rises further, Q9 turns on, and the fan rotates at medium speed in both transmit and receive modes. If the temperature rises further still, the fan rotates at high speed in transmit mode, and at medium speed in receive mode to reduce the fan noise.

If the temperature continues to rise, the temperature detection port of the microcomputer (IC1 in the digital unit) is made high to reduce the RF output forcibly. If the fan fails or does not rotate because something is stopping it, the RF output is forcibly reduced in the same way.

Digital Control Circuit

The TS-60S digital control circuit comprises a 16-bit microcomputer (M37702M4A-FP), a reset IC (M62003FP), an EEPROM (NM93C66LEM8 or AT93C66-10SI2.7), a latch (TC74HC573AF), and a decoder (TC74HC238AF). The latch and decoder are used to expand the output ports. The decoder outputs an enable signal pulse.

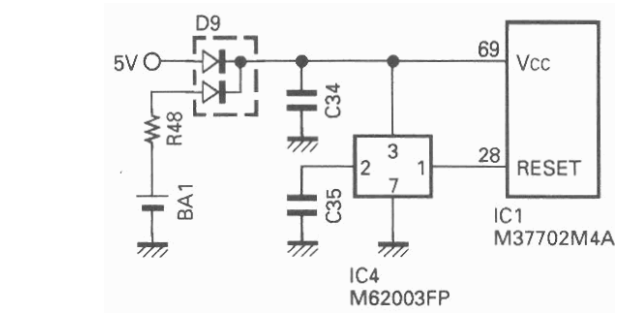
1. Power button

With this transceive, the power is turned on and off by the microcomputer. When the power button is pressed, the microcomputer detects it and energizes, the power relay to supply 14V to the transceiver. When the power button is pressed to turn the transceiver off, the microcomputer checks it a little longer than when turning the power on, and deenergizes the power relay.

2. Reset circuit

IC4 (M62003FP) monitors Vcc applied to the microcomputer. If the voltage falls below 2.15V, the IC outputs a reset signal (low) to the microcomputer, and the CPU initializes all internal data (including memory channel data). The reset signal is not output when the power is turned on or off or 14V is turned on or off. It is output when the battery voltage level goes low and 14V is turned on or off.

C35 generates the signal width (td) required to reset the microcomputer. (Fig. 12)



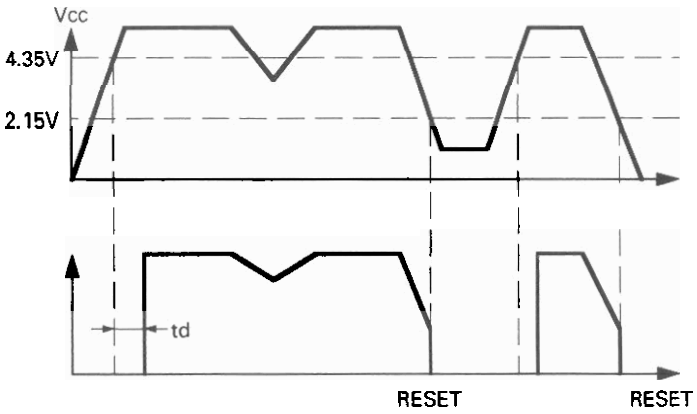


Fig. 12 Reset circuit

CIRCUIT DESCRIPTION

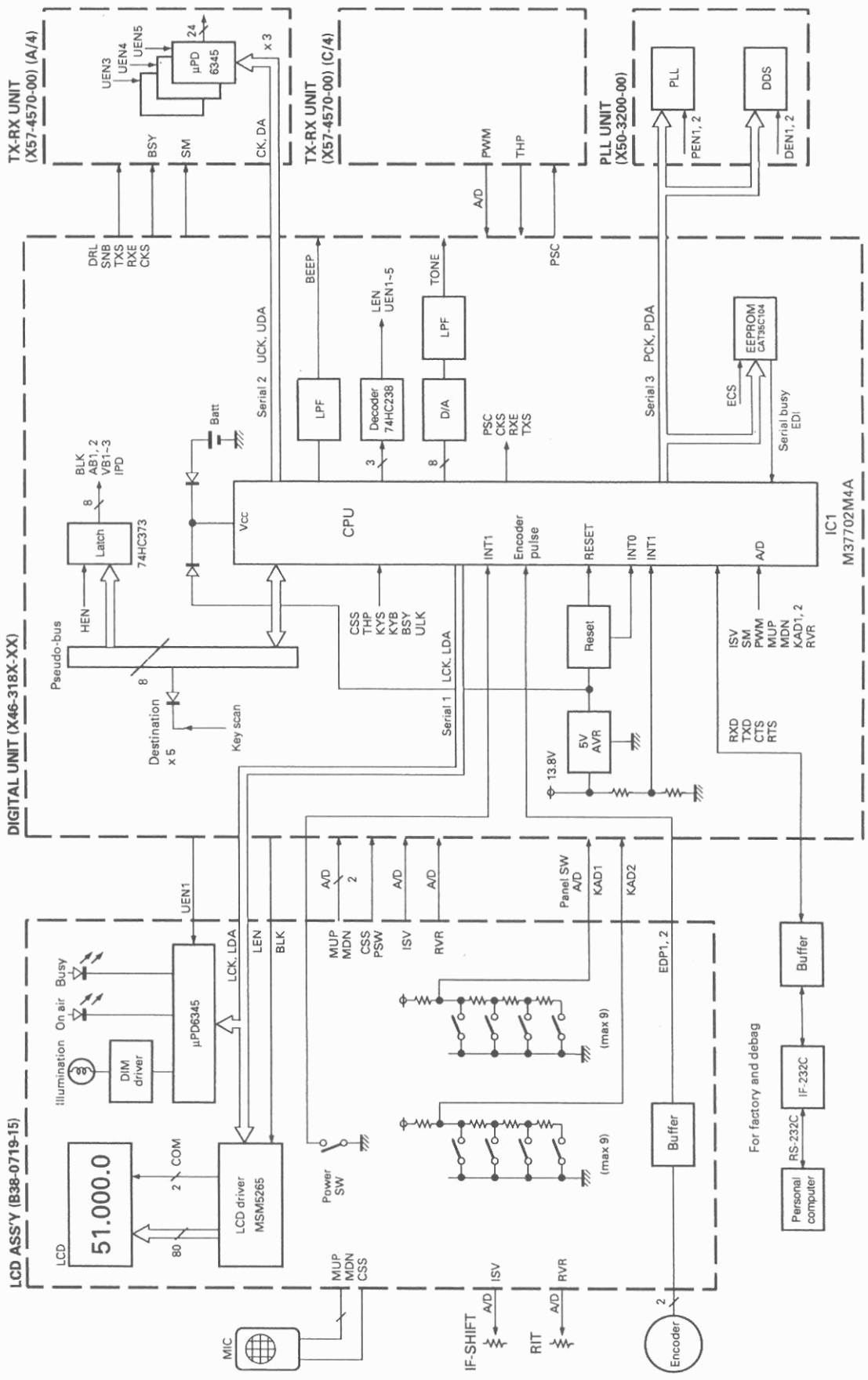


Fig. 13 Digital control block diagram

CIRCUIT DESCRIPTION

3. Backup circuit

This transceiver has two kinds of data stored in the microcomputer and EEPROM. User data, such as memory channel data, is stored in the microcomputer, and adjustment data, such as meter curves, is stored in the EEPROM. The EEPROM data is retained when the power supply voltage is off, but power is required to retain the microcomputer data. If 14V is not cut off, power is supplied from the 5V AVR in the digital unit. If 14 V is cut off, power is supplied from a lithium battery. To retain data with the lithium battery, the microcomputer must be in backup mode. So, the backup circuit shown in Figure.14 detects a voltage drop in the 14V line and outputs a backup request signal to the microcomputer.

4. PLL and DDS control circuit

The TS-60S has three PLLs and two DDSs. The main microcomputer outputs frequency data to the PLLs and DDSs serially according to the display frequency.

5. TX-RX unit control signal circuit

The microcomputer sends the mode signal, IF filter select signal, and power signal to the TX-RX unit. It receives meter signals and standby switch signals from the TX-RX unit, displays data on the meters, and performs the transmit operation. The output signal from the microcomputer goes to the serial-to-parallel converter (TC9174F). (Fig. 15)

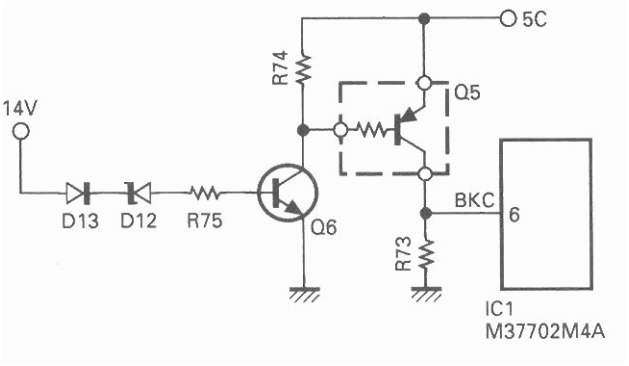


Fig. 14 Backup circuit

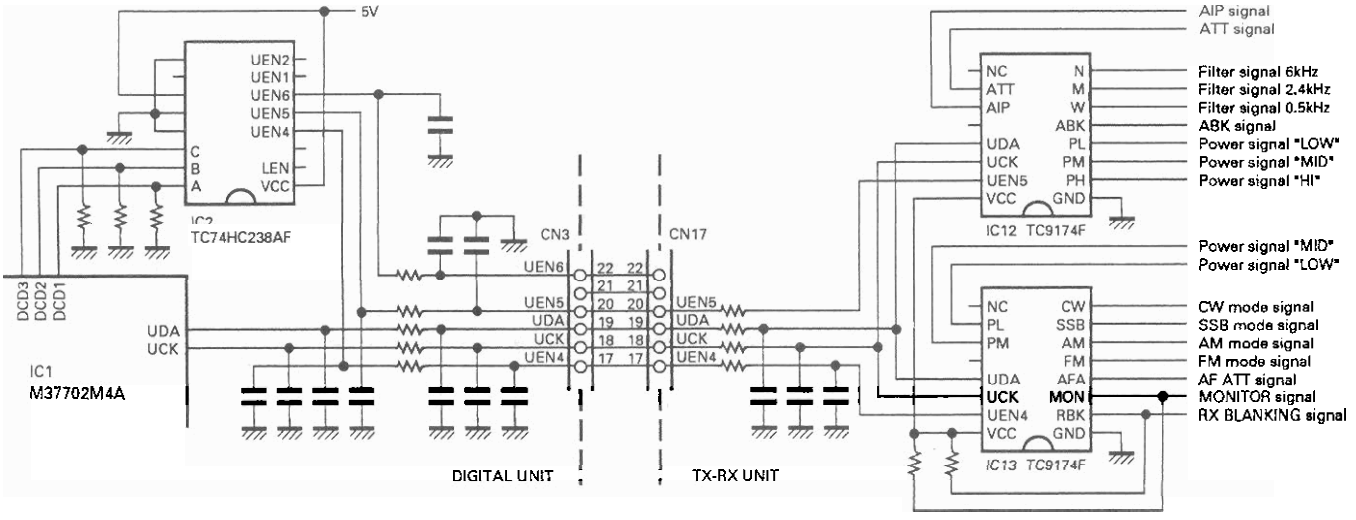


Fig. 15 TX-RX unit control signal circuit

CIRCUIT DESCRIPTION

6. Switch A/D input

The voltage divided by nine switches S16, S2 to S9, S10 to S15, and S17 to S19 is applied to the A/D input pin of the microcomputer when a button is pressed. (Fig. 16) When two or more buttons in the same group are pressed at the same time, only the button with the highest priority is detected (listed below).

KAD1		KAD2		Priority
S16	SPLIT	S11	F. LOCK	1
S3	AIP/AT	S12	DOWN	2
S4	NB	S13	UP	3
S5	RIT	S14	MHz	4
S6	M. IN	S15	A/B	5
S7	SCAN	S10	M/V	6
S8	M>V	S17	A=B	7
S9	CLR	S18	SSB/CW	8
S2	MENU	S19	FM/AM	9

Table 5

7. EEPROM

Adjustment data is stored in the EEPROM, which consists of 256 16-bit registers. Data can be written to and read from the EEPROM. Each time the power is switched on, data is read from the EEPROM. If corrupt data is detected, the default adjustment data is used. Adjustment data can be written into the EEPROM in service adjustment mode. (Fig. 17)

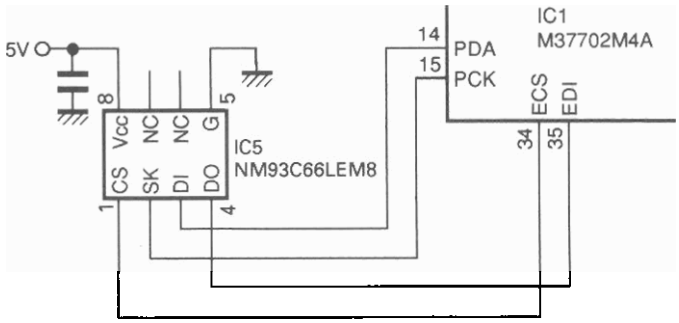


Fig. 17 EEPROM circuit

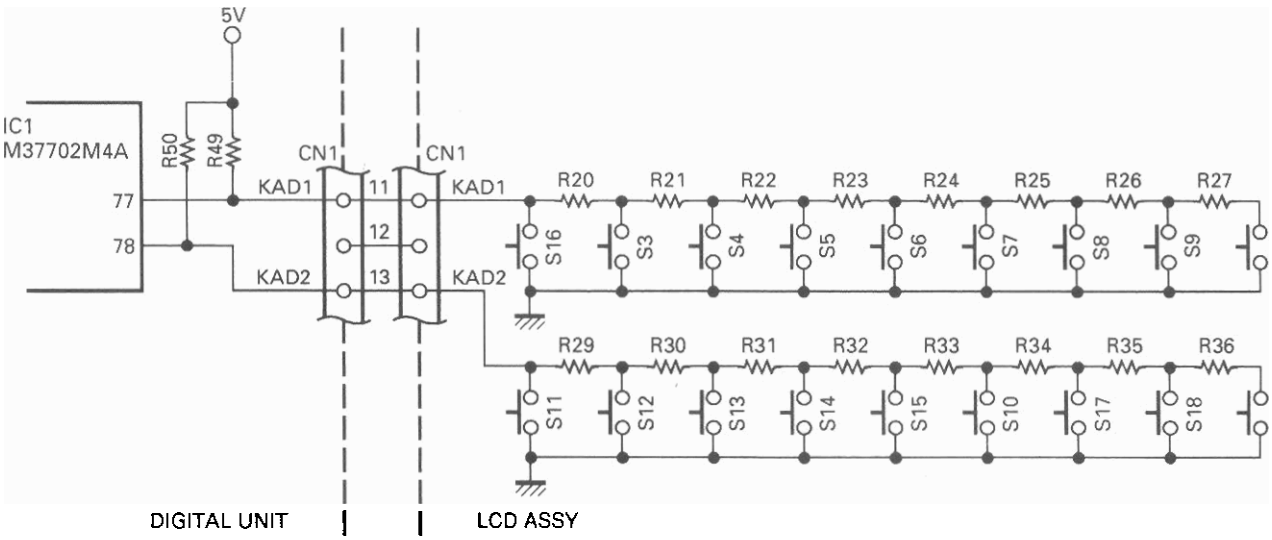


Fig. 16 Switch A/D input circuit

CIRCUIT DESCRIPTION

8. Encoder circuit

The encoder is a mechanical one. The waveforms of the encoder pulses are rectified by IC3 and IC4 (TC4S584F) in the LCD assembly, and the number of pulses is counted by the hardware counter in the microcomputer. The rotational speed of the encoder is detected. When the encoder is turned slowly, the frequency step is made fine; when it is turned quickly, the frequency step is made coarse to ensure smooth tuning and frequency change. The minimum frequency step is 5 Hz (50 Hz in FM mode); the maximum, 200 Hz (2kHz in FM mode). The frequency step is changed continuously according to the speed of rotation. (Fig. 18)

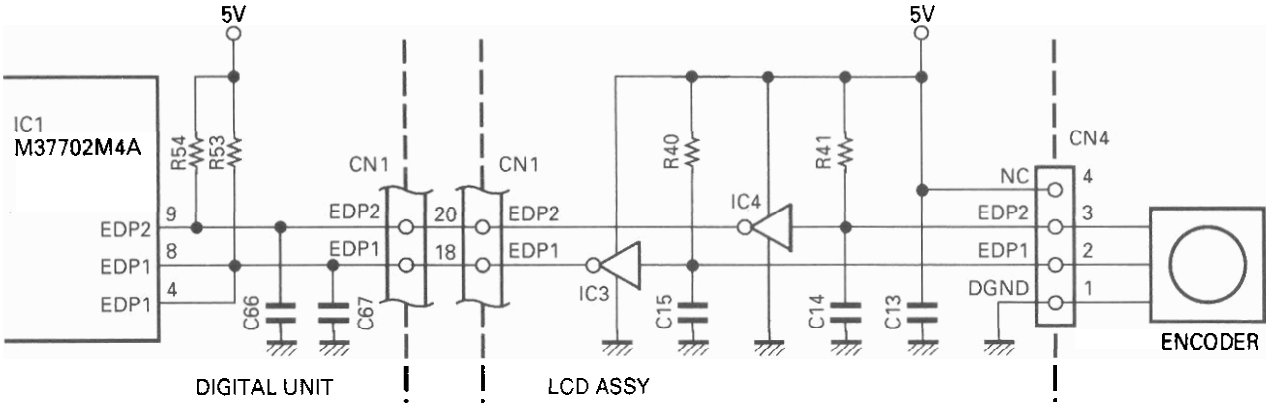


Fig. 18 Encoder circuit

9. Busy signal

The level of the port is monitored in receive mode, and busy indication and busy stop are performed during scanning.

10. Dimmer control

The dimmer is controlled in five steps (including OFF). The lamp is turned on or off by pin 7 of IC2 of the switch unit. The brightness of the dimmer lamp is determined by pins 5 and 6 of IC2. (Fig. 19)

11. Beep

The beep signal is generated using the timer in the microcomputer. The menu enable data (beep on/off, mode beep, warning Morse) is recognized, and the necessary code is output. A dot lasts about 40ms; a dash, about 120ms. The oscillation frequency is about 1.4kHz.

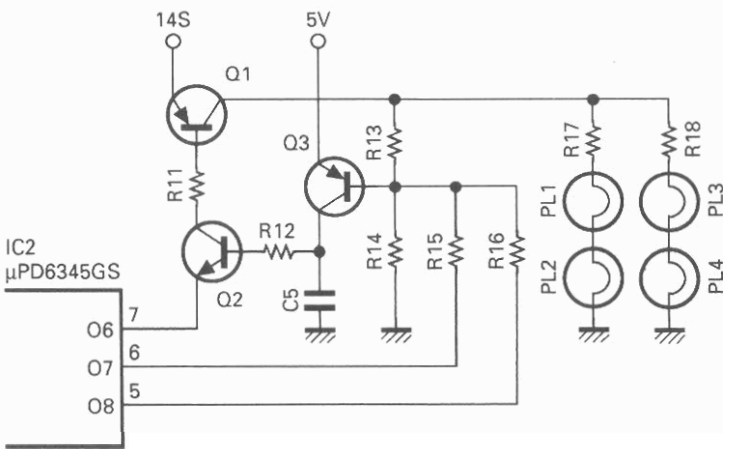


Fig. 19 Dimmer control circuit

CIRCUIT DESCRIPTION

12. Subtone

The subtone frequency is converted from digital to analog by a ladder resistor, and a pseudo-sine wave, including the 1750-Hz tone, is output. (Fig. 20)

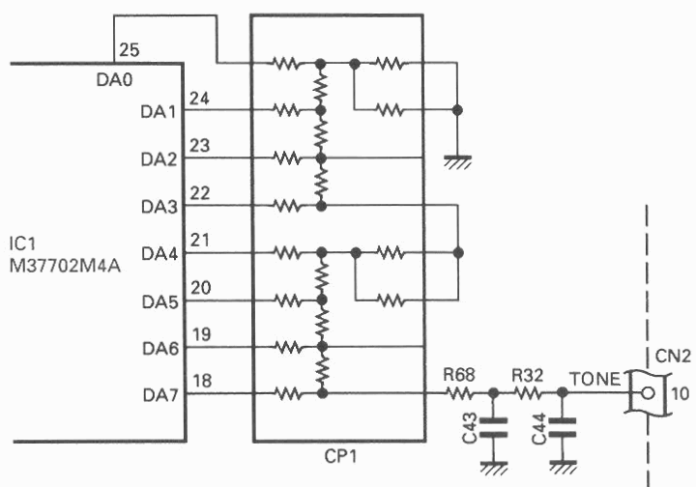


Fig. 20 Subtone circuit

CIRCUIT DESCRIPTION

13. Settings

- **Contents of menu**

If you hold down the F. LOCK key for more than 1.5 seconds, a menu is displayed. You can change the menu number with the encoder, change between menus A and B with the A/B key, and change settings with the UP/DOWN key.

Menu No.	Contents of menu A	State (display)	Initial state
00	Power change	Depending on marketplace	Depending on marketplace
01	Dimmer quantity changeover	OFF/d1/d2/d3/d4	d2
02	AGC SLOW/FAST changeover (SSB, CW, AM)	S/F	Depending on data
03	IF filter switching (SSB, CW, AM)	0.5/2.4/6kHz	Depending on data
04	SSB/CW switch change	SSB/ULC	SSB
05	CW delay time switching	See instruction manual.	600
06	CW pitch change (50-Hz step)	400~1000	800
07	CW reverse on/off	ON/OFF	OFF
08	Encoder lock on/off	ON/OFF	OFF
09	Program scan busy stop on/off	ON/OFF	ON
10	Program scan time-operate/carrier-operate changeover	0/1	0
11	Memory scan busy stop on/off	ON/OFF	ON
12	Memory scan time-operate/carrier-operate changeover	0/1	0
13	All memory scan on/off	ON/OFF	OFF
14	Four times power meter indication at lower power	ON/OFF	OFF
15	Repeater subtone on/off	ON/OFF	ON
16	MIC U/D step frequency change in SSB/CW mode	See instruction manual.	10kHz
17	MIC U/D step frequency change in FM/AM mode	See instruction manual.	10kHz

Menu No.	Contents of menu B	State (display)	Initial state
50	Beep tone on/off	ON/OFF	ON
51	Mode Morse on/off	ON/OFF	ON
52	Warning Morse on/off	ON/OFF	ON
53	Repeater subtone frequency setting	67.0~1750.0	Contents in memory
54	Repeater subtone mode setting	b/c	c
55	Meter peak hold on/off	ON/OFF	ON
56	Memory channel automatic increment on/off	ON/OFF	OFF
57	Standard memory channel frequency temporary change	ON/OFF	OFF
58	Program scan hold function on/off	ON/OFF	OFF
59	Memory protect 1 (write/erase inhibit) on/off	ON/OFF	OFF
60	Memory protect 2 (overwrite/erase inhibit) on/off	ON/OFF	OFF
61	(Not used)		
62	1-MHz/500-kHz changeover when 1-MHz step is on	1000/500kHz	1000
63	RIT frequency variable range 1.1-kHz/2.2-kHz changeover	1.1/2.2kHz	1.1kHz
64	Automatic power-off on/off	ON/OFF	OFF
65	Transmit inhibit function	ON/OFF	OFF
66	Microphone sensitivity change	H/L	L
67	PF1 key setting	00~99	83 (menu A)
68	PF2 key setting	00~99	00 (power change)
69	PF3 key setting	00~99	36 (TF-SET)
70	PF4 key setting	00~99	82 (monitor)
71	LSB transmit/receive carrier point setting	–100~200	0
72	USB transmit/receive carrier point setting	–100~200	0

CIRCUIT DESCRIPTION

- **PF key functions**

Three kinds of function (panel function, menu A/B function, and non-panel function) are assigned to the four PF keys on the microphone. To assign a function to a key, specify the number in the following table using the UP/DOWN key in the order of 67 to 70 (PF1 to PF4) in menu B mode. The PF keys are named PF1, PF2, PF3, and PF4 from the left, as viewed from the front of the microphone.

No.	Menu A function	No.	Panel key function	No.	Menu B function	No.	Special function
00	Menu 00	20	MENU	50	Menu 50	80	AF MUTE
01	Menu 01	21	AIP	51	Menu 51	81	AF ATT
02	Menu 02	22	ATT	52	Menu 52	82	MONITOR
03	Menu 03	23	NB	53	Menu 53	83	Menu A
04	Menu 04	24	F. LOCK	54	Menu 54	84	Menu B
05	Menu 05	25	UP	55	Menu 55	85	1Hz display
06	Menu 06	26	DOWN	56	Menu 56	99	OFF
07	Menu 07	27	MHz	57	Menu 57		
08	Menu 08	28	RIT	58	Menu 58		
09	Menu 09	29	SCAN	59	Menu 59		
10	Menu 10	30	CLR	60	Menu 60		
11	Menu 11	31	M. IN	61	OFF		
12	Menu 12	32	M>V	62	Menu 62		
13	Menu 13	33	M⇄V	63	Menu 63		
14	Menu 14	34	A/B	64	Menu 64		
15	Menu 15	35	SPLIT	65	Menu 65		
16	Menu 16	36	TF-SET	66	Menu 66		
17	Menu 17	37	A=B				
		38	SSB/CW				
		39	FM/AM				

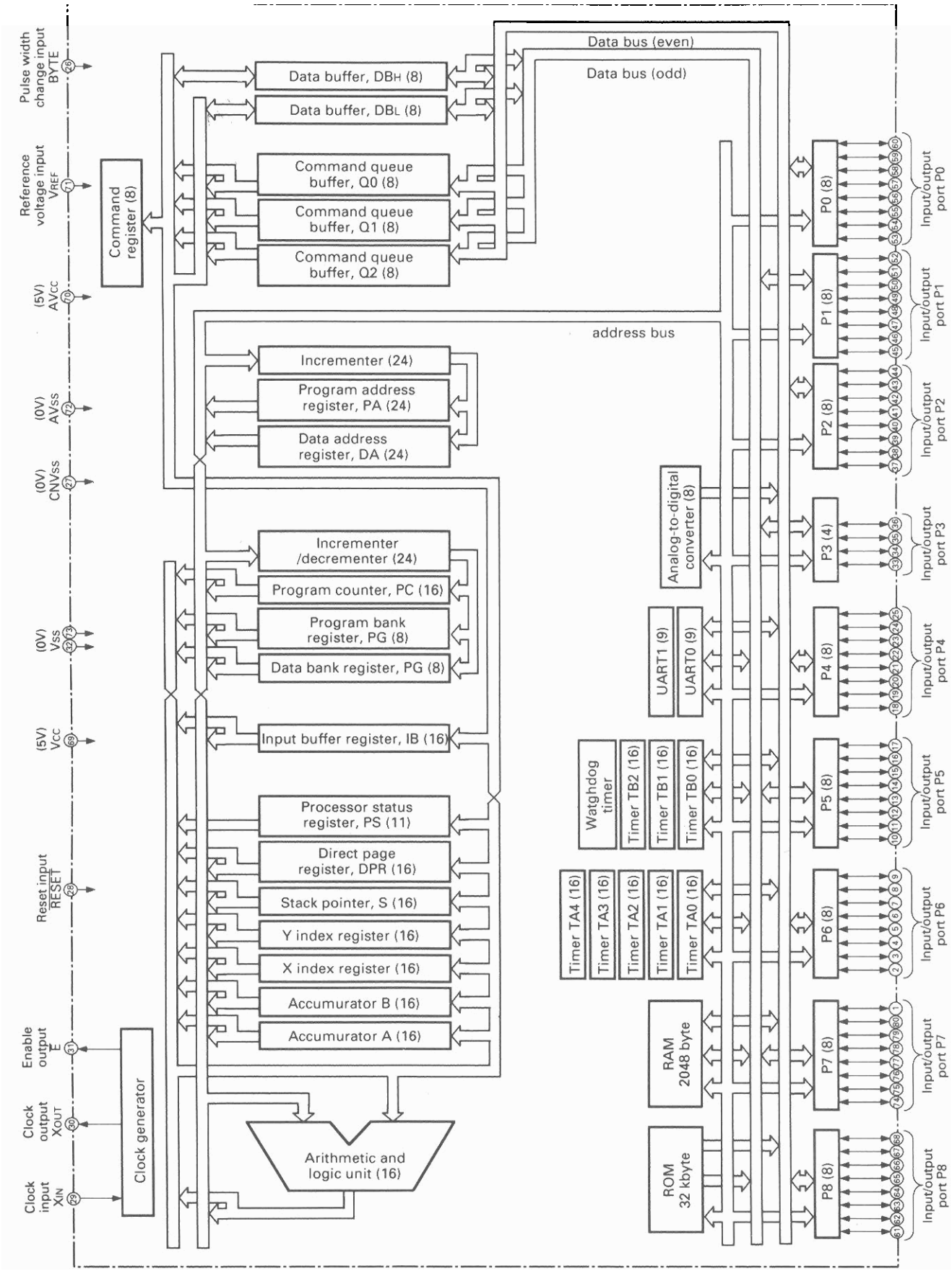
14. VCO switching data

Frequency	VCO data	
	VB2	VB1
40MHz ≤ f < 50MHz	L	H
50MHz ≤ f < 60MHz	H	L

SEMICONDUCTOR DATA

CPU : M37702M4A265FP (Digital Unit IC1)

Block diagram



SEMICONDUCTOR DATA

• Terminal function

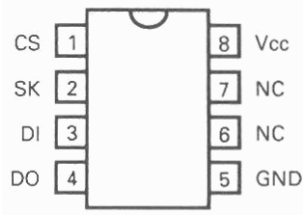
Pin	Pin name	Signal name	I/O	Function	Remarks
1	AN0/	MDN	I	Microphone down switch	
2	P67/	CSS	I	PTT switch	SW ON : "H"
3	P66/	LDA	O	LCD data	Destination D input strobe
4	TB0IN/	EDP1	I	Encoder pulse	
5	INT2/	LCK	O	LCD clock	
6	INT1/	BKC	I	Backup Vcc detection	Normally "H"
7	INT0/	PSW	I	Power switch	SW ON : "H"
8	TA4IN	EDP1	I	Encoder pulse	
9	TA4OUT	EDP2	I	Encoder pulse	
10	P57/	DRL	O	Power relay control	Power ON : "H"
11	P56/	THP	I	Final temperature detection	High temperature : "H"
12	P55/	NFT	O	Not FM TX	FM TX : "L"
13	P54/	PEN2	O	PLL enable	⎍ pulse
14	P53/	PDA	O	PLL/EEPROM/DDS data	
15	P52/	PCK	O	PLL/EEPROM/DDS clock	
16	P51/	NB	O	NB on/off	NB ON : "H"
17	P50/	BEEP	O	Beeper pulse	
18~22	P47~P43	DA7~DA3	O	D/A	
23	P42/	DA2	O	Digital-to-analog converter	/ø
24	P41/	DA1	O	Digital-to-analog converter	/RDY
25	P40/	DA0	O	Digital-to-analog converter	/HOLD
26	BYTE		I	(External bus width specification)	* = don't care
27	CNVss		I	CPU operation mode specification	
28	RESET	RES	I	CPU reset	Normally "H"
29	XIN		I	System clock	
30	XOUT		O	System clock	
31	E		O		
32	Vss				
33	P33/	DEN2	O	DDS2 enable	⎍ pulse
34	P32/	ECS	O	EEPROM chip select	Select : "H"
35	P31/	EDI	I/O	EEPROM data output/Busy input	Busy : "L"
36	P30/	UCK	O	Shift register clock	
37	P27/	UDA	O	Shift register data	
38	P26/	KYS	I	Key jack input	Key insert : "H"
39	P25	KYB	I	Key input	Key down : "H"
40	P24/	TXS	O	TX/RX control	TX : "H"
41	P23/	RXS	O	RX enable	RX : "H"
42	P22/	CKS	O	CKY control signal	TX : "H"
43	P21/	AGC	O	AGC slow/fast changeover	Fast : "L"
44	P20/	HEN	O	Latch enable	⎍ pulse
45~52	P17/~P10	D7~D0	I/O	Pseudo-bus	
53	P07/	BSY	I	Signal busy	Busy : "H"
54	P06/	MGS	O	Microphone sensitivity selection	High-sensitivity : "H"
55	P05/	ULK	I	Unlock signal	Unlock : "L"
56	P04/	PEN1	O	PLL enable	⎍ pulse
57	P03/	DEN1	O	DDS1 enable	⎍ pulse
58~60	P02/~P00/	DCD1~DCD3	O	Decoder output	
61	P87/	TXD	O	ASCI (debug)	
62	P86/	RXD	I	ASCI (debug)	
63	P85/	RTS	O	ASCI (debug)	
64	P84/	CTS	I	ASCI (degub)	
65~68			–	Not used	

SEMICONDUCTOR DATA

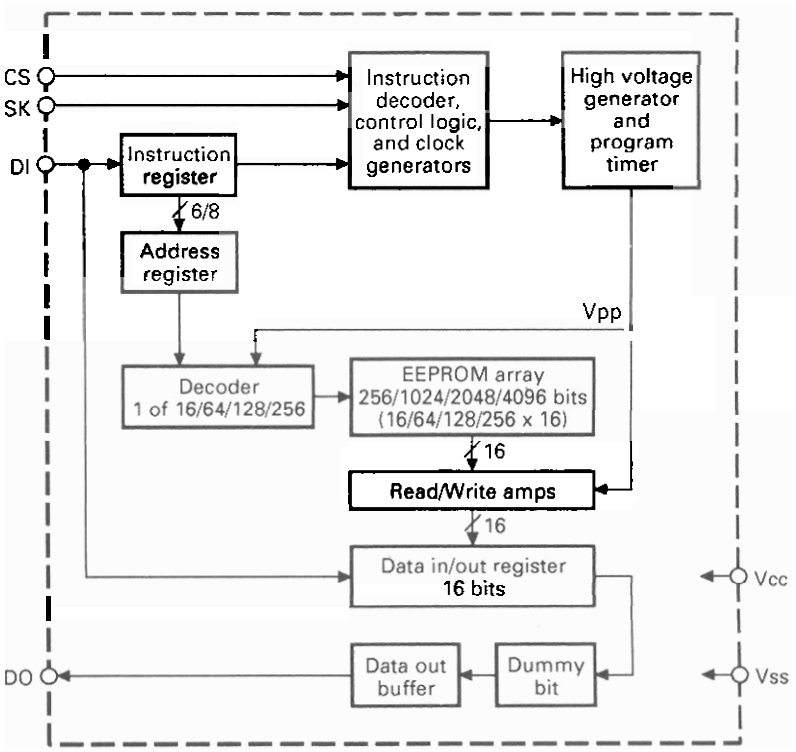
Pin	Pin name	Signal name	I/O	Function	Remarks
69	Vcc		I	Power supply	
70	AVcc		I	Analog-to-digital converter power supply	
71	VREF		I	Analog-to-digital converter reference power supply	
72	AVss		I	Analog-to-digital converter ground	
73	Vss		I	Ground	
74	AN7/	SM	I	Signal strength meter	
75	AN6/	PWM	I	Power meter	
76	AN5/	RVR	I	RIT VR	
77, 78	AN4/, AN3/	KAD1, KAD2	I	Panel key input	
79	AN2/	ISV	I	IF SHIFT VR	
80	AN1/	MUP	I	Microphone up switch	

EEPROM : NM93C66LEM8 or AT93C66-10SI2.7 (Digital Unit IC5)

- **Terminal connection diagram**



- **Block diagram**



- **Terminal names**

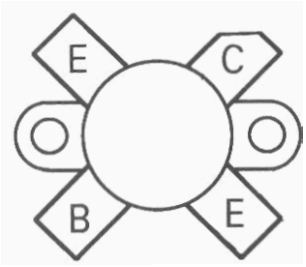
CS	Chip Select
SK	Serial Data Clock
DI	Serial Data Input
DO	Serial Data Output
GND	Ground
Vcc	Power Supply

TS-60S

SEMICONDUCTOR DATA

Final Transistor : SRFJ7001MP * (Final Unit Q5, 6)

- **External View**



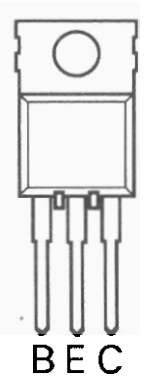
*** : Pair**

- **Maximum rating** (Ta = 25°C)

Item	Symbol	Rating	Unit
Collector-Base voltage	V_{CBO}	36	V
Collector-Emitter voltage	V_{CEO}	18	V
Emitter-Base voltage	V_{EBO}	4	V
Collector current	I_C	20	A
Collector dissipation (Tc=25°C)	P_D	250	W
Derate above 25°C		1.43	W/°C
Storage temperature range	Tstg	–65~+150	°C

Drive Transistor : 2SC1972-26 (Final Unit Q2, 3)

- **External View**



- **Maximum rating** (Ta = 25 ± 3°C)

Symbol	Condition	Rating	Unit
V_{CBO}		35	V
V_{EBO}		4	V
V_{CEO}	$R_{BE} = \infty$	17	V
I_C		3.5	A
P_C	Tc = 25°C	25	W
T_j		175	°C
Tstg		–55~+175	°C

DESCRIPTION OF COMPONENTS

FINAL UNIT (X45-3490-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC1	Comparator	Fan control.
IC101	Regulator	14V → 5V
IC102	Regulator	14V → 8V
Q1	Pre-drive amplifier	VHF band wide band-amplification.
Q2, 3	Drive amplifier	VHF band push-pull wide-band amplification.
Q4	Final bias supply	Final temperature compensation.
Q5, 6	Final amplifier	VHF band push-pull wide-band amplification.
Q7	Relay drive	Energizes or deenergizes the linear amplifier control relay.
Q8~10	Fan motor drive	Runs the fan during transmission or when the temperature rises.
Q11	Switching transistor	On when the fan runs.
Q101	Relay drive	The relay is energized when the power is turned on.
Q102	Switching transistor	On when overvoltage occurs.
D1	Temperature compensation	Pre-drive temperature detection.
D2	Temperature compensation	Drive temperature detection.
D3	Relay surge absorption	Linear amplifier relay.
D4, 5	Temperature compensation	Final temperature detection.
D6	Relay surge absorption	The relay is energized when the power switch is turned on.
D7	Protection diode	Reverse power connection protection.
D8	Switching	OR circuit.
D102	Protection diode	Relay counter-voltage bypass.
D103	Zener diode	Overvoltage detection.

DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC1	CPU	Microcomputer.
IC2	3 to 8 line decoder	Serial-to-parallel conversion.
IC3	Latch	Data retention.
IC4	Reset	
IC5	EEPROM	4k bits (Adjustment data memory).
IC6	Regulator	14V → 5.6V
Q2	Driver	
Q4	Driver	
Q5, 6	Signal switch	Off : Backup
D1~7	Switching	Destination selection.
D9	Switching (reverse-flow prevention)	OR circuit.
D11	Power supply	Voltage shift.
D12	Zener diode	Backup detection (voltage shift).
D13	Switching	Backup detection.
D14	Reverse-flow prevention	

IF UNIT (X48-3110-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1, 2	Switching	On when 0.5kHz filter is selected.
Q3	Switching	On when 2.4kHz filter is selected.
D1, 2	Switching	10.695MHz filter selection.
D3	Switching	On in FM receive mode.
D4~7	Switching	10.695MHz filter selection.

DESCRIPTION OF COMPONENTS

PLL UNIT (X50-3200-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC2	Divider	1/2, 2/5
IC3	Mixer	5 : 113.045~133.045MHz (K), 123.045~127.045MHz (E) input 11 : 75.045~75.545MHz input 13 : 38~57.5MHz output
IC4	Mixer	1 : 4.455~4.955MHz output 2 : 4MHz input
IC5	Mixer	1 : 75.045~75.545MHz output 2 : 80MHz input 5 : 4.455~4.955MHz input
IC7	Mixer	1 : 10.695MHz output 2 : 10MHz input
IC8	Inverter	Reference oscillation (20MHz) phase reversal.
IC10	VCO	62MHz VCO (HIC)
IC11	PLL	2,3,4 : Divide ratio setting input 5 : 10MHz input 7 : Lock voltage output 8 : Unlock output (High during UL) 11 : 38~57.5MHz input
IC201	MIC amplifier	FM MIC amplifier (HIC)
Q1	Signal switch	ULK signal.
Q2	Amplifier	LO1 (113.045~133.045MHz (K), 123.045~127.045MHz (E)) output.
Q3	Buffer	LO1 (113.045~133.045MHz (K), 123.045~127.045MHz (E)) mixer (IC3) input.
Q5	Amplifier	20MHz, divider (IC2) input.
Q9	Amplifier	10MHz, mixer (IC7) input.
Q10	Amplifier	CAR (10.695MHz) output.
Q11	Quadruple circuit	20MHz x 4
Q12	Crystal oscillator	20MHz
Q13, 14	Buffer	20MHz
Q16	Buffer	4.455~4.955MHz mixer (IC5) input.
Q17	Signal switch	FM MIC mute
Q18	Amplifier	LO2 (62.35MHz) output.
Q19	Buffer	38~57.5MHz
Q20	Amplifier	38~57.5MHz PLL (IC11) input.
Q21~23	LPF	Active low-pass filter.
Q200~202	Amplifier	NB amplifier.
Q203	Buffer	NB amplifier.
Q204	Amplifier	NB AGC.
Q205, 206	Signal switch	NB amplifier.
Q207	Signal switch	NB ON/OFF.
Q209	Signal switch	NB amplifier.
Q210	Buffer	Tone signal.
Q211	Switch	On in FM mode.
D1	Switching	ULK OR circuit.
D2	LED	On : Unlock
D3	Clipper	
D200	Detection	Noise detection.

TX-RX UNIT (X57-4570-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC2	HIC	FM frequency conversion, detection, signal strength meter output.
IC3	HIC	SSB, AM, CW detection, signal strength meter output.
IC4	Switching	Analog switch.
IC5	DC amplifier	For signal strength meter (except FM).
IC6	Switching	Analog switch.
IC7	Amplifier	Audio amplifier.
IC8	Balanced modulation	SSB, AM modulation.
IC10	Three-terminal regulator	Constant voltage, output 5V.
IC11	HIC	ALC, final protection.
IC12, 13	Extended I/O	Serial-to-parallel conversion.

DESCRIPTION OF COMPONENTS

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC14	Amplifier	Power meter.
Q1	Switching	Attenuator relay drive.
Q2	Switching	On in transmit mode, off in receive mode.
Q3,4	Switching	On in receive mode, off in transmit mode.
Q5~8	Mixer	IF : 73.045MHz RF : 40~60MHz (K), 50~54MHz (E) LO1 : 113.045~133.045MHz (K), 123.045~127.045MHz (E)
Q9, 10	RF amplifier	
Q11	Amplifier	LO1 amplification.
Q12	Switching	On when AIP is on.
Q13	Power supply	Ripple filter.
Q14	Switching	On when AIP is on.
Q15, 16	Switching	On when AIP is off.
Q17	IF1 amplifier	73.045MHz amplification.
Q18, 19	Mixer	IF1 : 73.045MHz LO2 : 62.35MHz IF2 : 10.695MHz
Q20	Amplifier	Buffer amplifier for NB noise amplifier.
Q21	Amplifier	IF2 amplification.
Q22	Switching	For NB.
Q23	Amplifier	Buffer amplifier for FM XF.
Q24	Amplifier	Amplification in all modes except FM.
Q25	Switching	Squelch time constant switching.
Q26	Switching	On in FM mode.
Q27, 28	Switching	On in receive mode.
Q29, 30	Amplifier	DC amplifier for squelch.
Q31, 32	Switching	For squelch.
Q33	Switching	On in FM mode.
Q34	Amplifier	For audio.
Q35	Switching	Audio mute.
Q36	Switching	Off : High microphone sensitivity.
Q37	Switching	On in CW mode (microphone mute).
Q38	Amplifier	Microphone amplifier.
Q39	Amplifier	Microphone amplifier (For FM).
Q40	Amplifier	Microphone amplifier (For SSB and AM).
Q41	Amplifier	Buffer for input to balanced modulator.
Q42	Amplifier	Amplifier for balanced modulator output.
Q43	Amplifier	10.695MHz amplification.
Q44	Switching	On at medium power.
Q45	Switching	On at low power.
Q46, 47	Mixer	LO2 : 62.35MHz IN : 10.695MHz OUT : 73.045MHz
Q48, 49	Mixer	LO1 : 113.045~133.045MHz (K), 123.045~127.045MHz (E) IN : 73.045MHz OUT : 40~60MHz (K), 50~54MHz (E)
Q50	Amplifier	Transmit drive amplifier.
Q51~53	Switching	DC/DC converter.
Q55	Switching	Medium/Narrow : On.
Q56	Switching	AF mute/wide : On.
Q57	Switching	SSB/CW : On.
Q58	Switching	FM/AM : On.
Q59	Switching	On for CW key down.
Q60	Switching	Off during monitoring.
Q61	Switching	Off during audio muting.
Q62~66	Switching	On in AM mode.
Q67	Switching	On : Squelch open.
Q69	RF amplifier	
Q70	Buffer	RF amplifier.
Q501	Signal switch	Transmit/receive changeover relay drive.

DESCRIPTION OF COMPONENTS

Ref. No.	Use/Function	Operation/Condition/Compatibility
D1	Relay surge absorption	For attenuator relay.
D2~5	Lightning surge absorption	
D8, 9	Switching	The diode is on when AIP is on.
D11	Switching	The diode is on when AIP is off.
D12	Switching	Switch for sending LO1 to the transmit or receive mixer.
D13	Switching	AGC time constant.
D14	Switching	Switch for sending LO1 to the transmit or receive mixer.
D16, 17	Switching	On in transmit mode, off in receive mode.
D18	Clipper	On when input is large.
D19	Reverse-flow prevention	
D20	Zener diode	For constant voltage.
D21, 22	Switching	On in transmit mode.
D23	Switching	On in receive mode.
D24	Reverse-flow prevention	
D25	Zener diode	For constant voltage.
D26	Reverse-flow prevention	
D27, 28	Switching	On in FM and CW modes.
D29	Reverse-flow prevention	
D30	Voltage shift	
D31	LED	Stabilizing power supply using Vp.
D34	Rectification	DC/DC converter.
D35, 36	Zener diode	For constant voltage.
D37~40	Reverse-flow prevention	
D41	Switching	On in receive mode, off in transmit mode.
D42, 43	Reverse-flow prevention	
D44	Switching	On in receive mode, off in transmit mode.
D46	Reverse-flow prevention	
D49	Switching	The diode is on when AIP is off.
D50, 51	Zener diode	For constant voltage.
D501	Spike surge absorption	Surge absorber.
D502	Relay surge absorption	Transmit/receive changeover relay.
D503, 504	RF detection	SWR, PO detection

DDS (X58-4020-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
IC1	DDS	
Q1	Buffer	D/A buffer.

VCO (X58-4120-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1	VCO1-A	113.045~123.044MHz.
Q2	Switching	VCO1-A change.
Q3	VCO1-B	123.045~133.045MHz.
Q4	Switching	VCO1-B change
Q5	Amplifier	
Q6	Buffer	VCO1 output, 113.045~123.044MHz (K), 123.045~133.045MHz (E).
D1	Varicap	VCO1-A.
D2	Switching	VCO1-A output.
D3	Varicap	VCO1-B.
D4	Switching	VCO1-B output.

DESCRIPTION OF COMPONENTS

ALC (X59-3990-00)

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1	Switching	CKY control.
Q2	Waveform rectification	ALC keying.
D1, 2	Reverse-flow prevention	

DSST (X59-4000-00)

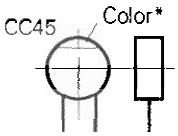
Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1	Switching	TXB.
Q2	Switching	RXB.
Q3, 4	Switching	On in transmit mode.
Q5	Switching	On in receive mode.
Q11	Oscillator	Sidetone.
D11	Temperature compensation	
D12	Switching	
D13	Reverse-flow prevention	

PARTS LIST

CAPACITORS

CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF

2 2 0 = 22pF
Multiplier
2nd number
1st number

• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	−80	−150	−220	−330	−470	−750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = −470 ± 60ppm/°C

• Tolerance

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 −20	+80 −20	+100 −0	More than 10μF −10 ~ +50 Less than 4.7μF −10 ~ +75

Less than 10pF

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	–
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	–
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	–

• Chip capacitors (Refer to the table above except dimension)

(EX) CC 73 F SL 1H 000 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) CK 73 F F 1H 000 Z
1 2 3 4 5 6 7
(Chip) (B, F)

RESISTORS

• Chip resistor (Carbon)

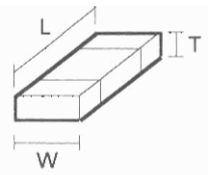
(EX) RD 73 E B 2B 000 J
1 2 3 4 5 6 7
(Chip) (B,F)

• Carbon resistor (Normal type)

(EX) RD 14 B B 2C 000 J
1 2 3 4 5 6 7

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension



Dimension (Chip capacitor)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25

• Dimension (Chip resistor)

Dimension code	L	W	T	Wattage
E	3.2 ± 0.2	1.6 ± 0.2	0.57	2B
F	2.0 ± 0.3	1.25 ± 0.2	0.45	2A

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
2A	1/10W	2E	1/4W	3A	1W
2B	1/8W	2H	1/2W	3D	2W
2C	1/6W				

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TS-60S

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			TS-60S			
1	1A		A01-2070-02	METALLIC CABINET(TOP)		
2	3B		A01-2071-02	METALLIC CABINET(BOTTOM)		
4	2A		A22-0784-03	SUB PANEL		
700	2A	*	A62-0295-03	PANEL ASSY		
6	3A	*	A62-0296-03	PANEL		
-			B10-1187-04	FRONT GLASS		
-			B11-1067-04	FILTER		
8	1A		B42-2455-04	LABEL (M4X8MAX)		
9	3B		B42-3343-04	LABEL (S/NO)		
10	3B		B42-3394-14	LABEL (FCC)	K	
-			B42-5526-04	LABEL	K	
12	-		B46-0310-03	WARRNTY CARD	E	
12	-		B46-0410-30	WARRNTY CARD	K	
14	-	*	B62-0410-00	INSTRUCTION MANUAL :ACSY		
14	-	*	B62-0411-00	INSTRUCTION MANUAL :ACSY	E	
15	3B	*	B72-0608-04	MODEL NAME PLATE	E	
15	3B	*	B72-0611-14	MODEL NAME PLATE	K	
17	1F		E04-0167-05	RF COAXIAL CABLE RECEPTACLE		
18	1F		E23-0616-14	TERMINAL (GND)		
19	-		E30-3157-05	DC CABLE :ACSY		
20	2B,3C		E31-3092-05	INSIDE CONNECTING WIRE(LO1)		
21	1E		E31-6117-05	INSIDE CONNECTING WIRE(RAT)		
22	3D		E31-6118-05	INSIDE CONNECTING WIRE		
23	2B		E33-1967-05	FINISHED WIRE SET(LCD-TXRX)		
24	2B		E37-0348-05	FLAT CABLE (LCD-DIG)		
25	1B		E37-0349-05	FLAT CABLE (DIG-TXRX)		
26	1F,2D		E37-0350-05	FLAT CABLE (FILTER-DIG)		
27	2D		E37-0352-05	CONNECTING WIRE (PLL-TXRX)		
28	2A		E37-0355-05	CONNECTING WIRE (SP)		
29	2B,2D		E37-0356-05	CONNECTING WIRE (PLL-TXRX)		
31	-		F05-2531-05	FUSE (25A) :ACSY		
32	2F		F10-2048-03	SHIELDING PLATE(FILTER UNIT)		
33	3B		F10-2049-03	SHIELDING PLATE(FILTER COVER)		
34	1D,2B		F10-2050-04	SHIELDING PLATE(DIGITAL)		
35	3B		F15-0681-04	SHADE (BOTTOM CASE)		
36	1F	*	F15-0685-04	SHADE (REAR SHIELDING PLATE)		
37	1C,2B		F20-0521-04	INSULATING BOARD (DIGITAL UNIT		
38	1F		F20-1119-04	INSULATING BOARD (FILTER UNIT)		
39	2B		F20-1132-14	INSULATING BOARD (SUB PANEL)		
41	3A		G01-0874-04	COIL SPRING		
42	1B,3B		G02-0576-14	FLAT SPRING (PLL,FILTER)		
43	3A		G02-0733-04	FALT SPRING (TORQUE)		
44	2B		G10-0708-04	AUXILIARY PART(CASE SIDE)		
45	3A		G10-0732-04	AUXILIARY PART(SPRING)		
-			G10-0733-04	AUXILIARY PART(TOP CASE)		
47	2A		G10-0743-04	AUXILIARY PART(SP,SUB)		
48	1A	*	G10-0746-04	AUXILIARY PART(FIBER)		
49	1C		G13-0828-04	CUSHION (VCO)		
50	3A		G13-1380-04	CUSHION (KNOB)		
51	2A		G13-1381-04	CUSHION (KNOB)		
52	2A		G13-1382-04	CUSHION (KNOB)		

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TS-60S
FINAL UNIT (X45-3490-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
53	-		G13-1402-04	CUSHION (BRACKET)		
54	2A	*	G13-1451-04	CUSHION (SP)		
55	1A	*	G13-1437-04	CUSHION (SP)		
56			H10-2761-02	POLYSTYRENE FOAMED FIXTURE		
57	-		H11-0877-04	POLYSTYRENE FOAMED BOARD	K	
57	-		H13-0898-04	CARTON BOARD	E	
58	-		H13-0899-04	CARTON BOARD (BRACKET)		
59	-		H13-0911-04	CARTON BOARD		
60	-		H25-0029-04	BAG (ACSY)		
61	-		H25-0079-04	BAG (MIC)		
62	-		H25-0106-04	BAG (BODY)		
63			H25-0708-04	BAG (DC CABLE)		
64	-	*	H52-0506-04	ITEM CARTON BOX		
65	3B		J02-0441-05	FOOT		
66	2A		J21-4406-04	HARDWARE FIXTURE (SP)		
67	-		J29-0604-03	BRACKET :ACSY		
68	3A		J30-0592-04	SPACER (TORQUE)		
69	2A		J31-0141-04	COLLAR (MIC)		
71	-		K01-0416-05	HANDLE AND SCREW :ACSY		
72	3A		K21-0793-04	KNOB (MAIN)		
73	3A		K29-4809-04	KNOB (AF VOL/RIT)		
74	2A		K29-4810-04	KNOB (SQL/IF SHIFT)		
75	2A		K29-4811-04	KNOB (POWER)		
76	3A		K29-4812-04	KNOB (F.LOCK)		
77	3A		K29-4813-04	KNOB (MHZ)		
78	3A		K29-4814-04	KNOB (DOWN)		
79	3A		K29-4815-04	KNOB (UP)		
80	3A		K29-4816-04	KNOB		
81	3A		K29-4817-04	KNOB		
82	3A		K29-4818-04	KNOB		
84	2B		N15-1040-46	FLAT WASHER (GND)		
A	1B,2B		N32-2606-46	FLAT HEAD MACHIN SCREW		
B	1A,1B		N33-2606-45	OVAL HEAD MACHIN SCREW(CASE)		
C	1B		N35-2604-46	BINDING HEAD MACHINE SCREW(IF)		
D	1C,2B		N35-2606-46	BINDING HEAD MACHINE SCREW(DIG		
E	2B		N35-4010-46	BINDING HEAD MACHINE SCREW(GND		
F	1B,1C		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
G	1F		N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
85	-		N99-0383-05	SCREW SET :ACSY		
-			S50-1406-05	MICRO SWITCH (MIC)		
SP	1A		T07-0298-05	LOUDSPEAKER(FULLRANGE)		
MIC	-		T91-0528-05	MICROPHONE :ACSY		
701	2B	*	B38-0719-15	LCD ASSY		
702	2E,3F	*	X45-3490-00	FINAL UNIT (A/2,B/2)		
703	1D,2B	*	X46-3180-11	DIGITAL UNIT	K	
703	1D,2B	*	X46-3182-71	DIGITAL UNIT	E	
704	1B		X48-3110-00	IF UNIT		
705	2B,2C	*	X50-3200-00	PLL UNIT (A/2,B/2)		
706	1B,2B	*	X57-4570-00	TX-RX UNIT (A/4･･･D/4)		
FINAL UNIT (X45-3490-00)						
C1			CK73FB1H391K	CHIP C 390PF K		

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FINAL UNIT (X45-3490-00)

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C2			CK73FB1E102K	CHIP C	1000PF	K		
C3			CK73FB1E103K	CHIP C	0.01UF	K		
C4			CK73FB1H102K	CHIP C	1000PF	K		
C5			CK73FB1E104K	CHIP C	0.10UF	K		
C6			CC73FSL1H821J	CHIP C	820PF	J		
C7 ,8			CK73FB1H102K	CHIP C	1000PF	K		
C9 ,10			CK73FB1E103K	CHIP C	0.01UF	K		
C11			CK73FB1E102K	CHIP C	1000PF	K		
C12			C90-2193-05	ELECTRO	39UF	25WV		
C13			CC45SL2H680J	CERAMIC	68PF	J		
C14			CK73FB1E103K	CHIP C	0.01UF	K		
C15			CK73FB1E102K	CHIP C	1000PF	K		
C17			CK73FB1E103K	CHIP C	0.01UF	K		
C18			CK73FB1H102K	CHIP C	1000PF	K		
C19			CK73FB1E104K	CHIP C	0.10UF	K		
C20			CE04EW1C100M	ELECTRO	10UF	16WV		
C23			CK73FB1E103K	CHIP C	0.01UF	K		
C24			CK45E2H222P	CERAMIC	2200PF	P		
C27			C90-2194-05	ELECTRO	220UF	25WV		
C28 ,29			CK73FB1E104K	CHIP C	0.10UF	K		
C30			CK73FB1H102K	CHIP C	1000PF	K		
C31			CE04EW1C100M	ELECTRO	10UF	16WV		
C32			CK73FB1E104K	CHIP C	0.10UF	K		
C33			CE04EW1E471M	ELECTRO	470UF	25WV		
C34 ,35			CK73FB1E103K	CHIP C	0.01UF	K		
C36			CK73FB1E104K	CHIP C	0.10UF	K		
C37			CK73FB1E103K	CHIP C	0.01UF	K		
C38			CC45SL2H820J	CERAMIC	82PF	J		
C39			CM93D2H391J	MICA	390PF	J		
C41			CK45B1H103K	CERAMIC	0.010UF	K		
C42 ,43			CK73FB1E103K	CHIP C	0.01UF	K		
C46			CK73FB1H102K	CHIP C	1000PF	K		
C47 ,48			CK73FB1E104K	CHIP C	0.10UF	K		
C49			CK73FB1H103K	CHIP C	0.010UF	K		
C50			CK73FB1H102K	CHIP C	1000PF	K		
C51			CK73FB1H103K	CHIP C	0.010UF	K		
C53 -55			CK73FB1H103K	CHIP C	0.010UF	K		
C57			CK73FB1H103K	CHIP C	0.010UF	K		
C58 ,59			CK45F1H223Z	CERAMIC	0.022UF	Z		
C60			CM73F2H391J	CHIP C	390PF	J		
C101			CK73FB1E104K	CHIP C	0.10UF	K		
C102-105			CK73FB1E103K	CHIP C	0.01UF	K		
C106-111			CK73FB1E104K	CHIP C	0.10UF	K		
C112,113			CK73FB1H102K	CHIP C	1000PF	K		
C115,116			CK73FB1H102K	CHIP C	1000PF	K		
C118-121			CE04NW1E100M	ELECTRO	10UF	25WV		
C122			CE04EW1E102M	ELECTRO	1000UF	25WV		
C123			CK73FB1E103K	CHIP C	0.01UF	K		
C124			CE04EW1E102M	ELECTRO	1000UF	25WV		
C125			CK73FB1H103K	CHIP C	0.010UF	K		
CN2			E04-0191-05	RF COAXIAL CABLE RECEPTACLE				
CN3 ,4			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)				
CN101			E40-5604-05	PIN CONNECTOR FOR INSIDE(11P)				
CN102			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)				
CN103,104			E40-3250-05	PIN CONNECTOR FOR INSIDE(6P)				

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FINAL UNIT (X45-3490-00)

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CN105			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)		
J1			E63-0401-05	PHONO JACK		
J2			E13-0166-05	PHONO JACK		
J101			E11-0451-05	PHONE JACK		
J102			E11-0450-05	PHONE JACK		
TP1 -3			E23-0512-05	TERMINAL		
W1			E37-0360-05	CONNECTING WIRE		
W2			E37-0361-05	CONNECTING WIRE		
W3			E37-0362-05	CONNECTING WIRE(DC CABLE)		
W4			E37-0363-05	CONNECTING WIRE(EALC)		
W5			E37-0364-05	CONNECTING WIRE(PHONE,KEY)		
W6			E37-0358-05	FLAT CABLE (TO FILTER)		
W7			E37-0359-05	CONNECTING WIRE(DRIVE)		
W8			E31-3301-05	INSIDE CONNECTING WIRE(PO)		
110	3E		F01-0994-02	HEAT SINK		
111	3E		F10-2052-04	SHIELDING PLATE		
112	2E		F20-1120-04	INSULATING BOARD		
113	1E		F29-0014-05	INSULATOR		
F101			F53-0093-05	FUSE		
M1	3E		F09-0438-05	FAN MOTOR		
115	2F		G02-0574-04	FLAT SPRING (IC101,102)		
117	3E		J99-0330-04	SHIELDING BOARD		
L1			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L2			L40-1292-48	SMALL FIXED INDUCTOR(3.3UH)		
L3		*	L39-1250-05	COIL		
L4		*	L39-1251-05	COIL		
L5			L33-0699-05	CHOKE COIL		
L6			L33-0617-05	CHOKE COIL		
L7			L33-0699-05	CHOKE COIL		
L8			L33-0617-05	CHOKE COIL		
L11			L33-0651-05	CHOKE COIL		
L12			L33-0617-05	CHOKE COIL		
L13		*	L39-1248-15	COIL		
L15			L40-3392-48	SMALL FIXED INDUCTOR(3.3UH)		
L17 ,18			L40-4791-14	SMALL FIXED INDUCTOR		
L101			L15-0016-05	LOW-FREQENCY CHOKE COIL		
L102			L40-1001-48	SMALL FIXED INDUCTOR		
M	1E,2E		N09-2187-05	SCREW (TRANSISTOR)		
N	3E		N35-3020-46	BINDING HEAD MACHINE SCREW		
P	2E,2F		N87-3006-46	BRAZIER HEAD TAPTITE SCREW		
R2			RK73FB2A270J	CHIP R 27 J 1/10W		
R4			R92-0670-05	CHIP R 0 OHM		
R5			RK73FB2A681J	CHIP R 680 J 1/10W		
R6			RK73FB2A331J	CHIP R 330 J 1/10W		
R7			RK73FB2A471J	CHIP R 470 J 1/10W		
R8 ,9			RK73FB2A4R7J	CHIP R 4.7 J 1/10W		
R10			R92-1242-05	FIXED RESISTOR 6.8 1/2W		
R11			R92-1243-05	FIXED RESISTOR 8.2		
R12 ,13			R92-1209-05	CHIP R 15 J 1/4W		
R14 ,15			R92-1292-05	FIXED RESISTOR 68 1W		
R16		*	R92-1378-05	FIXED RESISTOR 56 1/4W		
R21 ,22			RS14DB3A150J	FL-PROOF RS 15 J 1W		

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FINAL UNIT (X45-3490-00)
DIGITAL UNIT (X46-318X-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R25			RK73FB2A221J	CHIP R 220 J 1/10W		
R26			R92-1317-05	FIXED RESISTOR 18 1W		
R30			RK73FB2A333J	CHIP R 33K J 1/10W		
R31			RK73FB2A103J	CHIP R 10K J 1/10W		
R32			RK73FB2A474J	CHIP R 470K J 1/10W		
R33 ,34			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R35			RK73FB2A681J	CHIP R 680 J 1/10W		
R36			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R37			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R38			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R39			RK73FB2A101J	CHIP R 100 J 1/10W		
R40			RK73FB2A104J	CHIP R 100K J 1/10W		
R41			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R42			RK73FB2A103J	CHIP R 10K J 1/10W		
R43			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R44			RK73FB2A103J	CHIP R 10K J 1/10W		
R45			RK73FB2A333J	CHIP R 33K J 1/10W		
R47			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R48			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R50			R92-1316-05	FIXED RESISTOR 39 1W		
R51			R92-1292-05	FIXED RESISTOR 68 1W		
R52			R92-1240-05	FIXED RESISTOR 10 1/4W		
R53 ,54			RC05GF2H101J	FL-PROOF RS 100 J 1/2W		
R101			RK73FB2A472J	CHIP R 4.7K J 1/10W		
VR1			R12-0104-05	TRIM POT. 220		
VR2			R12-1085-05	TRIM POT. 2.2K		
K1			S51-1420-05	RELAY		
K101			S51-2423-05	RELAY		
IC101			UPC7805H	IC(VOLTAGE REGULATOR/ +5V)		
IC102			UPC7808H	IC(VOLTAGE REGULATOR/ +8V)		
D1			MA27T-B	DIODE		
D2			MA27-B	DIORD		
D3			LFB01	DIORD		
D4 ,5			MA27-B	DIORD		
D6			LFB01	DIORD		
D7			SG-5L(R)	DIORD		
D8			DAN202K	DIORD		
D102			LFB01	DIORD		
D103			RD18M(B1)	DIORD		
IC1			NJM2902M	IC(OP AMP X4)		
Q1			2SC1971	TRANSISTOR		
Q2 ,3		*	2SC1972-26	TRANSISTOR		
Q4			2SC3421(Y)	TRANSISTOR		
Q5 ,6		*	SRFJ7001MP	POWER MODULE(PAIR)		
Q7			FMC1	TRANSISTOR		
Q8 -10			DTD114EK	DIGITAL TRANSISTOR		
Q11			DTC124TK	DIGITAL TRANSISTOR		
Q101			DTC143TK	DIGITAL TRANSISTOR		
Q102			DTC114EK	DIGITAL TRANSISTOR		
TH1			5TP41L	THERMISTOR		
DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E						
C1 -4			CK73FB1H102K	CHIP C 1000PF K		
C5			CK73FB1E103K	CHIP C 0.01UF K		

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DIGITAL UNIT (X46-318X-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C6 -8			CK73FB1H102K	CHIP C 1000PF K		
C9			CK73FB1E103K	CHIP C 0.01UF K		
C10 -24			CK73FB1H102K	CHIP C 1000PF K		
C25 ,26			CC73FCH1H101J	CHIP C 100PF J		
C27 -29			CK73FB1E103K	CHIP C 0.01UF K		
C30			CC73FCH1H101J	CHIP C 100PF J		
C31			CK73FB1H102K	CHIP C 1000PF K		
C32 ,33			CC73FCH1H330J	CHIP C 33PF J		
C34			CK73FF1C105Z	CHIP C 1.0UF Z		
C35			CK73FF1E104Z	CHIP C 0.1UF Z		
C36			CK73FB1H102K	CHIP C 1000PF K		
C37 -45			CC73FCH1H101J	CHIP C 100PF J		
C46			C92-0009-05	CHIP TAN 4.7UF 10WV		
C47 -54			CK73FB1H102K	CHIP C 1000PF K		
C55			CK73EF1H104Z	CHIP C 0.1UF Z		
C56 ,57			CK73FB1H102K	CHIP C 1000PF K		
C58			C92-0009-05	CHIP TAN 4.7UF 10WV		
C59			CK73FF1C105Z	CHIP C 1.0UF Z		
C60			CK73FB1E103K	CHIP C 0.01UF K		
C61 ,62			CC73FCH1H101J	CHIP C 100PF J		
C63			CK73EF1H104Z	CHIP C 0.1UF Z		
C64			CK73FB1H102K	CHIP C 1000PF K		
C65			C92-0009-05	CHIP TAN 4.7UF 10WV		
C66 -73			CK73FB1H102K	CHIP C 1000PF K		
C74			CK73EF1H104Z	CHIP C 0.1UF Z		
C75			C92-0009-05	CHIP TAN 4.7UF 10WV		
C76 -77			CK73FB1H102K	CHIP C 1000PF K		
C78 ,79			CK73FB1H102K	CHIP C 1000PF K		
C80 -84			CK73FB1E103K	CHIP C 0.01UF K		
CN1			E40-5314-05	PIN CONNECTOR FOR INSIDE(25P)		
CN2			E40-5610-05	PIN CONNECTOR FOR INSIDE(11P)		
CN3			E40-5314-05	PIN CONNECTOR FOR INSIDE(25P)		
CN4			E40-5301-05	PIN CONNECTOR FOR INSIDE(12P)		
CN5			E40-5610-05	PIN CONNECTOR FOR INSIDE(11P)		
CN6			E40-5183-05	PIN CONNECTOR FOR INSIDE(6P)		
L1			L40-1801-18	SMALL FIXED INDUCTOR(18UH)		
X1			L77-1522-05	CRYSTAL RESONATOR(7.9MHZ)		
CP1			R90-0711-05	MULTI-COMP		
R1			RK73FB2A223J	CHIP R 22K J 1/10W		
R2			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R3 -5			RK73FB2A471J	CHIP R 470 J 1/10W		
R6			RK73FB2A223J	CHIP R 22K J 1/10W		
R7 -11			RK73FB2A471J	CHIP R 470 J 1/10W		
R12 -19			RK73FB2A103J	CHIP R 10K J 1/10W		
R20 -25			RK73FB2A221J	CHIP R 220 J 1/10W		
R26			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R27 -31			RK73FB2A221J	CHIP R 220 J 1/10W		
R32			RK73FB2A471J	CHIP R 470 J 1/10W		
R33 ,34			RK73FB2A221J	CHIP R 220 J 1/10W		
R35			RK73FB2A471J	CHIP R 470 J 1/10W		
R36			RK73FB2A223J	CHIP R 22K J 1/10W		
R37 -39			RK73FB2A471J	CHIP R 470 J 1/10W		
R40 ,41			RK73FB2A101J	CHIP R 100 J 1/10W		

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DIGITAL UNIT (X46-318X-XX)
IF UNIT (X48-3110-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R42 ,43			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R44			RK73FB2A104J	CHIP R 100K J 1/10W		
R45			RK73FB2A154J	CHIP R 150K J 1/10W		
R46 ,47			RK73FB2A104J	CHIP R 100K J 1/10W		
R48			RK73FB2A471J	CHIP R 470 J 1/10W		
R49 ,50			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R51 ,52			RK73FB2A473J	CHIP R 47K J 1/10W		
R53 -56			RK73FB2A103J	CHIP R 10K J 1/10W		
R57 ,58			RK73FB2A221J	CHIP R 220 J 1/10W		
R60 -68			RK73FB2A471J	CHIP R 470 J 1/10W		
R69 ,70			RK73FB2A103J	CHIP R 10K J 1/10W		
R71			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R73 ,74			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R75			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R81 -99			RK73FB2A103J	CHIP R 10K J 1/10W		
R100,101			R92-0670-05	CHIP R 0 ΩHM		
D3 -5			1SS133	DIΩRD	E	
D5			1SS133	DIΩRD	K	
D9			1SS301	DIΩRD		
D11			1SS301	DIΩRD		
D12			RD8.2M(B2)	DIΩRD		
D13 ,14			1SS355	DIΩRD (or MA110)		
IC1		*	M37702M4A265FP	IC(MPU)		
IC2			TC74HC238AF	IC		
IC3			TC74HC573AF	IC(8 bit LATCH)		
IC4			M62003FP	IC		
IC5			NM93C66LEM8	IC (or AT93C66-10SI2.7)		
IC6			NJM78L05UA	IC(VΩLTAGE REGULATΩR/ +5V)		
Q2			DTC143EK	DIGITAL TRANSISTΩR		
Q4			DTC143EK	DIGITAL TRANSISTΩR		
Q5			DTA143TK	DIGITAL TRANSISTΩR		
Q6			2SC2712(Y)			
IF UNIT (X48-3110-00)						
C1 -13			CK73FB1E103K	CHIP C 0.01UF K		
C14			CC73FCH1H120J	CHIP C 12PF J		
C15 ,16			CK73FB1E103K	CHIP C 0.01UF K		
C17			CC73FCH1H010C	CHIP C 1PF C		
C18			CC73FCH1H200J	CHIP C 20PF J		
C19			CC73FCH1H010C	CHIP C 1PF C		
C20 ,21			CC73FCH1H020C	CHIP C 2.0PF C		
CN1			E40-4465-05	PIN CΩNNECTΩR FΩR INSIDE(5P)		
CN2			E40-4464-05	PIN CΩNNECTΩR FΩR INSIDE(4P)		
CN3			E40-4465-05	PIN CΩNNECTΩR FΩR INSIDE(5P)		
CN4			E40-4463-05	PIN CΩNNECTΩR FΩR INSIDE(3P)		
XF2			L71-0433-05	CRYSTAL FILTER(10.695MHZ)		
XF3			L71-0249-05	CRYSTAL FILTER(10.695MHZ)		
R1			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R2			RK73FB2A101J	CHIP R 100 J 1/10W		
R3			RK73FB2A561J	CHIP R 560 J 1/10W		
R4			RK73FB2A473J	CHIP R 47K J 1/10W		
R5			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R6			RK73FB2A101J	CHIP R 100 J 1/10W		

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IF UNIT (X48-3110-00)
PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R7 -9			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R10			RK73FB2A391J	CHIP R 390 J 1/10W		
R11			RK73FB2A473J	CHIP R 47K J 1/10W		
R12			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R13			RK73FB2A101J	CHIP R 100 J 1/10W		
R14			RK73FB2A473J	CHIP R 47K J 1/10W		
R15			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R16 ,17			RK73FB2A101J	CHIP R 100 J 1/10W		
R18			RK73FB2A473J	CHIP R 47K J 1/10W		
R19			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R20			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R21			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A221J	CHIP R 220 J 1/10W		
D1 ,2			DAN235K	DIØRD		
D3			RLS135	DIØRD		
D4			DAN202K	DIØRD		
D5			DAN235K	DIØRD		
D6			1SS226	DIØRD		
D7			RLS135	DIØRD		
Q1 -3			DTC143TK	DIGITAL TRANSISTØR		
BA1	1C,2B		W09-0515-05	LITHIUM BATTERY(3V 270MAH)		
PLL UNIT (X50-3200-00)						
C2 ,3			CK73FB1E103K	CHIP C 0.01UF K		
C8 ,9			CC73FCH1H221J	CHIP C 220PF J		
C10 ,11			CC73FCH1H470J	CHIP C 47PF J		
C12 ,13			CC73FCH1H221J	CHIP C 220PF J		
C14 -16			CC73FCH1H470J	CHIP C 47PF J		
C17			CE04EW1A221M	ELECTRØ 220UF 10WV		
C18			CK73FB1E103K	CHIP C 0.01UF K		
C19 ,20			CK73FB1H102K	CHIP C 1000PF K		
C21			CK73FB1E103K	CHIP C 0.01UF K		
C22			CC73FCH1H030C	CHIP C 3PF C		
C25			CC73FCH1H010C	CHIP C 1PF C		
C26			CC73FCH1H0R5C	CHIP C 0.5PF C		
C27			CC73FCH1H070D	CHIP C 7PF D		
C28			CC73FCH1H020C	CHIP C 2.0PF C		
C30			CK73FB1E103K	CHIP C 0.01UF K		
C31 ,32			CK73FB1H102K	CHIP C 1000PF K		
C33 -37			CK73FB1E103K	CHIP C 0.01UF K		
C46 ,47			CK73FB1E103K	CHIP C 0.01UF K		
C48			C92-0037-05	ELECTRØ 10UF 16WV		
C55 -61			CK73FB1E103K	CHIP C 0.01UF K		
C62			CC73FCH1H560J	CHIP C 56PF J		
C63			CC73FSL1H391J	CHIP C 390PF J		
C64			CC73FCH1H390J	CHIP C 39PF J		
C65			CC73FCH1H680J	CHIP C 68PF J		
C66			CC73FCH1H390J	CHIP C 39PF J		
C67			CC73FCH1H101J	CHIP C 100PF J		
C68			CC73FCH1H680J	CHIP C 68PF J		
C69			CC73FCH1H390J	CHIP C 39PF J		
C70			CC73FCH1H070D	CHIP C 7PF D		
C71			CC73FCH1H680J	CHIP C 68PF J		

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PLL UNIT (X50-3200-00)

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C72			CC73FCH1H220J	CHIP C 22PF J		
C73			CC73FCH1H330J	CHIP C 33PF J		
C74			CC73FSL1H121J	CHIP C 120PF J		
C75			CC73FSL1H181J	CHIP C 180PF J		
C76			CC73FSL1H121J	CHIP C 120PF J		
C77 -79			CK73FB1E103K	CHIP C 0.01UF K		
C80			C92-0040-05	ELECTRO 47UF 16WV		
C81 -84			CK73FB1E103K	CHIP C 0.01UF K		
C85			CC73FSL1H181J	CHIP C 180PF J		
C86 -89			CK73FB1E103K	CHIP C 0.01UF K		
C90 ,91			CC73FCH1H0R5C	CHIP C 0.5PF C		
C93			CC73FCH1H180J	CHIP C 18PF J		
C94			CK73FB1H102K	CHIP C 1000PF K		
C104			CK73FB1E103K	CHIP C 0.01UF K		
C109			CC73FCH1H101J	CHIP C 100PF J		
C110-113			CK73FB1E103K	CHIP C 0.01UF K		
C114			CK73FB1H102K	CHIP C 1000PF K		
C115-117			CK73FB1E103K	CHIP C 0.01UF K		
C118			CC73FCH1H220J	CHIP C 22PF J		
C119			C92-0040-05	ELECTRO 47UF 16WV		
C120			CK73FB1E223K	CHIP C 0.022UF K		
C121			CC73FCH1H101J	CHIP C 100PF J		
C122			CC73FSL1H221J	CHIP C 220PF J		
C123			CK73FB1E103K	CHIP C 0.01UF K		
C124			CC73FCH1H0R5C	CHIP C 0.5PF C		
C125,126			CC73FCH1H150J	CHIP C 15PF J		
C127			CC73FCH1H390J	CHIP C 39PF J		
C129			CC73FCH1H390J	CHIP C 39PF J		
C130			CC73FSL1H151J	CHIP C 150PF J		
C131			CK73FB1E103K	CHIP C 0.01UF K		
C132			CC73FCH1H050C	CHIP C 5PF C		
C134			CK73FB1E103K	CHIP C 0.01UF K		
C135			CC73FCH1H100D	CHIP C 10PF D		
C136			CK73FB1E103K	CHIP C 0.01UF K		
C138			CK73EB1E104K	CHIP C 0.10UF K		
C139,140			CK73FB1E103K	CHIP C 0.01UF K		
C141			CK73FB1H102K	CHIP C 1000PF K		
C142			CC73FCH1H271J	CHIP C 270PF J		
C143			CK73FB1E104K	CHIP C 0.10UF K		
C146,147			CC73FCH1H330J	CHIP C 33PF J		
C148			C92-0037-05	ELECTRO 10UF 16WV		
C149			CK73FB1E103K	CHIP C 0.01UF K		
C150			CK73FB1E103K	CHIP C 0.01UF K		
C151			CE04EW1C101M	ELECTRO 100UF 16WV		
C152			CK73FB1H102K	CHIP C 1000PF K		
C153			CK73FB1E103K	CHIP C 0.01UF K		
C154,155			CK73FB1H102K	CHIP C 1000PF K		
C156			CC73FCH1H070D	CHIP C 7PF D		
C157			CC73FCH1H330J	CHIP C 33PF J		
C158			CC73FCH1H680J	CHIP C 68PF J		
C159			CK73FB1E103K	CHIP C 0.01UF K		
C160			CK73FB1H102K	CHIP C 1000PF K		
C163			CK73FB1H472K	CHIP C 4700PF K		
C164			CK73FB1H102K	CHIP C 1000PF K		
C165			CK73FB1E103K	CHIP C 0.01UF K		

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PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C166			CC73FCH1H180J	CHIP C 18PF J		
C167			CC73FCH1H470J	CHIP C 47PF J		
C168			CC73FCH1H060D	CHIP C 6PF D		
C169			CC73FCH1H100D	CHIP C 10PF D		
C170			CC73FCH1H080D	CHIP C 8PF D		
C171			CC73FCH1H270J	CHIP C 27PF J		
C172			CC73FCH1H030C	CHIP C 3PF C		
C173			CK73FB1E103K	CHIP C 0.01UF K		
C174			CC73FCH1H330J	CHIP C 33PF J		
C175			CK73FB1E103K	CHIP C 0.01UF K		
C176			CK73FB1H102K	CHIP C 1000PF K		
C177			CC73FCH1H101J	CHIP C 100PF J		
C178			CK73FB1E103K	CHIP C 0.01UF K		
C179,180			CK73FB1H102K	CHIP C 1000PF K		
C181			CE04EW1A221M	ELECTRO 220UF 10WV		
C182,183			CK73FB1E103K	CHIP C 0.01UF K		
C184,185			C92-0004-05	ELECTRO 1.0UF 16WV		
C186			C92-0040-05	ELECTRO 47UF 16WV		
C187			CK73FB1E103K	CHIP C 0.01UF K		
C188			CC73FCH1H101J	CHIP C 100PF J		
C189			CK73FB1E103K	CHIP C 0.01UF K		
C190			CC73FCH1H220J	CHIP C 22PF J		
C191			CK73FB1H103K	CHIP C 0.010UF K		
C200			CK73FB1E103K	CHIP C 0.01UF K		
C201			CC73FCH1H050C	CHIP C 5PF C		
C202			CK73FB1E103K	CHIP C 0.01UF K		
C203			CC73FCH1H470J	CHIP C 47PF J		
C204			CK73FB1E103K	CHIP C 0.01UF K		
C205			C92-0003-05	CHIP TAN 0.47UF 25WV		
C206-208			CK73FB1E103K	CHIP C 0.01UF K		
C209			CC73FCH1H470J	CHIP C 47PF J		
C210			CC73FCH1H100D	CHIP C 10PF D		
C211			CK73FB1E103K	CHIP C 0.01UF K		
C212			C92-0004-05	ELECTRO 1.0UF 16WV		
C213			CK73FB1E103K	CHIP C 0.01UF K		
C214			CK73FB1H102K	CHIP C 1000PF K		
C215			C92-0003-05	CHIP TAN 0.47UF 25WV		
C216,217			CK73FB1E103K	CHIP C 0.01UF K		
C226			CK73EF1C105Z	CHIP C 1.0UF Z		
C227			CK73FB1H472K	CHIP C 4700PF K		
C229,230			CK73FB1E103K	CHIP C 0.01UF K		
C231			C92-0009-05	CHIP TAN 4.7UF 10WV		
C232			CK73FF1C105Z	CHIP C 1.0UF Z		
C233			CK73FB1E103K	CHIP C 0.01UF K		
C234			CK73FB1H222K	CHIP C 2200PF K		
C235			CK73FF1C105Z	CHIP C 1.0UF Z		
C236			CK73FB1E103K	CHIP C 0.01UF K		
C237			C92-0009-05	CHIP TAN 4.7UF 10WV		
C238			CK73FB1E103K	CHIP C 0.01UF K		
C239			CE04EW1C101M	ELECTRO 100UF 16WV		
C240			CC73FCH1H030C	CHIP C 3PF C		
TC1			C05-0344-05	TRIMMER CAPACITOR 30PF		
CN1			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN2 -4			E04-0191-05	RF COAXIAL CABLE RECEPTACLE		

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PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
CN6 ,7			E40-5609-05	PIN CONNECTOR FOR INSIDE(11P)		
CN301			E40-5415-05	PIN CONNECTOR FOR INSIDE(11P)		
TP6			E23-0512-05	TERMINAL		
-			F10-2062-04	SHIELDING PLATE		
-			F20-1142-04	INSULATING BOARD		
CF1			L72-0391-05	CERAMIC FILTER (10.7MHZ)		
L1			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L2			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L4			L40-3982-48	SMALL FIXED INDUCTOR(0.39UH)		
L5			L40-1882-48	SMALL FIXED INDUCTOR(56NH)		
L9			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L12 ,13			L40-2701-48	SMALL FIXED INDUCTOR(27UH)		
L14			L40-1801-48	SMALL FIXED INDUCTOR(18UH)		
L15 ,16			L40-2701-48	SMALL FIXED INDUCTOR(27UH)		
L17			L40-2201-48	SMALL FIXED INDUCTOR(22UH)		
L18			L40-1801-48	SMALL FIXED INDUCTOR(18UH)		
L19			L40-4792-48	SMALL FIXED INDUCTOR(4.7UH)		
L20			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L21			L34-4222-05	COIL		
L22		*	L34-4368-05	COIL		
L23			L34-4222-05	COIL		
L27			L34-4334-05	COIL		
L28 ,29			L34-4222-05	COIL		
L32			L40-1501-48	SMALL FIXED INDUCTOR(15UH)		
L33			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L34			L40-4792-48	SMALL FIXED INDUCTOR(4.7UH)		
L36			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L37			L40-2282-48	SMALL FIXED INDUCTOR(0.22UH)		
L38 ,39			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L40 ,41			L40-3991-48	SMALL FIXED INDUCTOR(3.9UH)		
L42			L40-1892-48	SMALL FIXED INDUCTOR(1.8UH)		
L43			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L44			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L45			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L46			L40-3982-48	SMALL FIXED INDUCTOR(0.39UH)		
L200			L40-1092-48	SMALL FIXED INDUCTOR((1UH)		
L201			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L202,203			L34-0590-05	COIL		
L204			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L205			L33-0695-05	CHOKE COIL (1MH)		
X1			L77-1521-05	CRYSTAL RESONATOR (20MHZ)		
R1			RK73FB2A331J	CHIP R 330 J 1/10W		
R2 -10			RK73FB2A101J	CHIP R 100 J 1/10W		
R11			RK73FB2A181J	CHIP R 180 J 1/10W		
R12			RK73FB2A330J	CHIP R 33 J 1/10W		
R13			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R14			RK73FB2A103J	CHIP R 10K J 1/10W		
R15			R92-0670-05	CHIP R 0 OHM		
R16			RK73FB2A101J	CHIP R 100 J 1/10W		
R17			RK73FB2A221J	CHIP R 220 J 1/10W		
R18			RK73FB2A471J	CHIP R 470 J 1/10W		
R19			RK73FB2A100J	CHIP R 10 J 1/10W		
R20			RK73FB2A471J	CHIP R 470 J 1/10W		

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PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R21			RK73FB2A330J	CHIP R 33 J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A223J	CHIP R 22K J 1/10W		
R24			RK73FB2A471J	CHIP R 470 J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R27			RK73FB2A101J	CHIP R 100 J 1/10W		
R33			RK73FB2A470J	CHIP R 47 J 1/10W		
R34			RK73FB2A681J	CHIP R 680 J 1/10W		
R35			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R36			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R37			RK73FB2A184J	CHIP R 180K J 1/10W		
R38			RK73FB2A681J	CHIP R 680 J 1/10W		
R39			RK73FB2A103J	CHIP R 10K J 1/10W		
R40			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R42			RK73FB2A220J	CHIP R 22 J 1/10W		
R43			RK73FB2A331J	CHIP R 330 J 1/10W		
R44			RK73FB2A330J	CHIP R 33 J 1/10W		
R45			RK73FB2A101J	CHIP R 100 J 1/10W		
R46			RK73FB2A470J	CHIP R 47 J 1/10W		
R54			RK73FB2A101J	CHIP R 100 J 1/10W		
R55			RK73FB2A681J	CHIP R 680 J 1/10W		
R56			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R57 ,58			RK73FB2A101J	CHIP R 100 J 1/10W		
R59			RK73FB2A821J	CHIP R 820 J 1/10W		
R60			RK73FB2A124J	CHIP R 120K J 1/10W		
R61			RK73FB2A221J	CHIP R 220 J 1/10W		
R62			RK73FB2A101J	CHIP R 100 J 1/10W		
R63			RK73FB2A560J	CHIP R 56 J 1/10W		
R64			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R65			RK73FB2A333J	CHIP R 33K J 1/10W		
R66			RK73FB2A221J	CHIP R 220 J 1/10W		
R67			RK73FB2A101J	CHIP R 100 J 1/10W		
R71			RK73FB2A103J	CHIP R 10K J 1/10W		
R72			RK73FB2A223J	CHIP R 22K J 1/10W		
R73			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R74			RK73FB2A101J	CHIP R 100 J 1/10W		
R75 ,76			RK73FB2A473J	CHIP R 47K J 1/10W		
R77			RK73FB2A101J	CHIP R 100 J 1/10W		
R79			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R80			RK73FB2A101J	CHIP R 100 J 1/10W		
R81			RK73FB2A681J	CHIP R 680 J 1/10W		
R82			RK73FB2A471J	CHIP R 470 J 1/10W		
R84			RK73FB2A101J	CHIP R 100 J 1/10W		
R90			RK73FB2A101J	CHIP R 100 J 1/10W		
R91			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R92			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R93			RK73FB2A470J	CHIP R 47 J 1/10W		
R94			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R95			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R96			RK73FB2A331J	CHIP R 330 J 1/10W		
R97			RK73FB2A180J	CHIP R 18 J 1/10W		
R98			RK73FB2A101J	CHIP R 100 J 1/10W		
R99			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R101,102			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R103			RK73FB2A101J	CHIP R 100 J 1/10W		

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PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R104			RK73FB2A471J	CHIP R 470 J 1/10W		
R105			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R106			RK73FB2A821J	CHIP R 820 J 1/10W		
R107			RK73FB2A822J	CHIP R 8.2K J 1/10W		
R108			RK73FB2A331J	CHIP R 330 J 1/10W		
R109			RK73FB2A101J	CHIP R 100 J 1/10W		
R110			RK73FB2A223J	CHIP R 22K J 1/10W		
R111			RK73FB2A183J	CHIP R 18K J 1/10W		
R112			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R113			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R114			RK73FB2A683J	CHIP R 68K J 1/10W		
R115			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R116			RK73FB2A151J	CHIP R 150 J 1/10W		
R117			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R118			RK73FB2A101J	CHIP R 100 J 1/10W		
R200			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R201			RK73FB2A221J	CHIP R 220 J 1/10W		
R202			RK73FB2A103J	CHIP R 10K J 1/10W		
R203			RK73FB2A223J	CHIP R 22K J 1/10W		
R204			RK73FB2A333J	CHIP R 33K J 1/10W		
R205			RK73FB2A683J	CHIP R 68K J 1/10W		
R206,207			RK73FB2A103J	CHIP R 10K J 1/10W		
R208			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R209			RK73FB2A221J	CHIP R 220 J 1/10W		
R210			RK73FB2A103J	CHIP R 10K J 1/10W		
R211			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R212			RK73FB2A563J	CHIP R 56K J 1/10W		
R213			RK73FB2A101J	CHIP R 100 J 1/10W		
R214			RK73FB2A681J	CHIP R 680 J 1/10W		
R215			RK73FB2A333J	CHIP R 33K J 1/10W		
R216,217			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R218			RK73FB2A223J	CHIP R 22K J 1/10W		
R220			RK73FB2A101J	CHIP R 100 J 1/10W		
R221,222			RK73FB2A103J	CHIP R 10K J 1/10W		
R223,224			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R225			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R226			RK73FB2A101J	CHIP R 100 J 1/10W		
R227			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R228			RK73FB2A561J	CHIP R 560 J 1/10W		
R229			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R230			RK73FB2A103J	CHIP R 10K J 1/10W		
R231			RK73FB2A563J	CHIP R 56K J 1/10W		
R232			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R233			RK73FB2A681J	CHIP R 680 J 1/10W		
R234			RK73FB2A103J	CHIP R 10K J 1/10W		
R236			R92-0670-05	CHIP R 0 ΩHM		
VR1 ,2			R12-3132-05	TRIM PΩT 47K		
VR3			R12-6717-05	TRIM PΩT 47K		
VR301			R24-3410-05	PΩTENTIΩMETER(AF･VΩL/SΩL)		
VR302			R23-3408-15	PΩTENTIΩMETER(RIT/IF-SHIFT)		
W1 ,2			R92-1061-05	JUMPER REST 0 ΩHM		
D1			1SS184	DIΩRD		
D2			B30-2004-05	LED		
D3			1SS226	DIΩRD		

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PLL UNIT (X50-3200-00)
TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
D200			HSM88AS	DIORD		
IC2			UPD74HC390G	IC(DUAL DECADE COUNTER)		
IC3			SN76514N	IC(MIXER)		
IC4 ,5			SN16913P	IC(DUBLE BALANCED MIXERS)		
IC7			SN16913P	IC(DUBLE BALANCED MIXERS)		
IC8			SC7S04F	IC (or TC7S04F)		
IC10			KCH14	HIC		
IC11			CXD1225M	IC(PLL)		
IC201			KCA04	IC(MIC AMPLIFIER)		
Q1			DTC114TK	DIGITAL TRANSISTOR		
Q2 ,3			2SC2714(Y)	TRANSISROR		
Q5			2SC2712(Y)	TRANSISTOR		
Q9			RU201	TRANSISTOR		
Q10 -13			2SC2714(Y)	TRANSISTOR		
Q14			2SC2996(Y)	TRANSISTOR		
Q16			2SC2712(Y)	TRANSISTOR		
Q17			2SD1757K	TRANSISTOR		
Q18			2SC2954	TRAMSISTOR		
Q19			2SC2712(Y)	TRANSISTOR		
Q20			2SC2714(Y)	TRANSISTOR		
Q21 -23			2SC3722K(R)	TRANSISTOR		
Q200-203			2SC2714(Y)	TRANSISTOR		
Q204,205			2SC2712(Y)	TRANSISTOR		
Q206			DTA114EK	DIGITAL TRANSISTOR		
Q207			DTC114EK	DIGITAL TRANSISTOR		
Q209			DTC114EK	DIGITAL TRANSISTOR		
Q210			2SC2712(Y)	TRANSISTOR		
Q211			DTC114TK	DIGITAL TRANSISTOR		
A1		*	X58-4120-00	SUB UNIT (VCO)		
A2 ,3			X58-4020-00	SUB UNIT (DDS)		
TX-RX UNIT (X57-4570-00)						
C1			CK73FB1E103K	CHIP C 0.01UF K		
C2			CK73FB1E103K	CHIP C 0.01UF K		
C3			CC73GCH1H180J	CHIP C 18PF J		
C4			CC73GCH1H470J	CHIP C 47PF J		
C5			CC73GCH1H560J	CHIP C 56PF J		
C7			CC73GCH1H120J	CHIP C 12PF J		
C8			CK73FB1E104K	CHIP C 0.10UF K		
C9			CC73FCH1H560J	CHIP C 56PF J		
C9			CK73FF1C105Z	CHIP C 1.0UF Z		
C10			CK73EB1H104K	CHIP C 0.10UF K		
C11			CK73FB1E103K	CHIP C 0.01UF K		
C12			CK73FB1E103K	CHIP C 0.01UF K		
C17 ,18			CC73GCH1H560J	CHIP C 56PF J		
C19			CC73GCH1H120J	CHIP C 12PF J		
C20			CK73FB1E104K	CHIP C 0.10UF K		
C21			CK73GB1H102K	CHIP C 1000PF K		
C22 -24			CK73FB1E104K	CHIP C 0.10UF K		
C25			CK73GB1E103K	CHIP C 0.010UF K		
C26			CK73FB1E104K	CHIP C 0.10UF K		
C27			CC73FCH1H220J	CHIP C 22PF J		
C28			CC73FSL1H471J	CHIP C 470PF J		
C29			CK73FB1E104K	CHIP C 0.10UF K		
C32			CK73GB1E103K	CHIP C 0.010UF K		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C34 ,35			CK73FB1E104K	CHIP C 0.10UF K		
C36			CK73GB1E103K	CHIP C 0.010UF K		
C37			CK73GB1H471K	CHIP C 470PF K		
C38 ,39			CK73FB1E103K	CHIP C 0.01UF K		
C40			CK73GB1E103K	CHIP C 0.010UF K		
C41			CK73GB1H471K	CHIP C 470PF K		
C42			CK73FB1E103K	CHIP C 0.01UF K		
C43			CC73GCH1H100D	CHIP C 10PF D		
C44			CK73FF1C105Z	CHIP C 1.0UF Z		
C45			CC73FCH1H020C	CHIP C 2.0PF C		
C46			CC73FCH1H030C	CHIP C 3PF C		
C47			CC73FCH1H010C	CHIP C 1PF C		
C48			CC73FCH1H101J	CHIP C 100PF J		
C49			CK73FB1E104K	CHIP C 0.10UF K		
C50 ,51			CK73FB1E103K	CHIP C 0.01UF K		
C53			CK73GB1H102K	CHIP C 1000PF K		
C54			CC73FCH1H060D	CHIP C 6PF D		
C55			CC73FCH1H010C	CHIP C 1PF C		
C56			CK73GB1E103K	CHIP C 0.010UF K		
C58 ,59			CK73GB1E103K	CHIP C 0.010UF K		
C60			CK73FB1E103K	CHIP C 0.01UF K		
C62			CK73GB1E103K	CHIP C 0.010UF K		
C63 ,64			CK73FB1E103K	CHIP C 0.01UF K		
C65			CC73GCH1H020C	CHIP C 2.0PF C		
C66 ,67			CK73FB1E103K	CHIP C 0.01UF K		
C68			CK73FB1E104K	CHIP C 0.10UF K		
C69 ,70			CK73FB1E103K	CHIP C 0.01UF K		
C71			CC73FCH1H220J	CHIP C 22PF J		
C72 -74			CK73FB1E103K	CHIP C 0.01UF K		
C75			CK73GB1E103K	CHIP C 0.010UF K		
C76 -81			CK73FB1E103K	CHIP C 0.01UF K		
C82			CK73FB1H102K	CHIP C 1000PF K		
C83			CK73FB1E103K	CHIP C 0.01UF K		
C84			CC73FCH1H470J	CHIP C 47PF J		
C85			CC73FCH1H270J	CHIP C 27PF J		
C86			CK73FB1E103K	CHIP C 0.01UF K		
C87			C92-0009-05	CHIP TAN 4.7UF 10WV		
C88			CK73FB1E104K	CHIP C 0.10UF K		
C89			C92-0001-05	CHIP TAN 0.1UF 35WV		
C90			CK73FB1E104K	CHIP C 0.10UF K		
C91			CK73GB1E103K	CHIP C 0.010UF K		
C92			CK73FB1E103K	CHIP C 0.01UF K		
C93			CK73FF1C105Z	CHIP C 1.0UF Z		
C94			CK73FB1E104K	CHIP C 0.10UF K		
C95			CK73FF1C105Z	CHIP C 1.0UF Z		
C96			CK73FB1H472K	CHIP C 4700PF K		
C97 -100			CK73GB1E103K	CHIP C 0.010UF K		
C101			CC73FCH1H470J	CHIP C 47PF J		
C102			CK73FB1E103K	CHIP C 0.01UF K		
C103,104			C92-0003-05	CHIP TAN 0.47UF 25WV		
C105			C92-0509-05	TANTAL 10UF 6.3WV		
C106			C92-0004-05	ELECTRO 1.0UF 16WV		
C107,108			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C109			C92-0002-05	CHIP TAN 0.22UF 35WV		
C110			CK73FB1E223K	CHIP C 0.022UF K		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C111			CK73FB1E473K	CHIP C 0.047UF K		
C112			CK73FB1E103K	CHIP C 0.01UF K		
C113			CK73FB1H392K	CHIP C 3900PF K		
C114			CK73FB1E104K	CHIP C 0.10UF K		
C115			C92-0038-05	ELECTRO 22UF 16WV		
C116			C92-0041-05	ELECTRO 10UF 10WV		
C117,118			CK73FB1E104K	CHIP C 0.10UF K		
C119			CC73FSL1H471J	CHIP C 470PF J		
C120			CK73FB1H102K	CHIP C 1000PF K		
C121,122			C92-0040-05	ELECTRO 47UF 16WV		
C123			C90-2153-05	ELECTRO 470UF 10WV		
C124			CK73FB1E104K	CHIP C 0.10UF K		
C125			C92-0040-05	ELECTRO 47UF 16WV		
C126			C92-0038-05	ELECTRO 22UF 16WV		
C127			CE04EW1C331M	ELECTRO 330UF 16WV		
C128			CK73GB1H102K	CHIP C 1000PF K		
C129,130			CC73FCH1H101J	CHIP C 100PF J		
C131			C92-0009-05	CHIP TAN 4.7UF 10WV		
C132			C92-0007-05	CHIP TAN 2.2UF 20WV		
C133			C92-0009-05	CHIP TAN 4.7UF 10WV		
C134,135			CK73FF1C105Z	CHIP C 1.0UF Z		
C136			C92-0007-05	CHIP TAN 2.2UF 20WV		
C137			CK73FF1C105Z	CHIP C 1.0UF Z		
C138			C92-0009-05	CHIP TAN 4.7UF 10WV		
C139			CK73FF1C105Z	CHIP C 1.0UF Z		
C140			C92-0509-05	TANTAL 10UF 6.3WV		
C141,142			CK73FF1C105Z	CHIP C 1.0UF Z		
C143			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C144			CC73FCH1H050C	CHIP C 5PF C		
C145-147			CK73FB1E103K	CHIP C 0.01UF K		
C148			C92-0038-05	ELECTRO 22UF 16WV		
C149			CK73GB1E103K	CHIP C 0.010UF K		
C150-152			CK73FB1E103K	CHIP C 0.01UF K		
C153,154			CK73GB1E103K	CHIP C 0.010UF K		
C155-157			CK73FB1E103K	CHIP C 0.01UF K		
C158			CK73GB1E103K	CHIP C 0.010UF K		
C159			CC73FCH1H050C	CHIP C 5PF C		
C160			CK73GB1E103K	CHIP C 0.010UF K		
C161			CC73FCH1H200J	CHIP C 20PF J		
C162,163			CK73GB1E103K	CHIP C 0.010UF K		
C164,165			CK73FB1E103K	CHIP C 0.01UF K		
C166			CC73FCH1H010C	CHIP C 1PF C		
C167			CC73FCH1H0R5C	CHIP C 0.5PF C		
C168			CC73FCH1H010C	CHIP C 1PF C		
C169,170			CK73GB1E103K	CHIP C 0.010UF K		
C171			CK73FB1E103K	CHIP C 0.01UF K		
C172,173			CK73GB1E103K	CHIP C 0.010UF K		
C174,175			CK73GB1H102K	CHIP C 1000PF K		
C176			CK73FB1E104K	CHIP C 0.10UF K		
C181			CK73FB1E104K	CHIP C 0.10UF K		
C184			CK73FB1H102K	CHIP C 1000PF K		
C185,186			CK73FB1E104K	CHIP C 0.10UF K		
C187			C92-0037-05	ELECTRO 10UF 16WV		
C188			CK73FB1E104K	CHIP C 0.10UF K		
C189			CK73FB1H102K	CHIP C 1000PF K		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C192			CK73FB1H222K	CHIP C 2200PF K		
C193			CK73FB1H332K	CHIP C 3300PF K		
C194			C92-0040-05	ELECTRO 47UF 16WV		
C195			CK73FB1E103K	CHIP C 0.01UF K		
C196,197			C92-0040-05	ELECTRO 47UF 16WV		
C198			CK73FB1E103K	CHIP C 0.01UF K		
C199			C92-0047-05	ELECTRO 47UF 6.3WV		
C200			CK73FB1E103K	CHIP C 0.01UF K		
C201			CE04EW1C101M	ELECTRO 100UF 16WV		
C204,205			CK73FB1E103K	CHIP C 0.01UF K		
C207-210			CC73GCH1H470J	CHIP C 47PF J		
C211,212			CK73FB1E103K	CHIP C 0.01UF K		
C213			CC73GCH1H470J	CHIP C 47PF J		
C214			CC73GCH1H180J	CHIP C 18PF J		
C215			CK73GB1H102K	CHIP C 1000PF K		
C216			CK73FB1E473K	CHIP C 0.047UF K		
C217			CK73FF1C105Z	CHIP C 1.0UF Z		
C218			CK73FB1E223K	CHIP C 0.022UF K		
C219			C92-0004-05	ELECTRO 1.0UF 16WV		
C220,221			CK73FB1E103K	CHIP C 0.01UF K		
C222-225			CC73FUJ1H080D	CHIP C 8PF D		
C226			CK73GB1H102K	CHIP C 1000PF K		
C227,228			CC73FCH1H020C	CHIP C 2.0PF C		
C229			C92-0040-05	ELECTRO 47UF 16WV		
C230			C92-0004-05	ELECTRO 1.0UF 16WV		
C231			CK73GB1H102K	CHIP C 1000PF K		
C232			CE04EW1E4R7M	ELECTRO 4.7UF 25WV		
C240			CK73FB1H122K	CHIP C 1200PF K		
C241			CC73FCH1H270J	CHIP C 27PF J		
C242			C90-2114-05	ELECTRO 220UF 16WV		
C243			CC73FCH1H560J	CHIP C 56PF J		
C244			CK73FB1H102K	CHIP C 1000PF K		
C245			CC73FCH1H560J	CHIP C 56PF J		
C246			CK73FB1H103K	CHIP C 0.010UF K		
C247			CC73FCH1H560J	CHIP C 56PF J		
C249			CK73FB1H103K	CHIP C 0.010UF K		
C250			CK73FB1E104K	CHIP C 0.10UF K		
C251			CC73FCH1H120J	CHIP C 12PF J		
C252			CK73FB1E104K	CHIP C 0.10UF K		
C253			CK73FB1H103K	CHIP C 0.010UF K		
C254			CK73FB1E104K	CHIP C 0.10UF K		
C255			CK73FB1H102K	CHIP C 1000PF K		
C256			CC73FCH1H270J	CHIP C 27PF J		
C257			CK73FB1H102K	CHIP C 1000PF K		
C258			CK73FB1E103K	CHIP C 0.01UF K		
C260			CK73FB1H102K	CHIP C 1000PF K		
C261			CC73FCH1H101J	CHIP C 100PF J		
C262			CC73FCH1H121J	CHIP C 120PF J		
C263			CC73FCH1H470J	CHIP C 47PF J		
C264			CC73FCH1H121J	CHIP C 120PF J		
C265			CC73FCH1H330J	CHIP C 33PF J		
C266			CC73FCH1H680J	CHIP C 68PF J		
C267			CC73FCH1H560J	CHIP C 56PF J		
C268			CC73FCH1H560J	CHIP C 56PF J		
C269			CC73FCH1H680J	CHIP C 68PF J		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C274,275			CK73FB1E104K	CHIP C 0.10UF K		
C276,277			CK73GF1E104Z	CHIP C 0.1UF Z		
C278			CC73FCH1H120J	CHIP C 12PF J		
C501			CC73FCH1H470J	CHIP C 47PF J		
C502			CC73FCH1H560J	CHIP C 56PF J		
C503			CC73FCH1H390J	CHIP C 39PF J		
C504			CK73FB1H103K	CHIP C 0.01UF K		
C505			CC45CH2H030C	CHIP C 3PF C		
C506			CC73FCH1H560J	CHIP C 56PF J		
C507			CC73FCH1H101J	CHIP C 100PF J		
C508,509			CK73FB1E103K	CHIP C 0.01UF K		
C510			CK73FB1E104K	CHIP C 0.10UF K		
C511			CC45SL2H270J	CERAMIC 27PF J		
C512			CC45SL2H390J	CERAMIC 39PF J		
C513			CC45SL2H180J	CERAMIC 18PF J		
C514			CC45SL2H100D	CERAMIC 10PF D		
C515			CC45SL2H560J	CERAMIC 56PF J		
C516			CC45SL2H120J	CERAMIC 12PF J		
C517-519			CK73FB1H102K	CHIP C 1000PF K		
TC1			C05-0344-05	TRIMMER CAPACITOR 30PF		
TC501			C05-0030-15	TRIM CAP 20PF		
A1			E23-0918-04	TERMINAL		
CN1 -3			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN4			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
CN5 ,6			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN7			E40-5608-05	PIN CONNECTOR FOR INSIDE(5P)		
CN8			E40-5607-05	PIN CONNECTOR FOR INSIDE(4P)		
CN9			E40-5608-05	PIN CONNECTOR FOR INSIDE(5P)		
CN10			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN11			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN12			E40-3237-05	PIN CONNECTOR FOR INSIDE(2P)		
CN13			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
CN14			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)		
CN15			E40-3249-05	PIN CONNECTOR FOR INSIDE(5P)		
CN16			E40-3254-05	PIN CONNECTOR FOR INSIDE(10P)		
CN17			E40-5233-05	PIN CONNECTOR FOR INSIDE(25P)		
CN18			E40-3250-05	PIN CONNECTOR FOR INSIDE(6P)		
CN19			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN20			E40-5606-05	PIN CONNECTOR FOR INSIDE(3P)		
CN501			E04-0190-05	RF COAXIAL CABLE RECEPTACLE		
CN502			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN503			E40-5604-05	PIN CONNECTOR FOR INSIDE(11P)		
CN504			E40-5605-05	PIN CONNECTOR FOR INSIDE(12P)		
CN505			E04-0190-05	RF COAXIAL CABLE RECEPTACLE		
CN506			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
J501			E11-0454-05	PHONE JACK		
TP1 ,2			E40-0211-05	PIN CONNECTOR FOR INSIDE(2P)		
W1			E37-0179-05	CONNECTING WIRE		
W2			E37-0373-05	CONNECTING WIRE		
W502			E37-0445-05	CONNECTING WIRE (ANT)		
F1			F53-0055-05	FUSE (2A)		
-			J30-0545-05	SPACER (XF1)		

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CD1			L79-1013-05	FILTER(455KHZ)		
CF1			L72-0372-05	CERAMIC FILTER(455KHZ)		
L1			L40-2211-48	SMALL FIXED INDUCTOR(220UH)		
L2			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L3			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L4			L33-0695-05	CHOKE COIL (1MH)		
L5 ,6			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L7			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L10			L33-0695-05	CHOKE COIL (1MH)		
L11			L19-0324-05	TRANSFORMER		
L12			L39-0454-05	COIL		
L13			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L14			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L15			L34-4222-05	COIL		
L16			L34-4332-05	COIL		
L17			L34-4331-05	COIL		
L18			L19-0324-05	TRANSFORMER		
L19			L40-3392-48	SMALL FIXED INDUCTOR(3.3UH)		
L20			L19-0324-05	TRANSFORMER		
L21			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L22			L39-0454-05	COIL		
L23			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L24			L34-4209-05	COIL		
L25			L34-4330-05	COIL		
L26			L34-4216-05	COIL		
L27			L40-1082-48	SMALL FIXED INDUCTOR(0.1UH)		
L28			L34-4328-05	COIL		
L29 -32			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L33 ,34			L40-8295-48	SMALL FIXED INDUCTOR((8.2UH)		
L35 -37			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L38			L34-4327-05	COIL		
L39			L34-4326-05	COIL		
L40			L34-4329-05	COIL		
L41 -43			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L44 -46			L34-4333-05	COIL		
L47			L39-0454-05	COIL		
L48			L34-4333-05	COIL		
L49 ,50			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L51			L19-0324-05	TRANSFORMER		
L53			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L54			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L55			L19-0324-05	TRANSFORMER		
L56			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L57			L40-1021-13	SMALL FIXED INDUCTOR(1MH)		
L58			L33-0695-05	CHOKE COIL (1MH)		
L64			L40-4701-48	SMALL FIXED INDUCTOR(47MH)		
L65			L33-0695-05	CHOKE COIL		
L66			L34-4002-05	COIL		
L67			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L68			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L69			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L70			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L71			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L72			L40-1282-48	SMALL FIXED INDUCTOR		
L73			L40-1082-48	SMALL FIXED INDUCTOR		

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L74			L40-3395-48	SMALL FIXED INDUCTOR(3.3UH)		
L75			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L76			L40-1095-48	SMALL FIXED INDUCTOR		
L77			L40-6882-48	SMALL FIXED INDUCTOR(0.27UH)		
L78			L40-6882-48	SMALL FIXED INDUCTOR		
L79 ,80			L40-1082-48	SMALL FIXED INDUCTOR		
L501-503			L34-1359-05	COIL		
L504,505			L34-1391-05	COIL		
L506,507		*	L40-1021-33	SMALL FIXED INDUCTOR(2.2MH)		
L508			L39-0480-15	COIL		
X1			L77-0720-05	CRYSTAL RESONATOR(10.240MHZ)		
XF1			L71-0432-05	CRYSTAL FILTER (73.045MHZ)		
XF2			L71-0230-05	CRYSTAL FILTER (10.695MHZ)		
R1			RK73FB2A560J	CHIP R 56 J 1/10W		
R2			RK73EB2B471J	CHIP R 470 J 1/8W		
R3			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R4			RK73FB2A101J	CHIP R 100 J 1/10W		
R5			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R6			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R7			RK73FB2A151J	CHIP R 150 J 1/10W		
R8			RK73FB2A471J	CHIP R 470 J 1/10W		
R9 ,10			RK73GB1J681J	CHIP R 680 J 1/16W		
R11 -14			RK73FB2A100J	CHIP R 10 J 1/10W		
R15			RK73FB2A271J	CHIP R 270 J 1/10W		
R16			RK73FB2A100J	CHIP R 10 J 1/10W		
R18			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R19			RK73FB2A101J	CHIP R 100 J 1/10W		
R20			RK73FB2A220J	CHIP R 22 J 1/10W		
R21			RK73FB2A470J	CHIP R 47 J 1/10W		
R22			RK73FB2A391J	CHIP R 390 J 1/10W		
R23			RK73FB2A560J	CHIP R 56 J 1/10W		
R24			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R25			RK73FB2A471J	CHIP R 470 J 1/10W		
R26			RK73FB2A220J	CHIP R 22 J 1/10W		
R27			RK73FB2A150J	CHIP R 15 J 1/10W		
R28			RK73FB2A680J	CHIP R 68 J 1/10W		
R29			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R30			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R31			RK73GB1J474J	CHIP R 470K J 1/16W		
R32			RK73FB2A333J	CHIP R 33K J 1/10W		
R33			RK73FB2A181J	CHIP R 180 J 1/10W		
R34			RK73FB2A104J	CHIP R 100K J 1/10W		
R35			RK73GB1J101J	CHIP R 100 J 1/16W		
R39			RK73GB1J103J	CHIP R 10K J 1/16W		
R40			RK73GB1J681J	CHIP R 680 J 1/16W		
R41 ,42			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R43			RK73FB2A330J	CHIP R 33 J 1/10W		
R44			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R45			RK73FB2A330J	CHIP R 33 J 1/10W		
R46 ,47			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R48			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R49			RK73FB2A101J	CHIP R 100 J 1/10W		
R50			RK73GB1J101J	CHIP R 100 J 1/16W		
R51			RK73FB2A102J	CHIP R 1.0K J 1/10W		

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R52			RK73GB1J101J	CHIP R 100 J 1/16W		
R53			RK73GB1J103J	CHIP R 10K J 1/16W		
R54			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R55			RK73GB1J101J	CHIP R 100 J 1/16W		
R56			RK73FB2A333J	CHIP R 33K J 1/10W		
R57			RK73FB2A104J	CHIP R 100K J 1/10W		
R58			RK73FB2A223J	CHIP R 22K J 1/10W		
R59			RK73FB2A471J	CHIP R 470 J 1/10W		
R60			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R61			RK73FB2A103J	CHIP R 10K J 1/10W		
R62			RK73GB1J101J	CHIP R 100 J 1/16W		
R63			RK73GB1J103J	CHIP R 10K J 1/16W		
R64 -66			RK73GB1J101J	CHIP R 100 J 1/16W		
R67			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R68 -70			RK73FB2A101J	CHIP R 100 J 1/10W		
R71			RK73FB2A104J	CHIP R 100K J 1/10W		
R72			RK73GB1J471J	CHIP R 470 J 1/16W		
R73			RK73FB2A221J	CHIP R 220 J 1/10W		
R74			RK73FB2A224J	CHIP R 220K J 1/10W		
R75			RK73FB2A103J	CHIP R 10K J 1/10W		
R76			RK73GB1J820J	CHIP R 82 J 1/16W		
R77			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R78			RK73FB2A104J	CHIP R 100K J 1/10W		
R79			RK73GB1J104J	CHIP R 100K J 1/16W		
R80			RK73FB2A103J	CHIP R 10K J 1/10W		
R81			RK73GB1J101J	CHIP R 100 J 1/16W		
R82 ,83			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R84			RK73FB2A273J	CHIP R 27K J 1/10W		
R85			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R86			RK73FB2A473J	CHIP R 47K J 1/10W		
R87			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R88			RK73FB2A103J	CHIP R 10K J 1/10W		
R89 ,90			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R91			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R92			RK73GB1J103J	CHIP R 10K J 1/16W		
R93			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R94			RK73GB1J562J	CHIP R 5.6K J 1/16W		
R95			RK73GB1J153J	CHIP R 15K J 1/16W		
R96			RK73FB2A335J	CHIP R 3.3M J 1/10W		
R97			RK73FB2A123J	CHIP R 12K J 1/10W		
R98			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R99			RK73GB1J123J	CHIP R 12K J 1/16W		
R100			RK73FB2A473J	CHIP R 47K J 1/10W		
R101			RK73GB1J473J	CHIP R 47K J 1/16W		
R102			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R103			RK73FB2A474J	CHIP R 470K J 1/10W		
R104			RK73GB1J103J	CHIP R 10K J 1/16W		
R105			RK73FB2A103J	CHIP R 10K J 1/10W		
R106			RK73GB1J331J	CHIP R 330 J 1/16W		
R107			RK73FB2A393J	CHIP R 39K J 1/10W		
R108			RK73FB2A104J	CHIP R 100K J 1/10W		
R109			RK73FB2A823J	CHIP R 82K J 1/10W		
R110			RK73FB2A273J	CHIP R 27K J 1/10W		
R111			RK73GB1J104J	CHIP R 100K J 1/16W		
R112			RK73GB1J102J	CHIP R 1.0K J 1/16W		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R113			RK73GB1J473J	CHIP R 47K J 1/16W		
R114			RK73GB1J273J	CHIP R 27K J 1/16W		
R115			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R116			RK73GB1J271J	CHIP R 270 J 1/16W		
R117			RK73GB1J272J	CHIP R 2.7K J 1/16W		
R118			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R119			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R120			RK73FB2A473J	CHIP R 47K J 1/10W		
R121			RK73GB1J101J	CHIP R 100 J 1/16W		
R122			RK73FB2A104J	CHIP R 100K J 1/10W		
R123			RK73GB1J331J	CHIP R 330 J 1/16W		
R124			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R125			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R126			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R127			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R128			RK73GB1J471J	CHIP R 470 J 1/16W		
R129			RK73GB1J104J	CHIP R 100K J 1/16W		
R130			RK73FB2A223J	CHIP R 22K J 1/10W		
R131			RK73GB1J101J	CHIP R 100 J 1/16W		
R132			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R133			RK73FB2A151J	CHIP R 150 J 1/10W		
R134			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R135			RK73GB1J101J	CHIP R 100 J 1/16W		
R136			RK73GB1J104J	CHIP R 100K J 1/16W		
R137			RK73FB2A473J	CHIP R 47K J 1/10W		
R138			RK73FB2A471J	CHIP R 470 J 1/10W		
R139			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R140			RK73FB2A470J	CHIP R 47 J 1/10W		
R141,142			RK73GB1J471J	CHIP R 470 J 1/16W		
R143			RK73GB1J101J	CHIP R 100 J 1/16W		
R144			RK73FB2A184J	CHIP R 180K J 1/10W		
R145			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R146			RK73FB2A224J	CHIP R 220K J 1/10W		
R147			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R148			RK73GB1J224J	CHIP R 220K J 1/16W		
R149			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R150			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R151			RK73GB1J331J	CHIP R 330 J 1/16W		
R152			RK73GB1J101J	CHIP R 100 J 1/16W		
R153			RK73FB2A221J	CHIP R 220 J 1/10W		
R154			RK73FB2A224J	CHIP R 220K J 1/10W		
R155			R92-0670-05	CHIP R 0 ΩHM		
R156			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R157			RK73GB1J101J	CHIP R 100 J 1/16W		
R158			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R159			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R160			RK73GB1J561J	CHIP R 560 J 1/16W		
R161			RK73GB1J682J	CHIP R 6.8K J 1/16W		
R162,163			RK73FB2A223J	CHIP R 22K J 1/10W		
R164			RK73FB2A331J	CHIP R 330 J 1/10W		
R165			RK73GB1J103J	CHIP R 10K J 1/16W		
R166			RK73FB2A101J	CHIP R 100 J 1/10W		
R167			RK73GB1J101J	CHIP R 100 J 1/16W		
R168			RK73FB2A333J	CHIP R 33K J 1/10W		
R169			RK73GB1J271J	CHIP R 270 J 1/16W		

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PARTS LIST

※ New Parts
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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R170			RK73GB1J820J	CHIP R 82 J 1/16W		
R171			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R172			RK73GB1J823J	CHIP R 82K J 1/16W		
R173			RK73GB1J103J	CHIP R 10K J 1/16W		
R174			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R175-178			RK73FB2A330J	CHIP R 33 J 1/10W		
R179,180			RK73GB1J471J	CHIP R 470 J 1/16W		
R181,182			RK73FB2A101J	CHIP R 100 J 1/10W		
R183			RK73FB2A680J	CHIP R 68 J 1/10W		
R184			RK73FB2A101J	CHIP R 100 J 1/10W		
R185			R92-1252-05	CHIP R 0 ΩHM		
R186-189			RK73FB2A330J	CHIP R 33 J 1/10W		
R193			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R197			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R198			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R199			RK73GB1J101J	CHIP R 100 J 1/16W		
R200			RK73FB2A561J	CHIP R 560 J 1/10W		
R201-203			RK73FB2A330J	CHIP R 33 J 1/10W		
R204			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R206			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R207			RK73FB2A473J	CHIP R 47K J 1/10W		
R208,209			RK73FB2A223J	CHIP R 22K J 1/10W		
R210			RK73FB2A471J	CHIP R 470 J 1/10W		
R211			R92-0670-05	CHIP R 0 ΩHM		
R213			RK73FB2A473J	CHIP R 47K J 1/10W		
R214			RK73GB1J103J	CHIP R 10K J 1/16W		
R215			RK73GB1J682J	CHIP R 6.8K J 1/16W		
R216,217			RK73FB2A103J	CHIP R 10K J 1/10W		
R218			RK73FB2A471J	CHIP R 470 J 1/10W		
R219			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R220			RK73FB2A471J	CHIP R 470 J 1/10W		
R221,222			RK73GB1J104J	CHIP R 100K J 1/16W		
R223			RK73GB1J564J	CHIP R 560K J 1/16W		
R224,225			R92-1252-05	CHIP R 0 ΩHM		
R226			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R227			RK73GB1J223J	CHIP R 22K J 1/16W		
R228			RK73GB1J123J	CHIP R 12K J 1/16W		
R229			RK73FB2A470J	CHIP R 47 J 1/10W		
R230			RK73GB1J473J	CHIP R 47K J 1/16W		
R231			RK73GB1J104J	CHIP R 100K J 1/16W		
R232			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R233			RK73FB2A104J	CHIP R 100K J 1/10W		
R234			RK73FB2A101J	CHIP R 100 J 1/10W		
R235			RK73GB1J822J	CHIP R 8.2K J 1/16W		
R236			RK73FB2A681J	CHIP R 680 J 1/10W		
R238-241			RK73FB2A101J	CHIP R 100 J 1/10W		
R242,243			RK73FB2A221J	CHIP R 220 J 1/10W		
R244,245			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R246			RK73FB2A561J	CHIP R 560 J 1/10W		
R247			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R248			RK73GB1J272J	CHIP R 2.7K J 1/16W		
R251			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R252			RK73FB2A471J	CHIP R 470 J 1/10W		
R255			RK73FB2A391J	CHIP R 390 J 1/10W		
R256			RK73FB2A104J	CHIP R 100K J 1/10W		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R257			RK73FB2A101J	CHIP R 100 J 1/10W		
R258			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R259			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R260			RK73FB2A151J	CHIP R 150 J 1/10W		
R261			RK73FB2A271J	CHIP R 270 J 1/10W		
R262			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R268			RK73FB2A221J	CHIP R 220 J 1/10W		
R269,270			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R271			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R272-274			R92-1252-05	CHIP R 0 ØHM		
R275			R92-0670-05	CHIP R 0 ØHM		
R501			R92-1244-05	CHIP R 27 J 1/4W		
R502			R92-1279-05	FIXED RESISTØR 33 1W		
R503			R92-1282-05	FIXED RESISTØR 10 1W		
R505-508			RK73FB2A221J	CHIP R 220 J 1/10W		
VR1			R12-6711-05	TRIMMING PØT 4.7K		
VR2			R12-6719-05	TRIMMING PØT 100K		
VR3			R12-6711-05	TRIMMING PØT 4.7K		
VR4			R12-6713-05	TRIMMING PØT 10K		
VR5			R12-3126-05	TRIMMING PØT 10K		
VR6			R12-3132-05	TRIM PØT 47K		
VR7			R12-3126-05	TRIMMING PØT 10K		
VR8 ,9			R12-6713-05	TRIMMING PØT 10K		
VR10			R12-6719-05	TRIMMING PØT 100K		
VR11,12			R12-6713-05	TRIMMING PØT 10K		
VR13			R12-6705-05	TRIM PØT 470		
VR14			R12-4414-05	TRIMMING PØT 50K		
VR15-17			R12-6713-05	TRIMMING PØT 10K		
VR501			R12-0104-05	TRIM PØT. 220		
W503			R92-0150-05	JUMPER REST 0 ØHM		
K1			S51-1436-05	RELAY		
K501			S51-1429-05	RELAY		
D1			LFB01	DIØRD		
D2			V08(G)	DIØRD		
D3 ,4			RLS245	DIØRD		
D5			V08(G)	DIØRD		
D8 ,9			RLS135	DIØRD		
D11			RLS135	DIØRD		
D12			DAN235K	DIØRD		
D13			1SS355	DIØRD (or MA110)		
D14			DAN235K	DIØRD		
D16 ,17			RLS135	DIØRD		
D18			1SS226	DIØRD		
D19			1SS355	DIØRD (or MA110)		
D20			RD6.2M(B2)	DIØRD		
D21 -23			RLS135	DIØRD		
D24			1SS355	DIØRD (or MA110)		
D25			RD4.7M(B2)	DIØRD		
D26			1SS355	DIØRD (or MA110)		
D27 ,28			DAN202K	DIØRD		
D29 ,30			1SS355	DIØRD (or MA110)		
D31			B30-2001-05	LED		
D34			1SS226	DIØRD		
D35			RD6.2M(B2)	DIØRD		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
D37			1SS355	DIODE (or MA110)		
D38 ,39			DAN202K	DIODE		
D40			1SS355	DIODE (or MA110)		
D41			RLS135	DIODE		
D42			HSM88AS	DIODE		
D43			1SS355	DIODE (or MA110)		
D44			RLS135	DIODE		
D46			1SS355	DIODE (or MA110)		
D49			RLS135	DIODE		
D50			RD3.9M(B2)	DIODE		
D51		*	RD12M(B2)	DIODE		
D501			DSA301LA	DIODE		
D502			LFB01	DIODE		
D503,504			1SS101	DIODE		
IC2			KCD04	HIC(FM IF)		
IC3			KCD08	HIC		
IC4			XRU4066BCF	IC or		
IC4			BU4066BCF	IC		
IC5			NJM2904M	IC(OP AMP X2)		
IC6			XRU4066BCF	IC (or BU4066BCF)		
IC7			UPC1241H	IC		
IC8			UPC1037HA	IC(DUBBLE BALANCE MODULATOR)		
IC10			UPC78N05H	IC(VOLTAGE REGULATOR/+8V)		
IC11			KCC08	HIC		
IC12,13			TC9174F	IC(CMOS I/O EXTENSION)		
IC14			TA75S01F	IC		
Q1			DTA124EK	DIGITAL TRANSISTOR		
Q2			2SD1757K	TRANSISTOR		
Q3			2SA1213(Y)	TRANSISTOR		
Q4			DTC143TK	DIGITAL TRANSISTOR		
Q5 -10			2SK520(K44)	FET		
Q11			2SC2954	TRANSISTOR		
Q12			DTA124EK	DIGITAL TRANSISTOR		
Q13			2SC4728(S)	TRANSISTOR		
Q14 ,15			DTC143TK	DIGITAL TRANSISTOR		
Q16			2SA1213(Y)	TRANSISTOR		
Q17			3SK131(M)	FET		
Q18 ,19			2SK520(K43)	FET		
Q20			RU201	TRANSISTOR		
Q21			3SK131(M)	FET		
Q22			2SC2712(Y)	TRANSISTOR		
Q23			RU201	TRANSISTOR		
Q24			2SC2712(Y)	TRANSISTOR		
Q25			2SJ106(GR)	FET		
Q26			FMC1	TRANSISTOR		
Q27 ,28			DTC124EK	DIGITAL TRANSISTOR		
Q29			2SC2712(GR)	TRANSISTOR		
Q30			2SK210(GR)	FET		
Q31			2SA1162(Y)	TRANSISTOR		
Q32			FMC2	TRANSISTOR		
Q33			DTC124EK	DIGITAL TRANSISTOR		
Q34			2SC2712(Y)	TRANSISTOR		
Q35			2SD1757K	TRANSISTOR		
Q36 ,37			DTC143EK	DIGITAL TRANSISTOR		
Q38 ,39			2SC3722K(R)	TRANSISTOR		

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TX-RX UNIT (X57-4570-00)
DDS (X58-4020-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
Q40 -42			2SC2712(Y)	TRANSISTOR		
Q43			3SK131(M)	FET		
Q44 ,45			IMD3	TRANSISTOR		
Q46 ,47			3SK131(M)	FET		
Q48 ,49			3SK184(R)	FET		
Q50			2SC2954	TRANSISTOR		
Q51			2SA1162(Y)	TRANSISTOR		
Q52 ,53			2SC2712(Y)	TRANSISTOR		
Q55 -58			FMA3	TRANSISTOR		
Q59			DTA124EK	DIGITAL TRANSISTOR		
Q60 ,61			DTC124EK	DIGITAL TRANSISTOR		
Q62			2SD1757K	TRANSISTOR		
Q63 ,64			DTC143TK	DIGITAL TRANSISTOR		
Q65			DTC114EK	DIGITAL TRANSISTOR		
Q66			FMC1	TRANSISTOR		
Q67			DTC124EK	DIGITAL TRANSISTOR		
Q69			2SK520(K44)	FET		
Q70			2SC2714(Y)	TRANSISTOR		
Q501			FMC2	TRANSISTOR		
TH1			157-502-53002	THERMISTOR 5K		
TH2			157-501-53009	THERMISTOR 500		
TH3 ,4			157-102-53003	THERMISTOR 1K		
TH5			157-502-53002	THERMISTOR 5K		
TH6 ,7			157-302-53008	THERMISTOR 3K		
TH8			157-102-53003	THERMISTOR 1K		
TH9			157-103-55001	THERMISTOR 10K		
S1			W02-1764-05	ENCODER		
Z10			X59-3990-00	SUB UNIT (ALC)		
Z9			X59-4000-00	SUB UNIT (DSST･･･A/2)		
Z11			X59-4000-00	SUB UNIT (DSST･･･B/2)		
DDS (X58-4020-00)						
C1			CK73FB1E223K	CHIP C 0.022UF K		
C2			CK73FB1H102K	CHIP C 1000PF K		
C3 ,4			C92-0007-05	CHIP TAN 2.2UF 20WV		
C5			CK73FB1H102K	CHIP C 1000PF K		
C6			CC73FCH1H181J	CHIP C 180PF J		
C7			CC73FCH1H100D	CHIP C 10PF D		
C8			CC73FCH1H221J	CHIP C 220PF J		
C9			CC73FCH1H220J	CHIP C 22PF J		
C10			CC73FCH1H151J	CHIP C 150PF J		
C12 ,13			CC73FCH1H270J	CHIP C 27PF J		
C14 -17			CC73FCH1H101J	CHIP C 100PF J		
CN1			E40-5612-05	PIN CONNECTOR FOR INSIDE(8P)		
CN2			E40-5611-05	PIN CONNECTOR FOR INSIDE(2P)		
L1 -3			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L4 ,5			L40-2201-48	SMALL FIXED INDUCTOR(22UH)		
CP1 ,2			R90-0721-05	MULTIPLE COMPONENTS		
R1			RK73FB2A103J	CHIP R 10K J 1/10W		
R2			RK73FB2A153J	CHIP R 15K J 1/10W		
R3			RK73FB2A221J	CHIP R 220 J 1/10W		
R4			RK73FB2A101J	CHIP R 100 J 1/10W		

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DDS (X58-4020-00)
VCO (X58-4120-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R5			RK73FB2A471J	CHIP R 470 J 1/10W		
IC1			F71022	IC(DDS)		
Q1			2SC2712(GR)	TRANSISTOR		
VCO (X58-4120-00)						
C1			CK73FB1H102K	CHIP C 1000PF K		
C2			CC73FCH1H270J	CHIP C 27PF J		
C3			CC73FCH1H150J	CHIP C 15PF J		
C5			CC73FCH1H090D	CHIP C 9PF D		
C6			CC73FCH1H180J	CHIP C 18PF J		
C7			CC73FCH1H090D	CHIP C 9PF D		
C8			CK73FB1H102K	CHIP C 1000PF K		
C9			CC73FCH1H050C	CHIP C 5PF C		
C10			CK73FB1H102K	CHIP C 1000PF K		
C12			CC73FCH1H330J	CHIP C 33PF J		
C13			CC73FCH1H220J	CHIP C 22PF J		
C15			CC73FCH1H100D	CHIP C 10PF D		
C16			CC73FCH1H120J	CHIP C 12PF J		
C17			CC73FCH1H080D	CHIP C 8PF D		
C18			CK73FB1H102K	CHIP C 1000PF K		
C19			CC73FCH1H050C	CHIP C 5PF C		
C20 ,21			CK73FB1H102K	CHIP C 1000PF K		
C22			CC73FSL1H331J	CHIP C 330PF J		
C23 -28			CK73FB1H102K	CHIP C 1000PF K		
TC1 ,2			C05-0377-05	TRIMMER CAPACITOR 10PF		
CN1			E40-5201-05	PIN CONNECTOR FOR INSIDE(7P)		
-			F10-2060-14	SHIELDING PLATE		
-			F10-2061-04	SHIELDING PLATE		
-			G13-1395-04	FORMED PLATE		
L1			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L2		*	L34-4356-05	COIL		
L3			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L4		*	L34-4357-05	COIL		
			N30-2604-46	PAN HEAD MACHIN SCREW		
R2			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R3			RK73FB2A271J	CHIP R 270 J 1/10W		
R4			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R12			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R13			RK73FB2A271J	CHIP R 270 J 1/10W		
R14			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R20			RK73FB2A393J	CHIP R 39K J 1/10W		
R21			RK73FB2A103J	CHIP R 10K J 1/10W		
R22			RK73FB2A331J	CHIP R 330 J 1/10W		
R23			RK73FB2A560J	CHIP R 56 J 1/10W		
R24 ,25			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R26			RK73FB2A560J	CHIP R 56 J 1/10W		
R27			RK73FB2A471J	CHIP R 470 J 1/10W		
R28			RK73FB2A332J	CHIP R 3.3K J 1/10W		
D1			1SV166	DIORD		
D2			RLS135	DIORD		
D3			1SV166	DIORD		
D4			RLS135	DIORD		

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PARTS LIST

× New Parts
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VCO (X58-4120-00)
ALC (X59-3990-00)
DSST (X59-4000-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
Q1			2SK508NV(K52)	FET		
Q2			DTC114EU	DIGITAL TRANSISTOR		
Q3			2SK508NV(K52)	FET		
Q4			DTC114EU	DIGITAL TRANSISTOR		
Q5 ,6			2SC2714(Y)	TRANSISTOR		
ALC (X59-3990-00)						
C1			CK73GB1E103K	CHIP C 0.010UF K		
C2			CK73EF1E474Z	CHIP C 0.47UF Z		
C3			CK73FB1E104K	CHIP C 0.10UF K		
C4			CK73GB1E103K	CHIP C 0.010UF K		
C5			CK73FB1E473K	CHIP C 0.047UF K		
C6			CK73FB1E104K	CHIP C 0.10UF K		
R1			RK73GB1J562J	CHIP R 5.6K J 1/16W		
R2			RK73GB1J473J	CHIP R 47K J 1/16W		
R3			RK73GB1J223J	CHIP R 22K J 1/16W		
R4 -6			RK73GB1J473J	CHIP R 47K J 1/16W		
R7			RK73GB1J330J	CHIP R 33 J 1/16W		
R8			RK73GB1J222J	CHIP R 2.2K J 1/16W		
D1			DAP202K	DIORD		
D2			1SS355	DIORD		
Q1			FMC2	TRANSISTOR		
Q2			2SC2712(Y)	TRANSISTOR		
DSST (X59-4000-00)						
C1 ,2			CK73GB1H102K	CHIP C 1000PF K		
C11			C92-0509-05	TANTAL 10UF 6.3WV		
C12			CK73FB1E223K	CHIP C 0.022UF K		
C13 -16			CK73FB1E123K	CHIP C 0.012UF K		
C17 -19			CK73FB1E223K	CHIP C 0.022UF K		
C20			C92-0009-05	CHIP TAN 4.7UF 10WV		
R1 ,2			RK73GB1J681J	CHIP R 680 J 1/16W		
R3			RK73GB1J103J	CHIP R 10K J 1/16W		
R4 ,5			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R11 ,12			RK73GB1J823J	CHIP R 82K J 1/16W		
R13			RK73GB1J223J	CHIP R 22K J 1/16W		
R14			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R15			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R16			RK73GB1J103J	CHIP R 10K J 1/16W		
R17 ,18			RK73GB1J333J	CHIP R 33K J 1/16W		
R19			RK73GB1J103J	CHIP R 10K J 1/16W		
R20			RK73GB1J333J	CHIP R 33K J 1/16W		
R21			RK73GB1J183J	CHIP R 18K J 1/16W		
R22			RK73GB1J101J	CHIP R 100 J 1/16W		
D11 -13			1SS355	DIORD		
Q1 ,2			2SA1213(Y)	TRANSISTOR		
Q3 -5			DTC143TK	DIGITAL TRANSISTOR		
Q11			2SC2712(GR)	TRANSISTOR		

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LCD ASSY (B38-0719-15)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
LCD ASSY (B38-0719-15)						
C1			C92-0040-05	ELECTRO 47UF 16WV		
C2 -4			CK73FB1H103K	CHIP C 0.010UF K		
C5			CK73FB1H223K	CHIP C 0.022UF K		
C6 -13			CK73FB1H103K	CHIP C 0.01UF K		
C14 ,15			CK73FB1H102K	CHIP C 1000PF K		
-			E23-0623-04	EARTH RAG		
CN1			E40-5233-05	CONNECTOR (25P)		
CN2			E40-5398-05	CONNECTOR (11P)		
CN4			E40-3248-05	CONNECTOR (4P)		
CN5			E40-3251-05	CONNECTOR (7P)		
J1	2A		E06-0858-15	MIC CONNECTOR(8P)		
L1 ,2			L40-1011-18	CHOCK COIL (100UH)		
R1			RK73FB2A103J	CHIP R 10K J 1/10W		
R2 -4			RK73FB2A223J	CHIP R 22K J 1/10W		
R5			RK73FB2A104J	CHIP R 100K J 1/10W		
R6			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R7 ,8			RK73FB2A100J	CHIP R 10 J 1/10W		
R9 ,10			RK73FB2A271J	CHIP R 270 J 1/10W		
R11			RK73EB2B222J	CHIP R 2.2K J 1/8W		
R12			RK73EB2B102J	CHIP R 1.0K J 1/8W		
R13			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R14			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R15			RK73FB2A123J	CHIP R 12K J 1/10W		
R16			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R17 ,18			RK73EB2E100J	CHIP R 10 J 1/4W		
R20 -22			RK73EB2B271J	CHIP R 270 J 1/8W		
R23			RK73EB2B391J	CHIP R 390 J 1/8W		
R24			RK73EB2B471J	CHIP R 470 J 1/8W		
R25			RK73EB2B561J	CHIP R 560 J 1/8W		
R26			RK73EB2B821J	CHIP R 820 J 1/8W		
R27			RK73EB2B122J	CHIP R 1.2K J 1/8W		
R29 -31			RK73EB2B271J	CHIP R 270 J 1/8W		
R32			RK73EB2B391J	CHIP R 390 J 1/8W		
R33			RK73EB2B471J	CHIP R 470 J 1/8W		
R34			RK73EB2B561J	CHIP R 560 J 1/8W		
R35			RK73EB2B821J	CHIP R 820 J 1/8W		
R36			RK73EB2B122J	CHIP R 1.2K J 1/8W		
R37			RK73EB2B101J	CHIP R 100 J 1/8W		
R38 ,39			RK73EB2B470J	CHIP R 47 J 1/8W		
R40 ,41			RK73EB2A103J	CHIP R 10K J 1/10W		
R42			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R43 ,44			RK73FB2A103J	CHIP R 10K J 1/10W		
SW1 ,2			S40-1079-05	TACT SWITCH		
SW3 -14			S40-1086-05	TACT SWITCH		
SW15			S40-1079-05	TACT SWITCH		
SW16 -19			S40-1086-05	TACT SWITCH		
D1			1SS272	DIORD		
D3			B30-2117-08	LED (RED･･･ON AIR)		
D4		*	B30-2122-08	LED (GRN･･･BUSY)		
IC1			MSM5265GS-V1K	IC(LCD DRIVER)		
IC2			UPD6345GS	IC		

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LCD ASSY (B38-0719-15)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
IC3 ,4			TC4S584F	IC(SCHMITT TRIGGER)		
IC5			TC4SU69F	IC(INVERTER GATE)		
LCD1			B38-0714-08	LCD ELEMENT		
PL1 -4			B30-0865-15	LAMP (6.3V 75mA)		
Q1			2SA1307(Y)	TRANSISTOR		
Q2			2SC2712(Y)	TRANSISTOR		
Q3 ,4			2SA1162(Y)	TRANSISTOR		

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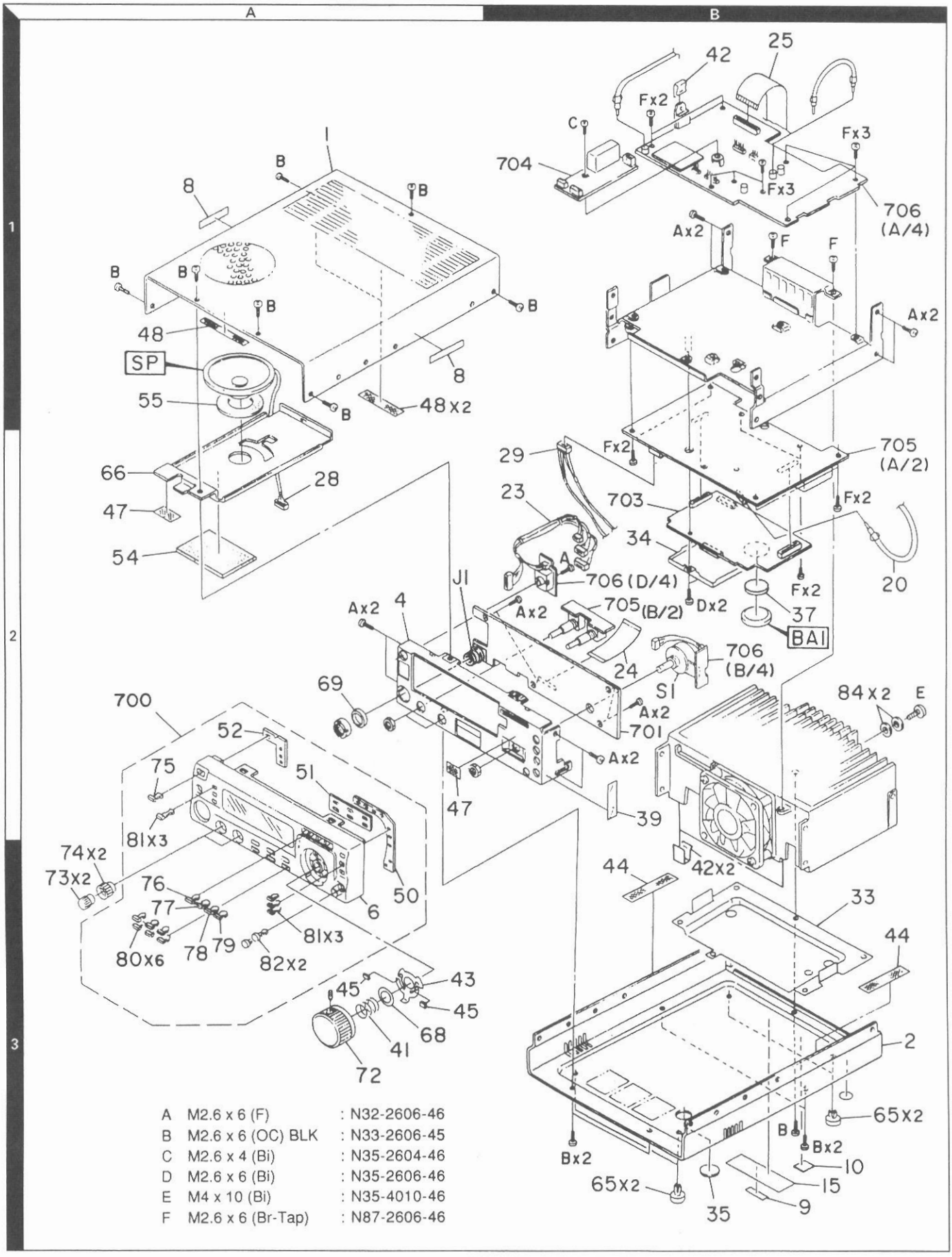
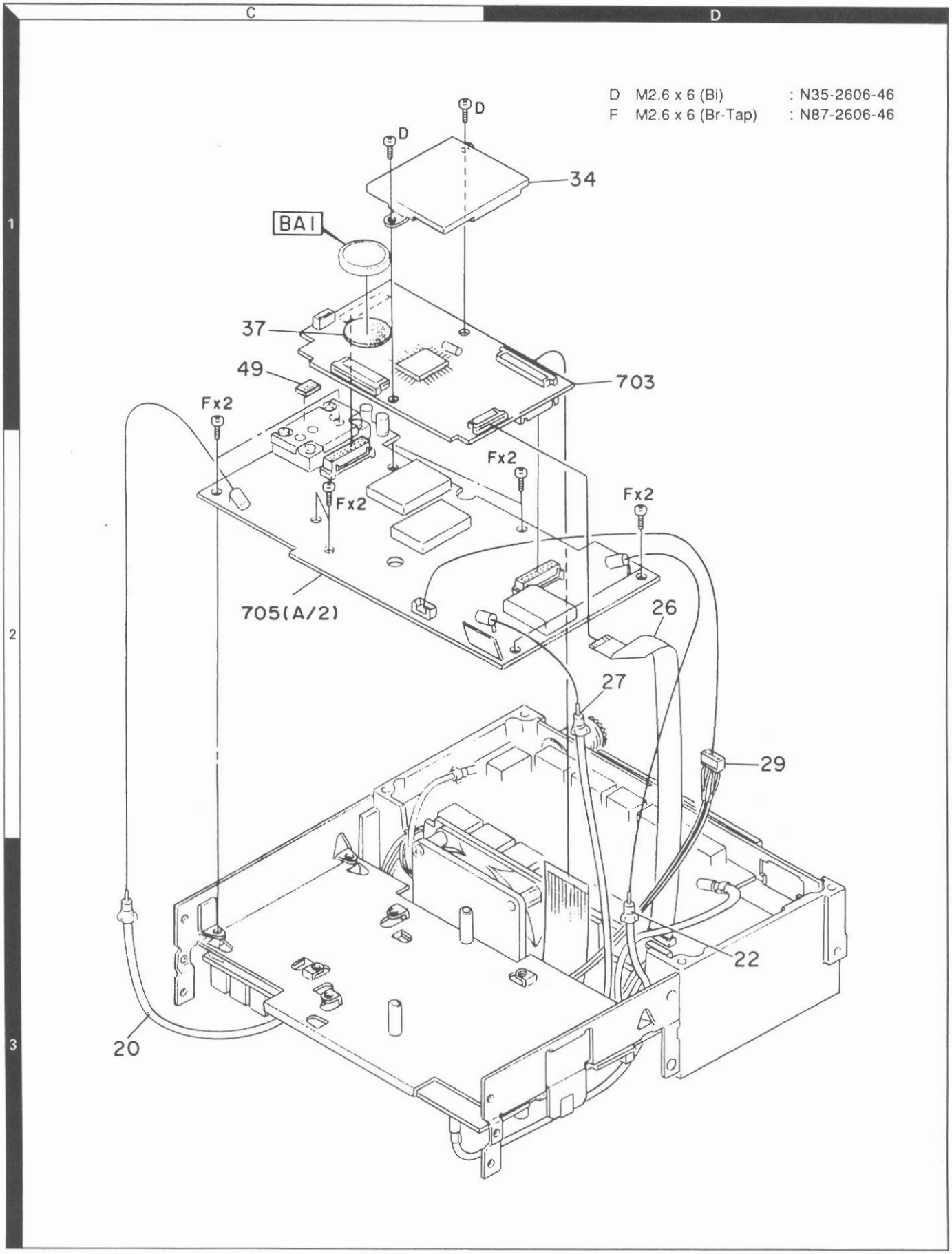
EXPLODED VIEW



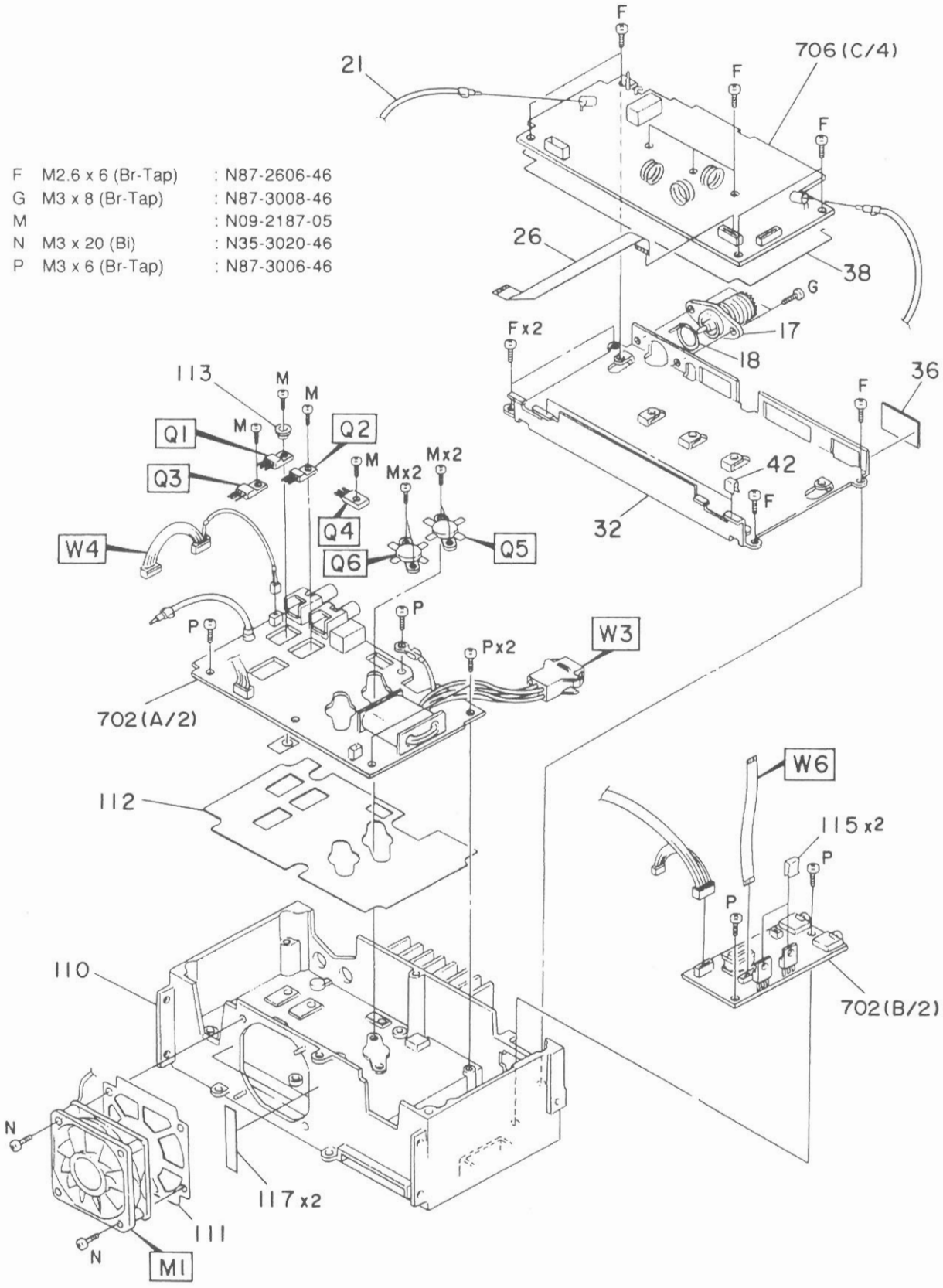
A	M2.6 x 6 (F)	: N32-2606-46
B	M2.6 x 6 (OC) BLK	: N33-2606-45
C	M2.6 x 4 (Bi)	: N35-2604-46
D	M2.6 x 6 (Bi)	: N35-2606-46
E	M4 x 10 (Bi)	: N35-4010-46
F	M2.6 x 6 (Br-Tap)	: N87-2606-46

EXPLODED VIEW

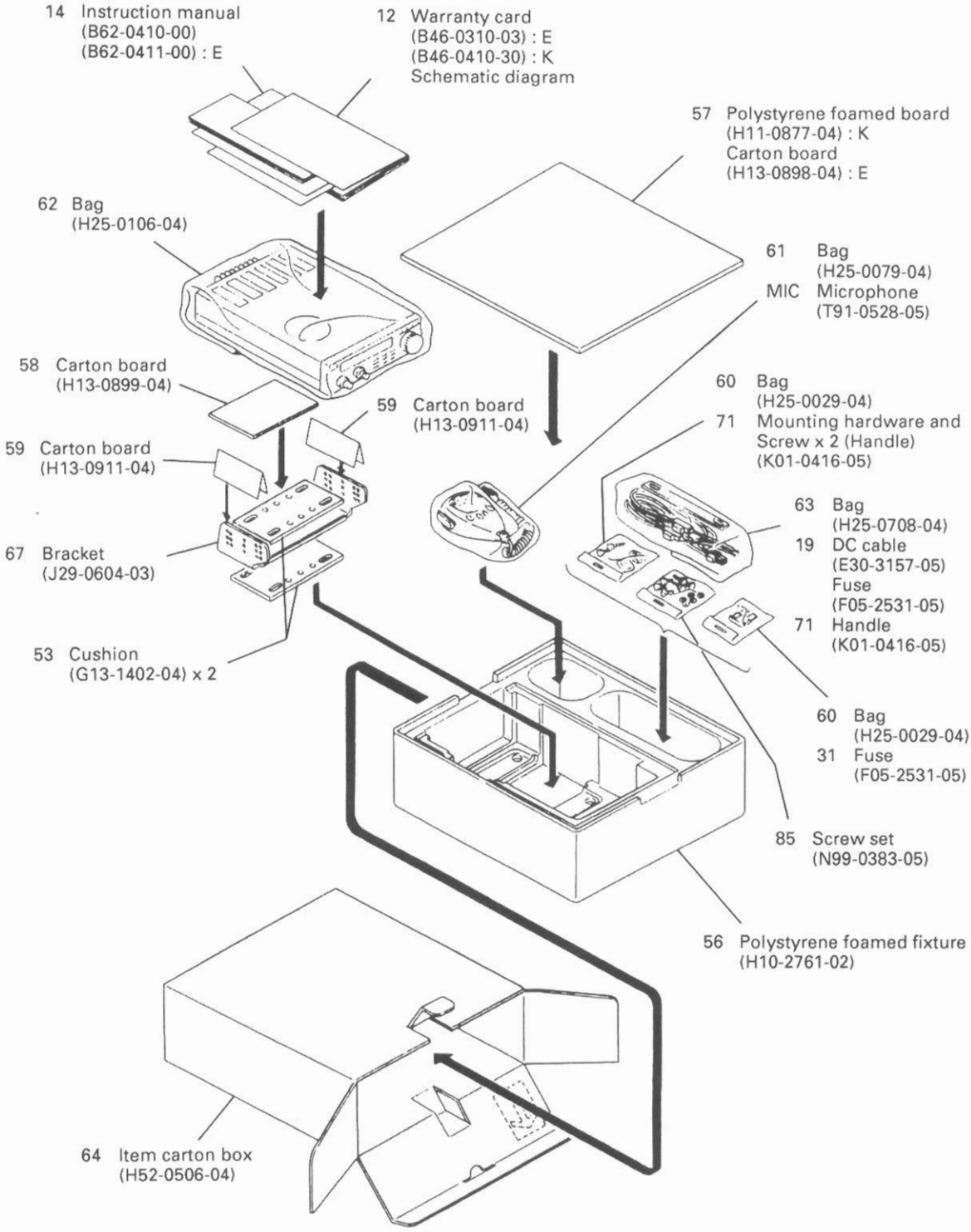


EXPLODED VIEW

F	M2.6 x 6 (Br-Tap)	: N87-2606-46
G	M3 x 8 (Br-Tap)	: N87-3008-46
M		: N09-2187-05
N	M3 x 20 (Bi)	: N35-3020-46
P	M3 x 6 (Br-Tap)	: N87-3006-46



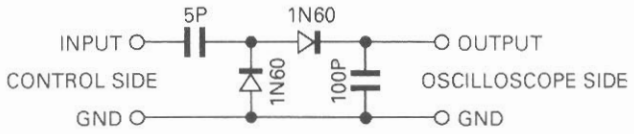
PACKING


14 Instruction manual
(B62-0410-00)
(B62-0411-00) : E
12 Warranty card
(B46-0310-03) : E
(B46-0410-30) : K
Schematic diagram
57 Polystyrene foamed board
(H11-0877-04) : K
Carton board
(H13-0898-04) : E
62 Bag
(H25-0106-04)
61 Bag
(H25-0079-04)
MIC Microphone
(T91-0528-05)
58 Carton board
(H13-0899-04)
59 Carton board
(H13-0911-04)
60 Bag
(H25-0029-04)
71 Mounting hardware and
Screw x 2 (Handle)
(K01-0416-05)
59 Carton board
(H13-0911-04)
63 Bag
(H25-0708-04)
19 DC cable
(E30-3157-05)
Fuse
(F05-2531-05)
67 Bracket
(J29-0604-03)
71 Handle
(K01-0416-05)
53 Cushion
(G13-1402-04) x 2
60 Bag
(H25-0029-04)
31 Fuse
(F05-2531-05)
85 Screw set
(N99-0383-05)
56 Polystyrene foamed fixture
(H10-2761-02)
64 Item carton box
(H52-0506-04)

ADJUSTMENT

Required Test Equipment

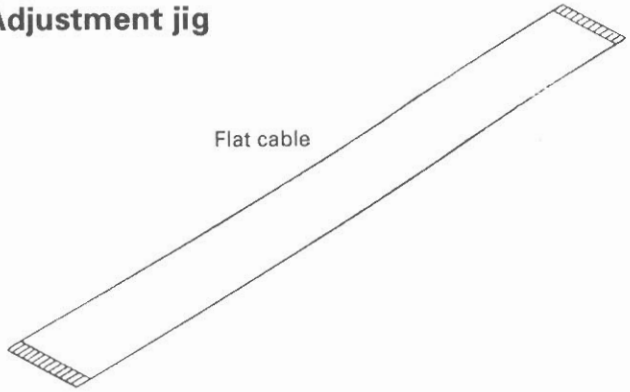
1. **DC Voltmeter (DC V.M)**
   1) Input resistance : More than 1MΩ
   2) Voltage range : 1.5 to 1000V AC/DC
   Note : A high-precision multimeter maybe used. However, accurate readings can not be obtained for high-impedance circuits.
2. **AC Ammeter**
   1) Current range : 1.5A, 3A, 20A, High-precision ammeter may be used.
3. **RF VTVM (RF V.M)**
   1) Input impedance : 1MΩ and less than 3pF, min.
   2) Voltage range : 10mV to 300V
   3) Frequency range : 10kHz to 100MHz or greate.
4. **AF Voltmeter (AF V.M)**
   1) Frequency range : 50Hz to 10kHz
   2) Input resistance : 1MΩ or greater
   3) Voltage range : 10mV to 30V
5. **AF Generator (AG)**
   1) Frequency range : 200Hz to 5kHz
   2) Output : 1mV or less to 1V, low distortion
6. **AF Dummy Load**
   1) Impedance : 8Ω
   2) Dissipation : 3W or greater
7. **Oscilloscope (SCOPE)**
   Vertical amplifier which has frequency characteristics higher than 100MHz.
   Requires high sensitivity, and external synchronization capabiliity.
8. **Tracking Generator**
   1) Center frequency : 50kHz to 90MHz
   2) Frequency deviation : Maximum ±35MHz
   3) Output voltage : 0.1V or greater
   4) Sweep rate : At least 0.5sec/cm
9. **Standard Signal Generator (SSG)**
   1) Frequency range : 50kHz to 500MHz
   2) Output : –133dBm/0.05μV to 7dBm/0.5μV
   3) Output impedance : 50Ω
   4) AM and FM modulation can be possible
   Note : Generator must be frequency stable.
10. **Frequency Counter (f. counter)**
    1) Minimum input voltage : 50mV
    2) Frequency range : 500MHz or greater
    3) Output impedance : 50Ω
11. **Noise Generator**
    Must generate ignition noise containing harmonics beyond 60MHz.
12. **RF Dummy Load**
    1) Impedance : 150Ω
    2) Dissipation : 150W or greater
13. **Power Meter**
    1) Impedance : 50Ω
    2) Dissipation : 150W continuous or greater
    3) Frequency limits : 60MHz or greater
14. **Spectrum Analyzer**
    1) Frequency range : 100kHz to 500MHz or greater
    2) Bandwidth : 1kHz to 3MHz
15. **Detector**
    1) For adjustment of PLL/VCO BPF

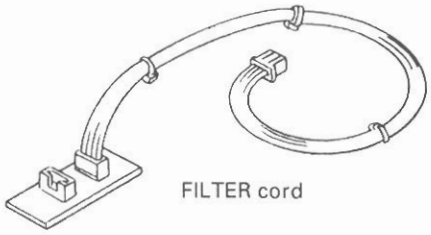


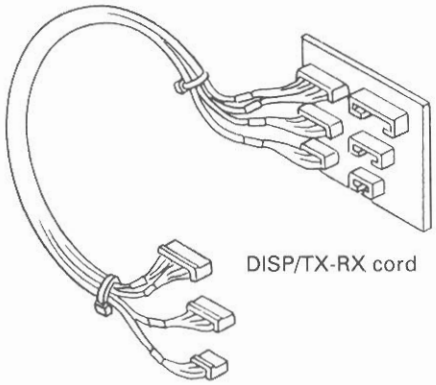
16. **Directional Coupler**
17. **Power Supply**
    PS-33, PS-53
18. **Microphone**
    MC-47
19. **Adjustment jig**
    EXtension cable (Use in common with TS-50S)

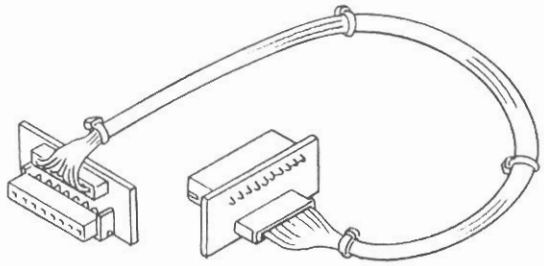
ADJUSTMENT

Adjustment jig

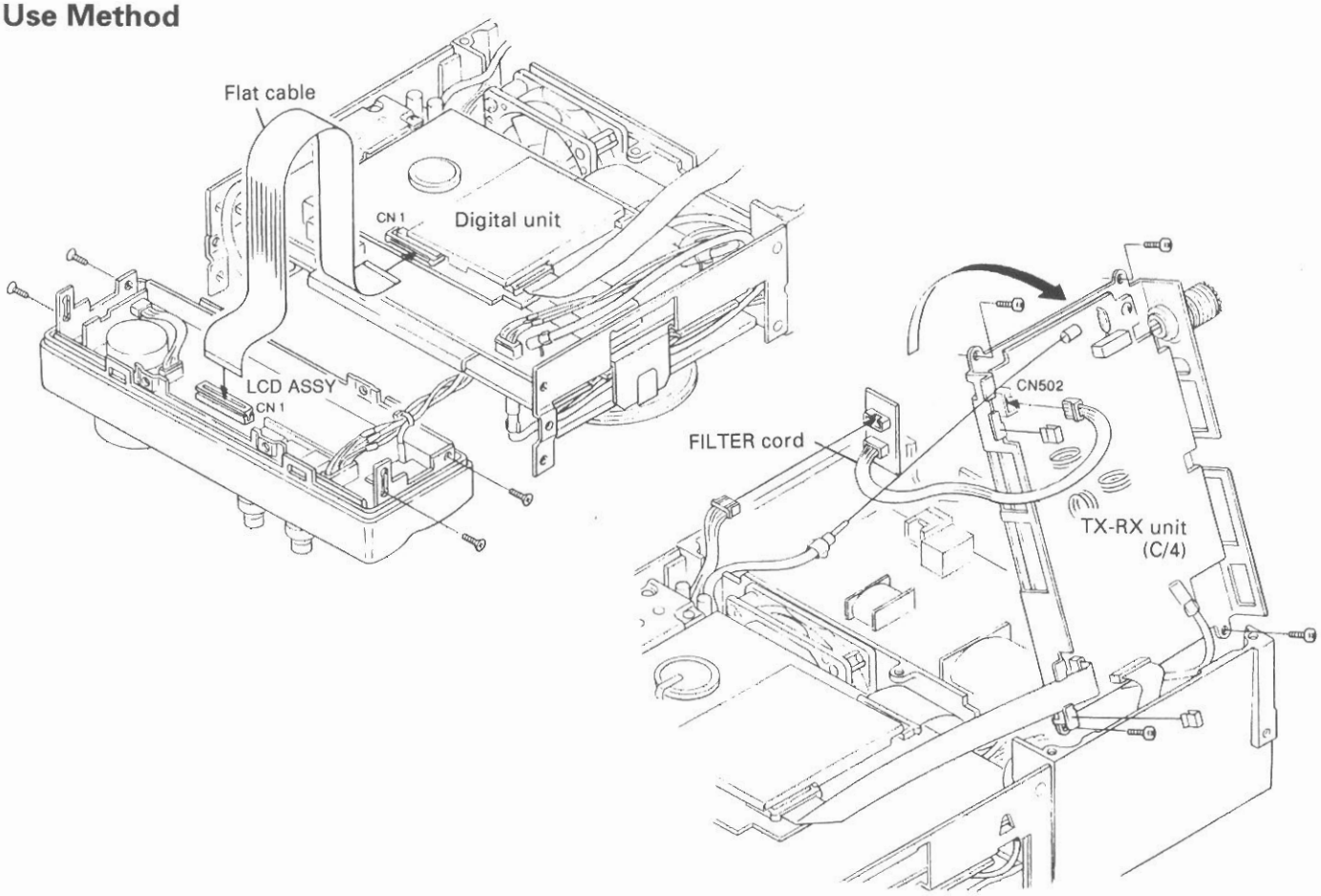




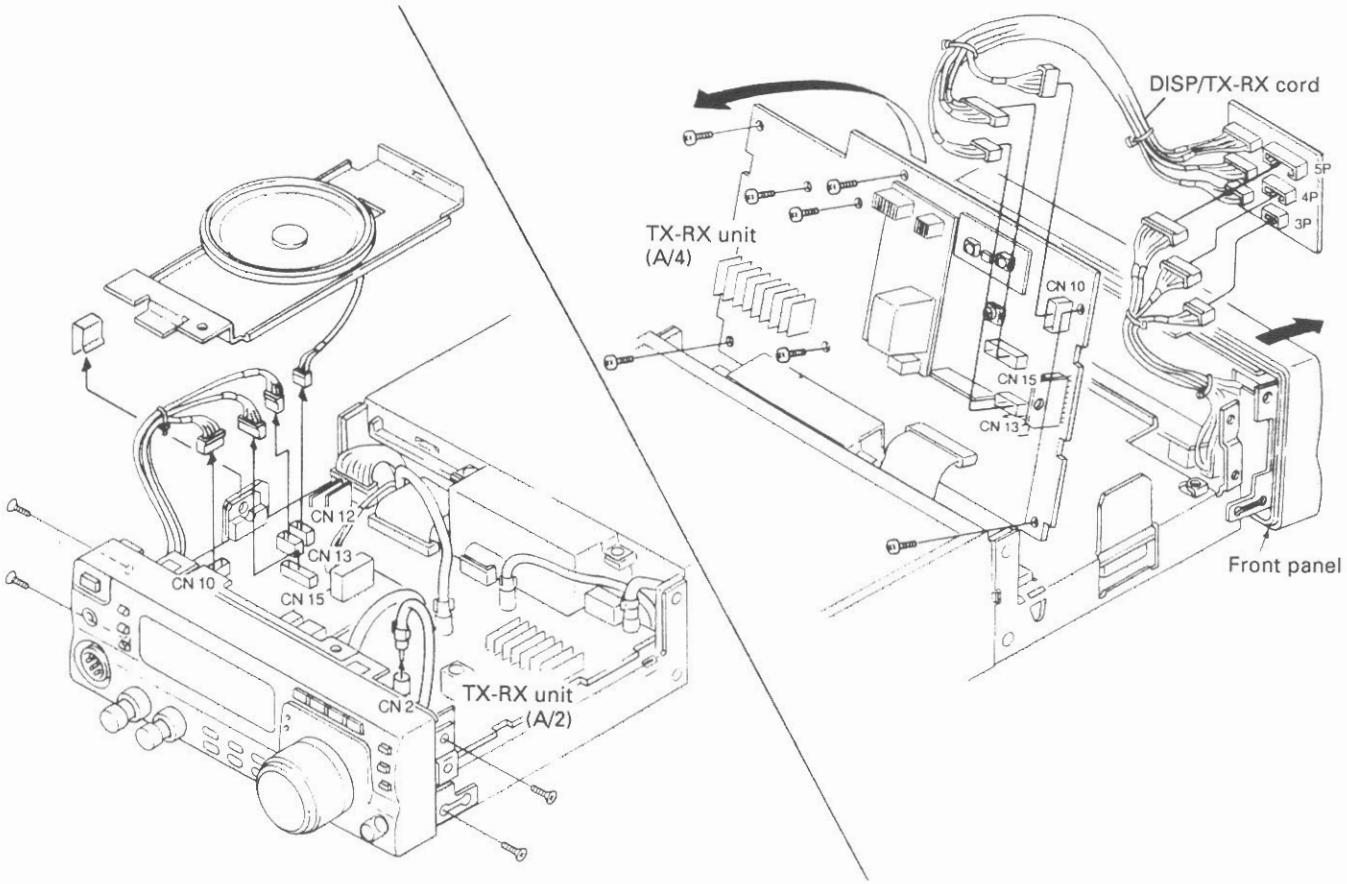


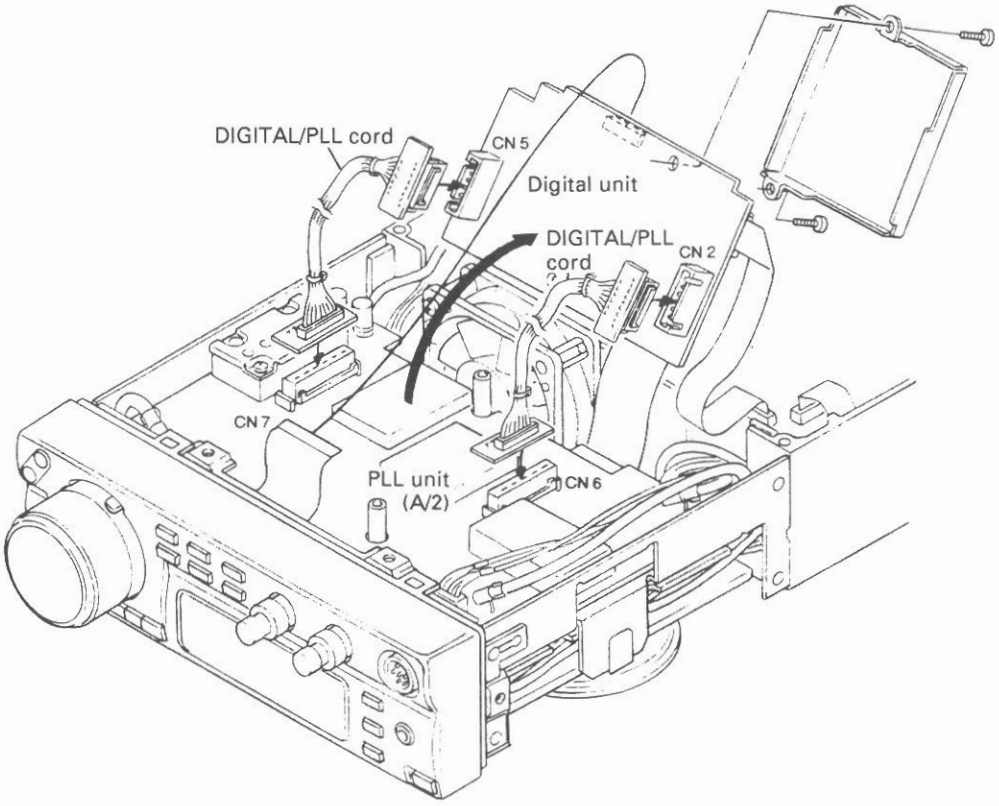


Use Method



ADJUSTMENT


DISP/TX-RX cord
5P
4P
3P
TX-RX unit
(A/4)
CN 10
CN 15
CN 13
Front panel
CN 12
CN 13
CN 10
CN 15
CN 2
TX-RX unit
(A/2)


DIGITAL/PLL cord
CN 5
Digital unit
DIGITAL/PLL
cord
CN 2
CN 7
PLL unit
(A/2)
CN 6

ADJUSTMENT

Service Adjustment Mode

- **Functions**

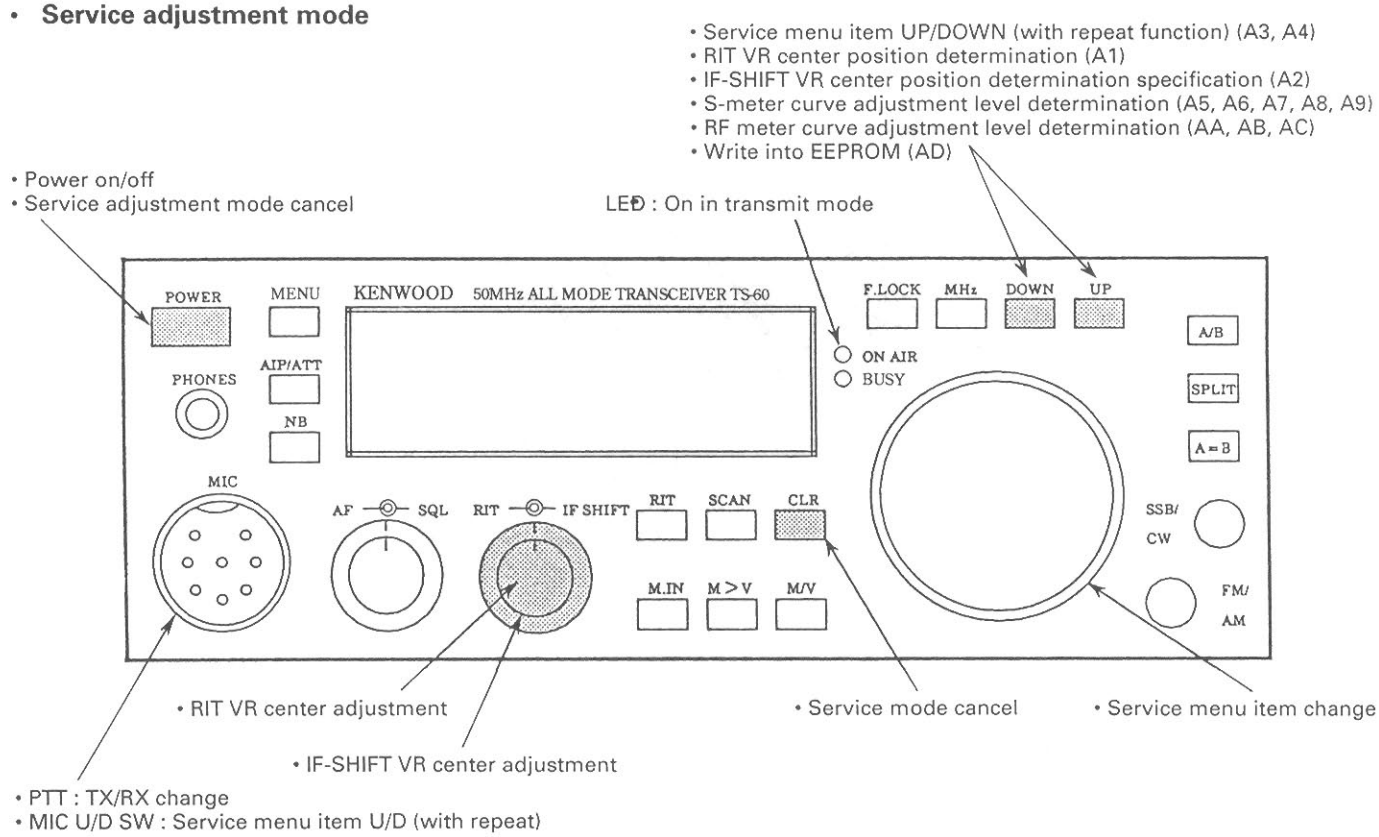
1) Only the adjustment items on the service adjustment mode menu are set in service adjustment mode.
2) Adjusted data items A1 to AC in service adjustment mode are stored in the EEPROM.
3) When you enter service adjustment mode, data is read from the EEPROM into the RAM of the microcomputer. You can then modify the settings.
4) The EEPROM is updated only when a write operation is performed with the UP/DOWN key when in menu AD.
5) Two sets of the same data are written into the EEPROM to check whether the data has been written correctly. Data may not be written correctly if the power is turned off during writing.
6) When the power is turned on, the two sets of data are compared. If they are not the same, "Error" is displayed, not HELLO, and the default values for the unmatched data are used.
7) Adjusted menu numbers are backed up.
8) The following items are changed as shown to perform adjustment correctly in service adjustment mode. (When service adjustment mode ends, the original state returns.)
   IF SHIFT → Center (0Hz)
   RIT → OFF
   AIP, ATT → OFF
   NB → OFF
   AGC → FAST
   Transmit/receive carrier point correction → Center (0Hz)
   Power → Hi
   Filter FM mode (RX) → OFF
   Other mode → 2.4k
9) A short tone is output when an item is changed with the UP/DOWN key. It is not output when repeating.

- **Setting**

1) Hold down the NB and MHz keys and switch the power on. (Turn the encoder to change the menu number.)
2) When the UP or DOWN key is pressed, the menu number is set.
3) Menu numbers A1 to A9 and AA to AC can be used in adjustment mode.
4) Press the CLR key to cancel adjustment mode. (It is also canceled when the power is turned off.)

Panel Operation

- **Service adjustment mode**



ADJUSTMENT

Service Adjustment Mode Menu

Menu No.	Menu contents	State (display)	Initial value
A0	Checksum display	–	–
A1	RIT VR machine center correction	00~FF	80
A2	IF-SHIFT VR machine center correction	00~FF	80
A3	LSB carrier point adjustment	–400~+400	0
A4	USB carrier point adjustment	–400~+400	0
A5	S-meter curve adjustment (non- FM) S1	00~FF	2E
A6	S-meter curve adjustment (non- FM) S9	00~FF	73
A7	S-meter curve adjustment (non- FM) Full scale	00~FF	C2
A8	S-meter curve adjustment (FM) Start	00~FF	91
A9	S-meter curve adjustment (FM) Full scale	00~FF	CC
AA	RF meter curve adjustment (low)	00~FF	3C
AB	RF meter curve adjustment (middle)	00~FF	80
AC	RF meter curve adjustment (high)	00~FF	B1
AD	Write into EEPROM	ready run good error	ready
AE	All LCD segments on	All segments on	All segments on

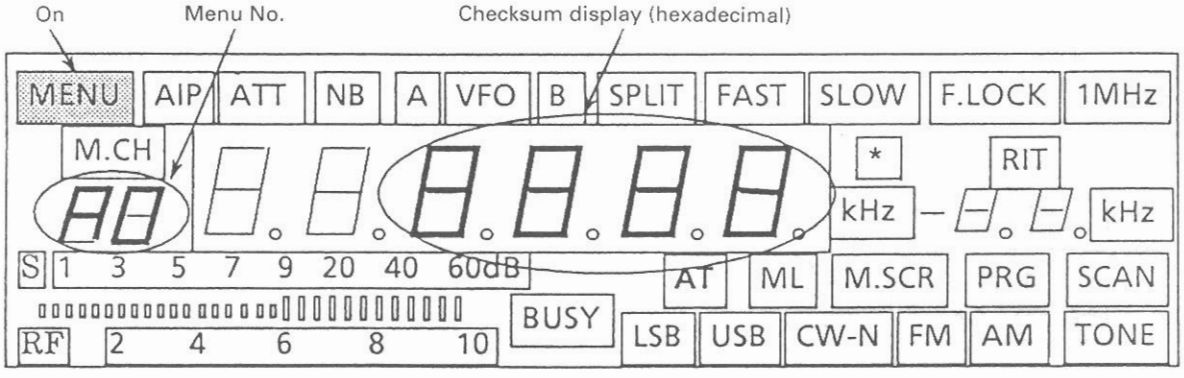
A0 : Checksum Display

- **Adjustment function**

  Displays the version of the installed program.

  Displays the two low-order bytes of the checksum obtained by adding all program codes.

- **Display**



All other indicators are off.

ADJUSTMENT

A1 : RIT VR Mechanical Center Correction

- **Adjustment function**

Input the RIT control center position to the microcomputer so that the RIT frequency is zero when the RIT control is at its center position.

- **Adjustment procedure**

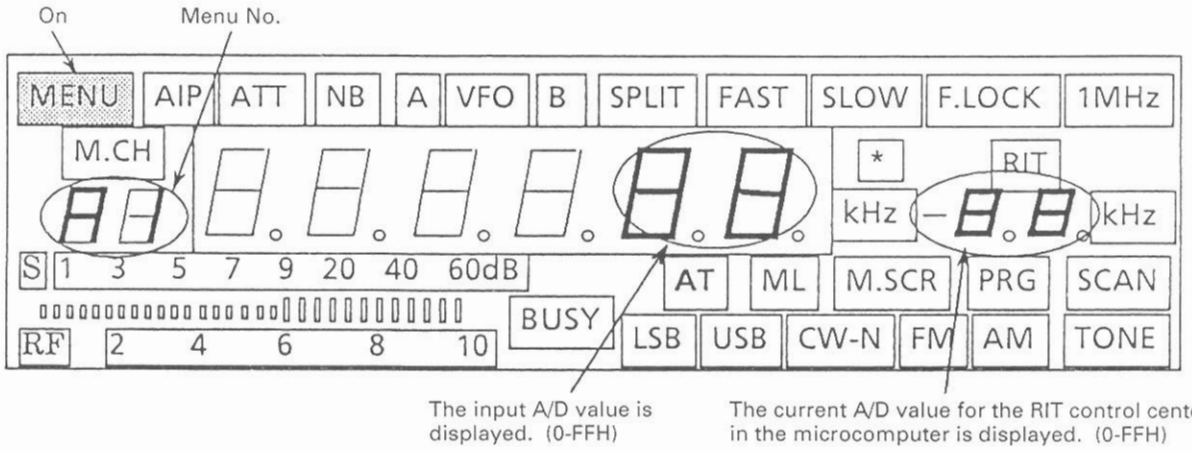
1. Set the RIT control to its center position.
2. Press the UP or DOWN key.

- **Remarks**

The center can be input unconditionally without pressing the UP/DOWN key. However, the UP/DOWN key must be pressed to prevent this menu item data from being modified accidentally when the RIT control is not at the center position.

When the UP/DOWN key is pressed, data is updated and the two displays match.

- **Display**



A2 : IF-SHIFT VR Mechanicale Center Correction

- **Adjustment function**

Input the IF-SHIFT control center position to the microcomputer so that the IF-SHIFT frequency is zero when the IF-SHIFT control is at its center position.

- **Adjustment procedure**

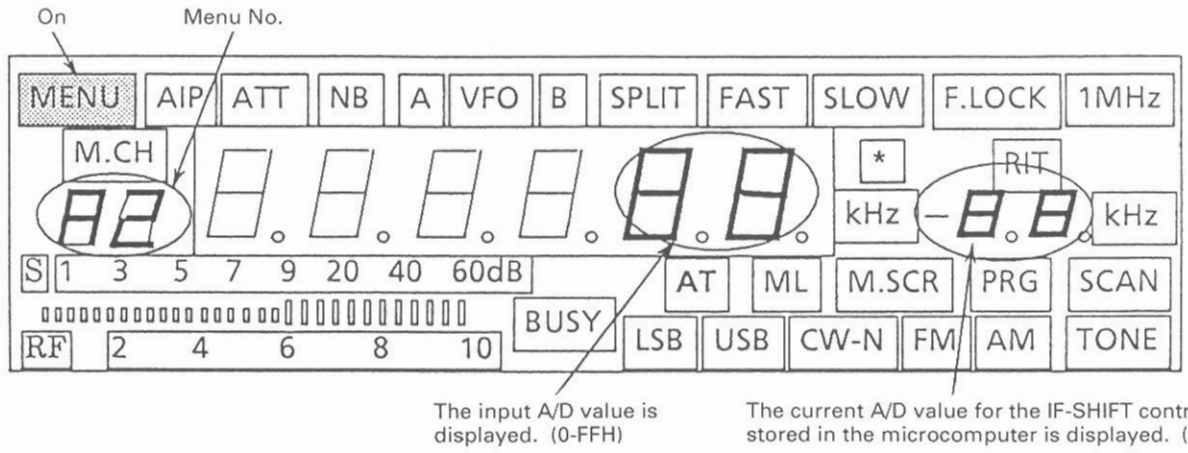
1. Set the IF-SHIFT control to its center position.
2. Press the UP or DOWN key.

- **Remarks**

The center can be input unconditionally without pressing the UP/DOWN key. However, the UP/DOWN key must be pressed to prevent this menu item data from being modified accidentally when the IF-SHIFT control is not at the center position.

When the UP/DOWN key is pressed, data is updated and the two displays match.

- **Display**



ADJUSTMENT

A3 : LSB Carrier Point Adjustment

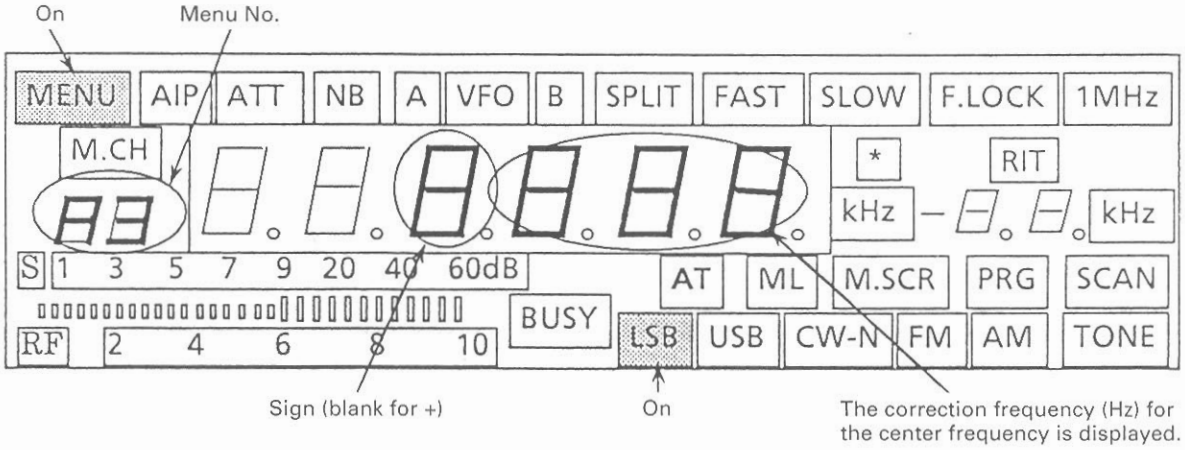
- **Adjustment function**

Adjust the carrier point in 10-Hz steps to correct variations in the center frequency of the IF filter in LSB mode.

- **Adjustment procedure**

1. Press the PTT button to enter transmit mode.
2. Change the correction frequency with the UP/DOWN key or MIC UP/DOWN key.

- **Display**



- **Remarks**

The plus sign (+) indicates the direction of moving away from the carrier. (Same as IF-SHIFT)

The frequency and mode are forcibly changed to 51.9MHz and LSB.

A4 : USB Carrier Point Adjustment

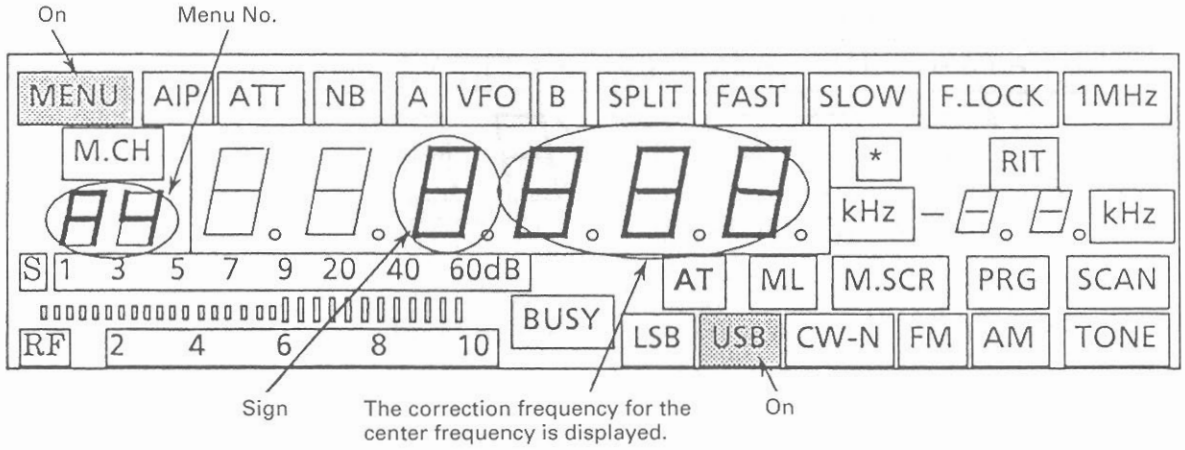
- **Adjustment function**

Adjust the carrier point in 10-Hz steps to correct variations in the center frequency of the IF filter in USB mode.

- **Adjustment procedure**

1. Press the PTT button to enter transmit mode.
2. Change the correction frequency with the UP/DOWN key or MIC UP/DOWN key.

- **Display**



- **Remarks**

The plus sign (+) indicates the direction of moving away from the carrier. (Same as IF-SHIFT)

The frequency and mode are forcibly changed to 51.9MHz and USB.

ADJUSTMENT

A5 : S-meter Curve Adjustment (S1) (non- FM)

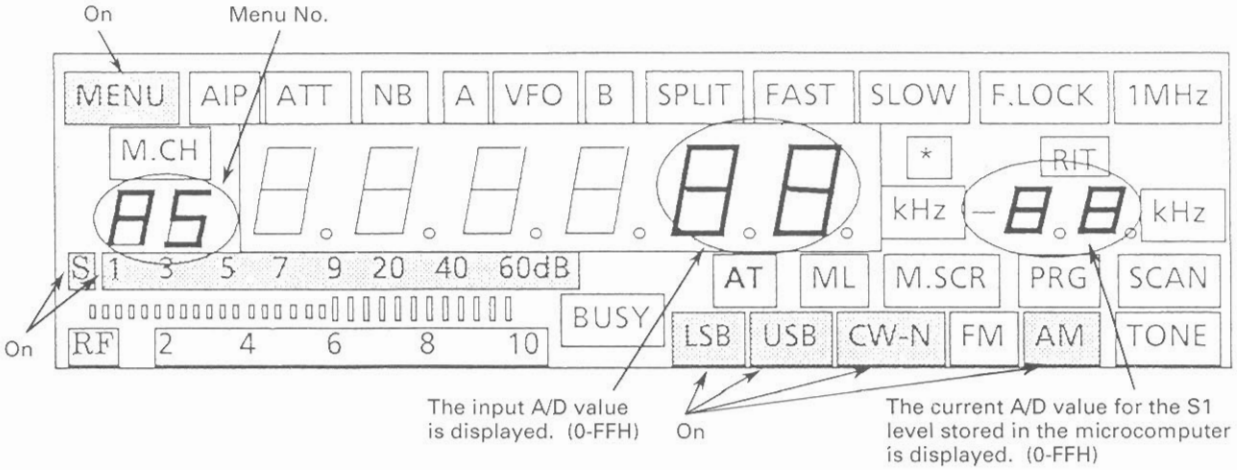
- **Adjustment function**

Input the S-meter voltage at which two bars of the S-meter light to the microcomputer to correct variations in the S1 level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

The threshold is the input level minus the fixed value (6). When the input signal exceeds the threshold, one bar of the S-meter lights. The curve between S1 and S9 is obtained from the level for menus A5 and A6 by line approximation. Only the A/D values for the S1, S9, and full-scale levels are stored in the EEPROM. The meter bars operate according to the currently set curve: The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

A6 : S-meter Curve Adjustment (S9) (non- FM)

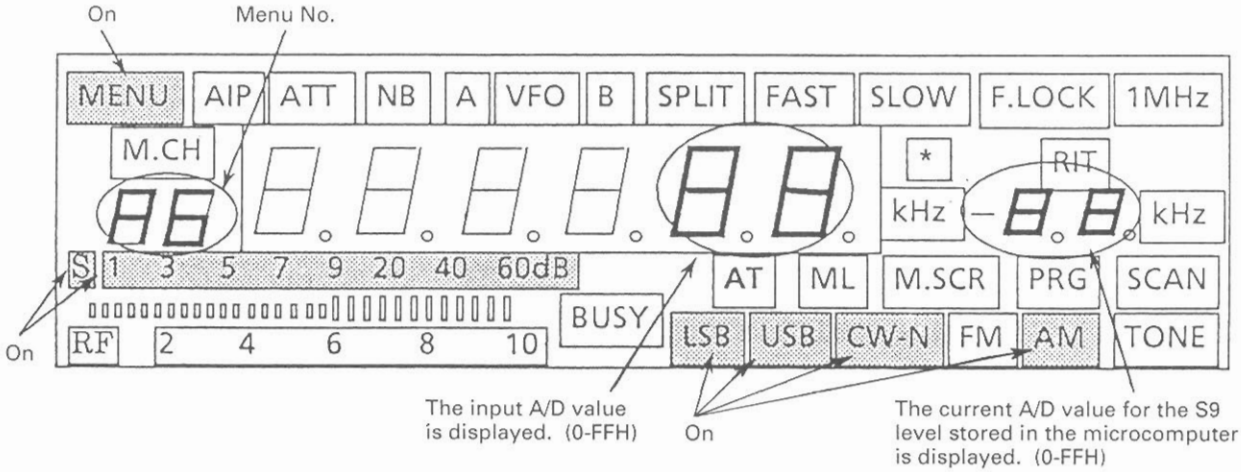
- **Adjustment function**

Input the S-meter voltage that indicates S9 (the first large segment) to correct variations in the S9 level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

The curve between S1 and S9 is obtained from the level for menus A5 and A6 by line approximation. The curve between S9 and full scale is obtained from the level for menus A6 and A7 by line approximation. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

ADJUSTMENT

A7 : S-meter Curve Adjustment (Full scale) (non- FM)

- **Adjustment function**

Input the S-meter voltage at which all the segments of the S- meter light to correct variations in the full-scale level of the S-meter.

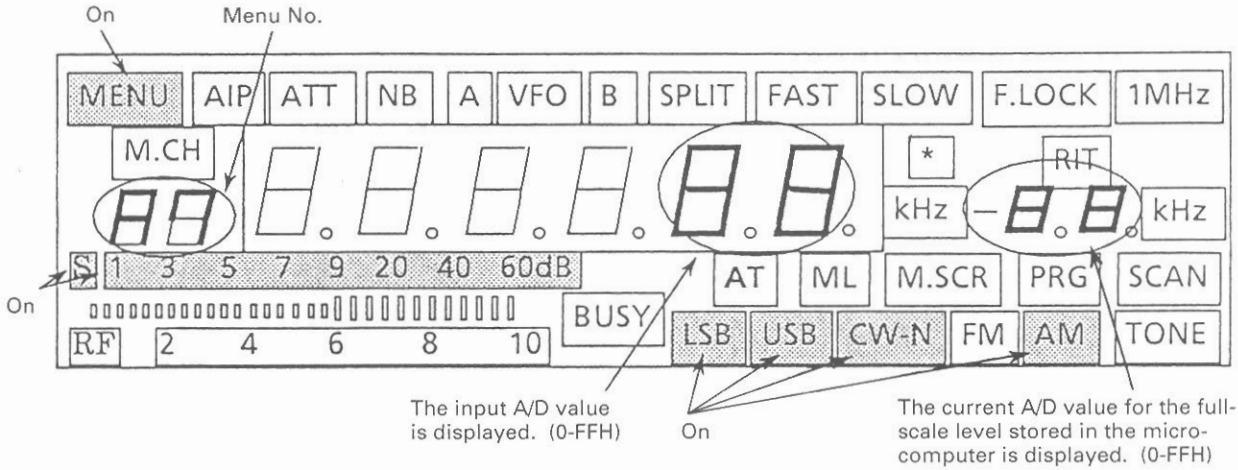
- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Remarks**

The curve between S9 and full scale is obtained from the level for menus A6 and A7 by line approximation. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

- **Display**



A8 : S-meter Curve Adjustment (S1) (FM)

- **Adjustment function**

Input the S-meter voltage at which two bars of the S-meter light to the microcomputer to correct variations in the S1 level of the S-meter.

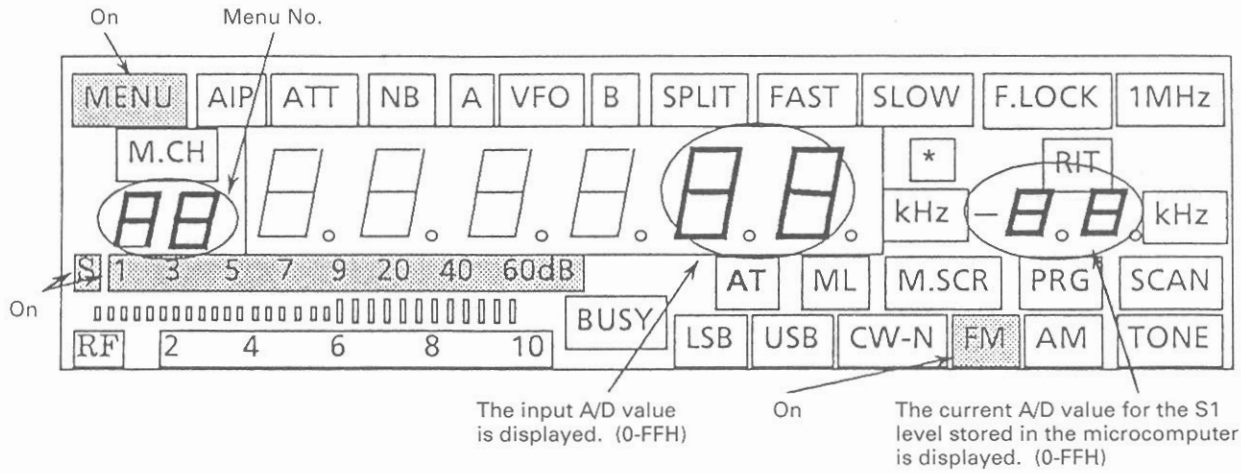
- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Remarks**

The threshold is the input level minus the fixed value (12). When the input signal exceeds the threshold, one bar of the S-meter lights. The curve between S1 and full scale is obtained from the level for menus A8 and A9 by line approximation. Only the A/D values for the S1 and full-scale levels are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and FM.

- **Display**



ADJUSTMENT

A9 : S-meter Curve Adjustment (Full scale) (FM)

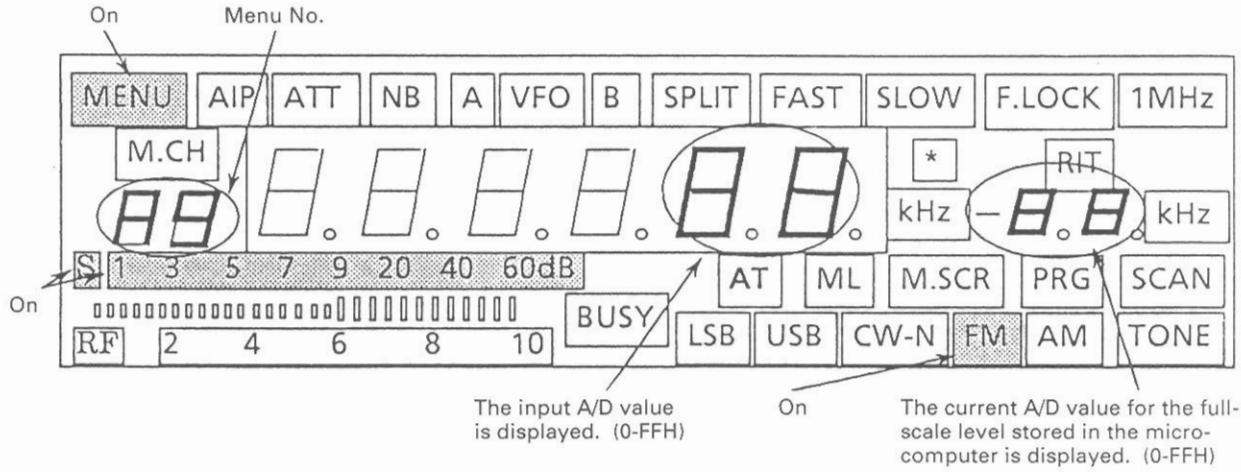
- **Adjustment function**

Input the S-meter voltage at which all the segments of the S- meter light to correct variations in the full-scale level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

Only the A/D values for S1 and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and FM.

AA : RF Meter Curve Adjustment (Low)

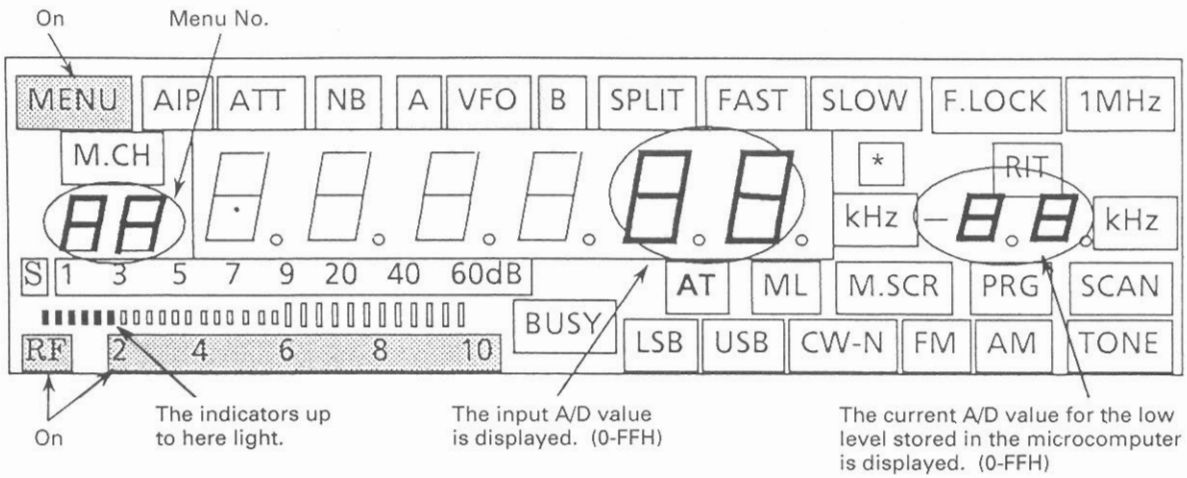
- **Adjustment function**

Input the RF meter voltage at which six segments of the RF meter light to the microcomputer to correct variations in the low level of the RF meter.

- **Adjustment procedure**

1. Input the specified level with the AG from MIC connector.
2. Transmit.
3. Press the UP or DOWN key.

- **Display**



- **Remarks**

The threshold for the RF meter registering a signal is the input level minus the fixed value (21H). The curve is obtained from the level for menu AA and the start level by line approximation. The curve between 2 and 6 is obtained from the level for menus AA and AB by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

ADJUSTMENT

AB : RF Meter Curve Adjustment (Middle)

- **Adjustment function**

Input the RF meter voltage for segment 6 (the first large segment) to the microcomputer to correct variations in the middle level of the RF meter.

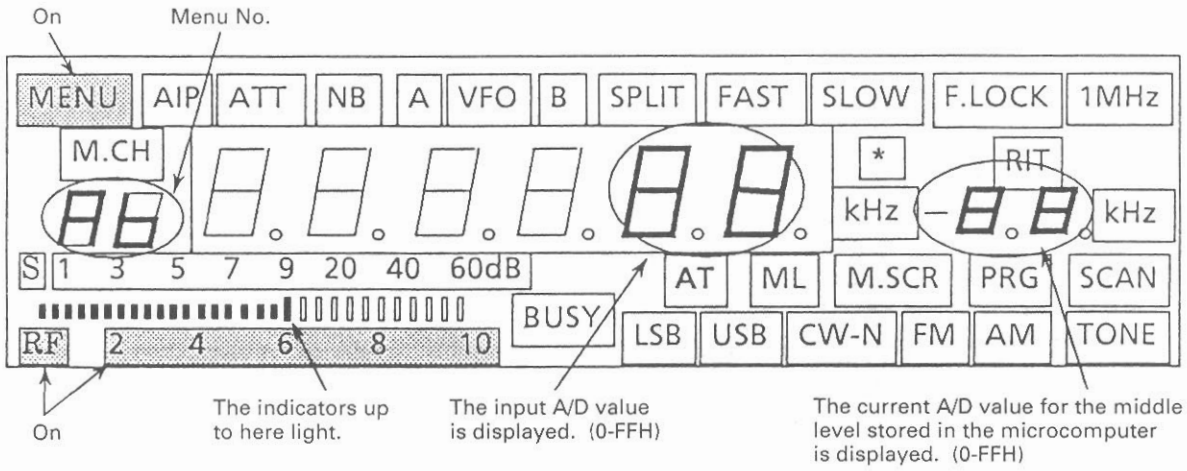
- **Adjustment procedure**

1. Input the specified level with the AG.
2. Transmit.
3. Press the UP or DOWN key.

- **Remarks**

The curve between 2 and 6 is obtained from the level for menus AA and AB by line approximation. The curve between 6 and full scale is obtained from the level for menus AB and AC by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

- **Display**



AC : RF Meter Curve Adjustment (High)

- **Adjustment function**

Input the RF meter voltage at which all the segments of the RF meter light to the microcomputer to correct variations in the full-scale level of the RF meter.

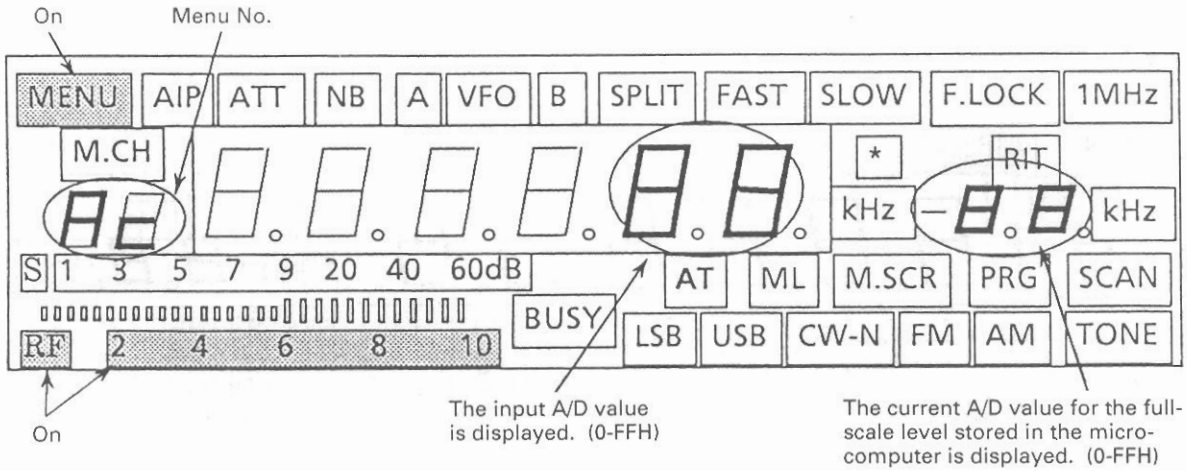
- **Adjustment procedure**

1. Input the specified level with the AG.
2. Transmit.
3. Press the UP or DOWN key.

- **Remarks**

The curve between 6 and full scale is obtained from the level for menus AB and AC by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

- **Display**



ADJUSTMENT

AD : Write into EEPROM

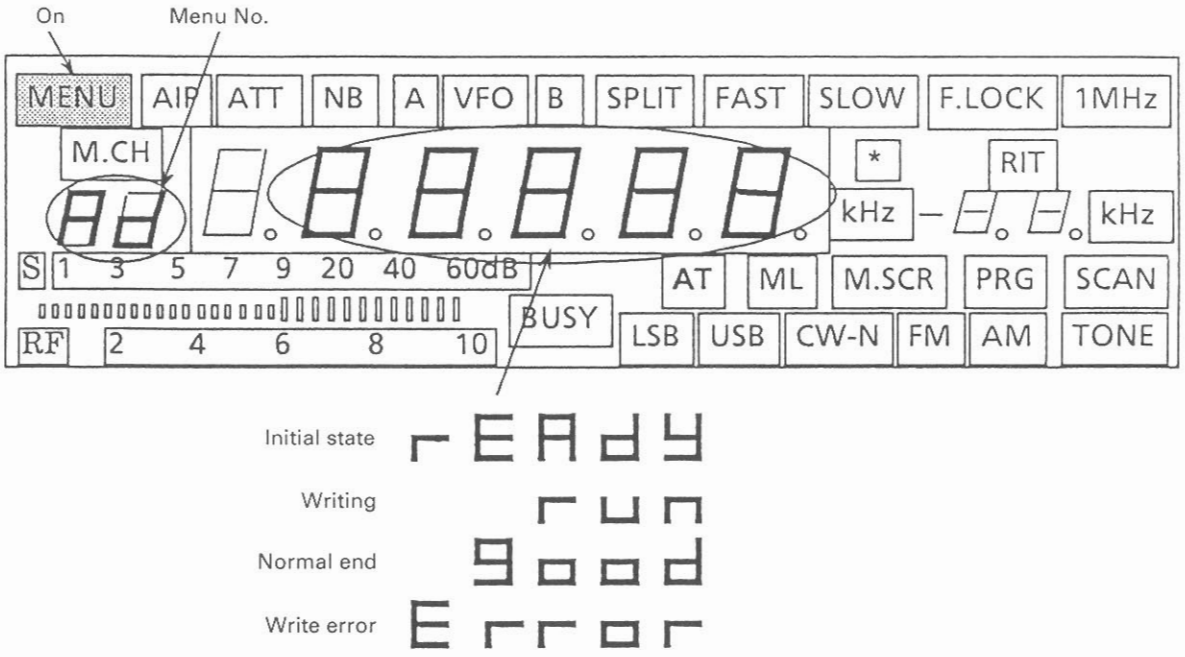
- **Adjustment function**
  Write data into the EEPROM.

- **Adjustment procedure**

1. Press the UP/DOWN key when "ready" is displayed.
2. While data is being written, "run" is displayed.
3. If the data is written correctly, "good" is displayed.
4. If a write error occurs, "error" is displayed.
   Press the UP/DOWN key again.
   If "error" is displayed repeatedly, check the EEPROM or other hardware for defects.

- **Remarks**
  Writing is performed unconditionally (even if nothing has been changed). Two sets of the same data are written into the EEPROM. "good" is displayed only when both sets of data have been written normally. The UP/DOWN key is effective only when "ready" or "error" is displayed, and does not have the repeat function.

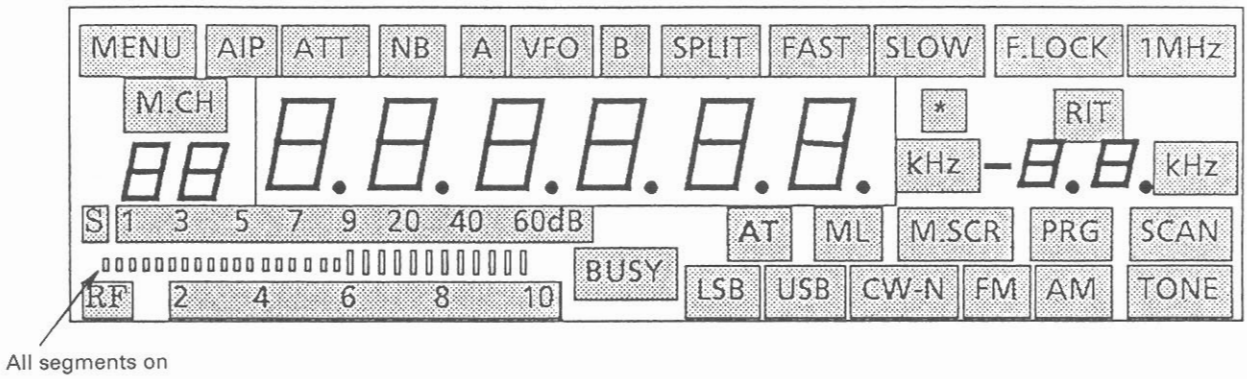
- **Display**



AE : All LCD Segments On

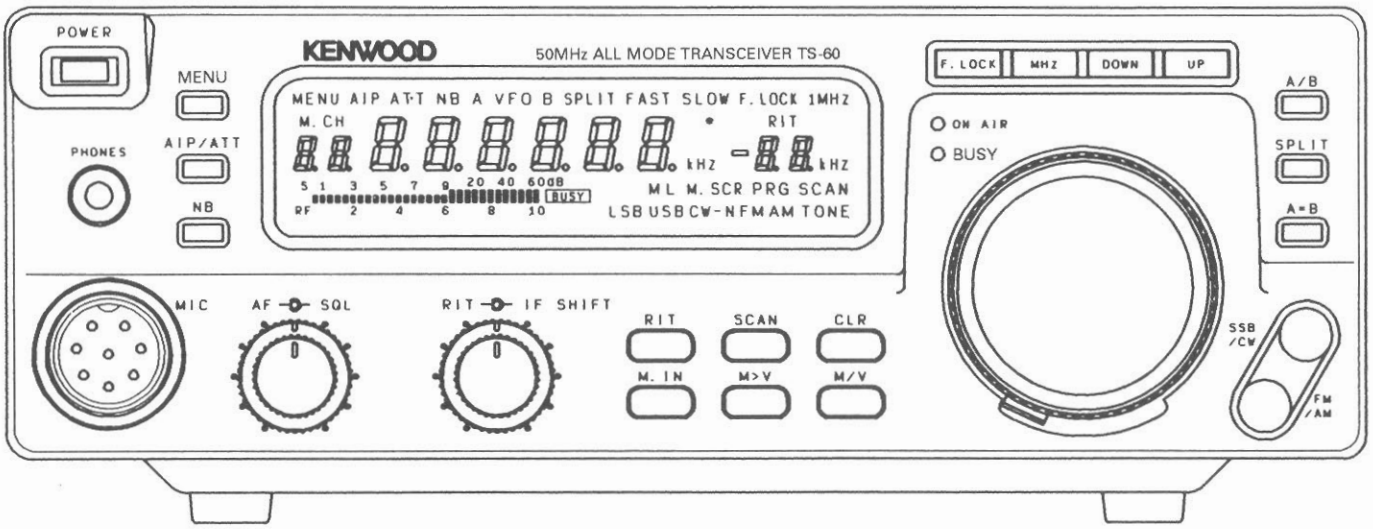
- **Adjustment function**
  Check LCD cells and rubber connector connection.

- **Display**

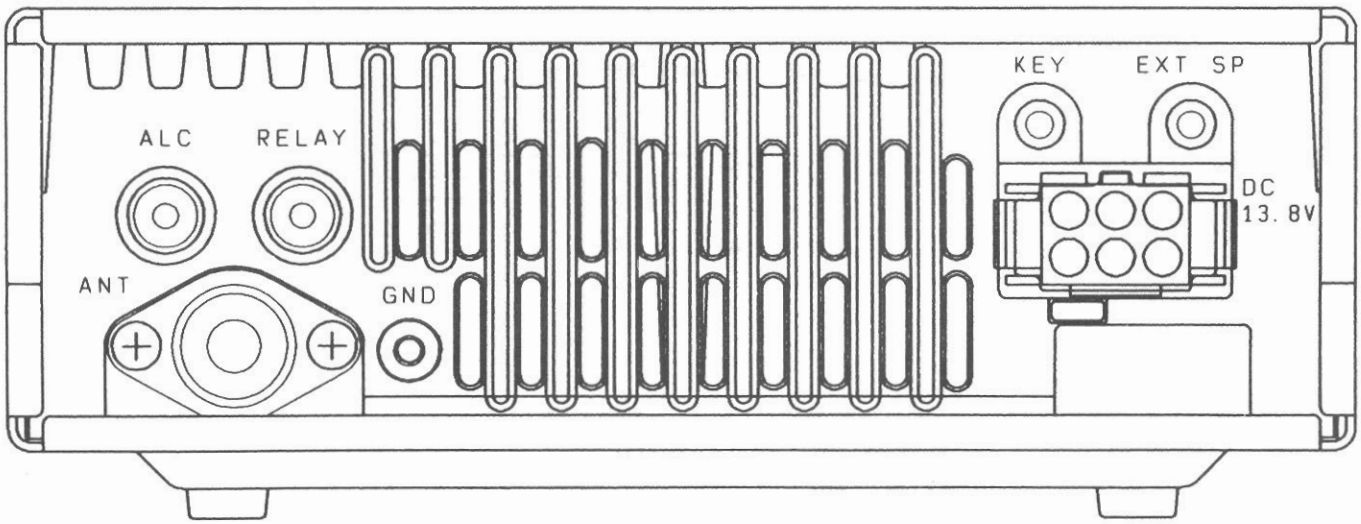


ADJUSTMENT

Front Panel



Rear Panel

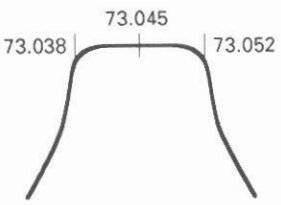


ADJUSTMENT

PLL and CAR Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC IN : 13.8V RIT VR : Center IF SHIFT VR : Center							
2. Reference OSC	1) MODE : FM	f. counter	PLL	TP1	PLL	TC1	20.000.00MHz	±20Hz
3. L28, 29 (80MHz)	1) MODE : FM	RF V.M		IC5-2 pin		L28 L29	Peak	
4. L21, 22, 23 (75.045~ 75.545MHz)	1) Frequency : 51.900MHz MODE : FM	RF V.M		TP3		L21~ L23	Peak Align the core by screwing it in.	
5. Lock voltage	1) Frequency : 40.100MHz MODE : LSB	DC V.M		TP2	VCO	TC1	2.8V	±0.1V
	2) Frequency : 49.999MHz MODE : FM						Check	5.0~8.0V
	3) Frequency : 50.000MHz MODE : CW				VCO	TC2	2.8V	±0.1V
	4) Frequency : 59.999MHz **K** Frequency : 53.999MHz **E** MODE : FM						Check	5.0~8.0V **K** 3.5V or more **E**
6. 10.695MHz level	1) Frequency : 52.100MHz MODE : CW	RF V.M 50Ω dummy load		TP4	PLL	L27	–4dBm	±1.0dBm

Receiver Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RFG	1) Frequency : 52.100MHz MODE : FM	DC V.M	TX-RX	TP4	TX-RX (A/4)	VR4	2.9V	±0.03V
2. MCF	1) Frequency : 52.100MHz MODE : FM Tracking generator output : –30dBm Spectrum analyzer setting Center frequency : 73.045MHz Frequency span : 70kHz ATT : 10dB V. REF : 2dB/DIV	Spectrum analyzer Tracking generator		TP2 TP1		L15~ L17	Repeat 2~3 times. Adjust it to make gain maximum, and make the band flat as shown in the right.	
3. IF AMP	1) Frequency : 52.099MHz MODE : USB SSG ATT : 0.25~0.5μV (–119~–113dBm)	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX (A/4)	L66 L24~ L26, L28 IFT in IC3 (2 pcs)	Repeat 2~3 times. AF output MAX.	
4. MIX BAL	1) Frequency : 52.099MHz MODE : USB SSG RF : OFF AIP : OFF					VR1	AF output MIN.	
5. SSB S-meter (S1)	1) Frequency : 52.099MHz MODE : USB SSG RF : OFF	SSG	Rear panel	ANT	TX-RX (A/4)		Record voltage.	
	2) SSG ATT : 0.7μV (–110dBm)	DC V.M	TX-RX (A/4)	TP5		VR in IC3	Record voltage + 0.1V.	
	3) Service adjustment mode menu No. (S MENU No.) : A5 SSG ATT : 1μV (–107dBm)						UP or DOWN key : 1 push	S1 check
(S9)	4) S MENU No. : A6 SSG ATT : 20μV (–81dBm)							S9 check

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
(FULL)	5) S MENU No. : A7 SSG ATT : 20mV (–21dBm)	SSG	Rear panel	ANT			UP or DOWN key : 1 push	Full scale check
6. FM S-meter (S1)	1) Frequency : 52.100MHz MODE : FM SSG ATT : 0.5mV (–53dBm) MOD : 1kHz DEV : 3kHz	DC V.M	TX-RX (A/4)	TP5	TX-RX (A/4)	VR2	4.5V	±0.01V
	2) S MENU No. : A8 SSG ATT : 0.5μV (–113dBm)	SSG	Rear panel	ANT			UP or DOWN key : 1 push	S1 check
(FULL)	3) S MENU No. : A9 SSG ATT : 5μV (–93dBm)							Full scale check
	4) SSG ATT : 4.5μV (–94dBm)						Check	Just before full scale.
7. Beep tone	1) AF VR : MIN SQL VR : MIN SSB/CW key : Push	DM. SP Oscilloscope	Rear panel	EXT. SP	TX-RX (A/4)	VR6	0.2Vp-p	±0.1Vp-p
8. NB	1) Frequency : 52.099MHz MODE : USB NB : ON	Noise G. DC V.M	PLL	TP5	PLL	L202 L203	Voltage MIN.	
							Adjust the noise generator output to S-meter 1 and 5 dots lights.	Noise disappears.
9. S/N (AIP : OFF)	1) Frequency and MODE : Indicated below However, USB : +1kHz LSB : –1kHz AF VR : 0.63V/8Ω	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP				
	Frequency / MODE / SSG ATT / SSG MOD / SSG DEV							
	40.100MHz **K** LSB 0.16μV (–123dBm) OFF						S/N measurement	10dB or more
	50.100MHz **E** LSB 0.16μV (–123dBm) OFF							
	52.100MHz AM 2.00μV (–101dBm) 1kHz 60%							
	52.100MHz USB 0.16μV (–123dBm) OFF							
	53.100MHz **E** USB 0.16μV (–123dBm) OFF							
	59.100MHz **K** USB 0.16μV (–123dBm) OFF							
	50.100MHz FM 0.25μV (–119dBm) 1kHz 3kHz						SINAD sensitivity measurement	12dB or more
10. Squelch (SSB)	1) Frequency : 52.099MHz MODE : USB SQL VR : 12 : 30 SSG RF : OFF	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX (A/4)	VR3	Set to the point squelch closes.	Knob position 10 : 00~14 : 00
	2) SSG ATT : 1.25μV (–105dBm)						Check	Squelch should open.
	3) SQL VR : MAX							Squelch should close.
	4) SSG ATT : 16μV (–83dBm) After checked, SQL VR : MIN							Squelch should open.
(FM)	5) Frequency : 52.100MHz MODE : FM SSG ATT : OFF				Front panel	SQL VR	Adjust SQL VR is slowly increase noise just goes off.	Knob position 8 : 00~12 : 00
	6) SSG ATT : 0.13μV (–125dBm)						Check	Squelch should open.
	7) SQL VR : MAX							Squelch should close.
	8) SSG ATT : 0.9μV (–108dBm) After checked, SQL VR : MIN							Squelch should open.
11. S-meter sensitivity	1) Frequency : 52.099MHz MODE : USB	SSG	Rear panel	ANT			S1 (two small dots lights)	Within 1μV (–107dBm) ± 6dB
							S9 (one large dot lights)	Within 20μV (–81dBm) ± 6dB
	2) Frequency : 52.100MHz MODE : FM						S-meter full scale (all dots lights)	Within 5μV (–93dBm) ± 6dB

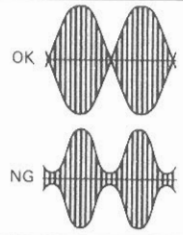
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. Noise	1) Frequency : 52.099MHz MODE : USB AF VR : MIN	SSG DM. SP. Oscilloscope AF V.M	Rear panel	ANT EXT. SP			Check	2mV/8Ω or less
13. Reset	1) POWER SW : OFF While pushing the A=B key POWER SW : ON						Reset display f. : 51.000.0kHz VFO : A MODE : FM	

Transmitter Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. ALC voltage	1) Frequency : 53.900MHz MODE : CW Remove the cable from CN19 to the TX-RX unit. Transmit	DC V.M 50Ω dymmy load	TX-RX (A/4) Rear panel	TP6 (ALC) ANT	TX-RX (A/4)	IC11-VR2	2.7V	±0.05V
2. TX AMP	1) Frequency : 53.900MHz MODE : CW Transmit	Synchro scope or Spectrum analyzer 50Ω dummy load	TX-RX (A/4) Rear panel	CN19 ANT	TX-RX (A/4)	L38~ L40 L44~ L46 L48	Repeat 2~3 times for MAX.	
3. MIX BIAS (CW level)	1) Frequency : 53.900MHz MODE : CW Transmit					VR12	Level MAX.	
	2) Transmit					VR11	Level MAX.	
(AM level)	3) MODE : AM Transmit After adjusted, CN19 connect.					VR10	Level MAX.	
4. Final idling current	1) Frequency : 51.900MHz MODE : USB Final unit VR1, VR2 : MIN Transmit	Power meter DC V.M	Rear panel	ANT	Final		Record current at VR1 and VR2 are MIN.	This current is total current.
						VR1	Total current + 250mA.	
						VR2	(Total current + 250mA) + 250mA.	
5. NULL	1) Frequency : 52.000MHz MODE : CW Transmit	DC V.M	TX-RX (C/4)	CN502-2	TX-RX (C/4)	TC501	Voltage MIN.	Reference value : 50mV or less
6. Power (HI)	1) Frequency : 52.000MHz MODE : CW Transmit	Power meter	Rear panel	ANT	TX-RX	VR14	95W	
(MID)	2) Frequency : 52.000MHz MODE : CW Transmit					VR16	45W	
(LOW)	3) Frequency : 52.000MHz MODE : CW Transmit					VR15	10W	
7. Power frequency response	1) Frequency : 53.900MHz MODE : CW Transmit				TX-RX (C/4)	VR501	MAX.	90W or more.
8. RF meter (FULL)	1) Frequency : 51.900MHz MODE : USB S MENU No. : AC TX output : 80W Transmit	Power meter AG	Rear panel Front panel	ANT MIC			UP or DOWN key : 1 push	Full scale check.

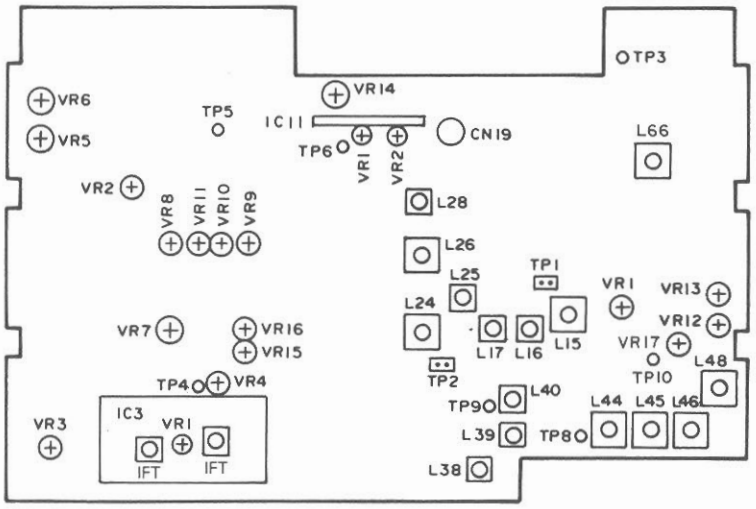
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
(2)	2) S MENU No. : AA TX output : 18W Transmit	Power meter	Rear panel	ANT			Up or DOWN key : 1 push	RF-meter "2" check.
(6)	3) S MENU No. : AB TX output : 40W Transmit	AG	Front panel	MIC				RF-meter "6" check.
9. CAR point	1) S MUNE No. : A3 or A4 (A3 : LSB, A4 : USB) AG1 : 300Hz/1.2mV AG2 : 2700Hz/2mV AG output : Level at which not activated. Transmit	Power meter Oscilloscope AG AF V.M	Rear panel Front panel	ANT MIC			Adjust so that wave-form cross by UP and DOWN key.	
10. Suppression	1) Frequency : 52.000MHz MODE : USB Transmit	Power meter Coupler Oscilloscope	Rear panel	ANT	TX-RX (A/4)	VR8 VR9	MIN. Set it to the minimum value by adjusting in the USB and modes alternately near the center of the VR.	–40dB or more.
11. MIC sensitivity	1) Frequency : 52.000MHz MODE : USB AG : 1kHz/3mV Transmit	Power meter AG AF V.M	Rear panel Front panel	ANT MIC	TX-RX (A/4)	VR7	60W	±1.0W
12. Spurious	1) Frequency : 50.000MHz MODE : CW Transmit	Power meter Coupler Spectrum analyzer	Rear panel	ANT	TX-RX (A/4)	VR13	Spurious MIN.	–60dB or more.
						VR17	50MHz±2MHz neatly spurious MIN.	
13. SWR protection	1) Frequency : 52.000MHz MODE : CW Transmit	150Ω dummy load Through-type power meter	Rear panel	ANT	TX-RX (A/4)	IC11-VR1	40W	
14. FM MAX DEV	1) Frequency : 52.050MHz MODE : FM AG : 1kHz/30mV **E** 1kHz/50mV **K** Transmit	Power meter Coupler Linear detector AG AF V.M	Rear panel Front panel	ANT MIC	PLL	VR2	± larger value should be 4.4kHz.	±0.1kHz
15. FM MIC sensitivity	1) Frequency : 52.050MHz MODE : FM AG : 1kHz/3mV **E** 1kHz/5mV **K** Transmit					VR1	±3.0kHz	±0.1kHz
16. AM MIC sensitivity	1) Frequency : 52.050MHz MODE : AM AG : 1kHz/3mV Transmit				TX-RX (A/4)	VR10	60% modulation	
17. Sub tone	1) Frequency : 52.050MHz MODE : FM M/V : 1 push SPLIT : 1 push A=B : 1 push Transmit					VR3	±0.75kHz	±0.1kHz
18. Side tone	1) Frequency : 52.000MHz MODE : CW AF VR : Center KEY : DOWN Transmit	Power meter Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX	VR5	0.2V/8Ω	±0.02V
19. TX power	1) Frequency : 52.000MHz	Power meter	Rear panel	ANT			Check	HI : 80~100W (AM : 15~30W) MID : 40~50W (AM : 10~20W) LOW : 8~12W (AM : 4~7W)

ADJUSTMENT

Adjustment Points

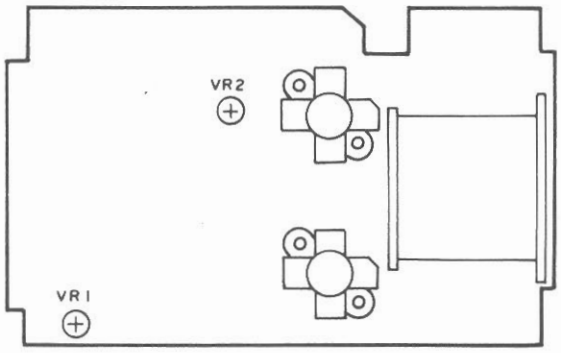
TX-RX UNIT (X57-4570-00) (A/4)



TX-RX UNIT (X57-4570-00) (A/4)

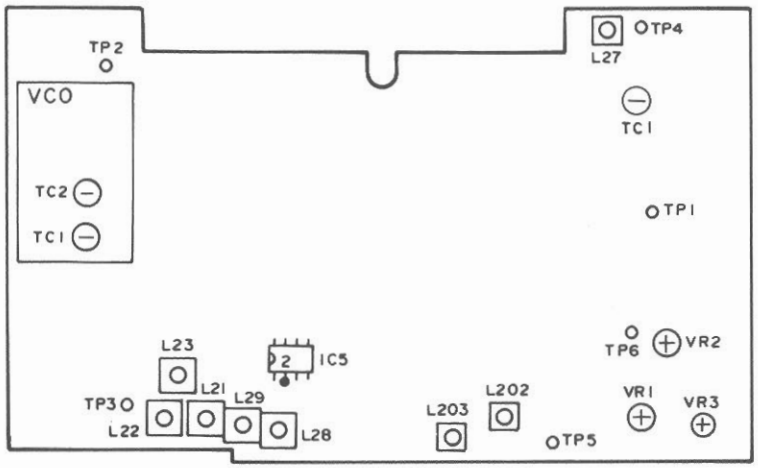
VR1 : MIX BAL	VR14 : Hi power
VR2 : FM meter	VR15 : Low power
VR3 : SSB squelch	VR16 : Mid power
VR4 : RFG	VR17 : Spurious
VR5 : Side tone	L15~17 : MCF
VR6 : Beep tone	L24~26, 28 : IF AMP
VR7 : MIC sensitivity	L38~40, 44~46, 48 : TX AMP
VR8, 9 : Suppression	L66 : RX AMP
VR10 : MIX BIAS (AM)	VR1 in IC3 : SSB S-meter (S1)
VR11 : MIX BIAS (CW)	IFT in IC3 : IF AMP
VR12 : MIX BIAS (MAX)	VR1 in IC11 : SWR protection
VR13 : Spurious	VR2 in IC11 : ALC voltage

FINAL UNIT (X45-3490-00)



FINAL UNIT (X45-3490-00)
VR1, 2 : Final idling current

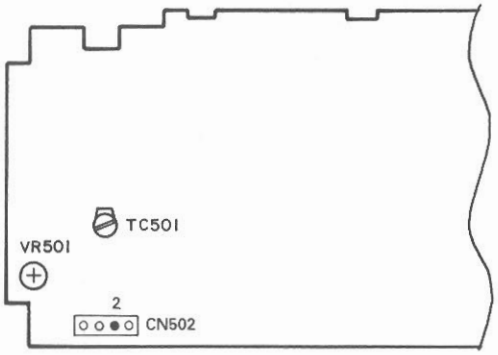
PLL UNIT (X50-3200-00)



PLL UNIT (X50-3200-00)
VR1 : FM MIC sensitivity
VR2 : FM MAX DEV
VR3 : Sub tone
L21~23 : 75.045~75.545MHz
L27 : 10.695MHz
L28, 29 : 80MHz
L202, 203 : NB
TC1 : Reference OSC

VCO (X58-4120-00)
TC1, 2 : Lock voltage

TX-RX UNIT (X57-4570-00) (C/4)



TX-RX UNIT (X57-4570-00) (C/4)
VR501 : Power frequency response
TC501 : NULL

TERMINAL FUNCTION

CN No.	Pin No.	Name	Function
LCD ASSY (B38-0719-15)			
CN1	1	DGND	Digital ground.
	2	LEN	LCD control enable.
	3	FSQ	FM squelch voltage.
	4	UEN1	Shift register enable.
	5	SSQ	SSB squelch voltage.
	6	BLK	All LCD segments off.
	7	5V	5V.
	8	NC	
	9	8V	8V.
	10	RVR	RIT VR voltage.
	11	KAD1	Key matrix voltage.
	12	AGND	Analog ground
	13	KAD2	Key matrix voltage.
	14	ISV	IF SHIFT VR voltage.
	15	MUP	Microphone UP switch.
	16	MDN	Microphone DOWN switch.
	17	PSW	POWER switch.
	18	EDP1	Encoder pulse.
	19	5A	Analog 5V.
	20	EDP2	Encoder pulse.
	21	CSS	PTT signal.
	22	14S	14V.
	23	LDA	LCD control data.
	24	LCK	LCD control clock.
	25	5C	5.6V for power switch.
CN2	1	AF1	AF VR-1.
	2	AF2	AF VR-2.
	3	AF3	AF VR-3 (ground).
	4	FSQ	FM squelch setting voltage.
	5	SSQ	SSB squelch setting voltage.
	6	AGND	Analog ground.
	7	5A	Analog 5V.
	8	RVR	RIT VR voltage.
	9	ISV	IF SHIFT VR voltage.
	10	DGND	Digital ground.
CN4	1	DGND	Digital ground.
	2	EDP1	Encoder pulse output.
	3	EDP2	Encoder pulse output.
	4	NC	
CN5	1	MIC	MIC.
	2	MICG	MIC ground.
	3	SPO	Speaker output.
	4	AGND	Analog ground.
	5	AF2	AF VR-2.
	6	AF1	AF VR-1.
	7	AFG	AF VR-3 (ground).
FINAL UNIT (X45-3490-00)			
CN2	Coaxial	PO	High-frequency output.
CN3	1	EALC	External ALC.
	2	EALG	External ALC ground.
CN4	1	MOT+	Fan power supply.
	2	MOT–	Fan power supply.
CN101	1	AGND	Analog ground.
	2	AGND	Analog ground.
	3	14	Always 14V.
	4	14S	14V when power is on.
	5	14S	14V when power is on.
	6	DGND	Digital ground.
	7	5V	5V when power is on.
	8	PSC	High when power switch is turned on.
	9	8V	8V when power is on.
	10	TXB	8V in transmit mode.
	11	THP	Final temperature detection.
CN102	1	14AG	Ground for 14AF.
	2	14AF	14V when power is on (with filter).
	3	8V	8V.
	4	14S	14V when power is on.
CN103	1	SEG	External speaker ground.
	2	ES2	External speaker.
	3	ES1	External speaker.
	4	AGND	Analog ground.
	5	STS	Sidetone switch.
	6	KEY	CW keying output.
CN104	1	14S	14V when power is on.
	2	14S	14V when power is on.
	3	8V	8V.
	4	TXB	8V in transmit mode.
	5	14S	14V when power is on.
	6	THP	Final temperature detection.
CN105	1	14	Always 14V.
	2	14	Always 14V.
W1 (1/2)	1	14S	14V when power is on.
	2	14S	14V when power is on.
	3	8V	8V when power is on.
	4	TXB	8V in transmit mode.
W1 (2/2)	1	14S	14V when power is on.
	2	THP	Final temperature detection.
W2	1	14	Always 14V.
	2	14	Always 14V.
W7	Coaxial	DRV	Drive input.
J1		RELAY	Linear relay control.
J2		EXT ALC	ALC input from linear.
J101		EXT SP	External speaker.
J102		KEY	CW key input.
DIGITAL UNIT (X46-318X-XX)			
CN1	1	DGND	Digital ground.
	2	LEN	LCD control enable.
	3	FSQ	FM squelch voltage.
	4	UEN1	Shift register enable 1.
	5	SSQ	SSB squelch voltage.
	6	BLK	All LCD segments off.
	7	5V	5V.
	8	NC	
	9	8V	8V.
	10	RVR	RIT VR voltage.
	11	KAD1	Key matrix voltage.
	12	AGND	Analog ground.
	13	KAD2	Key matrix voltage.
	14	ISV	IF SHIFT VR voltage.
	15	MUP	Microphone UP switch.
	16	MDN	Microphone DOWN switch.
	17	PSW	POWER switch.
	18	EDP1	Encoder pulse.
	19	5A	Analog 5V.
	20	EDP2	Encoder pulse.
	21	CSS	PTT signal.
	22	14S	14V.
	23	LDA	LCD control data.
	24	LCK	LCD control clock.
	25	5C	5.6V for power switch.
CN2	1	AB2	DDS2 (CAR) register selection.
	2	DE2	DDS2 (CAR) enable.

TERMINAL FUNCTION

CN No.	Pin No.	Name	Function
	3	NBS	NB ON/OFF control.
	4	RBK	RX RF blanking output.
	5	PCK	PLL clock.
	6	PDA	PLL data.
	7	GND	Ground.
	8	PE2	PLL2 (KCH14) enable.
	9	FMB	8V in FM mode, 0V in other modes.
	10	TONE	Subtone output.
	11	NFT	0V in FM transmit mode, 5V in other modes.
CN3	1	DGND	Digital ground.
	2	AGND	Analog ground.
	3	NC	
	4	KYS	Key jack input; when inserted.
	5	KYB	Key input.
	6	FMB	8V in FM mode, 0V in other modes.
	7	TRC	TX/RX control signal. High in transmit mode.
	8	RXS	RX enable.
	9	BEEP	Beep output.
	10	AGS	AGC slow/fast changeover.
	11	MGS	Microphone sensitivity selection.
	12	FSQ	FM squelch voltage.
	13	SSQ	SSB squelch voltage.
	14	BSY	Busy signal.
	15	RBK	RF blanking.
	16	SM	Signal meter voltage.
	17	UEN4	Shift register enable 4.
	18	UCK	Shift register clock.
	19	UDA	Shift register data.
	20	UEN5	Shift register enable 5.
	21	NC	
	22	UEN6	Shift register enable 6.
	23	CKS	CKS control signal.
	24	NC	
	25	PWM	Power meter voltage.
CN4	1	NC	
	2	NC	
	3	UEN2	Shift register enable 2.
	4	UCK	Shift register clock.
	5	UDA	Shift register data.
	6	14	14V.
	7	14S	14V.
	8	5V	5V.
	9	PSC	Power relay control.
	10	8V	8V.
	11	THP	Final temperature detection.
	12	DGND	Digital ground.
CN5	1	NC	
	2	ULK	Unlock detection input.
	3	PE1	PLL1 (LO1) enable.
	4	DE1	DDS1 (LO1) enable.
	5	AB1	DDS1 (LO1) register selection.
	6	8V	8V output.
	7	5V	5V output.
	8	GND	Ground.
	9	C3	0.03~10.4999MHz. VCO
	10	C2	10.5~21.4999MHz. selection line.
	11	C1	21.5~29.9999MHz. Active high
CN6	1	GND	Ground.
	2	5V	5V output.
	3	TXD	Personal computer interface.
	4	RXD	Personal computer interface.
	5	RTS	Personal computer interface.
	6	CTS	Personal computer interface.

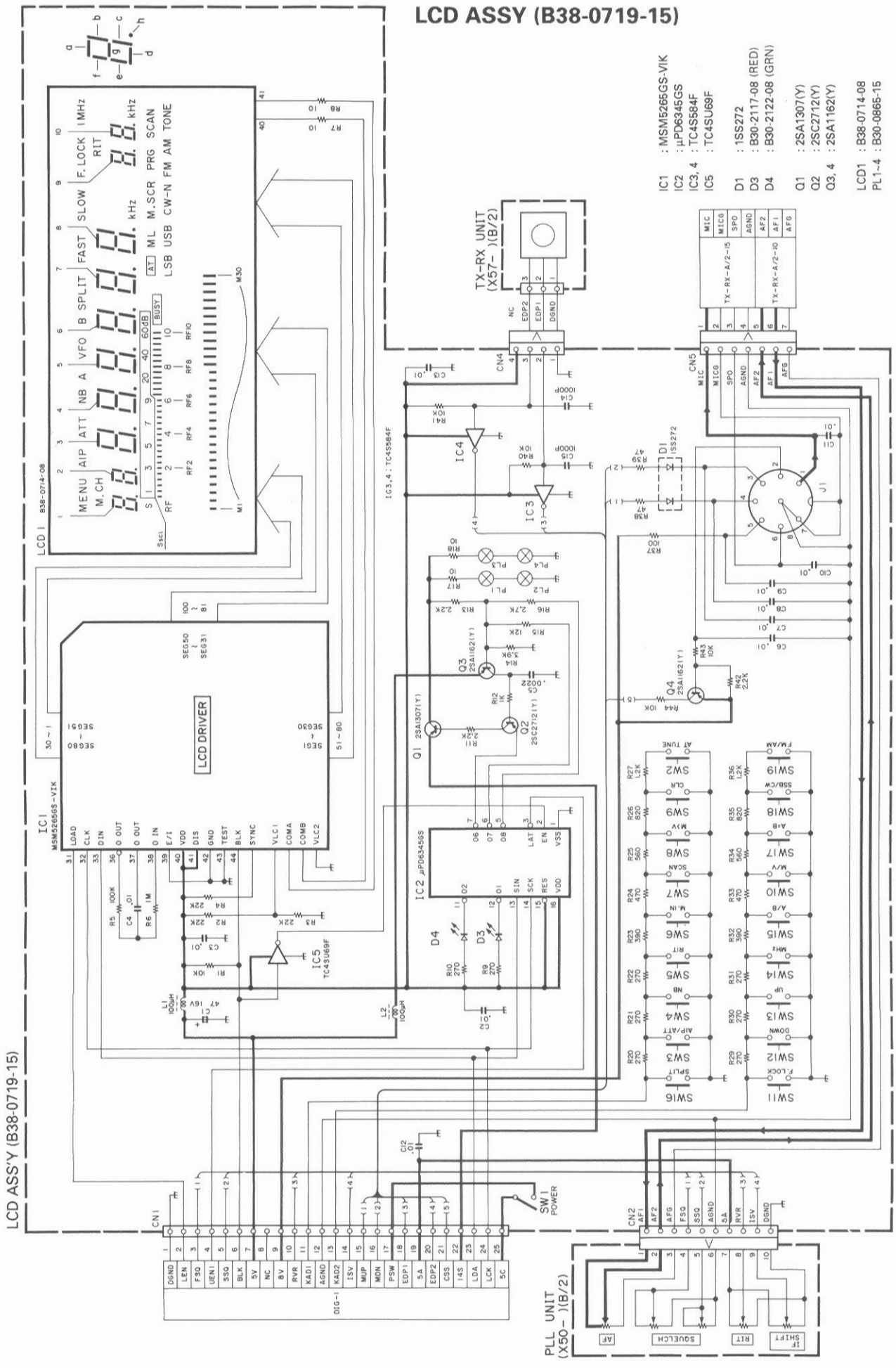
CN No.	Pin No.	Name	Function
PLL UNIT (X50-3200-00)			
CN1	1	FMM	FM modulator input.
	2	FMG	Ground.
	3	NBI	NB amplifier signal input.
	4	NBG	Ground.
CN2	Coaxial	LO1	LO1 output. 113.045~133.045MHz : K 123.045~127.045MHz : E
CN3	Coaxial	CAR	CAR output. 10.695MHz.
CN4	Coaxial	LO2	LO2 output. 62.35MHz.
CN5	1	NC	
	2	ULK	Unlock detection output.
	3	PE1	PLL1 (LO1) enable.
	4	DE1	DDS1 (LO1) enable.
	5	AB1	DDS1 (LO1) register selection.
	6	8V	8V.
	7	5V	5V.
	8	GND	Ground.
	9	C3	0.03~10.4999MHz. VCO
	10	C2	10.5~21.4999MHz. selection line.
	11	C1	21.5~29.9999MHz. Active high.
CN6	1	AB2	DDS2 (CAR) register selection.
	2	DE2	DDS2 (CAR) enable.
	3	NBS	NB ON/OFF control.
	4	RBK	RX RF blanking input.
	5	PCK	PLL clock.
	6	PDA	PLL data.
	7	GND	Ground.
	8	PE2	PLL2 (KCH14) enable.
	9	FMB	8V in FM mode, 0V in other modes.
	10	TONE	Subtone input.
	11	NFT	0V in FM transmit mode, 5V in other modes.
TX-RX UNIT (X57-4570-00)			
CN1	Coaxial	RAT	Receive signal input.
CN2	Coaxial	LO1	LO1 input. 113.045~133.045MHz : K 123.045~127.045MHz : E
CN3	Coaxial	LO2	LO2 input. 62.35MHz.
CN4	1	NBI	10.695MHz NB AMP output.
	2	NBG	NB ground.
	3	NC	
CN10	1	NC	
	2	AF2	AF VR-2.
	3	AF1	AF VR-1.
	4	AFG	AF VR-3 (ground).
CN11	Coaxial	CAR	CAR input. 10.695MHz.
CN12	1	SP	Speaker input.
	2	SPG	Speaker ground.
CN13	1	PHG	Head phone ground.
	2	PH2	Head phone through.
	3	PH1	Head phone output.
CN14	1	FMM	FM MIC output.
	2	FMG	FM MIC ground.
CN15	1	NC	
	2	MIC	MIC.
	3	MICG	MIC ground.
	4	SPO	Speaker output (MIC connector).
	5	AGND	Analog ground.
CN16	1	KEY	CW keying. High : Key down.
	2	STS	Sidetone switch.
	3	AGND	Analog ground.
	4	ES1	External speaker output.

TERMINAL FUNCTION

CN No.	Pin No.	Name	Function
	5	ES2	External speaker through.
	6	ESG	External speaker ground.
	7	14S	14V.
	8	8V	8V.
	9	14AF	14V (For audio IC).
	10	14AG	14V (For audio IC).
CN17	1	DGND	Digital ground.
	2	AGND	Analog ground
	3	NC	
	4	KYS	Key jack input.
	5	KYB	Key input. High : Key down.
	6	FMB	8V in FM mode.
	7	TRC	TX/RX control. High in transmit mode.
	8	RXS	RX switch. High in receive mode.
	9	BEEP	Beep.
	10	AGS	AGC switch. Low : Fast.
	11	MGS	Microphone sensitivity switch.
	12	FSQ	FM squelch setting voltage.
	13	SSQ	SSB squelch setting voltage.
	14	BSY	Busy signal.
	15	RBK	RF blanking.
	16	SM	Signal strength meter voltage.
	17	UEN4	Shift register enable.
	18	UCK	Shift register clock.
	19	UDA	Shift register data.
	20	UEN5	Shift register enable.
	21	NC	
	22	UEN6	Shift register enable.
	23	CKS	CKY (keying) control. Hight in transmit mode.
	24	NC	
	25	PWM	Power meter voltage.
CN18	1	EALC	External ALC.
	2	EALG	External ALC ground.
	3	TXB	8V in transmit mode.
	4	VSR	Reflected wave voltage.
	5	VSF	Progressive wave voltage.
	6	AGND	Analog ground.
CN19	Coaxial	DRV	Drive output.
CN501	Coaxial	RAT	Receive signal input.

CN No.	Pin No.	Name	Function
CN502	1	AGND	Analog ground.
	2	VSF	Progressive wave voltage.
	3	VSR	Reflected wave voltage.
	4	TXB	Transmission power supply 8V.
CN503	1	THP	Temperature protection. High during operation.
	2	TXB	Transmission power supply 8V.
	3	8V	8V.
	4	PSC	14V power relay control. High when power is turned on.
	5	5V	5V.
	6	DGND	Digital ground.
	7	14S	14V.
	8	14S	14V.
	9	14	14V.
	10	AGND	Analog ground.
	11	AGND	Analog ground.
CN504	1	NC	
	2	NC	
	3	UEN2	Shift register enable.
	4	UCK	Shift register clock.
	5	UDA	Shift register data.
	6	14	14V.
	7	14S	14V.
	8	5V	5V.
	9	PSC	14V power relay control. High when power is turned on.
	10	8V	8V.
	11	THP	Temperature protection. High during operation.
	12	DGND	Digital ground.
CN505	Coaxial	PO	Filter input.
CN506	1	PHG	Head phone ground.
	2	PH2	Head phone output.
	3	PH1	Head phone input.
W2	1	DGND	Digital ground.
	2	EDP1	Encoder pulse output.
	3	EDP2	Encoder pulse output.
W502		ANT	Antenna.
W503		ANT GND	Antenna ground.

TS-60S CIRCUIT DIAGRAM



PARTS LIST

* New Parts
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis
Teile ohne **Parts No.** werden nicht geliefert.

TS-60S

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
			TS-60S			
1	1A		A01-2070-02	METALLIC CABINET(TOP)		
2	3B		A01-2071-02	METALLIC CABINET(BOTTOM)		
4	2A		A22-0784-03	SUB PANEL		
700	2A	*	A62-0295-03	PANEL ASSY		
6	3A	*	A62-0296-03	PANEL		
-			B10-1187-04	FRONT GLASS		
-			B11-1067-04	FILTER		
8	1A		B42-2455-04	LABEL (M4X8MAX)		
9	3B		B42-3343-04	LABEL (S/NO)		
10	3B		B42-3394-14	LABEL (FCC)	K	
-			B42-5526-04	LABEL	K	
12	-		B46-0310-03	WARRNTY CARD	E	
12	-		B46-0410-30	WARRNTY CARD	K	
14	-	*	B62-0410-00	INSTRUCTION MANUAL :ACSY		
14	-	*	B62-0411-00	INSTRUCTION MANUAL :ACSY	E	
15	3B	*	B72-0608-04	MODEL NAME PLATE	E	
15	3B	*	B72-0611-14	MODEL NAME PLATE	K	
17	1F		E04-0167-05	RF COAXIAL CABLE RECEPTACLE		
18	1F		E23-0616-14	TERMINAL (GND)		
19	-		E30-3157-05	DC CABLE :ACSY		
20	2B,3C		E31-3092-05	INSIDE CONNECTING WIRE(LO1)		
21	1E		E31-6117-05	INSIDE CONNECTING WIRE(RAT)		
22	3D		E31-6118-05	INSIDE CONNECTING WIRE		
23	2B		E33-1967-05	FINISHED WIRE SET(LCD-TXRX)		
24	2B		E37-0348-05	FLAT CABLE (LCD-DIG)		
25	1B		E37-0349-05	FLAT CABLE (DIG-TXRX)		
26	1F,2D		E37-0350-05	FLAT CABLE (FILTER-DIG)		
27	2D		E37-0352-05	CONNECTING WIRE (PLL-TXRX)		
28	2A		E37-0355-05	CONNECTING WIRE (SP)		
29	2B,2D		E37-0356-05	CONNECTING WIRE (PLL-TXRX)		
31	-		F05-2531-05	FUSE (25A) :ACSY		
32	2F		F10-2048-03	SHIELDING PLATE(FILTER UNIT)		
33	3B		F10-2049-03	SHIELDING PLATE(FILTER COVER)		
34	1D,2B		F10-2050-04	SHIELDING PLATE(DIGITAL)		
35	3B		F15-0681-04	SHADE (BOTTOM CASE)		
36	1F	*	F15-0685-04	SHADE (REAR SHIELDING PLATE)		
37	1C,2B		F20-0521-04	INSULATING BOARD (DIGITAL UNIT		
38	1F		F20-1119-04	INSULATING BOARD (FILTER UNIT)		
39	2B		F20-1132-14	INSULATING BOARD (SUB PANEL)		
41	3A		G01-0874-04	COIL SPRING		
42	1B,3B		G02-0576-14	FLAT SPRING (PLL,FILTER)		
43	3A		G02-0733-04	FALT SPRING (TORQUE)		
44	2B		G10-0708-04	AUXILIARY PART(CASE SIDE)		
45	3A		G10-0732-04	AUXILIARY PART(SPRING)		
-			G10-0733-04	AUXILIARY PART(TOP CASE)		
47	2A		G10-0743-04	AUXILIARY PART(SP,SUB)		
48	1A	*	G10-0746-04	AUXILIARY PART(FIBER)		
49	1C		G13-0828-04	CUSHION (VCO)		
50	3A		G13-1380-04	CUSHION (KNOB)		
51	2A		G13-1381-04	CUSHION (KNOB)		
52	2A		G13-1382-04	CUSHION (KNOB)		

L:Scandinavia **K:**USA **P:**Canada
Y:PX(Far East, Hawaii) **T:**England **E:**Europe
Y:AAFES(Europe) **X:**Australia **M:**Other Areas

⚠ indicates safety critical components.

PARTS LIST

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Teile ohne Parts No. werden nicht geliefert.

TS-60S
FINAL UNIT (X45-3490-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
53	-		G13-1402-04	CUSHION (BRACKET)		
54	2A	*	G13-1451-04	CUSHION (SP)		
55	1A	*	G13-1437-04	CUSHION (SP)		
56			H10-2761-02	POLYSTYRENE FOAMED FIXTURE		
57	-		H11-0877-04	POLYSTYRENE FOAMED BOARD	K	
57	-		H13-0898-04	CARTON BOARD	E	
58	-		H13-0899-04	CARTON BOARD (BRACKET)		
59	-		H13-0911-04	CARTON BOARD		
60	-		H25-0029-04	BAG (ACSY)		
61	-		H25-0079-04	BAG (MIC)		
62	-		H25-0106-04	BAG (BODY)		
63			H25-0708-04	BAG (DC CABLE)		
64	-	*	H52-0506-04	ITEM CARTON BOX		
65	3B		J02-0441-05	FOOT		
66	2A		J21-4406-04	HARDWARE FIXTURE (SP)		
67	-		J29-0604-03	BRACKET :ACSY		
68	3A		J30-0592-04	SPACER (TORQUE)		
69	2A		J31-0141-04	COLLAR (MIC)		
71	-		K01-0416-05	HANDLE AND SCREW :ACSY		
72	3A		K21-0793-04	KNOB (MAIN)		
73	3A		K29-4809-04	KNOB (AF VOL/RIT)		
74	2A		K29-4810-04	KNOB (SQL/IF SHIFT)		
75	2A		K29-4811-04	KNOB (POWER)		
76	3A		K29-4812-04	KNOB (F.LOCK)		
77	3A		K29-4813-04	KNOB (MHZ)		
78	3A		K29-4814-04	KNOB (DOWN)		
79	3A		K29-4815-04	KNOB (UP)		
80	3A		K29-4816-04	KNOB		
81	3A		K29-4817-04	KNOB		
82	3A		K29-4818-04	KNOB		
84	2B		N15-1040-46	FLAT WASHER (GND)		
A	1B,2B		N32-2606-46	FLAT HEAD MACHIN SCREW		
B	1A,1B		N33-2606-45	OVAL HEAD MACHIN SCREW(CASE)		
C	1B		N35-2604-46	BINDING HEAD MACHINE SCREW(IF)		
D	1C,2B		N35-2606-46	BINDING HEAD MACHINE SCREW(DIG		
E	2B		N35-4010-46	BINDING HEAD MACHINE SCREW(GND		
F	1B,1C		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
G	1F		N87-3008-46	BRAZIER HEAD TAPTITE SCREW		
85	-		N99-0383-05	SCREW SET :ACSY		
-			S50-1406-05	MICRO SWITCH (MIC)		
SP	1A		T07-0298-05	LOUDSPEAKER(FULLRANGE)		
MIC	-		T91-0528-05	MICROPHONE :ACSY		
701	2B	*	B38-0719-15	LCD ASSY		
702	2E,3F	*	X45-3490-00	FINAL UNIT (A/2,B/2)		
703	1D,2B	*	X46-3180-11	DIGITAL UNIT	K	
703	1D,2B	*	X46-3182-71	DIGITAL UNIT	E	
704	1B		X48-3110-00	IF UNIT		
705	2B,2C	*	X50-3200-00	PLL UNIT (A/2,B/2)		
706	1B,2B	*	X57-4570-00	TX-RX UNIT (A/4･･･D/4)		
FINAL UNIT (X45-3490-00)						
C1			CK73FB1H391K	CHIP C 390PF K		

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PARTS LIST

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FINAL UNIT (X45-3490-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格			Destination 仕向	Remarks 備考
C2			CK73FB1E102K	CHIP C	1000PF	K		
C3			CK73FB1E103K	CHIP C	0.01UF	K		
C4			CK73FB1H102K	CHIP C	1000PF	K		
C5			CK73FB1E104K	CHIP C	0.10UF	K		
C6			CC73FSL1H821J	CHIP C	820PF	J		
C7 ,8			CK73FB1H102K	CHIP C	1000PF	K		
C9 ,10			CK73FB1E103K	CHIP C	0.01UF	K		
C11			CK73FB1E102K	CHIP C	1000PF	K		
C12			C90-2193-05	ELECTRO	39UF	25WV		
C13			CC45SL2H680J	CERAMIC	68PF	J		
C14			CK73FB1E103K	CHIP C	0.01UF	K		
C15			CK73FB1E102K	CHIP C	1000PF	K		
C17			CK73FB1E103K	CHIP C	0.01UF	K		
C18			CK73FB1H102K	CHIP C	1000PF	K		
C19			CK73FB1E104K	CHIP C	0.10UF	K		
C20			CE04EW1C100M	ELECTRO	10UF	16WV		
C23			CK73FB1E103K	CHIP C	0.01UF	K		
C24			CK45E2H222P	CERAMIC	2200PF	P		
C27			C90-2194-05	ELECTRO	220UF	25WV		
C28 ,29			CK73FB1E104K	CHIP C	0.10UF	K		
C30			CK73FB1H102K	CHIP C	1000PF	K		
C31			CE04EW1C100M	ELECTRO	10UF	16WV		
C32			CK73FB1E104K	CHIP C	0.10UF	K		
C33			CE04EW1E471M	ELECTRO	470UF	25WV		
C34 ,35			CK73FB1E103K	CHIP C	0.01UF	K		
C36			CK73FB1E104K	CHIP C	0.10UF	K		
C37			CK73FB1E103K	CHIP C	0.01UF	K		
C38			CC45SL2H820J	CERAMIC	82PF	J		
C39			CM93D2H391J	MICA	390PF	J		
C41			CK45B1H103K	CERAMIC	0.010UF	K		
C42 ,43			CK73FB1E103K	CHIP C	0.01UF	K		
C46			CK73FB1H102K	CHIP C	1000PF	K		
C47 ,48			CK73FB1E104K	CHIP C	0.10UF	K		
C49			CK73FB1H103K	CHIP C	0.010UF	K		
C50			CK73FB1H102K	CHIP C	1000PF	K		
C51			CK73FB1H103K	CHIP C	0.010UF	K		
C53 -55			CK73FB1H103K	CHIP C	0.010UF	K		
C57			CK73FB1H103K	CHIP C	0.010UF	K		
C58 ,59			CK45F1H223Z	CERAMIC	0.022UF	Z		
C60			CM73F2H391J	CHIP C	390PF	J		
C101			CK73FB1E104K	CHIP C	0.10UF	K		
C102-105			CK73FB1E103K	CHIP C	0.01UF	K		
C106-111			CK73FB1E104K	CHIP C	0.10UF	K		
C112,113			CK73FB1H102K	CHIP C	1000PF	K		
C115,116			CK73FB1H102K	CHIP C	1000PF	K		
C118-121			CE04NW1E100M	ELECTRO	10UF	25WV		
C122			CE04EW1E102M	ELECTRO	1000UF	25WV		
C123			CK73FB1E103K	CHIP C	0.01UF	K		
C124			CE04EW1E102M	ELECTRO	1000UF	25WV		
C125			CK73FB1H103K	CHIP C	0.010UF	K		
CN2			E04-0191-05	RF COAXIAL CABLE RECEPTACLE				
CN3 ,4			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)				
CN101			E40-5604-05	PIN CONNECTOR FOR INSIDE(11P)				
CN102			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)				
CN103,104			E40-3250-05	PIN CONNECTOR FOR INSIDE(6P)				

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FINAL UNIT (X45-3490-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
CN105			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)		
J1			E63-0401-05	PHONO JACK		
J2			E13-0166-05	PHONO JACK		
J101			E11-0451-05	PHONE JACK		
J102			E11-0450-05	PHONE JACK		
TP1 -3			E23-0512-05	TERMINAL		
W1			E37-0360-05	CONNECTING WIRE		
W2			E37-0361-05	CONNECTING WIRE		
W3			E37-0362-05	CONNECTING WIRE(DC CABLE)		
W4			E37-0363-05	CONNECTING WIRE(EALC)		
W5			E37-0364-05	CONNECTING WIRE(PHONE,KEY)		
W6			E37-0358-05	FLAT CABLE (TO FILTER)		
W7			E37-0359-05	CONNECTING WIRE(DRIVE)		
W8			E31-3301-05	INSIDE CONNECTING WIRE(PO)		
110	3E		F01-0994-02	HEAT SINK		
111	3E		F10-2052-04	SHIELDING PLATE		
112	2E		F20-1120-04	INSULATING BOARD		
113	1E		F29-0014-05	INSULATOR		
F101			F53-0093-05	FUSE		
M1	3E		F09-0438-05	FAN MOTOR		
115	2F		G02-0574-04	FLAT SPRING (IC101,102)		
117	3E		J99-0330-04	SHIELDING BOARD		
L1			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L2			L40-1292-48	SMALL FIXED INDUCTOR(3.3UH)		
L3		*	L39-1250-05	COIL		
L4		*	L39-1251-05	COIL		
L5			L33-0699-05	CHOKE COIL		
L6			L33-0617-05	CHOKE COIL		
L7			L33-0699-05	CHOKE COIL		
L8			L33-0617-05	CHOKE COIL		
L11			L33-0651-05	CHOKE COIL		
L12			L33-0617-05	CHOKE COIL		
L13		*	L39-1248-15	COIL		
L15			L40-3392-48	SMALL FIXED INDUCTOR(3.3UH)		
L17 ,18			L40-4791-14	SMALL FIXED INDUCTOR		
L101			L15-0016-05	LOW-FREQENCY CHOKE COIL		
L102			L40-1001-48	SMALL FIXED INDUCTOR		
M	1E,2E		N09-2187-05	SCREW (TRANSISTOR)		
N	3E		N35-3020-46	BINDING HEAD MACHINE SCREW		
P	2E,2F		N87-3006-46	BRAZIER HEAD TAPTITE SCREW		
R2			RK73FB2A270J	CHIP R 27 J 1/10W		
R4			R92-0670-05	CHIP R 0 OHM		
R5			RK73FB2A681J	CHIP R 680 J 1/10W		
R6			RK73FB2A331J	CHIP R 330 J 1/10W		
R7			RK73FB2A471J	CHIP R 470 J 1/10W		
R8 ,9			RK73FB2A4R7J	CHIP R 4.7 J 1/10W		
R10			R92-1242-05	FIXED RESISTOR 6.8 1/2W		
R11			R92-1243-05	FIXED RESISTOR 8.2		
R12 ,13			R92-1209-05	CHIP R 15 J 1/4W		
R14 ,15			R92-1292-05	FIXED RESISTOR 68 1W		
R16		*	R92-1378-05	FIXED RESISTOR 56 1/4W		
R21 ,22			RS14DB3A150J	FL-PROOF RS 15 J 1W		

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FINAL UNIT (X45-3490-00)
DIGITAL UNIT (X46-318X-XX)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R25			RK73FB2A221J	CHIP R 220 J 1/10W		
R26			R92-1317-05	FIXED RESISTOR 18 1W		
R30			RK73FB2A333J	CHIP R 33K J 1/10W		
R31			RK73FB2A103J	CHIP R 10K J 1/10W		
R32			RK73FB2A474J	CHIP R 470K J 1/10W		
R33 ,34			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R35			RK73FB2A681J	CHIP R 680 J 1/10W		
R36			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R37			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R38			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R39			RK73FB2A101J	CHIP R 100 J 1/10W		
R40			RK73FB2A104J	CHIP R 100K J 1/10W		
R41			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R42			RK73FB2A103J	CHIP R 10K J 1/10W		
R43			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R44			RK73FB2A103J	CHIP R 10K J 1/10W		
R45			RK73FB2A333J	CHIP R 33K J 1/10W		
R47			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R48			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R50			R92-1316-05	FIXED RESISTOR 39 1W		
R51			R92-1292-05	FIXED RESISTOR 68 1W		
R52			R92-1240-05	FIXED RESISTOR 10 1/4W		
R53 ,54			RC05GF2H101J	FL-PROOF RS 100 J 1/2W		
R101			RK73FB2A472J	CHIP R 4.7K J 1/10W		
VR1			R12-0104-05	TRIM POT. 220		
VR2			R12-1085-05	TRIM POT. 2.2K		
K1			S51-1420-05	RELAY		
K101			S51-2423-05	RELAY		
IC101			UPC7805H	IC(VOLTAGE REGULATOR/ +5V)		
IC102			UPC7808H	IC(VOLTAGE REGULATOR/ +8V)		
D1			MA27T-B	DIODE		
D2			MA27-B	DIORD		
D3			LFB01	DIORD		
D4 ,5			MA27-B	DIORD		
D6			LFB01	DIORD		
D7			SG-5L(R)	DIORD		
D8			DAN202K	DIORD		
D102			LFB01	DIORD		
D103			RD18M(B1)	DIORD		
IC1			NJM2902M	IC(OP AMP X4)		
Q1			2SC1971	TRANSISTOR		
Q2 ,3		*	2SC1972-26	TRANSISTOR		
Q4			2SC3421(Y)	TRANSISTOR		
Q5 ,6		*	SRFJ7001MP	POWER MODULE(PAIR)		
Q7			FMC1	TRANSISTOR		
Q8 -10			DTD114EK	DIGITAL TRANSISTOR		
Q11			DTC124TK	DIGITAL TRANSISTOR		
Q101			DTC143TK	DIGITAL TRANSISTOR		
Q102			DTC114EK	DIGITAL TRANSISTOR		
TH1			5TP41L	THERMISTOR		
DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E						
C1 -4			CK73FB1H102K	CHIP C 1000PF K		
C5			CK73FB1E103K	CHIP C 0.01UF K		

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C6 -8			CK73FB1H102K	CHIP C 1000PF K		
C9			CK73FB1E103K	CHIP C 0.01UF K		
C10 -24			CK73FB1H102K	CHIP C 1000PF K		
C25 ,26			CC73FCH1H101J	CHIP C 100PF J		
C27 -29			CK73FB1E103K	CHIP C 0.01UF K		
C30			CC73FCH1H101J	CHIP C 100PF J		
C31			CK73FB1H102K	CHIP C 1000PF K		
C32 ,33			CC73FCH1H330J	CHIP C 33PF J		
C34			CK73FF1C105Z	CHIP C 1.0UF Z		
C35			CK73FF1E104Z	CHIP C 0.1UF Z		
C36			CK73FB1H102K	CHIP C 1000PF K		
C37 -45			CC73FCH1H101J	CHIP C 100PF J		
C46			C92-0009-05	CHIP TAN 4.7UF 10WV		
C47 -54			CK73FB1H102K	CHIP C 1000PF K		
C55			CK73EF1H104Z	CHIP C 0.1UF Z		
C56 ,57			CK73FB1H102K	CHIP C 1000PF K		
C58			C92-0009-05	CHIP TAN 4.7UF 10WV		
C59			CK73FF1C105Z	CHIP C 1.0UF Z		
C60			CK73FB1E103K	CHIP C 0.01UF K		
C61 ,62			CC73FCH1H101J	CHIP C 100PF J		
C63			CK73EF1H104Z	CHIP C 0.1UF Z		
C64			CK73FB1H102K	CHIP C 1000PF K		
C65			C92-0009-05	CHIP TAN 4.7UF 10WV		
C66 -73			CK73FB1H102K	CHIP C 1000PF K		
C74			CK73EF1H104Z	CHIP C 0.1UF Z		
C75			C92-0009-05	CHIP TAN 4.7UF 10WV		
C76 -77			CK73FB1H102K	CHIP C 1000PF K		
C78 ,79			CK73FB1H102K	CHIP C 1000PF K		
C80 -84			CK73FB1E103K	CHIP C 0.01UF K		
CN1			E40-5314-05	PIN CONNECTOR FOR INSIDE(25P)		
CN2			E40-5610-05	PIN CONNECTOR FOR INSIDE(11P)		
CN3			E40-5314-05	PIN CONNECTOR FOR INSIDE(25P)		
CN4			E40-5301-05	PIN CONNECTOR FOR INSIDE(12P)		
CN5			E40-5610-05	PIN CONNECTOR FOR INSIDE(11P)		
CN6			E40-5183-05	PIN CONNECTOR FOR INSIDE(6P)		
L1			L40-1801-18	SMALL FIXED INDUCTOR(18UH)		
X1			L77-1522-05	CRYSTAL RESONATOR(7.9MHZ)		
CP1			R90-0711-05	MULTI-COMP		
R1			RK73FB2A223J	CHIP R 22K J 1/10W		
R2			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R3 -5			RK73FB2A471J	CHIP R 470 J 1/10W		
R6			RK73FB2A223J	CHIP R 22K J 1/10W		
R7 -11			RK73FB2A471J	CHIP R 470 J 1/10W		
R12 -19			RK73FB2A103J	CHIP R 10K J 1/10W		
R20 -25			RK73FB2A221J	CHIP R 220 J 1/10W		
R26			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R27 -31			RK73FB2A221J	CHIP R 220 J 1/10W		
R32			RK73FB2A471J	CHIP R 470 J 1/10W		
R33 ,34			RK73FB2A221J	CHIP R 220 J 1/10W		
R35			RK73FB2A471J	CHIP R 470 J 1/10W		
R36			RK73FB2A223J	CHIP R 22K J 1/10W		
R37 -39			RK73FB2A471J	CHIP R 470 J 1/10W		
R40 ,41			RK73FB2A101J	CHIP R 100 J 1/10W		

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DIGITAL UNIT (X46-318X-XX)
IF UNIT (X48-3110-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R42 ,43			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R44			RK73FB2A104J	CHIP R 100K J 1/10W		
R45			RK73FB2A154J	CHIP R 150K J 1/10W		
R46 ,47			RK73FB2A104J	CHIP R 100K J 1/10W		
R48			RK73FB2A471J	CHIP R 470 J 1/10W		
R49 ,50			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R51 ,52			RK73FB2A473J	CHIP R 47K J 1/10W		
R53 -56			RK73FB2A103J	CHIP R 10K J 1/10W		
R57 ,58			RK73FB2A221J	CHIP R 220 J 1/10W		
R60 -68			RK73FB2A471J	CHIP R 470 J 1/10W		
R69 ,70			RK73FB2A103J	CHIP R 10K J 1/10W		
R71			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R73 ,74			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R75			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R81 -99			RK73FB2A103J	CHIP R 10K J 1/10W		
R100,101			R92-0670-05	CHIP R 0 ΩHM		
D3 -5			1SS133	DIΩRD	E	
D5			1SS133	DIΩRD	K	
D9			1SS301	DIΩRD		
D11			1SS301	DIΩRD		
D12			RD8.2M(B2)	DIΩRD		
D13 ,14			1SS355	DIΩRD (or MA110)		
IC1		*	M37702M4A265FP	IC(MPU)		
IC2			TC74HC238AF	IC		
IC3			TC74HC573AF	IC(8 bit LATCH)		
IC4			M62003FP	IC		
IC5			NM93C66LEM8	IC (or AT93C66-10SI2.7)		
IC6			NJM78L05UA	IC(VΩLTAGE REGULATΩR/ +5V)		
Q2			DTC143EK	DIGITAL TRANSISTΩR		
Q4			DTC143EK	DIGITAL TRANSISTΩR		
Q5			DTA143TK	DIGITAL TRANSISTΩR		
Q6			2SC2712(Y)			
IF UNIT (X48-3110-00)						
C1 -13			CK73FB1E103K	CHIP C 0.01UF K		
C14			CC73FCH1H120J	CHIP C 12PF J		
C15 ,16			CK73FB1E103K	CHIP C 0.01UF K		
C17			CC73FCH1H010C	CHIP C 1PF C		
C18			CC73FCH1H200J	CHIP C 20PF J		
C19			CC73FCH1H010C	CHIP C 1PF C		
C20 ,21			CC73FCH1H020C	CHIP C 2.0PF C		
CN1			E40-4465-05	PIN CΩNNECTΩR FΩR INSIDE(5P)		
CN2			E40-4464-05	PIN CΩNNECTΩR FΩR INSIDE(4P)		
CN3			E40-4465-05	PIN CΩNNECTΩR FΩR INSIDE(5P)		
CN4			E40-4463-05	PIN CΩNNECTΩR FΩR INSIDE(3P)		
XF2			L71-0433-05	CRYSTAL FILTER(10.695MHZ)		
XF3			L71-0249-05	CRYSTAL FILTER(10.695MHZ)		
R1			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R2			RK73FB2A101J	CHIP R 100 J 1/10W		
R3			RK73FB2A561J	CHIP R 560 J 1/10W		
R4			RK73FB2A473J	CHIP R 47K J 1/10W		
R5			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R6			RK73FB2A101J	CHIP R 100 J 1/10W		

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IF UNIT (X48-3110-00)
PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R7 -9			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R10			RK73FB2A391J	CHIP R 390 J 1/10W		
R11			RK73FB2A473J	CHIP R 47K J 1/10W		
R12			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R13			RK73FB2A101J	CHIP R 100 J 1/10W		
R14			RK73FB2A473J	CHIP R 47K J 1/10W		
R15			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R16 ,17			RK73FB2A101J	CHIP R 100 J 1/10W		
R18			RK73FB2A473J	CHIP R 47K J 1/10W		
R19			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R20			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R21			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A221J	CHIP R 220 J 1/10W		
D1 ,2			DAN235K	DIØRD		
D3			RLS135	DIØRD		
D4			DAN202K	DIØRD		
D5			DAN235K	DIØRD		
D6			1SS226	DIØRD		
D7			RLS135	DIØRD		
Q1 -3			DTC143TK	DIGITAL TRANSISTØR		
BA1	1C,2B		W09-0515-05	LITHIUM BATTERY(3V 270MAH)		
PLL UNIT (X50-3200-00)						
C2 ,3			CK73FB1E103K	CHIP C 0.01UF K		
C8 ,9			CC73FCH1H221J	CHIP C 220PF J		
C10 ,11			CC73FCH1H470J	CHIP C 47PF J		
C12 ,13			CC73FCH1H221J	CHIP C 220PF J		
C14 -16			CC73FCH1H470J	CHIP C 47PF J		
C17			CE04EW1A221M	ELECTRØ 220UF 10WV		
C18			CK73FB1E103K	CHIP C 0.01UF K		
C19 ,20			CK73FB1H102K	CHIP C 1000PF K		
C21			CK73FB1E103K	CHIP C 0.01UF K		
C22			CC73FCH1H030C	CHIP C 3PF C		
C25			CC73FCH1H010C	CHIP C 1PF C		
C26			CC73FCH1H0R5C	CHIP C 0.5PF C		
C27			CC73FCH1H070D	CHIP C 7PF D		
C28			CC73FCH1H020C	CHIP C 2.0PF C		
C30			CK73FB1E103K	CHIP C 0.01UF K		
C31 ,32			CK73FB1H102K	CHIP C 1000PF K		
C33 -37			CK73FB1E103K	CHIP C 0.01UF K		
C46 ,47			CK73FB1E103K	CHIP C 0.01UF K		
C48			C92-0037-05	ELECTRØ 10UF 16WV		
C55 -61			CK73FB1E103K	CHIP C 0.01UF K		
C62			CC73FCH1H560J	CHIP C 56PF J		
C63			CC73FSL1H391J	CHIP C 390PF J		
C64			CC73FCH1H390J	CHIP C 39PF J		
C65			CC73FCH1H680J	CHIP C 68PF J		
C66			CC73FCH1H390J	CHIP C 39PF J		
C67			CC73FCH1H101J	CHIP C 100PF J		
C68			CC73FCH1H680J	CHIP C 68PF J		
C69			CC73FCH1H390J	CHIP C 39PF J		
C70			CC73FCH1H070D	CHIP C 7PF D		
C71			CC73FCH1H680J	CHIP C 68PF J		

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PLL UNIT (X50-3200-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C72			CC73FCH1H220J	CHIP C 22PF J		
C73			CC73FCH1H330J	CHIP C 33PF J		
C74			CC73FSL1H121J	CHIP C 120PF J		
C75			CC73FSL1H181J	CHIP C 180PF J		
C76			CC73FSL1H121J	CHIP C 120PF J		
C77 -79			CK73FB1E103K	CHIP C 0.01UF K		
C80			C92-0040-05	ELECTRO 47UF 16WV		
C81 -84			CK73FB1E103K	CHIP C 0.01UF K		
C85			CC73FSL1H181J	CHIP C 180PF J		
C86 -89			CK73FB1E103K	CHIP C 0.01UF K		
C90 ,91			CC73FCH1H0R5C	CHIP C 0.5PF C		
C93			CC73FCH1H180J	CHIP C 18PF J		
C94			CK73FB1H102K	CHIP C 1000PF K		
C104			CK73FB1E103K	CHIP C 0.01UF K		
C109			CC73FCH1H101J	CHIP C 100PF J		
C110-113			CK73FB1E103K	CHIP C 0.01UF K		
C114			CK73FB1H102K	CHIP C 1000PF K		
C115-117			CK73FB1E103K	CHIP C 0.01UF K		
C118			CC73FCH1H220J	CHIP C 22PF J		
C119			C92-0040-05	ELECTRO 47UF 16WV		
C120			CK73FB1E223K	CHIP C 0.022UF K		
C121			CC73FCH1H101J	CHIP C 100PF J		
C122			CC73FSL1H221J	CHIP C 220PF J		
C123			CK73FB1E103K	CHIP C 0.01UF K		
C124			CC73FCH1H0R5C	CHIP C 0.5PF C		
C125,126			CC73FCH1H150J	CHIP C 15PF J		
C127			CC73FCH1H390J	CHIP C 39PF J		
C129			CC73FCH1H390J	CHIP C 39PF J		
C130			CC73FSL1H151J	CHIP C 150PF J		
C131			CK73FB1E103K	CHIP C 0.01UF K		
C132			CC73FCH1H050C	CHIP C 5PF C		
C134			CK73FB1E103K	CHIP C 0.01UF K		
C135			CC73FCH1H100D	CHIP C 10PF D		
C136			CK73FB1E103K	CHIP C 0.01UF K		
C138			CK73EB1E104K	CHIP C 0.10UF K		
C139,140			CK73FB1E103K	CHIP C 0.01UF K		
C141			CK73FB1H102K	CHIP C 1000PF K		
C142			CC73FCH1H271J	CHIP C 270PF J		
C143			CK73FB1E104K	CHIP C 0.10UF K		
C146,147			CC73FCH1H330J	CHIP C 33PF J		
C148			C92-0037-05	ELECTRO 10UF 16WV		
C149			CK73FB1E103K	CHIP C 0.01UF K		
C150			CK73FB1E103K	CHIP C 0.01UF K		
C151			CE04EW1C101M	ELECTRO 100UF 16WV		
C152			CK73FB1H102K	CHIP C 1000PF K		
C153			CK73FB1E103K	CHIP C 0.01UF K		
C154,155			CK73FB1H102K	CHIP C 1000PF K		
C156			CC73FCH1H070D	CHIP C 7PF D		
C157			CC73FCH1H330J	CHIP C 33PF J		
C158			CC73FCH1H680J	CHIP C 68PF J		
C159			CK73FB1E103K	CHIP C 0.01UF K		
C160			CK73FB1H102K	CHIP C 1000PF K		
C163			CK73FB1H472K	CHIP C 4700PF K		
C164			CK73FB1H102K	CHIP C 1000PF K		
C165			CK73FB1E103K	CHIP C 0.01UF K		

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C166			CC73FCH1H180J	CHIP C 18PF J		
C167			CC73FCH1H470J	CHIP C 47PF J		
C168			CC73FCH1H060D	CHIP C 6PF D		
C169			CC73FCH1H100D	CHIP C 10PF D		
C170			CC73FCH1H080D	CHIP C 8PF D		
C171			CC73FCH1H270J	CHIP C 27PF J		
C172			CC73FCH1H030C	CHIP C 3PF C		
C173			CK73FB1E103K	CHIP C 0.01UF K		
C174			CC73FCH1H330J	CHIP C 33PF J		
C175			CK73FB1E103K	CHIP C 0.01UF K		
C176			CK73FB1H102K	CHIP C 1000PF K		
C177			CC73FCH1H101J	CHIP C 100PF J		
C178			CK73FB1E103K	CHIP C 0.01UF K		
C179,180			CK73FB1H102K	CHIP C 1000PF K		
C181			CE04EW1A221M	ELECTRO 220UF 10WV		
C182,183			CK73FB1E103K	CHIP C 0.01UF K		
C184,185			C92-0004-05	ELECTRO 1.0UF 16WV		
C186			C92-0040-05	ELECTRO 47UF 16WV		
C187			CK73FB1E103K	CHIP C 0.01UF K		
C188			CC73FCH1H101J	CHIP C 100PF J		
C189			CK73FB1E103K	CHIP C 0.01UF K		
C190			CC73FCH1H220J	CHIP C 22PF J		
C191			CK73FB1H103K	CHIP C 0.010UF K		
C200			CK73FB1E103K	CHIP C 0.01UF K		
C201			CC73FCH1H050C	CHIP C 5PF C		
C202			CK73FB1E103K	CHIP C 0.01UF K		
C203			CC73FCH1H470J	CHIP C 47PF J		
C204			CK73FB1E103K	CHIP C 0.01UF K		
C205			C92-0003-05	CHIP TAN 0.47UF 25WV		
C206-208			CK73FB1E103K	CHIP C 0.01UF K		
C209			CC73FCH1H470J	CHIP C 47PF J		
C210			CC73FCH1H100D	CHIP C 10PF D		
C211			CK73FB1E103K	CHIP C 0.01UF K		
C212			C92-0004-05	ELECTRO 1.0UF 16WV		
C213			CK73FB1E103K	CHIP C 0.01UF K		
C214			CK73FB1H102K	CHIP C 1000PF K		
C215			C92-0003-05	CHIP TAN 0.47UF 25WV		
C216,217			CK73FB1E103K	CHIP C 0.01UF K		
C226			CK73EF1C105Z	CHIP C 1.0UF Z		
C227			CK73FB1H472K	CHIP C 4700PF K		
C229,230			CK73FB1E103K	CHIP C 0.01UF K		
C231			C92-0009-05	CHIP TAN 4.7UF 10WV		
C232			CK73FF1C105Z	CHIP C 1.0UF Z		
C233			CK73FB1E103K	CHIP C 0.01UF K		
C234			CK73FB1H222K	CHIP C 2200PF K		
C235			CK73FF1C105Z	CHIP C 1.0UF Z		
C236			CK73FB1E103K	CHIP C 0.01UF K		
C237			C92-0009-05	CHIP TAN 4.7UF 10WV		
C238			CK73FB1E103K	CHIP C 0.01UF K		
C239			CE04EW1C101M	ELECTRO 100UF 16WV		
C240			CC73FCH1H030C	CHIP C 3PF C		
TC1			C05-0344-05	TRIMMER CAPACITOR 30PF		
CN1			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN2 -4			E04-0191-05	RF COAXIAL CABLE RECEPTACLE		

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CN6 ,7			E40-5609-05	PIN CONNECTOR FOR INSIDE(11P)		
CN301			E40-5415-05	PIN CONNECTOR FOR INSIDE(11P)		
TP6			E23-0512-05	TERMINAL		
-			F10-2062-04	SHIELDING PLATE		
-			F20-1142-04	INSULATING BOARD		
CF1			L72-0391-05	CERAMIC FILTER (10.7MHZ)		
L1			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L2			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L4			L40-3982-48	SMALL FIXED INDUCTOR(0.39UH)		
L5			L40-1882-48	SMALL FIXED INDUCTOR(56NH)		
L9			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L12 ,13			L40-2701-48	SMALL FIXED INDUCTOR(27UH)		
L14			L40-1801-48	SMALL FIXED INDUCTOR(18UH)		
L15 ,16			L40-2701-48	SMALL FIXED INDUCTOR(27UH)		
L17			L40-2201-48	SMALL FIXED INDUCTOR(22UH)		
L18			L40-1801-48	SMALL FIXED INDUCTOR(18UH)		
L19			L40-4792-48	SMALL FIXED INDUCTOR(4.7UH)		
L20			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L21			L34-4222-05	COIL		
L22		*	L34-4368-05	COIL		
L23			L34-4222-05	COIL		
L27			L34-4334-05	COIL		
L28 ,29			L34-4222-05	COIL		
L32			L40-1501-48	SMALL FIXED INDUCTOR(15UH)		
L33			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L34			L40-4792-48	SMALL FIXED INDUCTOR(4.7UH)		
L36			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L37			L40-2282-48	SMALL FIXED INDUCTOR(0.22UH)		
L38 ,39			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L40 ,41			L40-3991-48	SMALL FIXED INDUCTOR(3.9UH)		
L42			L40-1892-48	SMALL FIXED INDUCTOR(1.8UH)		
L43			L40-1092-48	SMALL FIXED INDUCTOR(1UH)		
L44			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L45			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L46			L40-3982-48	SMALL FIXED INDUCTOR(0.39UH)		
L200			L40-1092-48	SMALL FIXED INDUCTOR((1UH)		
L201			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L202,203			L34-0590-05	COIL		
L204			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L205			L33-0695-05	CHOKE COIL (1MH)		
X1			L77-1521-05	CRYSTAL RESONATOR (20MHZ)		
R1			RK73FB2A331J	CHIP R 330 J 1/10W		
R2 -10			RK73FB2A101J	CHIP R 100 J 1/10W		
R11			RK73FB2A181J	CHIP R 180 J 1/10W		
R12			RK73FB2A330J	CHIP R 33 J 1/10W		
R13			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R14			RK73FB2A103J	CHIP R 10K J 1/10W		
R15			R92-0670-05	CHIP R 0 OHM		
R16			RK73FB2A101J	CHIP R 100 J 1/10W		
R17			RK73FB2A221J	CHIP R 220 J 1/10W		
R18			RK73FB2A471J	CHIP R 470 J 1/10W		
R19			RK73FB2A100J	CHIP R 10 J 1/10W		
R20			RK73FB2A471J	CHIP R 470 J 1/10W		

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R21			RK73FB2A330J	CHIP R 33 J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A223J	CHIP R 22K J 1/10W		
R24			RK73FB2A471J	CHIP R 470 J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R27			RK73FB2A101J	CHIP R 100 J 1/10W		
R33			RK73FB2A470J	CHIP R 47 J 1/10W		
R34			RK73FB2A681J	CHIP R 680 J 1/10W		
R35			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R36			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R37			RK73FB2A184J	CHIP R 180K J 1/10W		
R38			RK73FB2A681J	CHIP R 680 J 1/10W		
R39			RK73FB2A103J	CHIP R 10K J 1/10W		
R40			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R42			RK73FB2A220J	CHIP R 22 J 1/10W		
R43			RK73FB2A331J	CHIP R 330 J 1/10W		
R44			RK73FB2A330J	CHIP R 33 J 1/10W		
R45			RK73FB2A101J	CHIP R 100 J 1/10W		
R46			RK73FB2A470J	CHIP R 47 J 1/10W		
R54			RK73FB2A101J	CHIP R 100 J 1/10W		
R55			RK73FB2A681J	CHIP R 680 J 1/10W		
R56			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R57 ,58			RK73FB2A101J	CHIP R 100 J 1/10W		
R59			RK73FB2A821J	CHIP R 820 J 1/10W		
R60			RK73FB2A124J	CHIP R 120K J 1/10W		
R61			RK73FB2A221J	CHIP R 220 J 1/10W		
R62			RK73FB2A101J	CHIP R 100 J 1/10W		
R63			RK73FB2A560J	CHIP R 56 J 1/10W		
R64			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R65			RK73FB2A333J	CHIP R 33K J 1/10W		
R66			RK73FB2A221J	CHIP R 220 J 1/10W		
R67			RK73FB2A101J	CHIP R 100 J 1/10W		
R71			RK73FB2A103J	CHIP R 10K J 1/10W		
R72			RK73FB2A223J	CHIP R 22K J 1/10W		
R73			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R74			RK73FB2A101J	CHIP R 100 J 1/10W		
R75 ,76			RK73FB2A473J	CHIP R 47K J 1/10W		
R77			RK73FB2A101J	CHIP R 100 J 1/10W		
R79			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R80			RK73FB2A101J	CHIP R 100 J 1/10W		
R81			RK73FB2A681J	CHIP R 680 J 1/10W		
R82			RK73FB2A471J	CHIP R 470 J 1/10W		
R84			RK73FB2A101J	CHIP R 100 J 1/10W		
R90			RK73FB2A101J	CHIP R 100 J 1/10W		
R91			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R92			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R93			RK73FB2A470J	CHIP R 47 J 1/10W		
R94			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R95			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R96			RK73FB2A331J	CHIP R 330 J 1/10W		
R97			RK73FB2A180J	CHIP R 18 J 1/10W		
R98			RK73FB2A101J	CHIP R 100 J 1/10W		
R99			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R101,102			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R103			RK73FB2A101J	CHIP R 100 J 1/10W		

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R104			RK73FB2A471J	CHIP R 470 J 1/10W		
R105			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R106			RK73FB2A821J	CHIP R 820 J 1/10W		
R107			RK73FB2A822J	CHIP R 8.2K J 1/10W		
R108			RK73FB2A331J	CHIP R 330 J 1/10W		
R109			RK73FB2A101J	CHIP R 100 J 1/10W		
R110			RK73FB2A223J	CHIP R 22K J 1/10W		
R111			RK73FB2A183J	CHIP R 18K J 1/10W		
R112			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R113			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R114			RK73FB2A683J	CHIP R 68K J 1/10W		
R115			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R116			RK73FB2A151J	CHIP R 150 J 1/10W		
R117			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R118			RK73FB2A101J	CHIP R 100 J 1/10W		
R200			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R201			RK73FB2A221J	CHIP R 220 J 1/10W		
R202			RK73FB2A103J	CHIP R 10K J 1/10W		
R203			RK73FB2A223J	CHIP R 22K J 1/10W		
R204			RK73FB2A333J	CHIP R 33K J 1/10W		
R205			RK73FB2A683J	CHIP R 68K J 1/10W		
R206,207			RK73FB2A103J	CHIP R 10K J 1/10W		
R208			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R209			RK73FB2A221J	CHIP R 220 J 1/10W		
R210			RK73FB2A103J	CHIP R 10K J 1/10W		
R211			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R212			RK73FB2A563J	CHIP R 56K J 1/10W		
R213			RK73FB2A101J	CHIP R 100 J 1/10W		
R214			RK73FB2A681J	CHIP R 680 J 1/10W		
R215			RK73FB2A333J	CHIP R 33K J 1/10W		
R216,217			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R218			RK73FB2A223J	CHIP R 22K J 1/10W		
R220			RK73FB2A101J	CHIP R 100 J 1/10W		
R221,222			RK73FB2A103J	CHIP R 10K J 1/10W		
R223,224			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R225			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R226			RK73FB2A101J	CHIP R 100 J 1/10W		
R227			RK73FB2A562J	CHIP R 5.6K J 1/10W		
R228			RK73FB2A561J	CHIP R 560 J 1/10W		
R229			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R230			RK73FB2A103J	CHIP R 10K J 1/10W		
R231			RK73FB2A563J	CHIP R 56K J 1/10W		
R232			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R233			RK73FB2A681J	CHIP R 680 J 1/10W		
R234			RK73FB2A103J	CHIP R 10K J 1/10W		
R236			R92-0670-05	CHIP R 0 ΩHM		
VR1 ,2			R12-3132-05	TRIM PΩT 47K		
VR3			R12-6717-05	TRIM PΩT 47K		
VR301			R24-3410-05	PΩTENTIΩMETER(AF･VΩL/SΩL)		
VR302			R23-3408-15	PΩTENTIΩMETER(RIT/IF-SHIFT)		
W1 ,2			R92-1061-05	JUMPER REST 0 ΩHM		
D1			1SS184	DIΩRD		
D2			B30-2004-05	LED		
D3			1SS226	DIΩRD		

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PLL UNIT (X50-3200-00)
TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
D200			HSM88AS	DIORD		
IC2			UPD74HC390G	IC(DUAL DECADE COUNTER)		
IC3			SN76514N	IC(MIXER)		
IC4 ,5			SN16913P	IC(DUBLE BALANCED MIXERS)		
IC7			SN16913P	IC(DUBLE BALANCED MIXERS)		
IC8			SC7S04F	IC (or TC7S04F)		
IC10			KCH14	HIC		
IC11			CXD1225M	IC(PLL)		
IC201			KCA04	IC(MIC AMPLIFIER)		
Q1			DTC114TK	DIGITAL TRANSISTOR		
Q2 ,3			2SC2714(Y)	TRANSISROR		
Q5			2SC2712(Y)	TRANSISTOR		
Q9			RU201	TRANSISTOR		
Q10 -13			2SC2714(Y)	TRANSISTOR		
Q14			2SC2996(Y)	TRANSISTOR		
Q16			2SC2712(Y)	TRANSISTOR		
Q17			2SD1757K	TRANSISTOR		
Q18			2SC2954	TRAMSISTOR		
Q19			2SC2712(Y)	TRANSISTOR		
Q20			2SC2714(Y)	TRANSISTOR		
Q21 -23			2SC3722K(R)	TRANSISTOR		
Q200-203			2SC2714(Y)	TRANSISTOR		
Q204,205			2SC2712(Y)	TRANSISTOR		
Q206			DTA114EK	DIGITAL TRANSISTOR		
Q207			DTC114EK	DIGITAL TRANSISTOR		
Q209			DTC114EK	DIGITAL TRANSISTOR		
Q210			2SC2712(Y)	TRANSISTOR		
Q211			DTC114TK	DIGITAL TRANSISTOR		
A1		*	X58-4120-00	SUB UNIT (VCO)		
A2 ,3			X58-4020-00	SUB UNIT (DDS)		
TX-RX UNIT (X57-4570-00)						
C1			CK73FB1E103K	CHIP C 0.01UF K		
C2			CK73FB1E103K	CHIP C 0.01UF K		
C3			CC73GCH1H180J	CHIP C 18PF J		
C4			CC73GCH1H470J	CHIP C 47PF J		
C5			CC73GCH1H560J	CHIP C 56PF J		
C7			CC73GCH1H120J	CHIP C 12PF J		
C8			CK73FB1E104K	CHIP C 0.10UF K		
C9			CC73FCH1H560J	CHIP C 56PF J		
C9			CK73FF1C105Z	CHIP C 1.0UF Z		
C10			CK73EB1H104K	CHIP C 0.10UF K		
C11			CK73FB1E103K	CHIP C 0.01UF K		
C12			CK73FB1E103K	CHIP C 0.01UF K		
C17 ,18			CC73GCH1H560J	CHIP C 56PF J		
C19			CC73GCH1H120J	CHIP C 12PF J		
C20			CK73FB1E104K	CHIP C 0.10UF K		
C21			CK73GB1H102K	CHIP C 1000PF K		
C22 -24			CK73FB1E104K	CHIP C 0.10UF K		
C25			CK73GB1E103K	CHIP C 0.010UF K		
C26			CK73FB1E104K	CHIP C 0.10UF K		
C27			CC73FCH1H220J	CHIP C 22PF J		
C28			CC73FSL1H471J	CHIP C 470PF J		
C29			CK73FB1E104K	CHIP C 0.10UF K		
C32			CK73GB1E103K	CHIP C 0.010UF K		

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TX-RX UNIT (X57-4570-00)

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C34 ,35			CK73FB1E104K	CHIP C 0.10UF K		
C36			CK73GB1E103K	CHIP C 0.010UF K		
C37			CK73GB1H471K	CHIP C 470PF K		
C38 ,39			CK73FB1E103K	CHIP C 0.01UF K		
C40			CK73GB1E103K	CHIP C 0.010UF K		
C41			CK73GB1H471K	CHIP C 470PF K		
C42			CK73FB1E103K	CHIP C 0.01UF K		
C43			CC73GCH1H100D	CHIP C 10PF D		
C44			CK73FF1C105Z	CHIP C 1.0UF Z		
C45			CC73FCH1H020C	CHIP C 2.0PF C		
C46			CC73FCH1H030C	CHIP C 3PF C		
C47			CC73FCH1H010C	CHIP C 1PF C		
C48			CC73FCH1H101J	CHIP C 100PF J		
C49			CK73FB1E104K	CHIP C 0.10UF K		
C50 ,51			CK73FB1E103K	CHIP C 0.01UF K		
C53			CK73GB1H102K	CHIP C 1000PF K		
C54			CC73FCH1H060D	CHIP C 6PF D		
C55			CC73FCH1H010C	CHIP C 1PF C		
C56			CK73GB1E103K	CHIP C 0.010UF K		
C58 ,59			CK73GB1E103K	CHIP C 0.010UF K		
C60			CK73FB1E103K	CHIP C 0.01UF K		
C62			CK73GB1E103K	CHIP C 0.010UF K		
C63 ,64			CK73FB1E103K	CHIP C 0.01UF K		
C65			CC73GCH1H020C	CHIP C 2.0PF C		
C66 ,67			CK73FB1E103K	CHIP C 0.01UF K		
C68			CK73FB1E104K	CHIP C 0.10UF K		
C69 ,70			CK73FB1E103K	CHIP C 0.01UF K		
C71			CC73FCH1H220J	CHIP C 22PF J		
C72 -74			CK73FB1E103K	CHIP C 0.01UF K		
C75			CK73GB1E103K	CHIP C 0.010UF K		
C76 -81			CK73FB1E103K	CHIP C 0.01UF K		
C82			CK73FB1H102K	CHIP C 1000PF K		
C83			CK73FB1E103K	CHIP C 0.01UF K		
C84			CC73FCH1H470J	CHIP C 47PF J		
C85			CC73FCH1H270J	CHIP C 27PF J		
C86			CK73FB1E103K	CHIP C 0.01UF K		
C87			C92-0009-05	CHIP TAN 4.7UF 10WV		
C88			CK73FB1E104K	CHIP C 0.10UF K		
C89			C92-0001-05	CHIP TAN 0.1UF 35WV		
C90			CK73FB1E104K	CHIP C 0.10UF K		
C91			CK73GB1E103K	CHIP C 0.010UF K		
C92			CK73FB1E103K	CHIP C 0.01UF K		
C93			CK73FF1C105Z	CHIP C 1.0UF Z		
C94			CK73FB1E104K	CHIP C 0.10UF K		
C95			CK73FF1C105Z	CHIP C 1.0UF Z		
C96			CK73FB1H472K	CHIP C 4700PF K		
C97 -100			CK73GB1E103K	CHIP C 0.010UF K		
C101			CC73FCH1H470J	CHIP C 47PF J		
C102			CK73FB1E103K	CHIP C 0.01UF K		
C103,104			C92-0003-05	CHIP TAN 0.47UF 25WV		
C105			C92-0509-05	TANTAL 10UF 6.3WV		
C106			C92-0004-05	ELECTRO 1.0UF 16WV		
C107,108			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C109			C92-0002-05	CHIP TAN 0.22UF 35WV		
C110			CK73FB1E223K	CHIP C 0.022UF K		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C111			CK73FB1E473K	CHIP C 0.047UF K		
C112			CK73FB1E103K	CHIP C 0.01UF K		
C113			CK73FB1H392K	CHIP C 3900PF K		
C114			CK73FB1E104K	CHIP C 0.10UF K		
C115			C92-0038-05	ELECTRO 22UF 16WV		
C116			C92-0041-05	ELECTRO 10UF 10WV		
C117,118			CK73FB1E104K	CHIP C 0.10UF K		
C119			CC73FSL1H471J	CHIP C 470PF J		
C120			CK73FB1H102K	CHIP C 1000PF K		
C121,122			C92-0040-05	ELECTRO 47UF 16WV		
C123			C90-2153-05	ELECTRO 470UF 10WV		
C124			CK73FB1E104K	CHIP C 0.10UF K		
C125			C92-0040-05	ELECTRO 47UF 16WV		
C126			C92-0038-05	ELECTRO 22UF 16WV		
C127			CE04EW1C331M	ELECTRO 330UF 16WV		
C128			CK73GB1H102K	CHIP C 1000PF K		
C129,130			CC73FCH1H101J	CHIP C 100PF J		
C131			C92-0009-05	CHIP TAN 4.7UF 10WV		
C132			C92-0007-05	CHIP TAN 2.2UF 20WV		
C133			C92-0009-05	CHIP TAN 4.7UF 10WV		
C134,135			CK73FF1C105Z	CHIP C 1.0UF Z		
C136			C92-0007-05	CHIP TAN 2.2UF 20WV		
C137			CK73FF1C105Z	CHIP C 1.0UF Z		
C138			C92-0009-05	CHIP TAN 4.7UF 10WV		
C139			CK73FF1C105Z	CHIP C 1.0UF Z		
C140			C92-0509-05	TANTAL 10UF 6.3WV		
C141,142			CK73FF1C105Z	CHIP C 1.0UF Z		
C143			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C144			CC73FCH1H050C	CHIP C 5PF C		
C145-147			CK73FB1E103K	CHIP C 0.01UF K		
C148			C92-0038-05	ELECTRO 22UF 16WV		
C149			CK73GB1E103K	CHIP C 0.010UF K		
C150-152			CK73FB1E103K	CHIP C 0.01UF K		
C153,154			CK73GB1E103K	CHIP C 0.010UF K		
C155-157			CK73FB1E103K	CHIP C 0.01UF K		
C158			CK73GB1E103K	CHIP C 0.010UF K		
C159			CC73FCH1H050C	CHIP C 5PF C		
C160			CK73GB1E103K	CHIP C 0.010UF K		
C161			CC73FCH1H200J	CHIP C 20PF J		
C162,163			CK73GB1E103K	CHIP C 0.010UF K		
C164,165			CK73FB1E103K	CHIP C 0.01UF K		
C166			CC73FCH1H010C	CHIP C 1PF C		
C167			CC73FCH1H0R5C	CHIP C 0.5PF C		
C168			CC73FCH1H010C	CHIP C 1PF C		
C169,170			CK73GB1E103K	CHIP C 0.010UF K		
C171			CK73FB1E103K	CHIP C 0.01UF K		
C172,173			CK73GB1E103K	CHIP C 0.010UF K		
C174,175			CK73GB1H102K	CHIP C 1000PF K		
C176			CK73FB1E104K	CHIP C 0.10UF K		
C181			CK73FB1E104K	CHIP C 0.10UF K		
C184			CK73FB1H102K	CHIP C 1000PF K		
C185,186			CK73FB1E104K	CHIP C 0.10UF K		
C187			C92-0037-05	ELECTRO 10UF 16WV		
C188			CK73FB1E104K	CHIP C 0.10UF K		
C189			CK73FB1H102K	CHIP C 1000PF K		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C192			CK73FB1H222K	CHIP C 2200PF K		
C193			CK73FB1H332K	CHIP C 3300PF K		
C194			C92-0040-05	ELECTRO 47UF 16WV		
C195			CK73FB1E103K	CHIP C 0.01UF K		
C196,197			C92-0040-05	ELECTRO 47UF 16WV		
C198			CK73FB1E103K	CHIP C 0.01UF K		
C199			C92-0047-05	ELECTRO 47UF 6.3WV		
C200			CK73FB1E103K	CHIP C 0.01UF K		
C201			CE04EW1C101M	ELECTRO 100UF 16WV		
C204,205			CK73FB1E103K	CHIP C 0.01UF K		
C207-210			CC73GCH1H470J	CHIP C 47PF J		
C211,212			CK73FB1E103K	CHIP C 0.01UF K		
C213			CC73GCH1H470J	CHIP C 47PF J		
C214			CC73GCH1H180J	CHIP C 18PF J		
C215			CK73GB1H102K	CHIP C 1000PF K		
C216			CK73FB1E473K	CHIP C 0.047UF K		
C217			CK73FF1C105Z	CHIP C 1.0UF Z		
C218			CK73FB1E223K	CHIP C 0.022UF K		
C219			C92-0004-05	ELECTRO 1.0UF 16WV		
C220,221			CK73FB1E103K	CHIP C 0.01UF K		
C222-225			CC73FUJ1H080D	CHIP C 8PF D		
C226			CK73GB1H102K	CHIP C 1000PF K		
C227,228			CC73FCH1H020C	CHIP C 2.0PF C		
C229			C92-0040-05	ELECTRO 47UF 16WV		
C230			C92-0004-05	ELECTRO 1.0UF 16WV		
C231			CK73GB1H102K	CHIP C 1000PF K		
C232			CE04EW1E4R7M	ELECTRO 4.7UF 25WV		
C240			CK73FB1H122K	CHIP C 1200PF K		
C241			CC73FCH1H270J	CHIP C 27PF J		
C242			C90-2114-05	ELECTRO 220UF 16WV		
C243			CC73FCH1H560J	CHIP C 56PF J		
C244			CK73FB1H102K	CHIP C 1000PF K		
C245			CC73FCH1H560J	CHIP C 56PF J		
C246			CK73FB1H103K	CHIP C 0.010UF K		
C247			CC73FCH1H560J	CHIP C 56PF J		
C249			CK73FB1H103K	CHIP C 0.010UF K		
C250			CK73FB1E104K	CHIP C 0.10UF K		
C251			CC73FCH1H120J	CHIP C 12PF J		
C252			CK73FB1E104K	CHIP C 0.10UF K		
C253			CK73FB1H103K	CHIP C 0.010UF K		
C254			CK73FB1E104K	CHIP C 0.10UF K		
C255			CK73FB1H102K	CHIP C 1000PF K		
C256			CC73FCH1H270J	CHIP C 27PF J		
C257			CK73FB1H102K	CHIP C 1000PF K		
C258			CK73FB1E103K	CHIP C 0.01UF K		
C260			CK73FB1H102K	CHIP C 1000PF K		
C261			CC73FCH1H101J	CHIP C 100PF J		
C262			CC73FCH1H121J	CHIP C 120PF J		
C263			CC73FCH1H470J	CHIP C 47PF J		
C264			CC73FCH1H121J	CHIP C 120PF J		
C265			CC73FCH1H330J	CHIP C 33PF J		
C266			CC73FCH1H680J	CHIP C 68PF J		
C267			CC73FCH1H560J	CHIP C 56PF J		
C268			CC73FCH1H560J	CHIP C 56PF J		
C269			CC73FCH1H680J	CHIP C 68PF J		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
C274,275			CK73FB1E104K	CHIP C 0.10UF K		
C276,277			CK73GF1E104Z	CHIP C 0.1UF Z		
C278			CC73FCH1H120J	CHIP C 12PF J		
C501			CC73FCH1H470J	CHIP C 47PF J		
C502			CC73FCH1H560J	CHIP C 56PF J		
C503			CC73FCH1H390J	CHIP C 39PF J		
C504			CK73FB1H103K	CHIP C 0.01UF K		
C505			CC45CH2H030C	CHIP C 3PF C		
C506			CC73FCH1H560J	CHIP C 56PF J		
C507			CC73FCH1H101J	CHIP C 100PF J		
C508,509			CK73FB1E103K	CHIP C 0.01UF K		
C510			CK73FB1E104K	CHIP C 0.10UF K		
C511			CC45SL2H270J	CERAMIC 27PF J		
C512			CC45SL2H390J	CERAMIC 39PF J		
C513			CC45SL2H180J	CERAMIC 18PF J		
C514			CC45SL2H100D	CERAMIC 10PF D		
C515			CC45SL2H560J	CERAMIC 56PF J		
C516			CC45SL2H120J	CERAMIC 12PF J		
C517-519			CK73FB1H102K	CHIP C 1000PF K		
TC1			C05-0344-05	TRIMMER CAPACITOR 30PF		
TC501			C05-0030-15	TRIM CAP 20PF		
A1			E23-0918-04	TERMINAL		
CN1 -3			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN4			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
CN5 ,6			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN7			E40-5608-05	PIN CONNECTOR FOR INSIDE(5P)		
CN8			E40-5607-05	PIN CONNECTOR FOR INSIDE(4P)		
CN9			E40-5608-05	PIN CONNECTOR FOR INSIDE(5P)		
CN10			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN11			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN12			E40-3237-05	PIN CONNECTOR FOR INSIDE(2P)		
CN13			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
CN14			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)		
CN15			E40-3249-05	PIN CONNECTOR FOR INSIDE(5P)		
CN16			E40-3254-05	PIN CONNECTOR FOR INSIDE(10P)		
CN17			E40-5233-05	PIN CONNECTOR FOR INSIDE(25P)		
CN18			E40-3250-05	PIN CONNECTOR FOR INSIDE(6P)		
CN19			E04-0154-05	RF COAXIAL CABLE RECEPTACLE		
CN20			E40-5606-05	PIN CONNECTOR FOR INSIDE(3P)		
CN501			E04-0190-05	RF COAXIAL CABLE RECEPTACLE		
CN502			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN503			E40-5604-05	PIN CONNECTOR FOR INSIDE(11P)		
CN504			E40-5605-05	PIN CONNECTOR FOR INSIDE(12P)		
CN505			E04-0190-05	RF COAXIAL CABLE RECEPTACLE		
CN506			E40-3247-05	PIN CONNECTOR FOR INSIDE(3P)		
J501			E11-0454-05	PHONE JACK		
TP1 ,2			E40-0211-05	PIN CONNECTOR FOR INSIDE(2P)		
W1			E37-0179-05	CONNECTING WIRE		
W2			E37-0373-05	CONNECTING WIRE		
W502			E37-0445-05	CONNECTING WIRE (ANT)		
F1			F53-0055-05	FUSE (2A)		
-			J30-0545-05	SPACER (XF1)		

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CD1			L79-1013-05	FILTER(455KHZ)		
CF1			L72-0372-05	CERAMIC FILTER(455KHZ)		
L1			L40-2211-48	SMALL FIXED INDUCTOR(220UH)		
L2			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L3			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L4			L33-0695-05	CHOKE COIL (1MH)		
L5 ,6			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L7			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L10			L33-0695-05	CHOKE COIL (1MH)		
L11			L19-0324-05	TRANSFORMER		
L12			L39-0454-05	COIL		
L13			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L14			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L15			L34-4222-05	COIL		
L16			L34-4332-05	COIL		
L17			L34-4331-05	COIL		
L18			L19-0324-05	TRANSFORMER		
L19			L40-3392-48	SMALL FIXED INDUCTOR(3.3UH)		
L20			L19-0324-05	TRANSFORMER		
L21			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L22			L39-0454-05	COIL		
L23			L40-4701-48	SMALL FIXED INDUCTOR(47UH)		
L24			L34-4209-05	COIL		
L25			L34-4330-05	COIL		
L26			L34-4216-05	COIL		
L27			L40-1082-48	SMALL FIXED INDUCTOR(0.1UH)		
L28			L34-4328-05	COIL		
L29 -32			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L33 ,34			L40-8295-48	SMALL FIXED INDUCTOR((8.2UH)		
L35 -37			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L38			L34-4327-05	COIL		
L39			L34-4326-05	COIL		
L40			L34-4329-05	COIL		
L41 -43			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L44 -46			L34-4333-05	COIL		
L47			L39-0454-05	COIL		
L48			L34-4333-05	COIL		
L49 ,50			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L51			L19-0324-05	TRANSFORMER		
L53			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L54			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L55			L19-0324-05	TRANSFORMER		
L56			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L57			L40-1021-13	SMALL FIXED INDUCTOR(1MH)		
L58			L33-0695-05	CHOKE COIL (1MH)		
L64			L40-4701-48	SMALL FIXED INDUCTOR(47MH)		
L65			L33-0695-05	CHOKE COIL		
L66			L34-4002-05	COIL		
L67			L40-1001-48	SMALL FIXED INDUCTOR(10UH)		
L68			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L69			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L70			L40-1882-48	SMALL FIXED INDUCTOR(5.6UH)		
L71			L40-1582-48	SMALL FIXED INDUCTOR(0.27UH)		
L72			L40-1282-48	SMALL FIXED INDUCTOR		
L73			L40-1082-48	SMALL FIXED INDUCTOR		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
L74			L40-3395-48	SMALL FIXED INDUCTOR(3.3UH)		
L75			L40-6872-48	SMALL FIXED INDUCTOR(0.27UH)		
L76			L40-1095-48	SMALL FIXED INDUCTOR		
L77			L40-6882-48	SMALL FIXED INDUCTOR(0.27UH)		
L78			L40-6882-48	SMALL FIXED INDUCTOR		
L79 ,80			L40-1082-48	SMALL FIXED INDUCTOR		
L501-503			L34-1359-05	COIL		
L504,505			L34-1391-05	COIL		
L506,507		*	L40-1021-33	SMALL FIXED INDUCTOR(2.2MH)		
L508			L39-0480-15	COIL		
X1			L77-0720-05	CRYSTAL RESONATOR(10.240MHZ)		
XF1			L71-0432-05	CRYSTAL FILTER (73.045MHZ)		
XF2			L71-0230-05	CRYSTAL FILTER (10.695MHZ)		
R1			RK73FB2A560J	CHIP R 56 J 1/10W		
R2			RK73EB2B471J	CHIP R 470 J 1/8W		
R3			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R4			RK73FB2A101J	CHIP R 100 J 1/10W		
R5			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R6			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R7			RK73FB2A151J	CHIP R 150 J 1/10W		
R8			RK73FB2A471J	CHIP R 470 J 1/10W		
R9 ,10			RK73GB1J681J	CHIP R 680 J 1/16W		
R11 -14			RK73FB2A100J	CHIP R 10 J 1/10W		
R15			RK73FB2A271J	CHIP R 270 J 1/10W		
R16			RK73FB2A100J	CHIP R 10 J 1/10W		
R18			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R19			RK73FB2A101J	CHIP R 100 J 1/10W		
R20			RK73FB2A220J	CHIP R 22 J 1/10W		
R21			RK73FB2A470J	CHIP R 47 J 1/10W		
R22			RK73FB2A391J	CHIP R 390 J 1/10W		
R23			RK73FB2A560J	CHIP R 56 J 1/10W		
R24			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R25			RK73FB2A471J	CHIP R 470 J 1/10W		
R26			RK73FB2A220J	CHIP R 22 J 1/10W		
R27			RK73FB2A150J	CHIP R 15 J 1/10W		
R28			RK73FB2A680J	CHIP R 68 J 1/10W		
R29			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R30			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R31			RK73GB1J474J	CHIP R 470K J 1/16W		
R32			RK73FB2A333J	CHIP R 33K J 1/10W		
R33			RK73FB2A181J	CHIP R 180 J 1/10W		
R34			RK73FB2A104J	CHIP R 100K J 1/10W		
R35			RK73GB1J101J	CHIP R 100 J 1/16W		
R39			RK73GB1J103J	CHIP R 10K J 1/16W		
R40			RK73GB1J681J	CHIP R 680 J 1/16W		
R41 ,42			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R43			RK73FB2A330J	CHIP R 33 J 1/10W		
R44			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R45			RK73FB2A330J	CHIP R 33 J 1/10W		
R46 ,47			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R48			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R49			RK73FB2A101J	CHIP R 100 J 1/10W		
R50			RK73GB1J101J	CHIP R 100 J 1/16W		
R51			RK73FB2A102J	CHIP R 1.0K J 1/10W		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R52			RK73GB1J101J	CHIP R 100 J 1/16W		
R53			RK73GB1J103J	CHIP R 10K J 1/16W		
R54			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R55			RK73GB1J101J	CHIP R 100 J 1/16W		
R56			RK73FB2A333J	CHIP R 33K J 1/10W		
R57			RK73FB2A104J	CHIP R 100K J 1/10W		
R58			RK73FB2A223J	CHIP R 22K J 1/10W		
R59			RK73FB2A471J	CHIP R 470 J 1/10W		
R60			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R61			RK73FB2A103J	CHIP R 10K J 1/10W		
R62			RK73GB1J101J	CHIP R 100 J 1/16W		
R63			RK73GB1J103J	CHIP R 10K J 1/16W		
R64 -66			RK73GB1J101J	CHIP R 100 J 1/16W		
R67			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R68 -70			RK73FB2A101J	CHIP R 100 J 1/10W		
R71			RK73FB2A104J	CHIP R 100K J 1/10W		
R72			RK73GB1J471J	CHIP R 470 J 1/16W		
R73			RK73FB2A221J	CHIP R 220 J 1/10W		
R74			RK73FB2A224J	CHIP R 220K J 1/10W		
R75			RK73FB2A103J	CHIP R 10K J 1/10W		
R76			RK73GB1J820J	CHIP R 82 J 1/16W		
R77			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R78			RK73FB2A104J	CHIP R 100K J 1/10W		
R79			RK73GB1J104J	CHIP R 100K J 1/16W		
R80			RK73FB2A103J	CHIP R 10K J 1/10W		
R81			RK73GB1J101J	CHIP R 100 J 1/16W		
R82 ,83			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R84			RK73FB2A273J	CHIP R 27K J 1/10W		
R85			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R86			RK73FB2A473J	CHIP R 47K J 1/10W		
R87			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R88			RK73FB2A103J	CHIP R 10K J 1/10W		
R89 ,90			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R91			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R92			RK73GB1J103J	CHIP R 10K J 1/16W		
R93			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R94			RK73GB1J562J	CHIP R 5.6K J 1/16W		
R95			RK73GB1J153J	CHIP R 15K J 1/16W		
R96			RK73FB2A335J	CHIP R 3.3M J 1/10W		
R97			RK73FB2A123J	CHIP R 12K J 1/10W		
R98			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R99			RK73GB1J123J	CHIP R 12K J 1/16W		
R100			RK73FB2A473J	CHIP R 47K J 1/10W		
R101			RK73GB1J473J	CHIP R 47K J 1/16W		
R102			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R103			RK73FB2A474J	CHIP R 470K J 1/10W		
R104			RK73GB1J103J	CHIP R 10K J 1/16W		
R105			RK73FB2A103J	CHIP R 10K J 1/10W		
R106			RK73GB1J331J	CHIP R 330 J 1/16W		
R107			RK73FB2A393J	CHIP R 39K J 1/10W		
R108			RK73FB2A104J	CHIP R 100K J 1/10W		
R109			RK73FB2A823J	CHIP R 82K J 1/10W		
R110			RK73FB2A273J	CHIP R 27K J 1/10W		
R111			RK73GB1J104J	CHIP R 100K J 1/16W		
R112			RK73GB1J102J	CHIP R 1.0K J 1/16W		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R113			RK73GB1J473J	CHIP R 47K J 1/16W		
R114			RK73GB1J273J	CHIP R 27K J 1/16W		
R115			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R116			RK73GB1J271J	CHIP R 270 J 1/16W		
R117			RK73GB1J272J	CHIP R 2.7K J 1/16W		
R118			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R119			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R120			RK73FB2A473J	CHIP R 47K J 1/10W		
R121			RK73GB1J101J	CHIP R 100 J 1/16W		
R122			RK73FB2A104J	CHIP R 100K J 1/10W		
R123			RK73GB1J331J	CHIP R 330 J 1/16W		
R124			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R125			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R126			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R127			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R128			RK73GB1J471J	CHIP R 470 J 1/16W		
R129			RK73GB1J104J	CHIP R 100K J 1/16W		
R130			RK73FB2A223J	CHIP R 22K J 1/10W		
R131			RK73GB1J101J	CHIP R 100 J 1/16W		
R132			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R133			RK73FB2A151J	CHIP R 150 J 1/10W		
R134			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R135			RK73GB1J101J	CHIP R 100 J 1/16W		
R136			RK73GB1J104J	CHIP R 100K J 1/16W		
R137			RK73FB2A473J	CHIP R 47K J 1/10W		
R138			RK73FB2A471J	CHIP R 470 J 1/10W		
R139			RK73GB1J152J	CHIP R 1.5K J 1/16W		
R140			RK73FB2A470J	CHIP R 47 J 1/10W		
R141,142			RK73GB1J471J	CHIP R 470 J 1/16W		
R143			RK73GB1J101J	CHIP R 100 J 1/16W		
R144			RK73FB2A184J	CHIP R 180K J 1/10W		
R145			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R146			RK73FB2A224J	CHIP R 220K J 1/10W		
R147			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R148			RK73GB1J224J	CHIP R 220K J 1/16W		
R149			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R150			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R151			RK73GB1J331J	CHIP R 330 J 1/16W		
R152			RK73GB1J101J	CHIP R 100 J 1/16W		
R153			RK73FB2A221J	CHIP R 220 J 1/10W		
R154			RK73FB2A224J	CHIP R 220K J 1/10W		
R155			R92-0670-05	CHIP R 0 ΩHM		
R156			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R157			RK73GB1J101J	CHIP R 100 J 1/16W		
R158			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R159			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R160			RK73GB1J561J	CHIP R 560 J 1/16W		
R161			RK73GB1J682J	CHIP R 6.8K J 1/16W		
R162,163			RK73FB2A223J	CHIP R 22K J 1/10W		
R164			RK73FB2A331J	CHIP R 330 J 1/10W		
R165			RK73GB1J103J	CHIP R 10K J 1/16W		
R166			RK73FB2A101J	CHIP R 100 J 1/10W		
R167			RK73GB1J101J	CHIP R 100 J 1/16W		
R168			RK73FB2A333J	CHIP R 33K J 1/10W		
R169			RK73GB1J271J	CHIP R 270 J 1/16W		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R170			RK73GB1J820J	CHIP R 82 J 1/16W		
R171			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R172			RK73GB1J823J	CHIP R 82K J 1/16W		
R173			RK73GB1J103J	CHIP R 10K J 1/16W		
R174			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R175-178			RK73FB2A330J	CHIP R 33 J 1/10W		
R179,180			RK73GB1J471J	CHIP R 470 J 1/16W		
R181,182			RK73FB2A101J	CHIP R 100 J 1/10W		
R183			RK73FB2A680J	CHIP R 68 J 1/10W		
R184			RK73FB2A101J	CHIP R 100 J 1/10W		
R185			R92-1252-05	CHIP R 0 ΩHM		
R186-189			RK73FB2A330J	CHIP R 33 J 1/10W		
R193			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R197			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R198			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R199			RK73GB1J101J	CHIP R 100 J 1/16W		
R200			RK73FB2A561J	CHIP R 560 J 1/10W		
R201-203			RK73FB2A330J	CHIP R 33 J 1/10W		
R204			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R206			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R207			RK73FB2A473J	CHIP R 47K J 1/10W		
R208,209			RK73FB2A223J	CHIP R 22K J 1/10W		
R210			RK73FB2A471J	CHIP R 470 J 1/10W		
R211			R92-0670-05	CHIP R 0 ΩHM		
R213			RK73FB2A473J	CHIP R 47K J 1/10W		
R214			RK73GB1J103J	CHIP R 10K J 1/16W		
R215			RK73GB1J682J	CHIP R 6.8K J 1/16W		
R216,217			RK73FB2A103J	CHIP R 10K J 1/10W		
R218			RK73FB2A471J	CHIP R 470 J 1/10W		
R219			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R220			RK73FB2A471J	CHIP R 470 J 1/10W		
R221,222			RK73GB1J104J	CHIP R 100K J 1/16W		
R223			RK73GB1J564J	CHIP R 560K J 1/16W		
R224,225			R92-1252-05	CHIP R 0 ΩHM		
R226			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R227			RK73GB1J223J	CHIP R 22K J 1/16W		
R228			RK73GB1J123J	CHIP R 12K J 1/16W		
R229			RK73FB2A470J	CHIP R 47 J 1/10W		
R230			RK73GB1J473J	CHIP R 47K J 1/16W		
R231			RK73GB1J104J	CHIP R 100K J 1/16W		
R232			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R233			RK73FB2A104J	CHIP R 100K J 1/10W		
R234			RK73FB2A101J	CHIP R 100 J 1/10W		
R235			RK73GB1J822J	CHIP R 8.2K J 1/16W		
R236			RK73FB2A681J	CHIP R 680 J 1/10W		
R238-241			RK73FB2A101J	CHIP R 100 J 1/10W		
R242,243			RK73FB2A221J	CHIP R 220 J 1/10W		
R244,245			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R246			RK73FB2A561J	CHIP R 560 J 1/10W		
R247			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R248			RK73GB1J272J	CHIP R 2.7K J 1/16W		
R251			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R252			RK73FB2A471J	CHIP R 470 J 1/10W		
R255			RK73FB2A391J	CHIP R 390 J 1/10W		
R256			RK73FB2A104J	CHIP R 100K J 1/10W		

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R257			RK73FB2A101J	CHIP R 100 J 1/10W		
R258			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R259			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R260			RK73FB2A151J	CHIP R 150 J 1/10W		
R261			RK73FB2A271J	CHIP R 270 J 1/10W		
R262			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R268			RK73FB2A221J	CHIP R 220 J 1/10W		
R269,270			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R271			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R272-274			R92-1252-05	CHIP R 0 ØHM		
R275			R92-0670-05	CHIP R 0 ØHM		
R501			R92-1244-05	CHIP R 27 J 1/4W		
R502			R92-1279-05	FIXED RESISTØR 33 1W		
R503			R92-1282-05	FIXED RESISTØR 10 1W		
R505-508			RK73FB2A221J	CHIP R 220 J 1/10W		
VR1			R12-6711-05	TRIMMING PØT 4.7K		
VR2			R12-6719-05	TRIMMING PØT 100K		
VR3			R12-6711-05	TRIMMING PØT 4.7K		
VR4			R12-6713-05	TRIMMING PØT 10K		
VR5			R12-3126-05	TRIMMING PØT 10K		
VR6			R12-3132-05	TRIM PØT 47K		
VR7			R12-3126-05	TRIMMING PØT 10K		
VR8 ,9			R12-6713-05	TRIMMING PØT 10K		
VR10			R12-6719-05	TRIMMING PØT 100K		
VR11,12			R12-6713-05	TRIMMING PØT 10K		
VR13			R12-6705-05	TRIM PØT 470		
VR14			R12-4414-05	TRIMMING PØT 50K		
VR15-17			R12-6713-05	TRIMMING PØT 10K		
VR501			R12-0104-05	TRIM PØT. 220		
W503			R92-0150-05	JUMPER REST 0 ØHM		
K1			S51-1436-05	RELAY		
K501			S51-1429-05	RELAY		
D1			LFB01	DIØRD		
D2			V08(G)	DIØRD		
D3 ,4			RLS245	DIØRD		
D5			V08(G)	DIØRD		
D8 ,9			RLS135	DIØRD		
D11			RLS135	DIØRD		
D12			DAN235K	DIØRD		
D13			1SS355	DIØRD (or MA110)		
D14			DAN235K	DIØRD		
D16 ,17			RLS135	DIØRD		
D18			1SS226	DIØRD		
D19			1SS355	DIØRD (or MA110)		
D20			RD6.2M(B2)	DIØRD		
D21 -23			RLS135	DIØRD		
D24			1SS355	DIØRD (or MA110)		
D25			RD4.7M(B2)	DIØRD		
D26			1SS355	DIØRD (or MA110)		
D27 ,28			DAN202K	DIØRD		
D29 ,30			1SS355	DIØRD (or MA110)		
D31			B30-2001-05	LED		
D34			1SS226	DIØRD		
D35			RD6.2M(B2)	DIØRD		

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TX-RX UNIT (X57-4570-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
D37			1SS355	DIODE (or MA110)		
D38 ,39			DAN202K	DIODE		
D40			1SS355	DIODE (or MA110)		
D41			RLS135	DIODE		
D42			HSM88AS	DIODE		
D43			1SS355	DIODE (or MA110)		
D44			RLS135	DIODE		
D46			1SS355	DIODE (or MA110)		
D49			RLS135	DIODE		
D50			RD3.9M(B2)	DIODE		
D51		*	RD12M(B2)	DIODE		
D501			DSA301LA	DIODE		
D502			LFB01	DIODE		
D503,504			1SS101	DIODE		
IC2			KCD04	HIC(FM IF)		
IC3			KCD08	HIC		
IC4			XRU4066BCF	IC or		
IC4			BU4066BCF	IC		
IC5			NJM2904M	IC(OP AMP X2)		
IC6			XRU4066BCF	IC (or BU4066BCF)		
IC7			UPC1241H	IC		
IC8			UPC1037HA	IC(DUBBLE BALANCE MODULATOR)		
IC10			UPC78N05H	IC(VOLTAGE REGULATOR/+8V)		
IC11			KCC08	HIC		
IC12,13			TC9174F	IC(CMOS I/O EXTENSION)		
IC14			TA75S01F	IC		
Q1			DTA124EK	DIGITAL TRANSISTOR		
Q2			2SD1757K	TRANSISTOR		
Q3			2SA1213(Y)	TRANSISTOR		
Q4			DTC143TK	DIGITAL TRANSISTOR		
Q5 -10			2SK520(K44)	FET		
Q11			2SC2954	TRANSISTOR		
Q12			DTA124EK	DIGITAL TRANSISTOR		
Q13			2SC4728(S)	TRANSISTOR		
Q14 ,15			DTC143TK	DIGITAL TRANSISTOR		
Q16			2SA1213(Y)	TRANSISTOR		
Q17			3SK131(M)	FET		
Q18 ,19			2SK520(K43)	FET		
Q20			RU201	TRANSISTOR		
Q21			3SK131(M)	FET		
Q22			2SC2712(Y)	TRANSISTOR		
Q23			RU201	TRANSISTOR		
Q24			2SC2712(Y)	TRANSISTOR		
Q25			2SJ106(GR)	FET		
Q26			FMC1	TRANSISTOR		
Q27 ,28			DTC124EK	DIGITAL TRANSISTOR		
Q29			2SC2712(GR)	TRANSISTOR		
Q30			2SK210(GR)	FET		
Q31			2SA1162(Y)	TRANSISTOR		
Q32			FMC2	TRANSISTOR		
Q33			DTC124EK	DIGITAL TRANSISTOR		
Q34			2SC2712(Y)	TRANSISTOR		
Q35			2SD1757K	TRANSISTOR		
Q36 ,37			DTC143EK	DIGITAL TRANSISTOR		
Q38 ,39			2SC3722K(R)	TRANSISTOR		

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TX-RX UNIT (X57-4570-00)
DDS (X58-4020-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
Q40 -42			2SC2712(Y)	TRANSISTOR		
Q43			3SK131(M)	FET		
Q44 ,45			IMD3	TRANSISTOR		
Q46 ,47			3SK131(M)	FET		
Q48 ,49			3SK184(R)	FET		
Q50			2SC2954	TRANSISTOR		
Q51			2SA1162(Y)	TRANSISTOR		
Q52 ,53			2SC2712(Y)	TRANSISTOR		
Q55 -58			FMA3	TRANSISTOR		
Q59			DTA124EK	DIGITAL TRANSISTOR		
Q60 ,61			DTC124EK	DIGITAL TRANSISTOR		
Q62			2SD1757K	TRANSISTOR		
Q63 ,64			DTC143TK	DIGITAL TRANSISTOR		
Q65			DTC114EK	DIGITAL TRANSISTOR		
Q66			FMC1	TRANSISTOR		
Q67			DTC124EK	DIGITAL TRANSISTOR		
Q69			2SK520(K44)	FET		
Q70			2SC2714(Y)	TRANSISTOR		
Q501			FMC2	TRANSISTOR		
TH1			157-502-53002	THERMISTOR 5K		
TH2			157-501-53009	THERMISTOR 500		
TH3 ,4			157-102-53003	THERMISTOR 1K		
TH5			157-502-53002	THERMISTOR 5K		
TH6 ,7			157-302-53008	THERMISTOR 3K		
TH8			157-102-53003	THERMISTOR 1K		
TH9			157-103-55001	THERMISTOR 10K		
S1			W02-1764-05	ENCODER		
Z10			X59-3990-00	SUB UNIT (ALC)		
Z9			X59-4000-00	SUB UNIT (DSST･･･A/2)		
Z11			X59-4000-00	SUB UNIT (DSST･･･B/2)		
DDS (X58-4020-00)						
C1			CK73FB1E223K	CHIP C 0.022UF K		
C2			CK73FB1H102K	CHIP C 1000PF K		
C3 ,4			C92-0007-05	CHIP TAN 2.2UF 20WV		
C5			CK73FB1H102K	CHIP C 1000PF K		
C6			CC73FCH1H181J	CHIP C 180PF J		
C7			CC73FCH1H100D	CHIP C 10PF D		
C8			CC73FCH1H221J	CHIP C 220PF J		
C9			CC73FCH1H220J	CHIP C 22PF J		
C10			CC73FCH1H151J	CHIP C 150PF J		
C12 ,13			CC73FCH1H270J	CHIP C 27PF J		
C14 -17			CC73FCH1H101J	CHIP C 100PF J		
CN1			E40-5612-05	PIN CONNECTOR FOR INSIDE(8P)		
CN2			E40-5611-05	PIN CONNECTOR FOR INSIDE(2P)		
L1 -3			L40-1011-48	SMALL FIXED INDUCTOR(100UH)		
L4 ,5			L40-2201-48	SMALL FIXED INDUCTOR(22UH)		
CP1 ,2			R90-0721-05	MULTIPLE COMPONENTS		
R1			RK73FB2A103J	CHIP R 10K J 1/10W		
R2			RK73FB2A153J	CHIP R 15K J 1/10W		
R3			RK73FB2A221J	CHIP R 220 J 1/10W		
R4			RK73FB2A101J	CHIP R 100 J 1/10W		

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DDS (X58-4020-00)
VCO (X58-4120-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
R5			RK73FB2A471J	CHIP R 470 J 1/10W		
IC1			F71022	IC(DDS)		
Q1			2SC2712(GR)	TRANSISTOR		
VCO (X58-4120-00)						
C1			CK73FB1H102K	CHIP C 1000PF K		
C2			CC73FCH1H270J	CHIP C 27PF J		
C3			CC73FCH1H150J	CHIP C 15PF J		
C5			CC73FCH1H090D	CHIP C 9PF D		
C6			CC73FCH1H180J	CHIP C 18PF J		
C7			CC73FCH1H090D	CHIP C 9PF D		
C8			CK73FB1H102K	CHIP C 1000PF K		
C9			CC73FCH1H050C	CHIP C 5PF C		
C10			CK73FB1H102K	CHIP C 1000PF K		
C12			CC73FCH1H330J	CHIP C 33PF J		
C13			CC73FCH1H220J	CHIP C 22PF J		
C15			CC73FCH1H100D	CHIP C 10PF D		
C16			CC73FCH1H120J	CHIP C 12PF J		
C17			CC73FCH1H080D	CHIP C 8PF D		
C18			CK73FB1H102K	CHIP C 1000PF K		
C19			CC73FCH1H050C	CHIP C 5PF C		
C20 ,21			CK73FB1H102K	CHIP C 1000PF K		
C22			CC73FSL1H331J	CHIP C 330PF J		
C23 -28			CK73FB1H102K	CHIP C 1000PF K		
TC1 ,2			C05-0377-05	TRIMMER CAPACITOR 10PF		
CN1			E40-5201-05	PIN CONNECTOR FOR INSIDE(7P)		
-			F10-2060-14	SHIELDING PLATE		
-			F10-2061-04	SHIELDING PLATE		
-			G13-1395-04	FORMED PLATE		
L1			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L2		*	L34-4356-05	COIL		
L3			L40-6882-48	SMALL FIXED INDUCTOR(0.68UH)		
L4		*	L34-4357-05	COIL		
			N30-2604-46	PAN HEAD MACHIN SCREW		
R2			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R3			RK73FB2A271J	CHIP R 270 J 1/10W		
R4			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R12			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R13			RK73FB2A271J	CHIP R 270 J 1/10W		
R14			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R20			RK73FB2A393J	CHIP R 39K J 1/10W		
R21			RK73FB2A103J	CHIP R 10K J 1/10W		
R22			RK73FB2A331J	CHIP R 330 J 1/10W		
R23			RK73FB2A560J	CHIP R 56 J 1/10W		
R24 ,25			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R26			RK73FB2A560J	CHIP R 56 J 1/10W		
R27			RK73FB2A471J	CHIP R 470 J 1/10W		
R28			RK73FB2A332J	CHIP R 3.3K J 1/10W		
D1			1SV166	DIORD		
D2			RLS135	DIORD		
D3			1SV166	DIORD		
D4			RLS135	DIORD		

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VCO (X58-4120-00)
ALC (X59-3990-00)
DSST (X59-4000-00)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
Q1			2SK508NV(K52)	FET		
Q2			DTC114EU	DIGITAL TRANSISTOR		
Q3			2SK508NV(K52)	FET		
Q4			DTC114EU	DIGITAL TRANSISTOR		
Q5 ,6			2SC2714(Y)	TRANSISTOR		
ALC (X59-3990-00)						
C1			CK73GB1E103K	CHIP C 0.010UF K		
C2			CK73EF1E474Z	CHIP C 0.47UF Z		
C3			CK73FB1E104K	CHIP C 0.10UF K		
C4			CK73GB1E103K	CHIP C 0.010UF K		
C5			CK73FB1E473K	CHIP C 0.047UF K		
C6			CK73FB1E104K	CHIP C 0.10UF K		
R1			RK73GB1J562J	CHIP R 5.6K J 1/16W		
R2			RK73GB1J473J	CHIP R 47K J 1/16W		
R3			RK73GB1J223J	CHIP R 22K J 1/16W		
R4 -6			RK73GB1J473J	CHIP R 47K J 1/16W		
R7			RK73GB1J330J	CHIP R 33 J 1/16W		
R8			RK73GB1J222J	CHIP R 2.2K J 1/16W		
D1			DAP202K	DIORD		
D2			1SS355	DIORD		
Q1			FMC2	TRANSISTOR		
Q2			2SC2712(Y)	TRANSISTOR		
DSST (X59-4000-00)						
C1 ,2			CK73GB1H102K	CHIP C 1000PF K		
C11			C92-0509-05	TANTAL 10UF 6.3WV		
C12			CK73FB1E223K	CHIP C 0.022UF K		
C13 -16			CK73FB1E123K	CHIP C 0.012UF K		
C17 -19			CK73FB1E223K	CHIP C 0.022UF K		
C20			C92-0009-05	CHIP TAN 4.7UF 10WV		
R1 ,2			RK73GB1J681J	CHIP R 680 J 1/16W		
R3			RK73GB1J103J	CHIP R 10K J 1/16W		
R4 ,5			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R11 ,12			RK73GB1J823J	CHIP R 82K J 1/16W		
R13			RK73GB1J223J	CHIP R 22K J 1/16W		
R14			RK73GB1J472J	CHIP R 4.7K J 1/16W		
R15			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R16			RK73GB1J103J	CHIP R 10K J 1/16W		
R17 ,18			RK73GB1J333J	CHIP R 33K J 1/16W		
R19			RK73GB1J103J	CHIP R 10K J 1/16W		
R20			RK73GB1J333J	CHIP R 33K J 1/16W		
R21			RK73GB1J183J	CHIP R 18K J 1/16W		
R22			RK73GB1J101J	CHIP R 100 J 1/16W		
D11 -13			1SS355	DIORD		
Q1 ,2			2SA1213(Y)	TRANSISTOR		
Q3 -5			DTC143TK	DIGITAL TRANSISTOR		
Q11			2SC2712(GR)	TRANSISTOR		

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LCD ASSY (B38-0719-15)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
LCD ASSY (B38-0719-15)						
C1			C92-0040-05	ELECTRO 47UF 16WV		
C2 -4			CK73FB1H103K	CHIP C 0.010UF K		
C5			CK73FB1H223K	CHIP C 0.022UF K		
C6 -13			CK73FB1H103K	CHIP C 0.01UF K		
C14 ,15			CK73FB1H102K	CHIP C 1000PF K		
-			E23-0623-04	EARTH RAG		
CN1			E40-5233-05	CONNECTOR (25P)		
CN2			E40-5398-05	CONNECTOR (11P)		
CN4			E40-3248-05	CONNECTOR (4P)		
CN5			E40-3251-05	CONNECTOR (7P)		
J1	2A		E06-0858-15	MIC CONNECTOR(8P)		
L1 ,2			L40-1011-18	CHOCK COIL (100UH)		
R1			RK73FB2A103J	CHIP R 10K J 1/10W		
R2 -4			RK73FB2A223J	CHIP R 22K J 1/10W		
R5			RK73FB2A104J	CHIP R 100K J 1/10W		
R6			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R7 ,8			RK73FB2A100J	CHIP R 10 J 1/10W		
R9 ,10			RK73FB2A271J	CHIP R 270 J 1/10W		
R11			RK73EB2B222J	CHIP R 2.2K J 1/8W		
R12			RK73EB2B102J	CHIP R 1.0K J 1/8W		
R13			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R14			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R15			RK73FB2A123J	CHIP R 12K J 1/10W		
R16			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R17 ,18			RK73EB2E100J	CHIP R 10 J 1/4W		
R20 -22			RK73EB2B271J	CHIP R 270 J 1/8W		
R23			RK73EB2B391J	CHIP R 390 J 1/8W		
R24			RK73EB2B471J	CHIP R 470 J 1/8W		
R25			RK73EB2B561J	CHIP R 560 J 1/8W		
R26			RK73EB2B821J	CHIP R 820 J 1/8W		
R27			RK73EB2B122J	CHIP R 1.2K J 1/8W		
R29 -31			RK73EB2B271J	CHIP R 270 J 1/8W		
R32			RK73EB2B391J	CHIP R 390 J 1/8W		
R33			RK73EB2B471J	CHIP R 470 J 1/8W		
R34			RK73EB2B561J	CHIP R 560 J 1/8W		
R35			RK73EB2B821J	CHIP R 820 J 1/8W		
R36			RK73EB2B122J	CHIP R 1.2K J 1/8W		
R37			RK73EB2B101J	CHIP R 100 J 1/8W		
R38 ,39			RK73EB2B470J	CHIP R 47 J 1/8W		
R40 ,41			RK73EB2A103J	CHIP R 10K J 1/10W		
R42			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R43 ,44			RK73FB2A103J	CHIP R 10K J 1/10W		
SW1 ,2			S40-1079-05	TACT SWITCH		
SW3 -14			S40-1086-05	TACT SWITCH		
SW15			S40-1079-05	TACT SWITCH		
SW16 -19			S40-1086-05	TACT SWITCH		
D1			1SS272	DIORD		
D3			B30-2117-08	LED (RED･･･ON AIR)		
D4		*	B30-2122-08	LED (GRN･･･BUSY)		
IC1			MSM5265GS-V1K	IC(LCD DRIVER)		
IC2			UPD6345GS	IC		

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LCD ASSY (B38-0719-15)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名／規格	Destination 仕向	Remarks 備考
IC3 ,4			TC4S584F	IC(SCHMITT TRIGGER)		
IC5			TC4SU69F	IC(INVERTER GATE)		
LCD1			B38-0714-08	LCD ELEMENT		
PL1 -4			B30-0865-15	LAMP (6.3V 75mA)		
Q1			2SA1307(Y)	TRANSISTOR		
Q2			2SC2712(Y)	TRANSISTOR		
Q3 ,4			2SA1162(Y)	TRANSISTOR		

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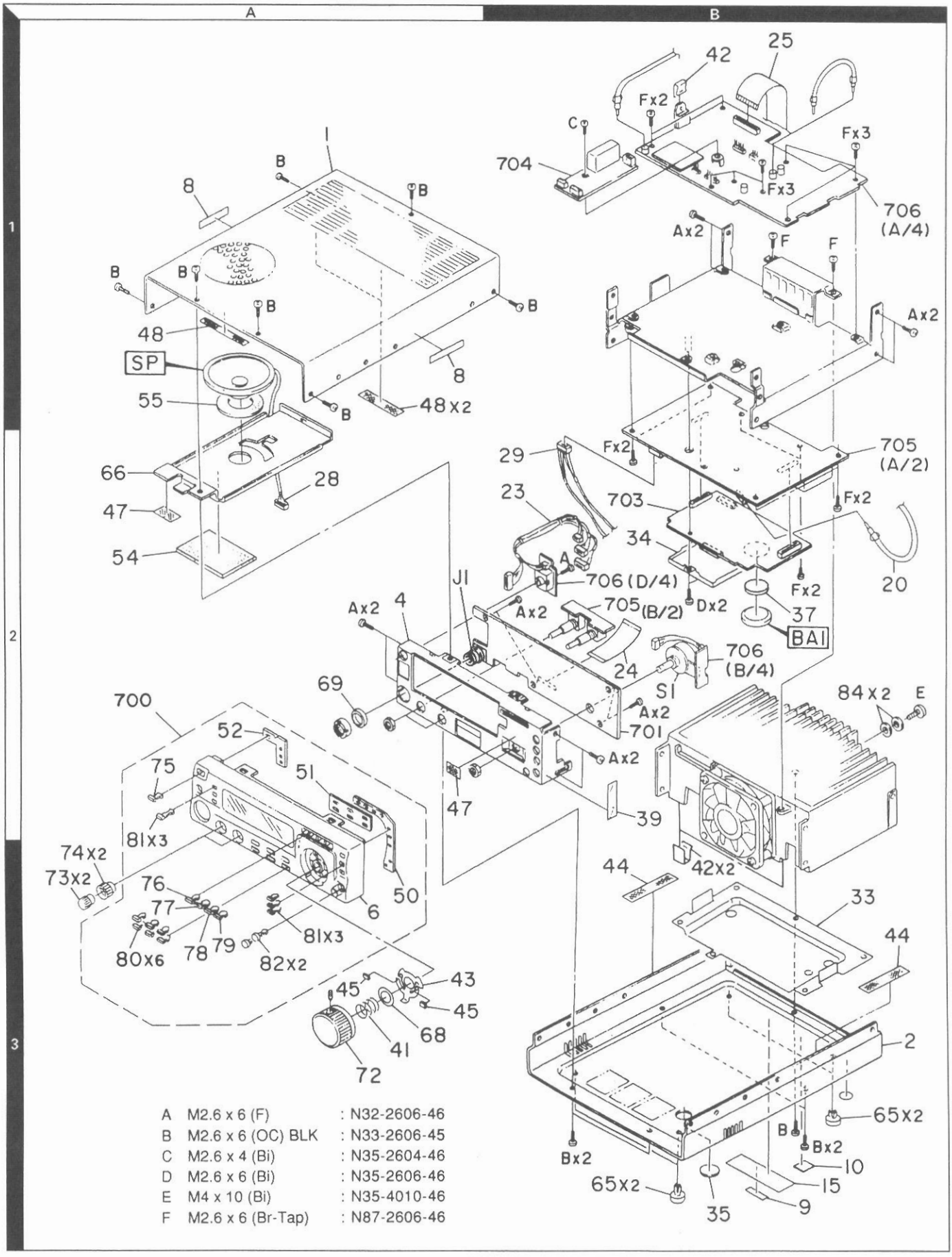
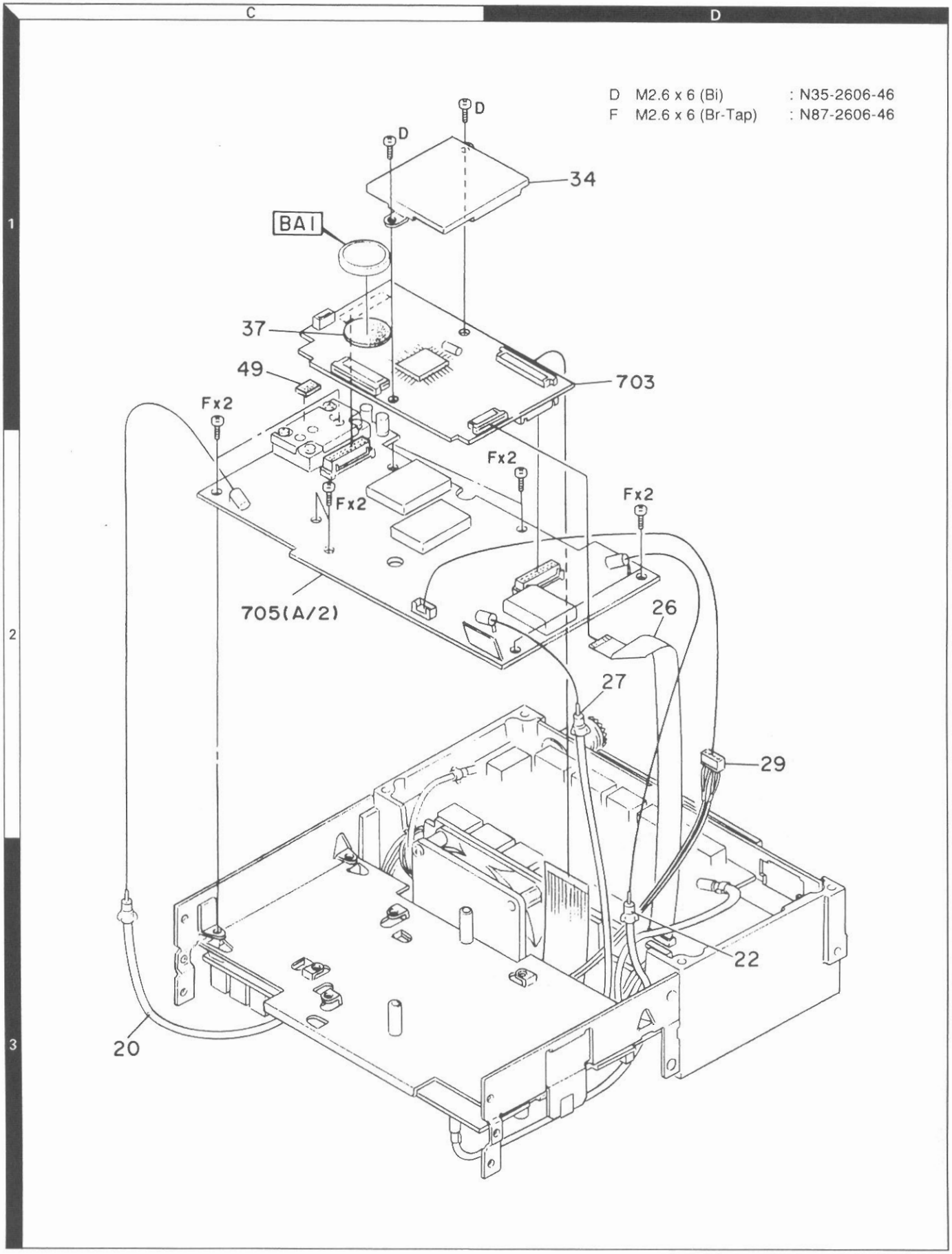
EXPLODED VIEW



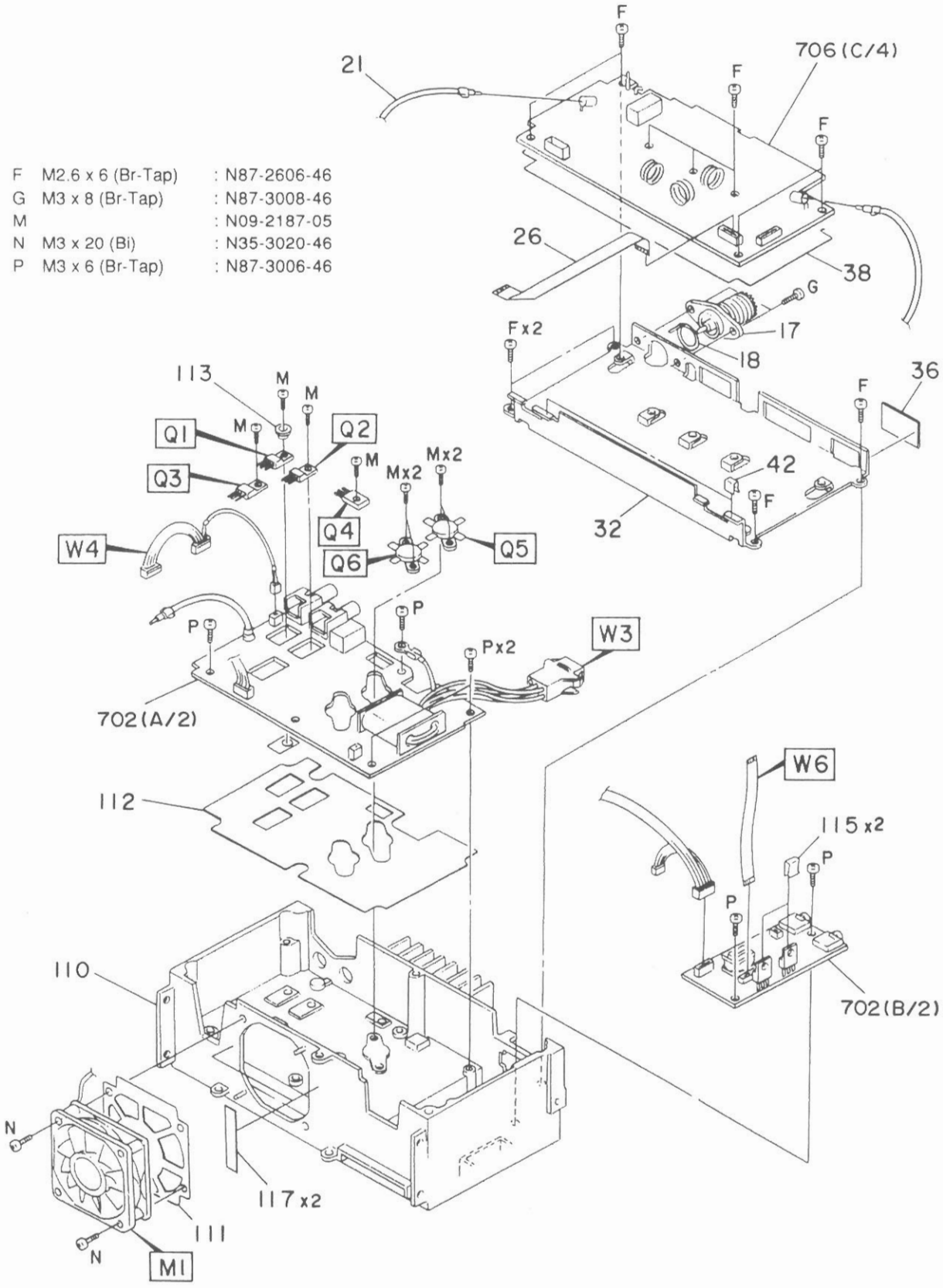
A	M2.6 x 6 (F)	: N32-2606-46
B	M2.6 x 6 (OC) BLK	: N33-2606-45
C	M2.6 x 4 (Bi)	: N35-2604-46
D	M2.6 x 6 (Bi)	: N35-2606-46
E	M4 x 10 (Bi)	: N35-4010-46
F	M2.6 x 6 (Br-Tap)	: N87-2606-46

EXPLODED VIEW

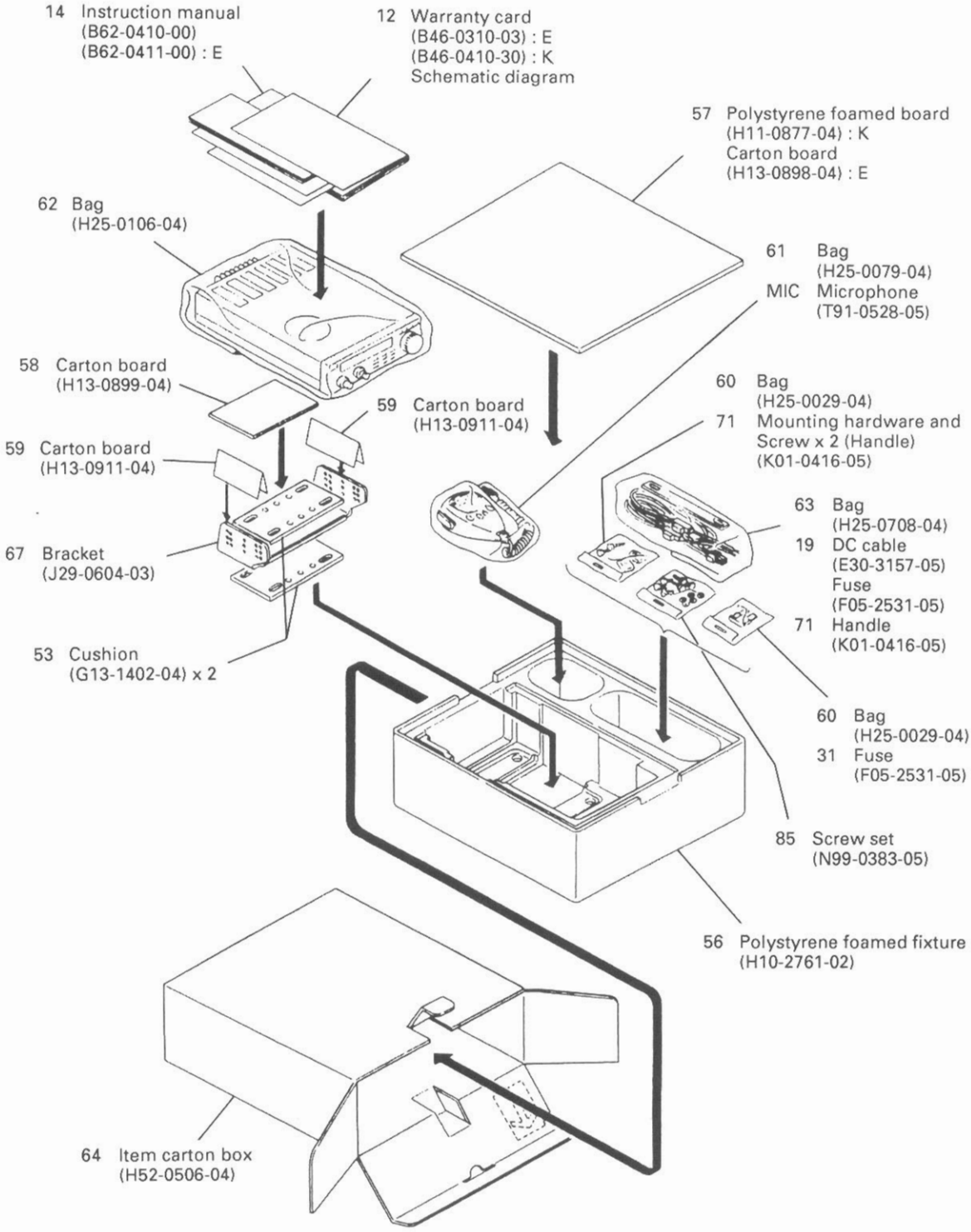


EXPLODED VIEW

F	M2.6 x 6 (Br-Tap)	: N87-2606-46
G	M3 x 8 (Br-Tap)	: N87-3008-46
M		: N09-2187-05
N	M3 x 20 (Bi)	: N35-3020-46
P	M3 x 6 (Br-Tap)	: N87-3006-46



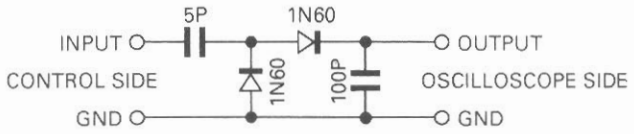
PACKING


14 Instruction manual
(B62-0410-00)
(B62-0411-00) : E
12 Warranty card
(B46-0310-03) : E
(B46-0410-30) : K
Schematic diagram
57 Polystyrene foamed board
(H11-0877-04) : K
Carton board
(H13-0898-04) : E
62 Bag
(H25-0106-04)
61 Bag
(H25-0079-04)
MIC Microphone
(T91-0528-05)
58 Carton board
(H13-0899-04)
59 Carton board
(H13-0911-04)
60 Bag
(H25-0029-04)
71 Mounting hardware and
Screw x 2 (Handle)
(K01-0416-05)
59 Carton board
(H13-0911-04)
63 Bag
(H25-0708-04)
19 DC cable
(E30-3157-05)
Fuse
(F05-2531-05)
67 Bracket
(J29-0604-03)
71 Handle
(K01-0416-05)
53 Cushion
(G13-1402-04) x 2
60 Bag
(H25-0029-04)
31 Fuse
(F05-2531-05)
85 Screw set
(N99-0383-05)
56 Polystyrene foamed fixture
(H10-2761-02)
64 Item carton box
(H52-0506-04)

ADJUSTMENT

Required Test Equipment

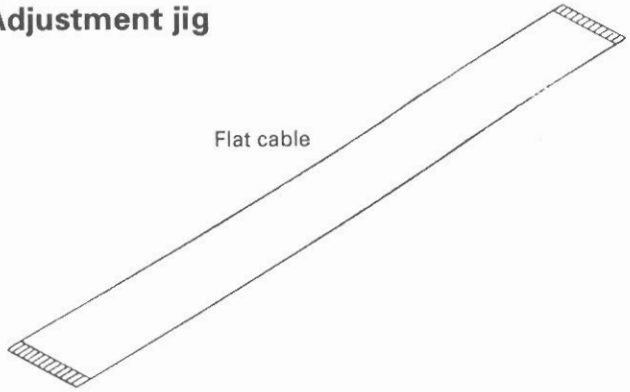
1. **DC Voltmeter (DC V.M)**
   1) Input resistance : More than 1MΩ
   2) Voltage range : 1.5 to 1000V AC/DC
   Note : A high-precision multimeter maybe used. However, accurate readings can not be obtained for high-impedance circuits.
2. **AC Ammeter**
   1) Current range : 1.5A, 3A, 20A, High-precision ammeter may be used.
3. **RF VTVM (RF V.M)**
   1) Input impedance : 1MΩ and less than 3pF, min.
   2) Voltage range : 10mV to 300V
   3) Frequency range : 10kHz to 100MHz or greate.
4. **AF Voltmeter (AF V.M)**
   1) Frequency range : 50Hz to 10kHz
   2) Input resistance : 1MΩ or greater
   3) Voltage range : 10mV to 30V
5. **AF Generator (AG)**
   1) Frequency range : 200Hz to 5kHz
   2) Output : 1mV or less to 1V, low distortion
6. **AF Dummy Load**
   1) Impedance : 8Ω
   2) Dissipation : 3W or greater
7. **Oscilloscope (SCOPE)**
   Vertical amplifier which has frequency characteristics higher than 100MHz.
   Requires high sensitivity, and external synchronization capabiliity.
8. **Tracking Generator**
   1) Center frequency : 50kHz to 90MHz
   2) Frequency deviation : Maximum ±35MHz
   3) Output voltage : 0.1V or greater
   4) Sweep rate : At least 0.5sec/cm
9. **Standard Signal Generator (SSG)**
   1) Frequency range : 50kHz to 500MHz
   2) Output : –133dBm/0.05μV to 7dBm/0.5μV
   3) Output impedance : 50Ω
   4) AM and FM modulation can be possible
   Note : Generator must be frequency stable.
10. **Frequency Counter (f. counter)**
    1) Minimum input voltage : 50mV
    2) Frequency range : 500MHz or greater
    3) Output impedance : 50Ω
11. **Noise Generator**
    Must generate ignition noise containing harmonics beyond 60MHz.
12. **RF Dummy Load**
    1) Impedance : 150Ω
    2) Dissipation : 150W or greater
13. **Power Meter**
    1) Impedance : 50Ω
    2) Dissipation : 150W continuous or greater
    3) Frequency limits : 60MHz or greater
14. **Spectrum Analyzer**
    1) Frequency range : 100kHz to 500MHz or greater
    2) Bandwidth : 1kHz to 3MHz
15. **Detector**
    1) For adjustment of PLL/VCO BPF

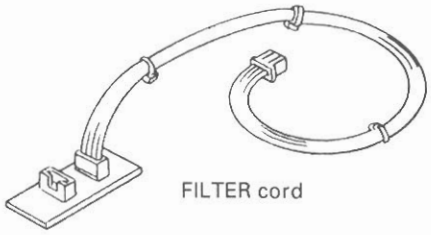


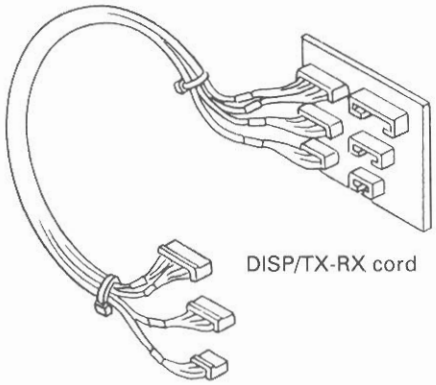
16. **Directional Coupler**
17. **Power Supply**
    PS-33, PS-53
18. **Microphone**
    MC-47
19. **Adjustment jig**
    EXtension cable (Use in common with TS-50S)

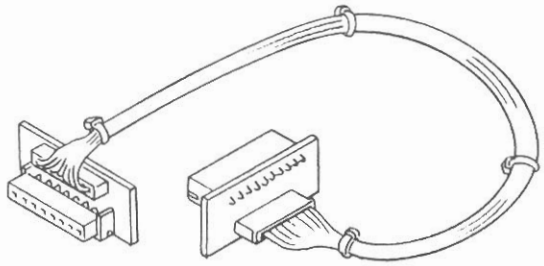
ADJUSTMENT

Adjustment jig

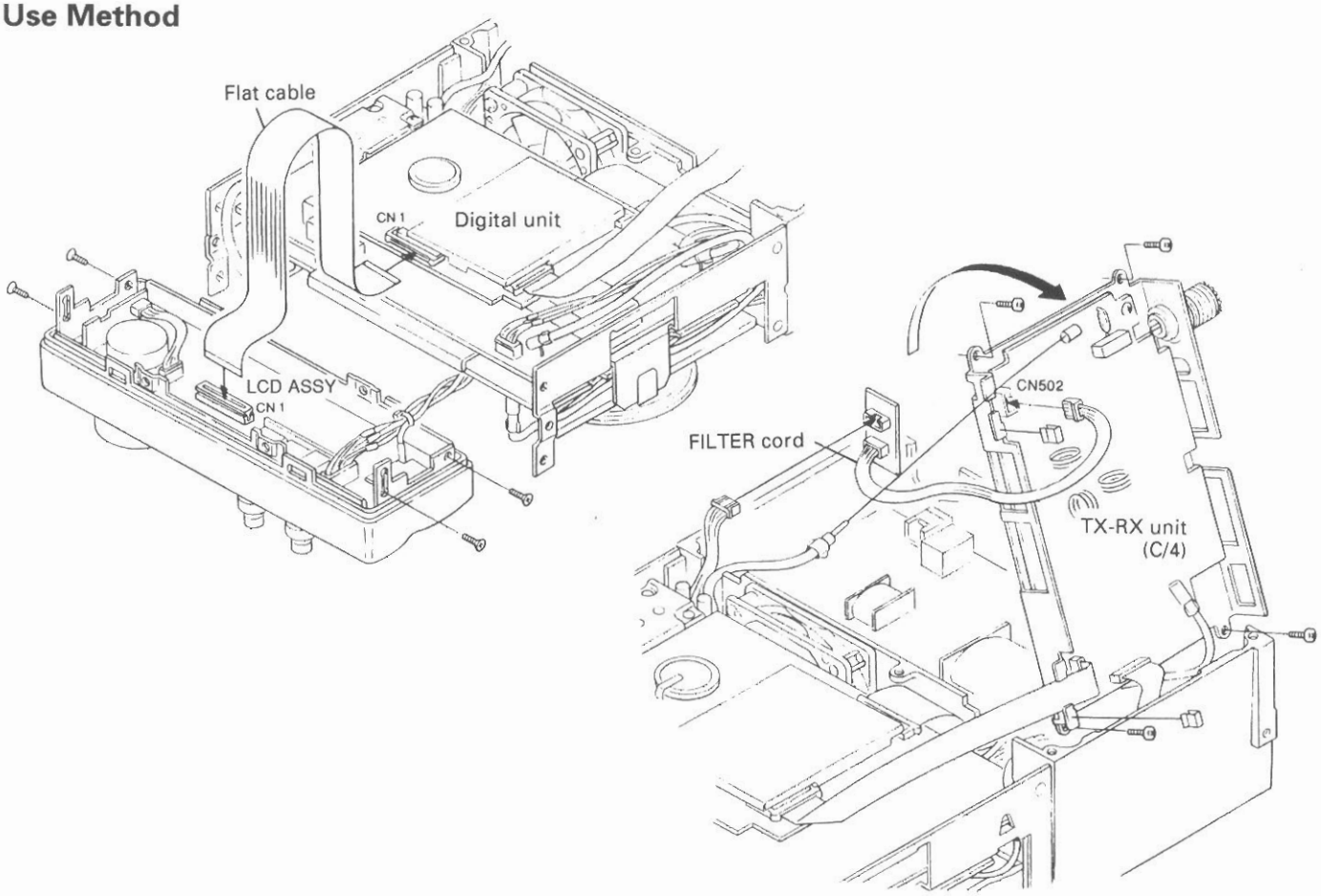




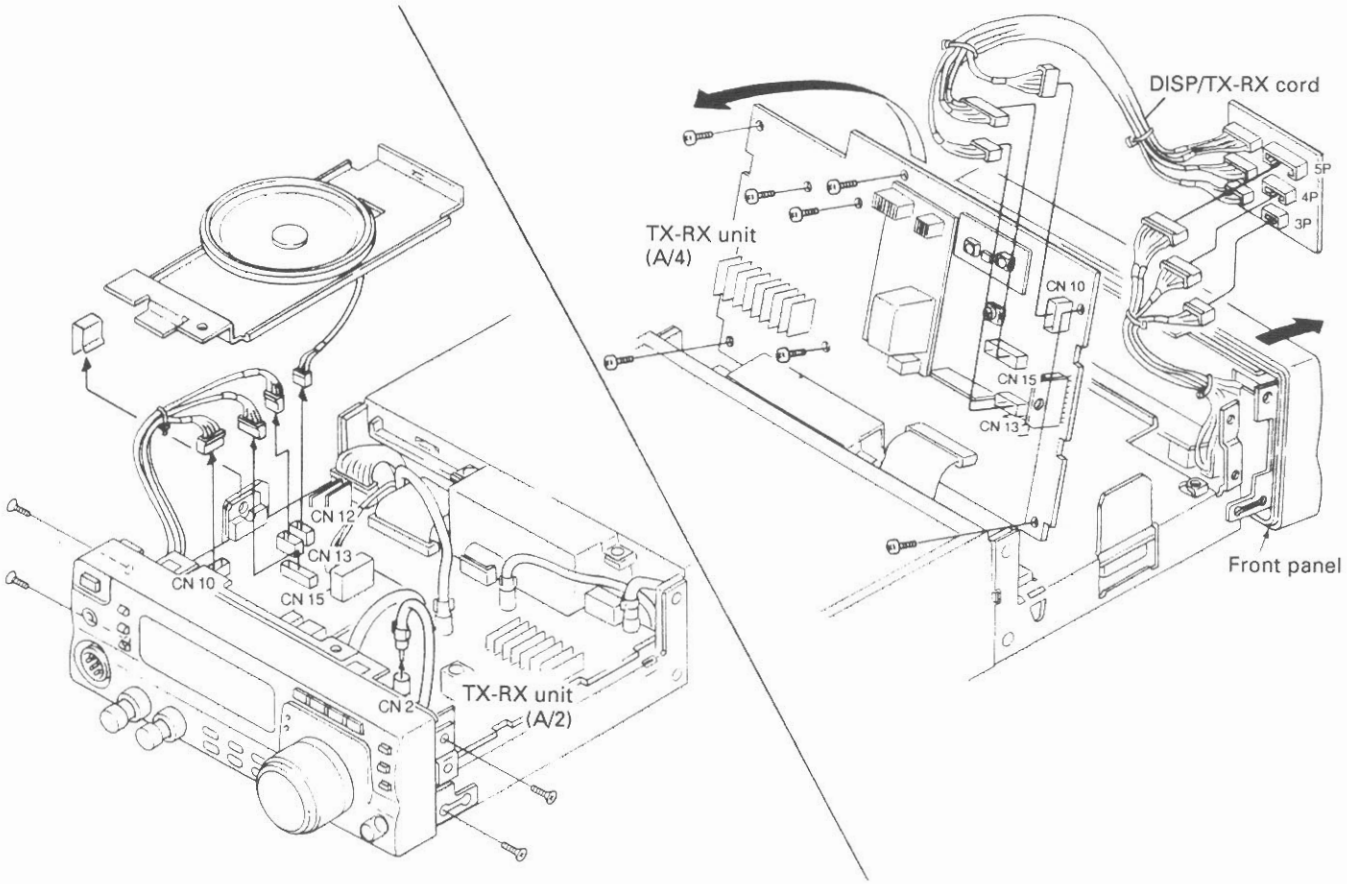


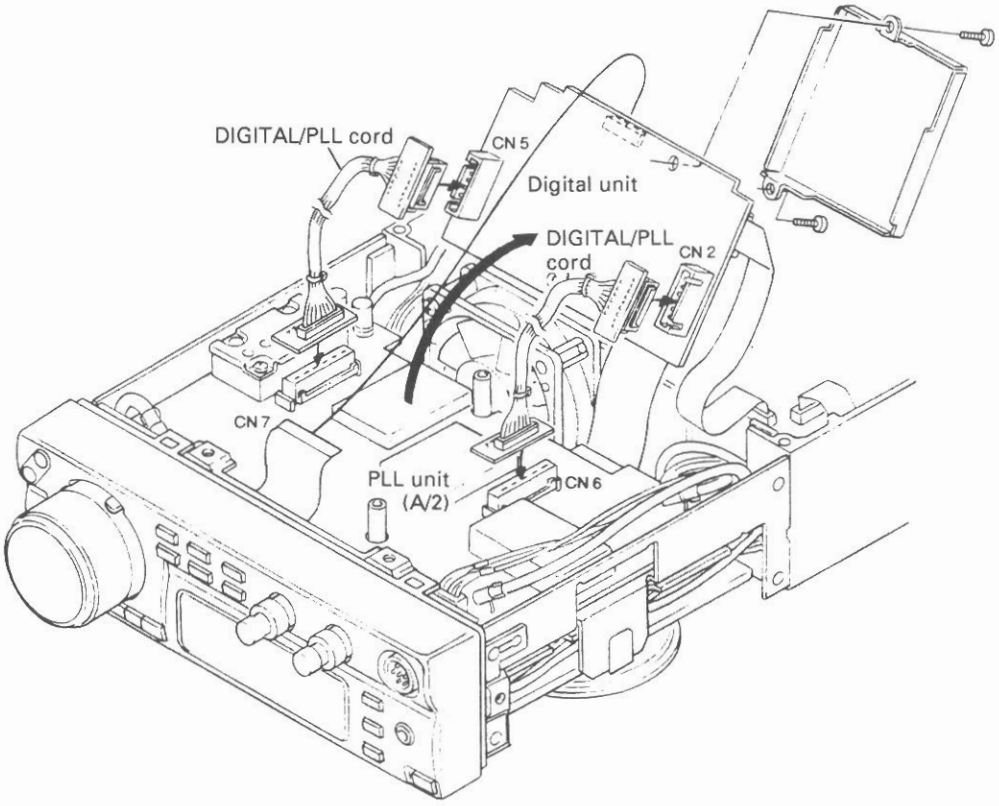


Use Method



ADJUSTMENT


DISP/TX-RX cord
5P
4P
3P
TX-RX unit
(A/4)
CN 10
CN 15
CN 13
Front panel
CN 12
CN 13
CN 10
CN 15
CN 2
TX-RX unit
(A/2)


DIGITAL/PLL cord
CN 5
Digital unit
DIGITAL/PLL
cord
CN 2
CN 7
PLL unit
(A/2)
CN 6

ADJUSTMENT

Service Adjustment Mode

- **Functions**

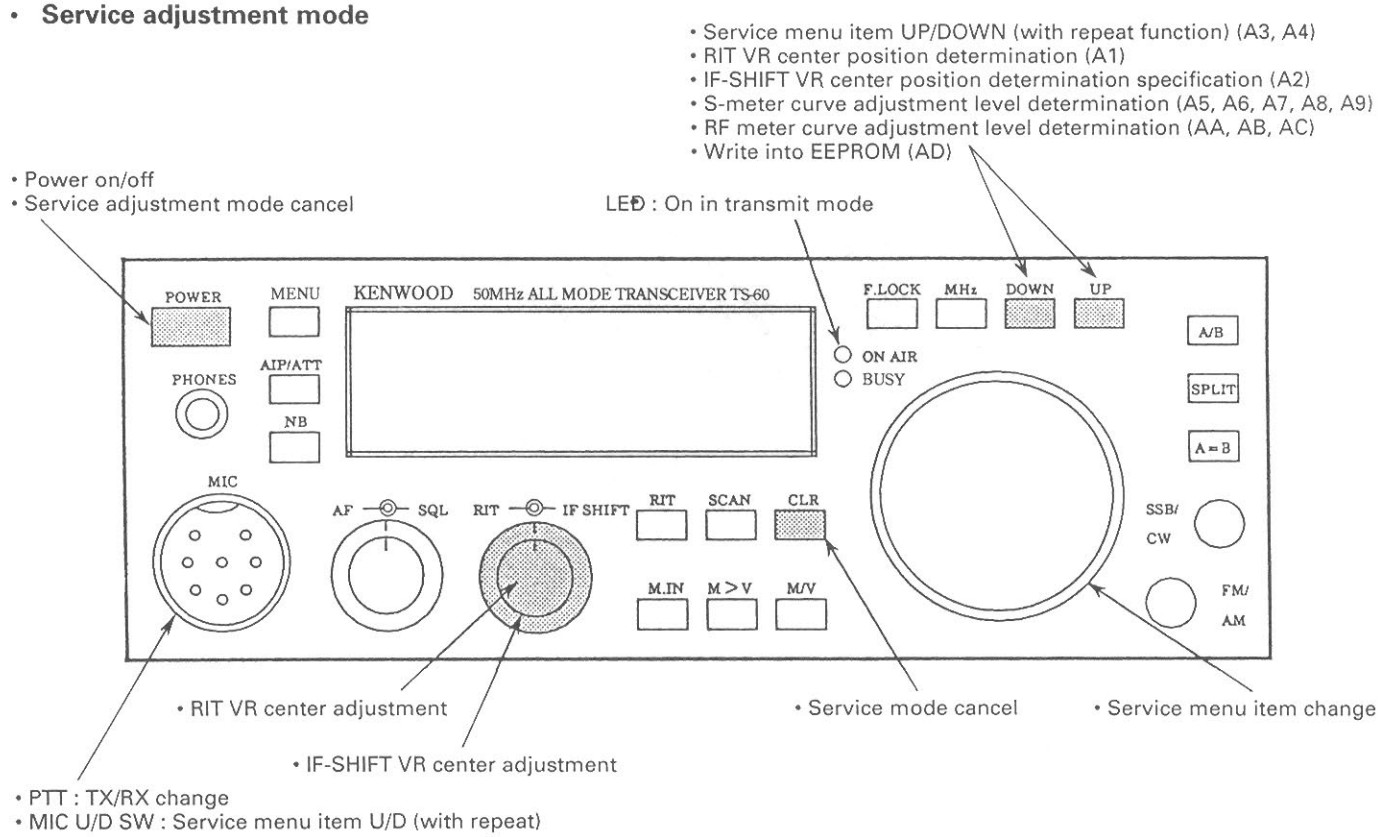
1) Only the adjustment items on the service adjustment mode menu are set in service adjustment mode.
2) Adjusted data items A1 to AC in service adjustment mode are stored in the EEPROM.
3) When you enter service adjustment mode, data is read from the EEPROM into the RAM of the microcomputer. You can then modify the settings.
4) The EEPROM is updated only when a write operation is performed with the UP/DOWN key when in menu AD.
5) Two sets of the same data are written into the EEPROM to check whether the data has been written correctly. Data may not be written correctly if the power is turned off during writing.
6) When the power is turned on, the two sets of data are compared. If they are not the same, "Error" is displayed, not HELLO, and the default values for the unmatched data are used.
7) Adjusted menu numbers are backed up.
8) The following items are changed as shown to perform adjustment correctly in service adjustment mode. (When service adjustment mode ends, the original state returns.)
   IF SHIFT → Center (0Hz)
   RIT → OFF
   AIP, ATT → OFF
   NB → OFF
   AGC → FAST
   Transmit/receive carrier point correction → Center (0Hz)
   Power → Hi
   Filter FM mode (RX) → OFF
   Other mode → 2.4k
9) A short tone is output when an item is changed with the UP/DOWN key. It is not output when repeating.

- **Setting**

1) Hold down the NB and MHz keys and switch the power on. (Turn the encoder to change the menu number.)
2) When the UP or DOWN key is pressed, the menu number is set.
3) Menu numbers A1 to A9 and AA to AC can be used in adjustment mode.
4) Press the CLR key to cancel adjustment mode. (It is also canceled when the power is turned off.)

Panel Operation

- **Service adjustment mode**



ADJUSTMENT

Service Adjustment Mode Menu

Menu No.	Menu contents	State (display)	Initial value
A0	Checksum display	–	–
A1	RIT VR machine center correction	00~FF	80
A2	IF-SHIFT VR machine center correction	00~FF	80
A3	LSB carrier point adjustment	–400~+400	0
A4	USB carrier point adjustment	–400~+400	0
A5	S-meter curve adjustment (non- FM) S1	00~FF	2E
A6	S-meter curve adjustment (non- FM) S9	00~FF	73
A7	S-meter curve adjustment (non- FM) Full scale	00~FF	C2
A8	S-meter curve adjustment (FM) Start	00~FF	91
A9	S-meter curve adjustment (FM) Full scale	00~FF	CC
AA	RF meter curve adjustment (low)	00~FF	3C
AB	RF meter curve adjustment (middle)	00~FF	80
AC	RF meter curve adjustment (high)	00~FF	B1
AD	Write into EEPROM	ready run good error	ready
AE	All LCD segments on	All segments on	All segments on

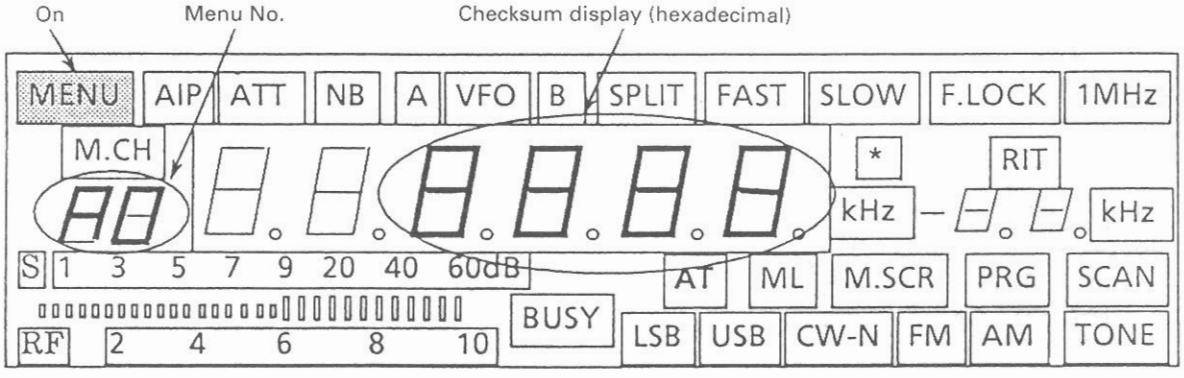
A0 : Checksum Display

- **Adjustment function**

  Displays the version of the installed program.

  Displays the two low-order bytes of the checksum obtained by adding all program codes.

- **Display**



All other indicators are off.

ADJUSTMENT

A1 : RIT VR Mechanical Center Correction

- **Adjustment function**

Input the RIT control center position to the microcomputer so that the RIT frequency is zero when the RIT control is at its center position.

- **Adjustment procedure**

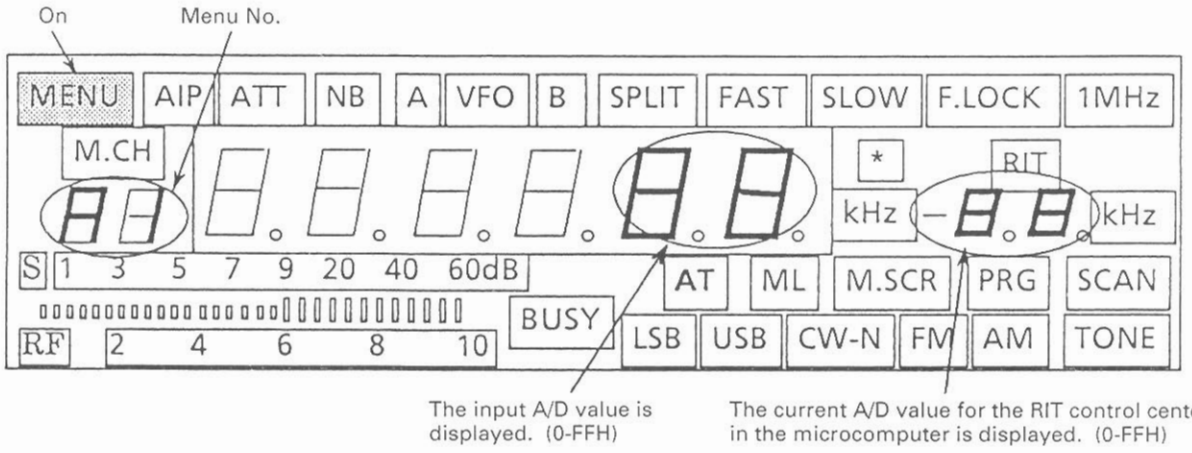
1. Set the RIT control to its center position.
2. Press the UP or DOWN key.

- **Remarks**

The center can be input unconditionally without pressing the UP/DOWN key. However, the UP/DOWN key must be pressed to prevent this menu item data from being modified accidentally when the RIT control is not at the center position.

When the UP/DOWN key is pressed, data is updated and the two displays match.

- **Display**



A2 : IF-SHIFT VR Mechanicale Center Correction

- **Adjustment function**

Input the IF-SHIFT control center position to the microcomputer so that the IF-SHIFT frequency is zero when the IF-SHIFT control is at its center position.

- **Adjustment procedure**

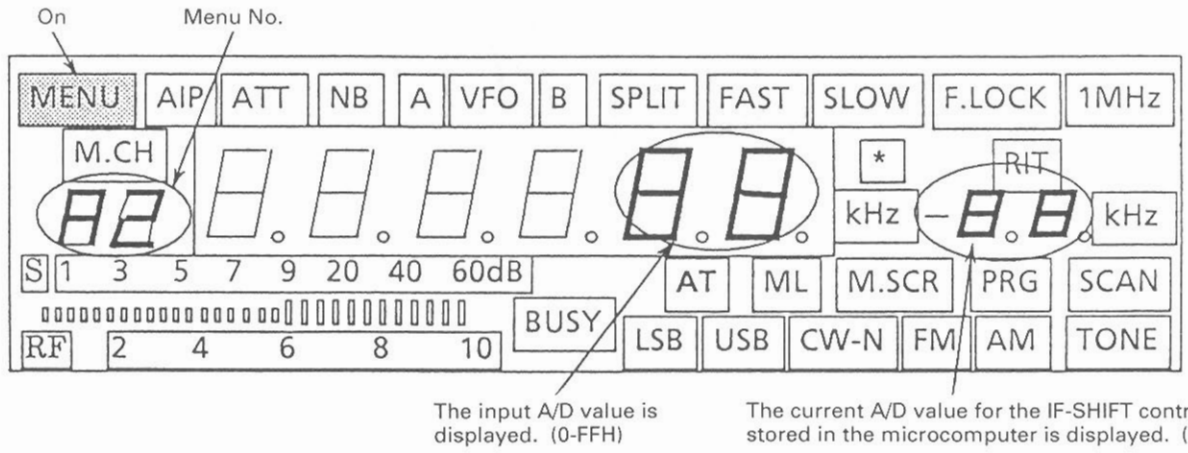
1. Set the IF-SHIFT control to its center position.
2. Press the UP or DOWN key.

- **Remarks**

The center can be input unconditionally without pressing the UP/DOWN key. However, the UP/DOWN key must be pressed to prevent this menu item data from being modified accidentally when the IF-SHIFT control is not at the center position.

When the UP/DOWN key is pressed, data is updated and the two displays match.

- **Display**



ADJUSTMENT

A3 : LSB Carrier Point Adjustment

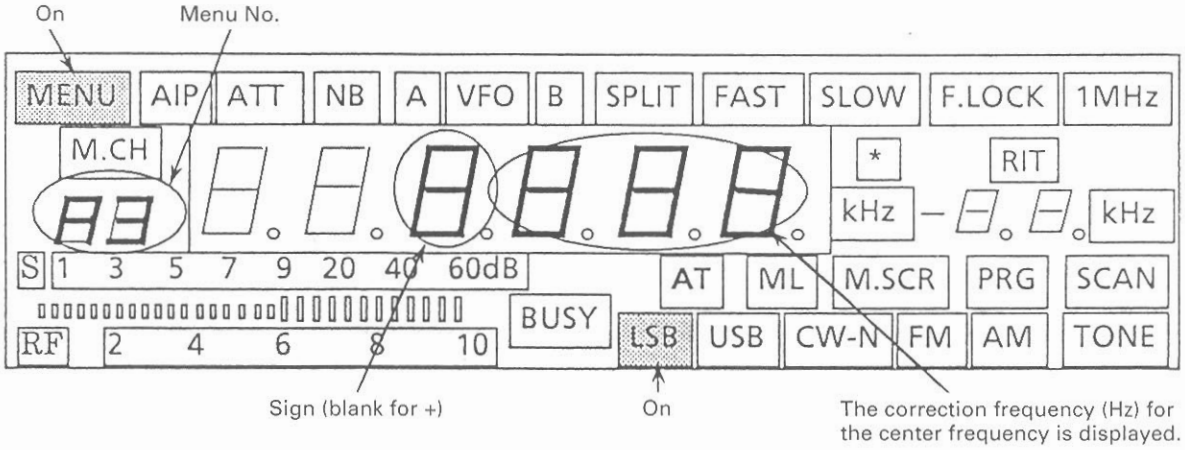
- **Adjustment function**

Adjust the carrier point in 10-Hz steps to correct variations in the center frequency of the IF filter in LSB mode.

- **Adjustment procedure**

1. Press the PTT button to enter transmit mode.
2. Change the correction frequency with the UP/DOWN key or MIC UP/DOWN key.

- **Display**



- **Remarks**

The plus sign (+) indicates the direction of moving away from the carrier. (Same as IF-SHIFT)

The frequency and mode are forcibly changed to 51.9MHz and LSB.

A4 : USB Carrier Point Adjustment

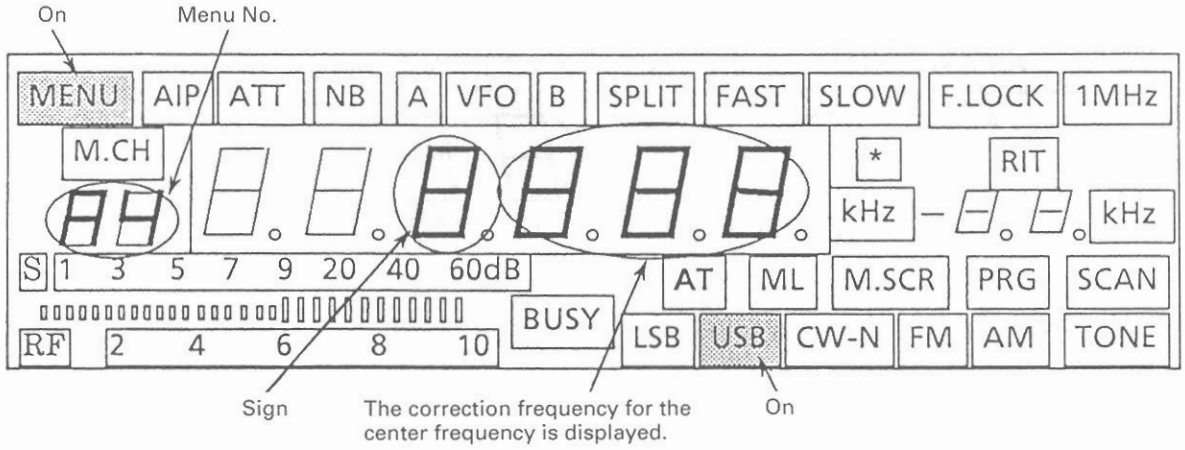
- **Adjustment function**

Adjust the carrier point in 10-Hz steps to correct variations in the center frequency of the IF filter in USB mode.

- **Adjustment procedure**

1. Press the PTT button to enter transmit mode.
2. Change the correction frequency with the UP/DOWN key or MIC UP/DOWN key.

- **Display**



- **Remarks**

The plus sign (+) indicates the direction of moving away from the carrier. (Same as IF-SHIFT)

The frequency and mode are forcibly changed to 51.9MHz and USB.

ADJUSTMENT

A5 : S-meter Curve Adjustment (S1) (non- FM)

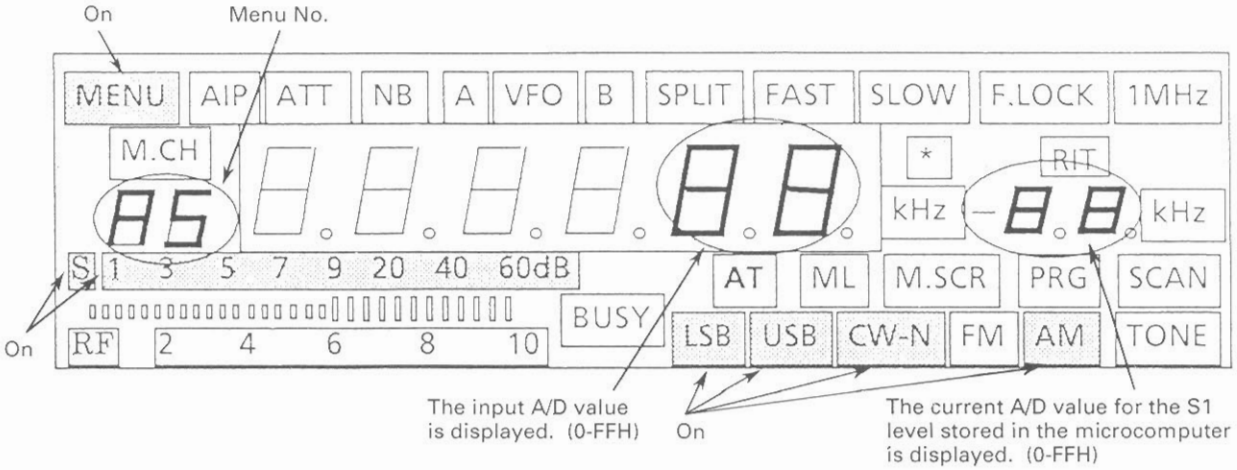
- **Adjustment function**

Input the S-meter voltage at which two bars of the S-meter light to the microcomputer to correct variations in the S1 level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

The threshold is the input level minus the fixed value (6). When the input signal exceeds the threshold, one bar of the S-meter lights. The curve between S1 and S9 is obtained from the level for menus A5 and A6 by line approximation. Only the A/D values for the S1, S9, and full-scale levels are stored in the EEPROM. The meter bars operate according to the currently set curve: The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

A6 : S-meter Curve Adjustment (S9) (non- FM)

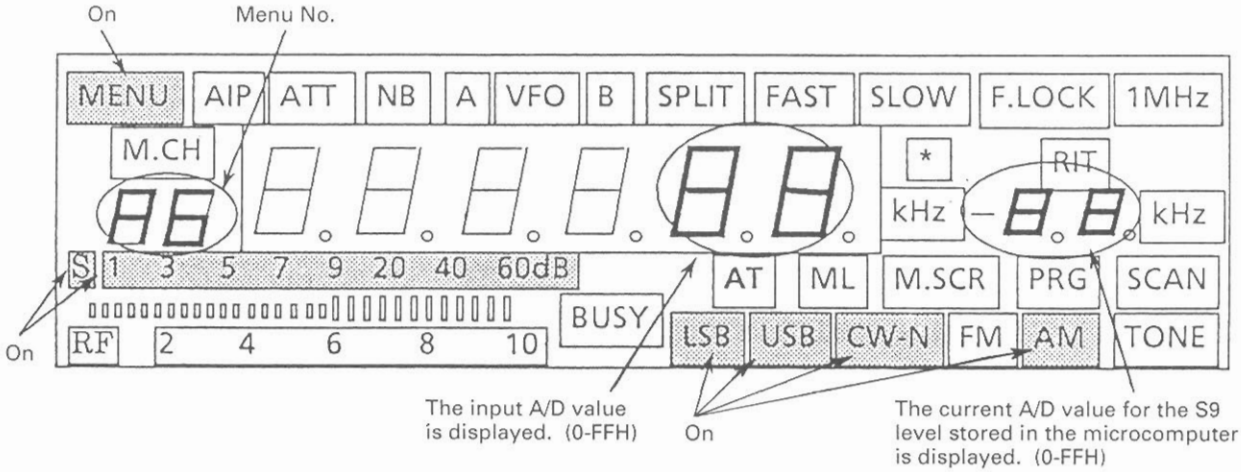
- **Adjustment function**

Input the S-meter voltage that indicates S9 (the first large segment) to correct variations in the S9 level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

The curve between S1 and S9 is obtained from the level for menus A5 and A6 by line approximation. The curve between S9 and full scale is obtained from the level for menus A6 and A7 by line approximation. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

ADJUSTMENT

A7 : S-meter Curve Adjustment (Full scale) (non- FM)

- **Adjustment function**

Input the S-meter voltage at which all the segments of the S- meter light to correct variations in the full-scale level of the S-meter.

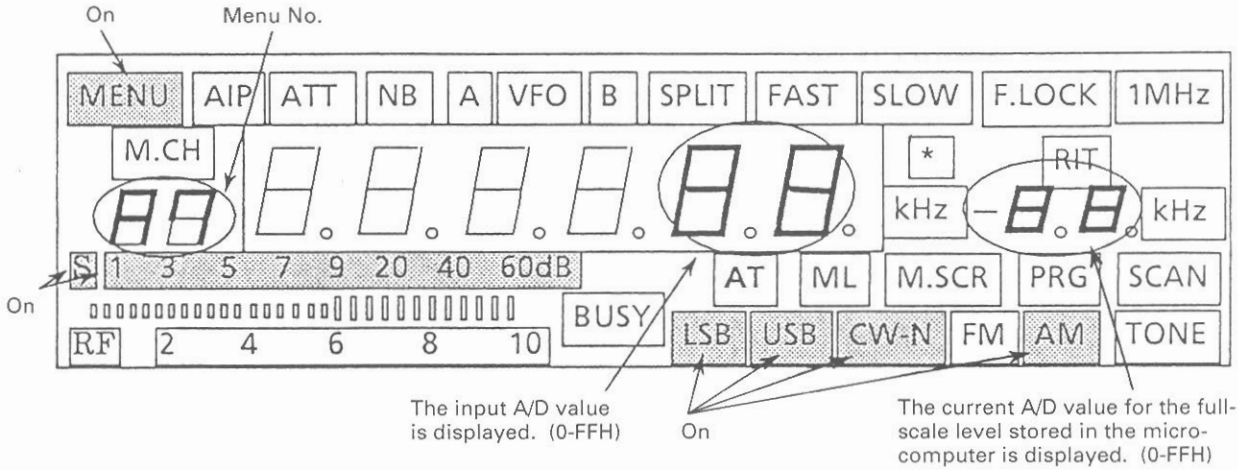
- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Remarks**

The curve between S9 and full scale is obtained from the level for menus A6 and A7 by line approximation. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and USB.

- **Display**



A8 : S-meter Curve Adjustment (S1) (FM)

- **Adjustment function**

Input the S-meter voltage at which two bars of the S-meter light to the microcomputer to correct variations in the S1 level of the S-meter.

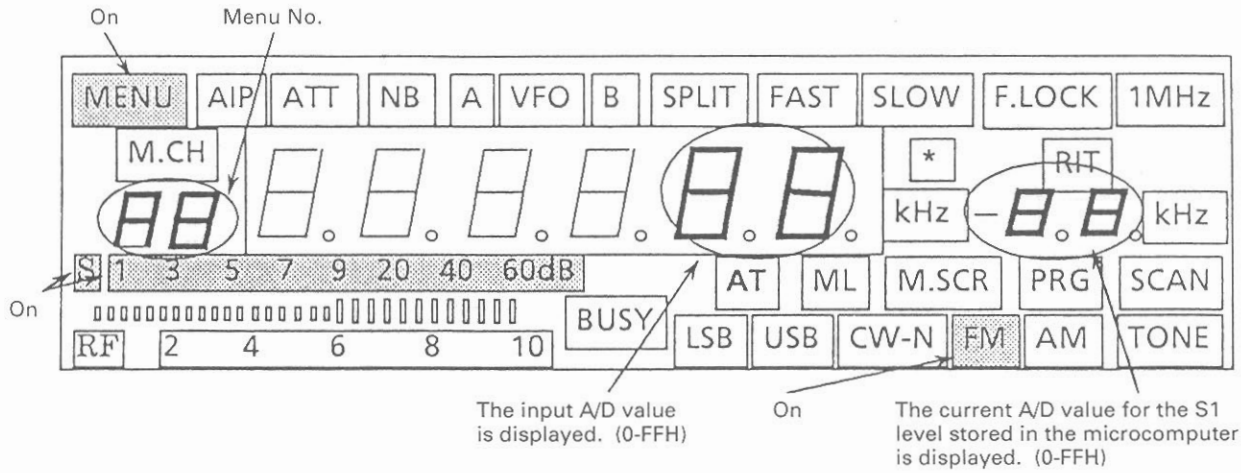
- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Remarks**

The threshold is the input level minus the fixed value (12). When the input signal exceeds the threshold, one bar of the S-meter lights. The curve between S1 and full scale is obtained from the level for menus A8 and A9 by line approximation. Only the A/D values for the S1 and full-scale levels are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and FM.

- **Display**



ADJUSTMENT

A9 : S-meter Curve Adjustment (Full scale) (FM)

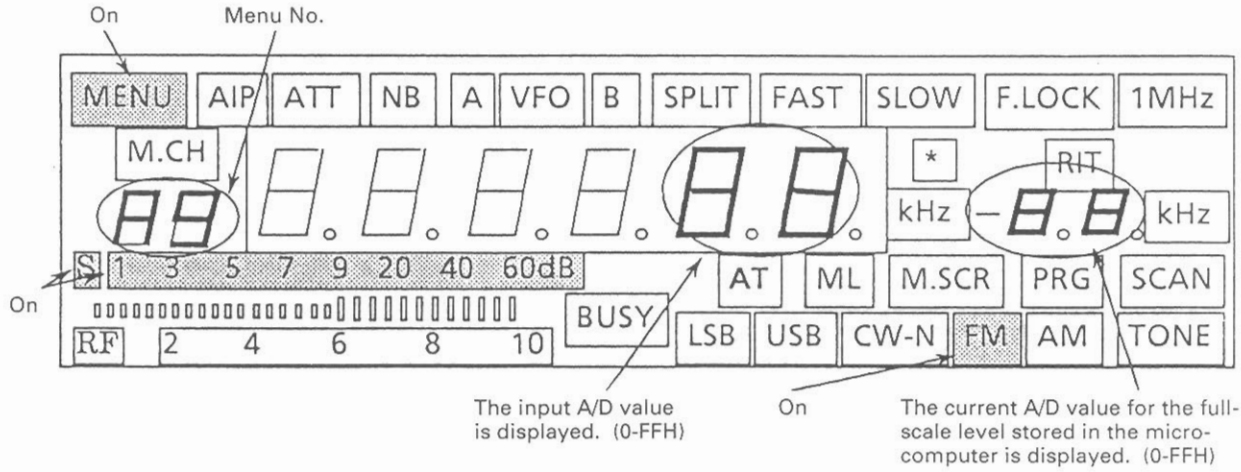
- **Adjustment function**

Input the S-meter voltage at which all the segments of the S- meter light to correct variations in the full-scale level of the S-meter.

- **Adjustment procedure**

1. Input the specified level with the signal generator.
2. Press the UP or DOWN key.

- **Display**



- **Remarks**

Only the A/D values for S1 and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are forcibly changed to 51.9MHz and FM.

AA : RF Meter Curve Adjustment (Low)

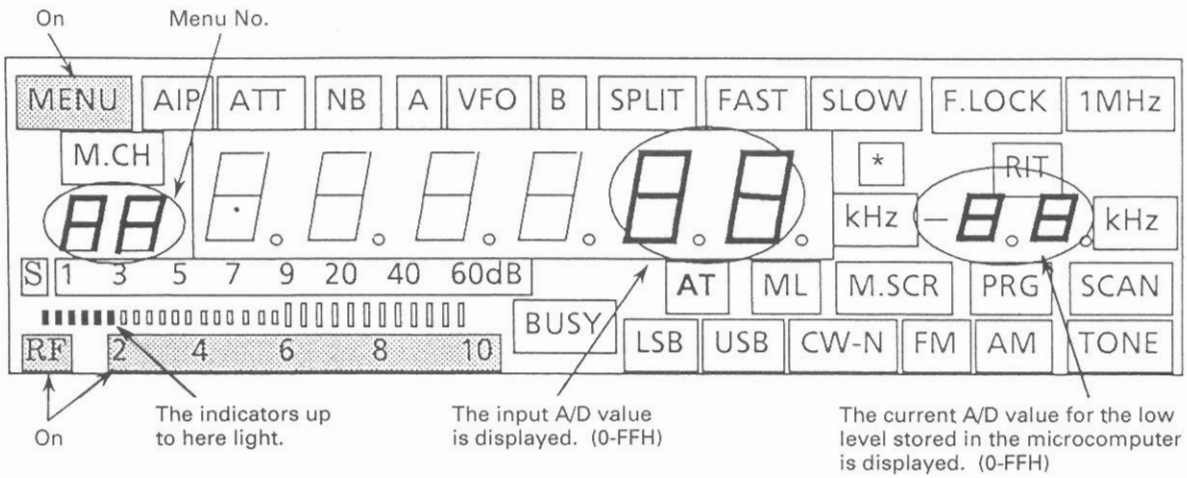
- **Adjustment function**

Input the RF meter voltage at which six segments of the RF meter light to the microcomputer to correct variations in the low level of the RF meter.

- **Adjustment procedure**

1. Input the specified level with the AG from MIC connector.
2. Transmit.
3. Press the UP or DOWN key.

- **Display**



- **Remarks**

The threshold for the RF meter registering a signal is the input level minus the fixed value (21H). The curve is obtained from the level for menu AA and the start level by line approximation. The curve between 2 and 6 is obtained from the level for menus AA and AB by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

ADJUSTMENT

AB : RF Meter Curve Adjustment (Middle)

- **Adjustment function**

Input the RF meter voltage for segment 6 (the first large segment) to the microcomputer to correct variations in the middle level of the RF meter.

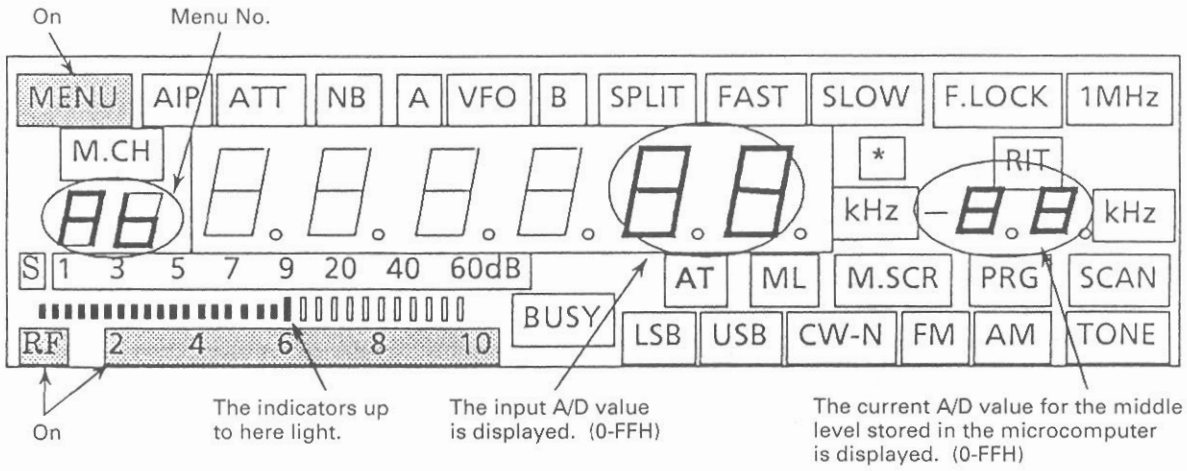
- **Adjustment procedure**

1. Input the specified level with the AG.
2. Transmit.
3. Press the UP or DOWN key.

- **Remarks**

The curve between 2 and 6 is obtained from the level for menus AA and AB by line approximation. The curve between 6 and full scale is obtained from the level for menus AB and AC by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

- **Display**



AC : RF Meter Curve Adjustment (High)

- **Adjustment function**

Input the RF meter voltage at which all the segments of the RF meter light to the microcomputer to correct variations in the full-scale level of the RF meter.

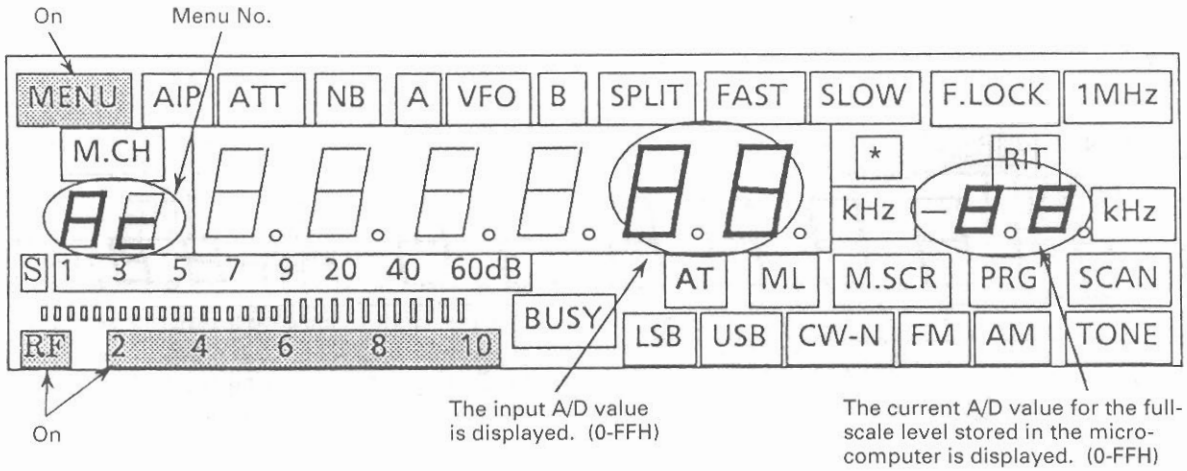
- **Adjustment procedure**

1. Input the specified level with the AG.
2. Transmit.
3. Press the UP or DOWN key.

- **Remarks**

The curve between 6 and full scale is obtained from the level for menus AB and AC by line approximation. Only the A/D values for 2, 6, and full scale are stored in the EEPROM. The meter bars operate according to the currently set curve. The curve is calculated when the UP/DOWN key is pressed. The frequency and mode are changed to 51.9MHz and USB.

- **Display**



ADJUSTMENT

AD : Write into EEPROM

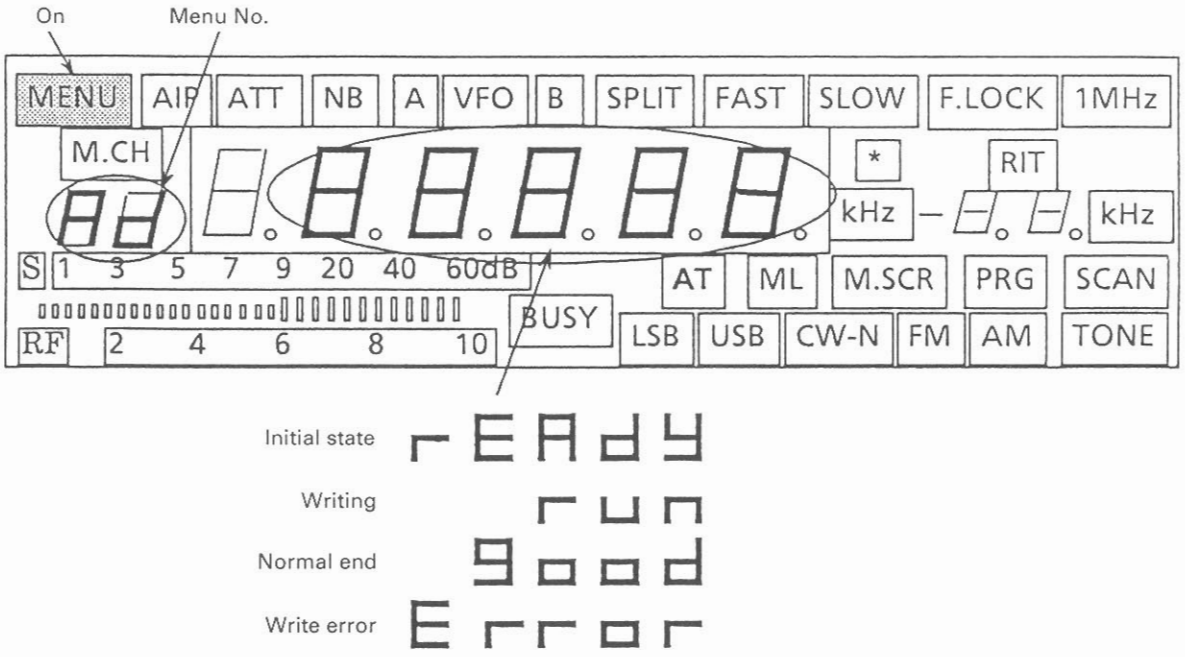
- **Adjustment function**
  Write data into the EEPROM.

- **Adjustment procedure**

1. Press the UP/DOWN key when "ready" is displayed.
2. While data is being written, "run" is displayed.
3. If the data is written correctly, "good" is displayed.
4. If a write error occurs, "error" is displayed.
   Press the UP/DOWN key again.
   If "error" is displayed repeatedly, check the EEPROM or other hardware for defects.

- **Remarks**
  Writing is performed unconditionally (even if nothing has been changed). Two sets of the same data are written into the EEPROM. "good" is displayed only when both sets of data have been written normally. The UP/DOWN key is effective only when "ready" or "error" is displayed, and does not have the repeat function.

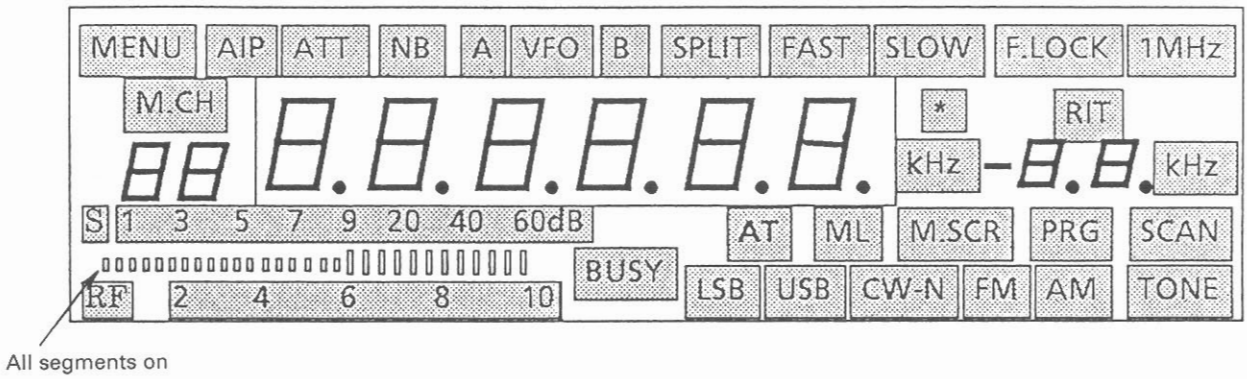
- **Display**



AE : All LCD Segments On

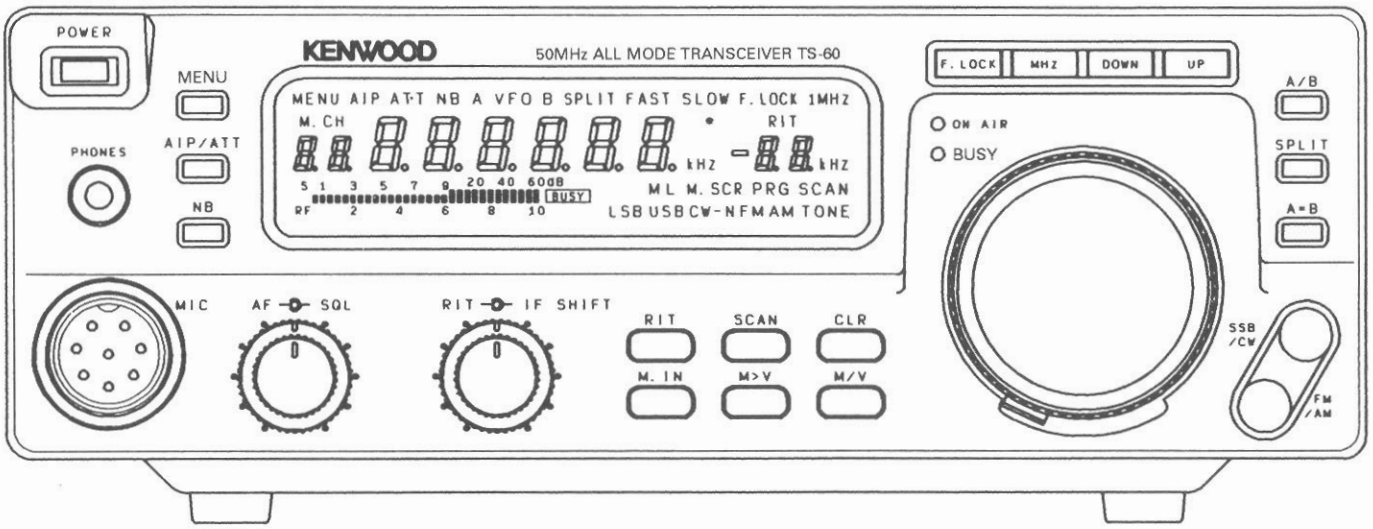
- **Adjustment function**
  Check LCD cells and rubber connector connection.

- **Display**

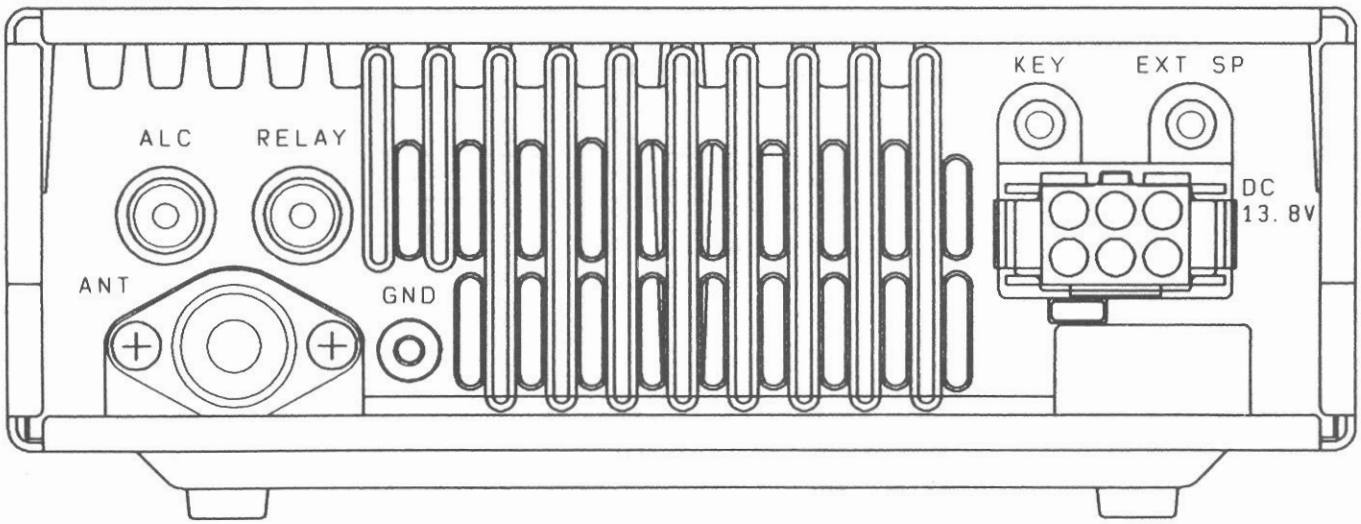


ADJUSTMENT

Front Panel



Rear Panel

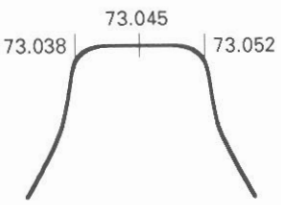


ADJUSTMENT

PLL and CAR Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) DC IN : 13.8V RIT VR : Center IF SHIFT VR : Center							
2. Reference OSC	1) MODE : FM	f. counter	PLL	TP1	PLL	TC1	20.000.00MHz	±20Hz
3. L28, 29 (80MHz)	1) MODE : FM	RF V.M		IC5-2 pin		L28 L29	Peak	
4. L21, 22, 23 (75.045~ 75.545MHz)	1) Frequency : 51.900MHz MODE : FM	RF V.M		TP3		L21~ L23	Peak Align the core by screwing it in.	
5. Lock voltage	1) Frequency : 40.100MHz MODE : LSB	DC V.M		TP2	VCO	TC1	2.8V	±0.1V
	2) Frequency : 49.999MHz MODE : FM						Check	5.0~8.0V
	3) Frequency : 50.000MHz MODE : CW				VCO	TC2	2.8V	±0.1V
	4) Frequency : 59.999MHz **K** Frequency : 53.999MHz **E** MODE : FM						Check	5.0~8.0V **K** 3.5V or more **E**
6. 10.695MHz level	1) Frequency : 52.100MHz MODE : CW	RF V.M 50Ω dummy load		TP4	PLL	L27	–4dBm	±1.0dBm

Receiver Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. RFG	1) Frequency : 52.100MHz MODE : FM	DC V.M	TX-RX	TP4	TX-RX (A/4)	VR4	2.9V	±0.03V
2. MCF	1) Frequency : 52.100MHz MODE : FM Tracking generator output : –30dBm Spectrum analyzer setting Center frequency : 73.045MHz Frequency span : 70kHz ATT : 10dB V. REF : 2dB/DIV	Spectrum analyzer Tracking generator		TP2 TP1		L15~ L17	Repeat 2~3 times. Adjust it to make gain maximum, and make the band flat as shown in the right.	
3. IF AMP	1) Frequency : 52.099MHz MODE : USB SSG ATT : 0.25~0.5μV (–119~–113dBm)	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX (A/4)	L66 L24~ L26, L28 IFT in IC3 (2 pcs)	Repeat 2~3 times. AF output MAX.	
4. MIX BAL	1) Frequency : 52.099MHz MODE : USB SSG RF : OFF AIP : OFF					VR1	AF output MIN.	
5. SSB S-meter (S1)	1) Frequency : 52.099MHz MODE : USB SSG RF : OFF	SSG	Rear panel	ANT	TX-RX (A/4)		Record voltage.	
	2) SSG ATT : 0.7μV (–110dBm)	DC V.M	TX-RX (A/4)	TP5		VR in IC3	Record voltage + 0.1V.	
	3) Service adjustment mode menu No. (S MENU No.) : A5 SSG ATT : 1μV (–107dBm)						UP or DOWN key : 1 push	S1 check
(S9)	4) S MENU No. : A6 SSG ATT : 20μV (–81dBm)							S9 check

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
(FULL)	5) S MENU No. : A7 SSG ATT : 20mV (–21dBm)	SSG	Rear panel	ANT			UP or DOWN key : 1 push	Full scale check
6. FM S-meter (S1)	1) Frequency : 52.100MHz MODE : FM SSG ATT : 0.5mV (–53dBm) MOD : 1kHz DEV : 3kHz	DC V.M	TX-RX (A/4)	TP5	TX-RX (A/4)	VR2	4.5V	±0.01V
	2) S MENU No. : A8 SSG ATT : 0.5μV (–113dBm)	SSG	Rear panel	ANT			UP or DOWN key : 1 push	S1 check
(FULL)	3) S MENU No. : A9 SSG ATT : 5μV (–93dBm)							Full scale check
	4) SSG ATT : 4.5μV (–94dBm)						Check	Just before full scale.
7. Beep tone	1) AF VR : MIN SQL VR : MIN SSB/CW key : Push	DM. SP Oscilloscope	Rear panel	EXT. SP	TX-RX (A/4)	VR6	0.2Vp-p	±0.1Vp-p
8. NB	1) Frequency : 52.099MHz MODE : USB NB : ON	Noise G. DC V.M	PLL	TP5	PLL	L202 L203	Voltage MIN.	
							Adjust the noise generator output to S-meter 1 and 5 dots lights.	Noise disappears.
9. S/N (AIP : OFF)	1) Frequency and MODE : Indicated below However, USB : +1kHz LSB : –1kHz AF VR : 0.63V/8Ω	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP				
	Frequency / MODE / SSG ATT / SSG MOD / SSG DEV							
	40.100MHz **K** LSB 0.16μV (–123dBm) OFF						S/N measurement	10dB or more
	50.100MHz **E** LSB 0.16μV (–123dBm) OFF							
	52.100MHz AM 2.00μV (–101dBm) 1kHz 60%							
	52.100MHz USB 0.16μV (–123dBm) OFF							
	53.100MHz **E** USB 0.16μV (–123dBm) OFF							
	59.100MHz **K** USB 0.16μV (–123dBm) OFF							
	50.100MHz FM 0.25μV (–119dBm) 1kHz 3kHz						SINAD sensitivity measurement	12dB or more
10. Squelch (SSB)	1) Frequency : 52.099MHz MODE : USB SQL VR : 12 : 30 SSG RF : OFF	SSG DM. SP Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX (A/4)	VR3	Set to the point squelch closes.	Knob position 10 : 00~14 : 00
	2) SSG ATT : 1.25μV (–105dBm)						Check	Squelch should open.
	3) SQL VR : MAX							Squelch should close.
	4) SSG ATT : 16μV (–83dBm) After checked, SQL VR : MIN							Squelch should open.
(FM)	5) Frequency : 52.100MHz MODE : FM SSG ATT : OFF				Front panel	SQL VR	Adjust SQL VR is slowly increase noise just goes off.	Knob position 8 : 00~12 : 00
	6) SSG ATT : 0.13μV (–125dBm)						Check	Squelch should open.
	7) SQL VR : MAX							Squelch should close.
	8) SSG ATT : 0.9μV (–108dBm) After checked, SQL VR : MIN							Squelch should open.
11. S-meter sensitivity	1) Frequency : 52.099MHz MODE : USB	SSG	Rear panel	ANT			S1 (two small dots lights)	Within 1μV (–107dBm) ± 6dB
							S9 (one large dot lights)	Within 20μV (–81dBm) ± 6dB
	2) Frequency : 52.100MHz MODE : FM						S-meter full scale (all dots lights)	Within 5μV (–93dBm) ± 6dB

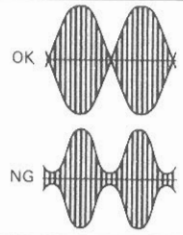
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
12. Noise	1) Frequency : 52.099MHz MODE : USB AF VR : MIN	SSG DM. SP. Oscilloscope AF V.M	Rear panel	ANT EXT. SP			Check	2mV/8Ω or less
13. Reset	1) POWER SW : OFF While pushing the A=B key POWER SW : ON						Reset display f. : 51.000.0kHz VFO : A MODE : FM	

Transmitter Section Adjustment

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. ALC voltage	1) Frequency : 53.900MHz MODE : CW Remove the cable from CN19 to the TX-RX unit. Transmit	DC V.M 50Ω dymmy load	TX-RX (A/4) Rear panel	TP6 (ALC) ANT	TX-RX (A/4)	IC11-VR2	2.7V	±0.05V
2. TX AMP	1) Frequency : 53.900MHz MODE : CW Transmit	Synchro scope or Spectrum analyzer 50Ω dummy load	TX-RX (A/4) Rear panel	CN19 ANT	TX-RX (A/4)	L38~ L40 L44~ L46 L48	Repeat 2~3 times for MAX.	
3. MIX BIAS (CW level)	1) Frequency : 53.900MHz MODE : CW Transmit					VR12	Level MAX.	
	2) Transmit					VR11	Level MAX.	
(AM level)	3) MODE : AM Transmit After adjusted, CN19 connect.					VR10	Level MAX.	
4. Final idling current	1) Frequency : 51.900MHz MODE : USB Final unit VR1, VR2 : MIN Transmit	Power meter DC V.M	Rear panel	ANT	Final		Record current at VR1 and VR2 are MIN.	This current is total current.
						VR1	Total current + 250mA.	
						VR2	(Total current + 250mA) + 250mA.	
5. NULL	1) Frequency : 52.000MHz MODE : CW Transmit	DC V.M	TX-RX (C/4)	CN502-2	TX-RX (C/4)	TC501	Voltage MIN.	Reference value : 50mV or less
6. Power (HI)	1) Frequency : 52.000MHz MODE : CW Transmit	Power meter	Rear panel	ANT	TX-RX	VR14	95W	
(MID)	2) Frequency : 52.000MHz MODE : CW Transmit					VR16	45W	
(LOW)	3) Frequency : 52.000MHz MODE : CW Transmit					VR15	10W	
7. Power frequency response	1) Frequency : 53.900MHz MODE : CW Transmit				TX-RX (C/4)	VR501	MAX.	90W or more.
8. RF meter (FULL)	1) Frequency : 51.900MHz MODE : USB S MENU No. : AC TX output : 80W Transmit	Power meter AG	Rear panel Front panel	ANT MIC			UP or DOWN key : 1 push	Full scale check.

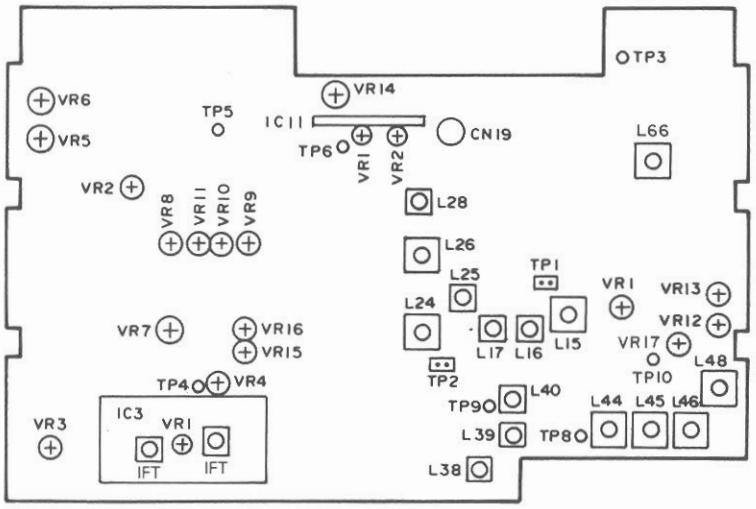
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
(2)	2) S MENU No. : AA TX output : 18W Transmit	Power meter	Rear panel	ANT			Up or DOWN key : 1 push	RF-meter "2" check.
(6)	3) S MENU No. : AB TX output : 40W Transmit	AG	Front panel	MIC				RF-meter "6" check.
9. CAR point	1) S MUNE No. : A3 or A4 (A3 : LSB, A4 : USB) AG1 : 300Hz/1.2mV AG2 : 2700Hz/2mV AG output : Level at which not activated. Transmit	Power meter Oscilloscope AG AF V.M	Rear panel Front panel	ANT MIC			Adjust so that wave-form cross by UP and DOWN key.	
10. Suppression	1) Frequency : 52.000MHz MODE : USB Transmit	Power meter Coupler Oscilloscope	Rear panel	ANT	TX-RX (A/4)	VR8 VR9	MIN. Set it to the minimum value by adjusting in the USB and modes alternately near the center of the VR.	–40dB or more.
11. MIC sensitivity	1) Frequency : 52.000MHz MODE : USB AG : 1kHz/3mV Transmit	Power meter AG AF V.M	Rear panel Front panel	ANT MIC	TX-RX (A/4)	VR7	60W	±1.0W
12. Spurious	1) Frequency : 50.000MHz MODE : CW Transmit	Power meter Coupler Spectrum analyzer	Rear panel	ANT	TX-RX (A/4)	VR13	Spurious MIN.	–60dB or more.
						VR17	50MHz±2MHz neatly spurious MIN.	
13. SWR protection	1) Frequency : 52.000MHz MODE : CW Transmit	150Ω dummy load Through-type power meter	Rear panel	ANT	TX-RX (A/4)	IC11-VR1	40W	
14. FM MAX DEV	1) Frequency : 52.050MHz MODE : FM AG : 1kHz/30mV **E** 1kHz/50mV **K** Transmit	Power meter Coupler Linear detector AG AF V.M	Rear panel Front panel	ANT MIC	PLL	VR2	± larger value should be 4.4kHz.	±0.1kHz
15. FM MIC sensitivity	1) Frequency : 52.050MHz MODE : FM AG : 1kHz/3mV **E** 1kHz/5mV **K** Transmit					VR1	±3.0kHz	±0.1kHz
16. AM MIC sensitivity	1) Frequency : 52.050MHz MODE : AM AG : 1kHz/3mV Transmit				TX-RX (A/4)	VR10	60% modulation	
17. Sub tone	1) Frequency : 52.050MHz MODE : FM M/V : 1 push SPLIT : 1 push A=B : 1 push Transmit					VR3	±0.75kHz	±0.1kHz
18. Side tone	1) Frequency : 52.000MHz MODE : CW AF VR : Center KEY : DOWN Transmit	Power meter Oscilloscope AF V.M	Rear panel	ANT EXT. SP	TX-RX	VR5	0.2V/8Ω	±0.02V
19. TX power	1) Frequency : 52.000MHz	Power meter	Rear panel	ANT			Check	HI : 80~100W (AM : 15~30W) MID : 40~50W (AM : 10~20W) LOW : 8~12W (AM : 4~7W)

ADJUSTMENT

Adjustment Points

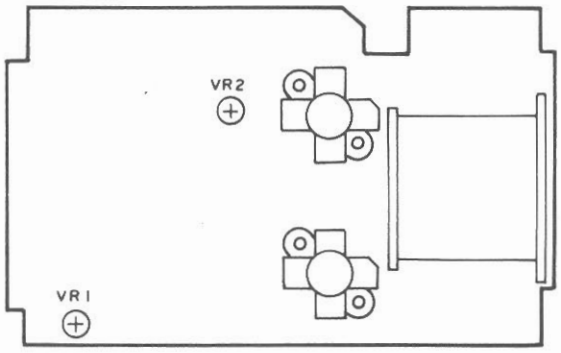
TX-RX UNIT (X57-4570-00) (A/4)



TX-RX UNIT (X57-4570-00) (A/4)

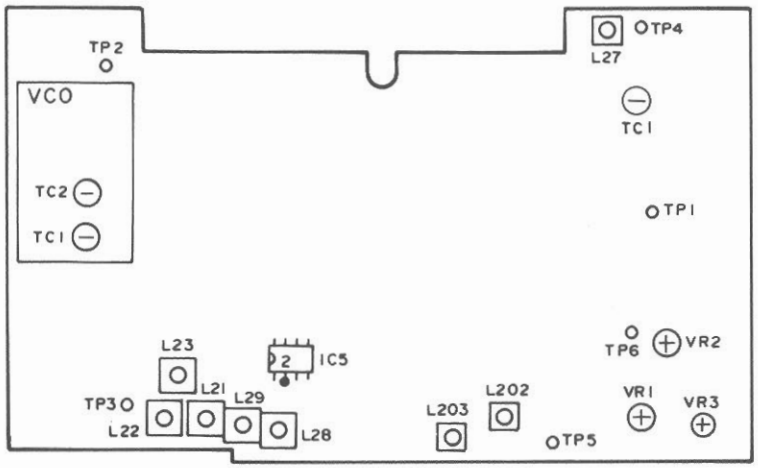
VR1 : MIX BAL	VR14 : Hi power
VR2 : FM meter	VR15 : Low power
VR3 : SSB squelch	VR16 : Mid power
VR4 : RFG	VR17 : Spurious
VR5 : Side tone	L15~17 : MCF
VR6 : Beep tone	L24~26, 28 : IF AMP
VR7 : MIC sensitivity	L38~40, 44~46, 48 : TX AMP
VR8, 9 : Suppression	L66 : RX AMP
VR10 : MIX BIAS (AM)	VR1 in IC3 : SSB S-meter (S1)
VR11 : MIX BIAS (CW)	IFT in IC3 : IF AMP
VR12 : MIX BIAS (MAX)	VR1 in IC11 : SWR protection
VR13 : Spurious	VR2 in IC11 : ALC voltage

FINAL UNIT (X45-3490-00)



FINAL UNIT (X45-3490-00)
VR1, 2 : Final idling current

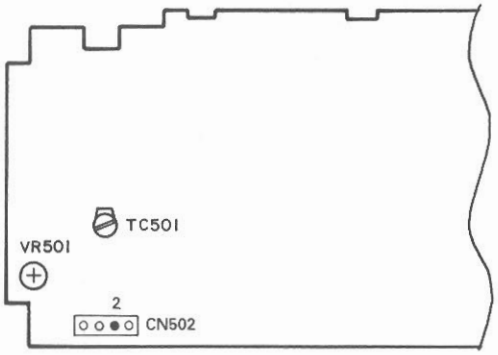
PLL UNIT (X50-3200-00)



PLL UNIT (X50-3200-00)
VR1 : FM MIC sensitivity
VR2 : FM MAX DEV
VR3 : Sub tone
L21~23 : 75.045~75.545MHz
L27 : 10.695MHz
L28, 29 : 80MHz
L202, 203 : NB
TC1 : Reference OSC

VCO (X58-4120-00)
TC1, 2 : Lock voltage

TX-RX UNIT (X57-4570-00) (C/4)



TX-RX UNIT (X57-4570-00) (C/4)
VR501 : Power frequency response
TC501 : NULL

TERMINAL FUNCTION

CN No.	Pin No.	Name	Function
LCD ASSY (B38-0719-15)			
CN1	1	DGND	Digital ground.
	2	LEN	LCD control enable.
	3	FSQ	FM squelch voltage.
	4	UEN1	Shift register enable.
	5	SSQ	SSB squelch voltage.
	6	BLK	All LCD segments off.
	7	5V	5V.
	8	NC	
	9	8V	8V.
	10	RVR	RIT VR voltage.
	11	KAD1	Key matrix voltage.
	12	AGND	Analog ground
	13	KAD2	Key matrix voltage.
	14	ISV	IF SHIFT VR voltage.
	15	MUP	Microphone UP switch.
	16	MDN	Microphone DOWN switch.
	17	PSW	POWER switch.
	18	EDP1	Encoder pulse.
	19	5A	Analog 5V.
	20	EDP2	Encoder pulse.
	21	CSS	PTT signal.
	22	14S	14V.
	23	LDA	LCD control data.
	24	LCK	LCD control clock.
	25	5C	5.6V for power switch.
CN2	1	AF1	AF VR-1.
	2	AF2	AF VR-2.
	3	AF3	AF VR-3 (ground).
	4	FSQ	FM squelch setting voltage.
	5	SSQ	SSB squelch setting voltage.
	6	AGND	Analog ground.
	7	5A	Analog 5V.
	8	RVR	RIT VR voltage.
	9	ISV	IF SHIFT VR voltage.
	10	DGND	Digital ground.
CN4	1	DGND	Digital ground.
	2	EDP1	Encoder pulse output.
	3	EDP2	Encoder pulse output.
	4	NC	
CN5	1	MIC	MIC.
	2	MICG	MIC ground.
	3	SPO	Speaker output.
	4	AGND	Analog ground.
	5	AF2	AF VR-2.
	6	AF1	AF VR-1.
	7	AFG	AF VR-3 (ground).
FINAL UNIT (X45-3490-00)			
CN2	Coaxial	PO	High-frequency output.
CN3	1	EALC	External ALC.
	2	EALG	External ALC ground.
CN4	1	MOT+	Fan power supply.
	2	MOT–	Fan power supply.
CN101	1	AGND	Analog ground.
	2	AGND	Analog ground.
	3	14	Always 14V.
	4	14S	14V when power is on.
	5	14S	14V when power is on.
	6	DGND	Digital ground.
	7	5V	5V when power is on.
	8	PSC	High when power switch is turned on.
	9	8V	8V when power is on.
	10	TXB	8V in transmit mode.
	11	THP	Final temperature detection.
CN102	1	14AG	Ground for 14AF.
	2	14AF	14V when power is on (with filter).
	3	8V	8V.
	4	14S	14V when power is on.
CN103	1	SEG	External speaker ground.
	2	ES2	External speaker.
	3	ES1	External speaker.
	4	AGND	Analog ground.
	5	STS	Sidetone switch.
	6	KEY	CW keying output.
CN104	1	14S	14V when power is on.
	2	14S	14V when power is on.
	3	8V	8V.
	4	TXB	8V in transmit mode.
	5	14S	14V when power is on.
	6	THP	Final temperature detection.
CN105	1	14	Always 14V.
	2	14	Always 14V.
W1 (1/2)	1	14S	14V when power is on.
	2	14S	14V when power is on.
	3	8V	8V when power is on.
	4	TXB	8V in transmit mode.
W1 (2/2)	1	14S	14V when power is on.
	2	THP	Final temperature detection.
W2	1	14	Always 14V.
	2	14	Always 14V.
W7	Coaxial	DRV	Drive input.
J1		RELAY	Linear relay control.
J2		EXT ALC	ALC input from linear.
J101		EXT SP	External speaker.
J102		KEY	CW key input.
DIGITAL UNIT (X46-318X-XX)			
CN1	1	DGND	Digital ground.
	2	LEN	LCD control enable.
	3	FSQ	FM squelch voltage.
	4	UEN1	Shift register enable 1.
	5	SSQ	SSB squelch voltage.
	6	BLK	All LCD segments off.
	7	5V	5V.
	8	NC	
	9	8V	8V.
	10	RVR	RIT VR voltage.
	11	KAD1	Key matrix voltage.
	12	AGND	Analog ground.
	13	KAD2	Key matrix voltage.
	14	ISV	IF SHIFT VR voltage.
	15	MUP	Microphone UP switch.
	16	MDN	Microphone DOWN switch.
	17	PSW	POWER switch.
	18	EDP1	Encoder pulse.
	19	5A	Analog 5V.
	20	EDP2	Encoder pulse.
	21	CSS	PTT signal.
	22	14S	14V.
	23	LDA	LCD control data.
	24	LCK	LCD control clock.
	25	5C	5.6V for power switch.
CN2	1	AB2	DDS2 (CAR) register selection.
	2	DE2	DDS2 (CAR) enable.

TERMINAL FUNCTION

CN No.	Pin No.	Name	Function
	3	NBS	NB ON/OFF control.
	4	RBK	RX RF blanking output.
	5	PCK	PLL clock.
	6	PDA	PLL data.
	7	GND	Ground.
	8	PE2	PLL2 (KCH14) enable.
	9	FMB	8V in FM mode, 0V in other modes.
	10	TONE	Subtone output.
	11	NFT	0V in FM transmit mode, 5V in other modes.
CN3	1	DGND	Digital ground.
	2	AGND	Analog ground.
	3	NC	
	4	KYS	Key jack input; when inserted.
	5	KYB	Key input.
	6	FMB	8V in FM mode, 0V in other modes.
	7	TRC	TX/RX control signal. High in transmit mode.
	8	RXS	RX enable.
	9	BEEP	Beep output.
	10	AGS	AGC slow/fast changeover.
	11	MGS	Microphone sensitivity selection.
	12	FSQ	FM squelch voltage.
	13	SSQ	SSB squelch voltage.
	14	BSY	Busy signal.
	15	RBK	RF blanking.
	16	SM	Signal meter voltage.
	17	UEN4	Shift register enable 4.
	18	UCK	Shift register clock.
	19	UDA	Shift register data.
	20	UEN5	Shift register enable 5.
	21	NC	
	22	UEN6	Shift register enable 6.
	23	CKS	CKS control signal.
	24	NC	
	25	PWM	Power meter voltage.
CN4	1	NC	
	2	NC	
	3	UEN2	Shift register enable 2.
	4	UCK	Shift register clock.
	5	UDA	Shift register data.
	6	14	14V.
	7	14S	14V.
	8	5V	5V.
	9	PSC	Power relay control.
	10	8V	8V.
	11	THP	Final temperature detection.
	12	DGND	Digital ground.
CN5	1	NC	
	2	ULK	Unlock detection input.
	3	PE1	PLL1 (LO1) enable.
	4	DE1	DDS1 (LO1) enable.
	5	AB1	DDS1 (LO1) register selection.
	6	8V	8V output.
	7	5V	5V output.
	8	GND	Ground.
	9	C3	0.03~10.4999MHz. VCO
	10	C2	10.5~21.4999MHz. selection line.
	11	C1	21.5~29.9999MHz. Active high
CN6	1	GND	Ground.
	2	5V	5V output.
	3	TXD	Personal computer interface.
	4	RXD	Personal computer interface.
	5	RTS	Personal computer interface.
	6	CTS	Personal computer interface.

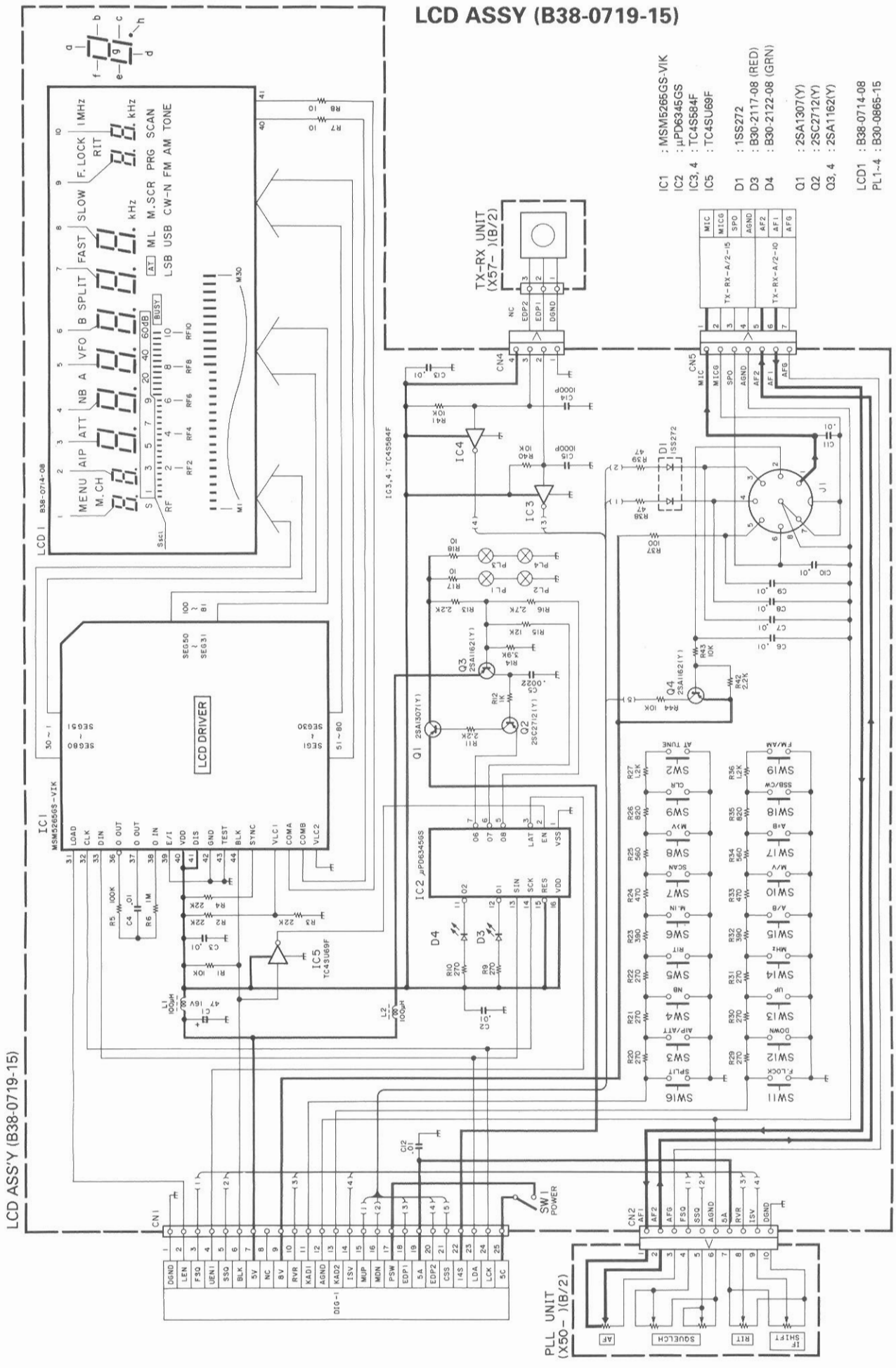
CN No.	Pin No.	Name	Function
PLL UNIT (X50-3200-00)			
CN1	1	FMM	FM modulator input.
	2	FMG	Ground.
	3	NBI	NB amplifier signal input.
	4	NBG	Ground.
CN2	Coaxial	LO1	LO1 output. 113.045~133.045MHz : K 123.045~127.045MHz : E
CN3	Coaxial	CAR	CAR output. 10.695MHz.
CN4	Coaxial	LO2	LO2 output. 62.35MHz.
CN5	1	NC	
	2	ULK	Unlock detection output.
	3	PE1	PLL1 (LO1) enable.
	4	DE1	DDS1 (LO1) enable.
	5	AB1	DDS1 (LO1) register selection.
	6	8V	8V.
	7	5V	5V.
	8	GND	Ground.
	9	C3	0.03~10.4999MHz. VCO
	10	C2	10.5~21.4999MHz. selection line.
	11	C1	21.5~29.9999MHz. Active high.
CN6	1	AB2	DDS2 (CAR) register selection.
	2	DE2	DDS2 (CAR) enable.
	3	NBS	NB ON/OFF control.
	4	RBK	RX RF blanking input.
	5	PCK	PLL clock.
	6	PDA	PLL data.
	7	GND	Ground.
	8	PE2	PLL2 (KCH14) enable.
	9	FMB	8V in FM mode, 0V in other modes.
	10	TONE	Subtone input.
	11	NFT	0V in FM transmit mode, 5V in other modes.
TX-RX UNIT (X57-4570-00)			
CN1	Coaxial	RAT	Receive signal input.
CN2	Coaxial	LO1	LO1 input. 113.045~133.045MHz : K 123.045~127.045MHz : E
CN3	Coaxial	LO2	LO2 input. 62.35MHz.
CN4	1	NBI	10.695MHz NB AMP output.
	2	NBG	NB ground.
	3	NC	
CN10	1	NC	
	2	AF2	AF VR-2.
	3	AF1	AF VR-1.
	4	AFG	AF VR-3 (ground).
CN11	Coaxial	CAR	CAR input. 10.695MHz.
CN12	1	SP	Speaker input.
	2	SPG	Speaker ground.
CN13	1	PHG	Head phone ground.
	2	PH2	Head phone through.
	3	PH1	Head phone output.
CN14	1	FMM	FM MIC output.
	2	FMG	FM MIC ground.
CN15	1	NC	
	2	MIC	MIC.
	3	MICG	MIC ground.
	4	SPO	Speaker output (MIC connector).
	5	AGND	Analog ground.
CN16	1	KEY	CW keying. High : Key down.
	2	STS	Sidetone switch.
	3	AGND	Analog ground.
	4	ES1	External speaker output.

TERMINAL FUNCTION

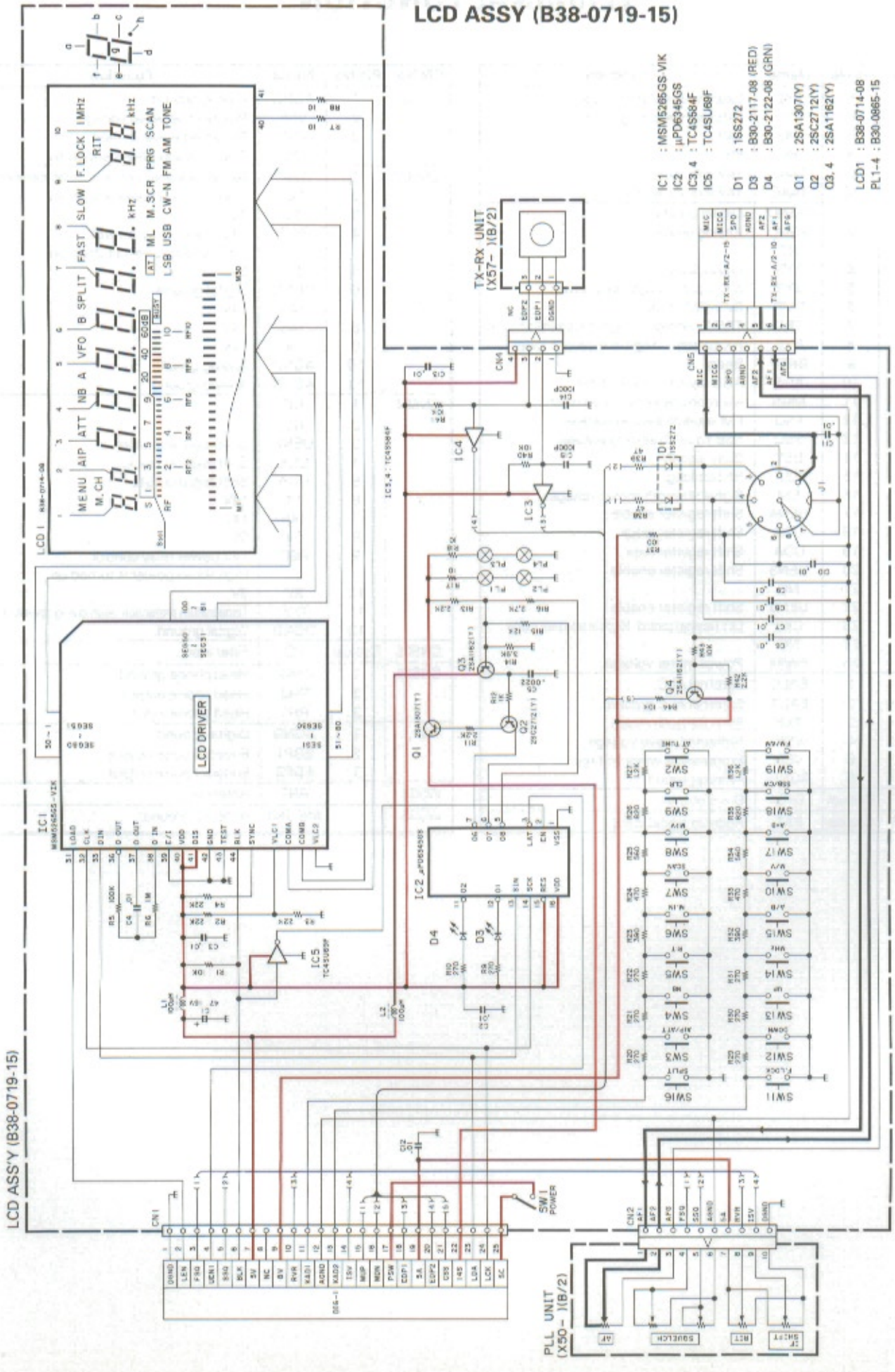
CN No.	Pin No.	Name	Function
	5	ES2	External speaker through.
	6	ESG	External speaker ground.
	7	14S	14V.
	8	8V	8V.
	9	14AF	14V (For audio IC).
	10	14AG	14V (For audio IC).
CN17	1	DGND	Digital ground.
	2	AGND	Analog ground
	3	NC	
	4	KYS	Key jack input.
	5	KYB	Key input. High : Key down.
	6	FMB	8V in FM mode.
	7	TRC	TX/RX control. High in transmit mode.
	8	RXS	RX switch. High in receive mode.
	9	BEEP	Beep.
	10	AGS	AGC switch. Low : Fast.
	11	MGS	Microphone sensitivity switch.
	12	FSQ	FM squelch setting voltage.
	13	SSQ	SSB squelch setting voltage.
	14	BSY	Busy signal.
	15	RBK	RF blanking.
	16	SM	Signal strength meter voltage.
	17	UEN4	Shift register enable.
	18	UCK	Shift register clock.
	19	UDA	Shift register data.
	20	UEN5	Shift register enable.
	21	NC	
	22	UEN6	Shift register enable.
	23	CKS	CKY (keying) control. Hight in transmit mode.
	24	NC	
	25	PWM	Power meter voltage.
CN18	1	EALC	External ALC.
	2	EALG	External ALC ground.
	3	TXB	8V in transmit mode.
	4	VSR	Reflected wave voltage.
	5	VSF	Progressive wave voltage.
	6	AGND	Analog ground.
CN19	Coaxial	DRV	Drive output.
CN501	Coaxial	RAT	Receive signal input.

CN No.	Pin No.	Name	Function
CN502	1	AGND	Analog ground.
	2	VSF	Progressive wave voltage.
	3	VSR	Reflected wave voltage.
	4	TXB	Transmission power supply 8V.
CN503	1	THP	Temperature protection. High during operation.
	2	TXB	Transmission power supply 8V.
	3	8V	8V.
	4	PSC	14V power relay control. High when power is turned on.
	5	5V	5V.
	6	DGND	Digital ground.
	7	14S	14V.
	8	14S	14V.
	9	14	14V.
	10	AGND	Analog ground.
	11	AGND	Analog ground.
CN504	1	NC	
	2	NC	
	3	UEN2	Shift register enable.
	4	UCK	Shift register clock.
	5	UDA	Shift register data.
	6	14	14V.
	7	14S	14V.
	8	5V	5V.
	9	PSC	14V power relay control. High when power is turned on.
	10	8V	8V.
	11	THP	Temperature protection. High during operation.
	12	DGND	Digital ground.
CN505	Coaxial	PO	Filter input.
CN506	1	PHG	Head phone ground.
	2	PH2	Head phone output.
	3	PH1	Head phone input.
W2	1	DGND	Digital ground.
	2	EDP1	Encoder pulse output.
	3	EDP2	Encoder pulse output.
W502		ANT	Antenna.
W503		ANT GND	Antenna ground.

TS-60S CIRCUIT DIAGRAM

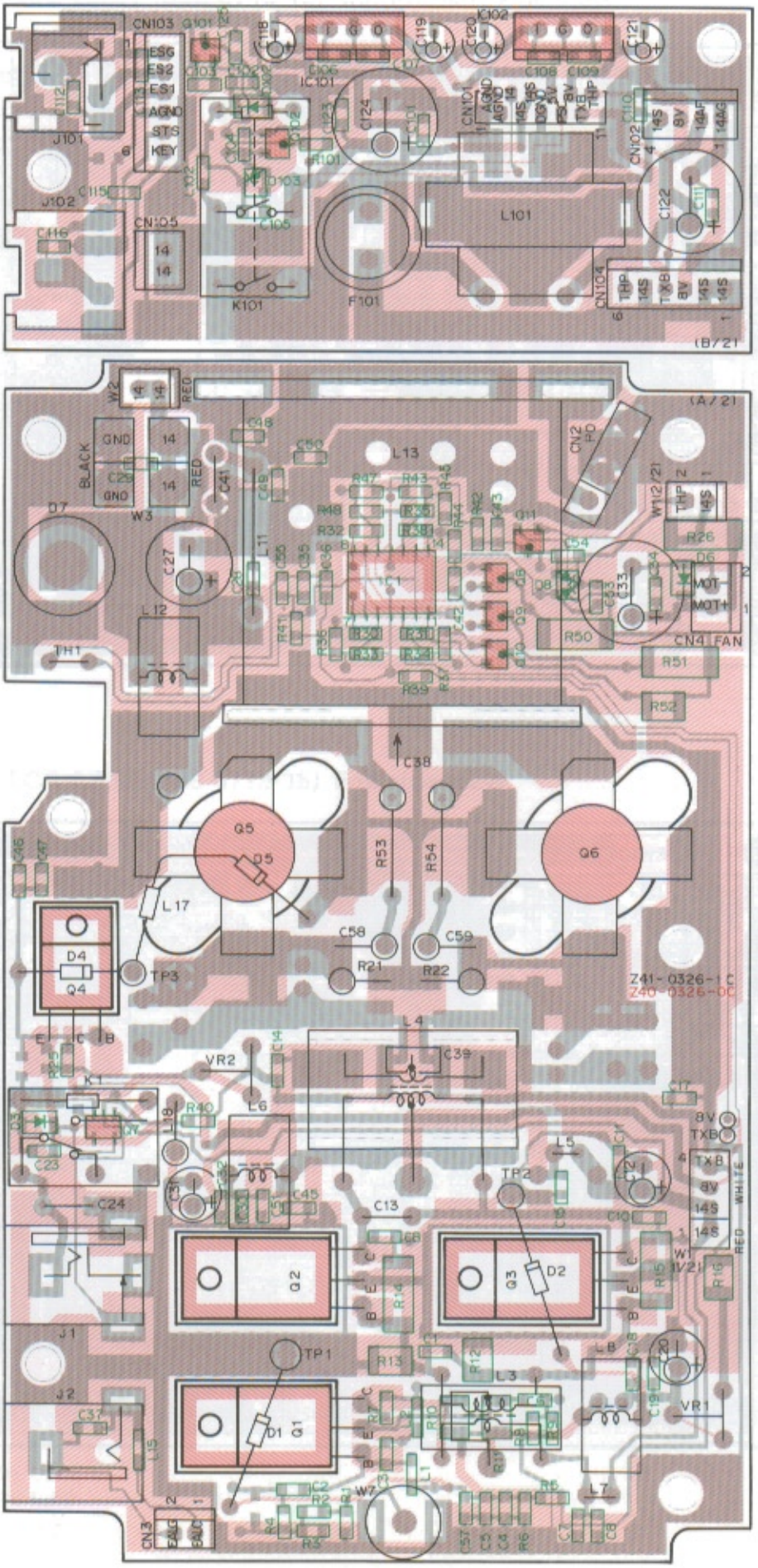


TS-60S CIRCUIT DIAGRAM

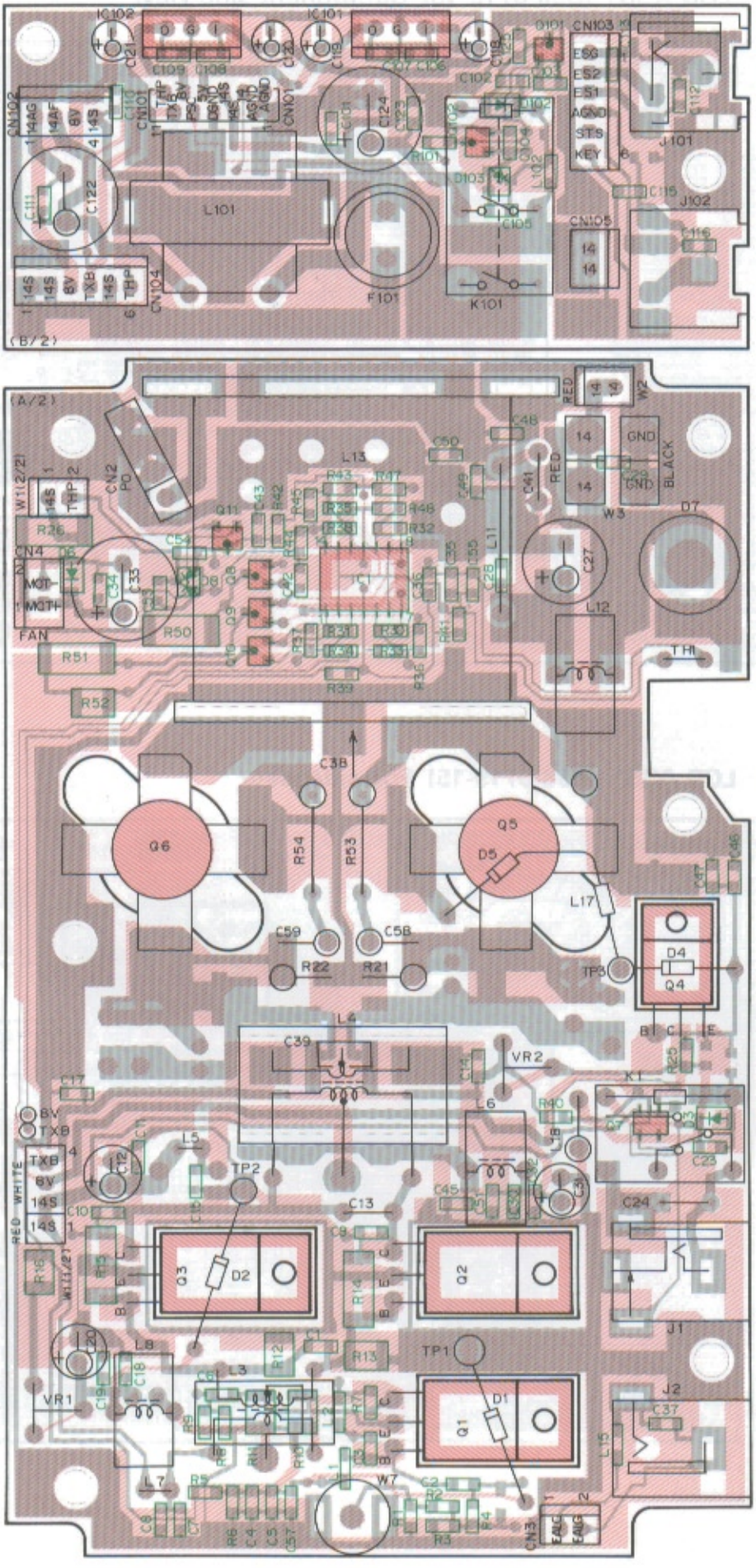


TS-60S PC BOARD VIEWS

FINAL UNIT (X45-3490-00) Component side view

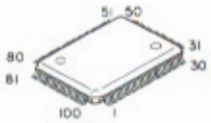


FINAL UNIT (X45-3490-00) Foil side view

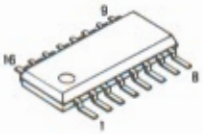


LCD ASSY (B38-0719-15) Component side view

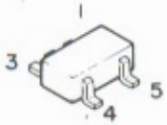
MSM5265GS-V1K



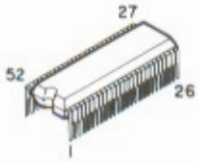
µPD6345GS



TC4S584F

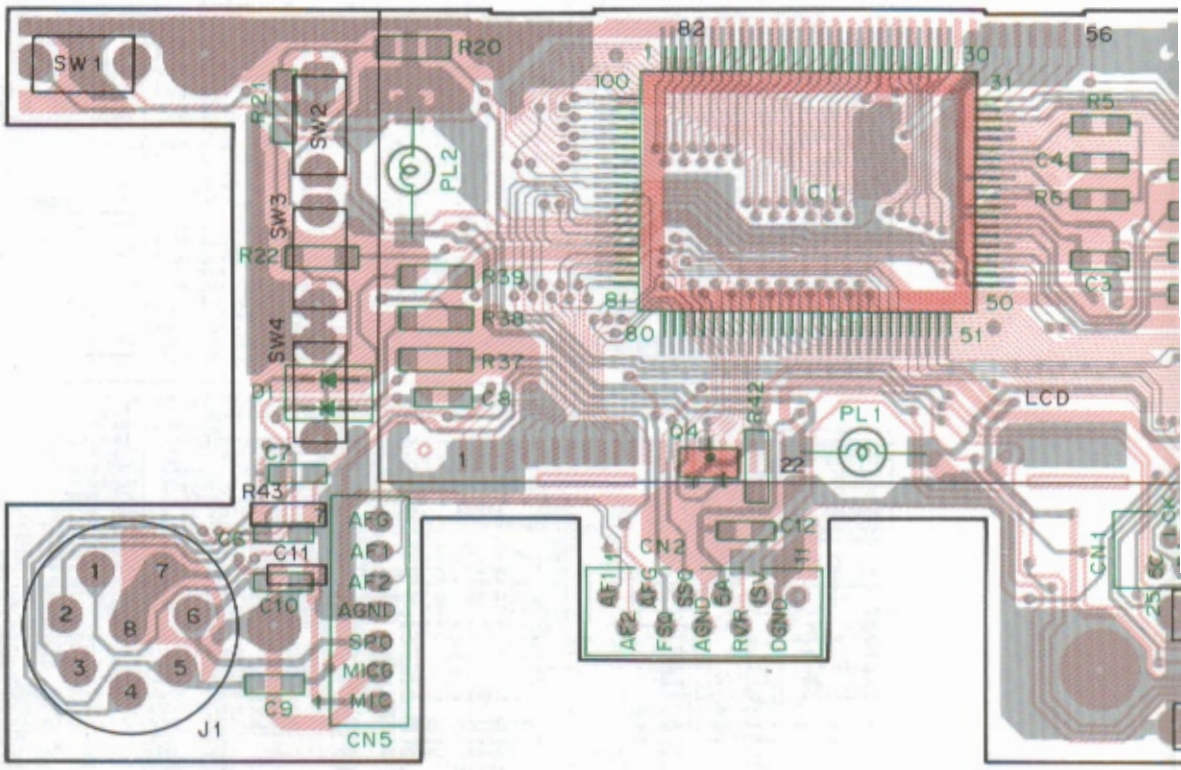


TC4SU69F

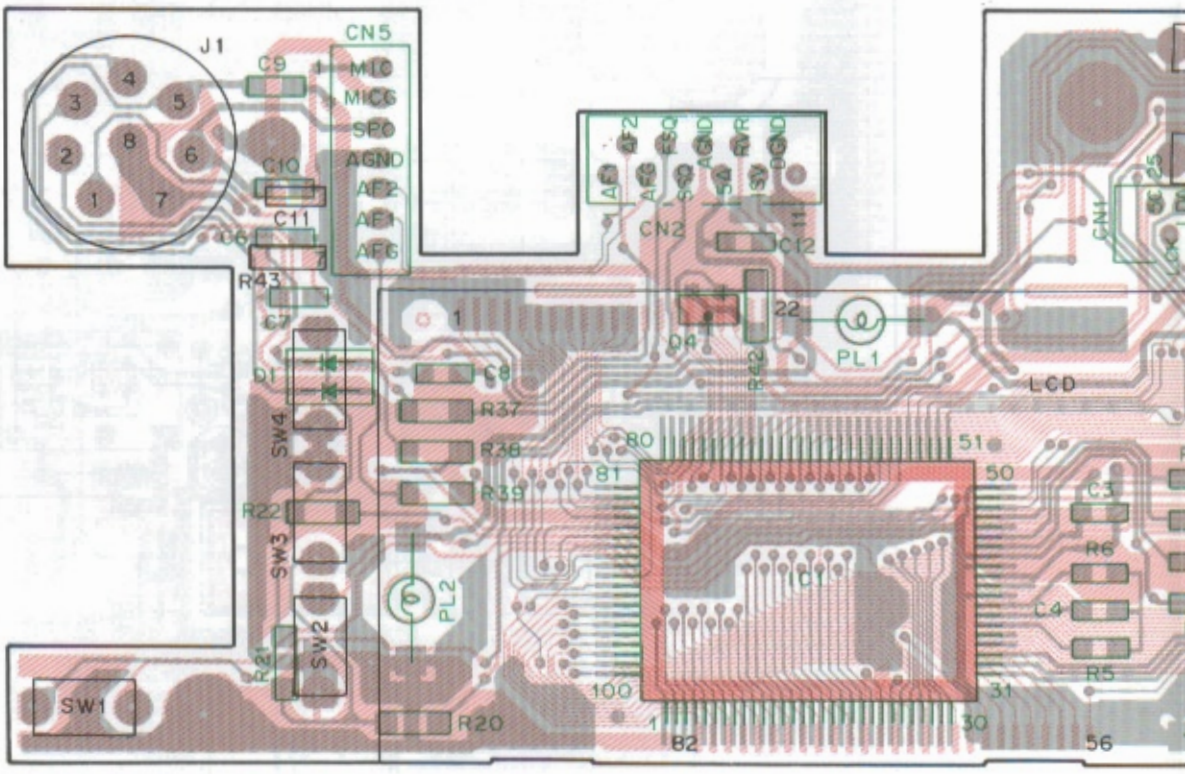


2SA1307

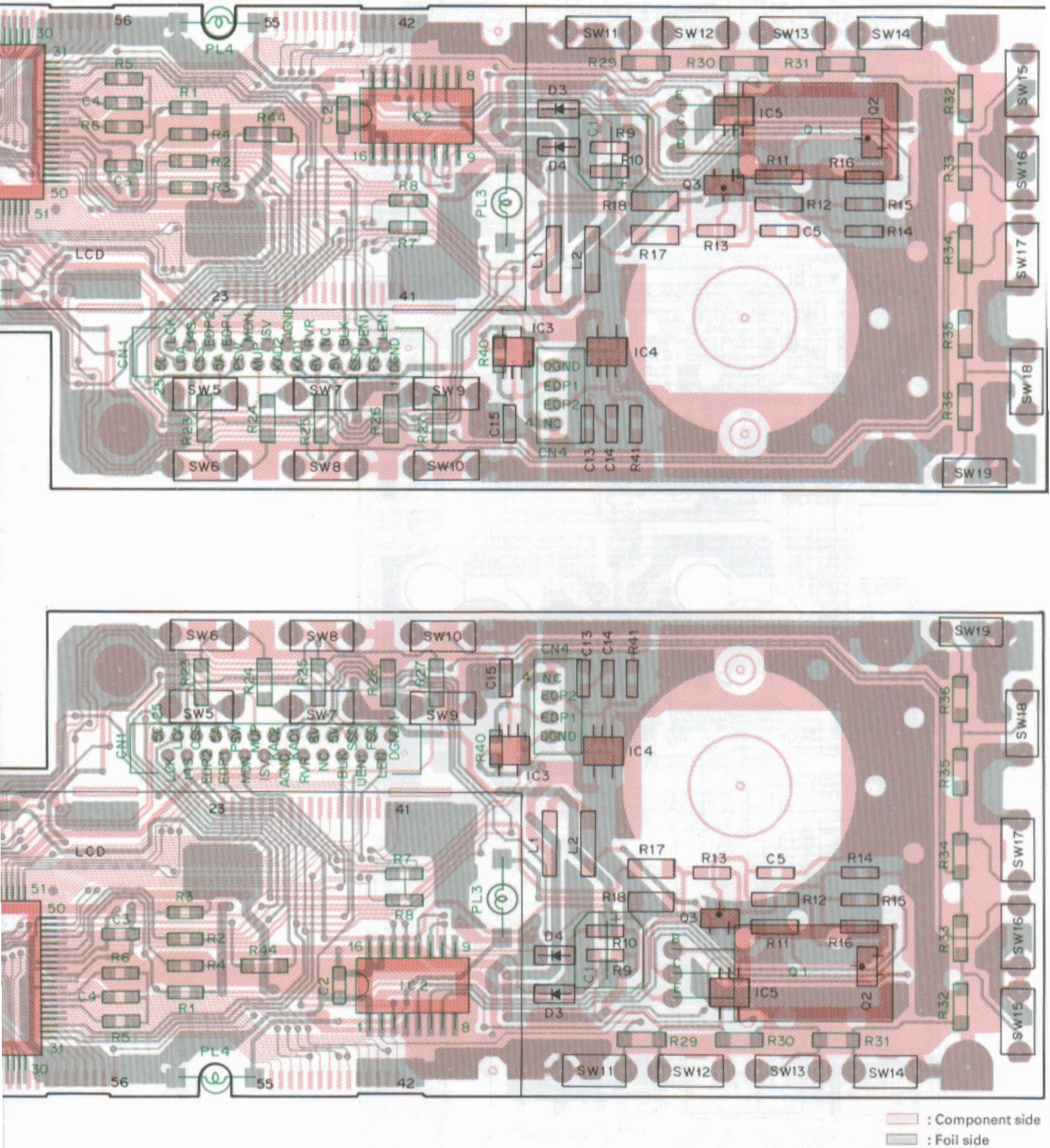
2SA1162
2SC2712



LCD ASSY (B38-0719-15) Foil side view

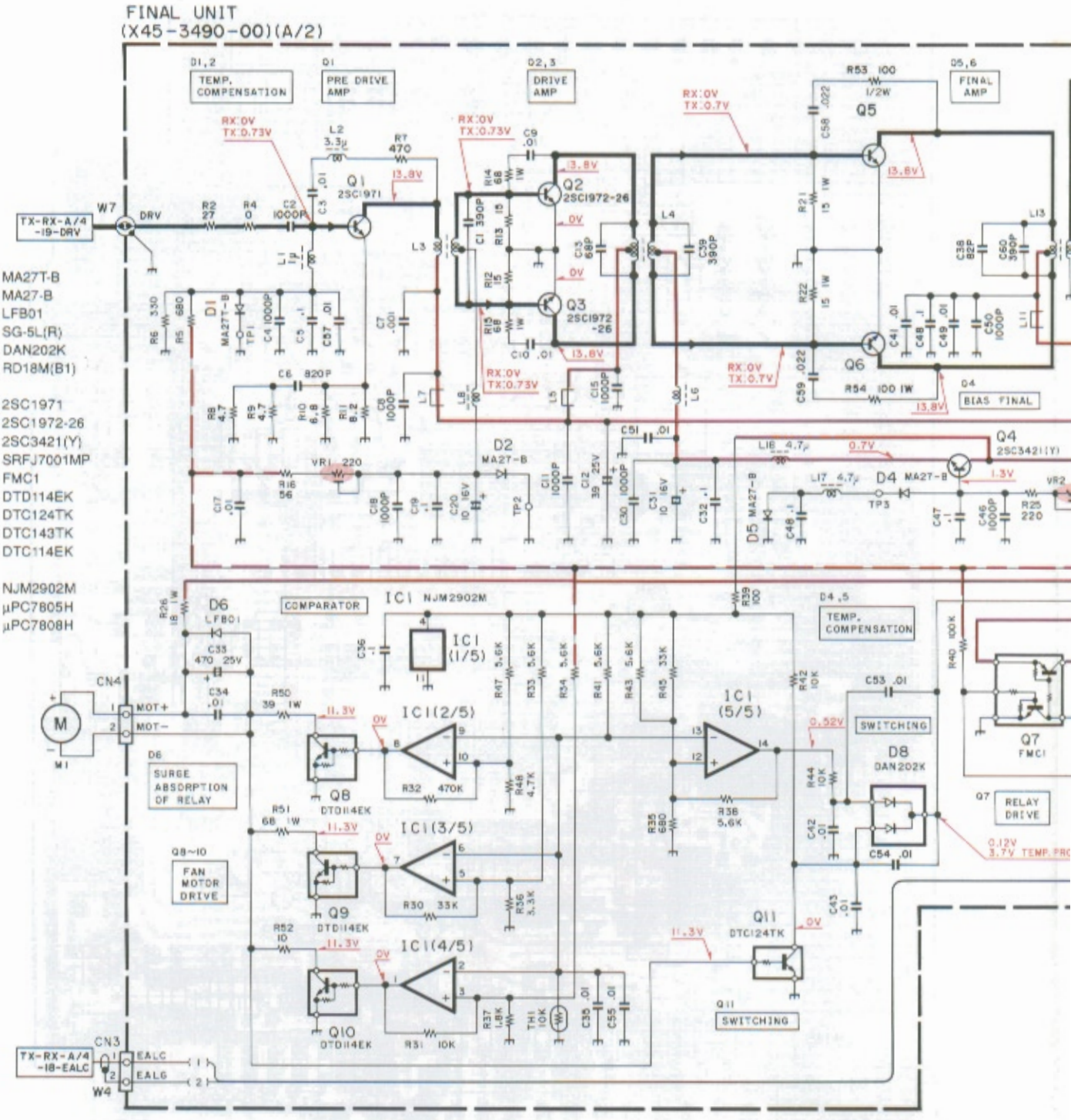


PC BOARD VIEWS TS-60



: Component side
: Foil side

FINAL UNIT (X45-3490-00)

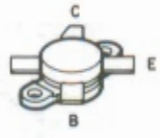


D1	: MA27T-B
D2,4,5	: MA27-B
D3,6,102	: LFB01
D7	: SG-5L(R)
D8	: DAN202K
D103	: RD18M(B1)
Q1	: 2SC1971
Q2,3	: 2SC1972-26
Q4	: 2SC3421(Y)
Q5,6	: SRFJ7001MP
Q7	: FMC1
Q8~10	: DTD114EK
Q11	: DTC124TK
Q101	: DTC143TK
Q102	: DTC114EK
IC1	: NJM2902M
IC101	: μPC7805H
IC102	: μPC7808H

2SC1971
2SC1972-26

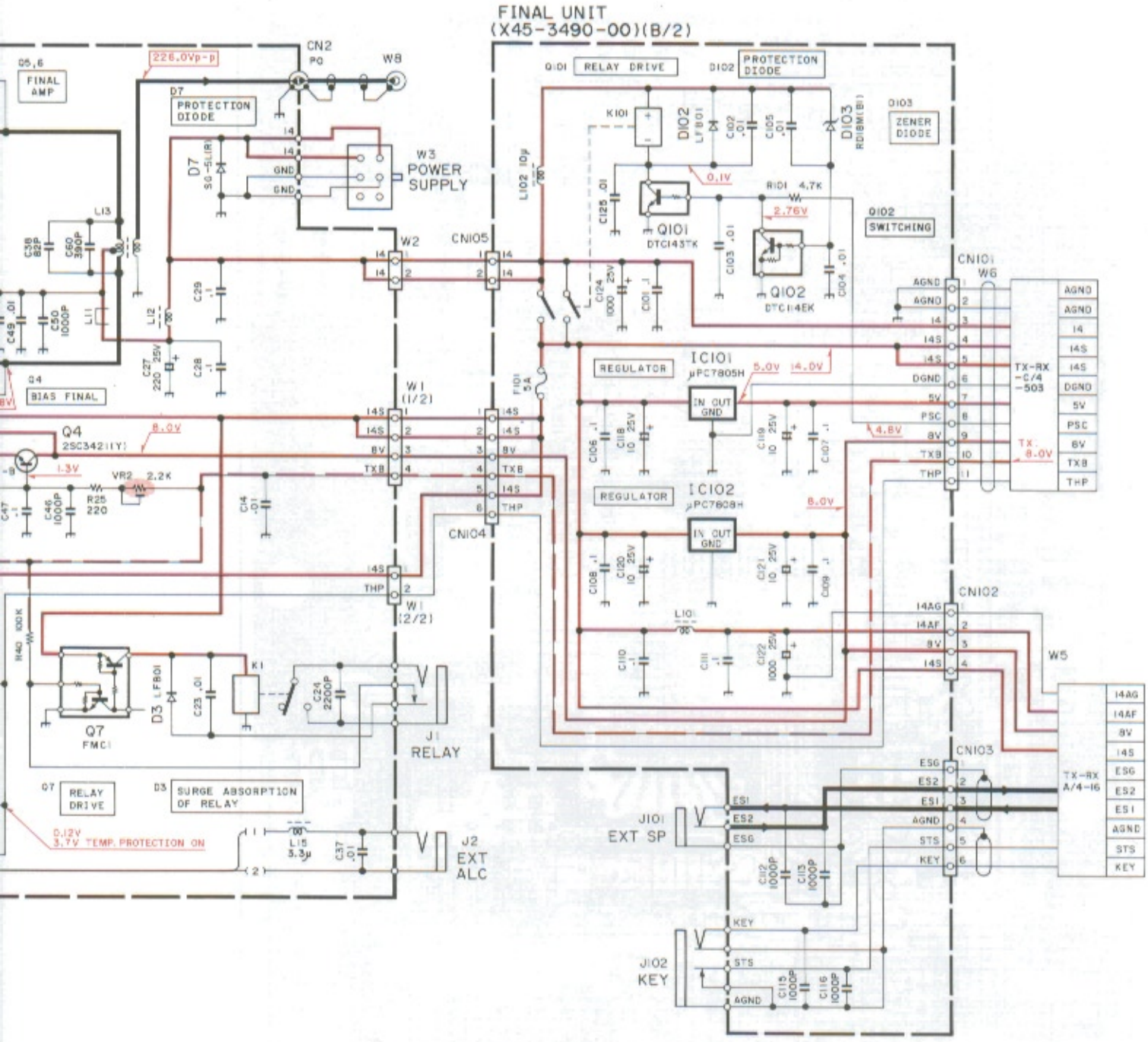
FMC1

SRFJ7001MP

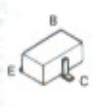


DTC114EK
DTC124TK
DTC143TK
DTD114EK

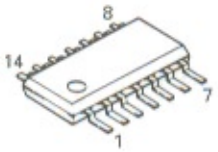
CIRCUIT DIAGRAM TS-60S



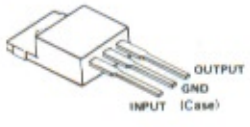
2SC3421



NJM2902M

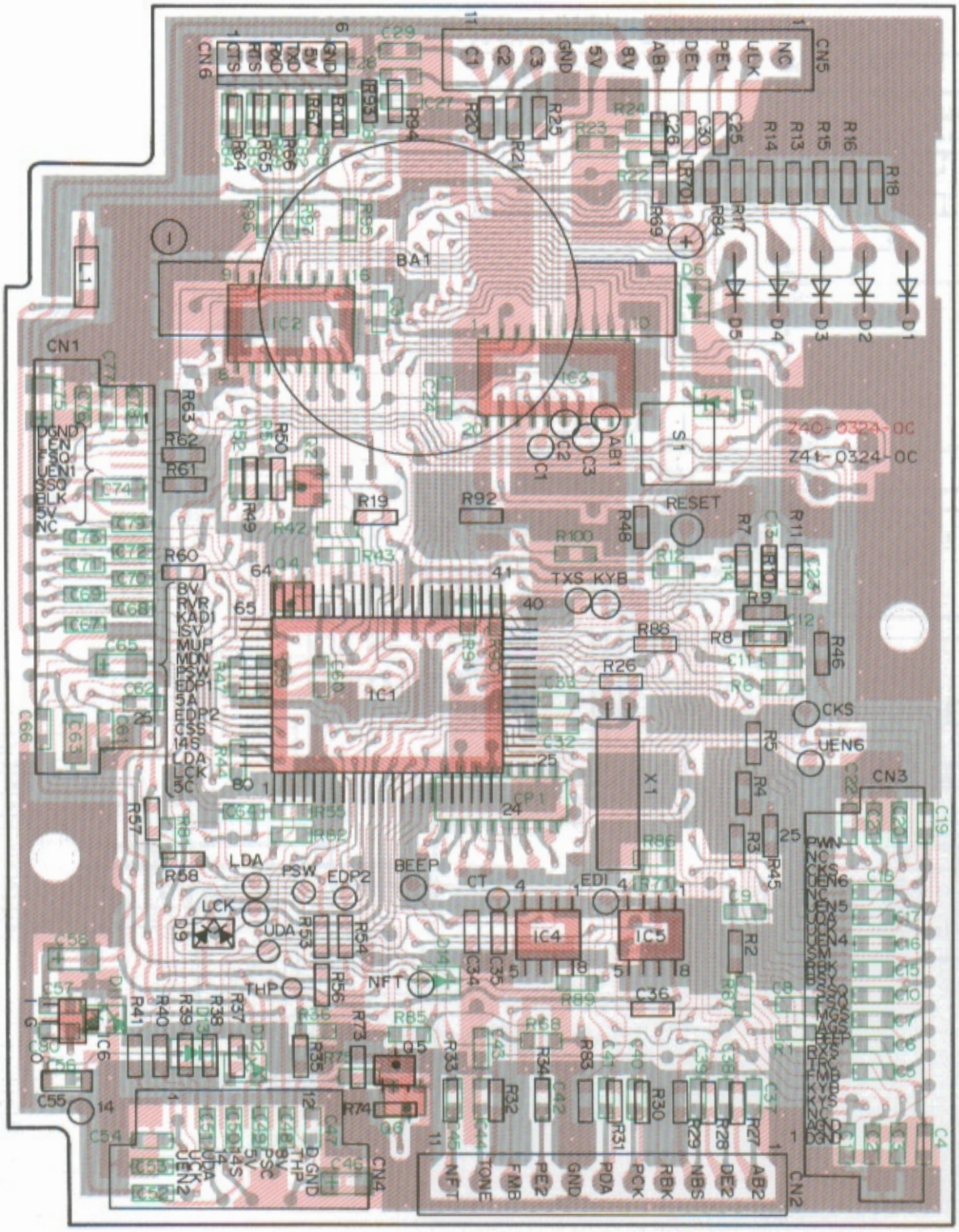


μPC7805H
μPC7808H

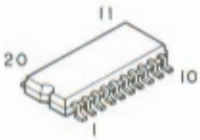


TS-60S PC BOARD VIEWS

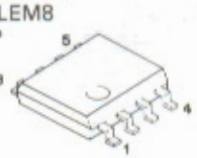
DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E Component side view



TC74HC573AF



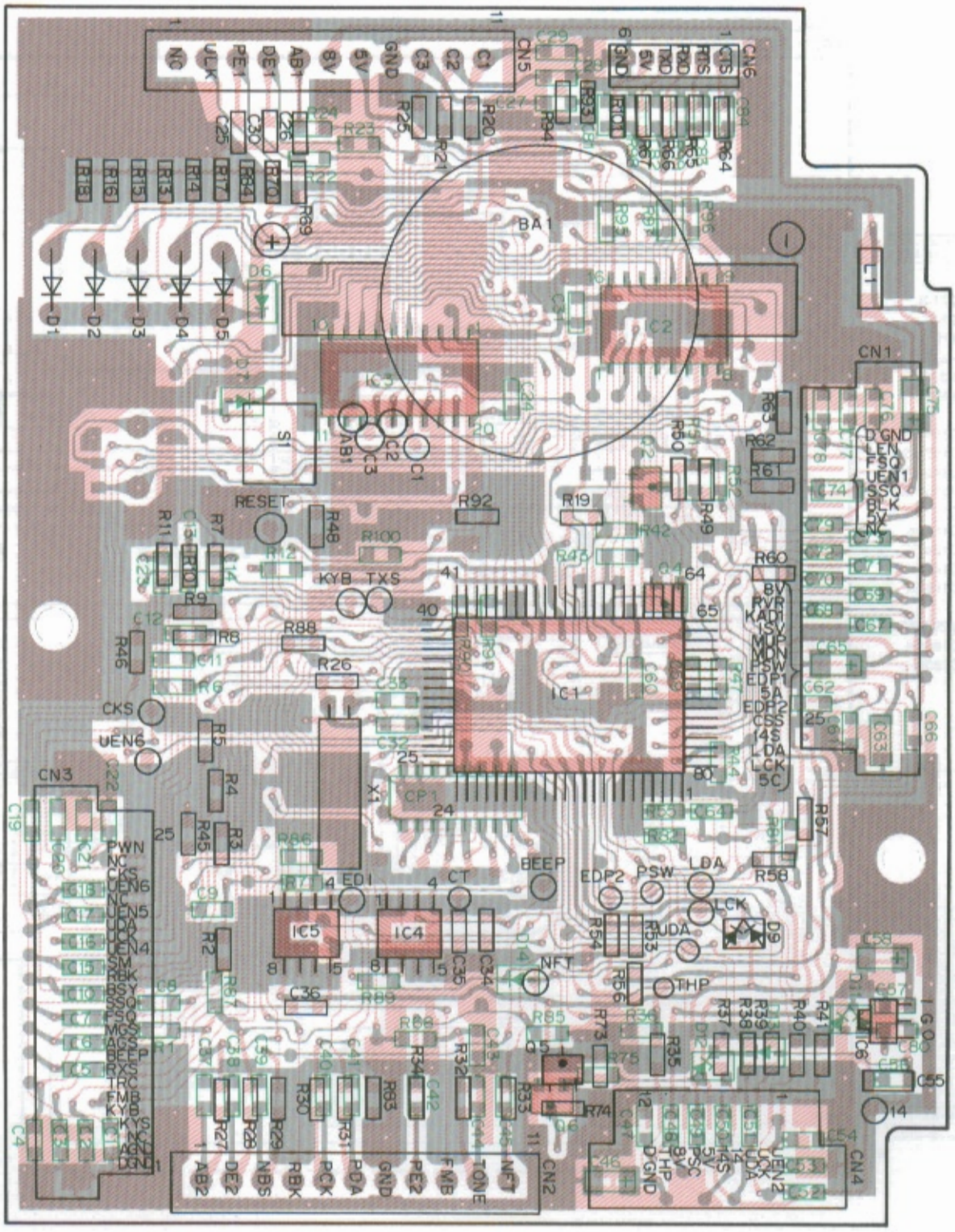
AT93C66-10SI2.7
NM93C66LEM8
M62003FP



NJM78L05UA

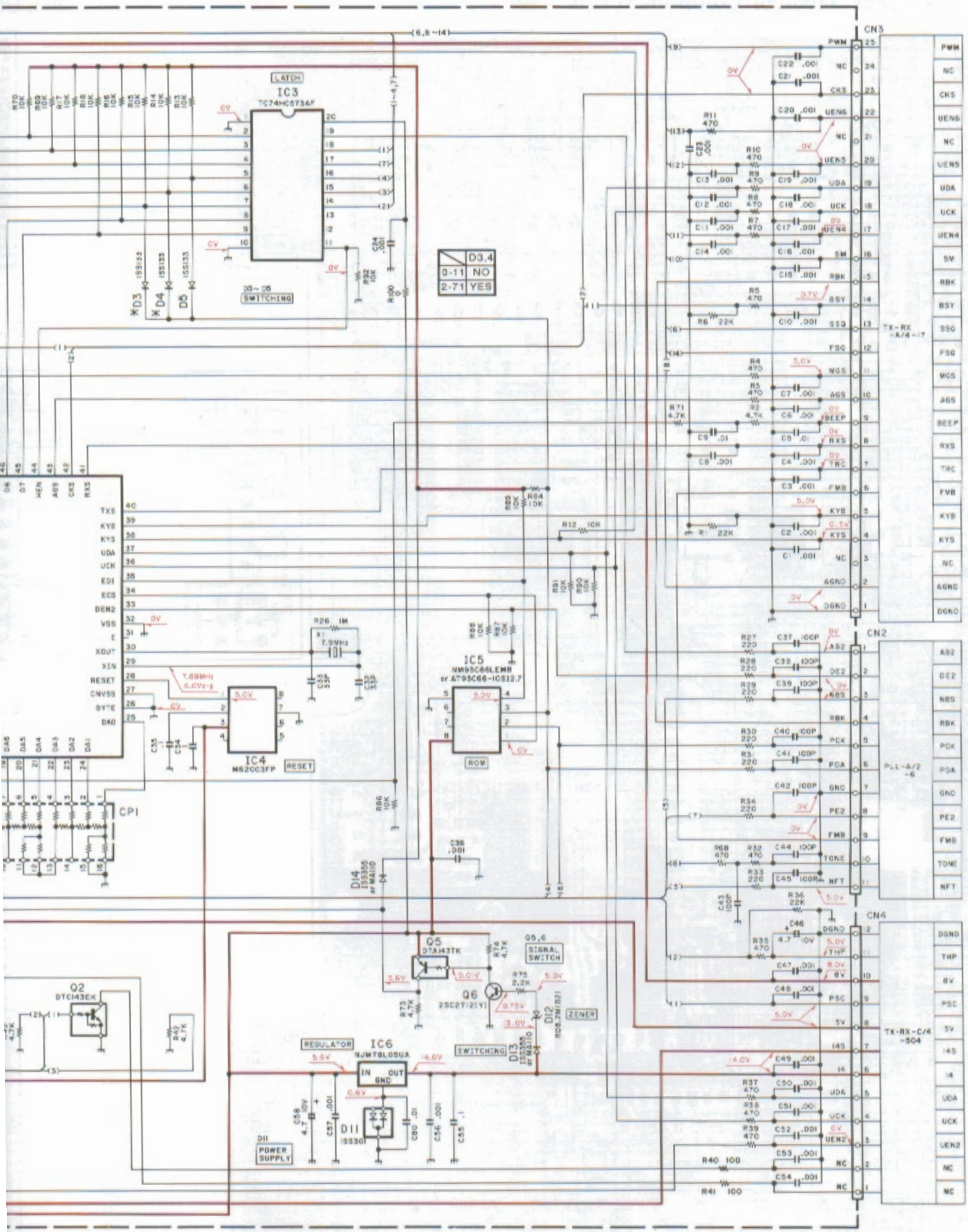
2SC2712
DTA143TK
DTC143EK

DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E Foil side view

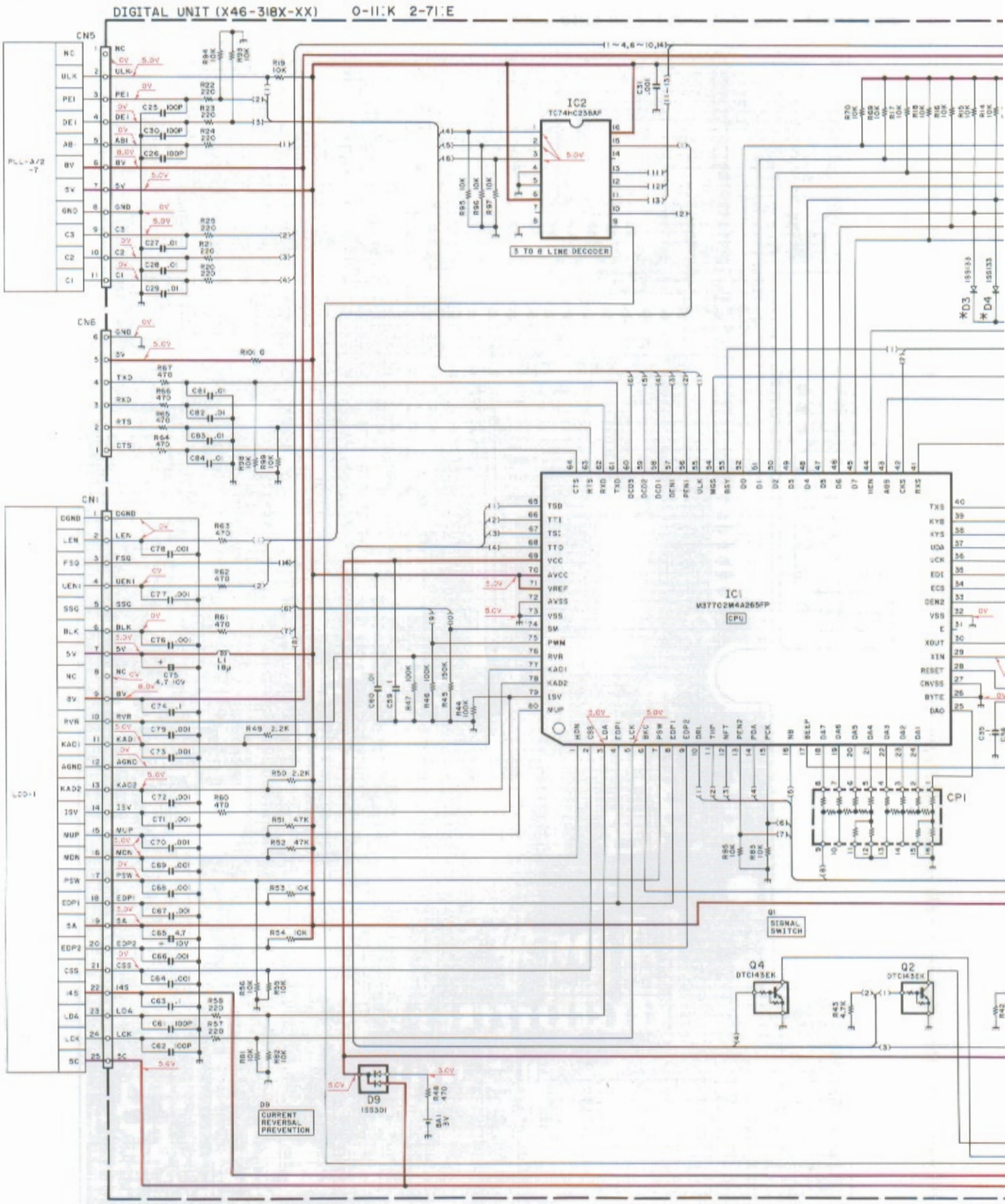


: Component side
: Foil side

CIRCUIT DIAGRAM TS-60S



DIGITAL UNIT (X46-318X-XX) 0-11 : K 2-71 : E



Q2,4 : DTC143EK
Q5 : DTA143EK
Q6 : 2SC2712(Y)

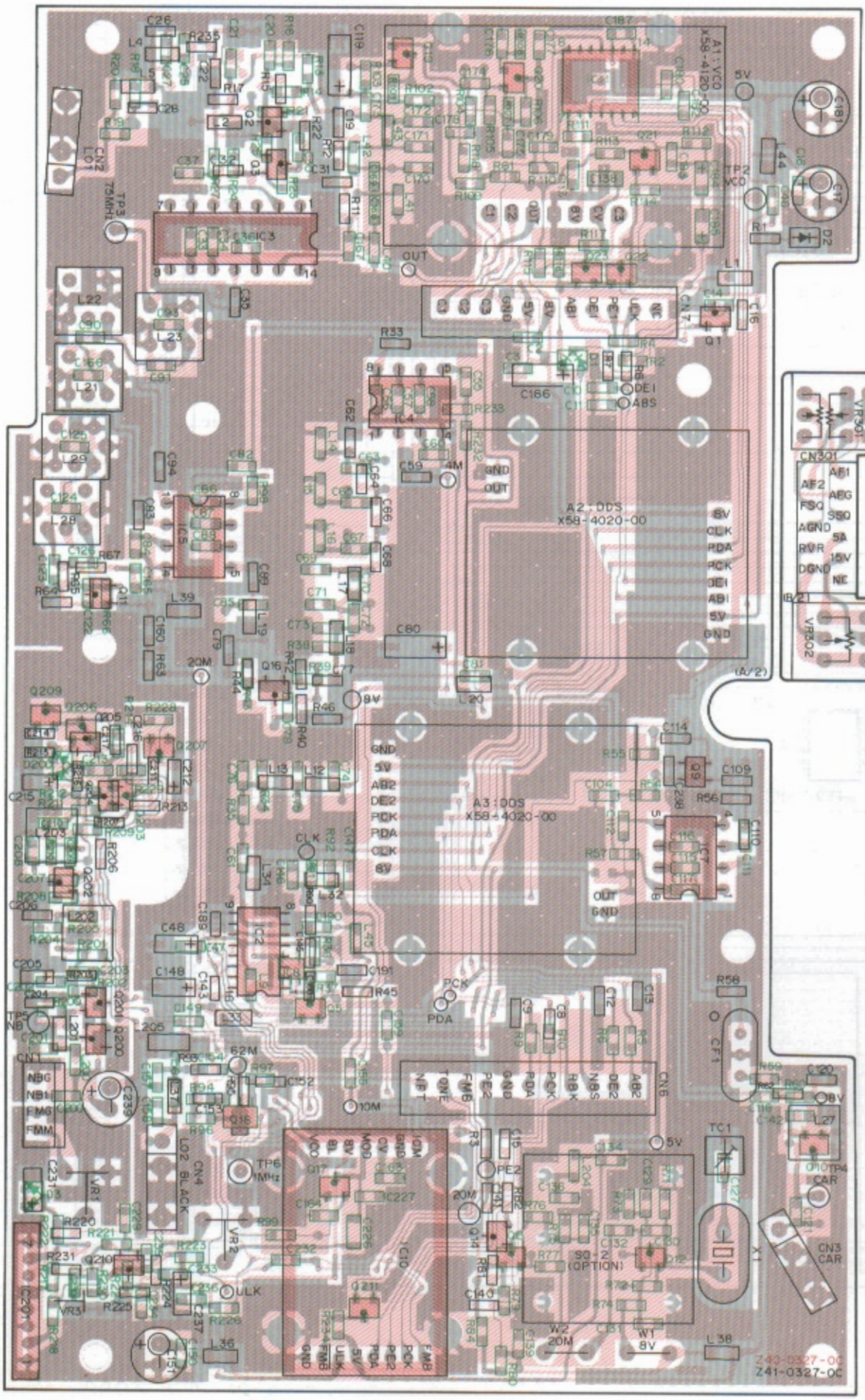
IC1 : M37702M4A265FP
IC2 : TC74HC238AF
IC3 : TC74HC573AF
IC4 : M62003FP

IC5 : NM93C66LEM8
or AT93C66-10SI2.7
IC6 : NJM78L05UA

D3~5 : 1SS133
D9,11 : 1SS301
D12 : RD8.2M(B2)
D13,14 : 1SS355 or MA110

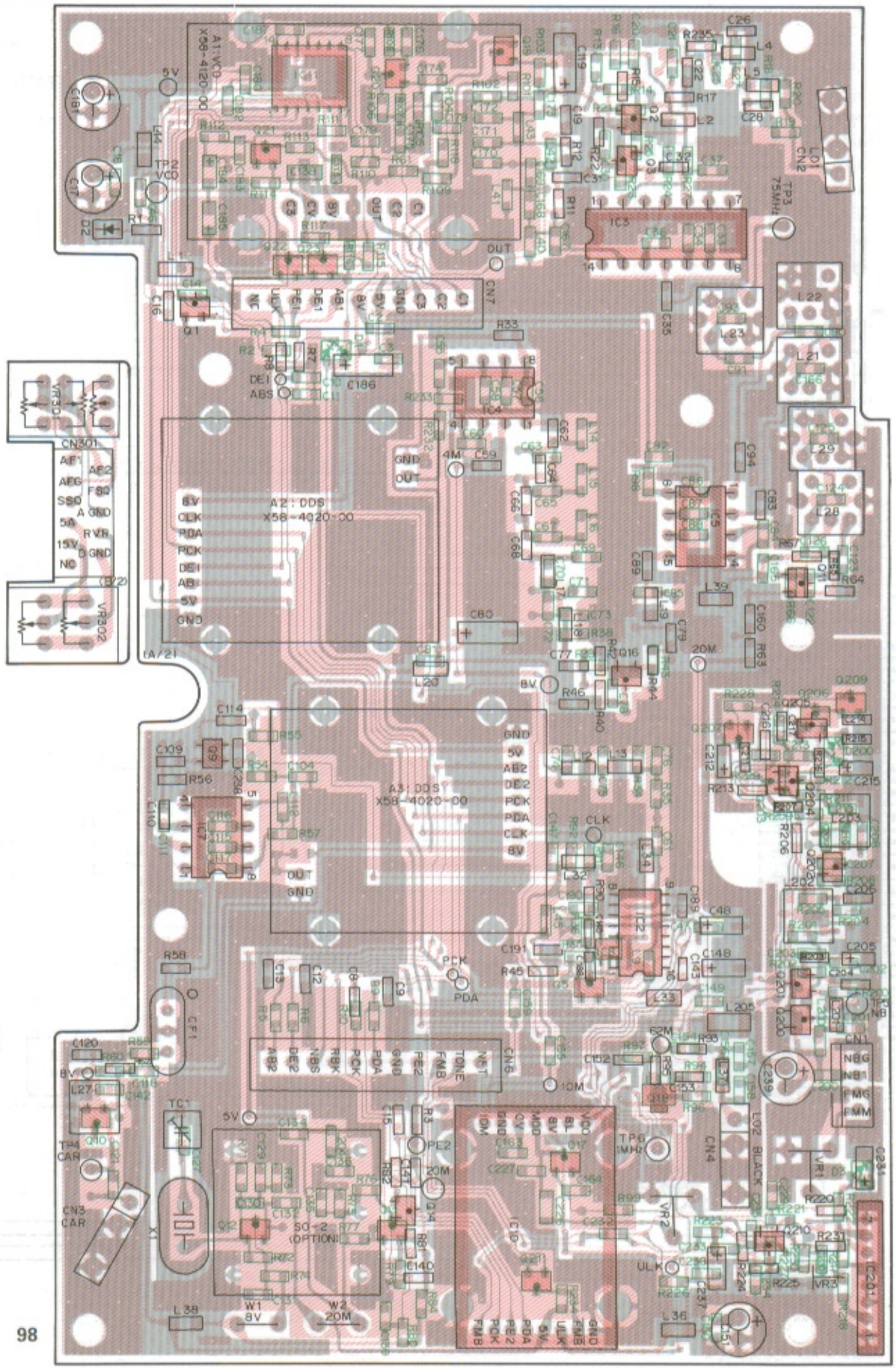
TS-60S PC BOARD VIEWS

PLL UNIT (X50-3200-00) Component side view

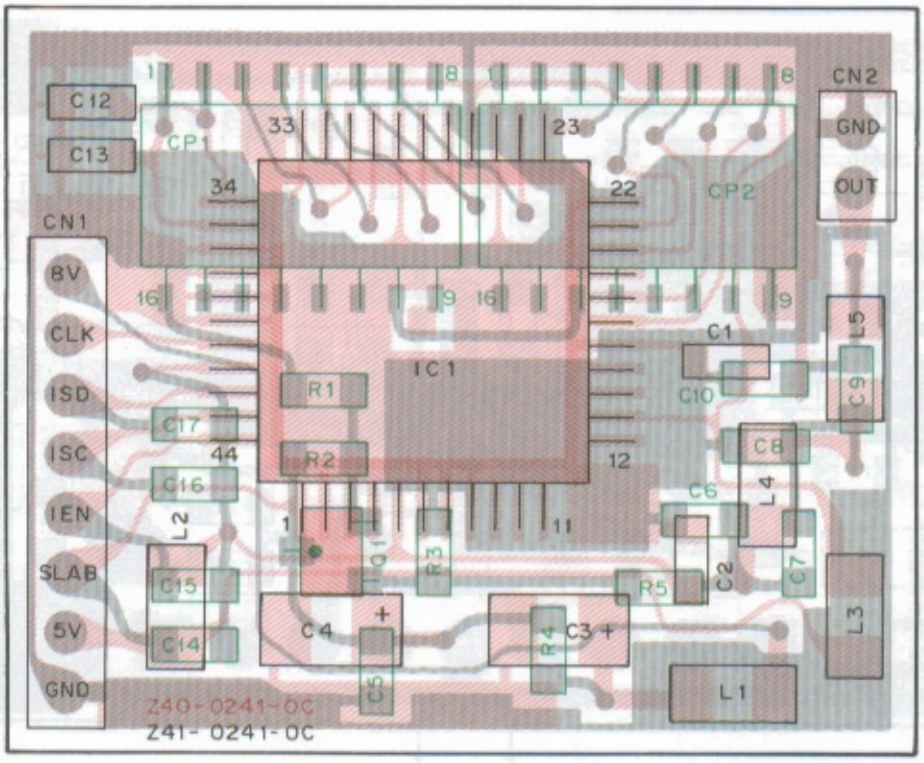


PLL UNIT (X50-3200-00) Foil side view

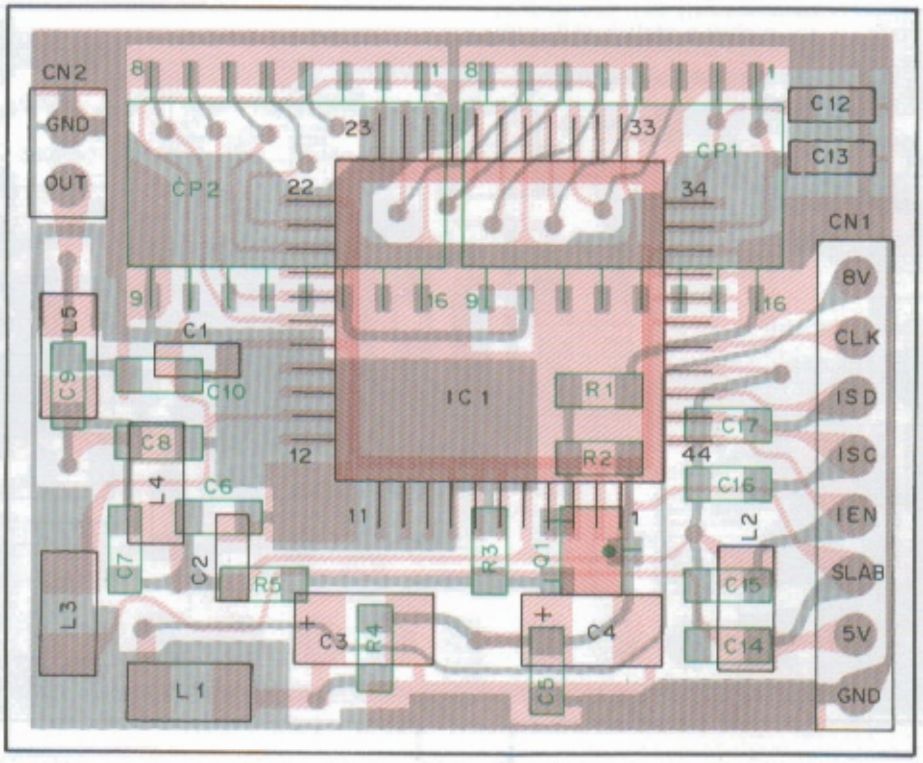
: Component side
: Foil side



DDS (X58-4020-00) Component side view



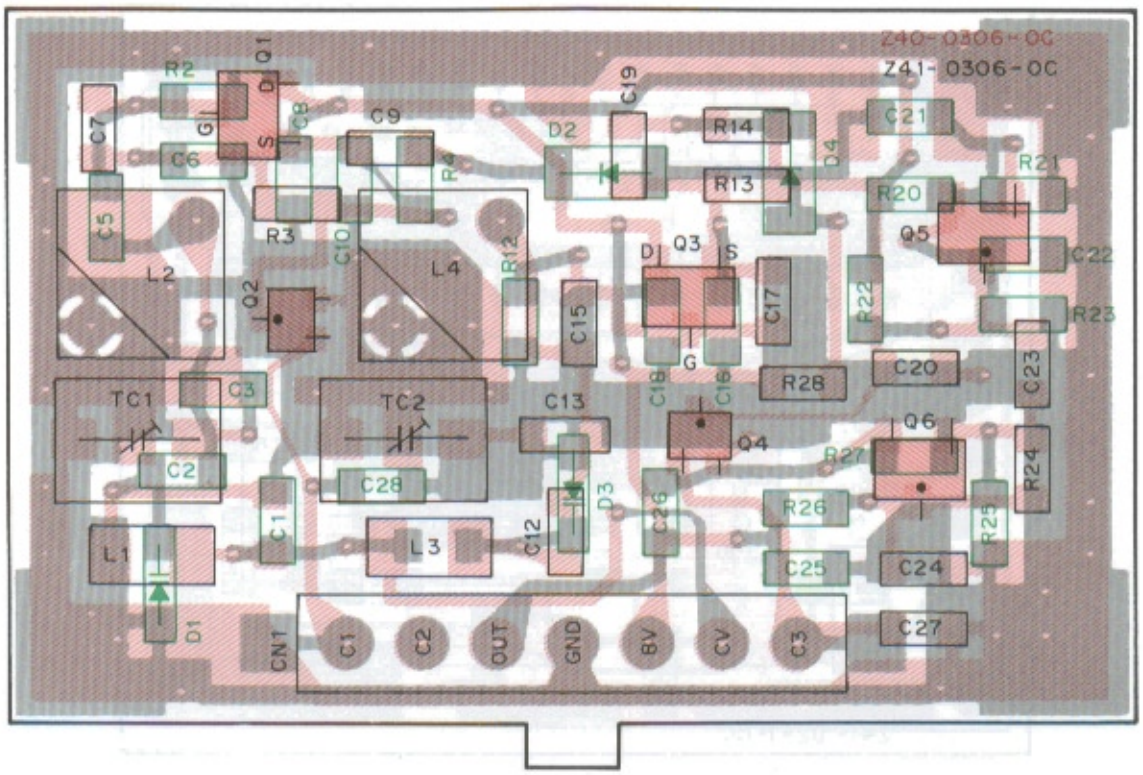
DDS (X58-4020-00) Foil side view



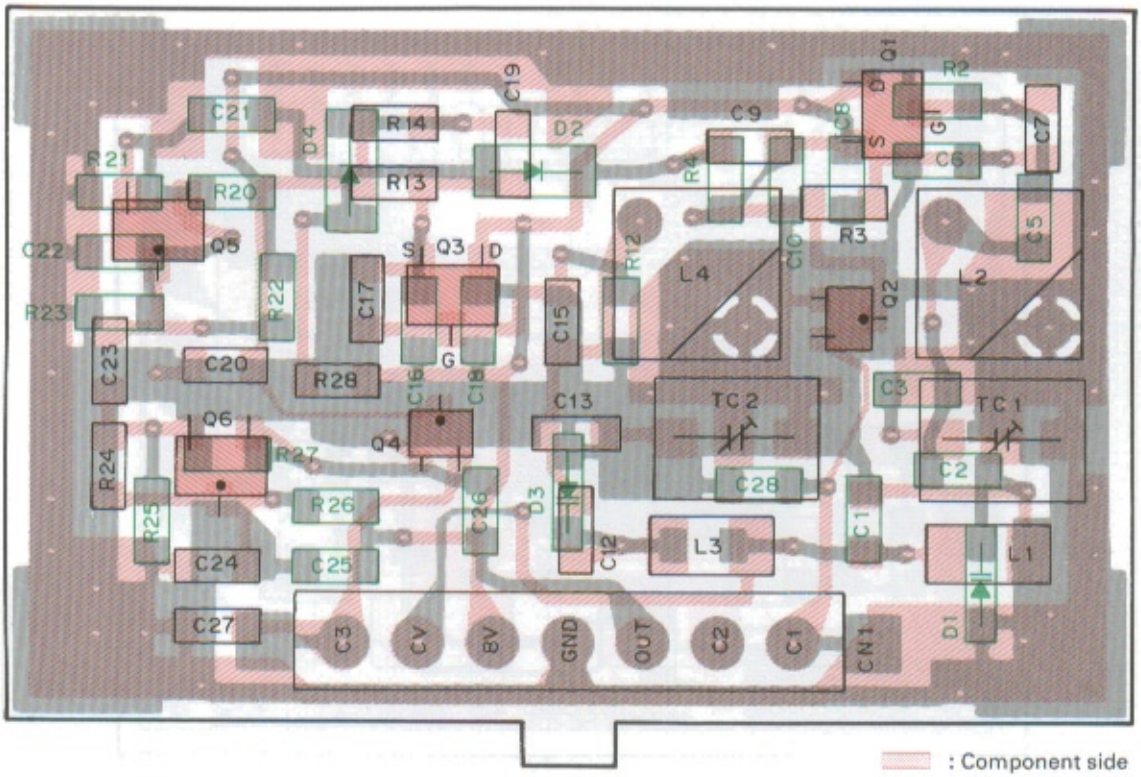
: Component side
: Foil side

TS-60S PC BOARD VIEWS

VCO (X58-4120-00) Component side view



VCO (X58-4120-00) Foil side view

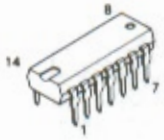


: Component side
: Foil side

PLL UNIT (X50-3200-00)

2SC2712
2SC2714
2SC2996
2SC3722K
2SD1757K
DTA114EK
DTC114EK
DTC114EU
DTC114TK

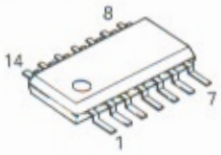
SN76514N



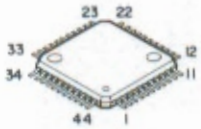
2SC2954

SC7S04F
TC7S04F

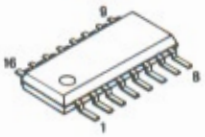
CXD1225M



F71022



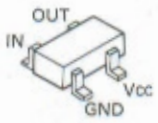
µPD74HC390G

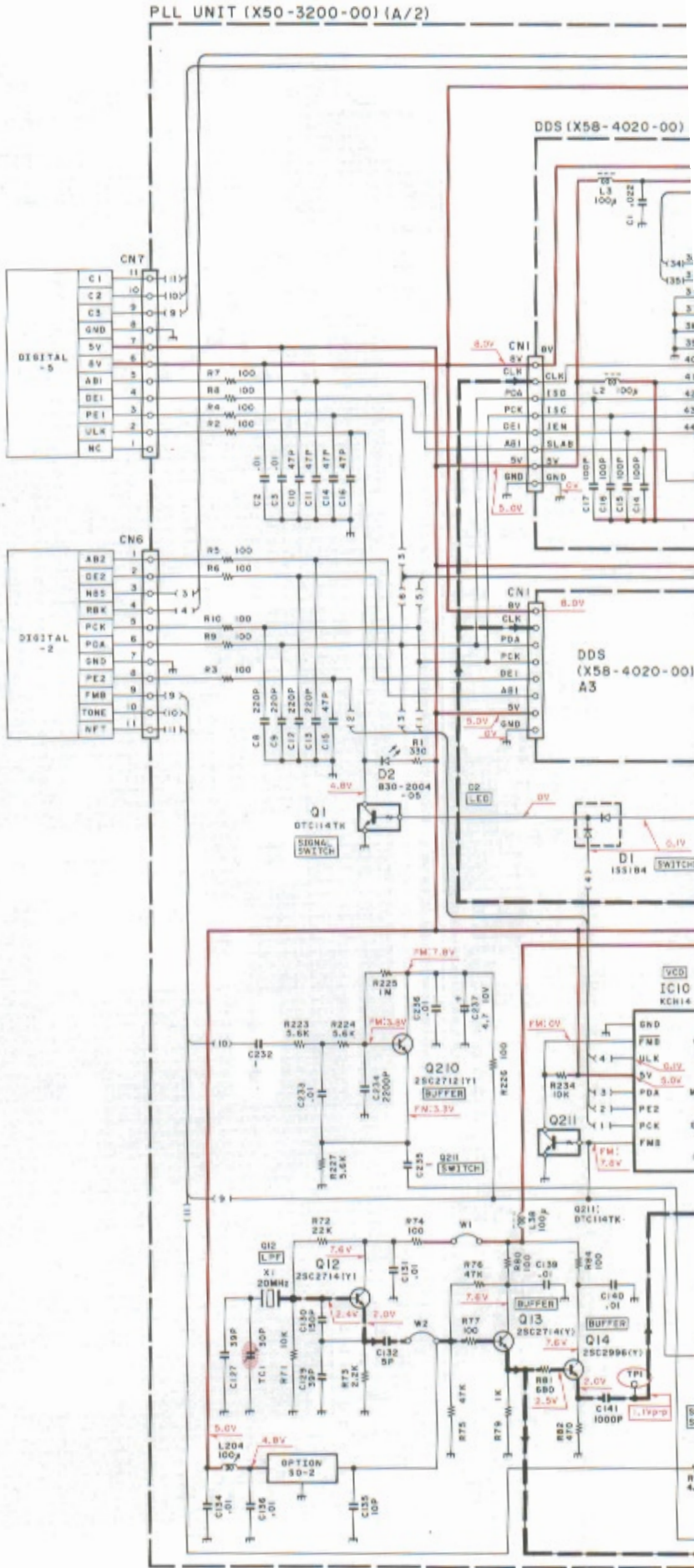


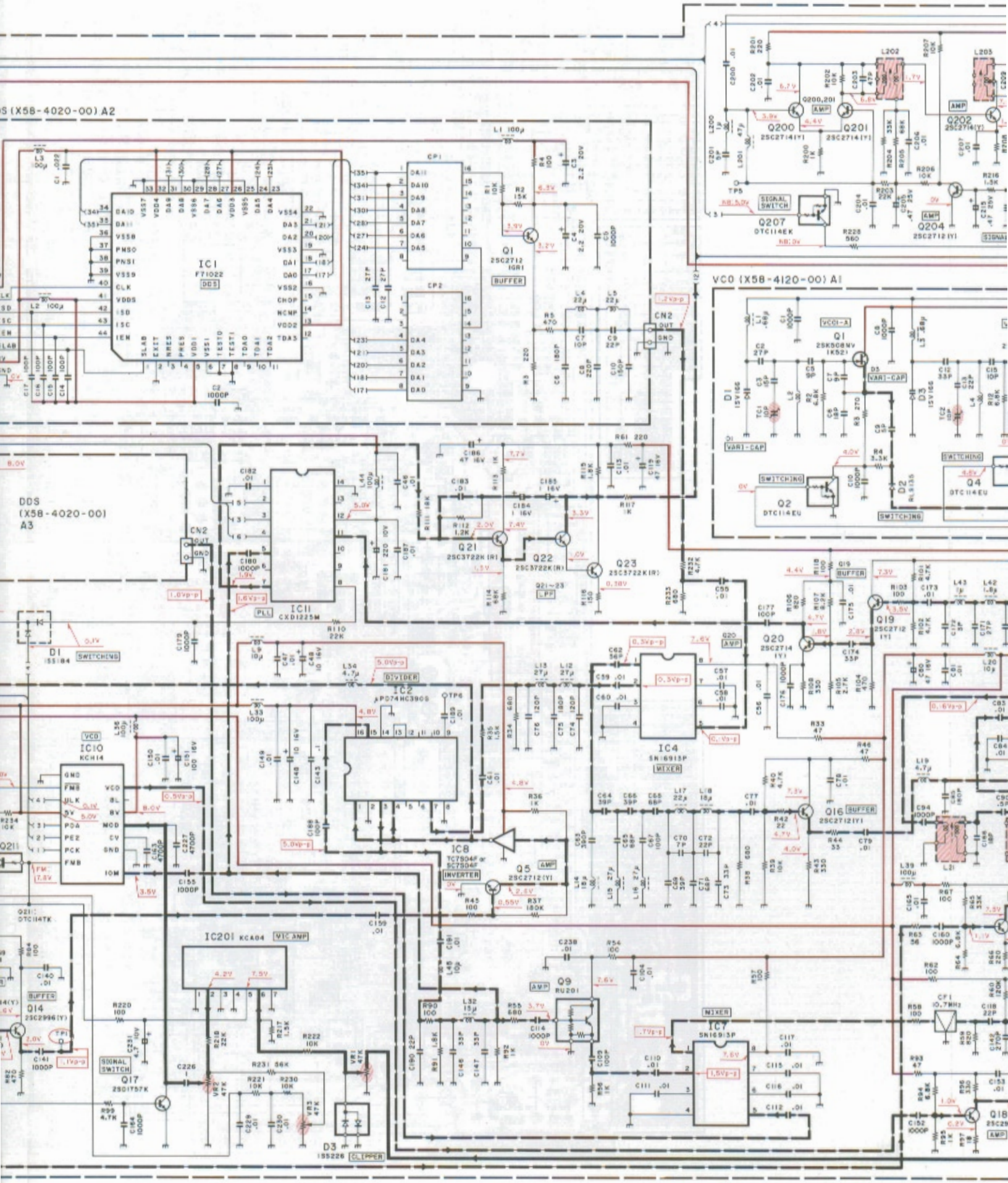
2SK508NV

SN16913P

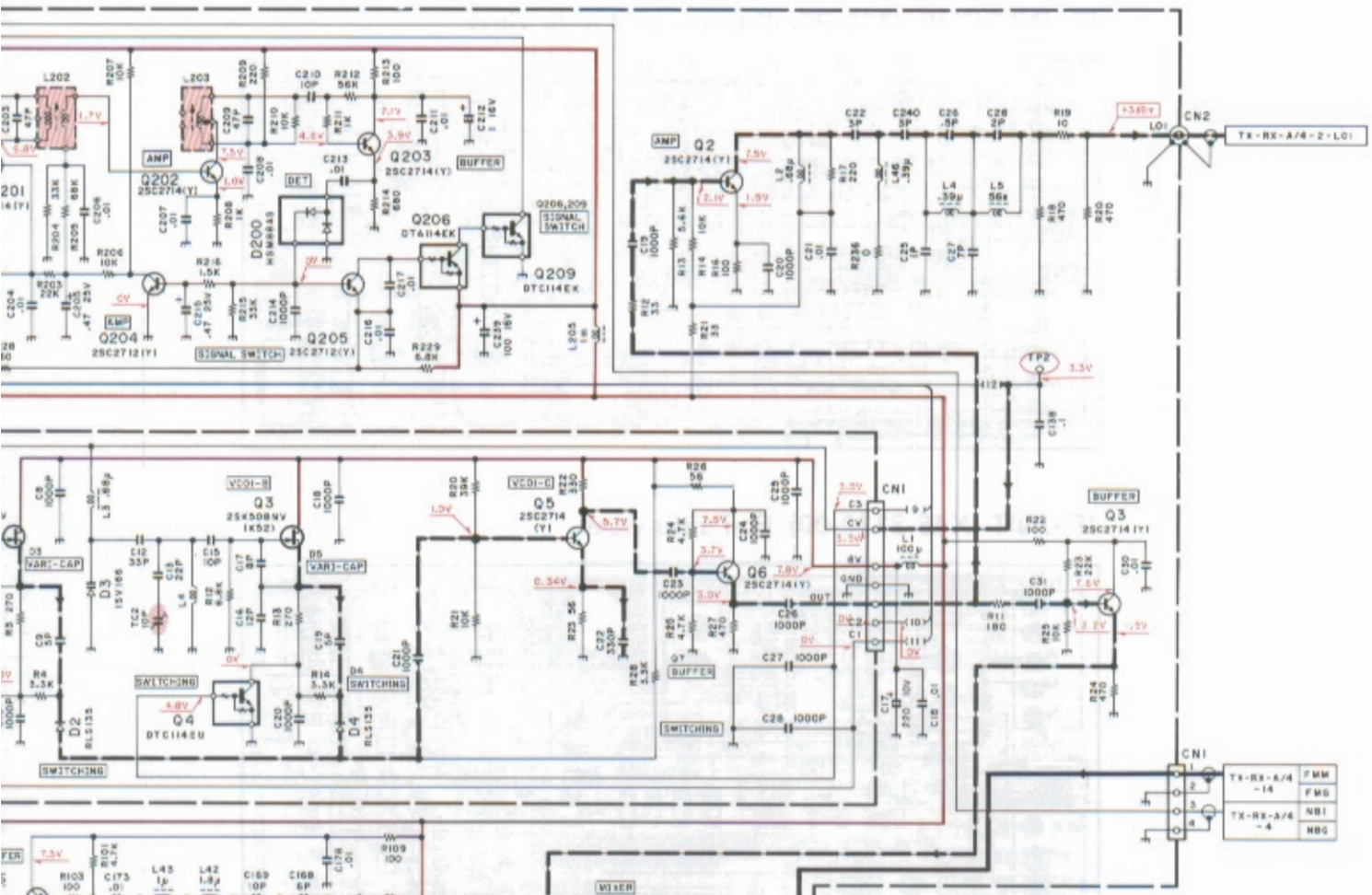
RU201

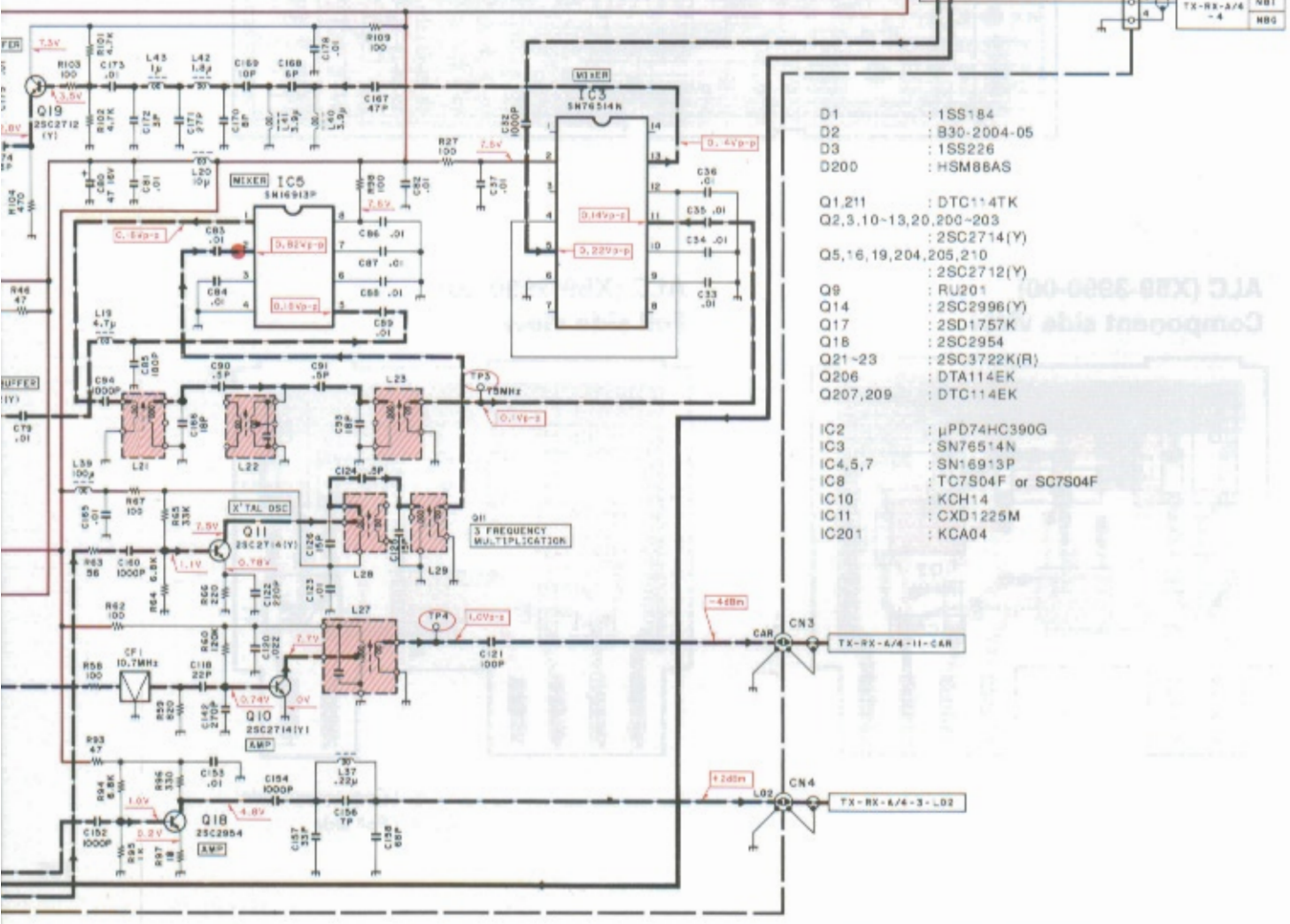





DDS (X58-4020-00) A2
DDS (X58-4020-00) A3
VCO (X58-4120-00) A1
IC1 F71022 DDS
IC2 μPD74HC390G
IC4 SN16913P MIXER
IC7 SN16913P MIXER
IC8 TC7S04F or SC7S04F INVERTER
IC10 KCH14 VCO
IC11 CXD1225M PLL
IC201 KCA04 VIC AMP
Q1 2SC2712 IGR1 BUFFER
Q2 DTC114EU
Q4 DTC114EU
Q5 2SC2712(Y) AMP
Q9 RU201 AMP
Q14 2SC2996(Y) BUFFER
Q16 2SC2712(Y) BUFFER
Q17 2SD1757K SIGNAL SWITCH
Q19 2SC2712 BUFFER
Q20 2SC2714 AMP
Q21 2SC3722K(R)
Q22 2SC3722K(R)
Q23 2SC3722K(R)
Q200 2SC2714(Y) AMP
Q201 2SC2714(Y) AMP
Q202 2SC2714(Y) AMP
Q204 2SC2712(Y) AMP
Q207 DTC114EK SIGNAL SWITCH
D1 1SS184 SWITCHING
D2 RLS135 SWITCHING
D3 1SS226 CLIPPER
CN2 OUT GND
TP5
TP6
CF1 10.7MHz

CIRCUIT DIAGRAM TS-60S

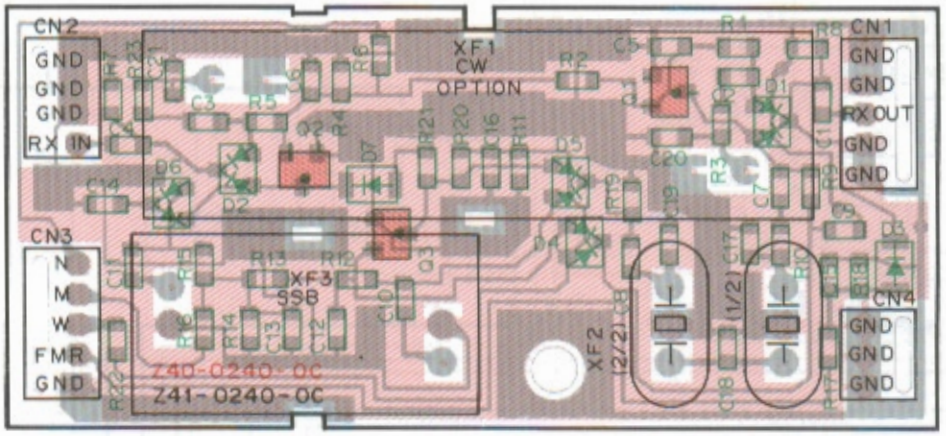




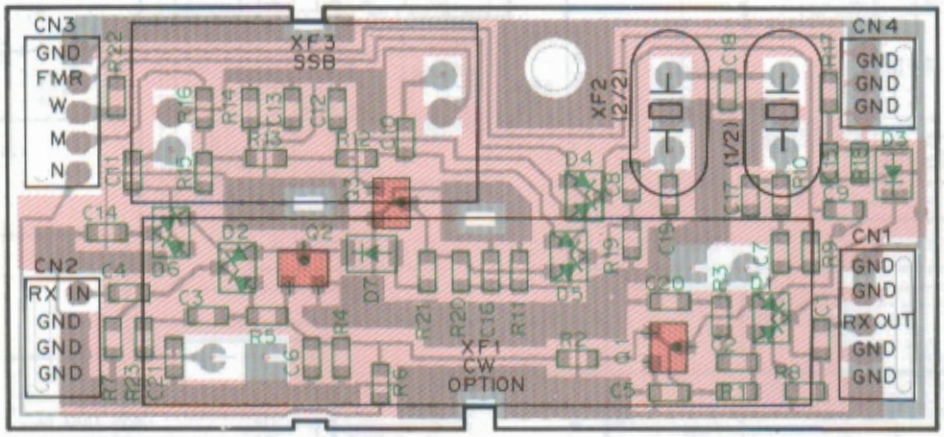
D1	: 1SS184
D2	: B30-2004-05
D3	: 1SS226
D200	: HSM88AS
Q1,211	: DTC114TK
Q2,3,10~13,20,200~203	: 2SC2714(Y)
Q5,16,19,204,205,210	: 2SC2712(Y)
Q9	: RU201
Q14	: 2SC2996(Y)
Q17	: 2SD1757K
Q18	: 2SC2954
Q21~23	: 2SC3722K(R)
Q206	: DTA114EK
Q207,209	: DTC114EK
IC2	: μPD74HC390G
IC3	: SN76514N
IC4,5,7	: SN16913P
IC8	: TC7S04F or SC7S04F
IC10	: KCH14
IC11	: CXD1225M
IC201	: KCA04

TS-60S PC BOARD VIEWS

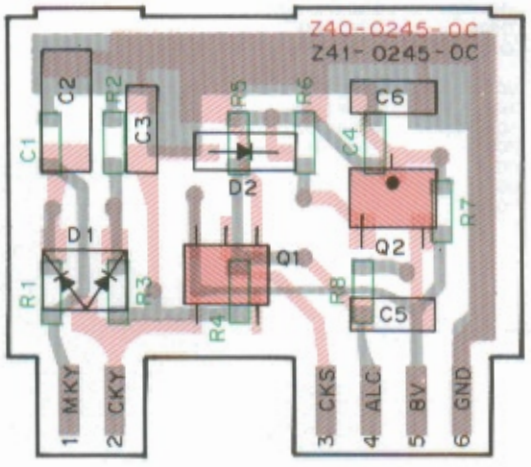
IF UNIT (X48-3110-00) Component side view



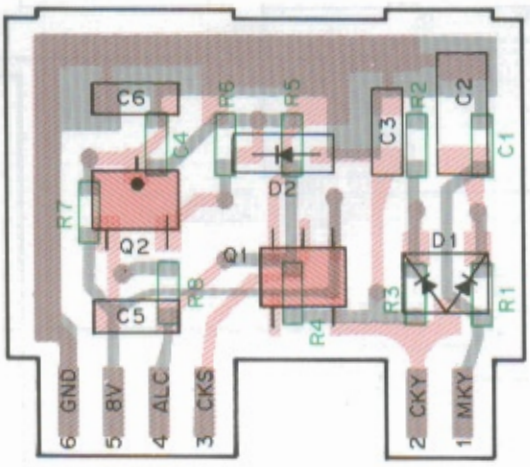
IF UNIT (X48-3110-00) Foil side view



ALC (X59-3990-00) Component side view

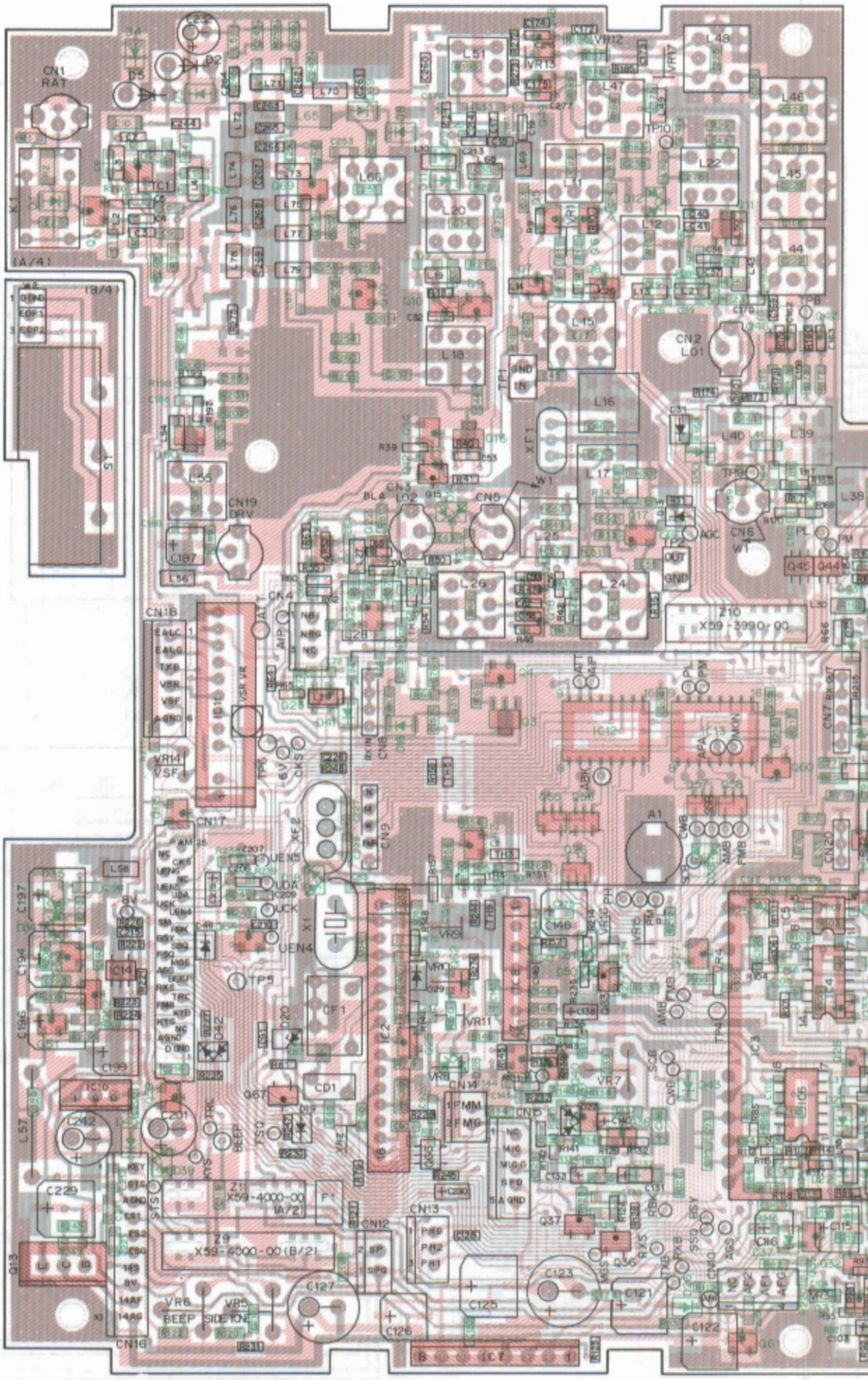


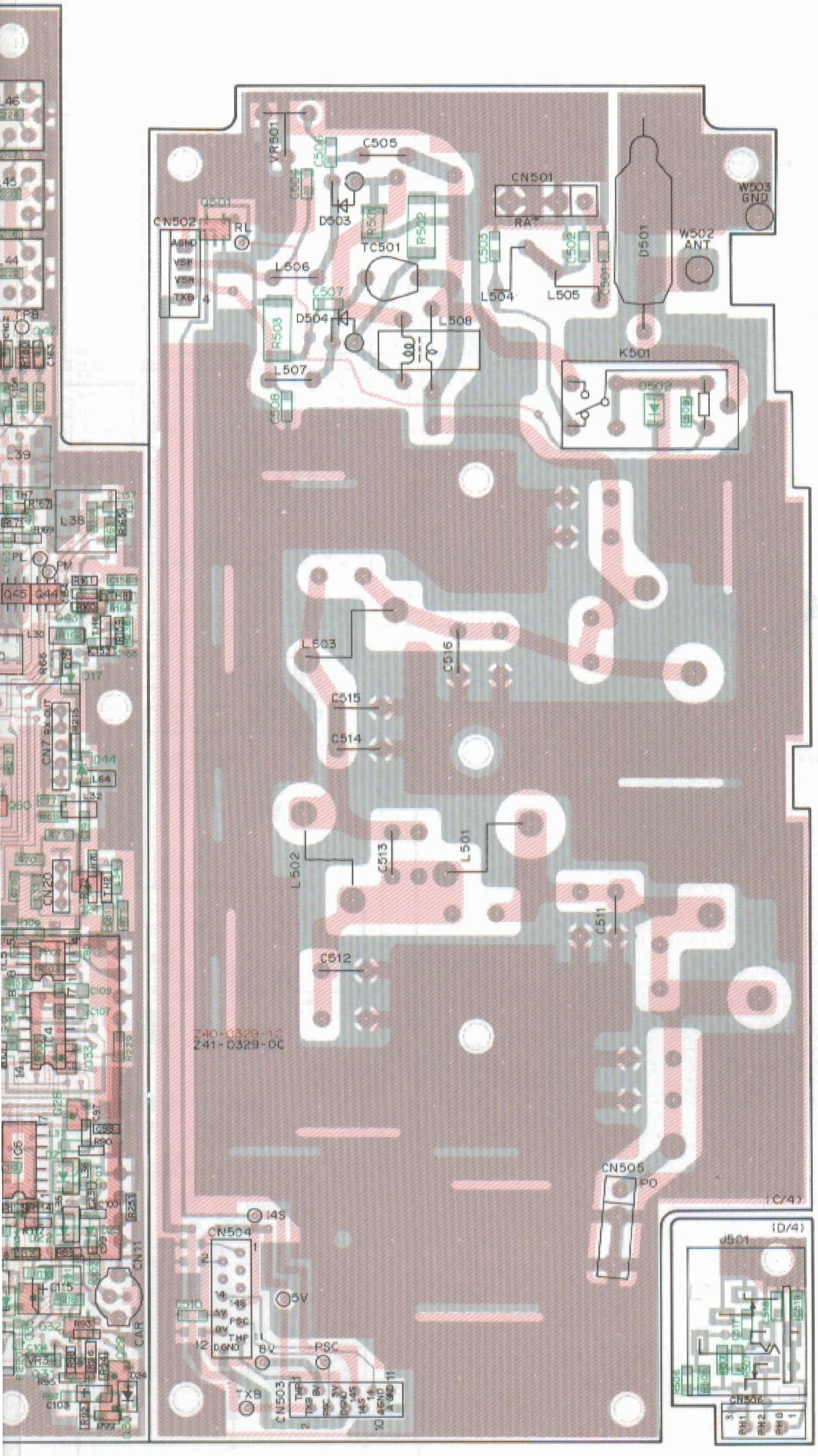
ALC (X59-3990-00) Foil side view



: Component side
: Foil side

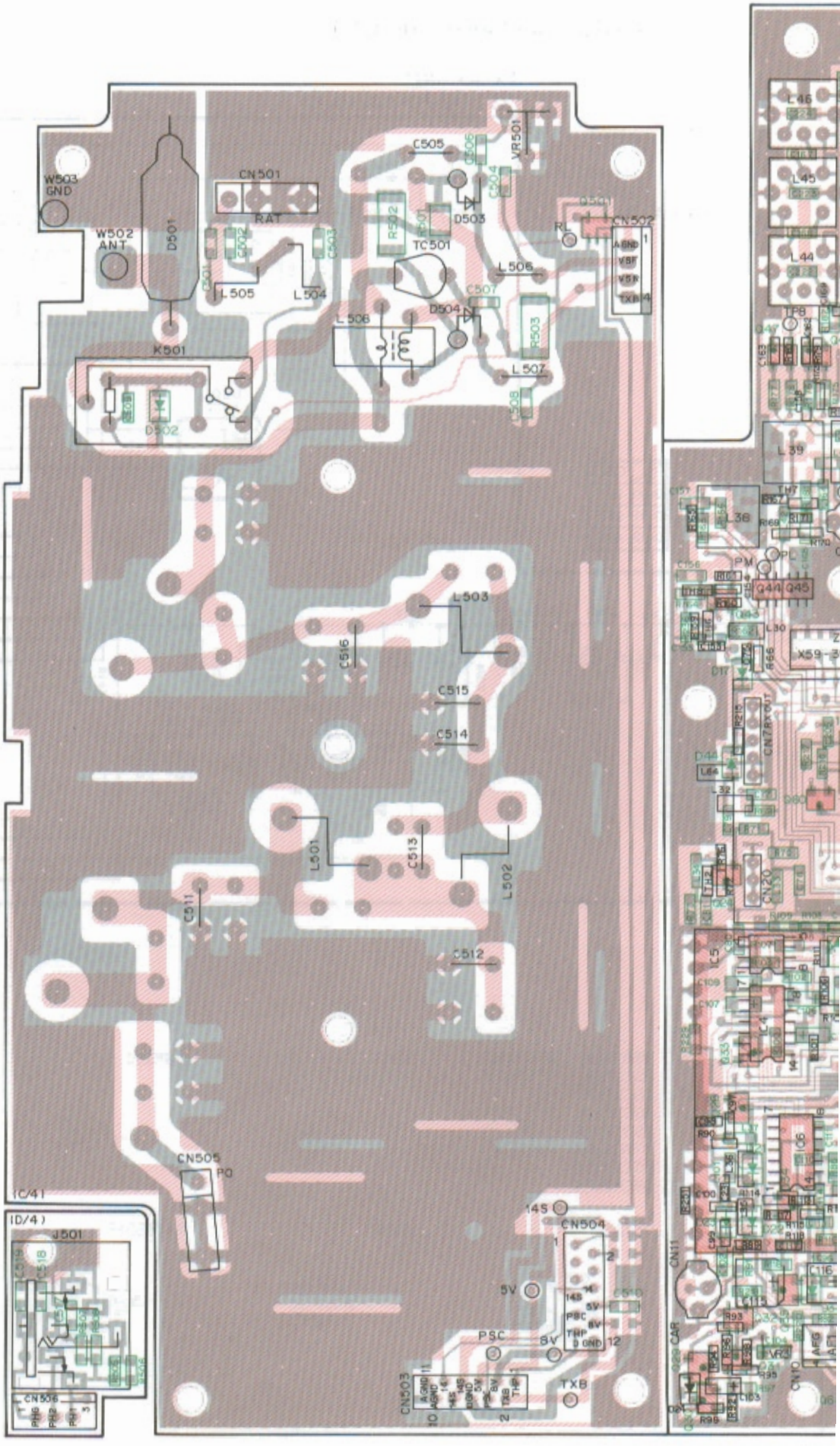
TX-RX UNIT (X57-4570-00) Component side view



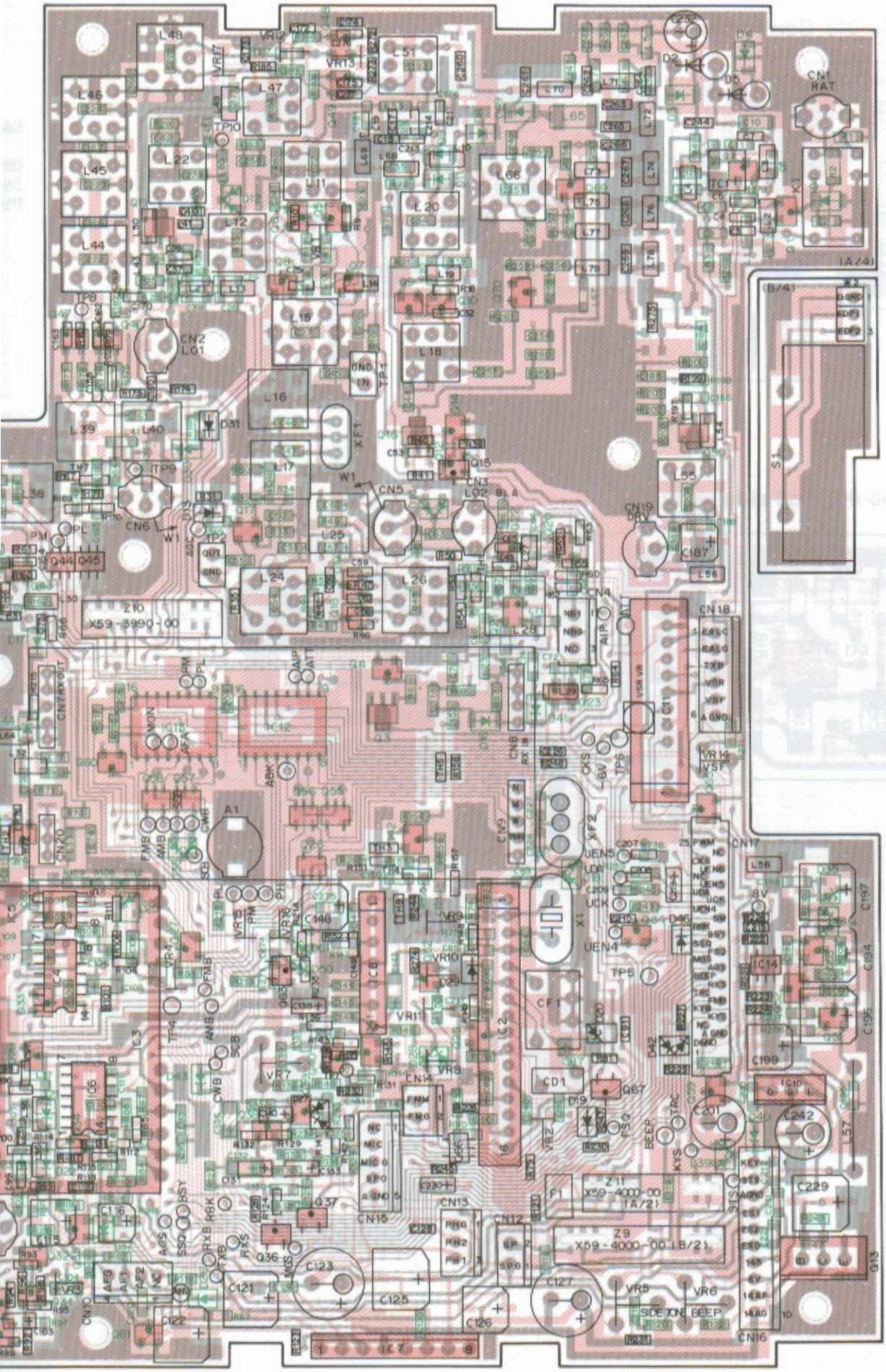


VR501
C506
C505
C504
D503
R501
R502
TC501
CN501
RA
C503
C502
C501
D501
W503
GND
W502
ANT
CN502
Q501
RL
AGND
VSF
VSR
TXB
L506
C507
D504
R503
L508
L504
L505
L507
K501
D502
C508
L503
C516
C515
C514
L502
C513
L501
C511
C512
Z40-0329-1C
Z41-0329-0C
CN505
PO
(C/4)
(D/4)
J501
CN504
14S
5V
C510
8V
PSC
TXB
CN503
CN506
RH1
RH2
RH0

TX-RX UNIT (X57-4570-00) Foil side view



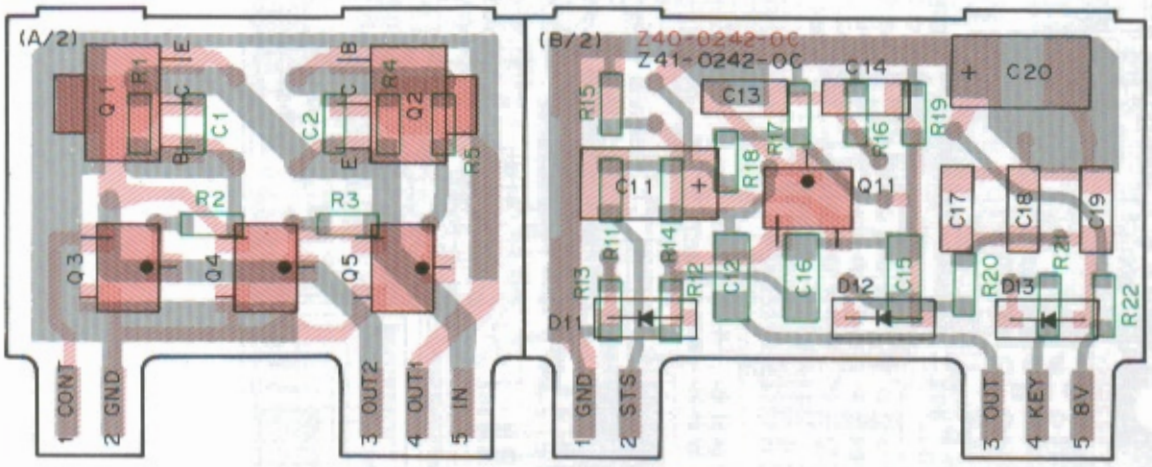
PC BOARD VIEW TS-60S



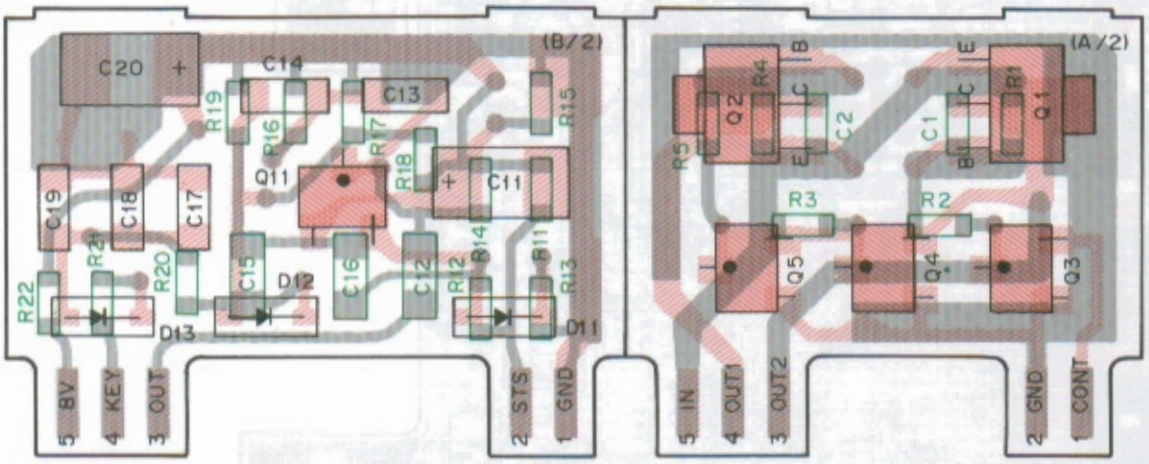
: Component side
: Foil side

TS-60S CIRCUIT DIAGRAM / PC BOARD VIEWS

DSST (X59-4000-00) Component side view

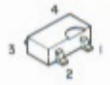


DSST (X59-4000-00) Foil side view

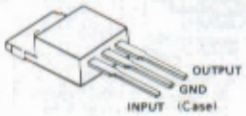


: Component side
: Foil side

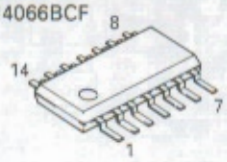
3SK131
3SK184



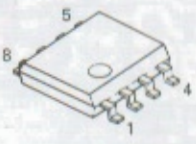
µPC78N05H



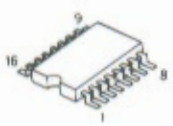
BU4066BCF
XRU4066BCF



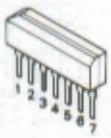
NJM2904M



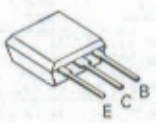
TC9174F



µPC1037HA

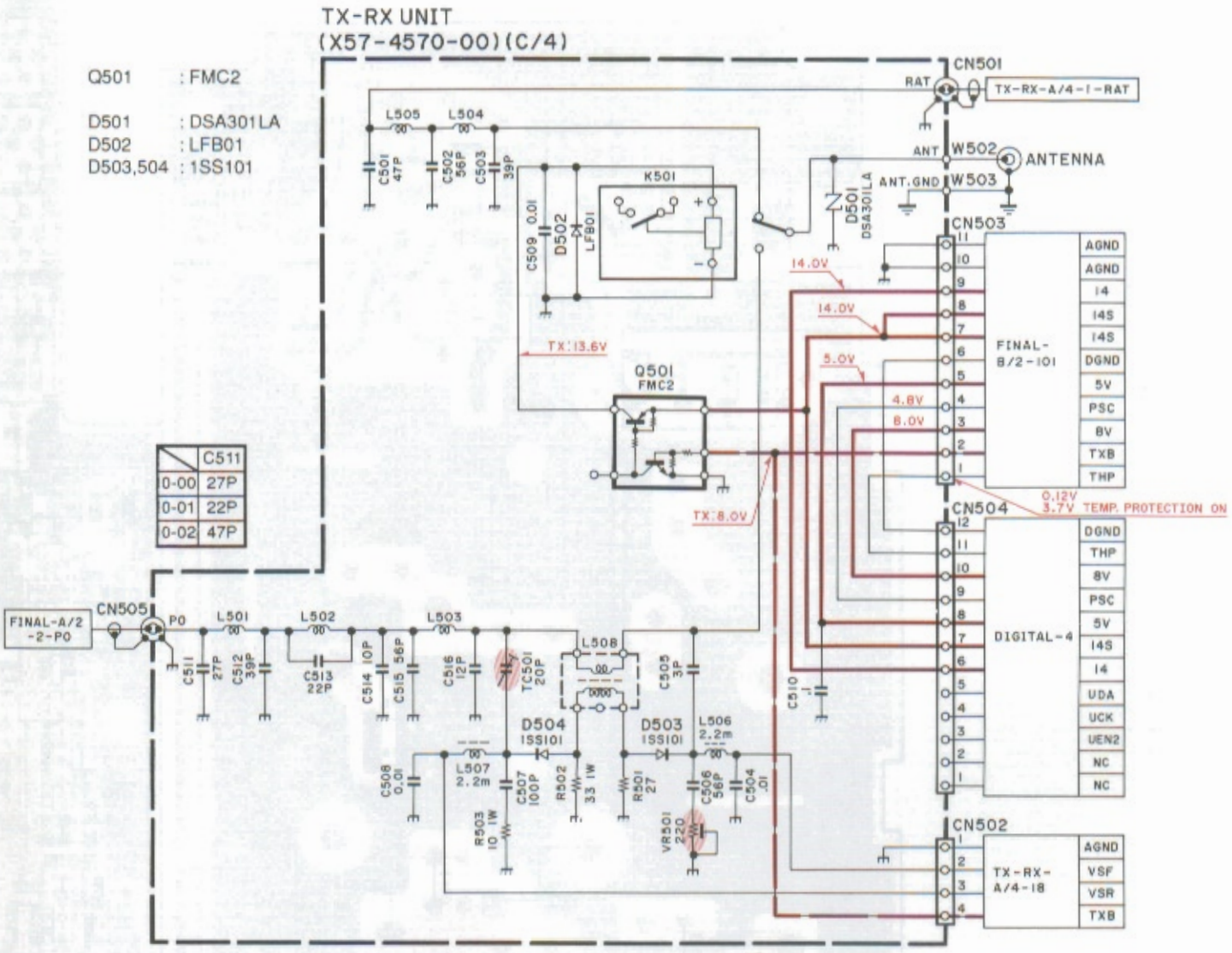


2SC4728



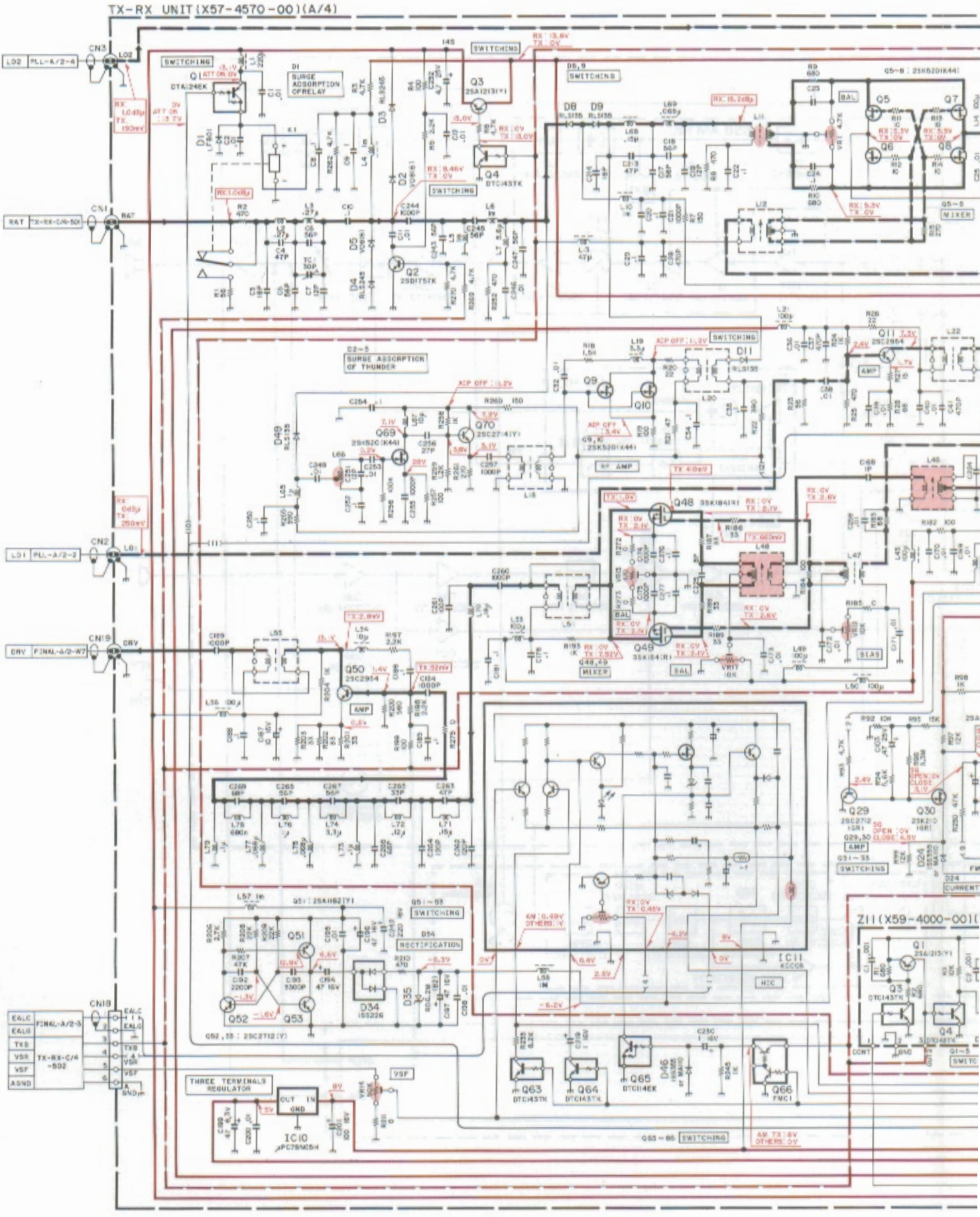
FMA3
FMC1
FMC2

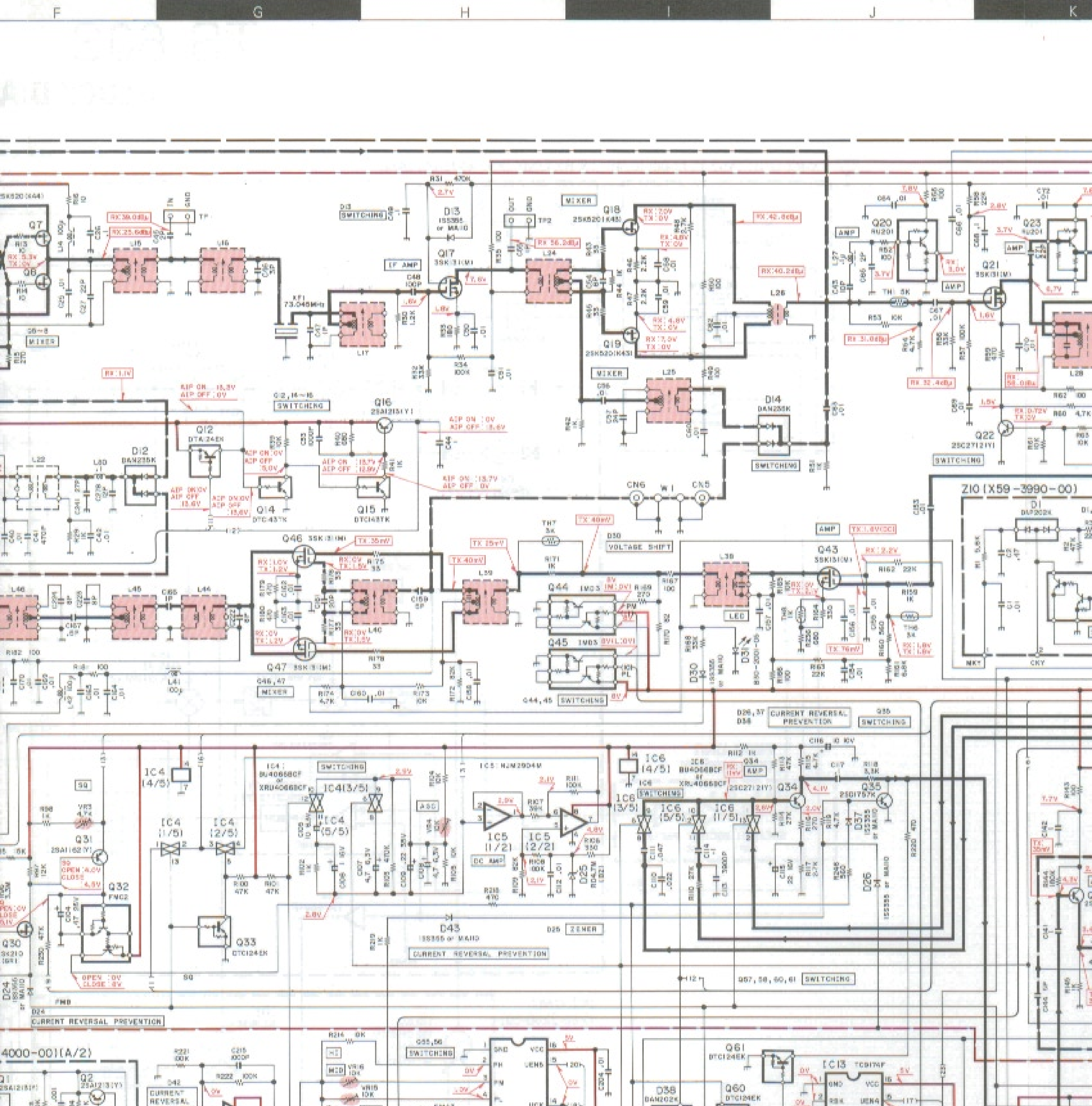
TX-RX UNIT (X57-4570-00) (C/4)



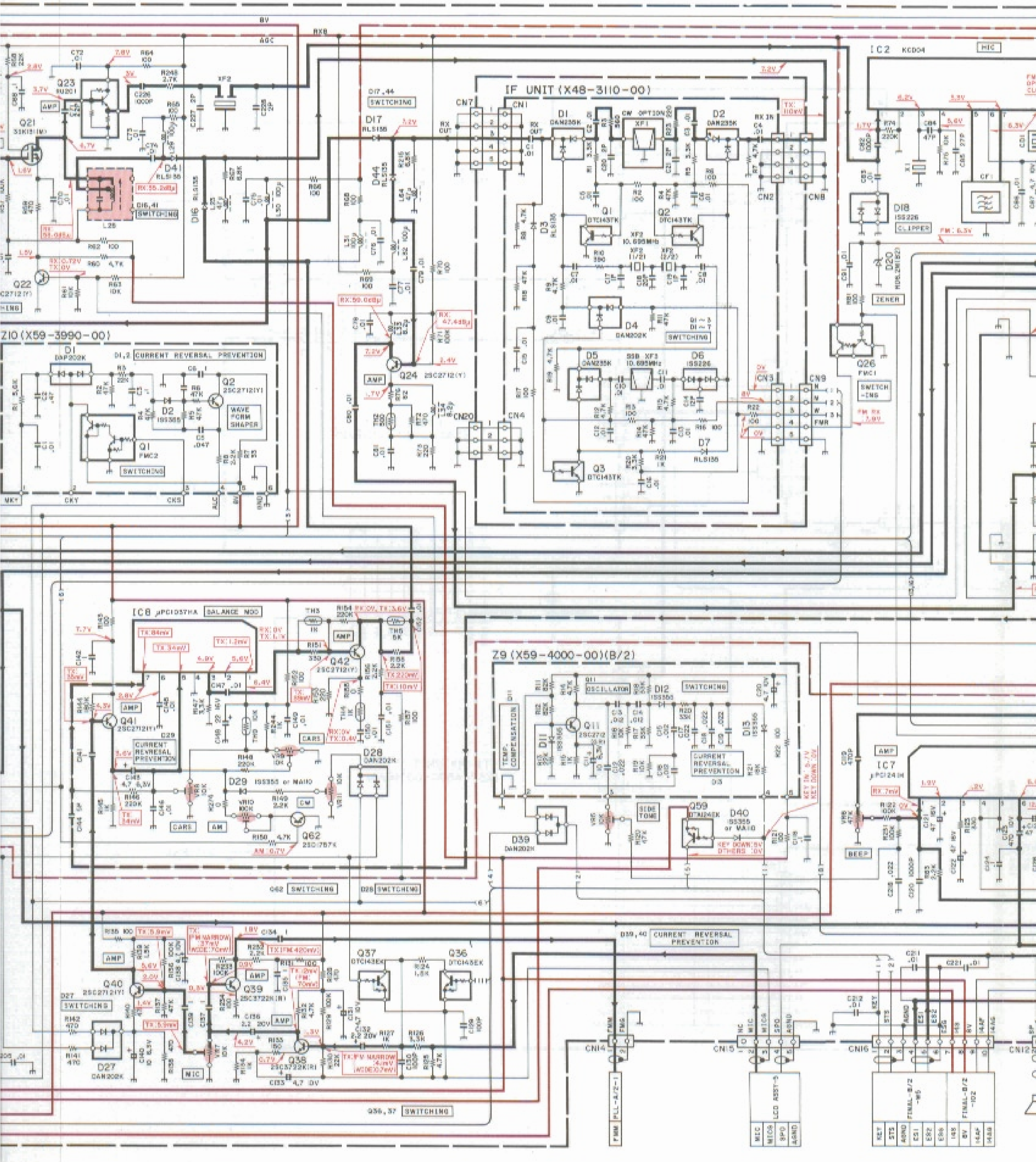
2SA1162 2SC2712 2SC2714 2SC3722K 2SD1757K DTA124EK DTC114EK DTC124EK	DTC143EK DTC143TK	2SA1213 2SC2954	2SK210	2SJ106 2SK520
RU201		IMD3	TA75S01F	μPC1241H

TX-RX UNIT (X57-4570-00)



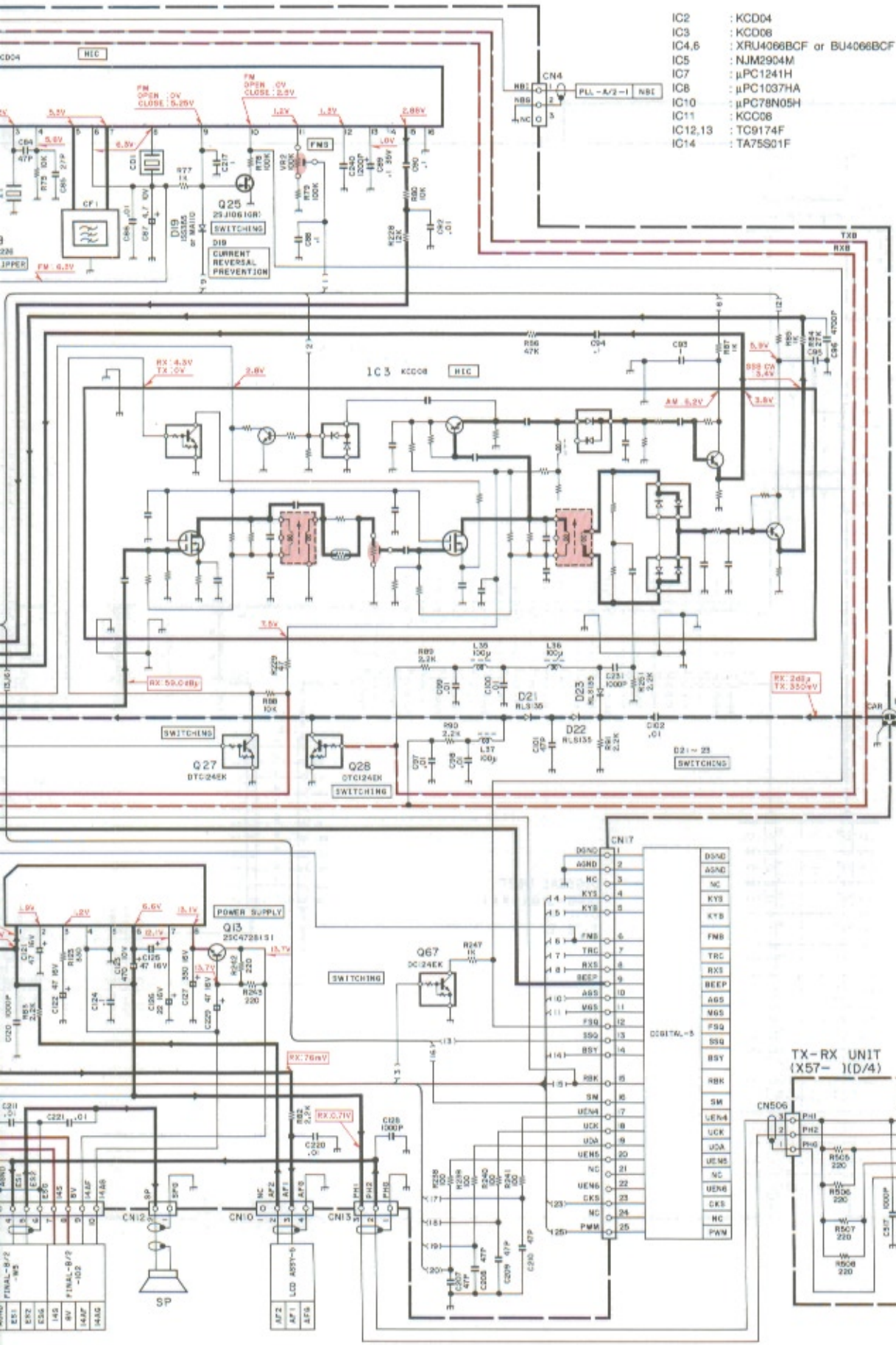

F
G
H
I
J
K
MIXER
Q6~8
IF AMP
Q17 3SK131(M)
D13 1SS355 or MA110
D13 SWITCHING
XF1 73.045MHz
Q18 2SK520(K43)
Q19 2SK520(K43)
MIXER
L24
L25
L26
D14 DAN235K
SWITCHING
CN6
W1
CN5
AMP
Q20 RU201
Q21 3SK131(M)
Q22 2SC2712(Y)
Q23 RU201
SWITCHING
Z10 (X59-3990-00)
D1 DLP202K
Q12,14~16 SWITCHING
Q12 DTA124EK
Q14 DTC143TK
Q15 DTC143TK
Q16 2SA1215(Y)
D12 DAN235K
AIP ON :13.7V
AIP OFF :0V
Q46 3SK131(M)
Q47 3SK131(M)
Q46,47 MIXER
L46
L45
L44
L40
L39
L38
LED
D30 VOLTAGE SHIFT
Q43 3SK131(M)
AMP
Q44 IMD3
Q45 IMD3
Q44,45 SWITCHING
D26,37 D38 CURRENT REVERSAL PREVENTION
Q35 SWITCHING
SQ
Q31 2SA1162(Y)
Q32 FMC2
Q33 DTC124EK
Q30
IC4 (4/5)
IC4 (1/5)
IC4 (2/5)
IC4 (3/5)
IC4 (5/5)
IC4: BU4066BCF or XRU4066BCF
SWITCHING
ASC
IC5: NJM2904M
IC5 (1/2) DC AMP
IC5 (2/2)
D43 1SS355 or MA110
CURRENT REVERSAL PREVENTION
D25 ZENER
IC6 (4/5)
IC6 (3/5)
IC6 (5/5)
IC6 (1/5)
IC6 BU4066BCF or XRU4066BCF
SWITCHING
Q34 2SC2712(Y) AMP
Q35 2SD1757K
D24 CURRENT REVERSAL PREVENTION
Q57,58,60,61 SWITCHING
4000-001 (A/2)
Q1 2SA1213(Y)
Q2 2SA1213(Y)
Q4 DTC143TK
Q5 DTC143TK
Q1~5 SWITCHING
D42 HSM88AS
CURRENT REVERSAL PREVENTION
IC14 TA75S01F AMP
HI
MID
LOW
VR16 10K
VR15 10K
D50
D51
Q55,56 SWITCHING
Q56 FMA3
Q55 FMA3
IC12 TC9174F
EXTENSION I/O
Q61 DTC124EK
Q60 DTC124EK
D38 DAN202K
Q58 FMA3
Q57 FMA3
IC13 TC9174F
EXTENSION I/O
Q40 2SC2712(Y)
D27 SWITCHING
D27 DAN202K
F1 2.0A

K L M N O

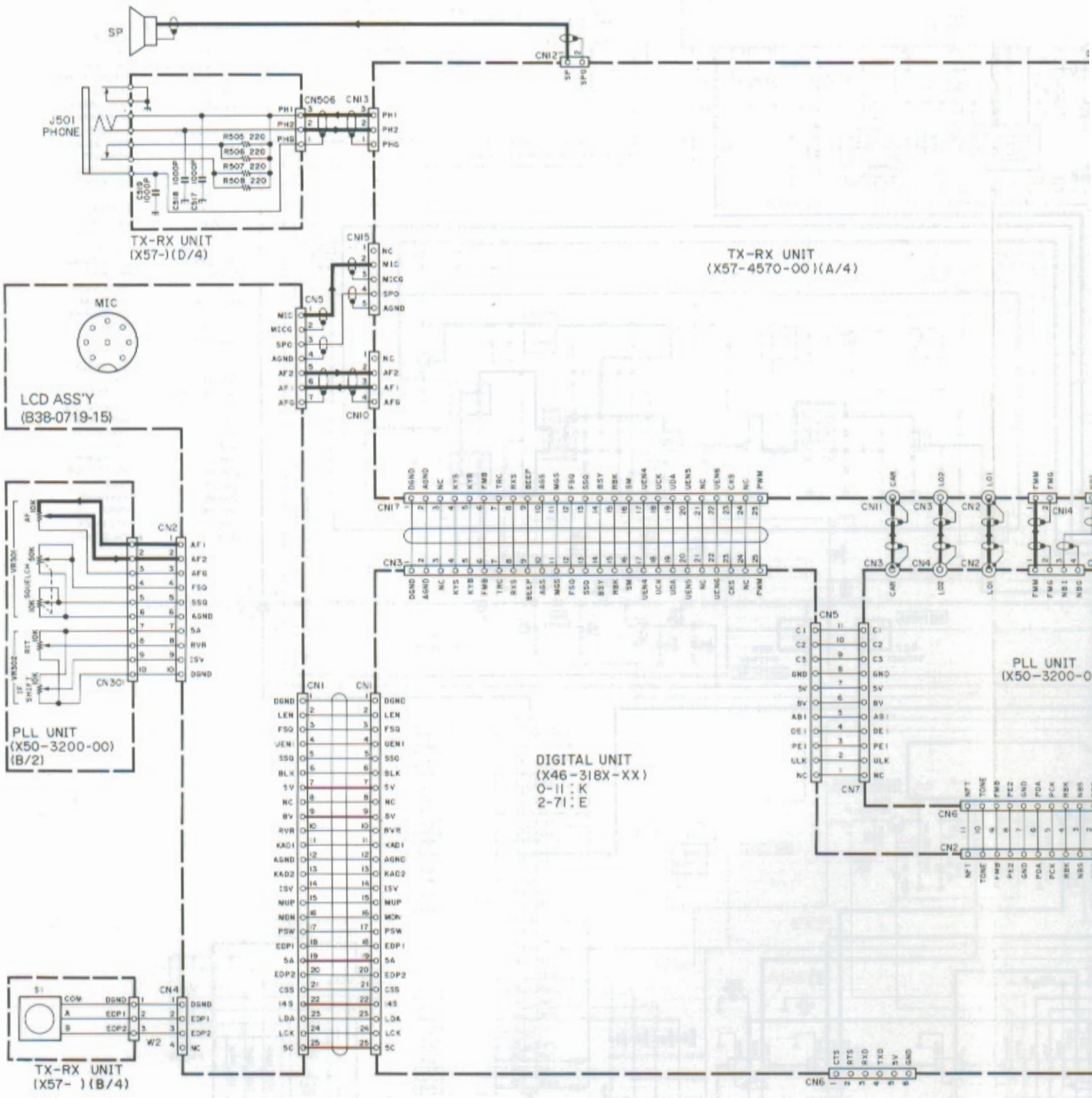


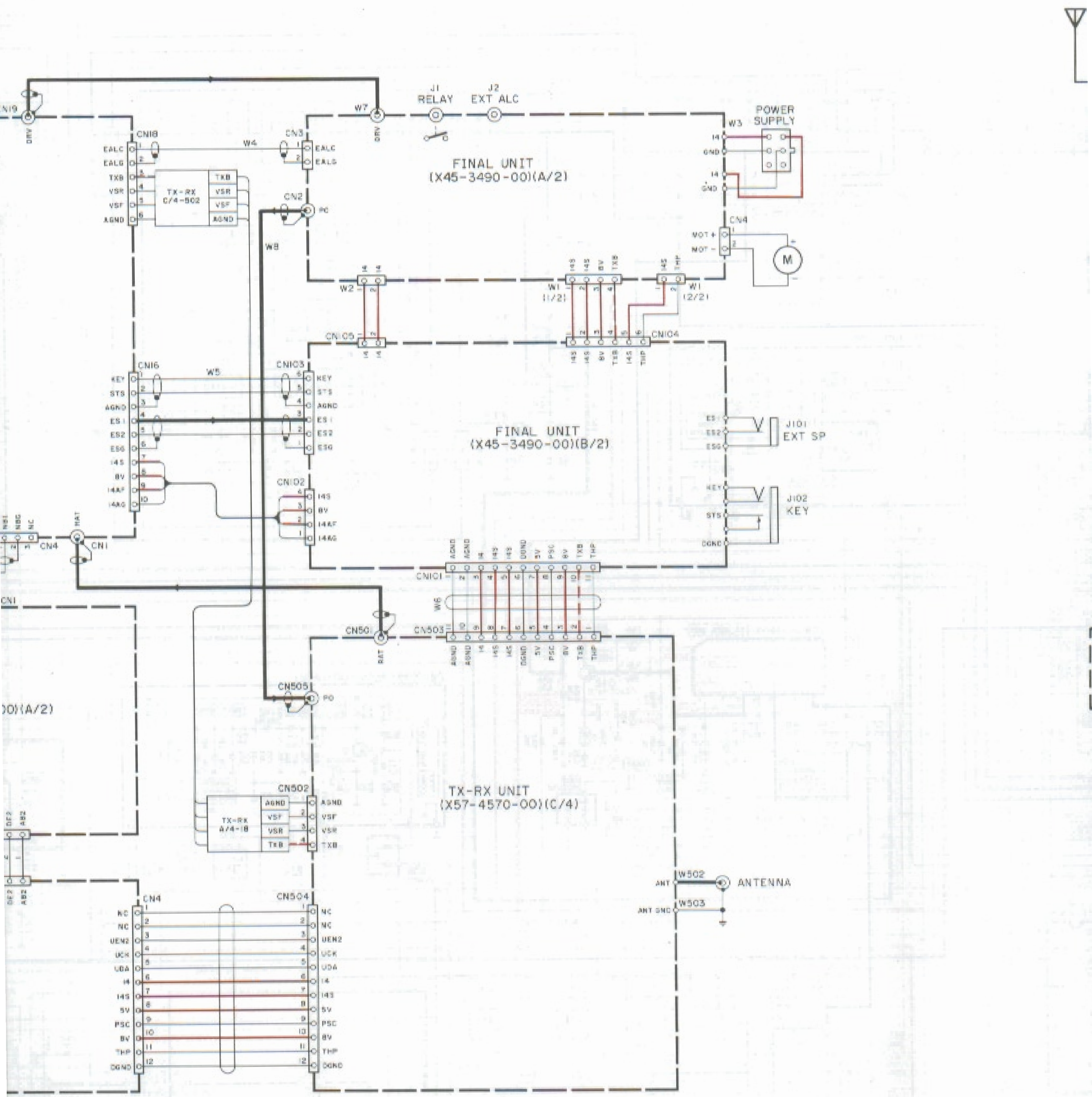
IF UNIT (X48-3110-00)
Z10 (X59-3990-00)
D1,2 CURRENT REVERSAL PREVENTION
WAVE FORM SHAPER
Z9 (X59-4000-00)(B/2)
IC8 μPC1037HA
BALANCE MOD
IC2 KCD04
MIC
IC7 μPC1241H
TEMP. COMPENSATION
OSCILLATOR
CURRENT REVERSAL PREVENTION
SIDE TONE
BEEP
CLIPPER
ZENER
SWITCHING
D39,40 CURRENT REVERSAL PREVENTION
Q36,37 SWITCHING
Q62 SWITCHING
D28 SWITCHING
CN14
CN15
CN16
LCD ASSY-5
FINAL-B/2 -W5
FINAL-B/2 -102
PLL-A/2-1

CIRCUIT DIAGRAM TS-60S



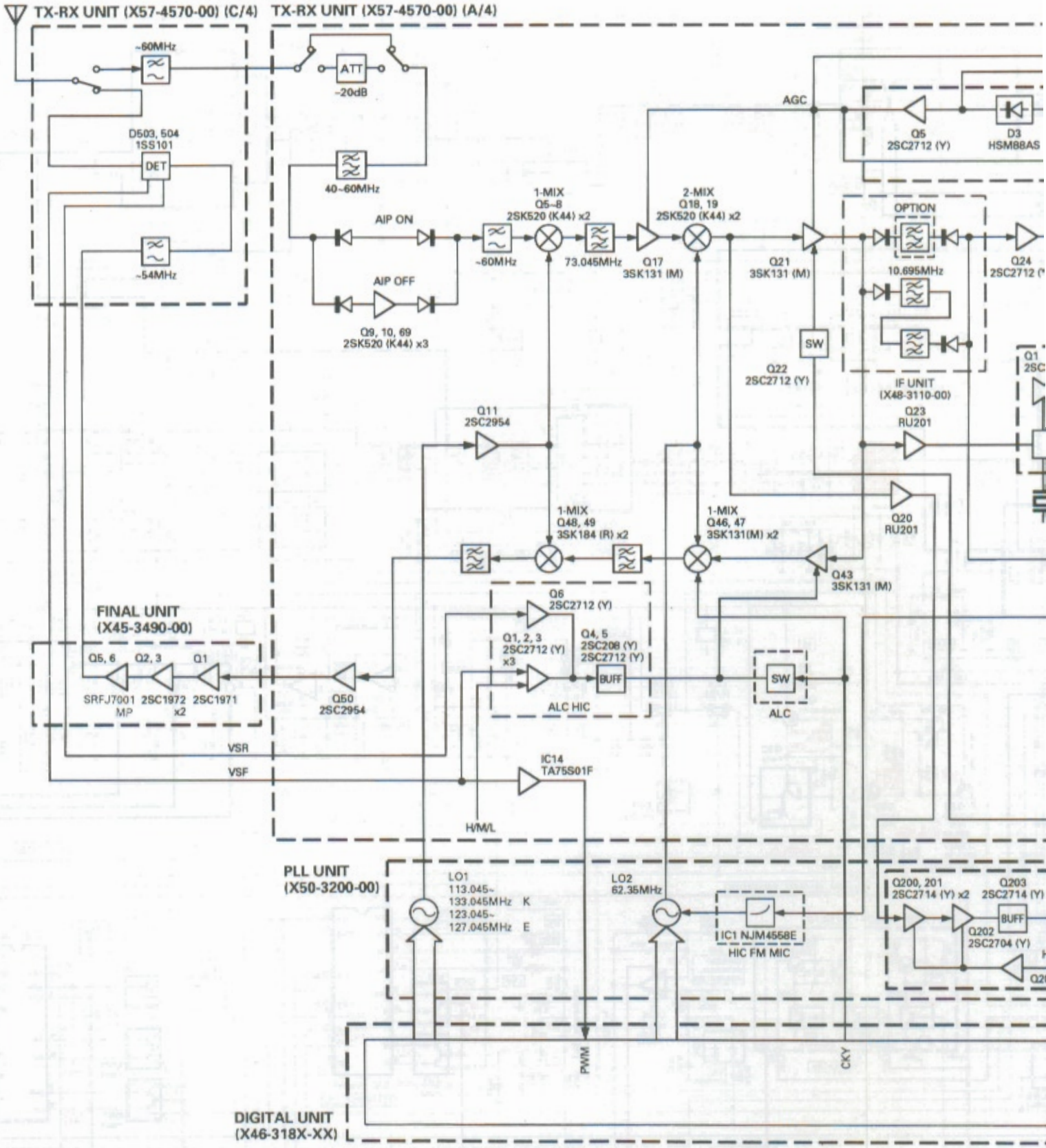
TS-60S SCHEMATIC DIAGRAM




J1
RELAY
J2
EXT ALC
POWER
SUPPLY
FINAL UNIT
(X45-3490-00)(A/2)
FINAL UNIT
(X45-3490-00)(B/2)
TX-RX UNIT
(X57-4570-00)(C/4)
TX-RX
C/4-502
TX-RX
A/4-18
J101
EXT SP
J102
KEY
ANTENNA
W1
W2
W3
W4
W5
W6
W7
W8
W502
W503
CN1
CN2
CN3
CN4
CN16
CN18
CN101
CN102
CN103
CN104
CN105
CN501
CN502
CN503
CN504
CN505
)0)(A/2)

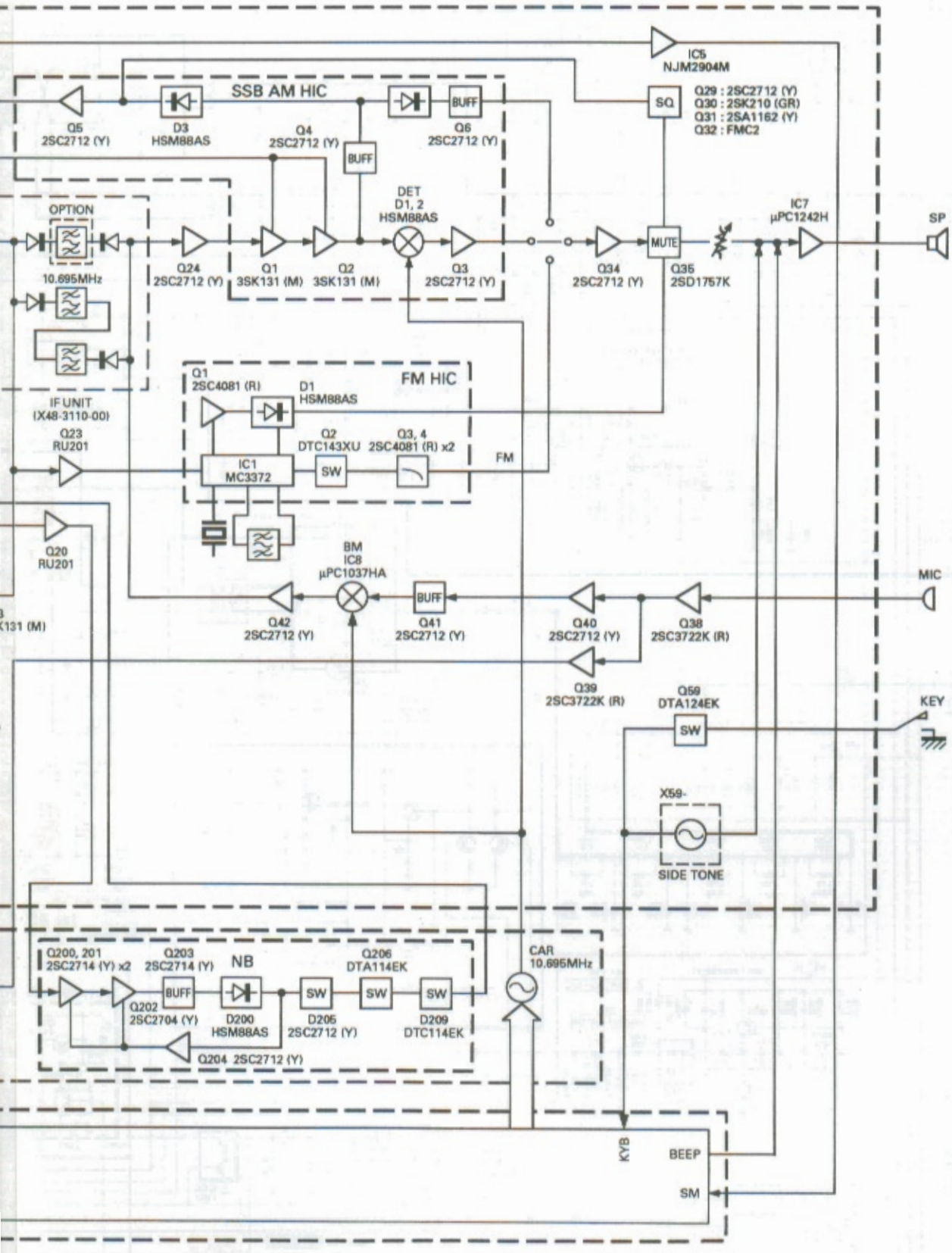
TS-60S TS-60

BLOCK DIAGRAM



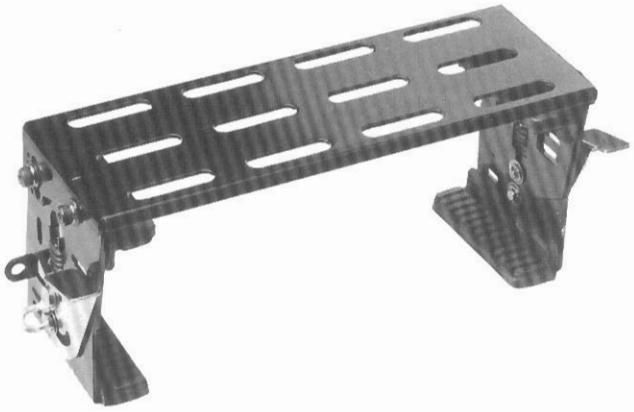
TS-60S

DIAGRAM



MB-13 (MOUNTING BRACKET) / PG-2Y (DC CABLE)

MB-13 External View

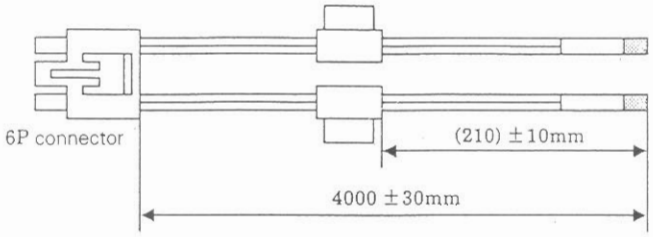


PG-2Y External View

MB-13 Specifications

Dimensions ..... 66 W x 196 D x 90 H (mm)
Weight 500g

PG-2Y Dime sions



MB-13 Parts List

Parts No.	New parts	Description
A13-0668-04		Angle
D10-0615-04		Lever (R)
D10-0616-04		Lever (L)
G01-0873-04		Spring coil
G13-0823-04		Cushion
J21-4433-04		Mounting hardware (R)
J21-4434-04		Mounting hardware (R)
J21-4435-04		Mounting hardware (L)
J21-4436-04		Mounting hardware (L)
J32-0922-04		Round boss
N09-0008-04		Hex. screw (Accessory)
N09-0632-05		Tapping screw (Accessory)
N14-0510-04		Flange nut (Accessory)
N15-1040-41		Flat washer
N15-1040-45		Flat washer (Accessory)
N15-1060-46		Flat washer (Accessory)
N16-0040-45		Spring wahser (Accessory)
N16-0060-46		Spring washer (Accessory)
N24-3030-41		E ring
N99-0304-04		Hex. bolt (Accessory)
W01-0401-05		Hex. wrench (Accessory)

PG-2Y Parts List

Parts No.	New parts	Description
E30-3159-05		DC cord
F05-2531-05		Fuse (25A/32V)

MC-47 (MULTI FUNCTION MICROPHONE)

MC-47 External View

MC-47 Specifications

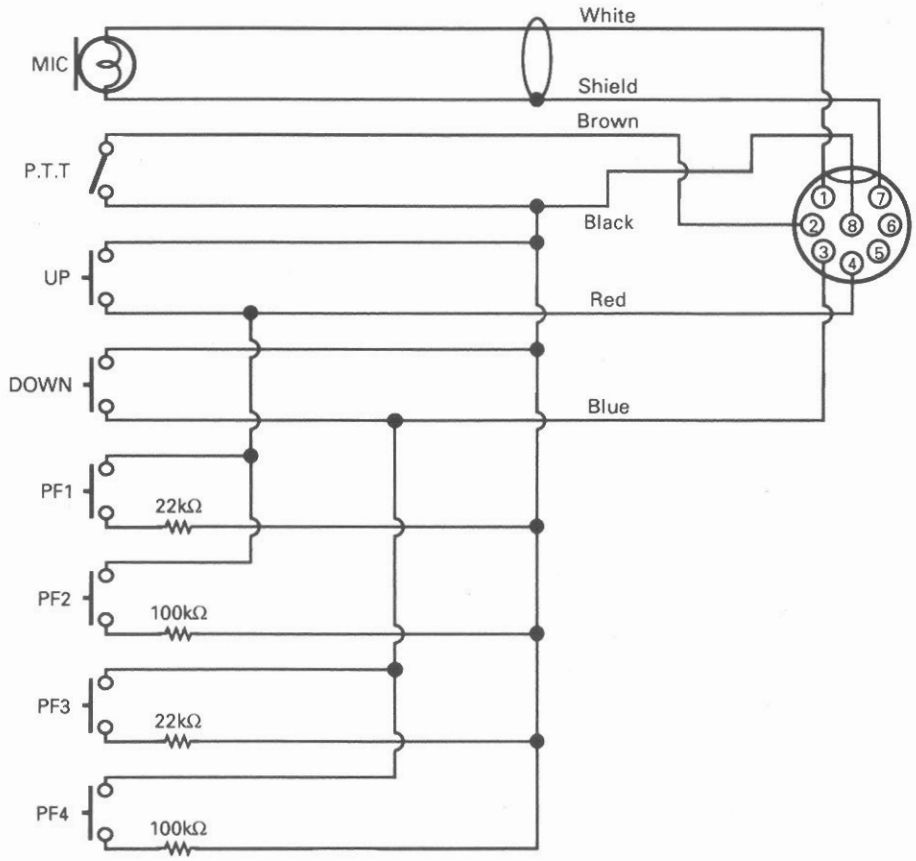
Electrical characteristics
- Impedance ..... 500Ω ± 30% (1kHz)
- Sensitivity ..... –78dB (0dB = 1V/μBAR, 1000Hz)
  –71dB ± 3dB (1kHz, 0dB = 1V/μBAR)

Dimensions ..... 53 W x 81 H x 36 D (mm)
Weight 200g

MC-47 Parts List

Parts No.	New parts	Description
E30-3171-08		Curl cord
K29-4857-08		PF knob
S50-1406-05		Tact switch (UP, DOWN)
S70-0427-08		Tact switch (PF1~4)
S74-0403-08		Micro switch (PTT)
T91-0528-05		Microphone assy
T91-0540-08		Microphone element

MC-47 Schematic diagram



SPECIFICATIONS

				Specifications
General	Mode			A3J (LSB, USB), A1 (CW), A3 (AM), F3 (FM)
	Number of memory channels			100
	Antenna impedance			50Ω
	Supply voltage			DC 13.8V ± 15%
	Grounding method			Negative ground
	Current	Receive (Standby)		2A or less
		Transmit (Maximum output)		20.5A or less
	Usable temperature range			–20°C to +60°C (–4°F to +140°F)
	Frequency stability (–10°C to +50°C)			Within ±10PPM
	Frequency accuracy (at room temperature)			Within ±10PPM
	Dimensions [W x H x D] ( ) : Projections included			179 x 60 x 233mm (180 x 69 x 270mm)
	weight (Main unit only)			2.9kg (6.4lbs)
Transmitter	Transmit frequency range			50 to 54MHz
	Power output	SSB, CW, FM	MAX	90W
			MID	50W
			MIN	10W
		AM	MAX	15 to 30W
			MID	10 to 20W
			MIN	4 to 7W
	Modulation type	SSB		Balanced
		FM		Variable reactance
		AM		low-level
	Spurious emissions			–60dB or less
	Carrier suppression (Modulation frequency 1.5kHz)			40dB or more
	Unwanted sideband suppression (Modulation frequency 1.5kHz)			40dB or more
	Maximum FM deviation			±5kHz or less
	Transmit frequency characteristics (–10dB)			400 to 2600Hz
	Microphone impedance			600Ω
Receiver	Circuit type	SSB, CW, AM		Double conversion
		FM		Triple conversion
	Receive frequency range			40 to 59.999MHz (K) 50 to 53.999MHz (E)
	Intermediate frequency	SSB, CW, AM		1st : 73.045MHz 2nd : 10.695MHz
		FM		1st : 73.045MHz 2nd : 10.695MHz 3rd : 455kHz
	Sensitivity	SSB, CW (at 10dB (S+N)/N)		0.16μV or less
		AM (at 10dB (S+N)/N)		2μV or less
		FM (12dB SINAD)		0.25μV or less
	Selecitivity	SSB, CW		–6dB : More than 2.2kHz –60dB : Less than 4.8kHz
		AM		–6dB : More than 5kHz –60dB : Less than 40kHz
		FM		–6dB : More than 12kHz –50dB : Less than 25kHz
	Image rejection			More than 80dB
	1st IF rejection			More than 70dB
	RIT shift frequency range (*)	10Hz step		More than ±1.1kHz
		20Hz step		More than ±2.2kHz
	Squelch sensitivity	SSB, CW, AM		Less than 2μV
		FM		Less than 0.25μV
	Audio output (8Ω, 5% distortion)			2.0W
	Audio output impedance			8Ω

Note

(*) : Menu selectable

Specifications are subject to change without notice or obligation due to ongoing technological developments.

TS-60S

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