144/440MHz FM DUAL BANDER
TM-V708A
SERVICE MANUAL

KENWOOD

Microphone
(T91-0636-05)

Panel (DISPLAY)
(A62-0775-03)

Button knob
(K29-5400-11)

Button knob
(K29-5400-11)

Knob (ENC)
(K29-5381-03)

Knob (SQL)
(K29-5223-03)

Cabinet (UPPER)
(A01-2122-23)

Knob (VOL)
(K29-5222-03)

Panel (MAIN UNIT)
(A62-1122-03)

CONTENTS

TM-V708A

CIRCUIT DESCRIPTION

Outline

This device is a dual-band 144/440MHz FM car transceiver planned and designed for amateur radio communications and has the following features.

1. Is capable of receiving packet data on one band while receiving audio on another band.
2. Enhanced Programmable Memory (PM) channels store virtually entire current operating environments for your quick recall.
3. Contains a total of 200 memory channels to program frequencies and other various data. Allows each memory channel to be named using up to 8 alphanumeric and special ASCII characters.
4. "Visual Scan" graphically and simultaneously shows the conditions of up to 181 frequency channels.
5. Continuous Tone Coded Squelch System (CTCSS) or Digital Code Squelch (DCS) rejects unwanted calls from other stations.
6. The separate front panel can be mounted in a convenient different place from the main unit.
7. Equipped with an easy-to-read large LCD with alphanumeric display capability.

List of Destination

Model & Destination		Guarantee frequency range (MHz)		Output Power (W)	
		144	440	144	440
TM-V708A	K	144-148	438-450	50	35

Accessories

Name	Parts number	Remarks	Destination K
Modular cable	E30-3391-05	3m	1
Panel bracket	J29-0663-13		1
	J29-0664-13		1
Bracket	J29-0628-23		1
Microphone	T91-0636-05	DTMF BACK LIT	1
DC cord	E30-2111-15		1
Fuse	F51-0017-15	15A	1
Mic Hook	J19-1526-04		1
Instruction manual	B62-1834-00	English	1
Warranty card	B46-0469-20		1
Screw set	N99-0382-05	For the body and MIC hook	1
Screw set	N99-2014-05	For the panel bracket	1
Foot	J02-0488-04	For protect from scratch on a desk	4

Unit for Model and Destination

Model & Destination		TX-RX UNIT	LCD ASSY
TM-V708A	K	X57-5860-12	B38-0829-05

CIRCUIT DESCRIPTION

1. Frequency configuration

The TM-V708A has an individual VCO and PLL unit for both VHF and UHF bands. Using these separate VCO and PLL circuit, it can receive 2 separate bands at the same time. Also, you can perform the full-duplex operation.

The VHF VCO is used for the following functions:
(i) VHF transmission
(ii) The first local oscillator for the main band (VHF) reception.
(iii) The first local oscillator for the sub band (UHF) reception (doubled).

The UHF VCO is used for the following functions:
(i) UHF transmission
(ii) The first local oscillator for the main band (UHF) reception.
(iii) The first local oscillator for the sub band (VHF) reception (halved).

The PLL reference frequency is generated by a 12.8MHz crystal oscillator connected to the VHF and UHF PLL ICs. This reference frequency is used for both PLL circuits.

The second local oscillator for the VHF band uses the tripled 12.8MHz reference oscillator frequency. The 45.05MHz second local oscillator for the UHF band is generated by the IF IC crystal oscillator circuit.
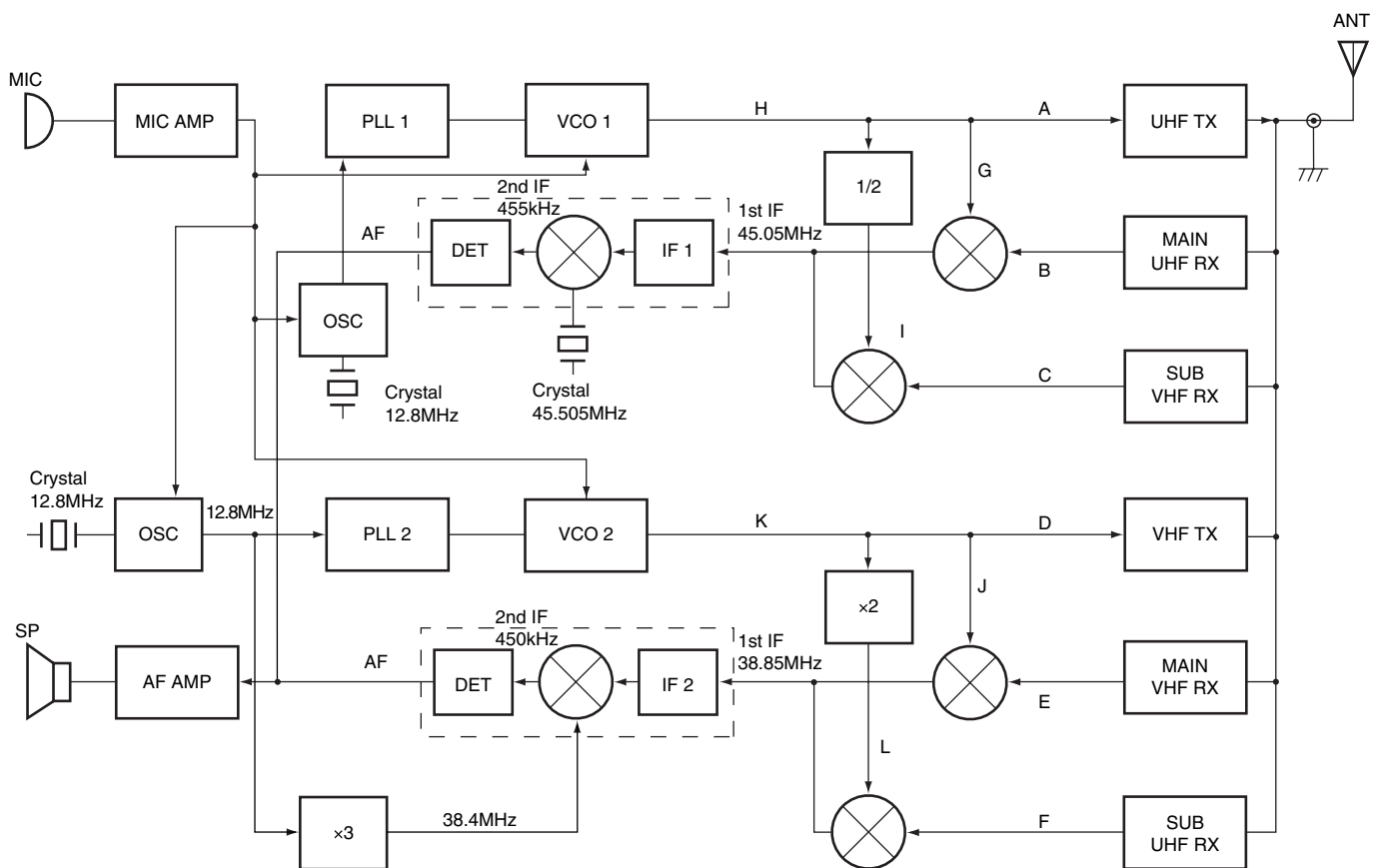
A	438.000~449.995MHz	D	144.000~147.995MHz	G	392.950~404.945MHz	J	182.850~186.845MHz
B	438.000~439.995MHz	E	144.000~145.995MHz	H	378.100~382.090MHz	K	195.575~200.5725MHz
C	144.000~147.995MHz	F	438.000~449.995MHz	I	189.050~193.045MHz	L	399.150~411.145MHz

Fig. 1 Frequency configuration

TM-V708A

CIRCUIT DESCRIPTION

2. Receiver system

2-1. Main VHF Receiver

The incoming signal from the antenna passes through a filter circuit and goes to the RF amplifier (Q205). The amplified signal enters the helical resonator (L209, L207, L204). The helical resonator is tuned to the desired frequency according to the BPF voltage output from the CPU with the varicap (D206, D205, D202). After the signal passes through a filter, it is amplified by another RF amplifier (Q202) and goes to the single balanced mixer (Q200, Q201). The frequency of the signal is converted by the first local oscillator (Upper heterodyne) to generate a 38.85MHz first IF signal. The signal passes through the MCF (XF100), is amplified by the IF amplifier (Q112) and enters the IF IC (IC100). Then the signal is converted to the 450kHz second IF signal by the second local oscillator, which is tripled 12.8MHz (Lower heterodyne). Then it is detected to generate an audio signal.
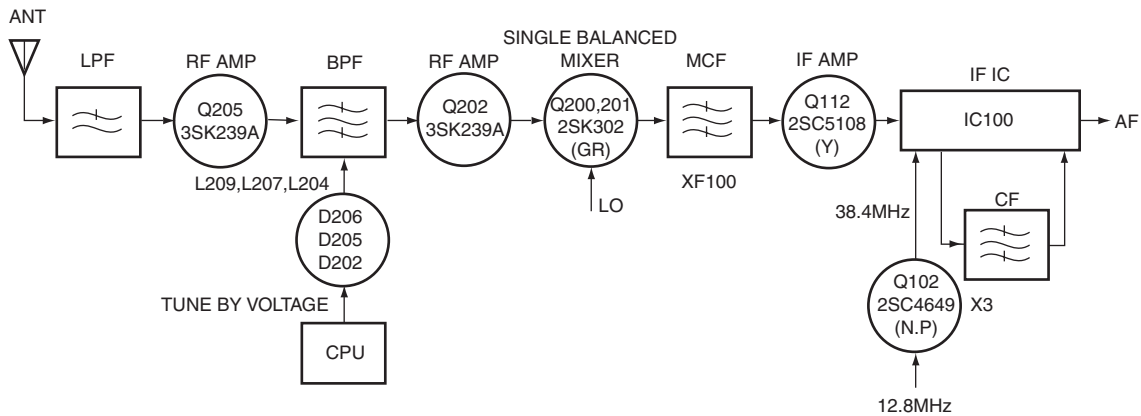
Fig. 2   Main VHF Receiver circuit

2-2. Main UHF Receiver

The incoming signal from the antenna passes through a filter circuit and enters the RF amplifier (Q508). The amplified signal passes through the SAW filter (L517), is amplified by another RF amplifier (Q505). Then it passes through the LC filter (L508) and enters the single balanced mixer (Q501, Q502). The frequency of the signal is converted by the first local oscillator (Lower heterodyne) to generate a 45.05MHz first IF signal. The signal passes through the MCF (XF400), is amplified by the IF amplifier (Q406) and enters the IF IC (IC400). The signal is converted to the 455kHz second IF signal by the second local oscillator (Upper heterodyne). Then it is detected to generate an audio signal.
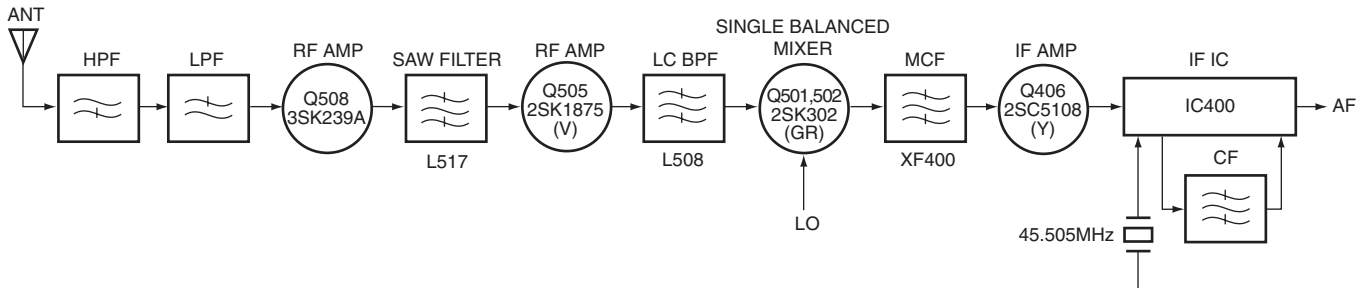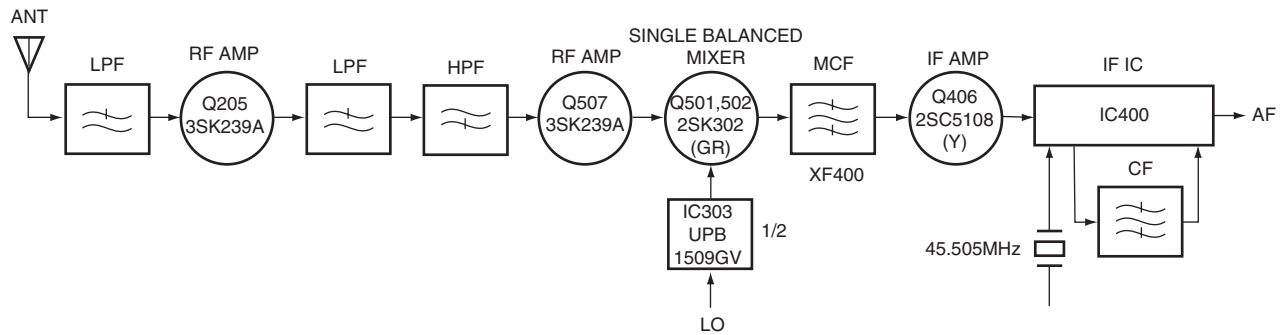
Fig. 3   Main UHF Receiver circuit

CIRCUIT DESCRIPTION

2-3. Sub VHF Receiver

The signal distributed from the RF amplifier (Q205) at the main VHF receiver circuit passes through a filter circuit. Then it enters the RF amplifier (Q507). The amplified signal goes to the single balanced mixer (Q501, Q502). The frequency of the signal is converted by the first local oscillator generated by half of the UHF VCO oscillator frequency, using the prescaler (IC303). It convents to the upper heterodyne

frequency to generate a 45.05MHz first IF signal. The signal passes through the MCF (XF400). Then it is amplified by the IF amplifier (Q406), and enters the IF IC (IC400). The signal is converted to the 455kHz second IF signal, using the second local oscillator (Upper heterodyne). Then the signal is detected to generate an audio signal.

Fig. 4   Sub VHF Receiver circuit

2-4. Sub UHF Receiver

The signal distributed from the RF amplifier (Q508) at the main UHF receiver circuit passes through a lifter circuit. Then it enters the single balanced mixer (Q200, Q201). The signal frequency is converted by the first local oscillator, generated by doubling the VHF VCO oscillator frequency (Lower heterodyne) by Q7, to generate a 38.85MHz first IF signal.

The signal passes through the MCF (XF100). Then it is amplified by the IF amplifier (Q112), and enters the IF IC (IC100). The signal is converted to the 450kHz second IF signal by the second local oscillator generated by tripling the 12.8MHz reference oscillator frequency (Lower heterodyne). Then the signal is detected to generate an audio signal.
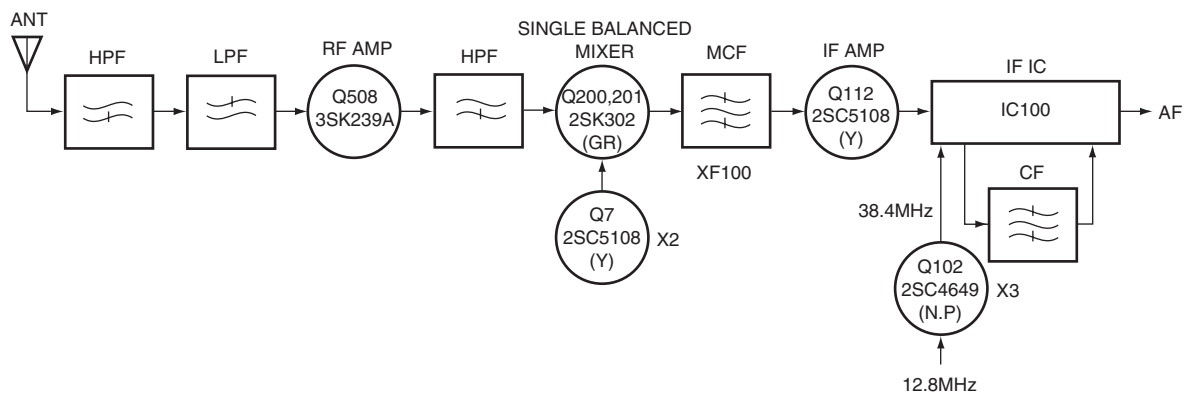
Fig. 5   Sub UHF Receiver circuit

TM-V708A

CIRCUIT DESCRIPTION

Item	Rating
Center Frequency	38.85MHz
Pass band width	±7.5kHz or more at 3dB
Attenuation band width	±25kHz or less at 40dB
Guaranteed attenuation	80dB or more within fo -910kHz (Spurious:20dB or more within ±1MHZ)
Ripple	1dB or less
Insertion loss	3dB or less
Termination impedance	500Ω ±5%, 6pF±0.5pF

Table1 MCF (L71-0491-15) (TX-RX Unit XF100)

Item	Rating
Center Frequency	45.05MHz
Pass band width	±7.5kHz or more at 3dB
Attenuation band width	±22kHz or less at 25dB
Guaranteed attenuation	80dB or more within fo -910kHz (Spurious:40dB or more within ±1MHz)
Ripple	1dB or less
Insertion loss	4dB or less
Termination impedance	800Ω ±10%, 2pF±10%

Table3 MCF (L71-0409-15) (TX-RX Unit XF400)

Item	Rating
Nominal center frequency	450kHz
6dB band width	±7.5kHz or more (from 450kHz)
50dB band width	±15.0kHz or less (from 450kHz)
Ripple	2dB or less (within 450±5kHz)
Insertion loss	6dB or less (at minimum lost point)
Guaranteed attenuation	35dB or more (within 450±100kHz)
I/O matching terminating impedance	1.5kΩ

Table2 Ceramic filter (L72-0979-05) (TX-RX Unit CF101)

Item	Rating
Nominal center frequency	455kHz
6dB band width	±7.5kHz or more (from 455kHz)
50dB band width	±15.0kHz or less (from 455kHz)
Ripple	2dB or less (within 455±5kHz)
Insertion loss	6dB or less (at maximum output point)
Guaranteed attenuation	35dB or more (within 455±100kHz)
I/O matching terminating impedance	1.5kΩ

Table4 Ceramic filter (L72-0981-05) (TX-RX Unit CF401)

2-5. Audio Circuit

The detected VHF audio signal is amplified by Q108 and de-emphasized by Q110. The UHF audio signal is amplified by Q402 and de-emphasized by Q405. One of these audio signals is selected with a cross point switch (IC702). The signal passes through the electronic variable resistor (IC804), is amplified by the AF amplifier (IC806), and fed to the speaker or the external speaker jack.

The VHF or UHF audio signal selected by the cross point switch, passes through the filter circuit (IC701) and goes to the CPU (IC604) for CTCSS and DCS decoding. The signal buffered by Q701 is output to the PR1 terminal of the DATA connector, and the signal buffered by Q700 is output to the PR9 terminal.
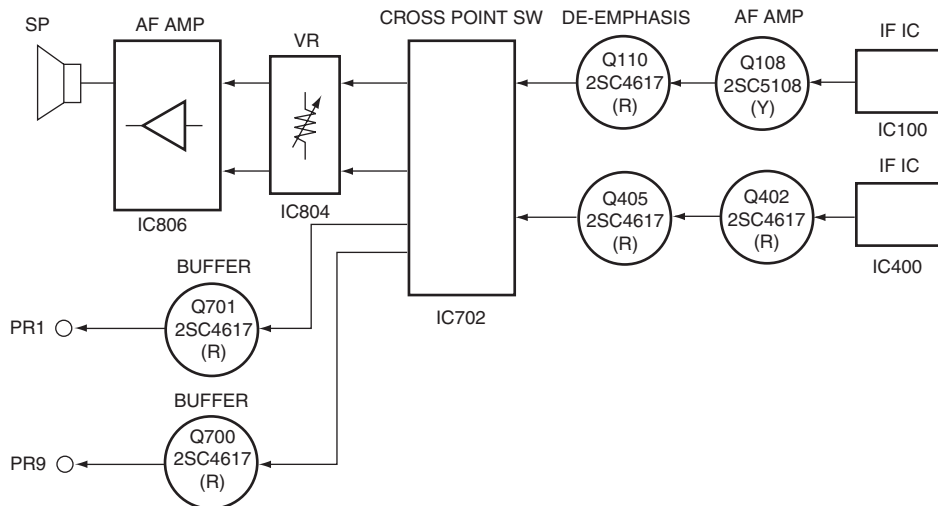
Fig. 6   Audio Circuit

CIRCUIT DESCRIPTION

※ RAV and RAU is de-emphasized audio signal RDV and RDU is not de-emphasized.

RAV from IF

RDV from IF

RAU from IF

RDU from IF

BEEP sound from CPU

VS-3 vocal sound of option

DTMF/1750 signal from CPU

DTMF sound from MIC.

IC702

A1

To SP1/INT SP side AMP

A0

To SP2 side AMP

To DTMF decoder

To CPU for DCS/CT CSS decode

To PR9 (DATA terminal)

To PR1 (DATA terminal)

To modulation line to transmit DTMF/1750
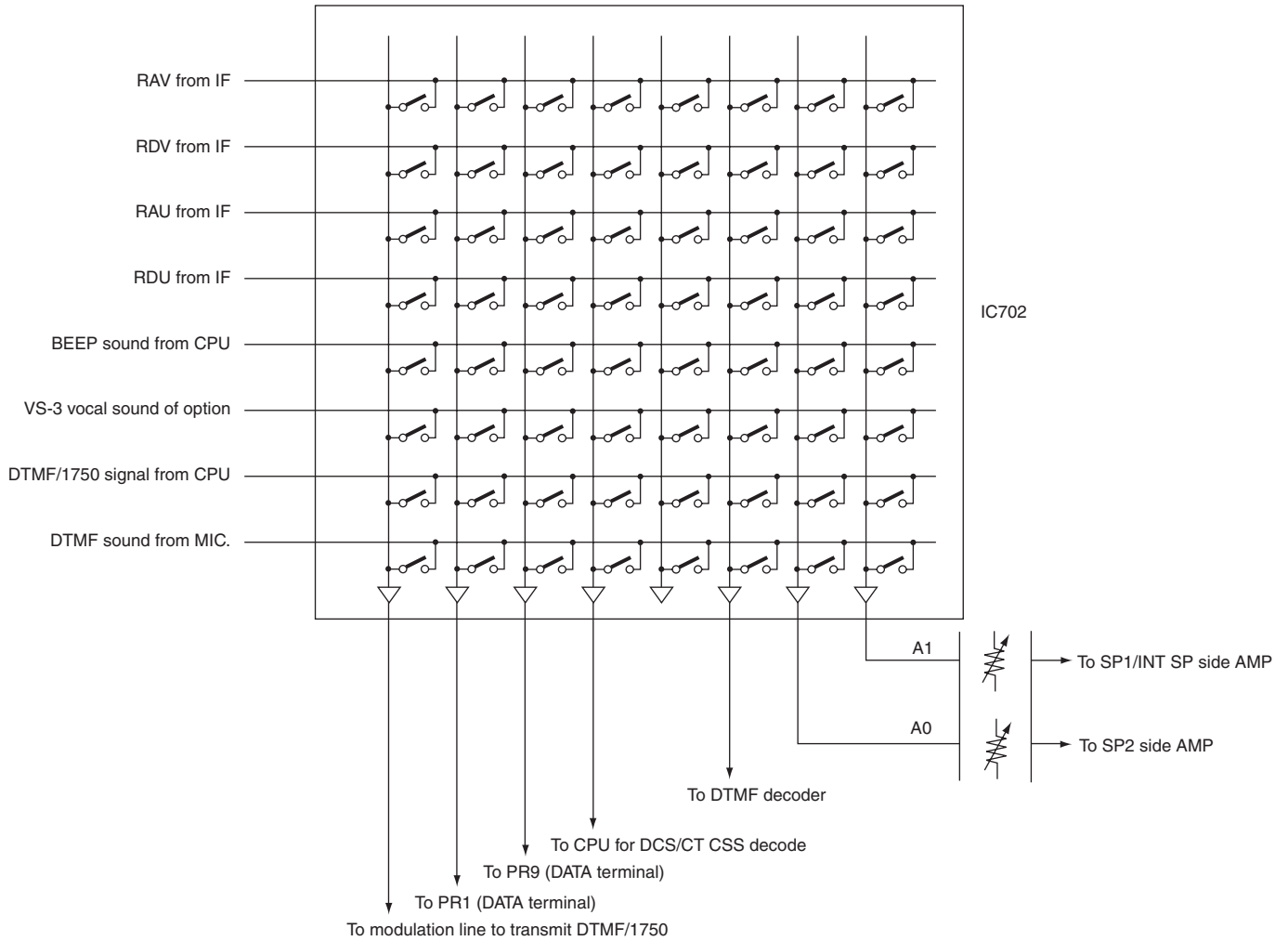
Fig. 7   Cross point switch (Audio switching circuit)

TM-V708A

CIRCUIT DESCRIPTION

3. Transmitter system

3-1. Modulation Circuit

The audio modulation input from the microphone is amplified by IC801. The DTMF signal and 1750Hz tone signal generated by the CPU are also mixed by IC801. The modulation signal from the DATA terminal is switched by IC803. It is directed to IC801 in 1200bps mode and to IC802 in 9600bps mode. The signal amplified by IC801 is pre-emphasized by Q801 and Q802, and its level is adjusted by IC804, and the resulting signal goes to each of the VHF and UHF VCOs as a modulation signal. The TONE/CTCSS/DCS signal generated by the CPU is fed to IC802 in the same way as the 9600bps mode signal from the DATA terminal. The signal amplified by IC802 is distributed and the level is adjusted. The modulating signal goes to each of the VHF and UHF VCOs. The signal is amplified by IC300 and modulates the reference oscillation circuit.
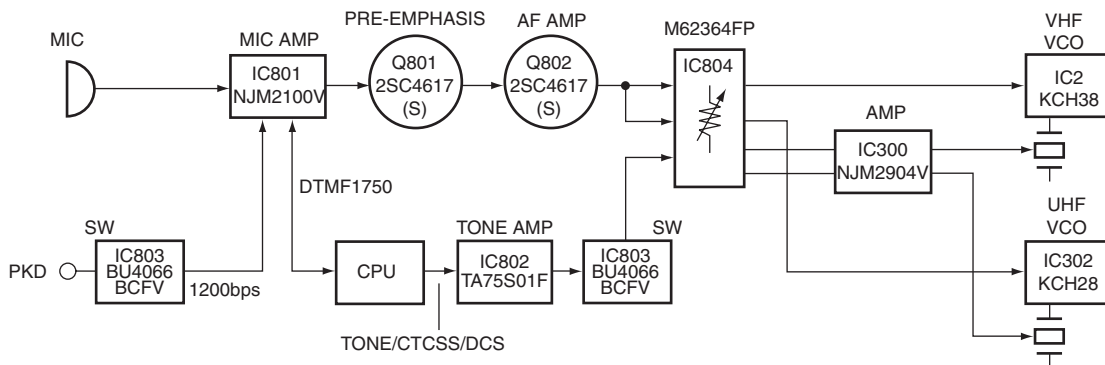
Fig. 8   Modulation circuit

3-2. Transmitter circuit

The VHF VCO output is amplified by 3-stage amplifier, RF amplifier (Q6) and driver amplifier (Q8, Q9). It is amplified to the final output by the power module. The signal passes through antenna switch (D14, D15) and low-pass lifter and is fed to the antenna.

The UHF VCO output is amplified by 4-stage amplifier, RF amplifier (Q304) and driver amplifier (Q307, Q309, and Q310). It is further amplified to the final output by the power module. The signal passes through antenna switch (D314), low-pass filter and high-pass filter. Then it is fed to the antenna.
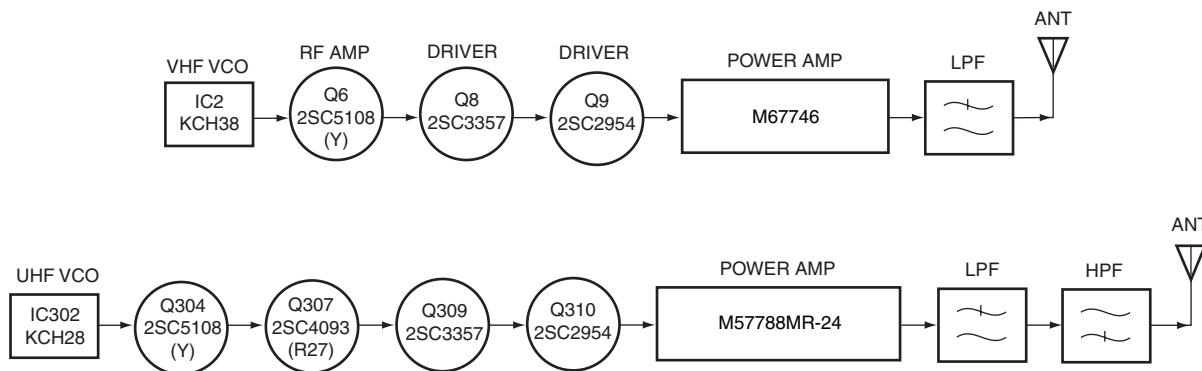
Fig. 9   Transmitter circuit

CIRCUIT DESCRIPTION

3-3. APC circuit

The Automatic transmission Power Control (APC) circuit has a differential amplifier (IC200) that compares the DC voltage generated by detecting part of the transmission output using diodes (VHF: D18, D19; UHF: D317, D318) with the reference voltage output from the CPU. The output signal is amplified by Q209 and Q208 and fed to the power module to keep transmission output constant.
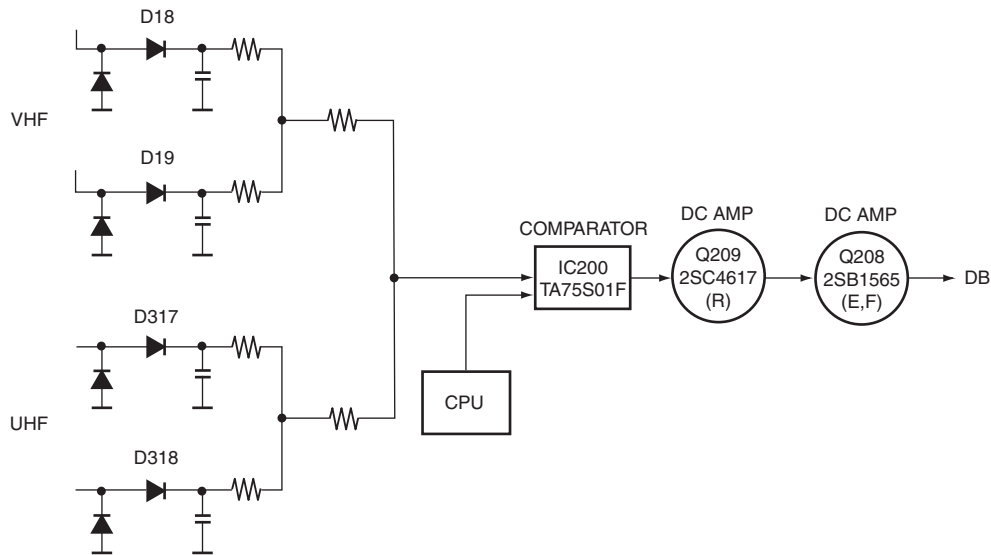
Fig. 10   APC circuit

3-4. Overheating protection circuit

To protect from the thermal destruction of the power module, the voltage of the thermistor (TH1) near the power module is monitored by the CPU (IC604). If it becomes high temperature, the APC voltage is controlled to cool down the temperature.

4. PLL circuit

4-1. Reference oscillator circuit

The 12.8MHz signal is generated by the crystal oscillator circuit (IC1 and IC301) and internally divided to generate 5kHz or 6.25kHz reference frequency. The 12.8MHz signal on IC1 side is tripled by Q102 to obtain the second local oscillator for the A band. The reference oscillation circuit is also modulated to improve the modulation characteristics of the DCS and 9600bps packet signal when it is transmitted.

Fig. 11   PLL circuit

TM-V708A
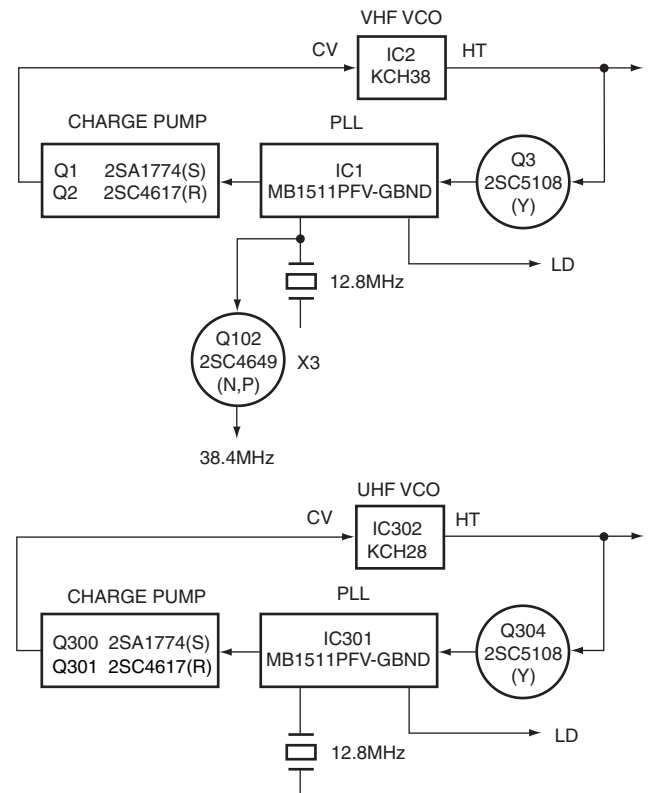
CIRCUIT DESCRIPTION

4-2. Phase comparator

Part of the VHF VCO output is amplified by Q3 and goes to VHF PLL IC. Also, a part of the UHF VCO output is amplified by Q302 and goes to the UHF PLL IC. The pulse-swallow type PLL IC divides the input VCO oscillator frequency using the data from the CPU (IC604). It compares its phase with that of the reference frequency to make the PLL synthesizer to generate the desired step.

4-3. Lock voltage (VCO control voltage)

The phase differential comparator, output from the PLL IC, results in a phase difference pulse. This pulse is amplified by a charge pump (Q1, Q2 or Q300, Q301), the ripples are removed by a low-pass filter Then the signal is supplied as the oscillator frequency control voltage for each VCO.

4-4. Unlock detection circuit

When the PLL is unlocked, a low state voltage is outputted from pin 8 of the PLL IC.

This signal is monitored by the CPU (IC604) to control transmission/reception switching timing.

5. Power supply circuit

5-1. Microcomputers and peripheral circuits
Reset and backup circuits

The CPU reset signal is generated by detecting a rising edge of the M5C line voltage with the reset IC (IC601). When the voltage supplied to the transceiver decreases and the B line voltage falls below the detection voltage of the voltage detection circuit (Q604, D604), the CPU (IC604) detects it through the interrupt pin, stores data in the EEPROM (IC602), and shuts the power off.

5-2. Voltage detection processing

The CPU (IC604) monitors and process various voltage status at IC604 A/D ports.

The squelch voltage is input from the IF IC and a change in the noise voltage is detected to control squelch. The S meter voltage is input from the IF IC to control the S meter display. The thermistor voltage (temperature) and the remote control microphone key operation are also detected through the A/D port.

5-3. Serial control

The CPU (IC604) controls the panel unit (X54-329 unit) through a synchronous serial communication.

Fig. 12   Structure of non-synchronized serial communication

6. AF Signal System

6-1. Beep circuit and mute circuit

A beep sound is generated by the CPU (IC604) and goes to cross point switch (IC702).

This signal is switched by the cross point switch (IC702) and are input to the electronic volume (IC804). While the beep signal is output from the microprocessor, audio signals for each band are muted by the cross point switch (IC702) with the serial data from the microprocessor (IC604).

The signals output from the electronic volume (IC804) are input to the speaker switching circuit and go through the audio mute circuit (Q804 and Q805). Then it is input to the power amp (IC806).
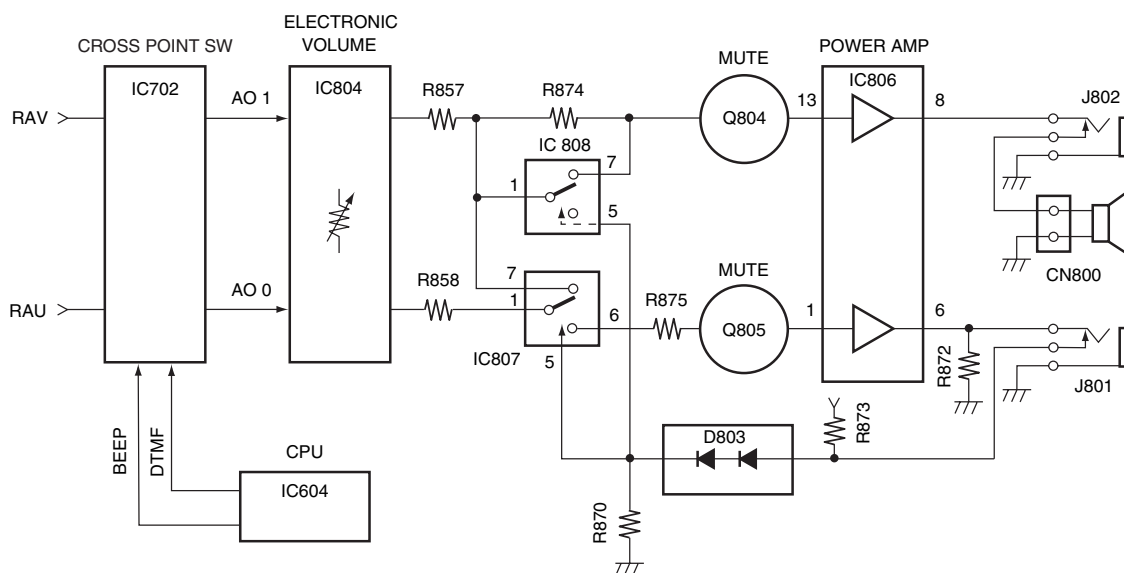
Fig. 13   Beep circuit and mute circuit

CIRCUIT DESCRIPTION

6-2. Speaker Switching Circuit

There are two speaker jacks, J801 and J802. The AF signals can be output in various combinations matching the internal speakers.

When no external speaker is connected to J801, Pins 5 of the multiplexer (IC807, IC808) go low, the AF signals AO 0 and AO 1 are added and input to the power amp (IC806).

When an external speaker is connected to J801, Pins 5 of the multiplexer (IC18) go high and AO 0 and AO 1 are input separately to the power amp.

The AF signal output combinations are as in the speaker combination table on the below.

	AO 1	AO 0
Internal speakers only	Internal speaker	
1 external speaker (J802)	external speaker	
1 external speaker (J801)	Internal speaker	external speaker
2 external speaker	external speaker	external speaker

Table5 Speaker combination table
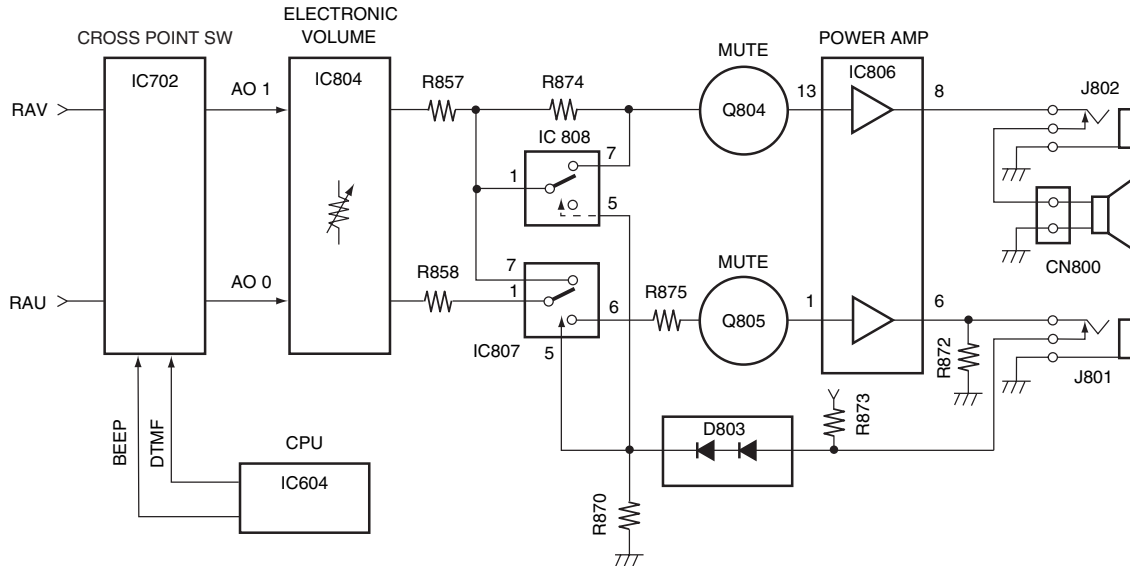
Fig. 14 Speaker switching circuit

6-3. Microphone Key Input

The microphone UP/DOWN and function keys are connected to the microprocessor analog input. The voltage when a key is ON operates the corresponding function. Also, the key input interrupt circuit is for switching the power ON/OFF with the microphone. When the DOWN, MR, and PF keys are pressed, an interrupt is generated and the microprocessor is awoken from stop mode. However, with the TM-V708A, the power ON/OFF switch function can be registered to the PF key on the microphone.
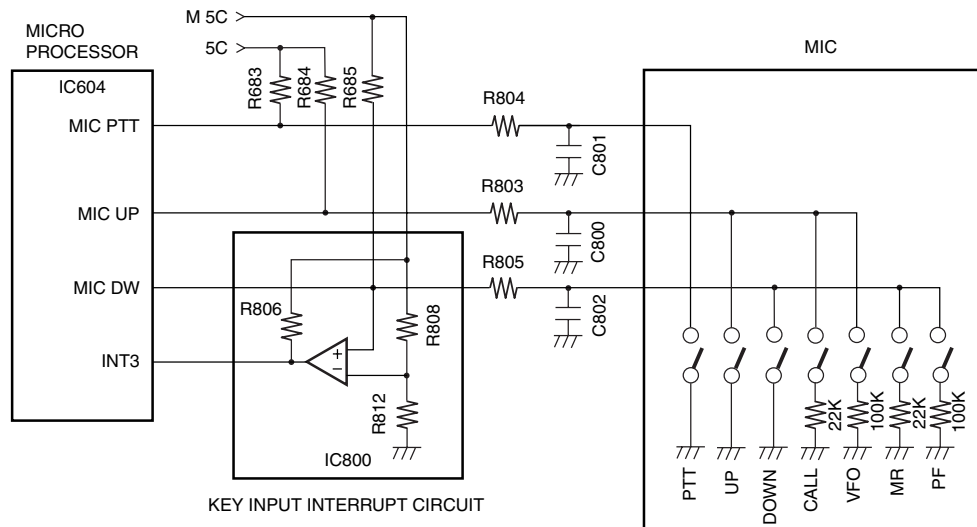
Fig. 15 Microphone key input circuit

TM-V708A

CIRCUIT DESCRIPTION

7. Data Terminal and Peripheral Circuits

J700 (data terminal) is the data communications terminal on the front. It handles transmission control, data input/output, and squelch signals.

There are two data communications modes: 9600bps mode and 1200bps mode. 9600bps mode communications are FAST FM mode of SSTV, GMSK and G3RUH packet communications. Unlike with 1200bps AFSK, with this type of high-speed modulation, frequency modulation is carried out after the digital base band signals (rectangular wave) are passed through a band limiting filter. For 9600bps GMSK for example, compared to 4800Hz signals (nearly sine wave signals passed through a filter), these signals have a hissing sound like digital modulation when listened to by ear.

Different types of modulation, such as GMSK and G3RUH, are distinguished by the type of band limiting filter.

Pin No.	Pin name	Specification		
1	PKD	bps switching	1200bps	9600bps
		Modulation input	40mVp-p	2Vp-p
		Frequency shift	3±0.5kHz	2.2±0.5kHz
4	PR9	Out level 500mVp-p/10kΩ		
		Always output during reception		
5	PR1	Output level 500mVp-p/10kΩ		
		Not output when squelch off		

Table6 DATA terminal input/output level

7-1. Transmission signals

Transmission modulation signals enter from PKD of the data tenninals (J700). The path to the modulation depends on whether communications are 1200bps or 9600bps mode.

For 1200bps mode, the transmission modulation signals pass through the analog switch (IC803), and are input to IC801 (Pin 6). The signals pass through the pre-emphasis (Q801, Q802), are adjusted by the electronic volume, and are input to the VCO.

For 9600bps mode, the transmission modulation signals pass through IC803 and amplified by the tone amp (IC802). Then it is adjusted by the electronic volume, and are input to the VCO.

The frequency shift depends on the input signal level, so there is an amplitude limiting circuit (D702, D703) to hold the signal below 4 Vp-p to avoid extreme shifts.

Thanks to this circuit, the PKD signal does not go above 4 Vp-p and the frequency shift does not fluctuate extremely.
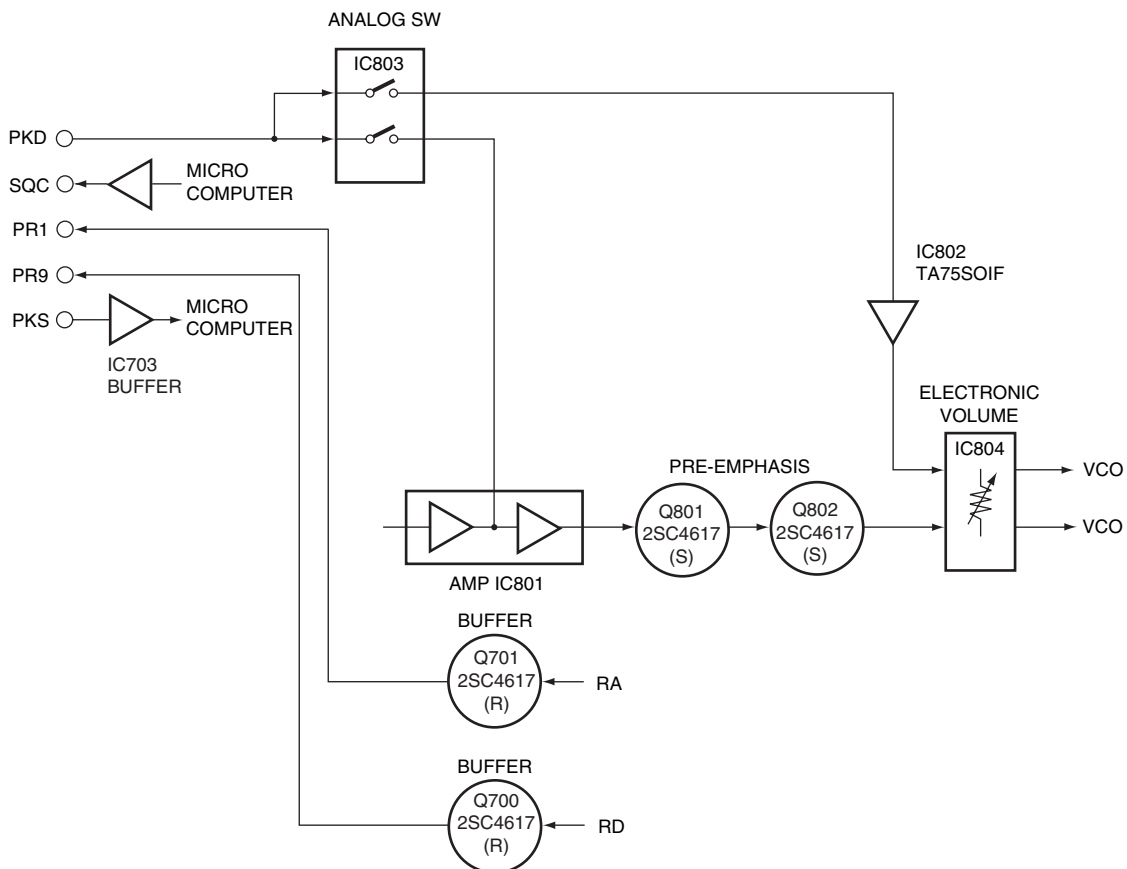
Fig. 16 Transmission signals

7-2. Reception signals

PR9 is the 9600bps data communications reception output. It outputs the FM detection circuit output (RD signals) through a buffer amp (Q700). These signals are always output whether the squelch is open or closed.

PR1 is the 1200bps data communications reception output. It outputs the FM detection circuit output (RA signals) through a buffer amp (Q701). Output is controlled with the cross point switch (IC702) according to whether squelch is open or closed.

7-3. Squelch signal output circuit

The squelch circuits is input to the TNC to prevents conflicts from occurring between simultaneous receive mode and transmit mode traffic during packet communications. (only during 1200bps) The signal is output from Pin 15 of IC703 to the data terminal. The logic is as shown in the Table below.

SQC terminal output (J700 Pin 6)	L: SQ CLOSE H: SQ BUSY

8. Panel Section (LCD ASSY: B38-0829-05)

The panel section controls serial communications with the main unit control section, the key input circuit, the display circuit, and the dimmer circuit through the microprocessor (IC4).

8-1. Serial communications circuit

A buffer amp is inserted in order to protect the microprocessor ports.

8-2. Key, Volume Input circuit

Circuits to operate the panel section keys are connected to each microprocessor port. The PSW key is pulled up and the other keys are pulled up with software within the microprocessor. Rotary encoder operating circuits are connected directly to the microprocessor. The control divides the power supply voltage, reads the A/D port of the microprocessor, and transfers that data to the main unit.

8-3. Display circuit

The TM- V708A display section is a 188x54-dot full-dot matrix LCD controlled by two LCD. As shown is Figure 17, the master IC (IC2) side is connected to 22 common dots and 88 segment dots and the stave IC (IC1) side is connected to 33 common dots and 100 segment dots. The LCD drive voltage is obtained by raising the power supply voltage (5V) within the IC.
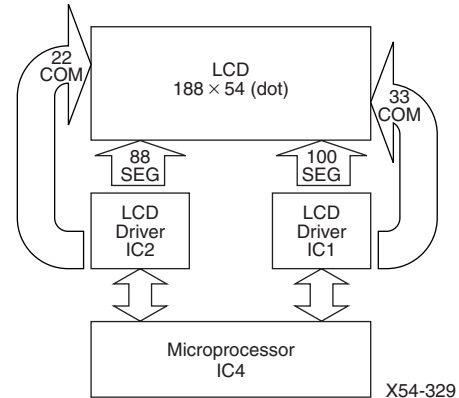
Fig. 17   Display circuit

8-4. Dimmer circuit

The dimmer circuit switches the lamp brightness to one of four levels or OFF. (See table7) The current flowing to the LEDs is varied by selecting resistors from R8 to R14.

Dimmer level	DIM 0	DIM 1	DIM 2	DIM 3
1	H	L	L	L
2	L	H	L	L
3	L	L	H	L
4	L	L	L	H
OFF	L	L	L	L

Table7   Port logic
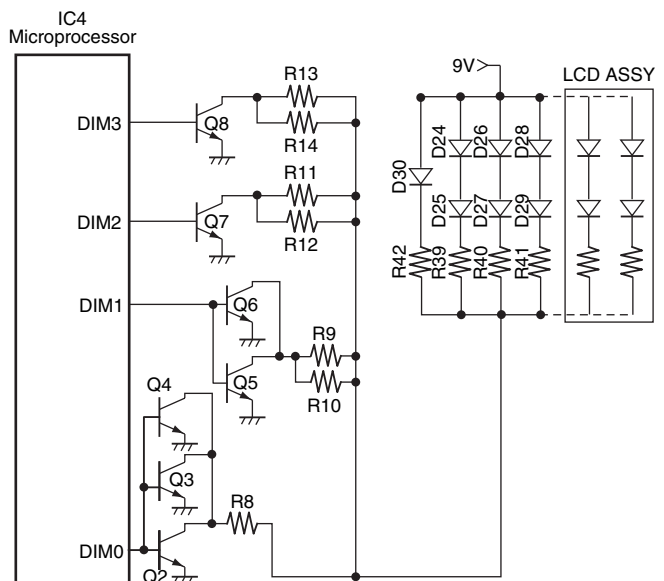
Fig. 18   Dimmer circuit

TM-V708A

SEMICONDUCTOR DATA

30622M8759GP (PANEL UNIT CPU : IC4)

Pin No.	Port Name	I/O	Function	Active Level
1	KYCALL	I	[CALL] key input	L
2	KYVFO	I	[VFO] key input	L
3	KYMR	I	[MR] key input	L
4	KYPM	I	[PM] key input	L
5	KYMNU	I	[MENU] key input	L
6	BYTE	I	Select 8-bit data bus (5C)	
7	CNVSS	I	Select memory expansion mode (GND)	
8	FUNC	I	[F1] key input	L
9	KYF1	I	[F2] key input	L
10	RESET	I	Reset	
11	XOUT	O	Clock output	
12	VSS	-	GND	
13	XIN	I	Clock input	
14	VCC	-	Power supply input	
15	NMI	(I)	Not used	
16	INT2	I	Interrupt from serial input port	
17	INT1	I	Encoder pulse 1 input	
18	INT0	I	Encoder pulse 2 input	
19	KYF2	I	[F3] key input	L
20	KYF3	I	[F4] key input	L
21	NC	I	Not used (VCC)	
22	NC	I	Not used (VCC)	
23-26	DIM3-0	O	Dimmer output	
27	PSW	O	Power SW control output	
28	BS	O	Beat shift output	
29	NC	I	Not used (VCC)	
30	NC	I	Not used (VCC)	
31	KYF4	I	[F5] key input	L
32	KYF5	I	[F6] key input	L
33	TXD0	O	Serial port for connecting to TX-RX unit	
34	RXD0	I	Serial port for connecting to TX-RX unit	
35	NC	I	Not used (VCC)	

Pin No.	Port Name	I/O	Function	Active Level
36	NC	I	Not used (VCC)	
37-41	NC	I	Not used	
42	RD	-	Read signal	
43	NC	-	Not used	
44	WR	-	Write signal	
45	LCDA0	O	LCD Address 0	
46	LCDCD2	O	LCD chip select 2	
47	LCDCD1	O	LCD chip select 1	
48	CS0	-	Flash ROM chip select signal	
49	A19	-	Not used (Open)	
50-59	A18-9	-	Address bus 18-9	
60	VCC	-	Power supply input	
61	A8	-	Address bus 8	
62	VSS	-	GND	
63-70	A7-0	-	Address bus 7-0	
71-78	LCDD7-0	I/O	LCD data bus 7-0	
79-86	D7-0	-	Data bus 7-0	
87	LCDRD	O	LCD read terminal	
88	LCDWR	O	LCD write terminal	
89	LCDRES	O	LCD reset	
90	PWR	I	[POWER] key input (key interrupt)	L
91	B-AFVR	I	B band R AF VOL (A/D)	
92	B-SQVR	I	B band R SQ VOL (A/D)	
93	A-AFVR	I	A band L AF VOL (A/D)	
94	AVSS	-	Analog power input (GND)	
95	A-SQVR	I	A band L SQ VOL (A/D)	
96	VREF	-	A/D reference voltage input	
97	AVCC	-	Analog power supply input (5C)	
98	MHz	I	[MHz] key input	L
99	B_KEY	I	[B BAND SEL] key input	L
100	A_KEY	I	[A BAND SEL] key input	L

SEMICONDUCTOR DATA

78F4218AGJZXA (TX-RX UNIT CPU : IC604)

Pin No.	Port Name	I/O	Function		Active Level
1	UPLLEN	O	U PLL Enable output	MB1511PFV	
2	VPLLEN	O	V PLL Enable output	MB1511PFV	
3	PSW1	O	Transceiver main power switch (SBSW)	H:ON	
4	PSW2	O	Transceiver main power switch (CPU)	L:ON	
5	MIC MUTE1	O	MIC MUTE 1 (MIC input)	H:Mute	H
6	MIC MUTE2	O	MIC MUTE 2 (SPF out)	H:Mute	H
7	RST SW	I	Hard reset switch	Normal:L	
8	SHIFT	O	Clock shift	Normal:L	
9	VDD	-	Positive power supply		–
10	X2	O	System clock	11.0592MHz	–
11	X1	I	System clock		–
12	VSS	-	GND		–
13	XT2	-	OPEN		–
14	XT1	-	Connect to VSS		–
15	RESET	I	System reset	H:Reset	H
16	BACKUP	I	Power voltage fall detection interrupt	H:Back up mode	H
17	NOT USED	I	Not used		–
18	NC	O	Not used		–
19	NOT USED	I	Not used		–
20	SIS	I	UART control signal input from STN panel		H
21	MUTE5	O	DTMF/1750Hz mute output	H:Mute	
22	MIC PWR	I	Remote control keys DOWN, MR, PF, power switch		L
23	AVDD	-	Connect to VDD		–
24	AVREF	-	Connect to VDD		–
25	THP	I	Temperature protection		–
26	SQ14	I	Noise level A/D input (VHF IF)		–
27	SW14	I	S meter level A/D input (VHF IF)		–
28	SQ43	I	Noise level A/D input (UHF IF)		–
29	SM43	I	S meter level A/D input (UHF IF)		–
30	P_DWAN	I	Remote control key A/D input UP, CALL, VFO		–
31	P_UPAN	I	Remote control key A/D input DOWN, MR, PF		–
32	TOIN	I	CTCSS, DCS input		
33	AVSS	-	Connect to VSS		–
34	DTMF/1750	O	BEEP/DTMF sound, 1750Hz tone, D/A output		
35	TONE	O	D/A output for SUB TONE		
36	AVREF	-	Connect to VDD		–
37	RxD2	I	UART data input from PC		L
38	TxD2	O	UART data output to PC		L
39	RTS2	O	UART control signal output to PC		–
40	RxD1	I	Panel UART data input		L
41	TxD1	O	UART data output to panel		L
42	NC	O	Not used		–
43	NC	O	Not used		–
44	STS	O	Not used		
45	NOT USED	I	Not used		–
46	NC	O	Not used		–
47	NC	O	Not used		–
48	NC	O	Not used		–
49	NC	O	Not used		–
50	PKSD	I	Transmission request DATA-PKS	L:Send from DATA	L
51	SQC1	O	DATA-SQC squelch signal output	H:Open	H
52	NC	O	Not used		–
53	NC	O	Not used		–

TM-V708A

SEMICONDUCTOR DATA

Pin No.	Port Name	I/O	Function		Active Level
54-58	NC	O	Not used		–
59	NC	O	Not used		–
60-63	SIM0-3	I	Destination judgment bit 0-3		
64	CH	I	Destination, channel display mode		L
65	PTT	I	[PTT] key input	L:Push down	L
66	PEPTR	I			L
67	CLK	O	Common clock (XSW, 2099, E2P, DAC, VPLL, UPLL)		
68	DATA	O	Common data (XSW, 2099, E2PSI, DAC, VPLL, UPLL)		
69	XSW_LD	O	Cross Point SW. LOAD		
70	2099LCK1	O	2099LCK		
71	2099LCK2	O	2099LCK		
72	VSS	-	GND		–
73	DTMFCK	O	DTMF CLOCK	LC73881M	
74	DTMFDT	I	DTMF DATA		
75	DTMFDET	I	Data detection		
76	VS3NAR	O	VS-3 NAR		
77	VS3RST	O	VS-3 RESET		
78	VS3CS	O	VS-3 Chip Select		
79	VS3DT	O	VS-3 DATA		
80	VS3CK	O	VS-3 CLK		
81	VDD	-	Positive power supply		–
82-83	NC	O	Not used		–
84	DA_EN	O	DAC Enable output	M62364FP	
85	NC				
86	NC	O	Not used		–
87	BEEP	O	Beep sound output		
88	NC				
89	NC	O	Not used		–
90	E12	O			
91	E96	O			
92	I12	O			
93	I96	O			
94	VPP	I	Flash writing 10V application pin	Normal:L	pulse
95	NC				
96	E2SO	I	Data input line for EEPROM (EEPROM SO pin)		
97	E2CS	O	EEPROM Chip Select	L:Enable	
98	SU43	O	UHF PLL speedup control output	(H:ON)	
99	VPLLUL	I	V UNLOCK detection	H:Lock	H
100	VPLLUL	I	U UNLOCK detection	H:Lock	H

COMPONENTS DESCRIPTION

TX-RX UNIT (X57-5860-12)

Ref No.	Application/Function	Operation/Condition/Compatibility
IC1	PLL IC	VHF PLL
IC2	VCO	VHF
IC3	Power Module	VHF
IC4	Power Module	UHF
IC100	IF LC	A band
IC101	AF select	VHF
IC200	APC voltage comparison	VHF
IC300	Modulation signal amplification	VHF
IC301	PLL IC	UHF PLL
IC302	VCO	UHF
IC303	Prescaler	UHF
IC304	Speed up switch	
IC400	IF IC	B band
IC501	AF PA	
IC601	Reset	
IC602	EEPROM	Setting, memory
IC603	AVR	
IC604	Control microcomputer	
IC700	DTMF decoder	
IC701	CTCSS, DCS filter	
IC702	Cross point switch	
IC703	Buffer	
IC800	Comparator	
IC801	MIC amp	
IC802	AF amp	
IC803	AF select switch	
IC804	Electronic control	
IC805	Buffer amp	APC, BPF
IC806	Audio amp	
IC807	AF switch	
IC808	Change switch	SP1/SP2
IC900	Expansion port	
IC901	Expansion port	
IC903	8V AVR	8C
IC904	AVR	
Q1	Charge pump	VHF
Q2	Charge pump	VHF
Q3	PLL comparison input amplifier	VHF
Q4	Ripple filter	VHF
Q6	VCO output amplifier	VHF
Q7	LO doubling circuit	VHF
Q8	Drive amplifier	VHF
Q9	Drive amplifier	VHF
Q10	Switch	
Q11	Switch	
Q102	Doubling circuit	VHF2nd LO doubling circuit
Q103	Power switch	R5V
Q104	Power switch	R5AM
Q105	IF amp	VHF
Q106	IF amp	VHF
Q107	IF amp	VHF
Q108	AF amp	VHF
Q110	AF amp	VHF

Ref No.	Application/Function	Operation/Condition/Compatibility
Q111	AGC amp	VHF
Q112	IF amp	VHF
Q113	AGC	
Q200	1st Mixer	VHF
Q201	1st Mixer	VHF
Q202	RF amp	VHF
Q203	RF amp	VHF
Q204	Change switch	VHF
Q205	RF amp	VHF
Q207	AGC control	VHF
Q208	APC control	VHF/UHF
Q209	APC control	VHF/UHF
Q210	RF amp	VHF
Q300	Charge pump	UHF
Q301	Charge pump	UHF
Q302	PLL comparison input amplifier	UHF
Q303	Ripple filter	UHF
Q304	VCO output amplifier	UHF
Q305	Doubling circuit	UHF LO
Q306	Power switch	UHF Prescaler
Q307	Drive amplifier	UHF
Q308	LO amp	UHF
Q309	Drive amplifier	UHF
Q310	Drive amplifier	UHF
Q402	AF amp	UHF
Q404	Power switch	R5U
Q405	AF amp	
Q406	IF amp	
Q500	IF amp	
Q501	1st Mixer	UHF
Q502	1st Mixer	UHF
Q503	Mixer	
Q505	RF amp	UHF
Q506	RF amp	UHF
Q507	RF amp	UHF
Q508	RF amp	UHF
Q509	RF amp	UHF
Q601	Reset switch	
Q603	Power switch	SM5C
Q604	System down detection	
Q700	AF amp	PR9
Q701	AF amp	PR1
Q702	Reset switch	
Q800	Microphone mute	
Q801	Pre-emphasis	
Q802	Pre-emphasis	
Q803	Microphone mute	
Q804	Mute	
Q805	Mute	
Q807	Mute	
Q900	Fan switch	
Q903	Power switch	T8V
Q904	Power switch	T8U

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COMPONENTS DESCRIPTION

Ref No.	Application/Function	Operation/Condition/Compatibility
Q905	Power switch	R8V, R8U
Q906	Power switch	RM43, RM80
Q907	Power switch	RS14, RM30
Q908	Power switch	R8UA, RM22
Q909	Power switch	RS43, RM14
Q910	AVR	PB
Q911	AVR	PB
Q912	Power switch	SB
Q913	Power switch	PB
Q914	Power switch	SB
D1	Reference oscillation circuit modulation	A band
D2	Reference oscillation circuit modulation	A band
D3	LD waveform rectification	A band
D4	Step-down	Charge pump
D5	Quick charge	A band VCO ripple filter
D6	OR circuit	RM14/RM22
D7	LO switch	LO Doubling circuit switch
D9	LO switch	LO Doubling circuit switch
D11	Signal switch	VHF TX
D12	Drive circuit bias	
D13	Drive circuit bias	
D14	ANT switch	VHF TX
D15	ANT switch	VHF TX
D16	ANT switch	VHF TX
D17	ANT switch	VHF TX
D18	Transmission output detection	VHF
D19	Transmission output detection	VHF
D102	AGC	
D200	RF switch	VHF
D201	RF switch	SUB UHF
D202	Helical tuning	VHF
D203	Filter tuning	SUB UHF
D204	RF switch	
D205	Helical tuning	VHF
D206	Helical tuning	VHF
D207	RF switch	VHF
D208	RF switch	
D209	RF switch	SUB UHF
D210	Over-voltage prevention	VHF
D211	Over-voltage prevention	VHF
D213	Voltage OR	RM14/RS14
D214	Voltage OR	RM14/RS14
D216	Band pass tuning	VHF filter
D217	OR circuit	RM22
D300	Reference oscillation circuit modulation	B band
D301	Reference oscillation circuit modulation	B band
D302	LD waveform rectification	B band
D303	Step-down	Charge pump
D304	Quick charge	B band VCO ripple filter

Ref No.	Application/Function	Operation/Condition/Compatibility
D305	RF switch	UHF LO
D306	RF switch	UHF TX
D307	RF switch	UHF LO
D309	RF switch	UHF LO
D310	RF switch	UHF LO
D312	UHF Drive circuit bias	UHF
D313	Over-voltage prevention	
D314	TX RF switch	UHF TX
D315	Over-voltage prevention	
D316	ANT switch	UHF TX
D317	Transmission output detection	UHF
D318	Transmission output detection	UHF
D500	RF switch	
D502	RF switch	SUB VHF
D503	RF switch	UHF
D505	RF switch	UHF
D507	RF switch	SUB UHF
D509	RF switch	UHF
D510	RF switch	UHF
D602	Reverse flow prevention	Reset switch detection
D605	Reverse flow prevention	M5C
D700	Bias	PR9
D701	Bias	PR1
D702	Over-voltage prevention	PKD
D703	Over-voltage prevention	PKD
D800	Reverse flow prevention	MIC 8V
D801	Reverse flow prevention	
D803	Voltage drop	
D900	Voltage OR	T8A
D902	Power supply reference voltage	PB
D903	Over-voltage detection	PB
D904	Reverse connection prevention	DC IN
D905	Reverse connection prevention	DC IN
TH1	Temperature detection	

PANEL UNIT (X54-3290-00)

Ref No.	Application/Function	Operation/Condition/Compatibility
IC1	Serial transmission buffer	
IC2	Serial transmission buffer	
IC3	AVR with reset function	
IC4	Control microcomputer	
IC5	ROM	
Q1	Power switch	
Q2-4,6, 7,9,10	Dimmer	
D1	Reverse flow prevention	
D2	Reset circuit	
D3-23	Over-voltage prevention (Surge elimination)	
D24-30	Key illumination	

TERMINAL FUNCTION

TX-RX UNIT (X57-5860-12)

CN No.	Pin No.	Name	Function
CN601	1	VCK	VS-3 clock
	2	VDT	VS-3 data
	3	VCS	VS-3 chip select
	4	RST	VS-3 reset
	5	NAR	VS-3 input enable
	6	E	GND
	7	C5	Common 5V
	8	VO	VS-3 audio
CN800	1	INT SP	Internal speaker
	2	E	GND
CN900	1		Fan power supply
	2		Fan GND

PANEL UNIT (X54-3290-00)

CN No.	Pin No.	Name	Function
CN1	1	D7	LCD driver data
	2	D6	LCD driver data
	3	D5	LCD driver data
	4	D4	LCD driver data
	5	D3	LCD driver data
	6	D2	LCD driver data
	7	D1	LCD driver data
	8	D0	LCD driver data
	9	RD	LCD driver RD
	10	WR	LCD driver WR
	11	A0	LCD driver A0
	12	GND	GND
	13	CS2	LCD driver chip select
	14	CS1	LCD driver chip select
	15	RES	LCD driver reset
	16	VDD	LCD driver VDD
	17	VL	Illumination LED control
	18	VL	Illumination LED control
	19	PB	Illumination LED power supply
	20	PB	Illumination LED power supply
CN2,CN3	1		GND
	2		VR power supply
	3		Switch
	4		VR voltage
	5		SQL voltage

TM-V708A

PARTS LIST

∗ New Parts.   ⚠ indicates safety critical components.
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.

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

TM-V708A (Y51-4570-12)
PANEL UNIT (X54-3290-00)

Ref. No.	Address	New parts	Parts No.	Description	Destination
			TM-V708A		
1	1B	∗	A01-2122-23	METALLIC CABINET(UPPER)	
2	3B	∗	A01-2172-13	METALLIC CABINET(LOWER)	
3	3A		A62-0775-03	PANEL(DISPLAY)	
4	2A	∗	A62-1122-03	PANEL(MAIN UNIT)	
5	3B		A82-0040-01	REAR PANEL(DISPLAY)	
10	2A	∗	B03-3605-14	DRESSING PLATE	
11	2A		B03-3606-04	DRESSING PLATE	
12	3A		B10-2631-02	FRONT GLASS	
13	3A		B38-0829-05	LCD ASSY	
14	1B		B42-2455-04	STICKER(4x8 MAX)	
18	3A		B43-1222-04	BADGE	
19	1C	∗	B46-0469-20	WARRANTY CARD	
20	1C	∗	B62-1834-00	INSTRUCTION MANUAL	
21	3B	∗	B72-2293-04	MODEL NAME-PLATE	
22	1B		E04-0167-05	RF COAXIAL PECEPTACLE(M)	
23	2C		E30-2111-15	DC CORD ACCESSORY	
24	1B		E30-2137-15	DC CORD	
25	2C		E30-3391-05	MODULAR CABLE(3m) ACCESSORY	
26	1B		E31-3197-15	LEAD WIRE WITH CONNECTOR(SP)	
27	3A		E37-0835-05	FLAT CABLE(DISPLAY)	
30	1B		F07-1429-03	COVER(FAN)	
31	2B		F10-2233-04	SHIELDING COVER(VCO)	
32	2B		F10-2332-12	SHIELDING COVER(POWER MODULE)	
33	2B		F12-0460-14	CONDUCTIVE SHEET	
34	1B		F51-0017-15	FUSE(6∗30 15A) ACCESSORY	
36	2C		F51-0018-05	FUSE(6∗30 20A)	
37	1B		G02-0803-03	FLAT SPRING(AF AMP,AVR)	
38	2B		G02-0809-04	FLAT SPRING(TX-RX PCB)	
39	2B		G10-0792-14	FIBROUS SHEET(FRONT PANEL)	
40	3B		G10-1257-04	FIBROUS SHEET(DISPLAY)	
42	1B		G11-0778-04	RUBBER CUSHION(SP)	
43	3B		G11-2600-14	SHEET(DISPLAY)	
44	3A		G11-2611-04	SHEET(DISPLAY)	
45	3A		G11-2612-14	SHEET(DISPLAY)	
46	3A		G13-1753-04	CUSHION(DISPLAY)	
48	1C		G13-1757-04	CUSHION(BRACKET)	
49	3A		G13-1784-04	CUSHION(PANEL PCB)	
50	2A		G13-1792-04	CUSHION	
51	2C		H02-0614-03	INNER CARTON CASE	
52	2D		H12-3074-12	PACKING FIXTURE(MAIN UNIT)	
55	1C		H12-3075-03	PACKING FIXTURE(DISPLAY)	
56	2D		H13-1106-24	CARTON BOARD	
57	2C		H21-0766-04	PROTECTION SHEET	
58	2C		H25-0085-04	PROTECTION BAG (100/200/0.07)	
59	1C		H25-0103-04	PROTECTION BAG (125/250/0.07)	
62	2D		H25-0720-04	PROTECTION BAG (200X350)	
63	3C	∗	H52-2084-02	ITEM CARTON CASE	
64	1D		J02-0488-04	FOOT ACCESSORY	
65	1D		J19-1526-04	HOLDER ACCESSORY	
66	2D		J29-0628-23	BRACKET(MAIN UNIT) ACCESSORY	
69	1C	∗	J29-0663-13	BRACKET(DISPLAY) ACCESSORY	
70	2C		J29-0664-13	BRACKET(DISPLAY) ACCESSORY	
71	3B		J32-0926-04	HEXAGON BOSS	

Ref. No.	Address	New parts	Parts No.	Description	Destination
72	3A		K29-5222-03	KNOB(VOL)	
73	3A		K29-5223-03	KNOB(SQL)	
74	3A		K29-5381-03	KNOB(ENC)	
75	3A		K29-5400-11	BUTTON KNOB	
A	3A		N14-0569-04	CIRCULAR NUT(VOL)	
B	1B		N33-2606-45	OVAL HEAD MACHINE SCREW(CASE)	
C	2B		N67-3008-46	PAN HEAD SEMS SCREW(PA MODULE)	
D	3B		N80-2010-45	PAN HEAD TAPTITE SCREW(PANEL)	
E	1B		N80-2610-45	PAN HEAD TAPTITE SCREW(FAN)	
F	1B		N83-2608-46	PAN HEAD TAPTITE SCREW(ANT)	
G	2B		N87-2606-46	BRAZIER HEAD TAPTITE SCREW	
76	1D		N99-0382-05	SCREW SET(MAIN UNIT) ACCESSORY	
77	2D		N99-2014-05	SCREW SET(DISPLAY) ACCESSORY	
78	1B		T07-0368-05	SPEAKER	
79	1B		T42-0311-25	MOTOR	
80	2C	∗	T91-0636-05	MICROPHONE ACCESSORY	
81	2B		212-1021-05	INSULATING TUBE(7mm)	
			PANEL UNIT (X54-3290-00)		
D24 -30			B30-2215-05	LED	
C1			CK73GB1C104K	CHIP C 0.10UF K	
C2 ,3			CC73GCH1H101J	CHIP C 100PF J	
C4			C92-0512-05	CHIP-TAN 1.0UF 16WV	
C5			CK73GB1C104K	CHIP C 0.10UF K	
C6			C92-0698-05	CHIP-ELE 47UF 16WV	
C7 ,8			CK73GB1H102K	CHIP C 1000PF K	
C9 ,10			CC73GCH1H220J	CHIP C 22PF J	
C11			CK73GB1H103K	CHIP C 0.010UF K	
C12			CK73GB1H102K	CHIP C 1000PF K	
C13 ,14			CK73GB1H472K	CHIP C 4700PF K	
C15			CK73GB1H103K	CHIP C 0.010UF K	
C16			CK73GB1H102K	CHIP C 1000PF K	
C17 -23			CK73GB1H103K	CHIP C 0.010UF K	
C24			CK73FB1C105K	CHIP C 1.0UF K	
C25			CK73GB1H472K	CHIP C 4700PF K	
CN1			E40-5852-05	FLAT CABLE CONNECTOR	
CN2 ,3			E40-5392-05	PIN ASSY	
CN4 ,5			E40-5409-05	PIN ASSY	
J1			E58-0457-05	MODULAR JACK	
L1 -7			L92-0140-05	CHIP FERRITE	
L9			L92-0140-05	CHIP FERRITE	
X1			L77-1814-05	CRYSTAL RESONATOR(11.0592MHZ)	
CP1 -15			R90-0741-05	MULTIPLE RESISTOR	
R2			RK73GB1J473J	CHIP R 47K J 1/16W	
R3			RK73GB1J103J	CHIP R 10K J 1/16W	
R4			RK73GB1J331J	CHIP R 330 J 1/16W	
R5 ,6			RK73GB1J473J	CHIP R 47K J 1/16W	
R8			R92-0670-05	CHIP R 0 OHM	
R9 ,10			RK73FB2A560J	CHIP R 56 J 1/10W	
R11 ,12			RK73FB2A181J	CHIP R 180 J 1/10W	
R13 ,14			RK73FB2A271J	CHIP R 270 J 1/10W	
R15			R92-1252-05	CHIP R 0 OHM 1/16W	
R17 -22			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R25			RK73GB1J103J	CHIP R 10K J 1/16W	

PARTS LIST

Ref. No.	Address	New parts	Parts No.	Description			Destination
R27 -29			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R30 -32			RK73GB1J473J	CHIP R	47K	J 1/16W	
R33			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R34 -38			RK73GB1J473J	CHIP R	47K	J 1/16W	
R39 -41			RK73FB2A391J	CHIP R	390	J 1/10W	
R42			RK73FB2A471J	CHIP R	470	J 1/10W	
R43			R92-1252-05	CHIP R	0 OHM	J 1/16W	
VR1 ,2	3B		R31-0629-05	VARIABLE RESISTOR			
S1 -12			S70-0439-15	TACT SWITCH			
D1			LFB01	DIODE			
D2			MA2S111	DIODE			
D3 -23			DA221	DIODE			
IC1 ,2			TC4S81F	MOS-IC			
IC3			L78LR05B-FA	MOS-IC			
IC4			30622M8759GP	MICROCONTROLLER IC			
IC5			AT29C020-90TI	ROM IC			
Q1			2SA1162(Y)	TRANSISTOR			
Q2 -4			DTC143EKA	DIGITAL TRANSISTOR			
Q6 ,7			DTC143EKA	DIGITAL TRANSISTOR			
Q9 ,10			DTC143EKA	DIGITAL TRANSISTOR			
S13	3A		W02-1978-05	ENCODER			

TX-RX UNIT (X57-5860-12)

Ref. No.	Address	New parts	Parts No.	Description			Destination
C1			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C2			CK73GB1H472K	CHIP C	4700PF	K	
C3			CK73GB1H103K	CHIP C	0.010UF	K	
C4			CC73GCH1H060D	CHIP C	6.0PF	D	
C5			CC73GCH1H050C	CHIP C	5.0PF	C	
C6 ,7			CK73GB1C104K	CHIP C	0.10UF	K	
C8			CK73GB1H471K	CHIP C	470PF	K	
C9			CC73GCH1H470J	CHIP C	47PF	J	
C10			CK73GB1H471K	CHIP C	470PF	K	
C11			CK73GB1C473K	CHIP C	0.047UF	K	
C12			C92-0002-05	CHIP-TAN	0.22UF	35WV	
C13			CK73GB1H103K	CHIP C	0.010UF	K	
C14			CK73GB1H102K	CHIP C	1000PF	K	
C15			C92-0695-05	CHIP-TAN	10UF	10WV	
C17			C92-0001-05	CHIP-TAN	0.1UF	35WV	
C19			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C21			CC73GCH1H101J	CHIP C	100PF	J	
C22			CK73GB1H102K	CHIP C	1000PF	K	
C23 ,24			CK73GB1H103K	CHIP C	0.010UF	K	
C25			C92-0593-05	CHIP-ELE	33UF	10WV	
C26 -29			CK73GB1H102K	CHIP C	1000PF	K	
C31			CC73GCH1H180J	CHIP C	18PF	J	
C32			CC73GCH1H040C	CHIP C	4.0PF	C	
C34			CC73GCH1H120J	CHIP C	12PF	J	
C35			CC73GCH1H050C	CHIP C	5.0PF	C	
C36			CK73GB1H102K	CHIP C	1000PF	K	
C37			CK73GB1H471K	CHIP C	470PF	K	
C38			CC73GCH1H010B	CHIP C	1.0PF	B	
C39 -41			CK73GB1H102K	CHIP C	1000PF	K	
C42			CC73GCH1H101J	CHIP C	100PF	J	
C43 -46			CK73GB1H102K	CHIP C	1000PF	K	
C47			CC73GCH1H390J	CHIP C	39PF	J	
C48 -50			CK73GB1H102K	CHIP C	1000PF	K	
C51			CK73FB1C105K	CHIP C	1.0UF	K	
C52			CK73GB1H102K	CHIP C	1000PF	K	
C53			CC73GCH1H270J	CHIP C	27PF	J	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C54			CK73GB1H102K	CHIP C	1000PF	K	
C55			C92-0523-05	CHIP-ELE	10UF	16WV	
C57			CK73GB1H102K	CHIP C	1000PF	K	
C58			CC73GCH1H101J	CHIP C	100PF	J	
C59			CK73GB1H103K	CHIP C	0.010UF	K	
C60			CK73GB1H102K	CHIP C	1000PF	K	
C61			CK73GB1H103K	CHIP C	0.010UF	K	
C62			C92-0523-05	CHIP-ELE	10UF	16WV	
C65 ,66			CK73GB1H102K	CHIP C	1000PF	K	
C67			CK73GB1H103K	CHIP C	0.010UF	K	
C68			CK73GB1H471K	CHIP C	470PF	K	
C69			C93-0552-05	CHIP C	2.0PF	C	
C70 ,71			CK73GB1H102K	CHIP C	1000PF	K	
C72			CC73GCH1H270J	CHIP C	27PF	J	
C73			C93-0603-05	CHIP C	1000PF	K	
C74			C93-0566-05	CHIP C	33PF	J	
C75			CC73GCH1H0R5B	CHIP C	0.5PF	B	
C76			CC73GCH1H010B	CHIP C	1.0PF	B	
C77			C93-0666-05	CHIP C	24PF	500WV	
C79			CK73GB1H102K	CHIP C	1000PF	K	
C80			C93-0563-05	CHIP C	18PF	J	
C81			CC73GCH1H0R5B	CHIP C	0.5PF	B	
C82			CC73GCH1H010B	CHIP C	1.0PF	B	
C83			CK73GB1C104K	CHIP C	0.10UF	K	
C86			CK73GB1H102K	CHIP C	1000PF	K	
C92			C93-0563-05	CHIP C	18PF	J	
C93			CC73GCH1H101J	CHIP C	100PF	J	
C100			CK73GB1C104K	CHIP C	0.10UF	K	
C101			CK73GB1H102K	CHIP C	1000PF	K	
C102			CC73GCH1H220J	CHIP C	22PF	J	
C103			CK73GB1H103K	CHIP C	0.010UF	K	
C105			CC73GCH1H050C	CHIP C	5.0PF	C	
C107,108			CK73GB1C104K	CHIP C	0.10UF	K	
C109			CK73GB1H102K	CHIP C	1000PF	K	
C110			CC73GCH1H270J	CHIP C	27PF	J	
C111			CK73GB1H102K	CHIP C	1000PF	K	
C112			CK73GB1C104K	CHIP C	0.10UF	K	
C113			C92-0610-05	CHIP-ELE	47UF	16WV	
C114			CK73GB1C104K	CHIP C	0.10UF	K	
C116			CK73GB1H471K	CHIP C	470PF	K	
C118			CK73GB1C473K	CHIP C	0.047UF	K	
C119			CK73GB1C104K	CHIP C	0.10UF	K	
C120			CC73GCH1H270J	CHIP C	27PF	J	
C121			CK73GB1C104K	CHIP C	0.10UF	K	
C122			CC73GCH1H271J	CHIP C	270PF	J	
C123,124			CK73GB1C104K	CHIP C	0.10UF	K	
C125			CC73GCH1H271J	CHIP C	270PF	J	
C126			CK73GB1C104K	CHIP C	0.10UF	K	
C128			CC73GCH1H101J	CHIP C	100PF	J	
C129			CK73GB1H472K	CHIP C	4700PF	K	
C131			CK73GB1C104K	CHIP C	0.10UF	K	
C132			CC73GCH1H150J	CHIP C	15PF	J	
C133			CK73GB1H102K	CHIP C	1000PF	K	
C134			CK73GB1C104K	CHIP C	0.10UF	K	
C135			CK73GB1H102K	CHIP C	1000PF	K	
C137			CK73GB1C104K	CHIP C	0.10UF	K	
C138			CK73GB1E123K	CHIP C	0.012UF	K	
C139			CK73GB1H102K	CHIP C	1000PF	K	
C140			CK73GB1H103K	CHIP C	0.010UF	K	
C141			CK73GB1E123K	CHIP C	0.012UF	K	

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Ref. No.	Address	New parts	Parts No.	Description			Destination
C142			CK73FB1C105K	CHIP C	1.0UF	K	
C144,145			CK73GB1C104K	CHIP C	0.10UF	K	
C146			CK73GB1C393K	CHIP C	0.039UF	K	
C147			CK73GB1H103K	CHIP C	0.010UF	K	
C153			CC73GCH1H100D	CHIP C	10PF	D	
C154			CK73FB1C105K	CHIP C	1.0UF	K	
C164			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C169			CC73GCH1H180J	CHIP C	18PF	J	
C170-172			CK73GB1H102K	CHIP C	1000PF	K	
C174			CK73GB1C104K	CHIP C	0.10UF	K	
C175			CC73GCH1H030B	CHIP C	3.0PF	B	
C200			CK73GB1H103K	CHIP C	0.010UF	K	
C201,202			CC73GCH1H680J	CHIP C	68PF	J	
C203,204			CK73GB1H103K	CHIP C	0.010UF	K	
C206-209			CK73GB1H102K	CHIP C	1000PF	K	
C210			CK73GB1H471K	CHIP C	470PF	K	
C211			CK73GB1H102K	CHIP C	1000PF	K	
C212,213			CK73GB1H471K	CHIP C	470PF	K	
C216			CC73GCH1H2R5B	CHIP C	2.5PF	B	
C217			CK73GB1H471K	CHIP C	470PF	K	
C218			CK73GB1H102K	CHIP C	1000PF	K	
C219			CC73GCH1H040C	CHIP C	4.0PF	C	
C220			CC73GCH1H020B	CHIP C	2.0PF	B	
C221			CC73GCH1H030B	CHIP C	3.0PF	B	
C222			CC73GCH1H330J	CHIP C	33PF	J	
C223			CK73GB1H471K	CHIP C	470PF	K	
C225			CC73GCH1H070D	CHIP C	7.0PF	D	
C226			CK73GB1H471K	CHIP C	470PF	K	
C227			CC73GCH1H220J	CHIP C	22PF	J	
C228			CC73GCH1H030B	CHIP C	3.0PF	B	
C229			CC73GCH1H330J	CHIP C	33PF	J	
C230			CK73GB1H471K	CHIP C	470PF	K	
C231			CK73GB1H103K	CHIP C	0.010UF	K	
C232			CK73GB1H102K	CHIP C	1000PF	K	
C233			CC73GCH1H050C	CHIP C	5.0PF	C	
C234,235			CK73GB1H102K	CHIP C	1000PF	K	
C236			CK73GB1H471K	CHIP C	470PF	K	
C239			CC73GCH1H040C	CHIP C	4.0PF	C	
C241			CC73GCH1H101J	CHIP C	100PF	J	
C242			CK73GB1H102K	CHIP C	1000PF	K	
C243			CC73GCH1H470J	CHIP C	47PF	J	
C244			CK73GB1C104K	CHIP C	0.10UF	K	
C245			CK73GB1H102K	CHIP C	1000PF	K	
C247			CK73GB1H102K	CHIP C	1000PF	K	
C248			CK73GB1H103K	CHIP C	0.010UF	K	
C249			C92-0610-05	CHIP-ELE	47UF	16WV	
C250			CC73GCH1H101J	CHIP C	100PF	J	
C251			CK73GB1C104K	CHIP C	0.10UF	K	
C252			CK73GB1H102K	CHIP C	1000PF	K	
C253			CK73GB1H471K	CHIP C	470PF	K	
C254			CK73GB1H102K	CHIP C	1000PF	K	
C255			CC73GCH1H030B	CHIP C	3.0PF	B	
C256			CK73GB1H102K	CHIP C	1000PF	K	
C257			CK73GB1C104K	CHIP C	0.10UF	K	
C258			CC73GCH1H010B	CHIP C	1.0PF	B	
C259			CC73GCH1H220J	CHIP C	22PF	J	
C270			CC73GCH1H470J	CHIP C	47PF	J	
C301			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C302			CK73GB1H472K	CHIP C	4700PF	K	
C303			CK73GB1H103K	CHIP C	0.010UF	K	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C304			CC73GCH1H060D	CHIP C	6.0PF	D	
C305			CC73GCH1H050C	CHIP C	5.0PF	C	
C307			CK73GB1C104K	CHIP C	0.10UF	K	
C308			CK73GB1H471K	CHIP C	470PF	K	
C309			CK73GB1C473K	CHIP C	0.047UF	K	
C310			CC73GCH1H470J	CHIP C	47PF	J	
C311			CK73GB1H471K	CHIP C	470PF	K	
C312			CK73GB1H103K	CHIP C	0.010UF	K	
C313			CK73GB1C473K	CHIP C	0.047UF	K	
C314			CK73GB1H102K	CHIP C	1000PF	K	
C315			C92-0002-05	CHIP-TAN	0.22UF	35WV	
C316			C92-0565-05	CHIP-TAN	6.8UF	10WV	
C317			CC73GCH1H050C	CHIP C	5.0PF	C	
C318			C92-0002-05	CHIP-TAN	0.22UF	35WV	
C319			CC73GCH1H030B	CHIP C	3.0PF	B	
C320			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C321			CK73GB1H103K	CHIP C	0.010UF	K	
C322			CK73GB1H471K	CHIP C	470PF	K	
C323			CC73GCH1H100D	CHIP C	10PF	D	
C324			CK73GB1H471K	CHIP C	470PF	K	
C325			CK73GB1H103K	CHIP C	0.010UF	K	
C326			C92-0593-05	CHIP-ELE	33UF	10WV	
C327			CC73GCH1H040C	CHIP C	4.0PF	C	
C328			CK73GB1H471K	CHIP C	470PF	K	
C329			CC73GCH1H040C	CHIP C	4.0PF	C	
C330			CK73GB1H471K	CHIP C	470PF	K	
C331			CK73GB1H102K	CHIP C	1000PF	K	
C332			CC73GCH1H470J	CHIP C	47PF	J	
C333			CC73GCH1H101J	CHIP C	100PF	J	
C334			CC73GCH1H080D	CHIP C	8.0PF	D	
C335			CC73GCH1H010B	CHIP C	1.0PF	B	
C336-338			CK73GB1H471K	CHIP C	470PF	K	
C339			CK73GB1H102K	CHIP C	1000PF	K	
C340			CC73GCH1H030B	CHIP C	3.0PF	B	
C341			CK73GB1H471K	CHIP C	470PF	K	
C342			CC73GCH1H010B	CHIP C	1.0PF	B	
C343			CK73GB1H471K	CHIP C	470PF	K	
C344			CK73GB1H102K	CHIP C	1000PF	K	
C345			CC73GCH1H050C	CHIP C	5.0PF	C	
C346			CK73GB1H471K	CHIP C	470PF	K	
C347			CK73GB1H102K	CHIP C	1000PF	K	
C348,349			CK73GB1H471K	CHIP C	470PF	K	
C350			CC73GCH1H050C	CHIP C	5.0PF	C	
C351			CC73GCH1H120J	CHIP C	12PF	J	
C352-354			CK73GB1H471K	CHIP C	470PF	K	
C355			CK73GB1C104K	CHIP C	0.10UF	K	
C356			CC73GCH1H080D	CHIP C	8.0PF	D	
C357-359			CK73GB1H471K	CHIP C	470PF	K	
C360			CC73GCH1H080D	CHIP C	8.0PF	D	
C361,362			CK73GB1H102K	CHIP C	1000PF	K	
C364			CK73GB1H103K	CHIP C	0.010UF	K	
C365			CC73GCH1H040C	CHIP C	4.0PF	C	
C366			CK73GB1H102K	CHIP C	1000PF	K	
C367			CK73GB1C104K	CHIP C	0.10UF	K	
C368			C93-0558-05	CHIP C	8.0PF	D	
C369			CK73GB1H102K	CHIP C	1000PF	K	
C372			CK73GB1H102K	CHIP C	1000PF	K	
C373			C93-0560-05	CHIP C	10PF	D	
C376			CC73GCH1H010B	CHIP C	1.0PF	B	
C377			CC73GCH1H020B	CHIP C	2.0PF	B	

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Ref. No.	Address	New parts	Parts No.	Description			Destination
C378			CC73GCH1H0R5B	CHIP C	0.5PF	B	
C379			CC73GCH1H020B	CHIP C	2.0PF	B	
C380			C93-0551-05	CHIP C	1.5PF	C	
C382			CC73FCH1HR75B	CHIP C	0.75PF	B	
C383			CC73GCH1HR75B	CHIP C	0.75PF	B	
C384			C93-0555-05	CHIP C	5.0PF	C	
C385,386			C93-0557-05	CHIP C	7.0PF	D	
C393			CK73GB1H471K	CHIP C	470PF	K	
C394			CK73GB1C104K	CHIP C	0.10UF	K	
C395			CC73GCH1H020B	CHIP C	2.0PF	B	
C397			CC73GCH1H050C	CHIP C	5.0PF	C	
C399			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C402,403			CK73GB1C104K	CHIP C	0.10UF	K	
C404			CK73GB1H103K	CHIP C	0.010UF	K	
C405			CK73GB1C104K	CHIP C	0.10UF	K	
C406			CC73GCH1H180J	CHIP C	18PF	J	
C407,408			CC73GCH1H271J	CHIP C	270PF	J	
C409			CC73GCH1H270J	CHIP C	27PF	J	
C410			CC73GCH1H101J	CHIP C	100PF	J	
C411			CK73GB1C473K	CHIP C	0.047UF	K	
C412			CC73GCH1H270J	CHIP C	27PF	J	
C413			C92-0610-05	CHIP-ELE	47UF	16WV	
C414			CK73GB1H472K	CHIP C	4700PF	K	
C415			CK73GB1C104K	CHIP C	0.10UF	K	
C416			CK73FB1C105K	CHIP C	1.0UF	K	
C418			CK73GB1C104K	CHIP C	0.10UF	K	
C420,421			CK73GB1E123K	CHIP C	0.012UF	K	
C422			CK73GB1C104K	CHIP C	0.10UF	K	
C423			CK73GB1C393K	CHIP C	0.039UF	K	
C424			CC73GCH1H150J	CHIP C	15PF	J	
C425			CK73GB1H103K	CHIP C	0.010UF	K	
C427			CK73GB1H103K	CHIP C	0.010UF	K	
C428			CK73GB1H102K	CHIP C	1000PF	K	
C429			CC73GCH1H060D	CHIP C	6.0PF	D	
C430			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C433			CK73GB1H102K	CHIP C	1000PF	K	
C434			CK73GB1H332K	CHIP C	3300PF	K	
C436			CK73GB1C104K	CHIP C	0.10UF	K	
C500			CC73GCH1H040C	CHIP C	4.0PF	C	
C501			CK73GB1H102K	CHIP C	1000PF	K	
C503,504			CK73GB1H102K	CHIP C	1000PF	K	
C505			CC73GCH1H101J	CHIP C	100PF	J	
C507,508			CK73GB1H103K	CHIP C	0.010UF	K	
C509			CC73GCH1H101J	CHIP C	100PF	J	
C510,511			CC73GCH1H680J	CHIP C	68PF	J	
C512			CC73GCH1H010B	CHIP C	1.0PF	B	
C513			CC73GCH1H101J	CHIP C	100PF	J	
C514,515			CK73GB1H103K	CHIP C	0.010UF	K	
C517			CK73GB1H471K	CHIP C	470PF	K	
C518,519			CC73GCH1H030B	CHIP C	3.0PF	B	
C520			CK73GB1H471K	CHIP C	470PF	K	
C521			CC73GCH1H040C	CHIP C	4.0PF	C	
C523,524			CK73GB1H471K	CHIP C	470PF	K	
C525			CC73GCH1H030B	CHIP C	3.0PF	B	
C526			CC73GCH1H100D	CHIP C	10PF	D	
C527,528			CK73GB1H471K	CHIP C	470PF	K	
C529			CC73GCH1H050C	CHIP C	5.0PF	C	
C531			CK73GB1H471K	CHIP C	470PF	K	
C532			CC73GCH1H040C	CHIP C	4.0PF	C	
C533			CK73GB1H471K	CHIP C	470PF	K	
C534			CC73GCH1H050C	CHIP C	5.0PF	C	
C535			CC73GCH1H030B	CHIP C	3.0PF	B	
C536,537			CK73GB1H102K	CHIP C	1000PF	K	
C538			CK73GB1H471K	CHIP C	470PF	K	
C539-544			CK73GB1H102K	CHIP C	1000PF	K	
C545			CK73GB1H471K	CHIP C	470PF	K	
C546			CC73GCH1H150J	CHIP C	15PF	J	
C548			CC73GCH1H020B	CHIP C	2.0PF	B	
C549			CC73GCH1H070D	CHIP C	7.0PF	D	
C550,551			CK73GB1H471K	CHIP C	470PF	K	
C552			CC73GCH1H470J	CHIP C	47PF	J	
C553			CK73GB1H471K	CHIP C	470PF	K	
C554			CC73GCH1H150J	CHIP C	15PF	J	
C555			CC73GCH1H470J	CHIP C	47PF	J	
C557			CC73GCH1H390J	CHIP C	39PF	J	
C558			CK73GB1H471K	CHIP C	470PF	K	
C559			CC73GCH1H060D	CHIP C	6.0PF	D	
C560			CC73GCH1H070D	CHIP C	7.0PF	D	
C561,562			CK73GB1H102K	CHIP C	1000PF	K	
C563			CC73GCH1H070D	CHIP C	7.0PF	D	
C564			CC73GCH1H100D	CHIP C	10PF	D	
C565			CC73GCH1H101J	CHIP C	100PF	J	
C567			CC73GCH1H020B	CHIP C	2.0PF	B	
C568			CC73GCH1H101J	CHIP C	100PF	J	
C569			CK73GB1H471K	CHIP C	470PF	K	
C570			CC73GCH1H020B	CHIP C	2.0PF	B	
C612,613			CK73GB1C104K	CHIP C	0.10UF	K	
C614			CK73GB1H471K	CHIP C	470PF	K	
C616			CK73GB1H102K	CHIP C	1000PF	K	
C617			C92-0756-05	CHIP-ELE	330UF	6.3WV	
C618			CK73GB1H103K	CHIP C	0.010UF	K	
C619			CK73GB1H102K	CHIP C	1000PF	K	
C620			CK73GB1H103K	CHIP C	0.010UF	K	
C621,622			CK73GB1H102K	CHIP C	1000PF	K	
C624,625			CC73GCH1H220J	CHIP C	22PF	J	
C626			CK73FB1C105K	CHIP C	1.0UF	K	
C627			CK73GB1H103K	CHIP C	0.010UF	K	
C628			CK73GB1H471K	CHIP C	470PF	K	
C629			CC73GCH1H101J	CHIP C	100PF	J	
C631,632			CK73FB1C105K	CHIP C	1.0UF	K	
C700			C92-0514-05	CHIP-TAN	2.2UF	10WV	
C702			CK73GB1C683J	CHIP C	0.068UF	J	
C703-708			CK73FB1C105K	CHIP C	1.0UF	K	
C709			CC73GCH1H221J	CHIP C	220PF	J	
C710			C92-0695-05	CHIP-TAN	10UF	10WV	
C711			CK73FB1C105K	CHIP C	1.0UF	K	
C712			CK73GB1H103K	CHIP C	0.010UF	K	
C713			CK73GB1H222K	CHIP C	2200PF	K	
C715,716			CK73FB1C105K	CHIP C	1.0UF	K	
C717			CK73GB1E123K	CHIP C	0.012UF	K	
C719			CK73GB1C683J	CHIP C	0.068UF	J	
C720,721			CK73FB1C105K	CHIP C	1.0UF	K	
C722			CK73GB1C104K	CHIP C	0.10UF	K	
C724			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C725-727			CC73GCH1H101J	CHIP C	100PF	J	
C728			CK73GB1C104K	CHIP C	0.10UF	K	
C729			CK73GB1C473K	CHIP C	0.047UF	K	
C730			CC73GCH1H101J	CHIP C	100PF	J	
C732,733			CC73GCH1H101J	CHIP C	100PF	J	
C734			CK73FB1C105K	CHIP C	1.0UF	K	

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Ref. No.	Address	New parts	Parts No.	Description			Destination
C736,737			CK73FB1C105K	CHIP C	1.0UF	K	
C738,739			CC73GCH1H101J	CHIP C	100PF	J	
C743			CK73GB1C473K	CHIP C	0.047UF	K	
C800-802			CK73GB1H103K	CHIP C	0.010UF	K	
C803			CK73GB1H471K	CHIP C	470PF	K	
C804			CK73GB1H103K	CHIP C	0.010UF	K	
C805			CK73GB1H471K	CHIP C	470PF	K	
C806,807			CK73GB1H103K	CHIP C	0.010UF	K	
C808			CK73GB1E223K	CHIP C	0.022UF	K	
C809			CC73GCH1H101J	CHIP C	100PF	J	
C810			CK73GB1H471K	CHIP C	470PF	K	
C812			CK73GB1C273K	CHIP C	0.027UF	K	
C814			CK73GB1H102K	CHIP C	1000PF	K	
C815			CK73GB1E123K	CHIP C	0.012UF	K	
C817			CK73GB1H103K	CHIP C	0.010UF	K	
C819			C92-0606-05	CHIP-TAN	4.7UF	10WV	
C820			CK73GB1E223K	CHIP C	0.022UF	K	
C821			CK73GB1H682K	CHIP C	6800PF	K	
C822			CK73GB1E223K	CHIP C	0.022UF	K	
C823			CK73GB1H102K	CHIP C	1000PF	K	
C824			CC73GCH1H300J	CHIP C	30PF	J	
C825			CK73GB1C104K	CHIP C	0.10UF	K	
C826			CK73GB1H103K	CHIP C	0.010UF	K	
C827			CK73GB1C104K	CHIP C	0.10UF	K	
C828			CK73GB1H332K	CHIP C	3300PF	K	
C829			CK73GB1H561K	CHIP C	560PF	K	
C830			CK73GB1C104K	CHIP C	0.10UF	K	
C831			CK73GB1H332K	CHIP C	3300PF	K	
C832			CK73GB1H561K	CHIP C	560PF	K	
C833			CK73GB1H102K	CHIP C	1000PF	K	
C834			C92-0514-05	CHIP-TAN	2.2UF	10WV	
C835,836			CK73FB1C105K	CHIP C	1.0UF	K	
C837			CK73GB1H471K	CHIP C	470PF	K	
C840			CK73GB1H103K	CHIP C	0.010UF	K	
C841			C92-0567-05	CHIP-TAN	68UF	6.3WV	
C842			CK73FB1C105K	CHIP C	1.0UF	K	
C843,844			CK73GB1E183K	CHIP C	0.018UF	K	
C845			CK73GB1H103K	CHIP C	0.010UF	K	
C846			CK73GB1C104K	CHIP C	0.10UF	K	
C847,848			CK73GB1H103K	CHIP C	0.010UF	K	
C849			CK73GB1C104K	CHIP C	0.10UF	K	
C850			CE04EW1H470M	ELECTRO	47UF	50WV	
C851			C92-0610-05	CHIP-ELE	47UF	16WV	
C852			CE04EW1C471M	ELECTRO	470UF	16WV	
C853			CK73GB1C104K	CHIP C	0.10UF	K	
C854			CE04EW1C471M	ELECTRO	470UF	16WV	
C855			CK73GB1C104K	CHIP C	0.10UF	K	
C856,857			C92-0610-05	CHIP-ELE	47UF	16WV	
C858			CE04EW1H470M	ELECTRO	47UF	50WV	
C859			CK73GB1H103K	CHIP C	0.010UF	K	
C860			CC73GCH1H101J	CHIP C	100PF	J	
C861			C92-0558-05	CHIP-ELE	100UF	16WV	
C862,863			CK73GB1H102K	CHIP C	1000PF	K	
C864,865			CK73GB1H103K	CHIP C	0.010UF	K	
C869			CK73GB1H102K	CHIP C	1000PF	K	
C870			CC73GCH1H390J	CHIP C	39PF	J	
C871			CK73GB1E183K	CHIP C	0.018UF	K	
C872			CK73GB1C473K	CHIP C	0.047UF	K	
C900,901			CK73GB1H102K	CHIP C	1000PF	K	
C902			C92-0558-05	CHIP-ELE	100UF	16WV	

Ref. No.	Address	New parts	Parts No.	Description			Destination
C903			CK73GB1H103K	CHIP C	0.010UF	K	
C904			CK73GB1H102K	CHIP C	1000PF	K	
C905			C92-0610-05	CHIP-ELE	47UF	16WV	
C906			CK73GB1C104K	CHIP C	0.10UF	K	
C907,908			C92-0610-05	CHIP-ELE	47UF	16WV	
C909,910			CK73GB1H103K	CHIP C	0.010UF	K	
C911			CK73GB1H102K	CHIP C	1000PF	K	
C912			CK73GB1C104K	CHIP C	0.10UF	K	
C913			CK73GB1H471K	CHIP C	470PF	K	
C914			C92-0610-05	CHIP-ELE	47UF	16WV	
C916			C92-0558-05	CHIP-ELE	100UF	16WV	
C917			CK73GB1H103K	CHIP C	0.010UF	K	
C919			CK73GB1H103K	CHIP C	0.010UF	K	
C920			CC73GCH1H101J	CHIP C	100PF	J	
C921			C92-0558-05	CHIP-ELE	100UF	16WV	
C922			CK73GB1H103K	CHIP C	0.010UF	K	
C923			CK73GB1C104K	CHIP C	0.10UF	K	
C924,925			CK73FB1C105K	CHIP C	1.0UF	K	
C926,927			CK73GB1H103K	CHIP C	0.010UF	K	
C929			CK73GB1H102K	CHIP C	1000PF	K	
C931			CK73GB1H102K	CHIP C	1000PF	K	
C932,933			C90-4075-05	ALUMINIUM ELECTRO	1000UF	25WV	
TC1			C05-0383-05	CERAMIC TRIMMER CAPACITOR(6PF)			
TC300			C05-0383-05	CERAMIC TRIMMER CAPACITOR(6PF)			
CN1			E23-0486-05	TERMINAL			
CN601			E40-5618-05	FLAT CABLE CONNECTOR			
CN602			E40-5823-05	FLAT CABLE CONNECTOR			
CN800			E40-3237-05	PIN ASSY			
CN900			E40-3237-05	PIN ASSY			
J602			E58-0410-05	MODULAR JACK			
J700			E56-0405-05	DIN SOCKET			
J800			E58-0469-05	MODULAR JACK			
J801,802			E11-0448-05	3.5D PHONE JACK(3P)			
W602			E37-0697-05	PROCESSED LEAD WIRE			
F800			F53-0108-05	FUSE(1.8A)			
F900			F53-0128-05	FUSE(0.5A)			
F901,902			F53-0108-05	FUSE(1.8A)			
			J30-0545-05	SPACER			
CF101			L72-0979-05	CERAMIC FILTER			
CF401			L72-0981-05	CERAMIC FILTER			
L1			L40-2275-92	SMALL FIXED INDUCTOR(22NH)			
L3			L40-1585-92	SMALL FIXED INDUCTOR(150NH)			
L5			L40-2275-92	SMALL FIXED INDUCTOR(22NH)			
L6			L40-3375-92	SMALL FIXED INDUCTOR(33NH)			
L7			L40-1085-34	SMALL FIXED INDUCTOR(100NH)			
L8			L34-1239-05	AIR-CORE COIL			
L9			L34-0894-05	AIR-CORE COIL			
L10			L34-0742-05	AIR-CORE COIL			
L11			L34-1239-05	AIR-CORE COIL			
L12			L34-0742-05	AIR-CORE COIL			
L14			L34-0742-05	AIR-CORE COIL			
L15			L34-4520-05	AIR-CORE COIL			
L16			L40-2275-92	SMALL FIXED INDUCTOR(22NH)			
L100,101			L40-5685-34	SMALL FIXED INDUCTOR(560NH)			
L102			L34-4459-05	COIL			
L200			L34-4595-05	COIL			
L201			L39-1421-05	TOROIDAL COIL			
L202			L40-1585-92	SMALL FIXED INDUCTOR(150NH)			
L203			L40-4775-92	SMALL FIXED INDUCTOR(47NH)			
L204			L34-4506-15	COIL			

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Ref. No.	Address	New parts	Parts No.	Description	Destination
L205,206			L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
L207			L34-4506-15	COIL	
L209			L34-4506-15	COIL	
L210			L40-4775-92	SMALL FIXED INDUCTOR(47NH)	
L211			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L213			L40-1585-92	SMALL FIXED INDUCTOR(150NH)	
L214			L40-1085-54	SMALL FIXED INDUCTOR(100NH)	
L215			L40-8271-34	SMALL FIXED INDUCTOR(82NH)	
L216,217			L40-1095-34	SMALL FIXED INDUCTOR(1UH)	
L219,220			L40-4775-92	SMALL FIXED INDUCTOR(47NH)	
L221			L40-6875-92	SMALL FIXED INDUCTOR(68NH)	
L222			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	
L223			L40-5675-54	SMALL FIXED INDUCTOR(56NH)	
L300			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
L301			L40-3975-92	SMALL FIXED INDUCTOR(39NH)	
L302			L40-6865-92	SMALL FIXED INDUCTOR(6.8NH)	
L303			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
L304			L40-6865-92	SMALL FIXED INDUCTOR(6.8NH)	
L305			L40-2275-92	SMALL FIXED INDUCTOR(22NH)	
L306			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L307			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	
L308			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	
L309			L40-1575-34	SMALL FIXED INDUCTOR(15NH)	
L310			L34-0742-05	AIR-CORE COIL	
L311			L34-1239-05	AIR-CORE COIL	
L312			L34-4617-15	AIR-CORE COIL	
L313,314			L34-1039-05	AIR-CORE COIL	
L315			L34-1228-05	AIR-CORE COIL	
L316			L34-1052-05	AIR-CORE COIL	
L317			L40-1875-54	SMALL FIXED INDUCTOR(18NH)	
L318,319			L34-4617-15	AIR-CORE COIL	
L400			L40-1095-34	SMALL FIXED INDUCTOR(1UH)	
L401			L34-4459-05	COIL	
L500			L34-4596-05	COIL	
L501			L40-1091-86	SMALL FIXED INDUCTOR(1.0U)	
L502			L40-6865-92	SMALL FIXED INDUCTOR(6.8NH)	
L503			L39-1421-05	TOROIDAL COIL	
L504			L40-3963-92	SMALL FIXED INDUCTOR(3.9NH)	
L505			L40-1563-92	SMALL FIXED INDUCTOR(1.5NH)	
L508			L79-1526-05	FILTER MODULE	
L509			L40-3975-92	SMALL FIXED INDUCTOR(39NH)	
L510			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	
L511			L40-8275-92	SMALL FIXED INDUCTOR(82NH)	
L512			L40-4763-92	SMALL FIXED INDUCTOR(4.7NH)	
L513			L40-2775-92	SMALL FIXED INDUCTOR(27NH)	
L514			L40-2285-92	SMALL FIXED INDUCTOR(220NH)	
L515			L40-1075-92	SMALL FIXED INDUCTOR(10NH)	
L516			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L517			L79-1575-05	FILTER MODULE	
L518,519			L40-1875-92	SMALL FIXED INDUCTOR(18NH)	
L520			L40-2785-92	SMALL FIXED INDUCTOR(270NH)	
L521			L40-1275-92	SMALL FIXED INDUCTOR(12NH)	
L522,523			L40-6875-34	SMALL FIXED INDUCTOR(68NH)	
L524			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L525			L40-1575-92	SMALL FIXED INDUCTOR(15NH)	
L526			L40-1085-92	SMALL FIXED INDUCTOR(100NH)	
L527,528			L40-5675-92	SMALL FIXED INDUCTOR(56NH)	
L529,530			L40-3975-92	SMALL FIXED INDUCTOR(39NH)	
L531,532			L40-1075-92	SMALL FIXED INDUCTOR(10NH)	
L602,603			L92-0131-05	CHIP FERRITE	

Ref. No.	Address	New parts	Parts No.	Description			Destination
X1			L77-1831-05	CRYSTAL RESONATOR(12.8MHZ)			
X300			L77-1831-05	CRYSTAL RESONATOR(12.8MHZ)			
X400			L77-1478-05	CRYSTAL RESONATOR(45.504711M)			
X600			L77-1814-05	CRYSTAL RESONATOR(11.0592MHZ)			
X700			L78-0459-05	RESONATOR(4.19MHZ)			
XF100			L71-0491-15	MCF(38.85MHZ)			
XF400			L71-0409-15	MCF(45.050M)			
R1			RK73GB1J224J	CHIP R	220K	J 1/16W	
R2			RK73GB1J473J	CHIP R	47K	J 1/16W	
R3			RK73GB1J471J	CHIP R	470	J 1/16W	
R4			RK73GB1J332J	CHIP R	3.3K	J 1/16W	
R5			RK73GB1J220J	CHIP R	22	J 1/16W	
R6			RK73GB1J223J	CHIP R	22K	J 1/16W	
R7 -9			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R10			RK73GB1J223J	CHIP R	22K	J 1/16W	
R11			RK73GB1J103J	CHIP R	10K	J 1/16W	
R12			RK73GB1J682J	CHIP R	6.8K	J 1/16W	
R13			RK73GB1J332J	CHIP R	3.3K	J 1/16W	
R14			RK73GB1J101J	CHIP R	100	J 1/16W	
R15			RK73GB1J122J	CHIP R	1.2K	J 1/16W	
R16			RK73GB1J101J	CHIP R	100	J 1/16W	
R17			RK73GB1J471J	CHIP R	470	J 1/16W	
R18			RK73GB1J152J	CHIP R	1.5K	J 1/16W	
R19			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R21			RK73GB1J224J	CHIP R	220K	J 1/16W	
R22 ,23			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R24			RK73GB1J332J	CHIP R	3.3K	J 1/16W	
R25			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R26			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R27			RK73GB1J101J	CHIP R	100	J 1/16W	
R28			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R31			RK73GB1J470J	CHIP R	47	J 1/16W	
R32			RK73GB1J473J	CHIP R	47K	J 1/16W	
R36			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R37 ,38			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R39			RK73GB1J101J	CHIP R	100	J 1/16W	
R40			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R41			RK73GB1J154J	CHIP R	150K	J 1/16W	
R42 -44			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R45			RK73GB1J822J	CHIP R	8.2K	J 1/16W	
R46			RK73GB1J100J	CHIP R	10	J 1/16W	
R47			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R48			RK73GB1J560J	CHIP R	56	J 1/16W	
R49			RK73GB1J470J	CHIP R	47	J 1/16W	
R50			RK73GB1J152J	CHIP R	1.5K	J 1/16W	
R51			RK73FB2A100J	CHIP R	10	J 1/10W	
R52			R92-0685-05	CHIP R	22	J 1/2W	
R54			RK73FB2A220J	CHIP R	22	J 1/10W	
R55			R92-0670-05	CHIP R	0 OHM		
R57			R92-1213-05	CHIP R	100	J 1/2W	
R58			RK73GB1J103J	CHIP R	10K	J 1/16W	
R60 ,61			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R62			RK73GB1J103J	CHIP R	10K	J 1/16W	
R63			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R64 ,65			RK73GB1J104J	CHIP R	100K	J 1/16W	
R67			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R68			RK73GB1J184J	CHIP R	180K	J 1/16W	
R102			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R106			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R107			RK73GB1J474J	CHIP R	470K	J 1/16W	

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Ref. No.	Address	New parts	Parts No.	Description				Destination
R109			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R111			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R112			RK73GB1J101J	CHIP R	100	J	1/16W	
R114			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R116			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R117			RK73GH1J153D	CHIP R	15K	D	1/16W	
R118			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R119			RK73GB1J474J	CHIP R	470K	J	1/16W	
R120			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R121			RK73GB1J184J	CHIP R	180K	J	1/16W	
R122			RK73GB1J332J	CHIP R	3.3K	J	1/16W	
R123			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R124			RK73GB1J184J	CHIP R	180K	J	1/16W	
R125			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R126			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R127			RK73GH1J153D	CHIP R	15K	D	1/16W	
R128			RK73GB1J474J	CHIP R	470K	J	1/16W	
R129			RK73GB1J224J	CHIP R	220K	J	1/16W	
R130			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R131			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R132			RK73GB1J564J	CHIP R	560K	J	1/16W	
R133			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R134			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R135			RK73GB1J182J	CHIP R	1.8K	J	1/16W	
R136			RK73GB1J473J	CHIP R	47K	J	1/16W	
R137			RK73GB1J103J	CHIP R	10K	J	1/16W	
R138			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R139			RK73GB1J474J	CHIP R	470K	J	1/16W	
R140			RK73GB1J471J	CHIP R	470	J	1/16W	
R141			RK73GB1J104J	CHIP R	100K	J	1/16W	
R142			RK73GB1J392J	CHIP R	3.9K	J	1/16W	
R143			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R145			RK73GB1J104J	CHIP R	100K	J	1/16W	
R146			RK73GB1J224J	CHIP R	220K	J	1/16W	
R147			RK73GB1J103J	CHIP R	10K	J	1/16W	
R148			RK73GB1J274J	CHIP R	270K	J	1/16W	
R149			RK73GB1J332J	CHIP R	3.3K	J	1/16W	
R150			RK73GB1J392J	CHIP R	3.9K	J	1/16W	
R151			RK73GB1J333J	CHIP R	33K	J	1/16W	
R152			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R153,154			RK73GB1J473J	CHIP R	47K	J	1/16W	
R155			RK73GB1J101J	CHIP R	100	J	1/16W	
R156			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R158			RK73GB1J471J	CHIP R	470	J	1/16W	
R163			RK73GB1J180J	CHIP R	18	J	1/16W	
R165			RK73GB1J563J	CHIP R	56K	J	1/16W	
R166			RK73GB1J223J	CHIP R	22K	J	1/16W	
R167			RK73GB1J473J	CHIP R	47K	J	1/16W	
R168			RK73GB1J151J	CHIP R	150	J	1/16W	
R169			RK73GB1J332J	CHIP R	3.3K	J	1/16W	
R170			RK73GB1J274J	CHIP R	270K	J	1/16W	
R200			RK73GB1J101J	CHIP R	100	J	1/16W	
R201			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R202			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R203,204			RK73GB1J221J	CHIP R	220	J	1/16W	
R205			RK73GB1J101J	CHIP R	100	J	1/16W	
R206			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R207			RK73GB1J104J	CHIP R	100K	J	1/16W	
R208,209			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R212			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R215			RK73GB1J184J	CHIP R	180K	J	1/16W	
R216			RK73GB1J471J	CHIP R	470	J	1/16W	
R217			RK73GB1J101J	CHIP R	100	J	1/16W	
R220			RK73GB1J683J	CHIP R	68K	J	1/16W	
R221			RK73GB1J104J	CHIP R	100K	J	1/16W	
R226			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R227			RK73GB1J104J	CHIP R	100K	J	1/16W	
R228			RK73GB1J221J	CHIP R	220	J	1/16W	
R229			RK73GB1J473J	CHIP R	47K	J	1/16W	
R230			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R231			RK73GB1J104J	CHIP R	100K	J	1/16W	
R232			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R233			RK73GB1J471J	CHIP R	470	J	1/16W	
R234,235			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R236			RK73GB1J221J	CHIP R	220	J	1/16W	
R237			RK73GB1J103J	CHIP R	10K	J	1/16W	
R238			RK73GB1J221J	CHIP R	220	J	1/16W	
R239			RK73GB1J101J	CHIP R	100	J	1/16W	
R240			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R242			RK73GB1J683J	CHIP R	68K	J	1/16W	
R244			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R247			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R249			R92-1213-05	CHIP R	100	J	1/2W	
R250			RK73FB2A220J	CHIP R	22	J	1/10W	
R251			RK73GB1J103J	CHIP R	10K	J	1/16W	
R252			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R253			RK73GB1J683J	CHIP R	68K	J	1/16W	
R254-256			RK73GB1J103J	CHIP R	10K	J	1/16W	
R257,258			RK73GB1J473J	CHIP R	47K	J	1/16W	
R259			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R260			RK73GB1J470J	CHIP R	47	J	1/16W	
R261			RK73GB1J184J	CHIP R	180K	J	1/16W	
R262,263			RK73GB1J103J	CHIP R	10K	J	1/16W	
R264			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R265			RK73GB1J473J	CHIP R	47K	J	1/16W	
R266			RK73GB1J222J	CHIP R	2.2K	J	1/16W	
R267			RK73GB1J104J	CHIP R	100K	J	1/16W	
R268-270			R92-1252-05	CHIP R	0 OHM	J	1/16W	
R271			RK73GB1J271J	CHIP R	270	J	1/16W	
R300			RK73GB1J104J	CHIP R	100K	J	1/16W	
R301			RK73GB1J333J	CHIP R	33K	J	1/16W	
R302			RK73GB1J393J	CHIP R	39K	J	1/16W	
R303,304			RK73GB1J473J	CHIP R	47K	J	1/16W	
R305			RK73GB1J224J	CHIP R	220K	J	1/16W	
R306			RK73GB1J123J	CHIP R	12K	J	1/16W	
R307			RK73GB1J473J	CHIP R	47K	J	1/16W	
R310			RK73GB1J220J	CHIP R	22	J	1/16W	
R311			RK73GB1J473J	CHIP R	47K	J	1/16W	
R312			RK73GB1J471J	CHIP R	470	J	1/16W	
R313-315			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R316-318			RK73GB1J103J	CHIP R	10K	J	1/16W	
R319			RK73GB1J472J	CHIP R	4.7K	J	1/16W	
R320			RK73GB1J101J	CHIP R	100	J	1/16W	
R321,322			RK73GB1J152J	CHIP R	1.5K	J	1/16W	
R323			RK73GB1J391J	CHIP R	390	J	1/16W	
R324			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R325			RK73GB1J474J	CHIP R	470K	J	1/16W	
R326			RK73GB1J102J	CHIP R	1.0K	J	1/16W	
R327			RK73GB1J104J	CHIP R	100K	J	1/16W	
R329			RK73GB1J332J	CHIP R	3.3K	J	1/16W	

PARTS LIST

TX-RX UNIT (X57-5860-12)

Ref. No.	Address	New parts	Parts No.	Description			Destination
R330			RK73GB1J470J	CHIP R	47	J 1/16W	
R331			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R332			RK73GB1J182J	CHIP R	1.8K	J 1/16W	
R333			RK73GB1J822J	CHIP R	8.2K	J 1/16W	
R334			RK73GB1J271J	CHIP R	270	J 1/16W	
R335			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R336			RK73GB1J101J	CHIP R	100	J 1/16W	
R337			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R338			RK73GB1J224J	CHIP R	220K	J 1/16W	
R339			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R340			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R341			RK73GB1J101J	CHIP R	100	J 1/16W	
R342-344			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R345			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R346			RK73GB1J122J	CHIP R	1.2K	J 1/16W	
R347			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R348			RK73GB1J822J	CHIP R	8.2K	J 1/16W	
R349			RK73GB1J101J	CHIP R	100	J 1/16W	
R350			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R351			RK73GB1J470J	CHIP R	47	J 1/16W	
R352			RK73GB1J101J	CHIP R	100	J 1/16W	
R353			RK73GB1J334J	CHIP R	330K	J 1/16W	
R354			RK73GB1J471J	CHIP R	470	J 1/16W	
R355			RK73GB1J221J	CHIP R	220	J 1/16W	
R356			RK73GB1J4R7J	CHIP R	4.7	J 1/16W	
R357			RK73GB1J100J	CHIP R	10	J 1/16W	
R358			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R359			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R360			RK73GB1J331J	CHIP R	330	J 1/16W	
R361			RK73GB1J152J	CHIP R	1.5K	J 1/16W	
R363			R92-1217-05	CHIP R	0 OHM		
R364			R92-0670-05	CHIP R	0 OHM		
R366			R92-0670-05	CHIP R	0 OHM		
R368			R92-1213-05	CHIP R	100	J 1/2W	
R369,370			RK73GB1J103J	CHIP R	10K	J 1/16W	
R371			RK73GB1J560J	CHIP R	56	J 1/16W	
R379			RK73GB1J221J	CHIP R	220	J 1/16W	
R380			RK73GB1J223J	CHIP R	22K	J 1/16W	
R381			RK73GB1J152J	CHIP R	1.5K	J 1/16W	
R382			RK73GB1J331J	CHIP R	330	J 1/16W	
R383			RK73GB1J474J	CHIP R	470K	J 1/16W	
R384			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R385,386			RK73GB1J104J	CHIP R	100K	J 1/16W	
R387			RK73GB1J124J	CHIP R	120K	J 1/16W	
R388			RK73GB1J274J	CHIP R	270K	J 1/16W	
R390			RK73GB1J184J	CHIP R	180K	J 1/16W	
R391			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R401			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R406			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R408			RK73GB1J103J	CHIP R	10K	J 1/16W	
R409			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R410,411			RK73GB1J184J	CHIP R	180K	J 1/16W	
R413			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R414			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R415			RK73GB1J223J	CHIP R	22K	J 1/16W	
R417			RK73GB1J474J	CHIP R	470K	J 1/16W	
R418			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R419			RK73GB1J392J	CHIP R	3.9K	J 1/16W	
R420			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R422			RK73GB1J103J	CHIP R	10K	J 1/16W	
R423			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R425			RK73GB1J274J	CHIP R	270K	J 1/16W	
R426			RK73GB1J471J	CHIP R	470	J 1/16W	
R427			RK73GB1J392J	CHIP R	3.9K	J 1/16W	
R428			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R429,430			RK73GB1J473J	CHIP R	47K	J 1/16W	
R433			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R434			RK73GB1J104J	CHIP R	100K	J 1/16W	
R438			RK73GB1J681J	CHIP R	680	J 1/16W	
R500,501			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R502			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R503			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R504			RK73GB1J101J	CHIP R	100	J 1/16W	
R505			RK73GB1J392J	CHIP R	3.9K	J 1/16W	
R506			RK73GB1J101J	CHIP R	100	J 1/16W	
R507			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R508			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R509,510			RK73GB1J221J	CHIP R	220	J 1/16W	
R511			RK73GB1J151J	CHIP R	150	J 1/16W	
R512			RK73GB1J101J	CHIP R	100	J 1/16W	
R513,514			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R516			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R517			RK73GB1J221J	CHIP R	220	J 1/16W	
R518			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R519			RK73GB1J221J	CHIP R	220	J 1/16W	
R520			RK73GB1J101J	CHIP R	100	J 1/16W	
R521			RK73GB1J471J	CHIP R	470	J 1/16W	
R522			RK73GB1J220J	CHIP R	22	J 1/16W	
R523			RK73GB1J334J	CHIP R	330K	J 1/16W	
R524,525			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R526			RK73GB1J101J	CHIP R	100	J 1/16W	
R527			RK73GB1J470J	CHIP R	47	J 1/16W	
R528			RK73GB1J101J	CHIP R	100	J 1/16W	
R529			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R530			RK73GB1J101J	CHIP R	100	J 1/16W	
R531-533			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R535			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R537			RK73GB1J221J	CHIP R	220	J 1/16W	
R538			RK73GB1J101J	CHIP R	100	J 1/16W	
R539			RK73GB1J823J	CHIP R	82K	J 1/16W	
R540			RK73GB1J184J	CHIP R	180K	J 1/16W	
R543			RK73GB1J222J	CHIP R	2.2K	J 1/16W	
R544			RK73GB1J472J	CHIP R	4.7K	J 1/16W	
R545			RK73GB1J103J	CHIP R	10K	J 1/16W	
R546			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R547			RK73GB1J184J	CHIP R	180K	J 1/16W	
R548			RK73GB1J823J	CHIP R	82K	J 1/16W	
R549			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R550			RK73GB1J332J	CHIP R	3.3K	J 1/16W	
R551			RK73GB1J220J	CHIP R	22	J 1/16W	
R552			RK73GB1J104J	CHIP R	100K	J 1/16W	
R553			RK73GB1J101J	CHIP R	100	J 1/16W	
R554			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R555			RK73GB1J822J	CHIP R	8.2K	J 1/16W	
R604-607			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R635			RK73GB1J474J	CHIP R	470K	J 1/16W	
R636			RK73GB1J223J	CHIP R	22K	J 1/16W	
R642,643			RK73GB1J473J	CHIP R	47K	J 1/16W	
R644			RK73GB1J474J	CHIP R	470K	J 1/16W	
R645			RK73GB1J563J	CHIP R	56K	J 1/16W	

TM-V708A

TX-RX UNIT (X57-5860-12)

Ref. No.	Address	New parts	Parts No.	Description			Destination	Ref. No.	Address	New parts	Parts No.	Description			Destination
R646			RK73GB1J223J	CHIP R	22K	J 1/16W		R807			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R647			RK73GB1J104J	CHIP R	100K	J 1/16W		R808			RK73GH1J153D	CHIP R	15K	D 1/16W	
R648			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R810			RK73GB1J330J	CHIP R	33	J 1/16W	
R650-655			RK73GB1J473J	CHIP R	47K	J 1/16W		R811			RK73GH1J153D	CHIP R	15K	D 1/16W	
R658			R92-1252-05	CHIP R	0 OHM	J 1/16W		R812			RK73GB1J473J	CHIP R	47K	J 1/16W	
R659			R92-0670-05	CHIP R	0 OHM			R813			RK73GB1J474J	CHIP R	470K	J 1/16W	
R661,662			R92-0670-05	CHIP R	0 OHM			R814			RK73GB1J223J	CHIP R	22K	J 1/16W	
R663			RK73GB1J103J	CHIP R	10K	J 1/16W		R815			RK73GB1J821J	CHIP R	820	J 1/16W	
R664,665			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R816			RK73GB1J183J	CHIP R	18K	J 1/16W	
R666			RK73GB1J473J	CHIP R	47K	J 1/16W		R817			RK73GB1J333J	CHIP R	33K	J 1/16W	
R668			RK73GB1J473J	CHIP R	47K	J 1/16W		R819			RK73GB1J104J	CHIP R	100K	J 1/16W	
R669			RK73GB1J472J	CHIP R	4.7K	J 1/16W		R821			RK73GB1J223J	CHIP R	22K	J 1/16W	
R670			R92-1252-05	CHIP R	0 OHM	J 1/16W		R822			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R672,673			RK73GB1J474J	CHIP R	470K	J 1/16W		R823			RK73GB1J471J	CHIP R	470	J 1/16W	
R675			R92-0670-05	CHIP R	0 OHM			R824			RK73GH1J153D	CHIP R	15K	D 1/16W	
R676			RK73GB1J473J	CHIP R	47K	J 1/16W		R825			RK73GH1J163D	CHIP R	16K	D 1/16W	
R680,681			R92-1252-05	CHIP R	0 OHM	J 1/16W		R826			RK73GB1J754J	CHIP R	750K	J 1/16W	
R683-687			RK73GB1J473J	CHIP R	47K	J 1/16W		R827			RK73GH1J153D	CHIP R	15K	D 1/16W	
R688			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R828			RK73GB1J822J	CHIP R	8.2K	J 1/16W	
R690			R92-1252-05	CHIP R	0 OHM	J 1/16W		R829			RK73GB1J152J	CHIP R	1.5K	J 1/16W	
R700-702			RK73GB1J104J	CHIP R	100K	J 1/16W		R830			RK73GB1J274J	CHIP R	270K	J 1/16W	
R703,704			RK73GB1J223J	CHIP R	22K	J 1/16W		R831			RK73GB1J391J	CHIP R	390	J 1/16W	
R705			RK73GB1J474J	CHIP R	470K	J 1/16W		R832			RK73GB1J473J	CHIP R	47K	J 1/16W	
R706			RK73GB1J104J	CHIP R	100K	J 1/16W		R834			RK73GB1J473J	CHIP R	47K	J 1/16W	
R707			RK73GB1J394J	CHIP R	390K	J 1/16W		R835			RK73GB1J185J	CHIP R	1.8M	J 1/16W	
R708			RK73GB1J823J	CHIP R	82K	J 1/16W		R836			RK73GB1J103J	CHIP R	10K	J 1/16W	
R709-711			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R837			RK73GB1J473J	CHIP R	47K	J 1/16W	
R712			RK73GB1J824J	CHIP R	820K	J 1/16W		R839			RK73GB1J473J	CHIP R	47K	J 1/16W	
R713,714			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R840			RK73GB1J185J	CHIP R	1.8M	J 1/16W	
R715			RK73GB1J184J	CHIP R	180K	J 1/16W		R841			RK73GB1J103J	CHIP R	10K	J 1/16W	
R716			RK73GB1J474J	CHIP R	470K	J 1/16W		R842			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R717			RK73GB1J184J	CHIP R	180K	J 1/16W		R843			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R718			RK73GB1J223J	CHIP R	22K	J 1/16W		R846			RK73GB1J224J	CHIP R	220K	J 1/16W	
R719			RK73GB1J224J	CHIP R	220K	J 1/16W		R849,850			RK73GB1J224J	CHIP R	220K	J 1/16W	
R720			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R851-853			RK73GB1J102J	CHIP R	1.0K	J 1/16W	
R721			RK73GB1J332J	CHIP R	3.3K	J 1/16W		R854			RK73GB1J122J	CHIP R	1.2K	J 1/16W	
R722			RK73GB1J103J	CHIP R	10K	J 1/16W		R855			RK73GB1J821J	CHIP R	820	J 1/16W	
R723			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R856			RK73GB1J683J	CHIP R	68K	J 1/16W	
R724			RK73GB1J472J	CHIP R	4.7K	J 1/16W		R857,858			RK73GB1J223J	CHIP R	22K	J 1/16W	
R725			RK73GB1J224J	CHIP R	220K	J 1/16W		R859			RK73GB1J103J	CHIP R	10K	J 1/16W	
R726			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R860			RK73GB1J223J	CHIP R	22K	J 1/16W	
R727			RK73GB1J222J	CHIP R	2.2K	J 1/16W		R861			RK73GB1J473J	CHIP R	47K	J 1/16W	
R728,729			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R862,863			RK73GB1J103J	CHIP R	10K	J 1/16W	
R730			RK73GB1J154J	CHIP R	150K	J 1/16W		R864,865			RK73GB1J473J	CHIP R	47K	J 1/16W	
R731			RK73GB1J104J	CHIP R	100K	J 1/16W		R866			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R732			RK73GB1J224J	CHIP R	220K	J 1/16W		R867,868			RK73GB1J4R7J	CHIP R	4.7	J 1/16W	
R733			R92-1252-05	CHIP R	0 OHM	J 1/16W		R869			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R734			RK73GB1J100J	CHIP R	10	J 1/16W		R870			RK73GB1J474J	CHIP R	470K	J 1/16W	
R735			RK73GB1J103J	CHIP R	10K	J 1/16W		R871			RK73GB1J473J	CHIP R	47K	J 1/16W	
R736			RK73GB1J474J	CHIP R	470K	J 1/16W		R872			RK73GB1J471J	CHIP R	470	J 1/16W	
R737			RK73GB1J104J	CHIP R	100K	J 1/16W		R873			RK73GB1J473J	CHIP R	47K	J 1/16W	
R738			R92-1252-05	CHIP R	0 OHM	J 1/16W		R874			R92-1252-05	CHIP R	0 OHM	J 1/16W	
R740-743			RK73GB1J103J	CHIP R	10K	J 1/16W		R875			RK73GB1J682J	CHIP R	6.8K	J 1/16W	
R744-747			RK73GB1J104J	CHIP R	100K	J 1/16W		R876,877			RK73GB1J103J	CHIP R	10K	J 1/16W	
R748			RK73GB1J472J	CHIP R	4.7K	J 1/16W		R878			RK73GB1J473J	CHIP R	47K	J 1/16W	
R749			RK73GB1J474J	CHIP R	470K	J 1/16W		R880			RK73GB1J103J	CHIP R	10K	J 1/16W	
R750			RK73GB1J333J	CHIP R	33K	J 1/16W		R881			RK73GB1J223J	CHIP R	22K	J 1/16W	
R800-802			R92-1252-05	CHIP R	0 OHM	J 1/16W		R882			RK73GB1J473J	CHIP R	47K	J 1/16W	
R803-805			RK73GB1J102J	CHIP R	1.0K	J 1/16W		R883			RK73GB1J223J	CHIP R	22K	J 1/16W	
R806			RK73GB1J473J	CHIP R	47K	J 1/16W		R884,885			R92-1252-05	CHIP R	0 OHM	J 1/16W	

PARTS LIST

TX-RX UNIT (X57-5860-12)

Ref. No.	Address	New parts	Parts No.	Description	Destination
R887			R92-1252-05	CHIP R 0 OHM J 1/16W	
R889			R92-1252-05	CHIP R 0 OHM J 1/16W	
R890,891			RK73GB1J683J	CHIP R 68K J 1/16W	
R892			RK73GB1J223J	CHIP R 22K J 1/16W	
R900			R92-0685-05	CHIP R 22 J 1/2W	
R902,903			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R904-906			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R909-911			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R912			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R913			RK73GB1J103J	CHIP R 10K J 1/16W	
R914			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R915			RK73GB1J103J	CHIP R 10K J 1/16W	
R916,917			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R918,919			RK73GB1J103J	CHIP R 10K J 1/16W	
R920			R92-1276-05	CHIP R 820 J 1/4W	
R921,922			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R926			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R927			RK73GH1J153D	CHIP R 15K D 1/16W	
R928			R92-1252-05	CHIP R 0 OHM J 1/16W	
S600			S70-0446-05	TACT SWITCH	
D1 ,2			HVC350B	VARIABLE CAPACITANCE DIODE	
D3			MA2S111	DIODE	
D4			DA221	DIODE	
D5			MA2S111	DIODE	
D6			DAN222	DIODE	
D7			DAN235E	DIODE	
D9			DAN235E	DIODE	
D11			HSC277	DIODE	
D12			1SS355	DIODE	
D13			DA221	DIODE	
D14 ,15			MA4PH633	DIODE	
D16			XB15A709	DIODE	
D17			HVU131	DIODE	
D18 ,19			MA742	DIODE	
D102			RB706F-40	DIODE	
D200,201			HSC277	DIODE	
D202			HVC350B	VARIABLE CAPACITANCE DIODE	
D203,204			HSC277	DIODE	
D205,206			HVC350B	VARIABLE CAPACITANCE DIODE	
D207-209			HSC277	DIODE	
D210,211			MA742	DIODE	
D213,214			MA2S111	DIODE	
D216			HVC350B	VARIABLE CAPACITANCE DIODE	
D217			MA2S111	DIODE	
D300,301			HVC350B	VARIABLE CAPACITANCE DIODE	
D302			MA2S111	DIODE	
D303			DA221	DIODE	
D304			MA2S111	DIODE	
D305,306			HSC277	DIODE	
D307			DAN235E	DIODE	
D309			DAN222	DIODE	
D310			DAN235E	DIODE	
D312			DA221	DIODE	
D313			HVU131	DIODE	
D314			MA4PH633	DIODE	
D315			HVU131	DIODE	
D316			XB15A709	DIODE	
D317,318			MA742	DIODE	
D500			DAN235E	DIODE	
D502			HSC277	DIODE	

Ref. No.	Address	New parts	Parts No.	Description	Destination
D503			DAN235E	DIODE	
D505			DAN235E	DIODE	
D507			HSC277	DIODE	
D509,510			HVC131	DIODE	
D602			MA2S111	DIODE	
D605			MA2S111	DIODE	
D700			MA2S111	DIODE	
D701			1SS355	DIODE	
D702,703			DA221	DIODE	
D800			1SS355	DIODE	
D801			DAN222	DIODE	
D803			DA221	DIODE	
D900			DAN222	DIODE	
D902			UDZS10B	ZENER DIODE	
D903		*	UDZS18B	ZENER DIODE	
D904,905			DSM3MA1	DIODE	
IC1			MB1511PFV-GBND	MOS-IC	
IC2			KCH38	HYBRID IC	
IC3			M67746	HYBRID IC	
IC4			M57788MR-24	HYBRID IC	
IC100			TA31136FN	MOS-IC	
IC101			TC4W53FU	MOS-IC	
IC200			TA75S01F	MOS-IC	
IC300			NJM2904V	MOS-IC	
IC301			MB1511PFV-GBND	MOS-IC	
IC302			KCH28	HYBRID IC	
IC303			UPB1509GV	BI-POLAR IC	
IC304			TC7S66FU	MOS-IC	
IC400			TA31136FN	MOS-IC	
IC501			TA4002F	BI-POLAR IC	
IC601			PST9130NR	MOS-IC	
IC602			AT25128A10SI27	ROM IC	
IC603			NJM78L05UA	BI-POLAR IC	
IC604		*	78F4218AGJZXA	MICROPROCESSOR IC	
IC700			LC73881M	MOS-IC	
IC701			NJM2904V	MOS-IC	
IC702			BU8241FS	MOS-IC	
IC703			TC74HC4050AFT	MOS-IC	
IC800			TC75S59F	MOS-IC	
IC801			NJM2100V	MOS-IC	
IC802			TA75S01F	MOS-IC	
IC803			BU4066BCFV	MOS-IC	
IC804			M62364FP	MOS-IC	
IC805			NJM2904V	MOS-IC	
IC806			LA4446	BI-POLAR IC	
IC807,808			TC4W53FU	MOS-IC	
IC900,901			BU2099FV	MOS-IC	
IC903			TA7808S	MOS-IC	
IC904			TA7805F	MOS-IC	
Q1			2SA1774(S)	TRANSISTOR	
Q2			2SC4617(R)	TRANSISTOR	
Q3			2SC5108(Y)	TRANSISTOR	
Q4			2SC4617(R)	TRANSISTOR	
Q6 ,7			2SC5108(Y)	TRANSISTOR	
Q8			2SC3357	TRANSISTOR	
Q9			2SC2954	TRANSISTOR	
Q10			2SJ484	FET	
Q11			DTC114EE	DIGITAL TRANSISTOR	
Q102			2SC4649(N,P)	TRANSISTOR	
Q103			UMC4N	TRANSISTOR	

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PARTS LIST

TX-RX UNIT (X57-5860-12)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
Q104			DTA114EE	DIGITAL TRANSISTOR							
Q105-108			2SC4617(R)	TRANSISTOR							
Q110,111			2SC4617(R)	TRANSISTOR							
Q112			2SC5108(Y)	TRANSISTOR							
Q113			2SC4617(R)	TRANSISTOR							
Q200,201			2SK302(GR)	FET							
Q202,203			3SK239A	FET							
Q204			2SK1824	FET							
Q205			3SK239A	FET							
Q207			2SK1824	FET							
Q208			2SB1565(E,F)	TRANSISTOR							
Q209			2SC4617(R)	TRANSISTOR							
Q210			2SC5066(O)	TRANSISTOR							
Q300			2SA1774(S)	TRANSISTOR							
Q301			2SC4617(R)	TRANSISTOR							
Q302			2SC5108(Y)	TRANSISTOR							
Q303			2SC4617(R)	TRANSISTOR							
Q304			2SC5108(Y)	TRANSISTOR							
Q305			2SC5066(O)	TRANSISTOR							
Q306			UMC4N	TRANSISTOR							
Q307			2SC4093(R27)	TRANSISTOR							
Q308			2SC5108(Y)	TRANSISTOR							
Q309			2SC3357	TRANSISTOR							
Q310			2SC2954	TRANSISTOR							
Q402			2SC4617(R)	TRANSISTOR							
Q404			UMC4N	TRANSISTOR							
Q405			2SC4617(R)	TRANSISTOR							
Q406			2SC5108(Y)	TRANSISTOR							
Q500			2SC4997	TRANSISTOR							
Q501,502			2SK302(GR)	FET							
Q503			3SK239A	FET							
Q505			2SK1875(V)	FET							
Q506			2SC5108(Y)	TRANSISTOR							
Q507,508			3SK239A	FET							
Q509			2SC5066(O)	TRANSISTOR							
Q601			2SC4617(R)	TRANSISTOR							
Q603			DTA144EE	DIGITAL TRANSISTOR							
Q604			2SK1824	FET							
Q700,701			2SC4617(R)	TRANSISTOR							
Q702			2SA1774(S)	TRANSISTOR							
Q800			2SC4919	TRANSISTOR							
Q801,802			2SC4617(S)	TRANSISTOR							
Q803-805			2SK1824	FET							
Q807			2SK1824	FET							
Q900			DTD143EK	DIGITAL TRANSISTOR							
Q903,904			2SB1132(Q,R)	TRANSISTOR							
Q905-909			FMA5	TRANSISTOR							
Q910			2SC4617(R)	TRANSISTOR							
Q911			2SB1132(Q,R)	TRANSISTOR							
Q912			2SB1386(R)	TRANSISTOR							
Q913,914			DTC114EE	DIGITAL TRANSISTOR							
TH1			157-153-65001	THERMISTOR							

TM-V708A

EXPLODED VIEW

A : N14-0569-04
B : N33-2606-45
C : N67-3008-46
D : N80-2010-45
E : N80-2610-45
F : N83-2608-46
G : N87-2606-46

Parts with the exploded numbers larger than 700 are not supplied.

TM-V708A

PACKING

C   D

20. Instruction Manual
(B62-1834-00)

19. Warranty card
(B46-0469-20)

55. Packing Fixture
(H12-3075-03)

64. Foot
(J02-0488-04)

69. Bracket
(J29-0663-13)

48. Cushion
(Bracket)
(G13-1757-04)

65. Holder
(J19-1526-04)

59. Protection Bag
(H25-0103-04)

76. Screw set
(N99-0382-05)

77. Screw set
(N99-2014-05)

58. Protection Bag
(H25-0085-04)

66. Bracket (Main unit)
(J29-0628-23)

80. Microphone
(T91-0636-05)

34. Fuse (15A)
(F51-0017-15)

25. Moduler Cable
(E30-3391-05)

56. Carton board
(H13-1106-24)

23. DC Cord
(E30-2111-15)

36. Fuse (20A)
(F51-0018-05)

57. Protection sheet
(H21-0766-04)

52. Packing FixtureX2
(H12-3074-12)

51. Inner Carton Case
(H02-0614-03)

70. Bracket
(J29-0664-13)

62. Protection Bag
(H25-0720-04)

63. Item Carton Case
(H52-2084-02)

Parts with the exploded numbers larger than 700 are not supplied.

ADJUSTMENT

Measuring Equipment for Adjustment

1. Digital voltmeter (D.V.M)
Input impedance: High

2. RF valve voltmeter (RF V.M)
Input impedance: 1MΩ or more, 2 pF or less Voltage range: Full scale = 10mV to 300V Measurable frequency range: up to 450MHz

3 .Frequency counter (f.counter)
Input sensitivity: About 50mV
Measurable frequency: 450MHz or more

4. DC power supply
Voltage: Variable in the range 10 to 17V
Current: 13A or more

5. Power meter
Measurement power: 60W, 30W, 10W
Impedance: 50Ω
Measurable frequency: 450MHz

6. AF valve voltmeter (AF V.M)
Input impedance: 1MΩ or more
Voltage range: Full scale = 1mV to 30V
Measurable frequency range: 50Hz to 10kHz

7. AF generator (AG)
Output frequency: 100Hz to 10kHz
Output voltage: 0.5mV to 1V

8. Line detector
Measurable frequency: 450MHz

9. Spectrum analyzer
Measurable frequency: 450MHz

10.Directional coupler

11.Oscilloscope
High sensitivity with horizontal input terminal

12. Standard signal generator (SSG)
The standard signal generator must be able to generate the 1GHz band frequencies and vary the amplitude and frequency
Output: -133dBm to greater than -13dBm

13. Dummy load (for AF)
8Ω, about 5W

14. Noise generator
The noise generator must be able to generate noise similar to ignition noise containing high-frequency components of 450MHz or more.

15. Sweep generator
The sweep generator must be able to sweep the 144 and 430MHz bands.

16. Tracking generator

17. Adjustment jig

Preparation

• Set the controls and switches to the positions listed below unless otherwise specified.

VOL control	Fully counterclockwise
SQL control	Fully counterclockwise
POWER switch	OFF
(For fixed stations) DC power supply POWER switch	OFF

UP
C8
(DC8V:100mA max.)
E
PTT

DWN
NC
MIC
ME
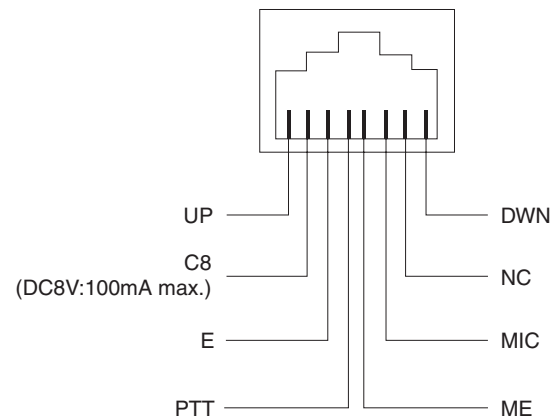
Microphone socket
(as viewed from the front of the set)

• Use an insulated rod, such as a plastic rod, for adjustment (especially for trimmers, coils, etc.).
• To protect the signal generator, never connect the microphone to the microphone socket when the receiver section is adjusted.
• Before the power cord is connected, make sure the power switch is off.
• Without specification of SSG, standard modulation is applied (MOD : 1kHz, DEV : ±3kHz, AF output: 0.63V/8Ω)
• See the instruction manual for transmit and receive operations.

TM-V708A

ADJUSTMENT

Adjustment Service Jig
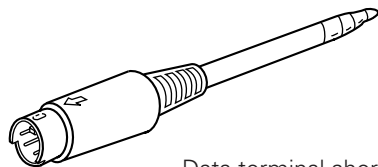
Data terminal short plug (W05-0611-00)

● Service jigs usage

⑥(SQC) ⑤(PR1)
④(PR9) ③(PKS)
E(GND)
②(DE) ①(PKD)
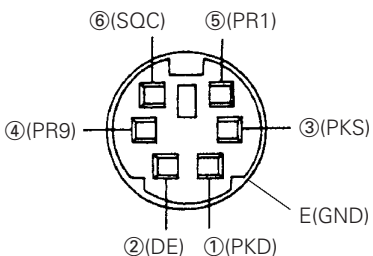
Pin assignment seen from direction B

PANEL   MIC
DATA
RESET

B
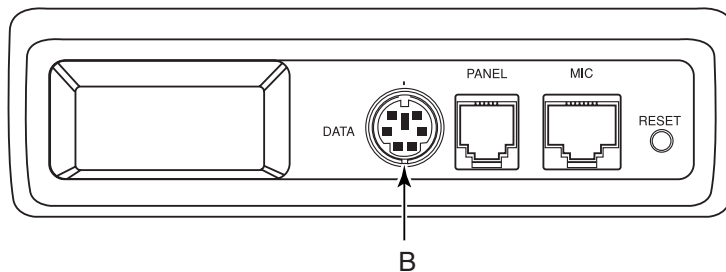
Short plug
  Terminals ③ and ⑥ are short circuited.

[Reference] ③ PKS (SEND switch for DATA terminal)
             Connect PTT output. If PKS is set to "L",
             data are sent and the microphone will be mute.
             ⑥ SQC (Squelch control output)
             This outputs squelch control output.

● Service jigs specification

Plug cable with 6P mini-DIN : Model PG-5A (cable parts No. E30-3202-05) processed like under fig.

Shield wire
E
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Blue

A →

Approx 1m

(Cut the cable at suitable length.)
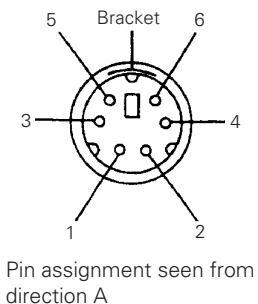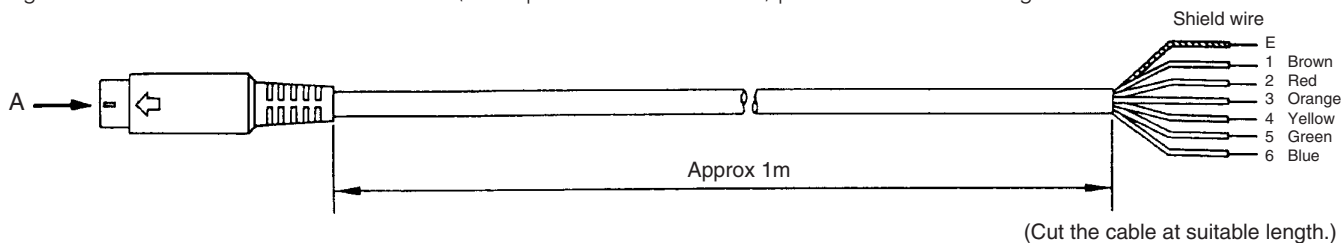
5 Bracket 6
3   4
1   2

Pin assignment seen from direction A

DIN pin No.	Color
1	Brown
2	Red
(3)	Orange
4	Yellow
5	Green
(6)	Blue
Bracket	Shield

Join these DIN pins.

Cut unnecessary wires at the bottom and wind insulation tape around top edge.

Orange wire

Short circuit (Soldering)

Blue wire
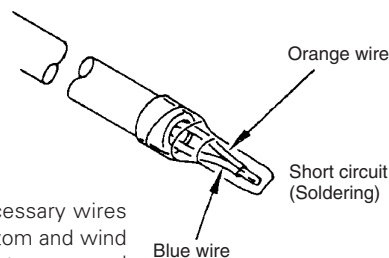
ADJUSTMENT

Parts layout
Front panel

CALL
VFO
MR
Encoder

PWR
PM
MNU

MHz F TONE REV LOW MUTE CTRL

SQL (BAND A) SQL (BAND B)

VOL/BAND SEL (BAND A) VOL/BAND SEL (BAND B)

Rear panel

ANT SP
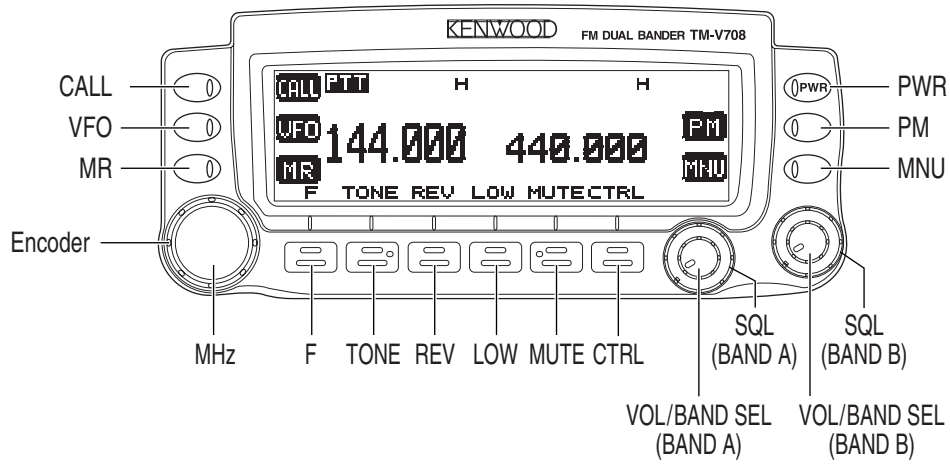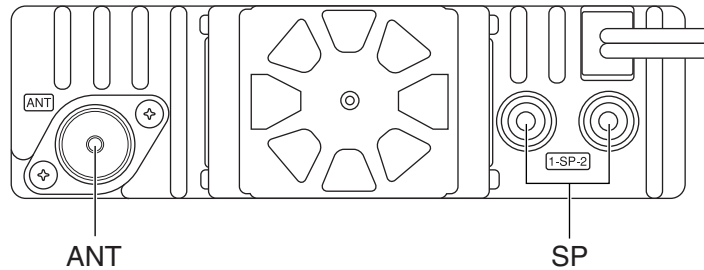
Adjustment parts layout

- TX-RX UNIT (Foil side view)
  (Unit under)

- Adjustment parts No.
  TC1 : Transmission frequency (VHF)
  TC300 : Transmission frequency (UHF)
  L204 : BPF (VHF)
  L207 : BPF(VHF)
  L209 : BPF(VHF)
  L102 : AF distortion (VHF)
  L200 : AF distortion (VHF)
  L401 : AF distortion (UHF)
  L500 : AF distortion (UHF)

- Test point
  SMV : BPF

TM-V708A
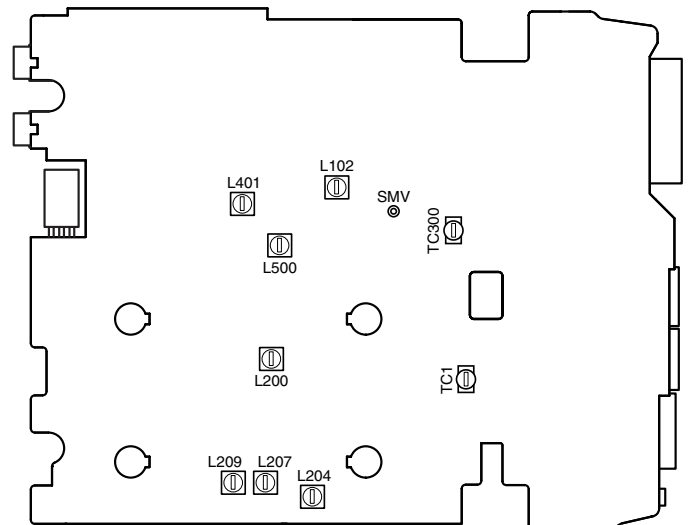
ADJUSTMENT

Adjustment mode

- This is the adjustment mode for making adjustments or setting levels.
- The following items can be adjusted or set.
  A. Squelch open sensitivity
  B. S meter (the first segment ON, all segments ON)
  C. Transmission output power (lower limit frequency, center frequency, and upper limit frequency of the band)
  D. Transmission deviation
  E. DCS modulation balance
  F. Tone deviation
  G. DCS deviation

Adjustment mode startup method
1. Turn **[PWR]** OFF and insert the adjustment plug into the data terminal of the transceiver.
2. Hold down the **[F]** and **[TONE]** keys, and turn **[PWR]** ON.
3. The transceiver will enter the adjustment mode and display the following:
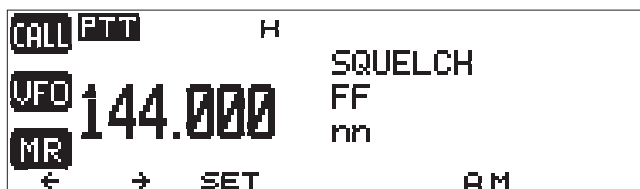
4. In adjustment mode, the desired band and frequency can be selected with **[VFO]**, **[MR]**, **[ENCODER]**, **[MHZ]**, and **[BAND SEL]**.
5. Pressing the **[⬅]** or **[➡]** key switches the adjustment item to the previous item or the next item among the seven adjustment items A-G.

A. Squelch open sensitivity (value set for each band)
1. Press the **[⬅]** and **[➡]** keys to display "SQUELCH". The current squelch level input value is displayed on the screen and adjustment can be performed. (See the figure below.)
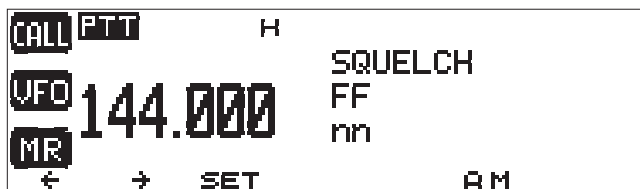
2. When specified SSG input is applied to the antenna connector and the **[SET]** key is pressed, an adjustment value is set.

B. S meter (value set for each band)
1. Press the **[⬅]** and **[➡]** keys to display "S METER". The current S meter input value is displayed on the screen and adjustment can be performed. (See the figure below.)

2. S meter (the first segment ON)
   When specified SSG input applied to the antenna connector and the **[S1]** key is pressed, a value is set so that the first segment of the S meter turns on.
3. S meter (all segments ON)
   When specified SSG input applied to the antenna connector and the **[S7]** key is pressed, a value is set so that the all segment of the S meter turns on.

C. Transmission output power
(values set independently for 144MHz and 430MHz)
1. Press the **[⬅]** and **[➡]** keys to display "APC". The current transmission output power setting is displayed on the screen. (See the figure below.)

2. Select a desired transmission output range (HI, MID, or LOW) with the **[LOW]** key.
3. Connect the power meter to the antenna connector. Connect a microphone to the microphone connector.
4. Lower limit frequency transmission output setting.
   (1) Set the lower limit frequency and press the microphone PTT button to enter transmit mode.
   (2) Adjust the power meter to the prescribed transmission power by turning the encoder.
   (3) When the specified transmission power value is reached, release the microphone PTT button and press the **[FREQ1]** key to set the adjustment value.
5. Center frequency transmission output setting.
   (1) Set the center limit frequency and press the microphone PTT button to enter transmit mode.
   (2) Adjustment the power meter to the prescribed transmission power by turning the encoder.
   (3) When the specified transmission power value is reached, release the microphone PTT button and press the **[FREQ2]** key to set the adjustment value.

ADJUSTMENT

6. Upper limit frequency transmission output setting.
    (1) Set the upper limit frequency and press the microphone PTT button to enter transmit mode.
    (2) Adjustment the power meter to the prescribed transmission power by turning the encoder.
    (3) When the specified transmission power value is reached, release the microphone PTT button and press the **[FREQ3]** key to set the adjustment value.

D. Transmission deviation
(values set independently for 144MHz and 430MHz)

1. Press the **[←]** and **[→]** keys to display "MAX DEV". The current transmission deviation setting is display on the screen. (See the figure below.)

```
CALL PTT          H       MAX DEV
VFO 144.000               FF
MR                        nn
  ←   →   SET             LOW
```

2. Connect the direct wave detector and power meter to the ANT terminal, apply the prescribed A.G. input from the MIC input terminal, and transmit.
   Turn the **[ENCODER]** knob to adjust the direct wave detector reading to the prescribed value.
3. When the prescribed value is reached, stop transmission and press the **[SET]** key to set the adjustment value.

E. DCS modulation balance
(values set independently for 144MHz and 430MHz)

1. Press the **[←]** and **[→]** keys to display "DCS BALANCE".
   The current DCS modulation balance setting is display on the screen. (See the figure below.)

```
CALL PTT          H       DCS BALANCE
VFO 144.000               FF
MR                        nn
  ←   →   SET             LOW
```

2. Connect the linear detector and oscilloscope to the antenna connector. Connect a microphone to the microphone connector.
3. When the microphone PTT button is pressed to enter transmit mode, 50Hz square waves are internally generated and modulated.
4. While observing the oscilloscope, turn the encoder to adjust the DCS modulation waveform to square waveform.
5. When the DCS modulation waveform becomes square waveform, release the microphone PTT button and press the **[SET]** key to set the adjustment value.

F. Tone deviation
(values set independently for 144MHz and 430MHz)

1. Press the **[←]** and **[→]** keys to display "TONE DEV". The current Tone deviation setting is display on the screen. (See the figure below.)

```
CALL PTT T        H       TONE DEV
VFO 144.000               FF
MR                        nn
  ←   →   SET         T.SEL LOW
```

2. Connect the linear detector and oscilloscope to the antenna connector. Connect a microphone to the microphone connector.
3. When the **[T.SEL]** key is pressed, the tone frequency setting mode is entered, so set a tone frequency to be adjusted by turning the encoder.
4. The microphone PTT button is pressed to enter transmit mode.
5. Connect the direct wave detector and power meter to the ANT terminal, apply the prescribed A.G. input from the MIC input terminal, and transmit.
   Turn the **[ENCODER]** knob to adjust the direct wave detector reading to the prescribed value.
6. When the prescried value is reached, stop transmission and press the **[SET]** key to set the adjustment value.

G. DCS deviation
(values set independently for 144MHz and 430MHz)

1. Press the **[←]** and **[→]** keys to display "DCS DEV". The current DCS deviation setting is display on the screen. (See the figure below.)

```
CALL PTT DCS      H       DCS DEV
VFO 144.000               FF
MR                        nn
  ←   →   SET         T.SEL LOW
```

2. Connect the linear detector and oscilloscope to the antenna connector. Connect a microphone to the microphone connector.
3. When the **[T.SEL]** key is pressed, the tone frequency setting mode is entered, so set a tone frequency to be adjusted by turning the encoder.
4. The microphone PTT button is pressed to enter transmit mode.
5. Connect the direct wave detector and power meter to the ANT terminal, apply the prescribed A.G. input from the MIC input terminal, and transmit.
   Turn the **[ENCODER]** knob to adjust the direct wave detector reading to the prescribed value.
6. When the prescried value is reached, stop transmission and press the **[SET]** key to set the adjustment value.

Note: To end adjustment mode, switch off the power.

TM-V708A

ADJUSTMENT

Common section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) Power voltage:13.8V 2) Band A, Band B VOL, SQL knob:MIN							
2. Reset								
3. BPF adjust	1) Band A FREQ.: 146.050MHz SSG:5.01µV (-93Bm)	SSG D.V.M	Rear panel TX-RX	ANT SMV	TX-RX	L204 L207 L209	To maximize voltage	1.8V or higher

PARTIAL OR FULL RESET?

If your transceiver seems to be malfunctioning, initializing the transceiver may resolve the problem. Use Full Reset to initialize all settings that you have customized. Partial (VFO) Reset does not initialize the following settings:

Memory channels	Memory channel names
Memory channel lockout	Call channels
Program scan channels	PM channels
DTMF memory channels	DTMF memory channel names

Some of the VFO factory defaults are listed below:

Parameter	Band A	Band B
VFO freq.	144.000MHz	440.000MHz
Freq. step	5kHz	25kHz
Tone freq.	88.5Hz	88.5Hz

1. Press **[MNU]** to enter Menu mode.
2. Press **[▲]/[▼]** to select "AUX (1–9–)", then press **[OK]**.
3. Press **[▲]/[▼]** to select "RESET (1–9–7)", then press **[OK]**.

```
AUX        1-9-7
 ▸RESET
              NO
ESC BACK  ↑    ↓    OK
```

4. Press **[▲]/[▼]** to select Partial (VFO) Reset, PM Reset, or Full Reset, then press **[OK]**.
   • A confirmation message appears.
   • Press **[ESC]** to quit resetting.
5. Press **[OK]**.

After switching the power OFF, you may press **[VFO]** + **POWER ON** for Partial Reset, or **[MR]** + **POWER ON** for Full Reset. This allows you to skip steps 1 to 4.

You can also use the RESET button to perform Full Reset.

Note : When in All-control Lock or Channel Display mode, you cannot perform Partial Reset or Full Reset.

① DATA connector

② PANEL connector

③ MIC connector

④ RESET button
Press to perform Full Reset. No confirmation message appears. Use this switch when the microcomputer and/or the memory chip malfunction because of ambient factors.

ADJUSTMENT

Receiver section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF distortion adjust	1) Band A FREQ.:146.250MHz SSG:0.178μV (-122dBm) AF output:0.63V/8Ω	SSG Oscilloscope AF V.M Distortion meter	Rear panel	ANT EXT.SP	TX-RX	L200 L102	SINAD MAX	
	2) Band A FREQ.:444.250MHz SSG:0.178μV (-122dBm) AF output:0.63V/8Ω					L500 L401	SINAD MAX	
2. High level input S/N and distortion check	1) Band A FREQ.:146.050MHz SSG:501μV (-53dBm) AF output:2.83V/8Ω	SSG Oscilloscope AF V.M Distortion meter	Rear panel	ANT EXT.SP			Check	S/N 42dB or more Distortion rate:4% or less
	2) Band B FREQ.:444.150MHz SSG:501μV (-53dBm) AF output:2.83V/8Ω							
3. Sensitivity check	1) Band A FREQ.:146.050MHz FREQ.:144.050MHz FREQ.:147.925MHz SSG:0.25μV (-119dBm) AF output:0.63V/8Ω	SSG Distortion meter Oscilloscope AF V.M	Rear panel	ANT EXT.SP			Check	SINAD 12dB or more
	2) Band B FREQ.:444.150MHz FREQ.:438.100MHz FREQ.:449.875MHz SSG:0.178μV (-122dBm) AF output:0.63V/8Ω							
	3) Band A (Sub band) FREQ.:441.150MHz SSG:0.28μV (-118dBm) AF output:0.63V/8Ω							
	4) Band B (Sub band) FREQ.:146.050MHz SSG:0.398μV (-115dBm) AF output:0.63V/8Ω							
4. Squelch write	Switch to adjustment mode and carry out the operations for Item A. Band A 1) FREQ.:146.350MHz SSG:0.07μV (-130dBm) SSG DEV:3kHz MOD:1kHz	SSG	Rear panel	ANT EXT.SP	Display	[SET] key	Write	
	2) FREQ.:127.100MHz SSG:0.07μV (-130dBm) SSG DEV:3kHz MOD:1kHz							
	3) FREQ.:223.100MHz SSG:0.158μV (-123dBm) SSG DEV:3kHz MOD:1kHz							

ADJUSTMENT

Receiver section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
4. Squelch write	4) FREQ.:146.350MHz SSG:0.20µV (-121dBm) SSG MOD:60% 1kHz	SSG	Rear panel	ANT EXT.SP	Display	[SET] key	Write	
	5) FREQ.:127.100MHz SSG:0.20µV (-121dBm) SSG MOD:60% 1kHz							
	6) FREQ.:223.100MHz SSG:0.20µV (-121dBm) SSG MOD:60% 1kHz							
	Band B 7) FREQ.:444.350MHz SSG:0.07µV (-130dBm) SSG DEV:3kHz MOD:1kHz							
	8) FREQ.:437.100MHz SSG:0.07µV (-130dBm) SSG DEV:3kHz MOD:1kHz							
	9) FREQ.:868.900MHz SSG:0.40µV (-115dBm) SSG DEV:3kHz MOD:1kHz							
	Band B (Sub band) 10) FREQ.:146.350MHz SSG:0.07µV (-130dBm) SSG DEV:3kHz MOD:1kHz							
	Band A (Sub band) 11) FREQ.:444.350MHz SSG:0.07µV (-130dBm) SSG DEV:3kHz MOD:1kHz							
	12) FREQ.:390.100MHz SSG:0.40µV (-115dBm) SSG DEV:3kHz MOD:1kHz							
	13) FREQ.:444.350MHz SSG:0.20µV (-121dBm) SSG MOD:60% 1kHz							
	14) FREQ.:390.100MHz SSG:0.707µV (-110dBm) SSG MOD:60% 1kHz							
5. Squelch check	1) Band A FREQ.:146.050MHz SSG:OFF Set to the point where noise will be erased by turning the squelch knob.	SSG Oscilloscope	Rear panel	ANT EXT.SP	Display		Check	SQL knob position: 8:00 ~ 11:00 BUSY lights off.
	2) SSG:0.126µV (-125dBm)						Check	Squelch open. BUSY lights on.
	3) Squelch knob: clockwise MAX							AF output disappear. BUSY lights off.
	4) Band B FREQ.:444.150MHz Set to the point where noise will be erased by turning the squelch knob.						Check	SQL knob position: 8:00 ~ 11:00 BUSY lights off.

ADJUSTMENT

Receiver section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. Squelch check	5) SSG:0.112μV (-126dBm)	SSG Oscilloscope	Rear panel	ANT EXT.SP	Display		Check	Squelch open. BUSY lights on.
	6) Squelch knob: clockwise MAX							AF output disappear. BUSY lights off.
	7) Band B (Sub band) FREQ.:146.050MHz SSG:OFF Set to the point where noise will be erased by turning the squelch knob.						Check	SQL knob position: 8:00 ~ 11:00 BUSY lights off.
	8) SSG:0.178μV (-122dBm)							Squelch open. BUSY lights on.
	9) Squelch knob: clockwise MAX							AF output disappear. BUSY lights off.
	10)Band A (Sub band) FREQ.:444.150MHz Set to the point where noise will be erased by turning the squelch knob.						Check	SQL knob position: 8:00 ~ 11:00 BUSY lights off.
	11)SSG:0.199μV (-121dBm)							Squelch open. BUSY lights on.
	12)Squelch knob: clockwise MAX							AF output disappear. BUSY lights off.
6. S-meter write	Switch to adjustment mode and carry out the operations for Item B. Band A 1) FREQ.:146.350MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28μV (-118dBm)	SSG	Rear panel	ANT	Display	[S1] key	Write	One Segment in S-meter lights.
	②S7 SSG:3.54μV (-96dBm)					[S7] key		All segments in S-meter light.
	2) FREQ.:127.100MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28μV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:3.54μV (-96dBm)					[S7] key		All segments in S-meter light.
	3) FREQ.:223.100MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.707μV (-110dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:7.94μV (-89dBm)					[S7] key		All segments in S-meter light.

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ADJUSTMENT

Receiver section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. S-meter write	4) FREQ.:146.350MHz SSG MOD:60%,1kHz ①S1 SSG:0.28μV (-118dBm)	SSG	Rear panel	ANT	Display	[S1] key	Write	One Segment in S-meter lights.
	②S7 SSG:39.8μV (-75dBm)					[S7] key		All segments in S-meter light.
	5) FREQ.:127.100MHz SSG MOD:60%,1kHz ①S1 SSG:0.28μV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:39.8μV (-75dBm)					[S7] key		All segments in S-meter light.
	6) FREQ.:223.100MHz SSG MOD:60%,1kHz ①S1 SSG:0.707μV (-110dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:39.8μV (-75dBm)					[S7] key		All segments in S-meter light.
	Band A (Sub band) 7) FREQ.:444.350MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28μV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:3.54μV (-96dBm)					[S7] key		All segments in S-meter light.
	8) FREQ.:390.100MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.707μV (-110dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:7.94μV (-89dBm)					[S7] key		All segments in S-meter light.
	9) FREQ.:444.350MHz SSG MOD:60%,1kHz ①S1 SSG:0.28μV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:39.8μV (-75dBm)					[S7] key		All segments in S-meter light.
	10)FREQ.:390.100MHz SSG MOD:60%,1kHz ①S1 SSG:1.30μV (-105dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:39.8μV (-75dBm)					[S7] key		All segments in S-meter light.

ADJUSTMENT

Receiver section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
6. S-meter write	Band B 11)FREQ.:444.350MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28µV (-118dBm)	SSG	Rear panel	ANT	Display	[S1] key	Write	One Segment in S-meter lights.
	②S7 SSG:3.54µV (-96dBm)					[S7] key		All segments in S-meter light.
	12)FREQ.:437.100MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28µV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:3.54µV (-96dBm)					[S7] key		All segments in S-meter light.
	13)FREQ.:868.900MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:1.30µV (-105dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:12.8µV (-85dBm)					[S7] key		All segments in S-meter light.
	Band B (Sub band) 14)FREQ.:146.350MHz SSG DEV:3kHz MOD:1kHz ①S1 SSG:0.28µV (-118dBm)					[S1] key		One Segment in S-meter lights.
	②S7 SSG:3.54µV (-96dBm)					[S7] key		All segments in S-meter light.
7. S-meter check	1) Band A FREQ.:146.050MHz 2) Band A (Sub band) FREQ.:444.150MHz 3) Band B FREQ.:444.150MHz 4) Band B (Sub band) FREQ.:146.050MHz SSG:0.501µV (-113dBm)	SSG	Rear panel	ANT	Display	S-meter	Check	More than one segment in S-meter lights.
	5) SSG:1.99µV (-101dBm)							Six or smaller segments in S-meter light.
	6) SSG:6.3µV (-91dBm)							All segments in S-meter light.
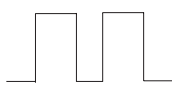
TM-V708A

ADJUSTMENT

Transmission section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Transmission frequency adjust	1) Band A FREQ.:146.000MHz Transmission	f. counter Power meter	Rear panel	ANT	TX-RX	TC1	146.000 MHz	Not Warm up the set. ±100Hz
	2) Band B FREQ.:444.000MHz Transmission					TC300	444.000 MHz	
2-1.POWER write or check Band A	For 1), 2) and 4), switch to adjustment mode and carry out the operations for Item C. 1) POWER:LOW FREQ.:146.000MHz Transmission	Power meter Ammeter	Rear panel	ANT	Display	Encoder [FREQ2] key	Write	5.0W±0.5W
	2) POWER:MID Transmission							12W±1W
	3) POWER:MAX Transmission						Check	48W or more
	4) POWER:HI Transmission				Display	Encoder [FREQ2] key	Write	1) If MAX Power is 52W or more, adjust TX power within 50W±1W. 2) If MAX Power is between from 48W to 52W, adjust TX power within (MAX Power -2W)±1W.
	5) FREQ.:144.000MHz FREQ.:147.975MHz POWER:HI Transmission						Check	44 ~ 60W
	6) POWER:MID Transmission							10 ~ 14W
	7) POWER:LOW Transmission							3 ~ 10W
2-2.POWER write or check Band B	For 1), 2) and 4), switch to adjustment mode and carry out the operations for Item C. 1) POWER:LOW FREQ.:444.000MHz Transmission	Power meter Ammeter	Rear panel	ANT	Display	Encoder [FREQ2] key	Write	5.0W±0.5W
	2) POWER:MID Transmission							12W±1W
	3) POWER:MAX Transmission						Check	33W or more
	4) POWER:HI FREQ.:444.000MHz FREQ.:438.000MHz FREQ.:449.975MHz Transmission				Display	Encoder [FREQ2] key	Write	1) If MAX Power is 37W or more, adjust TX power within 35W±1W. 2) If MAX Power is between from 33W to 37W, adjust TX power within (MAX Power -2W)±1W.

ADJUSTMENT

Transmission section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
2-2.POWER write or check Band B	5) FREQ.:438.000MHz FREQ.:449.975MHz POWER:HI Transmission	Power meter Ammeter	Rear panel	ANT			Check	28 ~ 42W
	6) POWER:MID Transmission							10 ~ 14W
	7) POWER:LOW Transmission							3 ~ 10W
3. DEV write or check	For 1) and 3), switch to adjustment mode and carry out the operations for Item D. 1) Band A FREQ.:146.000MHz AG:1kHz/50mV Transmission	Power meter Linear detector Oscilloscope AG AF V.M	Rear panel	ANT	Display	Encoder [SET] key	Write	±4.2kHz±0.15kHz
	2) Down AG output from the above state by 20dB (1kHz/5.0mV) Transmission						Check	±2.38 ~ 4.05kHz
	3) Band B FREQ.:444.000MHz AG:1kHz/50mV Transmission				Display	Encoder [SET] key	Write	±4.2kHz±0.15kHz
	4) Down AG output from the above state by 20dB (1kHz/5.0mV) Transmission						Check	±2.38 ~ 4.05kHz
4. DCS balance adjustment	Switch to adjustment mode and carry out the operations for Item E. 1) Band A FREQ.:146.000MHz Transmission 2) Band B FREQ.:444.000MHz Transmission	Power meter Linear detector Oscilloscope	Rear panel	ANT	Display	Encoder [SET] key	By turning an encoder, adjust the modulation wave until it becomes the square wave	
5. TONE DEV write or check Band A	For 1)and 3), Switch to adjustment mode and carry out the operations for Item F. 1) FREQ.:146.100MHz TONE:88.5Hz Transmission	Power meter Linear detector Oscilloscope	Rear panel	ANT	Display	Encoder [SET] key	Write	±0.8kHz±0.15kHz
	2) FREQ.:146.100MHz TONE:88.5Hz Transmission						Check	±0.5 ~ 1.3kHz
Band B	3) FREQ.:445.100MHz TONE:88.5Hz Transmission				Display	Encoder [SET] key	Write	±0.8kHz±0.15kHz

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ADJUSTMENT

Transmission section

Item	Condition	Measurement			Adjustment			Specifications/ Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
5. TONE DEV write or check Band B	4) FREQ.:445.100MHz TONE:88.5Hz Transmission	Power meter Linear detector Oscilloscope	Rear panel	ANT			Check	±0.5 ~ 1.3kHz
6. DCS DEV write or check Band A	For 1) and 3), Switch to adjustment mode and carry out the operations for Item G. 1) FREQ.:146.200MHz Transmission	Power meter Linear detector Oscilloscope	Rear panel	ANT	Display	Encoder [SET] key	Write	±0.8kHz±0.15kHz
	2) FREQ.:146.200MHz Transmission						Check	±0.5 ~ 1.3kHz
Band B	3) FREQ.:445.200MHz Transmission				Display	Encoder [SET] key	Write	±0.8kHz±0.15kHz
	4) FREQ.:445.200MHz Transmission						Check	±0.5 ~ 1.3kHz
7. Protection check	1) Band A FREQ.:146.000MHz POWER:HI ANT:short circuit and open	Ammeter					Check	12.0A or less
	2) Band B FREQ.:444.000MHz POWER:HI ANT:short circuit and open Transmission							12.0A or less

∗ **At the end of adjustments, reconfirm "3. DEV".**

TM-V708A PC BOARD

TX-RX UNIT
Component side

Ref.NO.	Address
IC1	H11
IC2	H11
IC3	L11
IC4	L8
IC101	I6
IC301	H8
IC302	H8
IC701	E7
IC703	F5
IC802	F10
IC803	F10
IC804	F9
IC805	H6
IC806	2N
IC900	H4
IC901	J3
IC903	L2
IC904	K3
Q4	H10
Q10	K10
Q11	K9
Q103	J5
Q104	H5
Q105	I6
Q106	I6
Q107	I6
Q108	I5
Q110	I5
Q111	H6
Q112	J6
Q208	O6
Q303	H8
Q402	K6
Q404	L5
Q405	K7
Q406	L6
Q700	E7
Q701	E8
Q801	F11
Q802	F11
Q803	F11
Q807	E5
Q900	O7
Q910	I3
Q911	I3
Q912	L3
Q913	I3
Q914	L3
D3	H10
D4	H11
D5	H11
D102	I6
D302	H8
D303	H9
D304	H8
D700	E7
D701	E7
D702	E9
D703	E9
D800	E10
D902	I3
D903	I3

TX-RX UNIT (X57-5860-12) Component side view (J72-0653-11)

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J72-0653-11
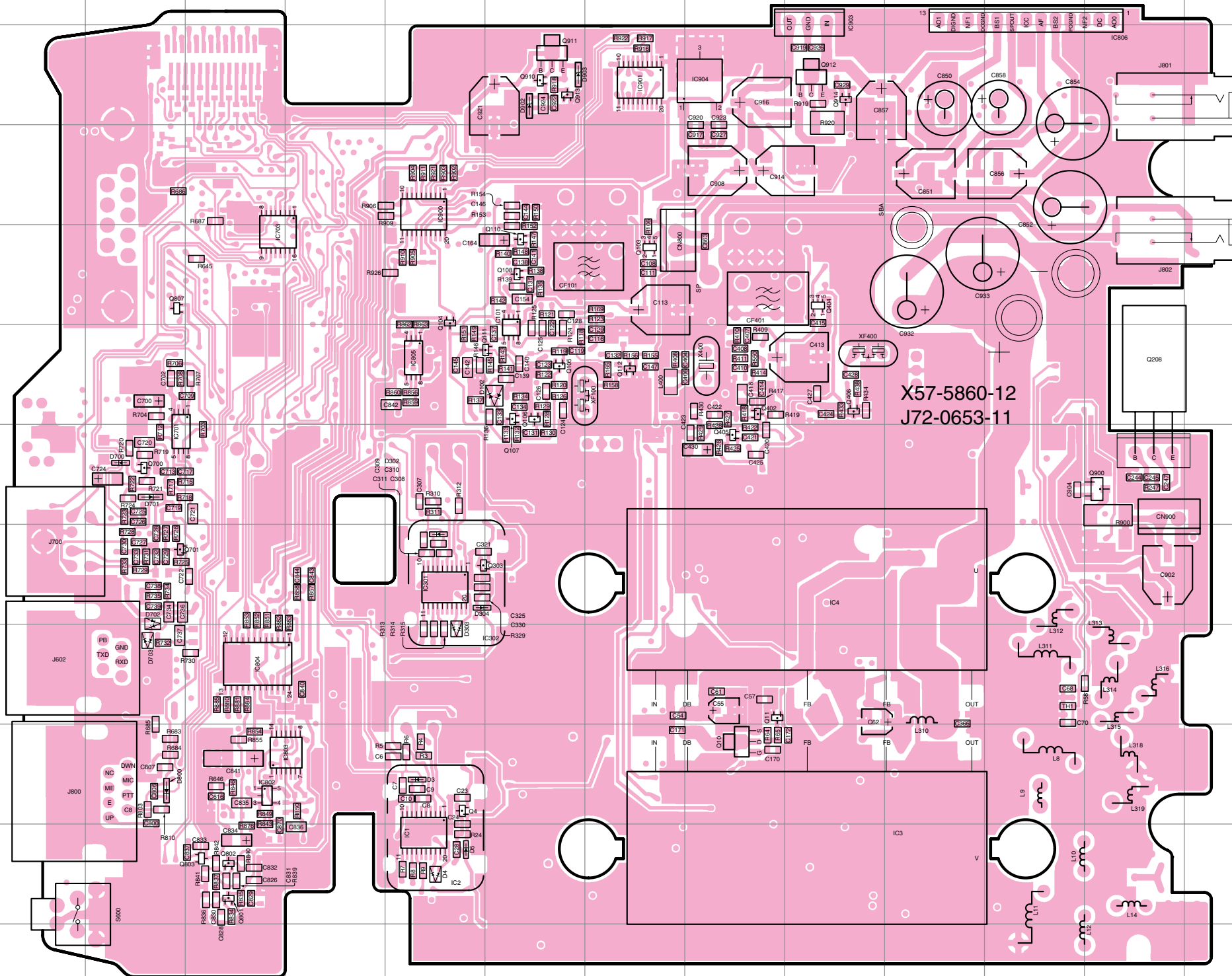
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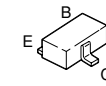
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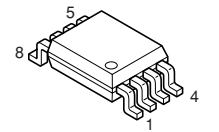
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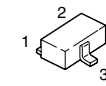
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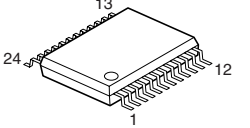
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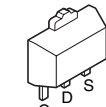
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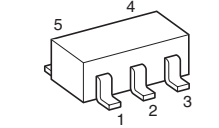
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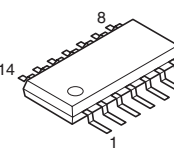
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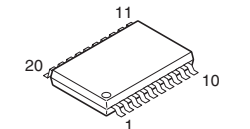
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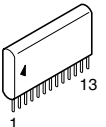
TC74HC4050AFT

TA7808S

2SB1386

M67746

M57788MR-24

Component side

Layer 1
Layer 2
Layer 3
Layer 4
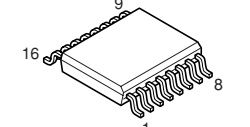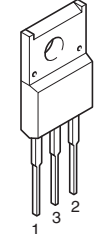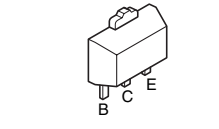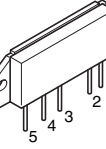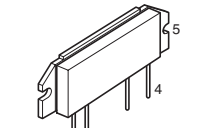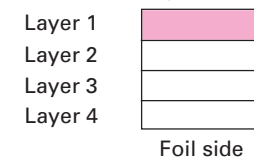
Foil side

TX-RX UNIT Foil side

Ref.NO.	Address	Ref.NO.	Address
IC100	K6	Q903	I4
IC200	E7	Q904	H4
IC300	M9	Q905	I4
IC303	K8	Q906	J4
IC304	L8	Q907	J4
IC400	I6	Q908	I4
IC501	G8	Q909	J4
IC601	M5	D1	L9
IC602	M5	D2	L9
IC603	K4	D6	J10
IC604	N5	D7	I10
IC700	O7	D9	K12
IC702	N8	D11	K11
IC800	O9	D12	K11
IC801	N11	D13	K10
IC807	G3	D14	F10
IC808	G3	D15	F10
Q1	L10	D16	F11
Q2	L10	D17	G11
Q3	L11	D18	F11
Q6	K11	D19	F12
Q7	K12	D200	I11
Q8	K11	D201	I11
Q9	K10	D202	I11
Q102	K6	D203	H10
Q113	I11	D204	I11
Q200	I9	D205	I11
Q201	I10	D206	H11
Q202	I11	D207	H11
Q203	I10	D208	H11
Q204	G10	D209	H11
Q205	G11	D210	G10
Q207	G11	D211	G10
Q209	E7	D213	G11
Q210	H11	D214	G11
Q300	L8	D216	I11
Q301	L8	D217	G11
Q302	L8	D300	L6
Q304	L9	D301	L6
Q305	H7	D305	K9
Q306	K8	D306	K9
Q307	K9	D307	K9
Q308	K8	D309	J8
Q309	J9	D310	J8
Q310	J9	D312	J9
Q500	H7	D313	G8
Q501	J7	D314	F9
Q502	I7	D315	G9
Q503	G7	D316	F9
Q505	H8	D317	E8
Q506	H8	D318	E8
Q507	I8	D500	H7
Q508	G9	D502	I8
Q509	F8	D503	I8
Q601	O11	D505	G9
Q603	M5	D507	H9
Q604	K4	D509	G8
Q702	O7	D510	H8
Q800	N10	D602	O11
Q804	G3	D605	K4
Q805	F4	D801	N10

Ref.NO.	Address
D803	E3
D900	H4
D904	F6
D905	F5

TX-RX UNIT (X57-5860-12) Foil side view (J72-0653-11)

X57-5860-12
J72-0653-11
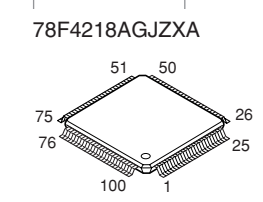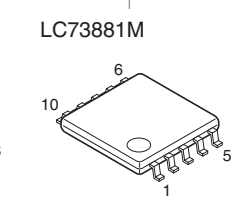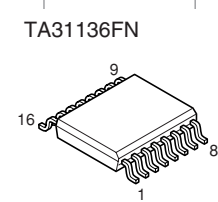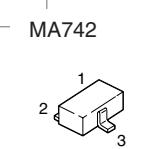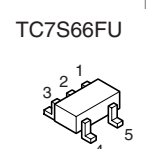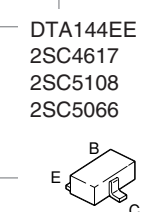
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PST9130NR

FMA5 UMC4N

TA4002F

2SA1774 2SC4997

NJM78L05UA

NJM2100V UPB1509GV

TC4W53FU

BU8241FS

2SK302

AT25128N10SI27

2SK1875

3SK239A

TC75S59F

DTA144EE 2SC4617 2SC5108 2SC5066

TC7S66FU

MA742

TA31136FN

LC73881M

78F4218AGJZXA

Component side
Layer 1
Layer 2
Layer 3
Layer 4
Foil side

49

50
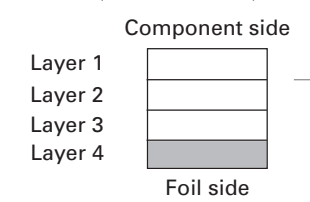
TX-RX UNIT
Component side + Foil side

TX-RX UNIT (X57-5860-12) Component side + Foil side view (J72-0653-11)

X57-5860-12
J72-0653-11

Ref.NO.	Address	Ref.NO.	Address
IC1	H11	Q203	K10
IC2	H11	Q204	M10
IC3	L11	Q205	M11
IC4	L8	Q207	M11
IC100	I6	Q208	O6
IC101	I6	Q209	O7
IC200	O7	Q210	L11
IC300	G9	Q300	H8
IC301	H8	Q301	H8
IC302	H9	Q302	H8
IC303	I8	Q303	H8
IC304	H8	Q304	H9
IC400	K6	Q305	L7
IC501	M8	Q306	I8
IC601	G5	Q307	I9
IC602	G5	Q308	I8
IC603	I4	Q309	J9
IC604	F5	Q310	J9
IC700	E7	Q402	K6
IC701	E7	Q404	L5
IC702	F8	Q405	K7
IC703	F5	Q406	L6
IC800	E9	Q500	L7
IC801	F11	Q501	J7
IC802	F10	Q502	K7
IC803	F10	Q503	M7
IC804	F9	Q505	L8
IC805	H6	Q506	L8
IC806	2N	Q507	K8
IC807	M3	Q508	M9
IC808	M3	Q509	N8
IC900	H4	Q601	E11
IC901	J3	Q603	G5
IC903	L2	Q604	I4
IC904	K3	Q700	E7
Q1	H10	Q701	E8
Q2	H10	Q702	E7
Q3	H11	Q800	E10
Q4	H10	Q801	F11
Q6	I11	Q802	F11
Q7	I12	Q803	F11
Q8	I11	Q804	M3
Q9	I10	Q805	N4
Q10	K10	Q807	E5
Q11	K9	Q900	O7
Q102	I6	Q903	K4
Q103	J5	Q904	L4
Q104	H5	Q905	K4
Q105	I6	Q906	J4
Q106	I6	Q907	J4
Q107	I6	Q908	K4
Q108	I5	Q909	J4
Q110	I5	Q910	I3
Q111	H6	Q911	I3
Q112	J6	Q912	L3
Q113	K11	Q913	I3
Q200	K9	Q914	L3
Q201	K10	D1	H9
Q202	K11	D2	H9
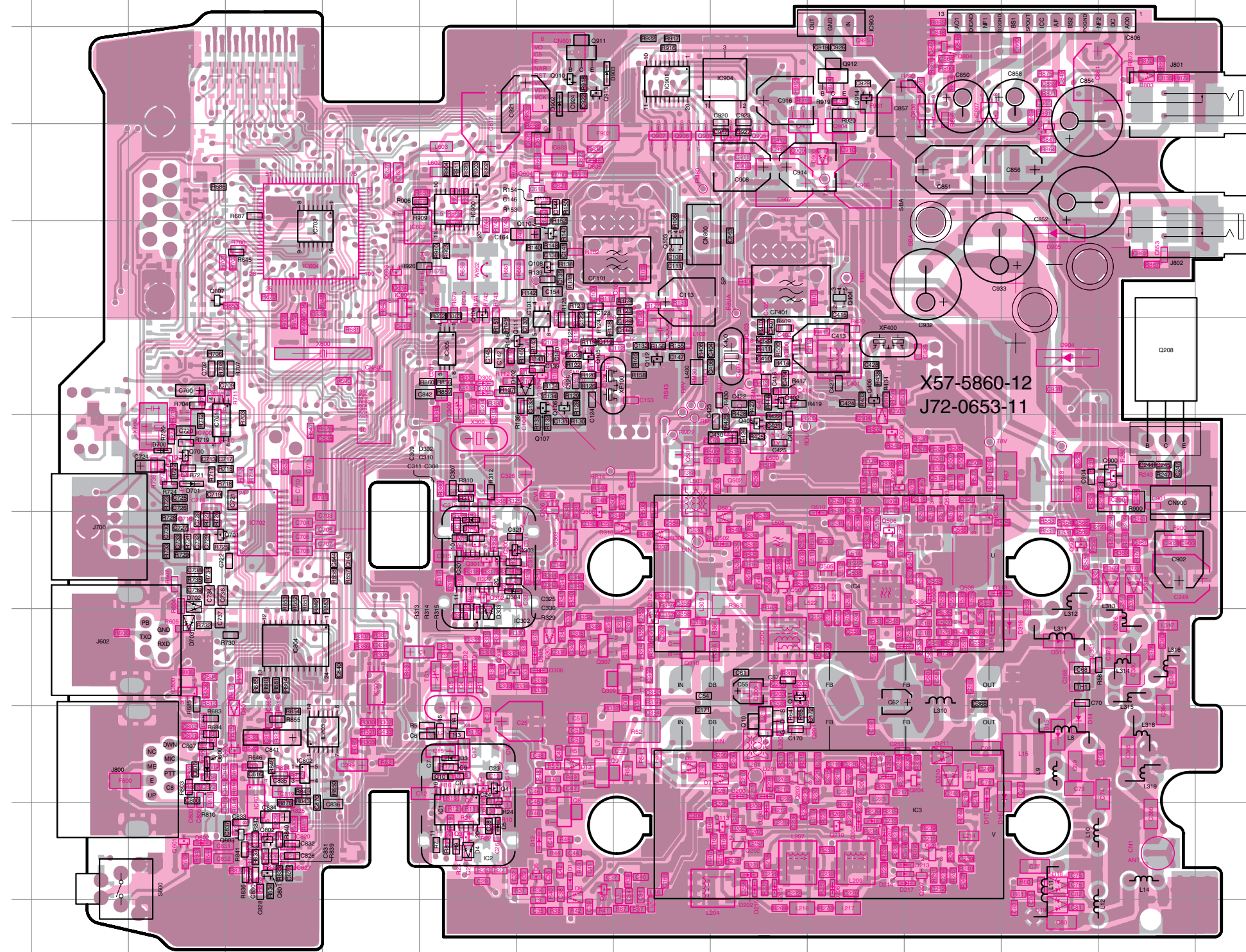
Ref.NO.	Address	Ref.NO.	Address	Ref.NO.	Address	Ref.NO.	Address	Ref.NO.	Address
D3	H10	D13	I10	D200	K10	D208	L11	D300	H6
D4	H11	D14	N10	D201	K10	D209	L11	D301	H6
D5	H11	D15	N10	D202	K11	D210	M10	D302	H8
D6	J10	D16	M11	D203	L10	D211	M10	D303	H9
D7	K10	D17	M11	D204	K11	D213	L11	D304	H8
D9	I12	D18	N11	D205	K11	D214	L11	D305	I9
D11	I11	D19	N12	D206	L11	D216	K11	D306	I9
D12	I11	D102	I6	D207	L11	D217	L11	D307	I9

Ref.NO.	Address	Ref.NO.	Address	Ref.NO.	Address	Ref.NO.	Address
D309	J8	D318	O8	D602	E11	D803	O3
D310	J8	D500	L7	D605	I4	D900	L4
D312	J9	D502	K8	D700	E7	D902	I3
D313	M8	D503	K8	D701	E7	D903	I3
D314	N9	D505	M9	D702	E9	D904	N6
D315	M9	D507	L9	D703	E9	D905	N5
D316	N9	D509	M8	D800	E10		
D317	O8	D510	L8	D801	F10		

● Connect 1 and 4
Component side

Layer 1
Layer 2
Layer 3
Layer 4

Foil side
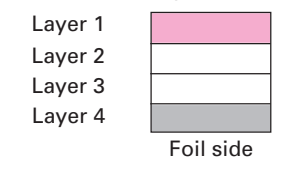
PANEL UNIT (X54-3290-00) Component side view (J72-0707-12)

PANEL UNIT
Component side

Ref.NO.	Address
IC1	5C
IC2	5E
IC3	8H
IC4	6K
IC5	5I
Q1	7L
Q2	4H
Q3	4H
Q4	4G
Q6	5G
Q7	5F
Q9	5E
Q10	5F
D1	8G
D2	7H
D3	5M
D4	4E
D5	4D
D6	4D
D7	5M
D8	5M
D9	8G
D10	8I
D11	8I
D12	8I
D13	8I
D14	7K
D15	7M
D16	7M
D17	7M
D18	7L
D19	7M
D20	7L
D21	8D
D22	8D
D23	8D
D24	6C
D25	5C
D26	5N
D27	6N
D28	8J
D29	8H
D30	8E

X54-3290-00 (A / 3)
J72-0707-12

X54 (B / 3)

X54 (C / 3)

Component side

Layer 1
Layer 2

Foil side

2SA1162

DTC143EKA

L78LR05B-FA

DA221

30622M8759GP

AT29C020-90TI

TC4SB1F

53

54
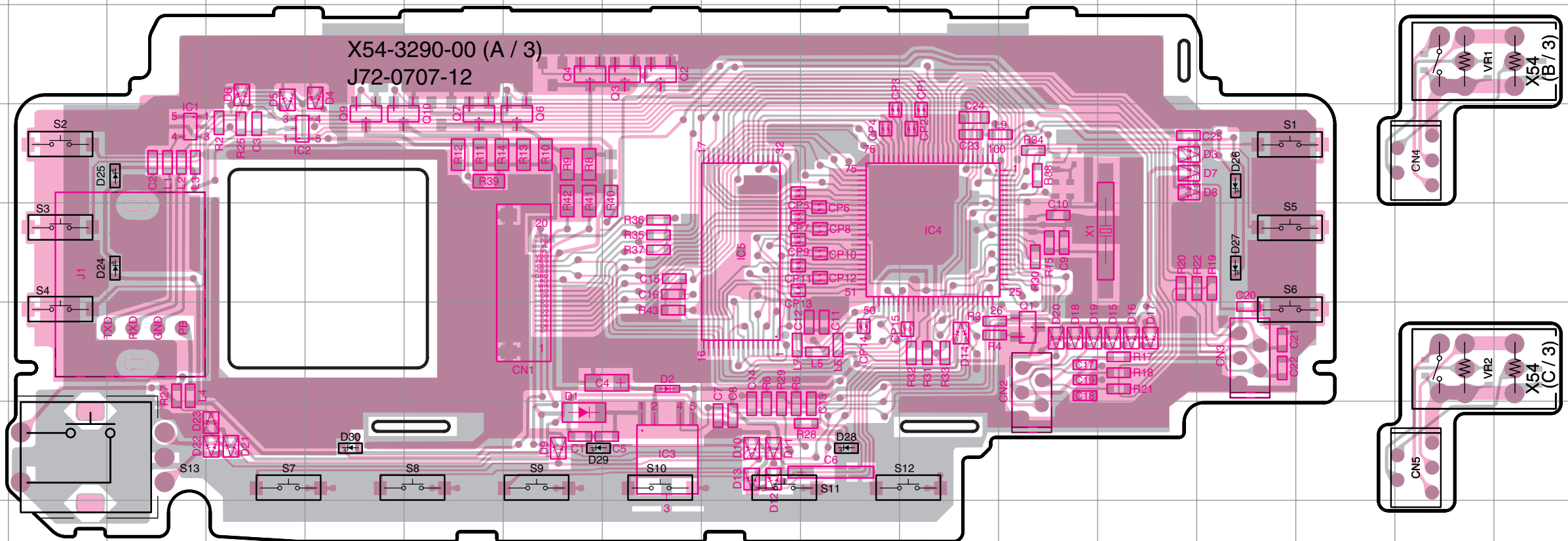
TM-V708A PC BOARD

PANEL UNIT
Foil side

Ref.NO.	Address
IC1	5Q
IC2	5O
IC3	8L
IC4	6I
IC5	6K
Q1	7H
Q2	4L
Q3	4L
Q4	4M
Q6	5M
Q7	5N
Q9	5O
Q10	5N
D1	8M
D2	7L
D3	5G
D4	4O
D5	4P
D6	4P
D7	5G
D8	5G
D9	8M
D10	8K
D11	8K
D12	8K
D13	8K
D14	7I
D15	7G
D16	7G
D17	7G
D18	7H
D19	7G
D20	7H
D21	8P
D22	8P
D23	8P
D24	6Q
D25	5Q
D26	5F
D27	6F
D28	8J
D29	8L
D30	8O

PANEL UNIT (X54-3290-00) Foil side view (J72-0707-12)

X54-3290-00 (A / 3)
J72-0707-12

X54 (B / 3)
X54 (C / 3)

2SA1162

DTC143EKA

L78LR05B-FA

DA221

30622M8759GP

AT29C020-90TI

TC4SB1F

Component side
Layer 1
Layer 2
Foil side

55

56

X57-5860-12
TX-RX UNIT(RF)

X57-5860-12 TX-RX UNIT (CONTROL)

Note : The components marked with a dot (●) are parts of layer1.

TM-V708A   SCHEMATIC DIAGRAM

Note : The components marked with a dot (●) are parts of layer1.

TM-V708A   TM-V708A

BLOCK DIAGRAM

X57-5860-12

INTERCONNECTION DIAGRAM

TM-V708A
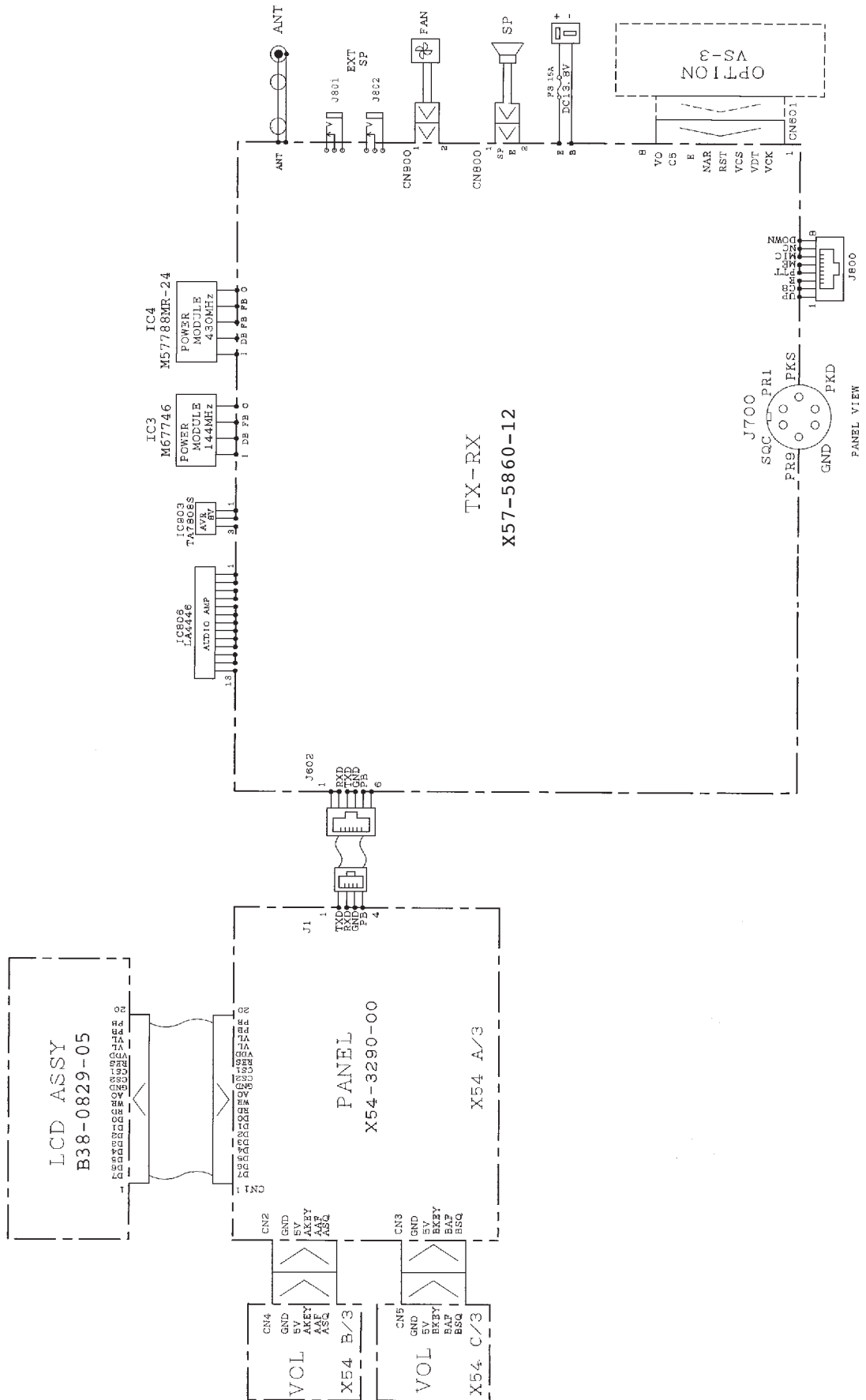
LEVEL DIAGRAM

Transmitter Section
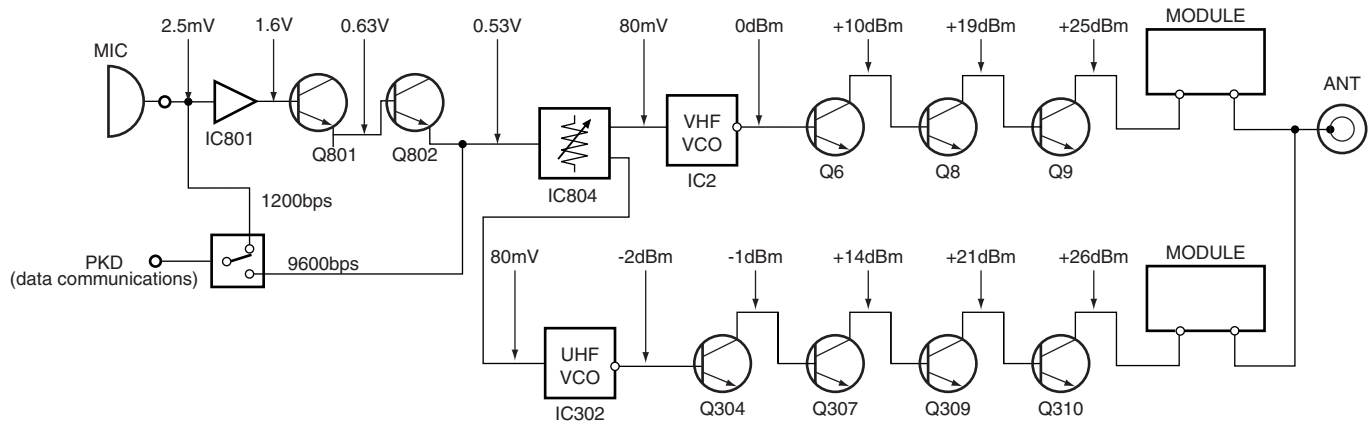
Note1: Set the AG so that the microphone socket input is 3kHz deviation at 1kHz modulation.

The data communication connector input level is 3kHz deviation at 1kHz modulation for 1200bps and 2kHz deviation at 1kHz modulation for 9600bps.

Note2: The transmit frequency is 145.0 or 435.0MHz.

Note3: The HI/MID/LOW switch is set to HI.

Note4: The measurements with the power meter, except for the ANT connector, are the values with the APC off.

Receiver Section
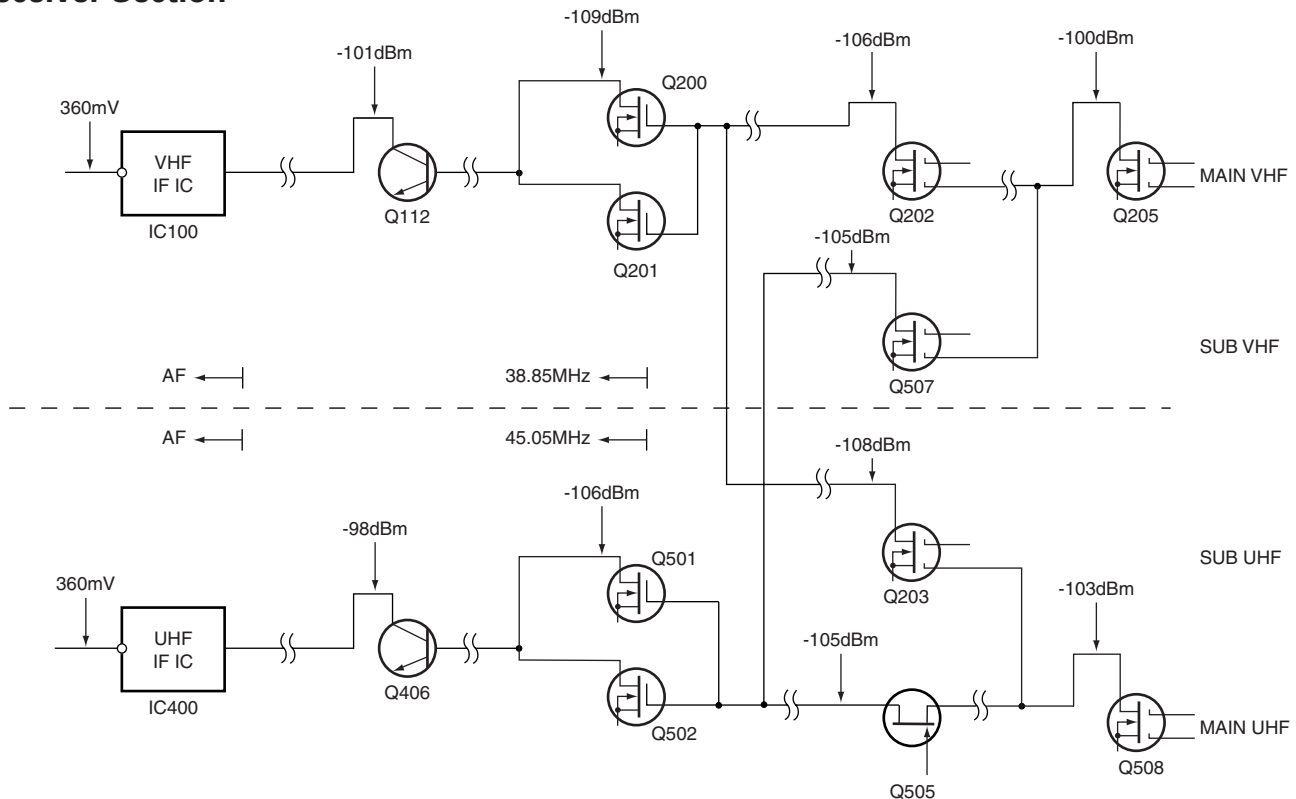
Note1: The 12dB SINAD levels were plotted using a standard signal generator through a 0.01μF ceramic capacitor at each point from the RF to the first IF.

Note2: The AF levels were measured with an AF voltmeter when the -73dBm (50μV) standard signal generator signal modulated by a 1kHz modulation frequency and a 3kHz deviation was received and the AF output was adjusted to 0.63V/8Ω by the AF VR.

OPTION
PG-4X (Extension cable kit)

PG-4X MAIN PARTS LIST

Ref. No	New Parts	Parts No.	Q'ty	Parts Name
1		E30-3199-15	1	DC CORD (6m)
2	∗	E30-7521-05	1	MODULAR CABLE (4m:MIC)
3		E30-3395-05	1	MODULAR CABLE (4m:PANEL)
4		E30-3399-05	1	TRUNK CABLE (4m:SP)
5		E58-0472-05	1	MODULAR JACK (6 PIN)
6		E58-0473-05	1	MODULAR JACK (8 PIN)
7		G13-0978-04	1	CUSHION
8		J19-1433-05	2	HOLDER
9		L79-1417-05	2	LINE FILTER
10		N99-2016-05	1	SCREW SET

TM-V708A

SPECIFICATIONS

Specifications are subject to change without notice due to advancements in technology.

General		VHF Band	UHF Band
Frequency range		144~148MHz	438~450MHz
Mode		F3E (FM)	
Antenna impedance		50Ω	
Usable temperature range		-20°C ~ +60°C (-4°F~ +140°F)	
Power supply		13.8V DC ±15%(11.7~15.8V)	
Grounding method		Negative ground	
Current	Transmit (max.)	11.5A or less	10.0A or less
	Receive (at 2W output)	1.0A or less	
Frequency stability(-10°C ~ +50°C)		Within ± 3ppm	
Dimensions	Main Body	140 x 40 x 195mm / 5.51" x 1.58" x 7.68"	
(W x H x D projections not included)	Panel	140 x 60 x 33.3mm / 5.51" x 2.36" x 1.31"	
Weight	Main Body	Approx.1.2kg / 2.6 lb	
	Panel	Approx.180g / 6.3oz	
Transmitter			
Power output	High	50W	35W
	Mid	Approx.10W	
	Low	Approx.5W	
Modulation		Reactance	
Spurious emissions		-60dB or less	
Maximum frequency deviation		± 5kHz	
Audio distortion (at 60% modulation)		3% or less	
Microphone impedance		600Ω	
Receiver			
Circuitry		Double conversion superheterodyne	
Intermediate frequency (1st/2nd)		38.85MHz/450kHz	45.05MHz/455kHz
Sensitivity	VHF or UHF band	0.16μV or less	
(12dB SINAD)	Sub VHF or UHF band (in VHF/VHF or UHF/UHF mode)	0.25μV or less	
Selectivity (-6dB)		12kHz or more	
Selectivity (-40dB)		28kHz or less	
Squelch sensitivity		0.1μV or less	
Audio output (8 ohms, 5%distortion)		2W or higher	
Audio output impedance		8Ω	

Note: Receiver specifications apply only when using the main VHF or UHF band. They do not apply to the sub VHF or UHF band in VHF/VHF or UHF/UHF mode.